



2022 Physical Education Standards of Learning Curriculum Framework

Adopted August 17, 2022 by the Virginia Board of Education

Daniel A. Gecker, President
Tammy Mann, Vice President
Grace Creasey
Pamela Davis-Vaught
Suparna Dutta
William Hansen
Anne B. Holton
Andy Rotherham
H. Alan Seibert

Superintendent of Public Instruction Jillian Balow

INTRODUCTION

The *Physical Education Standards of Learning for Virginia Public Schools* identify the academic content for the essential concepts, processes, and skills for physical education in kindergarten through grade twelve. These standards provide school divisions and teachers with a guide for creating aligned curricula and learning experiences in physical education to help students understand the benefits of achieving and maintaining a physically active lifestyle and learn the skills necessary for performing a variety of physical activities.

The 2022 *Physical Education Standards of Learning* support the Profile of a Virginia Graduate through the development and use of communication, collaboration, creativity, critical thinking and civic responsibility skills necessary to adopt and maintain human movement fundamental to optimizing health and performance, preventing injury, managing feelings, and building healthy relationships.

The *Physical Education Standards of Learning* and the proposed *Physical Education Standards of Learning Curriculum Framework* have been organized into strands to provide clarity for learning expectations and to provide learning progressions.

GOALS AND STRANDS

1. *Demonstrate competence in motor skills and movement patterns needed to perform a variety of physical activities. (Motor Skill Development)*

This strand focuses student learning on the development and demonstration of competence in motor skills and movement forms, increasing the likelihood of participation in physical activities. Students will have movement experiences that build competent and confident movers through acquisition, performance, and refinement of movement skills in developmental, tactical, and cooperative activities. Movement competence is defined as the development of sufficient skill and ability to ensure successful performance in physical activities. In the elementary years, students develop maturity and adaptability in the use of fundamental motor skills and patterns that are then further refined and combined during the middle school years. As motor patterns become more refined and proficient throughout the middle years, they can be transitioned into specialized skills and patterns and used in more complex learning settings. High school students will demonstrate a level of competence in several physical activities that they are likely to continue beyond graduation.

2. *Apply knowledge of the structures and functions of the body and how they relate to and are affected by human movement to learning and developing motor skills and specialized movement forms. (Anatomical Basis of Movement)*

This strand focuses student learning on understanding basic anatomy and physiology along with movement concepts and principles, to improve motor skills. While the skilled-movement goal involves learning how to perform physical activities skillfully, this goal directs students toward learning about movement. Concepts and principles from various fields of study support skillful movement performance. These fields of study include motor control, exercise physiology, and biomechanics/kinesiology. Active learning experiences will connect the anatomical content with activities being performed. Elementary students establish basic musculoskeletal vocabulary and use simple concepts as they develop their movements. Middle school students learn and apply more complex concepts of human movement. High school students develop a working knowledge of human anatomy and physiology concepts and principles, enabling them to independently apply concepts in order to acquire new skills or enhance existing skills.

3. *Achieve and maintain a health-enhancing level of personal fitness. (Fitness Planning)*

This strand focuses student learning on understanding the relationship between a health-enhancing level of physical fitness and the prevention of chronic disease. The intent is for students to explain the importance of fitness and active lifestyles, to be able to evaluate personal fitness levels, and to create an appropriate fitness plan with goals, activities, and timelines that will maintain and improve their levels of physical fitness. Recommended criterion-referenced wellness testing includes Progressive Aerobic Cardiovascular Endurance Run (PACER), cadence push-ups, cadence curl-ups, back-saver sit and reach, and trunk lift. Elementary students become aware of health-related fitness components (aerobic capacity, muscular strength and endurance, flexibility, and body composition), engage in physical activities, and develop a basic fitness plan. Middle school students continue to learn about the components of fitness: how they are developed and improved, how they interrelate, and how they contribute to overall fitness to develop and implement a personal fitness plan. High school students plan, implement, evaluate, and modify a personal, goal-driven fitness plan that enables them to achieve and maintain the level of fitness needed to meet their personal goals for various work-related, sport, and leisure activities.

4. *Demonstrate the aptitude, attitude, and skills to lead responsible, fulfilling, and respectful lives. (Social and Emotional Development)*

This strand focuses student learning on the skills and behaviors that lead to personal and group success in physical activity, both in school and in settings outside school. Students will explain and apply skills for communication, cooperation, conflict resolution, goal setting and attainment, critical and creative thinking, resilience, and self-directed learning. Students will explain and demonstrate the importance of and ability to be safe in activities. Students will understand that inclusion is a social and emotional experience associated with feelings of belonging, acceptance, and value that creates a supportive environment for all students. Elementary students recognize and use rules and procedures, focus on safety, respect similarities and dissimilarities, and cooperate with others. Middle school students participate cooperatively with others and understand reasons for rules and procedures. High school students initiate and exhibit responsible behaviors and positively affect the behaviors of others in physical activity settings inside and outside school.

5. *Explain the importance of energy balance and the nutritional needs of the body to maintain optimal health and prevent chronic disease. (Energy Balance)*

This strand focuses student learning on energy balance (nutrition and fitness concepts – functional fitness) and explains the importance of energy balance for physical health and chronic disease prevention. This includes physical activity guidelines, types of physical activity needed for energy balance, importance of physical activity, health-related components of fitness, nutrition guidelines, meal planning, screen time, and sleep. Elementary students understand the basic nutrition and fitness concepts of energy balance. The middle school student will extend learning of energy balance, including nutrition, fitness concepts, physical activity, health-related components of fitness, nutrition guidelines, meal planning, screen time, and sleep and will explain the connection to personal health and fitness. The high school student will explain the importance of energy balance and nutritional needs of the body to maintain optimal health and prevent chronic disease for the present and into the adult years.

The combination of these five strands leads students toward being able to lead an active, healthy lifestyle skillfully, knowledgeably, responsibly, and vigorously.

The proposed *2022 Physical Education Standards of Learning Curriculum Framework*, a companion document to the *2022 Physical Education Standards of Learning*, amplifies and supports the *Physical Education Standards of Learning* and further defines the content knowledge, skills, and understandings. The standards and *Curriculum Framework* are not intended to encompass the entire

curriculum for a given grade level or course. School divisions are encouraged to incorporate the standards and *Curriculum Framework* into a broader, locally designed or selected curriculum. The *Curriculum Framework* delineates in greater specificity the minimum content that all teachers should teach and all students should learn.

Each topic in the proposed 2022 *Physical Education Standards of Learning Curriculum Framework* is developed around the Standards of Learning. The format of the *Curriculum Framework* facilitates teacher planning by identifying the key concepts, knowledge, and skills that should be the focus of instruction for each standard. The *Curriculum Framework* is divided into two sections: Essential Understandings and Knowledge and Skills. The purpose of each section is explained below.

Essential Understandings

This section includes content and key concepts that help teachers plan instruction.

Essential Knowledge and Skills

This section provides an expansion of the physical education knowledge and skills that each student should know and be able to demonstrate. This is not meant to be an exhaustive list of student expectations. This section also includes resources to assist with locally designed or selected curriculum.

KINDERGARTEN

Participating in movement experiences to develop fundamental movement patterns is the primary focus of the kindergarten physical education curriculum. While children at this level vary in development across all movement skills, they should demonstrate continuous improvement in movement under very simple conditions. While developing fundamental skill patterns, students begin to learn key movement concepts that help them perform in educational games, dances, and gymnastics. Students are introduced to a few critical elements (i.e., small, isolated parts of the whole skill or movement). They learn how their bodies react to vigorous physical activity. Students learn to use safe practices, cooperate with and respect others, and follow classroom rules. Experiences in physical education help them develop a positive attitude for leading a healthy, active lifestyle.

Motor Skill Development

- K.1 The student will demonstrate progress toward the developmentally appropriate form of selected locomotor, non-locomotor, and manipulative skills to understand the various ways the body can move.
- a) Demonstrate and differentiate between walking, jogging, running, hopping, galloping, and jumping.
 - b) Demonstrate bending, pushing, pulling, turning, and balancing on one foot.
 - c) Demonstrate moving forward, sideways, and side to side.
 - d) Demonstrate moving at low, medium, and high levels.
 - e) Demonstrate traveling in straight, curving, and zigzagging pathways.
 - f) Demonstrate moving fast, slow, and at moderate speeds.
 - g) Demonstrate simple educational gymnastic skills, including one roll (narrow or curled).
 - h) Demonstrate at least two critical elements used in eye-hand coordination skills while stationary (e.g., bouncing and catching a ball, tossing, catching a ball/beanbag, volleying a balloon, tossing and rolling underhand to targets, and striking stationary objects with a long or short implement or noodle.)
 - i) Demonstrate at least two critical elements used in eye-foot coordination skills (e.g., dribbling [small taps], kicking a stationary ball).
 - j) Demonstrate moving to a beat and to rhythmic patterns using basic locomotor and non-locomotor rhythmic patterns in personal and general space.
 - k) Demonstrate jumping over a stationary rope and a self-turn single jump.

Essential Understandings	Essential Knowledge and Skills
<p>Movement competency involves a variety of movement forms.</p> <ul style="list-style-type: none"> • Locomotor skills: walking, jogging, running, hopping, galloping, and jumping. (K.1.a) • Non-locomotor skills that include bending, pushing, pulling, turning, and balancing on one foot. (K.1.b) • Moving and changing directions: forward, sideways, and side to side. (K.1.c) • Moving and changing levels: low, medium, and high. (K.1.d) • Moving and changing pathways: straight, curved, and zigzag. (K.1.e) • Moving and changing speeds: fast, slow, and moderate. (K.1.f) • Exploring body shapes and movements, including rolls (narrow or curled.) (K.1.g) • Manipulative skills, including bounce and catch, toss and catch, volleying with hand, tossing and rolling a ball underhand to target, and striking stationary objects with an implement. (K.1.h) • Manipulative skills, including dribbling with the foot/feet and kicking a stationary ball to a target, and jumping over a stationary and self-turn rope. (K.1.i, K.1.k) • Moving to beats and rhythmic patterns using instruments and music in personal and general space. (K.1.j) <p>There are basic critical elements associated with the performance of manipulative skills. (K.1.h, K.1.i)</p> <ul style="list-style-type: none"> • Bounce <ul style="list-style-type: none"> ○ Knees slightly bent; ○ Use finger pads; ○ Firm contact with top of ball; ○ Push straight down; 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • demonstrate locomotor skills in relation to self and various obstacles and equipment that may include moving under/over, on/off, in front/behind near/away, around, and alongside (K.1.a, K.1.c, K.1.d, K.1.e); • label pictures of walking, running, hopping, galloping, and jumping (K.1.a); • demonstrate different body shapes, such as letters of the alphabet, while bending, pushing, pulling, and turning while maintaining balance (K.1.b); • demonstrate locomotor skills while changing directions, levels, pathways, and speed (K.1.c, K.1.d, K.1.e, K.1.f); • demonstrate simple educational gymnastic skills, including rolls (i.e., log roll, pencil roll, egg roll) while maintaining balance (K.1.g); • demonstrate bouncing and catching a ball, individually or with a partner (K.1.h); • demonstrate tossing and catching to self, with partner, and/or to a stationary target (K.1.h); • demonstrate volleying a light weight ball/balloon up using two hands (K.1.h); • demonstrate tossing and rolling underhand to a partner and/or to a stationary target (K.1.h); • demonstrate striking off a tee or striking with

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ Waist-level height. • Catch from a bounce <ul style="list-style-type: none"> ○ Eyes on the ball; ○ Fingers apart; ○ Catch with hands only; no cradling against the body; ○ Make eye contact with the passer (catching a bounced ball from a passer); ○ Show hands (catching a bounced ball from the passer.) • Toss, underhand throw, underhand roll to a partner/target <ul style="list-style-type: none"> ○ Face and look at the target; ○ Swing throwing arm backward to begin a backward-forward arm (tick-tock) swing; ○ Step with opposite foot as tossing/throwing/rolling arm moves forward; ○ Point to the target and release ball between knee and waist level during upward swing for underhand throw; ○ Bend at hip and release ball under knee for underhand roll; ○ Follow through with hand pointing to the target with the palm facing upward. • Catch from throw <ul style="list-style-type: none"> ○ Watch the ball all the way into the hands; ○ Place body in the path of the object; ○ Extend arms outward to reach for ball; ○ Thumbs in for catch above the waist; ○ Thumbs out for catch at or below the waist; 	<ul style="list-style-type: none"> a bat using a suspended ball (K.1.h); • demonstrate dribbling in general space using different pathways (K.1.e, K.1.i); • demonstrate kicking/passing to a stationary target (K.1.i); • demonstrate rhythmic activities with manipulatives (e.g., parachutes, rhythm sticks) (K.1.j); • demonstrate movements with a partner, such as leading/following and mirroring/matching (K.1.j); • demonstrate jump rope skills using a line, stationary rope, and a self-turn single rope (K.1.k). <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OPEN Online Physical Education Network Health Smart Virginia PE Central Dynamic PE ASAP</p>

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ One foot slightly in front of the other (balanced stance); ○ Catch with hands only; no cradling against the body; ○ Pull the ball in to the body as the catch is made; ○ Relax and absorb the force of the object. • Volley <ul style="list-style-type: none"> ○ Watch the ball/balloon and face the target in preparation of volley; ○ Strike the ball/balloon with flat surface of hand; ○ Swing to strike low with palm; ○ Make contact with ball/balloon between knee and waist; ○ Push up to strike high using finger pads; ○ Follow through straight upward and toward target. • Strike stationary objects with long-handled implements <ul style="list-style-type: none"> ○ Non-dominant hand grips the bottom of the long-handled implement with dominant hand stacked above with knuckles in line with each other; ○ Side to target (non-throwing arm closest to target); ○ Knees slightly bent; ○ Eyes follow ball to center of striking implement from start to finish; ○ Step toward target with opposite foot; ○ Striking arm way back; ○ Weight transfer from back foot to front foot; ○ Rotate hips; ○ Wrist unlocks on follow-through for completion of striking action. • Strike stationary objects with short-handled implement <ul style="list-style-type: none"> ○ Shake hands with the paddle; 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ Firm grip and wrist; ○ Hit with a flat surface at center of paddle or racket; ○ Follow through toward target. • Dribble (foot) <ul style="list-style-type: none"> ○ Knees slightly bent; ○ Contact behind the center of a <i>partially deflated</i> ball with shoelaces, inside of the foot, or outside of foot; ○ Contact behind the center of the ball; ○ Ball stays close to feet/soft touches; ○ Ball moves forward with gentle taps; ○ Eyes looking forward; ○ Tap with both feet. • Kick toward a target <ul style="list-style-type: none"> ○ Focus eyes on stationary ball; ○ Step and plant the non-kicking foot beside the ball; ○ Pendulum swing with kicking leg; ○ Contact the ball with shoelaces (not toes); ○ Contact behind the center of the ball with the inside of the foot for balls that will stay on the ground (low-level kick); ○ Contact ball below the center of the ball with shoelaces for balls that will travel in air; ○ Kicking foot follows through in the direction of the kick with opposite arm stretched forward for balance. 	

Anatomical Basis of Movement

K.2 The student will identify basic structures of the body and basic spatial awareness concepts.

- a) Explain that the body has muscles and bones that help the body move.
- b) Identify that the heart is a special muscle that pumps blood throughout the body.
- c) Demonstrate the concept of personal and general space.

Essential Understandings	Essential Knowledge and Skills
<p>Parts of the body work together to help the body move.</p> <ul style="list-style-type: none"> • Muscles and bones work together to create movement. (K.2.a) • The heart is a muscle needed for all movement. (K.2.a) • The main role of the heart is to move blood throughout the body. (K.2.b) <p>Moving in personal space helps everyone be safer. (K.2.c)</p> <ul style="list-style-type: none"> • Performing isolated/stationary skills in personal space (with and without equipment) is important for safe play. • Maintaining personal space while moving throughout general space (with and without equipment) is important for safe play. 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • identify pictures of bones and muscles (K.2.a); • identify a picture of the heart (K.2.b); • identify where heart is located (K.2.b); • demonstrate moving safely (without touching others) when in personal space or when moving in general space (K.2.b); • compare heartbeat while stationary and moving (K.2.c); • identify picture of activities that make the heart beat faster (K.2.c); • demonstrate personal space during stationary skills/movements (K.2.c); • demonstrate personal space (away from others) while moving and performing skills (K.2.c). <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes</p>

Essential Understandings	Essential Knowledge and Skills
	OPEN Online Physical Education Network Health Smart Virginia PE Central Dynamic PE ASAP KidsHealth.org

Fitness Planning

K.3 The student will identify physical activities that promote fitness.

- a) Explain that physical activity helps the body become stronger.
- b) Identify physical activities that can be done at home, individually and with family and friends to keep the body healthy.
- c) Explain that moving faster makes the heart beat faster.
- d) Explain that fitness requires staying physically active.

Essential Understandings	Essential Knowledge and Skills
<p>Physical activity keeps the body healthy and can be done at home with friends and family. (K.3.a, K.3.b)</p> <ul style="list-style-type: none"> • Physical activity is any bodily movement that results in increased energy expenditure. • Physical activities help the body grow. • Physical activities can be done at school and at home. • Physical activity can be done with family and friends. <p>The faster the body moves, the faster the heart beats. (K.3.c)</p> <p>Fitness activities need to be done in order to stay physically active. (K.3.d)</p>	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • recognize that physical activity helps the body grow (K.3.a); • identify/draw pictures of physical activities that can be done at school and at home (K.3.b); • identify/draw pictures of physical activities that can be done with family and friends (K.3.b); • compare heartbeat while stationary and moving (K.3.c); • identify pictures of activities that make the heart beat faster (K.3.c); • explain the relationship between fitness and physical activity (K.3.d). <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OPEN Online Physical Education Network</p>

Essential Understandings	Essential Knowledge and Skills
	<p>Health Smart Virginia PE Central Dynamic PE ASAP KidsHealth.org American Heart Association</p>

Social and Emotional Development

K.4 The student will demonstrate appropriate behaviors and safe practices in physical activity settings.

- a) Demonstrate cooperative and safe behaviors during play.
- b) Identify three classroom (procedural) rules.

Essential Understandings	Essential Knowledge and Skills
<p>Safe participation is needed in all physical activity settings when participating alone or with others.</p> <ul style="list-style-type: none"> • Maintaining personal space while moving makes everyone feel safe. (K.4.a) • Following rules when playing with others keeps everyone safe. (K.4.b) 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • demonstrate how to follow safety rules (K.4.a); • demonstrate sharing space, sharing equipment, taking turns, and helping others (K.4.a); • identify three class safety rules (K.4.b). <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OPEN Online Physical Education Network Health Smart Virginia PE Central Dynamic PE ASAP EverFi KidsHealth.org</p>

Energy Balance

- K.5 The student will identify basic concepts of energy balance.
- a) Explain how food provides energy for the body.
 - b) Identify one fruit and one vegetable.
 - c) Explain that fruits and vegetables provide energy for the body.

Essential Understandings	Essential Knowledge and Skills
<p>Energy for the body comes from food.</p> <ul style="list-style-type: none"> • The body needs energy to move. (K.5.a) • Fruits and vegetables provide nutrients and vitamins to help the body grow and function. (K.5.c) <p>There are many types of fruits and vegetables that provide energy for the body. (K.5.b)</p> <ul style="list-style-type: none"> • Examples of vegetables include carrots, parsnips, radishes, onions, potatoes, pumpkins, peas, cucumbers, squash, asparagus, broccoli, lettuce. • Examples of fruits include apples, peaches, bananas, strawberries, grapes, watermelons, tomatoes, blueberries, raspberries. <p>Note: Include fruits and vegetables that may be more familiar to various cultures.</p>	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • identify what gives the body energy to move (K.5.a); • label/identify pictures of fruits and vegetables (K.5.b); • explain the relationship between fruits and vegetables and energy (K.5.c). <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OPEN Online Physical Education Network Health Smart Virginia PE Central American Heart Association KidsHealth.org MyPlate.gov</p>

GRADE ONE

Students in grade one refine locomotor skills and further develop fundamental non-locomotor and manipulative skills in educational games, dance, and gymnastics. They identify some critical elements (i.e., small, isolated parts of the whole skill) and start to practice applying them to improve movement skills. They continue to develop an understanding of key concepts and anatomical basis of movement principles and link these concepts and principles to their movement. Students explore and experiment with a range of movement experiences in environmental contexts, with the goal of becoming confident and competent movers. Students relate participation in vigorous physical activity to changes in the body, to enjoyment, and to improving their health and wellness. They further their understanding of the importance of physical activity and energy balance (nutrition) in their lives. As students increase their understanding of movement, they gain a deeper understanding of how the body moves. Students continue to develop socially as they work safely alone and in groups. The natural enjoyment of physical activity should be reinforced and complemented by educational games, dance, and gymnastic activities in which students learn and are successful.

Motor Skill Development

- 1.1 The student will demonstrate developmentally appropriate form and at least two correct critical elements (i.e., small, isolated parts of the whole skill or movement) of locomotor, non-locomotor, and manipulative skills.
 - a) Demonstrate critical elements used and distinguish between walking, jogging, running, galloping, leaping, skipping, and sliding.
 - b) Demonstrate non-locomotor skills of twisting, curling, bending, stretching, and balancing on different body parts.
 - c) Demonstrate forward, sideways, backward (slow), and side-to-side movement.
 - d) Demonstrate jogging, running, skipping, galloping, sliding and leaping using pathways (straight, curving, and zigzagging) and speeds (fast, slow, and moderate).
 - e) Demonstrate simple educational gymnastic skills, including balancing at different levels, two different rolls (narrow or curled), moving in two different directions, and transfer of weight.
 - f) Demonstrate developmentally appropriate form with at least two critical elements used in eye-hand coordination skills while stationary and moving (e.g., dribbling a ball with the hand, underhand tossing and catching a ball/beanbag to self and with a partner, throwing and rolling underhand to targets, volleying a balloon upward with various body parts, volleying a balloon in the air with a short implement or noodle, striking a stationary object with the hand or with a short-handled implement or noodle.)

- g) Demonstrate developmentally appropriate form with at least two critical elements used in eye-foot coordination skills (e.g., dribbling a ball, kicking a moving or stationary ball to a target.)
- h) Perform a teacher-led rhythmic pattern or dance in personal space and general space.
- i) Demonstrate consecutive jumps (more than one) with a short rope (self-turn), long rope (student-turn), and forward, backward, zigzag, hopping, and leaping over a stationary rope.

Essential Understandings	Essential Knowledge and Skills
<p>Skilled movements can be broken down into smaller parts/critical elements. Movement proficiency can be improved by performing critical elements of locomotor skills, including walking, jogging, running, galloping, leaping, skipping, and sliding. (1.1.a)</p> <ul style="list-style-type: none"> • Walking <ul style="list-style-type: none"> ○ Toes pointed in direction of movement; ○ Upright torso; ○ Arms move in opposition of legs; ○ No flight phase (one foot is always in contact with the ground.) • Jogging/Running <ul style="list-style-type: none"> ○ Look ahead and not at feet during movement; ○ Bend knees at right angles during recovery phase; ○ Arms bent at elbows; ○ Arms drive forward and backward in opposition of legs; ○ Foot lands heel to toe; ○ Flight phase present between steps; ○ Travel at a steady, gentle pace when jogging. • Galloping <ul style="list-style-type: none"> ○ Eyes facing direction of movement; ○ Establish lead leg with both feet facing forward; 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • label pictures of people galloping, leaping, skipping, and sliding (1.1.a); • demonstrate at least two critical elements for locomotor skills (walking, jogging, running, galloping, leaping, skipping, and sliding) (1.1.a); • demonstrate twisting, curling, bending, stretching, and balancing on different body parts (1.1.b); • demonstrate moving and changing directions and speed (1.1.c,1.1.d); • demonstrate balancing at different levels, rolls (narrow or curled), moving in different directions, and movements that involve transfer of weight (e.g., donkey kick) (1.1.e); • demonstrate at least two critical elements for dribbling a ball with the hand, underhand tossing and catching a ball/beanbag to self and with a partner, throwing and rolling underhand to targets, volleying a balloon

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ Start with lead leg moving in direction of movement; ○ Trail leg pointed in direction of movement and does not pass lead leg; ○ Turn shoulders and hips in direction of movement. • Leaping <ul style="list-style-type: none"> ○ Look ahead; ○ Flight from one foot to the other; ○ Take off on one foot; ○ Land on the other foot; ○ Straight legs during flight; ○ Arms move in opposition; ○ Controlled and balanced landing. • Skipping <ul style="list-style-type: none"> ○ Look ahead and step forward and hop on the same foot; ○ Repeat with the other foot and move in an alternating step-hop pattern; ○ Lift knee sharply upward; ○ Swing arms in opposition to feet; ○ Maintain balance. • Sliding <ul style="list-style-type: none"> ○ Establish lead leg; ○ Trail leg stays behind; ○ Legs open then close; ○ Rhythmic arm movements; ○ Keep body sideways; ○ Look in direction of movement. 	<p>upward with various body parts, volleying a balloon in the air with a short implement or noodle, striking a stationary object with the hand or with a short-handled implement or noodle (1.1.f);</p> <ul style="list-style-type: none"> • demonstrate at least two critical elements for eye-foot coordination skills (dribbling and kicking) while moving in low organized games (1.1.g); • demonstrate moving to a beat or rhythmic pattern in personal and general space (1.1.h); • perform a teacher-led dance sequence (1.1.h); • demonstrate consecutive jumps with a self-turn rope and student-turned long rope (1.1.i); • demonstrate hopping and leaping over a stationary rope (1.1.i). <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OPEN Online Physical Education Network Health Smart Virginia PE Central Dynamic PE ASAP</p>

Essential Understandings	Essential Knowledge and Skills
<p>Movement competency involves a variety of non-locomotor skills, movement forms, directions, and speeds in personal and general space. (1.1.b, 1.1.c, 1.1.d)</p> <p>Movement proficiency includes maintaining balance in a variety of movements, including balancing at different levels, rolls (narrow or curled) moving in different directions, and movements that involve transfer of weight (e.g., donkey kick.) (1.1.e)</p> <p>Developmentally appropriate form includes performance of at least two critical elements. Developmentally appropriate form for eye-hand coordination manipulative skills include dribbling a ball with the hand, underhand tossing and catching a ball/beanbag with self and with a partner, throwing and rolling underhand to targets, volleying a balloon upward with various body parts, volleying a balloon in the air with a short implement or noodle, striking a stationary object with the hand or with a short-handled implement or noodle. (1.1.f)</p> <ul style="list-style-type: none"> • Dribbling with hands <ul style="list-style-type: none"> ○ Knees slightly bent/opposite foot forward when dribbling in self space; ○ Use finger pads and not the palm of the hand; ○ Firm contact with top of ball using wrist flexion to push (not strike) the ball to the floor; ○ Look in space ahead and not down at the ball; ○ Waist-height bounce; ○ Keep the ball close to dribbling hand side of the body. • Toss, underhand throw, underhand roll to partner/target 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ Face and look at the target; ○ Swing throwing arm backward to begin a backward-forward arm (tick-tock) swing; ○ Step with opposite foot as tossing/throwing/rolling arm moves forward; ○ Point to the target and release ball between knee and waist level during upward swing for underhand throw; ○ Bend at hip and release ball under knee for underhand roll; ○ Follow through with hand pointing to the target with the palm facing upward. • Volley <ul style="list-style-type: none"> ○ Watch the ball/balloon; ○ Strike the ball/balloon with flat surface; ○ Swing to strike low with palm; ○ Push up to strike high using finger pads; ○ Follow through upward. • Strike stationary objects with long-handled implements <ul style="list-style-type: none"> ○ Non-dominant hand grips the bottom of the long-handled implement with dominant hand stacked above with knuckles in line with each other; ○ Side to target (non-throwing arm closest to target); ○ Knees slightly bent; ○ Eyes follow ball to center of striking implement from start to finish; ○ Step toward target with opposite foot; ○ Striking arm way back; ○ Weight transfer from back foot to front foot; 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ Rotate hips; ○ Wrist unlocks on follow-through for completion of striking action. <ul style="list-style-type: none"> • Strike stationary objects with short-handled implement <ul style="list-style-type: none"> ○ Shake hands with the paddle; ○ Firm grip and wrist; ○ Hit with a flat surface at center of paddle or racket; ○ Follow through toward target. <p>Developmentally appropriate skills include the ability to perform of at least two critical elements proficiently. Developmentally appropriate performance for eye-foot coordination manipulative skills include dribbling a ball with feet and kicking a moving or stationary ball to a target. (1.1.g)</p> <ul style="list-style-type: none"> • Dribble (foot) <ul style="list-style-type: none"> ○ Knees slightly bent; ○ Push the center of the ball with shoelaces, inside of the foot, or outside of foot; ○ Contact behind the center of the ball; ○ Ball stays close to feet/soft touches; ○ Tap with both feet to move ball forward; ○ Head up, eyes looking forward using peripheral vision to see the ball; ○ Stay light on your feet with weight on toes. • Kick toward a target <ul style="list-style-type: none"> ○ Eyes focused on ball throughout kick; ○ Contact the ball with shoelaces (not toes); ○ Contact behind the center of the ball for low-level kick; ○ Contact ball below the center of the ball for travel in air; 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ Non-kicking foot beside the ball; ○ Forward and sideward swing of arm opposite kicking leg; ○ Hips and shoulders rotate forward; ○ Kicking foot follows through toward target area. <p>Movement involves patterns. Patterns include a beat or rhythmic pattern. (1.1.h)</p> <p>Jumping rope promotes cardiorespiratory endurance, strengthening the heart muscle, and motor coordination. Jumping rope can include consecutive jumps (more than one) with a self-turn rope or a long rope (student-turned), and leaping, hopping, and jumping over a stationary rope in multiple directions. (1.1.i)</p>	

Anatomical Basis of Movement

- 1.2 The student will identify basic anatomical structures and basic spatial awareness concepts.
- a) Identify where the brain is located.
 - b) Explain that muscles attach to bones to help the body move.
 - c) Describe how the heart and lungs work together to keep the body moving.
 - d) Explain that the heart is a muscle that grows stronger with movement.
 - e) Demonstrate the appropriate use of personal and general space.

Essential Understandings	Essential Knowledge and Skills
<p>Movement involves many body parts working together.</p> <ul style="list-style-type: none"> • The brain controls thoughts, memory, speech and movement, and is located in the head and protected by the skull. (1.2.a) • Muscles attach to two bones to help move a joint. (1.2.b) • Two lungs in your chest take in oxygen from the air to pass into the heart. The heart pumps oxygen in the blood to every cell in the body needed for movement. (1.2.c) <p>The heart is a muscle that needs exercise/movement like all other muscles. The heart grows stronger with exercise/movement. (1.2.d)</p> <p>Performing isolated/stationary skills in personal space and keeping personal space while moving (with and without equipment) is important for safe play. (1.1.e)</p>	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • identify a picture of the brain and show where it is located (1.2.a); • identify that muscles are attached to two bones to move a joint (1.2.b); • identify the path of air and oxygen from lungs to heart to blood to the body (1.2.c); • identify/draw pictures of activities that help the heart grow stronger (1.2.d); • describe why the heart beats faster during exercise (1.2.d); • demonstrate isolated/stationary skills in personal space and maintain personal space while moving (with and without equipment) (1.2.e). <p>Additional Resources: SHAPE America National Standards and Grade-Level Outcomes</p>

Essential Understandings	Essential Knowledge and Skills
	OPEN Online Physical Education Network Health Smart Virginia PE Central Dynamic PE ASAP KidsHealth.org

Fitness Planning

- 1.3 The student will identify changes in the body that occur during moderate to vigorous physical activity.
- a) Identify physical activities to do at home, individually, and with others, to help the body move and grow.
 - b) Identify one cardiorespiratory activity that increases heart and breathing rates to make the heart stronger.
 - c) Identify and demonstrate physical activity at two or more intensity levels that increase heart rate and breathing.

Essential Understandings	Essential Knowledge and Skills
<p>Physical activity keeps the body healthy and makes the heart stronger.</p> <ul style="list-style-type: none"> • Home activities may include walking, biking, skating, jumping rope, running, and exercises (e.g., push-ups, curl-ups, jumping jacks.) (1.3.a) <p>Activities such as running, jumping rope and biking increase the heart rate and breathing rates. (1.3.b)</p> <p>Intensity: how hard a person is working during an activity. (1.3.c)</p> <ul style="list-style-type: none"> • Intensity level examples: <ul style="list-style-type: none"> ○ Intensity Level 1 – Standing ○ Intensity Level 2 – Slow, such as walking ○ Intensity Level 3 – Medium, such as skipping, galloping ○ Intensity Level 4 – Fast, such as jogging/running ○ Intensity Level 5 – Sprinting 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • select/draw pictures of physical activities that can be done at home (1.3.a); • select/draw pictures of activities that increase heart rate and breathing rates (1.3.b); • demonstrate activities that increase heart rate and breathing rates (1.3.b, 1.3.c); • participate in a variety of stations that vary in intensity levels (1.3.c). <p>Additional Resources: SHAPE America National Standards and Grade-Level Outcomes OPEN Online Physical Education Network Health Smart Virginia PE Central Dynamic PE ASAP KidsHealth.org American Heart Association</p>

Social and Emotional Development

- 1.4 The student will demonstrate basic knowledge and skills for safe and cooperative play, individually and with others, without reminders from the teacher.
- a) Work cooperatively with peers and demonstrate safe equipment use when working individually or with peers.
 - b) Demonstrate safety rules for physical activities.
 - c) Demonstrate the safe and respectful use of space.
 - d) Participate in developing classroom (procedural) rules that promote relationship skills and support a positive and safe learning environment during physical activity.
 - e) Demonstrate the use of self-management skills to control emotions during physical activity.
 - f) Explain that physical activity helps improve mood and brain function for learning.
 - g) Participate in activities that are constructed to support inclusion.

Essential Understandings	Essential Knowledge and Skills
<p>Class rules, procedures, and cooperating with others helps to ensure a safe learning and playing environment.</p> <ul style="list-style-type: none"> • Cooperation includes encouraging others, sharing, showing concern, and working together. (1.4.a) • Safety rules for activity include specifics for different equipment (distribution, use, and collection) and ways to move during activity. (1.4.a, 1.4.b) • Safe use of space includes boundaries and moving in personal and general space. (1.4.c) • Classroom rules may include how to enter class, follow directions, exit class, and how to participate safely in emergency drills. (1.4.d) • Self-management during physical activity includes control of the body for safety and emotions for enjoyment. (1.4.e) • Regular exercise helps a person’s brain process information and manage emotions more easily. (1.4.f) • Activities support inclusion when students feel accepted, valued, and a 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • demonstrate cooperative skills (1.4.a); • demonstrate safe equipment use (1.4.a); • name and demonstrate activity safety rules (1.4.b); • name and demonstrate safe use of indoor and outdoor space (1.4.c); • name/select/draw pictures of class rules (1.4.d); • demonstrate the ability to transition from one activity to another (1.4.e); • list and demonstrate calming activities that may include mindfulness practices (1.4.f); • demonstrate the ability to participate safely in group activities with peer-selected and

Essential Understandings	Essential Knowledge and Skills
<p>sense of belonging. (1.4.g)</p>	<p>teacher-selected groups (1.4.g).</p> <p>Additional Resources: SHAPE America National Standards and Grade-Level Outcomes OPEN Online Physical Education Network Health Smart Virginia PE Central Dynamic PE ASAP EverFi KidsHealth.org</p>

Energy Balance

- 1.5 The student will identify basic nutrition concepts of energy balance.
- a) Name the food groups as identified by the U.S. Department of Agriculture (USDA).
 - b) Name one food from each (USDA) food group.
 - c) Explain why the body needs water.
 - d) Explain that food provides energy for physical activity.

Essential Understandings	Essential Knowledge and Skills
<p>There are five USDA food groups. The groups are fruits, vegetables, protein, grains, and dairy. (1.5.a)</p> <p>There are many types of fruits, vegetables, protein, grains, and dairy that provide energy for the body. (1.5.b)</p> <ul style="list-style-type: none"> • Examples of fruits include apples, peaches, bananas, strawberries, grapes, watermelons, tomatoes, blueberries, and raspberries. • Examples of vegetables include carrots, parsnips, radishes, onions, potatoes, pumpkins, peas, cucumbers, squash, asparagus, broccoli, and lettuce. • Examples of protein include beef, chicken, pork, turkey, fish, nuts, and eggs. • Examples of grains include bread, bagels, rice, pasta, oatmeal, cereal, and crackers. • Examples of dairy include milk, yogurt, and cheese. <p>Note: Include foods that may be more familiar to various cultures.</p> <p>Water is essential for good health. (1.5.c)</p> <ul style="list-style-type: none"> • Water helps keep the body temperature normal, aides in digestion, and helps get rid of waste. 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • list the USDA food groups (1.5.a); • match pictures of foods to the corresponding USDA food group (1.5.b); • list an example of a food from each of the USDA food groups (1.5.b); • explain why the body needs water (1.5.c); • identify what gives the body energy to move (1.5.d). <p>Additional Resources: SHAPE America National Standards and Grade-Level Outcomes OPEN Online Physical Education Network Health Smart Virginia PE Central American Heart Association KidsHealth.org MyPlate.gov</p>

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<ul style="list-style-type: none">• Water is also the main ingredient in perspiration or sweat. <p>The food we consume provides energy for the body to move and be physically active. (1.5.d)</p>	
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GRADE TWO

Students in grade two focus on correct movement patterns, not on traditional games, while participating in movement experiences to develop fundamental motor skills and patterns. Students identify some critical elements (i.e., small, isolated parts of the whole skill or movement) and apply them in their movement. They vary movement patterns and begin to combine skills in educational game, dance, and gymnastic activities. Students’ progress in skill development and in understanding key elements of fundamental movement skills, including movement concepts, major muscles and bones, health-related fitness concepts, energy balance concepts, and the benefits of physical activity. Students work cooperatively and responsibly in groups and begin to build skills to meet movement challenges. They participate in physical activities at school and identify opportunities to participate in regular physical activity outside school.

Motor Skill Development

- 2.1 The student will demonstrate developmentally appropriate form using at least two critical elements or all correct critical elements of locomotor, non-locomotor, and manipulative skills.
- a) Demonstrate developmentally appropriate form for jogging, running, skipping, galloping, sliding, hopping, jumping, and leaping.
 - b) Demonstrate a simple educational gymnastic sequence, including balance, roll, transfer of weight from feet to hands, and jumping and landing horizontally (distance) and vertically.
 - c) Demonstrate at least two critical elements of eye-hand coordination skills for dribbling with the dominant/preferred hand while walking, overhand throwing, underhand throwing and catching individually and with a partner, underhand throwing and rolling to a target, and consecutive upward volleying with hand(s), with a short/long-handled implement or noodle and striking/batting a ball off a tee using hard and soft force with control.
 - d) Demonstrate at least two critical elements of eye-foot coordination skills while kicking a moving ball, foot dribbling with control while walking to open spaces, and kicking/passing to a partner or a stationary target.
 - e) Demonstrate moving to a rhythm by performing basic dance sequences (teacher- or student-led dances).
 - f) Demonstrate at least two critical elements for jumping forward and backward with a short rope (self-turn) and jumping with long rope (student-turn).

Essential Understandings	Essential Knowledge and Skills
Skilled movements can be broken down into smaller parts/critical elements.	In order to meet these standards, it is expected that

Essential Understandings	Essential Knowledge and Skills
<p>Movement proficiency can be improved by performing the critical elements of locomotor skills. (2.1.a)</p> <ul style="list-style-type: none"> • Jogging/Running <ul style="list-style-type: none"> ○ Look ahead and not at feet during movement; ○ Bend knees at right angles during recovery phase; ○ Arms bent at elbows; ○ Arms drive forward and backward in opposition of legs; ○ Foot lands heel to toe; ○ Flight phase present between steps; ○ Travel at a steady, gentle pace when jogging. • Skipping <ul style="list-style-type: none"> ○ Look ahead and step forward and hop on the same foot; ○ Repeat with the other foot and move in an alternating step-hop pattern; ○ Lift knee sharply upward; ○ Swing arms in opposition to feet; ○ Maintain balance. • Galloping <ul style="list-style-type: none"> ○ Eyes facing direction of movement; ○ Establish lead leg with both feet facing forward; ○ Start with lead leg moving in direction of movement; ○ Trail leg pointed in direction of movement and does not pass lead leg; ○ Turn shoulders and hips in direction of movement. • Sliding <ul style="list-style-type: none"> ○ Establish lead leg, knees slightly bent, weight on balls of feet; 	<p>students will</p> <ul style="list-style-type: none"> • demonstrate critical elements for jogging, running, skipping, galloping, sliding, hopping, jumping, and leaping (2.1.a); • identify differences between jogging and running (2.1.a); • identify differences between skipping and galloping (2.1.a); • demonstrate an educational gymnastics sequence that includes a balance, roll, transfer of weight from feet to hands, and flight movement (2.1.b); • demonstrate two or more critical elements for dribbling with the dominant/preferred hand while walking, overhand throwing, underhand throwing and catching individually and with a partner, underhand throwing and rolling to a target, and consecutive upward volleying with hand(s), with a short/long-handled implement or noodle and striking/batting a ball off a tee using hard and soft force with control (2.1.c); • explain the difference between and effects of hard and soft force (2.1.c); • demonstrate at least two critical elements while kicking a moving ball (2.1.d); • demonstrate at least two critical elements when dribbling with feet while traveling in

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ Look in direction of movement; ○ Lead foot slides sideways and other foot moves quickly to lead foot; ○ Weight shifts sideways as legs open then close; ○ Rhythmic arm movements; arms forward for balance. <ul style="list-style-type: none"> • Hopping <ul style="list-style-type: none"> ○ Take off on one foot; ○ Arms extend upward for lift; ○ Land on same foot; ○ Hold opposite knee at 90-degree angle; ○ Knee and ankle flex upon contact with floor to maintain balance. • Jumping <ul style="list-style-type: none"> ○ Focus eyes ahead; ○ Bend knees in preparatory phase with feet shoulder-width apart; ○ Bend at waist in preparatory phase; ○ Swing arms in full backward-forward motion; ○ Take off on two feet; ○ Explode up and forward; ○ Extend body in flight phase; ○ Land on two feet heels contact first; ○ Soft landing/bend knees when landing. <p>Jogging and running are physical activities that make the heart stronger. (2.1.a)</p> <ul style="list-style-type: none"> • Jogging is low to moderate intensity at low speed. Knees may not come up as high when jogging and arms do not swing as much. • Running is done at moderate to vigorous intensity and higher speed. Knees come up higher and arms swing more to build momentum and 	<p>space (2.1.d);</p> <ul style="list-style-type: none"> • demonstrate at least two critical elements while passing a ball to a target/partner (2.1.d); • demonstrate rhythm in a teacher- or student-led basic dance sequence (2.1.e); • demonstrate consecutive jumps with self-turn rope and consecutive jumps with a long rope (student-turn) (2.1.f); • demonstrate critical elements for jumping forward and backward with a self-turn short rope (2.1.f); • demonstrate critical elements for jumping with a student-turn long rope (2.1.f). <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OPEN Online Physical Education Network Health Smart Virginia PE Central Dynamic PE ASAP</p>

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Essential Understandings	Essential Knowledge and Skills
<p>speed.</p> <p>Movement proficiency includes maintaining balance in a variety of movements during an educational gymnastics sequence, including rolling, transferring of weight from feet to hands, and flight. (2.1.b)</p> <p>Manipulative skills can be broken down into smaller parts/critical elements to improve proficiency. Approaching developmentally appropriate form in eye-hand and eye-foot coordination skills includes performance of two or more critical elements. (2.1.c, 2.1.d)</p> <ul style="list-style-type: none"> • Dribble with hands while walking <ul style="list-style-type: none"> ○ Head up looking for open space; ○ Pads of fingers contact top of ball; ○ Firm and flexible wrist as hand pushes ball to floor; ○ Hand absorbs ball slightly on return; ○ Waist-height bounce; ○ Ball slightly in front of body; ○ Knees bent slightly with dribbling arm close to the body. • Overhand throw <ul style="list-style-type: none"> ○ Non-throwing shoulder toward target; ○ Step to target with opposite foot; ○ Throwing arm raised in backswing; ○ Rotate hips during throw; ○ Weight shifts from back to front foot; ○ Throwing arm follows through to target with wrist to opposite knee. • Catch from underhand throw 	

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Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ Watch the ball all the way into the hands; ○ Arms in front of body, elbows flexed; ○ Place body in the path of the object; ○ Arms extend to reach for ball; ○ Thumbs in for catch above the waist; ○ Thumbs out for catch at or below the waist; ○ One foot slightly in front of the other (balanced stance); ○ Catch with hands only; no cradling against the body; ○ Pull the ball in to the body as the catch is made; ○ Relax and absorb the force of the object. • Toss, underhand throw, underhand roll to partner/target <ul style="list-style-type: none"> ○ Face the target; ○ Eye on target; ○ Use a backward-forward arm swing (tick-tock swing); ○ Step with opposite foot as tossing/throwing/rolling arm moves forward; ○ Release ball between knee and waist level during upward swing for throw; ○ Bend at hip (roll); ○ Release ball under knee for roll; ○ Follow through with hand pointing to the target. • Volley with hand <ul style="list-style-type: none"> ○ Shoulders facing target; ○ One foot slightly ahead of other; ○ Tick-tock swing movement with volleying hand; ○ Contact ball with palm; 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ Contact occurs at waist level; ○ Follow through upward; ○ Track the ball with eyes; ○ Move body into position for next contact; ○ Continuous volley. • Strike stationary objects with long-handled implements <ul style="list-style-type: none"> ○ Non-dominant hand grips the bottom of the long-handled implement with dominant hand stacked above with knuckles in line with each other; ○ Side to target (non-throwing arm closest to target); ○ Knees slightly bent; ○ Eyes follow ball to center of striking implement from start to finish; ○ Step toward target with opposite foot; ○ Striking arm way back; ○ Weight transfer from back foot to front foot; ○ Rotate hips; ○ Wrist unlocks on follow-through for completion of striking action. • Strike stationary objects with short-handled implement <ul style="list-style-type: none"> ○ Shake hands with the paddle; ○ Firm grip and wrist; ○ Hit with a flat surface at center of paddle or racket; ○ Follow through toward target. • Kick toward a target <ul style="list-style-type: none"> ○ Eyes focused on ball throughout kick; ○ Contact the ball with shoelaces (not toes); 	

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Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ Contact behind the center of the ball for low-level kick; ○ Contact ball below the center of the ball for travel in air; ○ Non-kicking foot plants beside the ball; ○ Forward and sideward swing of arm opposite kicking leg; ○ Hips and shoulders rotate forward; ○ Kicking foot follows through toward target area. <ul style="list-style-type: none"> • Dribble (foot) <ul style="list-style-type: none"> ○ Knees slightly bent; ○ Push the center of the ball with shoelaces, inside of the foot, or outside of foot; ○ Contact behind the center of the ball; ○ Ball stays close to feet/soft touches; ○ Tap with both feet to move ball forward; ○ Head up, eyes looking forward, using peripheral vision to see the ball; ○ Stay light on your feet with weight on toes. • Passing to a partner <ul style="list-style-type: none"> ○ Non-kicking foot beside the ball; ○ Use inside of foot; ○ Step to the target; ○ Contact behind the center of the ball; ○ Firm and controlled pass; ○ Follow through toward target. <p>Force is strength or energy exerted. (2.1.c)</p> <ul style="list-style-type: none"> • Using increased force (hard) with manipulatives may include throwing for a farther distance or striking harder to make the ball go farther. 	

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Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Using decreased force (soft) with manipulatives may include throwing easier over a shorter distance or to improve accuracy to a target. • Control includes ability to use more or less force as needed for intended target or outcome. <p>Movement competency involves patterns. (2.1.e)</p> <ul style="list-style-type: none"> • Basic dance sequences that are teacher- or student-led. • Moving to a beat or rhythmic pattern in personal and general space. <p>Jumping rope helps with cardiorespiratory endurance, strengthening the heart, and helps with coordination. Progression toward developmentally appropriate form helps with jumping efficiency. (2.1.f)</p> <ul style="list-style-type: none"> • Critical elements of jumping forward and backward with a short rope (self-turn) include <ul style="list-style-type: none"> ○ Elbows close to body; ○ Loose grip on handles; ○ Wrists move in small circles; ○ Bend knees; ○ Quiet feet when landing; ○ Jump on balls of the feet; ○ Jump to a rhythm. • Critical elements of jumping forward and backward with a long rope (student-turn) include <ul style="list-style-type: none"> ○ Face the turner; ○ Watch rope; ○ Small jumps; ○ Bend knees; 	

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Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none">○ Quiet feet during landing;○ Jump on balls of the feet;○ Keep the rhythm.	

Anatomical Basis of Movement

- 2.2 The student will identify major musculoskeletal structures and the cardiorespiratory system and explain the importance of spatial awareness while moving.
- a) Describe the concept of relationships (e.g., over, under, around, in front of, behind, through) in dynamic movement situations.
 - b) Explain the importance of spatial awareness (personal and general space) in static and dynamic movement situations.
 - c) Explain that the brain sends messages to the body through the spinal cord for movement and other activities.
 - d) Identify major muscles, including the quadriceps, biceps, abdominals, and heart.
 - e) Explain that muscles contract (tense or tighten) to keep the body in a balanced position.
 - f) Identify major bones, including the skull, ribs, and spine.
 - g) Identify the major structures of the cardiorespiratory system (heart and lungs).

Essential Understandings	Essential Knowledge and Skills
<p>Spatial awareness is knowing where the body is in space in relation to objects and other people.</p> <ul style="list-style-type: none"> • Spatial concepts include over, under, on, in, around, in front of, behind, and through. (2.2.a) • The ability to move without touching other people or objects (static) and change movements as people or objects change position (dynamic) is important for safety and participation in physical activities. (2.2.b) <p>The brain is the communication center for the body and sends messages to the body for movement. Muscles and bones work together for physical movement.</p> <ul style="list-style-type: none"> • The brain sends messages through nerves in the spinal cord to the body to move. (2.2.c) • Major muscles include the quadriceps, biceps, abdominals, and heart. (2.2.d) • Muscles contract to keep the body in a balanced position. (2.2.e) 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • identify spatial relationships (2.2.a); • state/identify that moving with others and objects is important for safety and for participation in activities (2.2.b); • identify the function of the brain for movement as sending signals/messages through the spinal cord to the rest of the body (2.2.c); • identify pictures of the quadriceps, biceps, abdominals, and heart, and where the muscles are located on the body (2.2.d); • identify a function of muscles while balancing (2.2.e);

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Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Major bones include the skull, ribs, and spine. (2.2.f) Note: additional bones and muscles may be included. <p>The cardiorespiratory system includes the heart and lungs. (2.2.g)</p>	<ul style="list-style-type: none"> • identify pictures of the skull, ribs, and spine and where the bones are located on the body (2.2.f); • identify pictures of the lungs and where they are located on the body (2.2.g); • describe that the cardiorespiratory system is the heart and lungs working together to get oxygen to the body (2.2.g). <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OPEN Online Physical Education Network Health Smart Virginia PE Central Dynamic PE ASAP KidsHealth.org</p>

Fitness Planning

- 2.3 The student will describe the components of fitness and identify physical activities that promote aerobic capacity, muscular strength, endurance, flexibility, and body composition.
- a) Describe muscular strength as important in lifting/moving heavy objects.
 - b) Describe muscular endurance as important in moving throughout the day.
 - c) Describe flexibility as important in moving in many directions.
 - d) Describe cardiorespiratory endurance as important for maintaining a healthy heart and lungs.
 - e) Describe body composition as the components that make up a person’s body weight (percentages of fat, bone, water, and muscle in the human body).
 - f) Identify one activity to promote each component of fitness (i.e., cardiorespiratory endurance, muscular strength, muscular endurance, flexibility, and body composition).
 - g) Identify opportunities to participate in regular physical activity inside and outside school, individually and with others.
 - h) Identify and demonstrate three different physical activities that increase heart rate and breathing.

Essential Understandings	Essential Knowledge and Skills
<p>Physical activities are needed for physical fitness. Muscular strength, muscular endurance, flexibility, and cardiorespiratory endurance are important for daily activities and for good health.</p> <ul style="list-style-type: none"> • Muscular strength is the maximum force that muscles can exert in a single effort, including rising from a chair and lifting /moving heavy objects. (2.3.a) • Muscular endurance is the ability to sustain or repeat muscular activity, including running, biking, and walking, over a long period of time. (2.3.b) • Flexibility is range of motion of muscles at the joint and is important in moving in many directions, including bending and reaching. (2.3.c) <p>The heart is a muscle that gets stronger with physical activity. (2.3.d)</p> <ul style="list-style-type: none"> • Cardiorespiratory endurance (taking in oxygen and using it throughout the body for energy for movement over sustained activity) is important 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • describe muscular strength (2.3.a); • describe muscular endurance (2.3.b); • describe flexibility (2.3.c); • describe cardiorespiratory endurance (2.3.d); • describe body composition (2.3.e); • list/identify one activity for each component of fitness and body composition (2.3.f); • list/identify physical activities that can be done inside and outside school individually and with others (2.3.g); • identify and demonstrate three physical activities and increase heart rate and

Essential Understandings	Essential Knowledge and Skills
<p>for maintaining a healthy heart.</p> <p>Body composition is the components that make up a person’s body weight (percentages of fat, bone, water, and muscle in the human body.) (2.3.e)</p> <p>Improving muscular strength and endurance, flexibility, and cardiorespiratory endurance will also improve body composition. (2.3.e)</p> <p>Activities to promote/improve fitness include (2.3.f, 2.3.h)</p> <ul style="list-style-type: none"> • cardiorespiratory endurance – biking, walking, running, dance; • muscular strength – resistance activities (bands, weights), dance; • muscular (strength) endurance - plank, push-ups, curl-ups, burpees; • flexibility – stretching activities such as yoga; • body composition – whole-body activities such as burpees, jumping rope. <p>Physical activity should be done daily (60 minutes each day), including activities inside and outside school.</p> <ul style="list-style-type: none"> • Activities outside school may include biking, walking, running, dancing, skating, canoeing, kayaking, and swimming. (2.3.g) 	<p>breathing (2.3.h).</p> <p>Additional Resources: SHAPE America National Standards and Grade-Level Outcomes OPEN Online Physical Education Network Health Smart Virginia PE Central Dynamic PE ASAP KidsHealth.org American Heart Association</p>

Social and Emotional Development

- 2.4 The student will identify, demonstrate, and apply cooperative, respectful, and safe behaviors in physical activity settings.
- a) Identify one activity that is enjoyed and done with friends outside the physical education class.
 - b) Identify one collaborative group activity that is challenging, and demonstrate one way to improve communication skills.
 - c) Demonstrate cooperative skills, including taking turns and sharing equipment.
 - d) Demonstrate safe participation and proper care of equipment individually and with others.
 - e) Demonstrate an understanding of established classroom safety rules and procedures.
 - f) Demonstrate the use of responsible decision-making steps to resolve conflict in physical activity settings.
 - g) Identify the characteristics of inclusion as belonging, acceptance, and value.

Essential Understandings	Essential Knowledge and Skills
<p>Physical activity is good for physical, emotional, and social health.</p> <ul style="list-style-type: none"> • Choosing a variety of physical activities that are enjoyable help people be physically active every day. (2.4.a) <p>Physical activities and skills can be improved through practice, experience, and feedback. (2.4.b)</p> <ul style="list-style-type: none"> • Communication skills in a collaborative activity include active listening, speaking one at a time, speaking directly to one another, speaking honestly and kindly, sharing ideas, trying different ideas, and working together for a common goal. • Collaborative activities may include cooperative games and group activities (e.g., student-created dance segment). <p>Class rules, procedures, and cooperating with others helps to ensure a safe learning and playing environment. Students demonstrate cooperative skills by not only being responsible for learning the material for the day but also for helping their group-mates learn. (2.4.c)</p> <ul style="list-style-type: none"> • Cooperation includes 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • identify/draw a physical activity done outside physical education class that they enjoy (2.4.a); • identify/draw an activity/skill that may be challenging and state a way to improve (2.4.b); • identify way(s) to improve communication skills in a collaborative activity (2.4.b); • demonstrate cooperative skills (2.4.c); • demonstration safe participation and proper care of equipment (2.4.d); • identify two safety rules for physical education class (2.4.e); • demonstrate responsible decision making skills to resolve simple conflicts (2.4.f); • describe situations that need adult

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ encouraging others; ○ sharing; ○ showing concern; ○ working together. <p>Safe participation includes good listening skills, including the student’s ability to follow rules and directions for all activities and equipment use.</p> <ul style="list-style-type: none"> • Safe participation includes following rules for the activity/game, rules for equipment (distribution, use, and collection), and use of space (boundaries, spatial awareness, and moving in personal and general space.) (2.4.d) • Classroom rules may include how to enter class, follow directions, exit class, activity-specific rules, and how to participate safely in emergency drills. (2.4.e) <p>Learning to resolve conflicts allows all students to participate safely, participate fully and enjoy activities. Steps to resolve conflict may include: (2.4.f)</p> <ul style="list-style-type: none"> • remaining calm; • using respectful language; • identifying the conflict; • creating solutions; • agreeing on a solution to try; • understanding when adult intervention is necessary and telling the proper adult. <p>When children feel included in physical activity, they are more likely to fully participate and enjoy the activity. (2.4.g)</p> <ul style="list-style-type: none"> • Inclusion is a feeling that is characterized by belonging, acceptance, and 	<p>intervention to resolve (2.4.f);</p> <ul style="list-style-type: none"> • explain what it means to respect others (2.4.g); • demonstrate encouraging words and giving positive feedback (2.4.g). <p>Additional Resources: SHAPE America National Standards and Grade-Level Outcomes OPEN Online Physical Education Network Health Smart Virginia PE Central Dynamic PE ASAP EverFi KidsHealth.org</p>

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Essential Understandings	Essential Knowledge and Skills
value.	

Energy Balance

- 2.5 The student will describe the impact of balancing energy intake and physical activity output.
- a) Explain that calcium is important for bone growth.
 - b) Identify examples of healthy snacks.
 - c) Identify different hydration choices.
 - d) Explain that choosing nutritious foods and being physically active are components of being healthy.
 - e) Explain how fruits and vegetables provide energy for physical activity.

Essential Understandings	Essential Knowledge and Skills
<p>Calcium, most often found in the dairy food group, is vital for health and maintenance of the body, especially improved bone health. (2.5.a)</p> <p>Healthy snacks may include yogurt, string cheese, whole-grain granola, fruits, and vegetables. (2.5.b)</p> <p>Hydration choices may include (2.5.c)</p> <ul style="list-style-type: none"> • Water: A clear liquid that has zero calories and contains no sugar; • Milk: A dairy drink that helps build strong teeth and bones; • Unhealthy drink choices that contain too much sugar and calories are sports drinks, sodas, juice drinks, and energy drinks. <p>Physical activity and choosing nutritious foods/drinks are important for good health. (2.5.d)</p> <ul style="list-style-type: none"> • Energy balance involves the consumption of food and drinks from the five food groups that provide the body the energy it needs in order to perform physical activity/movement. <p>Fruits and vegetables contain fiber and important nutrients for growth and development that help provide vital energy for physical activity/movement.</p>	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • explain how calcium supports bone growth (2.5.a); • identify/select examples of healthy snacks (2.5.b); • identify/select examples of healthy and unhealthy hydration choices (2.5.c); • explain that the body needs healthy foods, healthy drinks, and physical activity to grow and be healthy (2.5.d); • describe the effects of energy intake on physical activity output (2.5.d); • explain how fruits and vegetables provide healthy energy for physical activity (2.5.e). <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OPEN Online Physical Education Network</p>

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Essential Understandings	Essential Knowledge and Skills
(2.5.e)	Health Smart Virginia PE Central American Heart Association KidsHealth.org MyPlate.gov

GRADE THREE

Skill development remains a central focus for students in grade three as they begin to accept feedback from and provide appropriate feedback to others. Students refine, vary, and combine skills in complex situations and demonstrate more proficient movement patterns in educational games, dance, and gymnastic activities to become confident and competent movers. Students identify critical elements (small, isolated parts of the whole skill or movement) and apply them in their movement. They develop fitness knowledge and can relate regular physical activity to energy balance and health benefits. Students continue to build knowledge of body structures and systems. They know safe practices, rules, and procedures and apply them with little or no reinforcement. Students work cooperatively with peers and understand that there are many differences in movement skill and ability levels among their classmates.

Motor Skill Development

- 3.1 The student will demonstrate progression toward the use of all critical elements for various skills and apply skills in increasingly complex movement activities.
- a) Demonstrate the critical elements of eye-hand coordination skills for dribbling with dominant/preferred hand while finding open spaces, overhand/underhand throwing and catching with a partner, underhand throwing and rolling at a target, and volleying consecutive upward with hand(s) or with a short/long implement/noodle and striking/batting a ball off a tee using hard and soft force with control.
 - b) Demonstrate progress toward the use of all critical elements used in eye-foot coordination skills while kicking a moving ball, foot dribbling with control while walking to open spaces, and kicking/passing to a partner or a stationary target.
 - c) Perform an educational gymnastic sequence with balance, transfer of weight, travel, and change of direction.
 - d) Demonstrate dance patterns for various dance movements and create a pattern/combination of movements into a repeatable sequence.
 - e) Demonstrate at least two critical elements for four different jumps with a short rope (self-turn) or long rope (student turn) and jumping/landing horizontally (distance) and vertically (height) using proper takeoff and landing form).

Essential Understandings	Essential Knowledge and Skills
Manipulative and movement skills can be broken down into smaller parts/critical elements to improve proficiency. Developmentally appropriate movement includes progression toward use of all critical elements. Eye-hand and eye-foot	In order to meet these standards, it is expected that students will <ul style="list-style-type: none"> • demonstrate critical elements in isolation and

Essential Understandings	Essential Knowledge and Skills
<p>coordination skills should be proficient in isolation before engaging in low organized activities. (3.1.a, 3.1.b)</p> <ul style="list-style-type: none"> • Dribble with hands while finding space <ul style="list-style-type: none"> ○ Head up looking for open space; ○ Pads of fingers contact top of ball; ○ Firm and flexible wrist as hand pushes ball to floor; ○ Hand absorbs ball slightly on return; ○ Waist-height bounce; ○ Ball slightly in front of body; ○ Knees bent slightly with dribbling arm close to the body. • Overhand throw <ul style="list-style-type: none"> ○ Non-throwing shoulder toward target; ○ Step to target with opposite foot; ○ Throwing arm raised in backswing; ○ Rotate hips during throw; ○ Weight shifts from back to front foot; ○ Throwing arm follows through to target with wrist to opposite knee. • Catch from underhand throw <ul style="list-style-type: none"> ○ Watch the ball all the way into the hands; ○ Arms in front of body, elbows flexed; ○ Place body in the path of the object; ○ Arms extend to reach for ball; ○ Thumbs in for catch above the waist; ○ Thumbs out for catch at or below the waist; ○ One foot slightly in front of the other (balanced stance); ○ Catch with hands only; no cradling against the body; 	<p>in low organized activities for dribbling with dominant/preferred hand while finding open spaces, overhand/underhand throwing and catching with a partner, underhand throwing and rolling at a target, and volleying consecutive upward with hand(s) or with a short/long implement/noodle and striking/batting a ball off a tee using hard and soft force with control (3.1.a);</p> <ul style="list-style-type: none"> • explain the relationship between force and energy (3.1.a); • explain the effect force has on manipulative skills (3.1.a); • demonstrate use of force needed to throw/strike to a target or for distance (3.1.a); • demonstrate critical elements used in eye-foot coordination skills while kicking a moving ball, foot dribbling with control while walking to open spaces, and kicking/passing to a partner or a stationary target (3.1.b); • create and perform an educational gymnastic sequence with balance, transfer of weight, travel, and change of direction (3.1.c); • demonstrate simple dances in various formations (3.1.d); • create and perform a dance sequence with

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ Pull the ball in to the body as the catch is made; ○ Relax and absorb the force of the object. • Toss, underhand throw, underhand roll to partner/target <ul style="list-style-type: none"> ○ Face the target; ○ Eye on target; ○ Use a backward-forward arm swing (tick-tock swing); ○ Step with opposite foot as tossing/throwing/rolling arm moves forward; ○ Release ball between knee and waist level during upward swing for throw; ○ Bend at hip (roll); ○ Release ball under knee for roll; ○ Follow through with hand pointing to the target. • Volley with hand <ul style="list-style-type: none"> ○ Shoulders facing target; ○ One foot slightly ahead of other; ○ Tick-tock swing movement with volleying hand; ○ Contact ball with palm; ○ Contact occurs at waist level; ○ Follow through upward; ○ Track the ball with eyes; ○ Move body into position for next contact; ○ Continuous volley. • Volley objects with short-handled implement <ul style="list-style-type: none"> ○ Shake hands with the paddle; 	<p>different locomotor patterns, levels, shapes, pathways, and flow (3.1.d);</p> <ul style="list-style-type: none"> • perform a self-turn jump rope sequence containing four different types of jumps (3.1.e); • demonstrate at least two critical elements for jumping with a short self-turn rope (3.1.e); • demonstrate proper takeoff and landing form when jumping and landing horizontally for distance and vertically for height (3.1.e). <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OPEN Online Physical Education Network Health Smart Virginia PE Central Dynamic PE ASAP</p>

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ Firm grip and wrist; ○ Contact occurs at waist level; ○ Hit with a flat surface at center of paddle or racket; ○ Follow through toward target; ○ Track the ball with eyes; ○ Move body into position for next contact; ○ Continuous volley. • Strike/bat a ball off a tee <ul style="list-style-type: none"> ○ Non-dominant hand grips the bottom of the long-handled implement with dominant hand stacked above with knuckles in line with each other; ○ Side to target (non-throwing arm closest to target); ○ Knees slightly bent; ○ Eyes follow ball to center of striking implement from start to finish; ○ Step toward target with opposite foot; ○ Striking arm way back; ○ Weight transfer from back foot to front foot; ○ Rotate hips; ○ Wrist unlocks on follow-through for completion of striking action. • Performance in isolation and in low organized activities, including eye-foot coordination skills while kicking a moving ball, foot dribbling with control while walking to open spaces, and kicking/passing to a partner or a stationary target. (3.1.b) • Kick a moving ball <ul style="list-style-type: none"> ○ Eyes focused on ball throughout kick; ○ Contact the ball with shoelaces (not toes); 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ Contact behind the center of the ball for low-level kick; ○ Contact ball below the center of the ball for travel in air; ○ Non-kicking foot plants beside the ball; ○ Forward and sideward swing of arm opposite kicking leg; ○ Hips and shoulders rotate forward; ○ Kicking foot follows through toward target area. <ul style="list-style-type: none"> • Dribble (foot) <ul style="list-style-type: none"> ○ Knees slightly bent; ○ Push the center of the ball with shoelaces, inside of the foot, or outside of foot; ○ Contact behind the center of the ball; ○ Ball stays close to feet/soft touches; ○ Tap with both feet to move ball forward; ○ Head up, eyes looking forward using peripheral vision to see the ball; ○ Stay light on your feet with weight on toes. • Passing to a partner/stationary target <ul style="list-style-type: none"> ○ Non-kicking foot beside the ball; ○ Use inside of foot; ○ Step to the target; ○ Contact behind the center of the ball; ○ Firm and controlled pass; ○ Follow through toward target. <p>Force is strength or energy exerted. (3.1.a, 3.1.b)</p> <ul style="list-style-type: none"> • Using increased force (hard) with manipulatives may include throwing for a farther distance or striking harder to make the ball go farther. 	

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Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Using decreased force (soft) with manipulatives may include throwing easier over a shorter distance or to improve accuracy to a target. • Control includes the ability to use more or less force as needed for intended target or outcome. <p>Movement proficiency includes maintaining balance, transfer of weight, travel, and change of directions in movements during an educational gymnastics sequence. (3.1.c)</p> <ul style="list-style-type: none"> • Movement sequences can be teacher-led or student-created and include elements of balance, transfer of weight, travel, and change in direction. <p>Movement competency involves patterns and combinations of different movement concepts. These patterns and combinations can be performed in a repeatable sequence.(3.1.d)</p> <ul style="list-style-type: none"> • Basic dances occur in different formations (e.g., line, square, circle) • Dance sequences can include locomotor patterns, levels, shapes, pathways, and directions. <p>Jumping rope helps with cardiorespiratory endurance, strengthening the heart, and helps with coordination. Progression toward developmentally appropriate form helps with jumping efficiency. Developmentally appropriate form includes the execution of critical elements within different types of jumps. (3.1.e)</p> <ul style="list-style-type: none"> • Critical elements of jumping forward and backward with a short rope (self-turn) include <ul style="list-style-type: none"> ○ Elbows close to body; ○ Loose grip on handles; ○ Wrists move in small circles; ○ Bend knees; 	

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Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ Feet are “quiet” when landing; ○ Jump on the balls of the feet; ○ Look forward; ○ Jump initiated when rope passes over head; ○ Jump to a rhythm. • Critical elements of jumping forward and backward with a long rope (student-turn) include <ul style="list-style-type: none"> ○ Face the turner; ○ Watch the rope; ○ Small jumps; ○ Bend knees; ○ Quiet feet during landing; ○ Jump on the balls of the feet; ○ Keep the rhythm. • Critical elements of jumping and landing horizontally for distance and vertically for height include <ul style="list-style-type: none"> ○ Focus eyes ahead; ○ Bend knees in preparatory phase; ○ Bend at waist in preparatory phase; ○ Swing arms in full backward-forward motion; ○ Take off on two feet; ○ Explode forward (horizontal/distance); ○ Explode up (vertical/height); ○ Extend body in flight phase; ○ Land on two feet; ○ Soft landing/bend knees when landing. 	

Anatomical Basis of Movement

- 3.2 The student will identify major structures of the body, including body systems, muscles, and bones, and identify basic movement principles.
- a) Apply the concept of creating space while moving.
 - b) Identify major muscles, including the hamstrings and triceps.
 - c) Describe the components and function of the cardiorespiratory system, including the heart, lungs, and blood vessels.
 - d) Identify major bones, including the femur, tibia, fibula, humerus, radius, and ulna.
 - e) Identify one activity and the muscles and bones that help the body perform the activity.

Essential Understandings	Essential Knowledge and Skills
<p>Spatial awareness is knowing where the body is in space in relation to objects and other people. (3.2.a)</p> <ul style="list-style-type: none"> • Moving to open space requires awareness and planning. <p>Major muscles are important for movement and balance. (3.2.b)</p> <ul style="list-style-type: none"> • Major muscles include: <ul style="list-style-type: none"> ○ hamstrings ○ triceps ○ quadriceps ○ biceps ○ abdominals ○ heart. <p>Cardiorespiratory system includes heart, lungs, and blood vessels. (3.2.c)</p> <ul style="list-style-type: none"> • The heart beats to pump blood through the blood vessels to and from the lungs to carry oxygen to the organs of the body and waste products. <p>Major bones are important for movement and balance. (3.2.d)</p> <ul style="list-style-type: none"> • Major bones include: 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • demonstrate moving to open spaces during low organized activity and/or skill development (3.2.a); • identify pictures of hamstrings and triceps and where the muscles are located on the body (3.2.b); • identify the parts of the cardiorespiratory system (3.2.c); • describe the path of oxygen through the cardiorespiratory system (3.2.c); • identify pictures of the femur, tibia, fibula, humerus, radius, and ulna and where the bones are located on the body (3.2.d); • select one activity and list the muscles and bones that help the body perform the activity (3.2.e).

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Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ skull ○ ribs ○ spine ○ femur ○ tibia ○ fibula ○ humerus ○ radius ○ ulna. • Additional bones and muscles may be included. <p>Bones work with muscles to produce movement. (3.2.e)</p> <ul style="list-style-type: none"> • Examples: <ul style="list-style-type: none"> ○ hopping involves leg muscles and bones quadriceps, hamstrings, femur, tibia, and fibula; ○ curl-ups involve abdominal muscles and spine. 	<p>Additional resources:</p> <p>SHAPE America National Standards and Grade-Level Outcomes</p> <p>OPEN Online Physical Education Network</p> <p>Health Smart Virginia</p> <p>PE Central</p> <p>Dynamic PE ASAP</p> <p>KidsHealth.org</p>

Fitness Planning

- 3.3 The student will describe and explain how to measure each of the components of health-related fitness.
- a) Explain the health-related components of fitness (i.e., cardiorespiratory endurance, muscular strength, muscular endurance, flexibility, and body composition).
 - b) Identify one physical activity to improve each component of health-related fitness.
 - c) Demonstrate one activity for each component of health-related fitness.
 - d) Participate in four or more activities and reach a moderate to vigorous physical activity (MVPA) range for each activity.
 - e) Identify the carotid artery and the radial artery for measuring heart rate.

Essential Understandings	Essential Knowledge and Skills
<p>Physical fitness can be evaluated by measuring each component. (3.3.a) Each health-related component of fitness can be maintained or improved by physical activity. (3.3.a)</p> <p>Health-related components of fitness are important for disease prevention and functional health. (3.3.a)</p> <ul style="list-style-type: none"> • Cardiorespiratory endurance is the ability of the heart, lungs, and blood vessels to deliver oxygen to muscles during prolonged exercise. • Muscular strength is the ability to exert a maximal amount of force, such as lifting objects, for a short period of time. • Muscular endurance is the ability to do something again and again, like jogging/running and biking, for an extended period of time without getting tired. • Flexibility allows the joints to move through range of motion (muscles work with bones for movement.) • Body composition includes body weight and the relative amounts of muscle, fat, bone, and other vital tissues of the body. <p>Health-related fitness tests or assessments include (3.3.b)</p>	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • describe/identify the health-related components of fitness (3.3.a); • identify/name/list one measure for each component of health-related fitness (3.3.b); • participate in fitness tests to practice form and make connections to the importance of health-related fitness components (Note: Test results should not be a focus; it is an inappropriate practice to grade students on fitness test results.); • demonstrate one activity for each component of health-related fitness (3.3.c); • identify/describe three levels of exercise intensity for at least four different activities (3.3.d); • identify and describe physiological changes as intensity increases, such as sweating,

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Cardiorespiratory endurance <ul style="list-style-type: none"> ○ step test ○ Progressive Aerobic Cardiovascular Endurance Run (PACER) • Muscular strength and muscular endurance <ul style="list-style-type: none"> ○ plank ○ push-ups ○ curl-ups • Flexibility <ul style="list-style-type: none"> ○ sit and reach ○ shoulder stretch • Body composition <ul style="list-style-type: none"> ○ Body mass index (BMI) based on height and weight. A high BMI can be an indicator of high body fatness. BMI can be used to screen for weight categories that may lead to health problems, but it is not diagnostic of body fatness or health of an individual (CDC). ○ Body circumference measurements may include neck, waist, and hips. ○ Bioelectrical impedance analysis: A person places their hands on a device for about 20 seconds that runs a small current of electricity through the body to gauge body composition. ○ Waist-hip ratio: calculated by dividing waist measurement by hip measurement; $WHR = \text{waist circumference} / \text{hip circumference}$. ○ Waist circumference. <p>Activities for components of health-related fitness may include (3.3.c)</p> <ul style="list-style-type: none"> • Cardiorespiratory endurance <ul style="list-style-type: none"> ○ walking ○ jogging ○ running 	<p>increased heart rate, and increased respiration (3.3.d);</p> <ul style="list-style-type: none"> • use heart rate to distinguish between moderate and vigorous activities (3.3.d, 3.3.e). <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OPEN Online Physical Education Network Health Smart Virginia PE Central Dynamic PE ASAP KidsHealth.org American Heart Association</p>

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Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ biking • Muscular strength and muscular endurance <ul style="list-style-type: none"> ○ plank ○ push-ups ○ curl-ups ○ resistance activities • Flexibility <ul style="list-style-type: none"> ○ static stretching ○ yoga exercises • Body composition <ul style="list-style-type: none"> ○ burpees ○ jumping jacks ○ other full-body exercises. <p>Moderate to vigorous physical activity is needed for energy balance and overall physical health. (3.3.d)</p> <p>Intensity levels help a person understand how hard their body is working during physical activity. (3.3.d)</p> <p>Sixty minutes of moderate to vigorous physical activity (MVPA) is recommended for children and refers to the level of exercise intensity. (3.3.d)</p> <ul style="list-style-type: none"> • Exercise intensity levels may include low (walking slowly; you can talk and sing), moderate (walking briskly; you can talk but not sing during the activity), and vigorous (jumping rope: not be able to say more than a few words without pausing for a breath.) <p>Blood vessels such as arteries supply oxygen to the body when the heart pumps</p>	

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Essential Understandings	Essential Knowledge and Skills
<p>the blood. The more intense the exercise, the more the heart pumps and the faster blood is pumped through the arteries. This is called a pulse. (3.3.e)</p> <ul style="list-style-type: none">• The pulse can be measured at the carotid artery or the radial artery.<ul style="list-style-type: none">○ The carotid artery is in the neck and supplies blood to the brain, neck, and face.○ The radial artery is in the wrist.	

Social and Emotional Development

- 3.4 The student will demonstrate an understanding of the purposes for rules, procedures, and respectful behaviors while in various physical activity settings.
- a) Explain the importance of rules for activities.
 - b) Participate in the development of classroom rules and guidelines for appropriate behavior that support a positive, safe, and inclusive environment in physical activity settings.
 - c) Describe the importance of cooperating and working with peers to achieve a goal.
 - d) Implement teacher feedback to improve performance.
 - e) Provide clear and specific feedback to a classmate to improve performance in an individually selected physical activity opportunity.
 - f) Describe how group and individual physical activity can bring enjoyment to self and peers.
 - g) Differentiate between inclusive and non-inclusive activities/environments.

Essential Understandings	Essential Knowledge and Skills
<p>Activity rules are important for safe participation, safe learning, and inclusion of all students. (3.4.a)</p> <p>Student input for class rules and procedures for a positive environment may include (3.4.b)</p> <ul style="list-style-type: none"> • appropriate language use; • how to enter and exit class. <p>Student input for class rules and procedures for a safe environment may include (3.4.b)</p> <ul style="list-style-type: none"> • how to enter and exit class; • following directions; • activity-specific rules; • how to participate safely in emergency drills; • rules for equipment (distribution, use, and collection); 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • provide/identify reasons that rules for activities are important (3.4.a); • provide the teacher with recommendations for class rules and procedures (3.4.b); • demonstrate class rules and procedures (3.4.b); • describe cooperation (3.4.c); • demonstrate cooperative skills (3.4.c); • describe how teacher feedback was used to improve performance of a skill (3.4.d); • use critical skill elements to provide appropriate feedback to a classmate (3.4.e); • describe one group physical activity to

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<ul style="list-style-type: none">• use of space (boundaries, spatial awareness, and moving in personal and general space.). <p>Student input for class rules and procedures for an inclusive environment may include (3.4.b)</p> <ul style="list-style-type: none">• how to greet people;• how to choose partners or groups;• steps for showing respect. <p>Cooperation is important when achieving a goal. Cooperation includes, but is not limited to (3.4.c)</p> <ul style="list-style-type: none">• encouraging others;• sharing showing concern;• working together. <p>Feedback is information about performance of a skill or task that may include what is done well and what may need improvement. Feedback is important to learning and improvement of challenging skills. (3.4.d, 3.4.e)</p> <p>Choosing a variety of physical activities that are enjoyable help people be physically active every day. (3.4.f)</p> <p>Practicing identifying the needs of others and asking respectful questions of peers can help create an environment and activities that are inclusive. (3.4.g)</p> <ul style="list-style-type: none">• Students will learn to look for signs that an environment or activity is inclusive, such as:<ul style="list-style-type: none">○ whether all students are participating;○ if anyone is in an unsafe situation.	<ul style="list-style-type: none">• participate in for enjoyment (3.4.f);• reflect about whether they felt accepted, belonging, and valued during activities or in environments (3.4.g);• identify and describe inclusive and non-inclusive environments (3.4.g). <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OPEN Online Physical Education Network Health Smart Virginia PE Central Dynamic PE ASAP EverFi KidsHealth.org</p>
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Energy Balance

3.5 The student will describe energy balance.

- a) Explain that energy balance relates to good nutrition (energy in) and physical activity (energy out).
- b) Identify one food per group to create a healthy meal that meets USDA guidelines.
- c) Identify healthy hydration choices and the amount of water needed for the body to function, using the formula of one ounce of water per two pounds of body weight.
- d) Identify the macronutrients (i.e., fat, protein, carbohydrates).
- e) Identify foods that are beneficial before and after physical activity.

Essential Understandings	Essential Knowledge and Skills
<p>Energy balance relates to good nutrition (energy in) and physical activity (energy out). (3.5.a)</p> <ul style="list-style-type: none"> • Energy balance involves the consumption of food and drinks from the five food groups that provide the body the energy it needs in order to perform physical activity/movement. <p>A healthy meal contains one food from each food group. An example of a healthy meal could be (3.5.b)</p> <ul style="list-style-type: none"> • Peanut butter and banana sandwich (whole-wheat bread [grain], peanut butter [protein], banana slices [fruit]), celery sticks [vegetables], and low-fat milk [dairy.] <p>Drinking enough water every day is good for overall health. (3.5.c)</p> <ul style="list-style-type: none"> • Although daily fluid intake can come from a variety of foods and beverages, drinking plain water is the healthiest form of hydration because it has zero calories and no added sugar. • The amount of water needed varies by person. Following the formula of an ounce of water per two pounds of body weight, a 70-pound child would need at least 35 ounces of water per day. 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • explain energy balance as it relates to good nutrition and physical activity (3.5.a); • identify/select one food per USDA food group to design a healthy meal (3.5.b); • identify/select healthy hydration choices (3.5.c); • identify the amount of water needed for the body to function (3.5.c); • identify/select the macronutrients (fat, protein, carbohydrates) (3.5.d); • identify/select foods that are beneficial before and after physical activity (3.5.e). <p>Additional resources:</p>

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Essential Understandings	Essential Knowledge and Skills
<p>Macronutrients are nutrients the body needs in larger amounts to function properly and include fat (avocados, walnuts), protein (eggs, beans fish), and carbohydrates (oatmeal, bread, pasta.) (3.5.d, 3.5.e)</p> <p>Foods that are beneficial for before activity are quickly digested. Foods that are beneficial for after activity are lower in sugar. Foods that are more beneficial before and after physical activity may include (3.5.e):</p> <ul style="list-style-type: none"> • Before <ul style="list-style-type: none"> ○ granola bars; ○ trail mix; ○ unsweetened applesauce. • After <ul style="list-style-type: none"> ○ protein bars; ○ peanut butter and banana sandwich; ○ turkey and cheese sandwich. 	<p>SHAPE America National Standards and Grade-Level Outcomes</p> <p>OPEN Online Physical Education Network</p> <p>Health Smart Virginia</p> <p>PE Central</p> <p>American Heart Association</p> <p>KidsHealth.org</p> <p>MyPlate.gov</p>

GRADE FOUR

In grade four, students make continuous progress across all fundamental motor patterns. Proficient movement patterns are possible as students combine locomotor and manipulative skills in increasingly complex situations. Students create sequences in educational dances and gymnastics. They apply movement concepts and principles and knowledge of anatomical structures in individual movement performances, and tactical strategies in modified activities. Fitness assessment is appropriate at this grade level, and students interpret the results of their assessments and set personal goals based on the results. Students exhibit appropriate etiquette, integrity, and conflict-resolution skills, and they apply proper rules and procedures.

Motor Skill Development

- 4.1 The student will refine movement skills and demonstrate the ability to combine them in increasingly complex movement environments/activities.
- a) Demonstrate progression toward the use of all critical elements for specialized locomotor, non-locomotor, and manipulative skill combinations in small-sided games, modified sports activities, and lifetime activities, including overhand and underhand throwing and catching with a partner while moving to open spaces, overhand and underhand throwing to a target for distance, dribbling with non-dominant/non-preferred hand while walking at various speeds to open spaces, underhand volleying, catching thrown objects, striking a ball with short and long implement with force and control, and underhand volleying/striking, dribbling and passing a soccer ball with varying speed while moving to open spaces with control.
 - b) Create and perform an educational gymnastic sequence that combines four or more of the following movements: traveling, balancing, rolling, and other types of weight transfer with smooth transitions from one movement to the other.
 - c) Create and perform a routine to music that has smooth transitions with an apparent beginning, middle, and end, and integrate shapes, levels, pathways, and locomotor patterns.
 - d) Perform a jump rope routine/challenge (e.g., self-turn, long rope, jump bands).
 - e) Demonstrate the use of pacing, speed, and endurance in a variety of activities.

Essential Understandings	Essential Knowledge and Skills
Manipulative and movement skills can be broken down into smaller parts/critical elements to improve proficiency. Developmentally appropriate movement includes performance of all critical elements. Eye-hand and eye-foot skills are	In order to meet these standards, it is expected that students will <ul style="list-style-type: none"> • demonstrate critical elements for

<p>performed in isolation, games, and modified sports activities. (4.1.a, 4.1.b)</p> <ul style="list-style-type: none"> • Overhand throw <ul style="list-style-type: none"> ○ Non-throwing shoulder toward target; ○ Step to target with opposite foot; ○ Throwing arm raised in backswing; ○ Rotate hips during throw; ○ Weight shifts from back to front foot; ○ Throwing arm follows through to target with wrist to opposite knee. • Catch from throw <ul style="list-style-type: none"> ○ Watch the ball all the way into the hands; ○ Arms in front of body, elbows flexed; ○ Place body in the path of the object; ○ Arms extend to reach for ball; ○ Thumbs in for catch above the waist; ○ Thumbs out for catch at or below the waist; ○ One foot slightly in front of the other (balanced stance); ○ Catch with hands only; no cradling against the body; ○ Pull the ball in to the body as the catch is made; ○ Relax and absorb the force of the object. • Toss, underhand throw, underhand roll to partner/target <ul style="list-style-type: none"> ○ Face the target; ○ Eye on target; ○ Use a backward-forward arm swing (tick-tock swing); ○ Step with opposite foot as tossing/throwing/rolling arm moves forward; ○ Release ball between knee and waist level during upward swing for throw; 	<p>specialized locomotor, non-locomotor, and manipulative skill combinations in small-sided games, modified sports activities, and lifetime activities, including overhand and underhand throwing and catching with a partner while moving to open spaces, overhand and underhand throwing to a target for distance, dribbling with non-dominant/non-preferred hand while walking at various speeds to open spaces, underhand volleying, catching thrown objects, striking a ball with short and long implement with force and control, and underhand volleying/striking, dribbling and passing a soccer ball with varying speed while moving to open spaces with control (4.1.a);</p> <ul style="list-style-type: none"> • explain the relationship between force and speed (4.1.a); • explain the effect force has on manipulative skills such as striking, throwing, and dribbling with feet (4.1.a); • demonstrate the use of force needed to dribble with non-dominant/non-preferred hand while maintaining control (4.1.a); • create and perform a continuous educational gymnastic sequence that combines four or more of the following movements: traveling, balancing, rolling,
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<ul style="list-style-type: none"> ○ Bend at hip (roll); ○ Release ball under knee for roll; ○ Follow through with hand pointing to the target. • Dribble with hands while finding space at different speeds <ul style="list-style-type: none"> ○ Head up looking for open space; ○ Pads of fingers contact top of ball; ○ Firm and flexible wrist as hand pushes ball to floor; ○ Hand absorbs ball slightly on return; ○ Waist-height bounce; ○ Ball slightly in front of body; ○ Knees bent slightly with dribbling arm close to the body. • Underhand volley <ul style="list-style-type: none"> ○ Shoulders facing target; ○ One foot slightly ahead of other; ○ Tick-tock swing movement with volleying hand; ○ Contact ball with palm; ○ Contact occurs at waist level; ○ Follow through upward; ○ Track the ball with eyes; ○ Move body into position for next contact; ○ Continuous volley. • Volley objects with short-handled implement <ul style="list-style-type: none"> ○ Shake hands with the paddle; ○ Firm grip and wrist; ○ Contact occurs at waist level; ○ Hit with a flat surface at center of paddle or racket; 	<p>and other types of weight transfer (4.1.b);</p> <ul style="list-style-type: none"> • create and perform a partner dance sequence with an apparent beginning, middle, and end that integrates shapes, levels, pathways, and locomotor patterns (4.1.c); • create and perform a jump-rope routine (self-turn or long rope) (4.1.d); • demonstrate the use of pacing, speed, and endurance in a variety of activities (4.1.e); • demonstrate the ability to self-pace in a cardiovascular endurance activity (4.1.e). <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OPEN Online Physical Education Network Health Smart Virginia PE Central Dynamic PE ASAP</p>
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<ul style="list-style-type: none">○ Follow through toward target.○ Track the ball with eyes;○ Move body into position for next contact;○ Continuous volley. • Strike/bat a ball off a tee<ul style="list-style-type: none">○ Non-dominant hand grips the bottom of the long-handled implement with dominant hand stacked above with knuckles in line with each other;○ Side to target (non-throwing arm closest to target);○ Knees slightly bent;○ Eyes follow ball to center of striking implement from start to finish;○ Step toward target with opposite foot;○ Striking arm way back;○ Weight transfer from back foot to front foot;○ Rotate hips;○ Wrist unlocks on follow-through for completion of striking action. • Kick a moving ball<ul style="list-style-type: none">○ Eyes focused on ball throughout kick;○ Contact the ball with shoelaces (not toes);○ Contact behind the center of the ball for low-level kick;○ Contact ball below the center of the ball for travel in air;○ Non-kicking foot plants beside the ball;○ Forward and sideward swing of arm opposite kicking leg;○ Hips and shoulders rotate forward;○ Kicking foot follows through toward target area. • Dribble (foot)	
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- Knees slightly bent;
 - Push the center of the ball with shoelaces, inside of the foot, or outside of foot;
 - Contact behind the center of the ball;
 - Ball stays close to feet/soft touches;
 - Tap with both feet to move ball forward;
 - Head up, eyes looking forward using peripheral vision to see the ball;
 - Stay light on your feet with weight on toes.
- Passing to a partner/stationary target
 - Non-kicking foot beside the ball;
 - Use inside of foot;
 - Step to the target;
 - Contact behind the center of the ball;
 - Firm and controlled pass;
 - Follow through toward target.

Force is strength or energy exerted. (4.1.a)

- Using increased force (hard) with manipulatives may include throwing for a farther distance or striking harder to make the ball go farther.
- Using decreased force (soft) with manipulatives may include throwing easier over a shorter distance or to improve accuracy to a target.
- Control includes the ability to use more or less force as needed for intended target or outcome.

Movement proficiency includes maintaining balance in a variety of movements, such as traveling, rolling, and weight transfer, during an educational gymnastics sequence. (4.1.b)

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<p>Movement competency involves patterns. Patterns include dance sequences with a beginning, middle, and end that integrates shapes, levels, pathways, and locomotor patterns. (4.1.c)</p> <p>Jumping rope helps with cardiorespiratory endurance, strengthening the heart, and helps with coordination. Jump rope activities can include short and long ropes and a variety of types of jumps. (4.1.d)</p> <p>Pacing is the rate of movement or performance usually in reference to achieving a goal of time or distance. Speed is the rate at which someone is able to move; swiftness or rate of performance or action. Endurance is the ability to sustain a prolonged stressful effort or activity; relates to an activity or sporting event that takes place over a long distance. (4.1.e)</p>	
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Anatomical Basis of Movement

- 4.2 The student will identify major structures and begin to apply knowledge of anatomy to explain movement patterns.
- a) Identify the major components of the cardiorespiratory system and describe the relationship between the heart, lungs, and blood vessels.
 - b) Identify the major muscle groups, including the deltoid and gluteal.
 - c) Identify the major components of the skeletal system, including the sternum, vertebrae, patellae, and phalanges.
 - d) Locate the radial and/or carotid pulse.
 - e) Identify the bones and muscles needed to perform one fitness activity and one skilled movement.
 - f) Apply the concept of closing space during movement sequences.

Essential Understandings	Essential Knowledge and Skills
<p>The cardiorespiratory system carries oxygen to the muscles and organs of the body and removes waste products. (4.2.a)</p> <ul style="list-style-type: none"> • Components of the cardiorespiratory system include <ul style="list-style-type: none"> ○ heart; <ul style="list-style-type: none"> ▪ acts as a pump to send blood to the lungs for oxygen ▪ pumps oxygenated blood to muscles and organs ○ lungs; <ul style="list-style-type: none"> ▪ take in oxygen through breathing ▪ put oxygen in blood vessels ○ blood vessels. <ul style="list-style-type: none"> ▪ arteries carry blood with oxygen from the heart to muscles ▪ organs and veins carry blood without oxygen back to heart <p>Major muscles are important for movement. (3.2.b)</p> <ul style="list-style-type: none"> • Major muscles include <ul style="list-style-type: none"> ○ hamstrings; ○ triceps; ○ quadriceps; 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • identify the major components of the cardiorespiratory system—including the heart, lungs, and blood vessels—and describe how they function together (4.2.a); • identify major muscle groups, including deltoid and gluteal (4.2.b); • identify major components of the skeletal system, including the sternum, vertebrae, patella, and phalange (4.2.c); • locate the radial and/or carotid pulse (4.2.d); • identify the bones and muscles needed to perform one fitness activity and one skilled movement (4.2.e); • approach a defender using a controlled movement pattern to close space (4.2.f).

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Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ biceps; ○ abdominals; ○ heart; ○ deltoid; ○ gluteal. <p>Bones provide shape and support for the body, as well as protection for some organs. (4.2.c)</p> <ul style="list-style-type: none"> • Major bones include <ul style="list-style-type: none"> ○ skull; ○ ribs; ○ spine; ○ femur; ○ tibia; ○ fibula; ○ humerus; ○ radius; ○ ulna; ○ sternum; ○ vertebrae; ○ patella; ○ phalange. • Additional bones and muscles may be included. <p>The pulse is a measure of heart rate, or the number of times your heart beats in one minute. This can be measured through the radial and carotid artery. The pulse can be found on different places of the body. (4.2.d)</p> <ul style="list-style-type: none"> • The radial artery is located on the inside of the wrist near the side of the 	<p>Additional resources:</p> <p>SHAPE America National Standards and Grade-Level Outcomes</p> <p>OPEN Online Physical Education Network</p> <p>Health Smart Virginia</p> <p>PE Central</p> <p>Dynamic PE ASAP</p> <p>KidsHealth.org</p>

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Essential Understandings	Essential Knowledge and Skills
<p>thumb.</p> <ul style="list-style-type: none"> • The carotid artery is found in the neck between the windpipe and neck muscle, and just under the lower jawbone. <p>Bones work with muscles to produce movement. (4.2.e) Examples include, but are not limited to</p> <ul style="list-style-type: none"> • running. <ul style="list-style-type: none"> ○ leg muscles (quadriceps, hamstrings); ○ bones (femur, tibia, fibula, and patella); ○ abdominals and vertebrae help provide balance. <p>The ability to stop/confront/tag/play defense in an activity or game requires the ability to move and close spaces. (4.2.f).</p> <ul style="list-style-type: none"> • Closing space requires awareness and planning. • Spatial awareness is knowing where the body is in space in relation to objects and other people. • Small-sided games allow students to learn how to guard a peer for defense and not guard a peer while on offense. 	

Fitness Planning

- 4.3 The student will apply knowledge of health-related fitness, gather and analyze data, and set measurable goals to improve fitness levels.
- a) Describe the components of health-related fitness (i.e., cardiorespiratory endurance/aerobic capacity, muscular strength and endurance, flexibility, body composition) and list at least three physical activities associated with each component.
 - b) Analyze personal baseline data using data from a standardized health-related criterion-referenced test (e.g., Virginia wellness-related criterion-referenced fitness standards).
 - c) Create a SMART (specific, measurable, attainable, realistic, timely) goal for at least one health-related component of fitness to improve or maintain fitness level.
 - d) Identify two physical activities that can be done at school and two physical activities that can be done at home to meet fitness goals.
 - e) Analyze post-fitness testing results and reflect on goal progress/attainment.
 - f) Define the FITT (frequency, intensity, time, and type of exercise) principles.
 - g) Calculate resting and activity heart rate during a variety of physical activities.

Essential Understandings	Essential Knowledge and Skills
<p>Health-related components of fitness are important for disease prevention and functional health. (4.3.a) Activities to support each component can be done at home and/or at school. (4.3.d)</p> <ul style="list-style-type: none"> • Cardiorespiratory endurance is the ability of the heart, lungs, and blood vessels to deliver oxygen to muscles during prolonged exercise. Activities may include <ul style="list-style-type: none"> ○ running; ○ jogging; ○ swimming; ○ cycling. • Muscular strength is the ability to exert a maximal amount of force, such as lifting objects, for a short period of time. Activities may include <ul style="list-style-type: none"> ○ lifting weights; 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • describe the components of health-related fitness and list associated measurements (4.3.a); • analyze baseline data from a standardized health-related criterion-referenced test (Virginia wellness-related criterion-referenced fitness standards, CDC guidelines) (4.3.b); • use a student-created SMART goal for at least one health-related component of fitness to improve or maintain fitness level

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ resistance band activities; ○ weighted squats; ○ walking up a steep hill. • Muscular endurance is the ability to do something again and again for an extended period of time without getting tired. Activities may include <ul style="list-style-type: none"> ○ elongated time in a static hold, such as a plank; ○ high repetitions of a dynamic activity, such as push-ups, squats and curl-ups. • Flexibility allows joints to move through range of motion as muscles work with bones for movement. Activities may include <ul style="list-style-type: none"> ○ stretching; ○ yoga; ○ tai chi. • Body composition includes body weight and the relative amounts of muscle, fat, bone, and other vital tissues of the body. Activities may include <ul style="list-style-type: none"> ○ burpees; ○ jumping jacks; ○ other full-body exercises. • Body mass index (BMI) is based on height and weight. <p>Baseline and post data can be analyzed and compared to determine areas of improvement/progress as well as design future programs. (4.3.b)</p> <p>SMART goals can be used to target and improve one or multiple areas of health-related fitness. (4.3.c)</p> <ul style="list-style-type: none"> • SMART goal statements are specific, measurable, attainable, realistic, and timely. 	<p>(4.3.c);</p> <ul style="list-style-type: none"> • identify/list activities that can be done at school and activities that can be done at home to meet fitness goals (4.3.d); • analyze post-fitness testing results and reflect (written or oral) on goal progress/attainment (4.3.e); • describe the FITT principle: <ul style="list-style-type: none"> ○ Frequency: How often you do the physical activity (days per week)? ○ Intensity: How hard your body is working during physical activity (light, moderate, vigorous)? ○ Time: How long you spend doing the physical activity? ○ Type of exercise: The kind of activity you choose to gain a specific benefit (example, jogging, swimming, biking, body weight exercises, yoga, etc.) (4.3.f); • measure active and resting heart rate using the carotid or radial pulse during a variety of exercises (4.3.g). <p>Additional resources: Health Smart Virginia OpenPhyzed Focused Fitness</p>

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Essential Understandings	Essential Knowledge and Skills
<p>Baseline and post data can be analyzed and compared to determine areas of improvement/progress as well as design future programs. (4.3.e)</p> <ul style="list-style-type: none"> • Note: Fitness assessments should be conducted at the end of the school year for the purposes of student reflection on goal progress/attainment and state reporting. <p>FITT principle—frequency, intensity, time, and type of exercise—is a formula for planning what type of physical activity/activities, how often to do them, how hard, and for how long to meet fitness goals. (4.3.f)</p> <p>Heart rate can be calculated by measuring the pulse at the carotid or radial artery. (4.3.g)</p> <ul style="list-style-type: none"> • The carotid artery is in the neck and supplies blood to the brain, neck, and face. • The radial artery is in the wrist. 	<p>American Heart Association</p>

Social and Emotional Development

- 4.4 The student will demonstrate positive interactions with others in cooperative and competitive physical activities.
- a) Identify a group goal and the strategies needed for successful completion while working-productively and respectfully with others.
 - b) Identify and demonstrate conflict-resolution strategies for positive solutions in resolving disagreements in physical activity settings.
 - c) Define *etiquette* and demonstrate appropriate behavior when participating in physical activity settings as well as application of rules and procedures.
 - d) Define *integrity* and describe its importance in a physical activity setting.
 - e) Identify how participation in physical activity improves mood and positively impacts the brain.
 - f) Differentiate and communicate about activities that facilitate feelings of inclusion and those that do not.

Essential Understandings	Essential Knowledge and Skills
<p>Cooperative strategies for groups may include verbalizing and justifying ideas, active listening, being respectful of others, considering others’ perspectives, handling conflicts, collaborating, building consensus, and accepting responsibility. (4.4.a)</p> <p>Conflict resolution skills may include (4.4.b)</p> <ul style="list-style-type: none"> • ability to reduce one’s stress quickly – calming oneself before addressing the conflict; • being emotionally aware of the feelings of self and the other person; • stating what the conflict is about; • communication skills; <ul style="list-style-type: none"> ○ listening carefully to others; ○ speaking directly to each other; ○ speaking honestly and with kindness; • proposing solutions or compromises; • agreeing on a solution or compromise to try. 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • list a group goal and the strategies used for successfully meeting the goal (4.4.a); • list conflict-resolution strategies and one example for using the strategies (4.4.b); • define <i>etiquette</i> (4.4.c); • demonstrate appropriate etiquette and application of rules and procedures for physical activities (4.4.c); • define <i>integrity</i> and describe the importance of integrity in a physical activity setting (4.4.d); • evaluate through self-reflection mood and focus before and after physical activity (4.4.e);

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Essential Understandings	Essential Knowledge and Skills
<p>Etiquette is the rules indicating the proper and polite way to behave. (4.4.c)</p> <ul style="list-style-type: none"> • Example: Taking turns when playing golf. • Demonstrating etiquette looks like: <ul style="list-style-type: none"> ○ following established rules for an activity; ○ allowing full participation by all individuals; ○ using appropriate language during the activity. <p>Integrity is the quality of being honest and fair. Integrity in physical activity settings allow for inclusive, fair, and safe participation for all participants. (4.4.d)</p> <p>Regular exercise helps a person’s brain process information and emotions more easily. (4.4.e)</p> <p>Self-reflection allows students to identify whether they felt acceptance, belonging and valued during activities or in environments. (4.4.f)</p>	<ul style="list-style-type: none"> • define <i>inclusion</i> (4.4.f); • define the three tenets of inclusion; acceptance, belonging, and value (4.4.f); • reflect on personal experiences when they felt, and did not feel, included (4.4.f). <p>Additional resources: OPEN Online Physical Education Network Health Smart Virginia PE Central Dynamic PE ASAP EverFi KidsHealth.org</p>

Energy Balance

- 4.5 The student will explain the nutrition and activity components of energy balance.
- a) Define *calorie* and identify the number of calories per gram of fat (nine), protein (four), and carbohydrates (four).
 - b) Explain the uses of salt and sugar and the harm of excessive salt and sugar intake.
 - c) Identify examples of each macronutrient (i.e., fat, protein, carbohydrates).
 - d) Calculate the calories per gram of macronutrients for various foods.
 - e) Explain the importance of hydration.
 - f) Compare and contrast different hydration choices.
 - g) Explain the role of moderate to vigorous physical activity (MVPA) for energy balance.
 - h) Identify different portion sizes for each food group.

Essential Understandings	Essential Knowledge and Skills
<p>Calories in food provide energy in the form of heat. The body stores and “burns” calories as fuel for body functions. (4.5.a)</p> <ul style="list-style-type: none"> • A calorie is a unit of measurement or unit of energy; an amount of food having a heat-producing or energy-producing value in food when oxidized in the body. • Number of calories per gram of each macronutrient: fat–9, protein–4, and carbohydrates–4. <p>Salt and sugar are often added to foods and drinks to enhance flavor (4.5.b).</p> <ul style="list-style-type: none"> • Salt/sodium is used by the body to maintain fluid levels and is necessary for the health of the heart, liver, and kidneys. Too much salt/sodium can increase risk for high blood pressure and can lead to heart and other diseases. • Sugars are carbohydrates and serve as the main energy source for the body. Excess sugar can lead to unhealthy cravings and obesity, which puts a child at risk for developing high blood pressure, elevated cholesterol levels and type 2 diabetes. 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • define calorie and identify the number of calories per gram of each macronutrient (4.5.a); • explain how the body uses salt and sugar (4.5.b); • describe the effects of excessive salt and sugar intake (4.5.b); • identify/select examples of each macronutrient (4.5.c); • use food labels to calculate the calories per gram of macronutrients for a variety of foods (4.5.d); • explain the importance of hydration (4.5.e); • compare different hydration choices (4.5.f); • explain the role of moderate to vigorous

Essential Understandings	Essential Knowledge and Skills
<p>Macronutrients are nutrients the body needs in larger amounts to function properly and include fat (avocados, walnuts), protein (eggs, beans fish), and carbohydrates (oatmeal, bread, pasta.) (4.5.c)</p> <ul style="list-style-type: none"> • Carbohydrates provide sugar needed for energy; sugar from carbohydrates is broken down into glucose; glucose is released into the bloodstream for energy for the body; limited amounts of carbohydrates can be stored. • Fat is used for energy; any unused energy is stored; the body can store unlimited amounts of fat. • Protein is broken down into amino acids, used to build muscle, and to make other proteins that are essential for the body to function. <p>Each macronutrient provides the body a different amount of energy (calories) per gram. (4.5.d)</p> <ul style="list-style-type: none"> • Calories per gram of macronutrients example: cereal label <ul style="list-style-type: none"> ○ Total fat – 2 grams x 9 calories per gram = 18 calories from fat ○ Total carbohydrates – 30 grams x 4 calories per gram = 120 calories from carbohydrates ○ Protein – 3 grams x 4 calories per gram = 12 calories from protein <p>Hydration/drinking water is important for the body. Without enough water (dehydration), a person can feel sick. (4.5.e) Water helps</p> <ul style="list-style-type: none"> • regulate body temperature; • keep joints lubricated; • prevent infections; • deliver nutrients to cells. 	<p>physical activity for energy balance (4.5.g);</p> <ul style="list-style-type: none"> • identify/select portion sizes for each food group (4.5.h). <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes Health Smart Virginia MyPlate.gov OpenPhyzed KidsHealth.org</p>

Essential Understandings	Essential Knowledge and Skills
<p>Water is the best choice for hydration. (4.5.f)</p> <ul style="list-style-type: none"> • Milk is important for children because of calcium and vitamin D. • It is best to limit sugary drinks. • Unhealthy drink choices that contain too much sugar and calories are sports drinks, sodas, juice drinks, and energy drinks. <p>Energy is another word for calories. Energy balance is the balance between calories consumed (energy in) and calories expended (energy out). Moderate to vigorous physical activity (MVPA) is important for balancing the energy from calories consumed. Energy balance in children supports natural growth without promoting excess weight gain. (4.5.g)</p> <ul style="list-style-type: none"> • Moderate physical activity refers to activities equivalent in intensity to brisk walking or bicycling. Vigorous physical activity produces large increases in breathing or heart rate, such as jogging, aerobic dance or bicycling uphill. <p>Portion sizes range for each food group as the body requires varying amounts for optimal health. (4.5.h)</p> <ul style="list-style-type: none"> • Portion size is the amount of food or drink that is served. Children are smaller, so their portion sizes are also smaller. The closed fist of a child is equal to a cup for their age. Recommended daily amounts vary by age but on average are (4.5.g): <ul style="list-style-type: none"> ○ Fruit: 1-2 cups ○ Vegetables: 1½-2½ cups ○ Grains: 2-3 ounce equivalent ○ Protein: 3-6 ounce equivalent ○ Dairy: 2½-3 cups 	

GRADE FIVE

Students in grade five apply movement principles and concepts and knowledge of anatomical structures and functions to enhance their movement performance, personal fitness, and game strategy and tactics. They develop proficiency in physical activities, dances, and educational gymnastics. Students demonstrate specialized skills alone, with a partner, or in a small group. They access and use resources to plan and improve personal fitness as they exhibit a physically active lifestyle. Students continue to develop responsible personal and social behaviors as they work with others in safe and respectful ways.

Motor Skill Development

- 5.1 The student will demonstrate movement forms, create movement patterns, and begin to describe movement principles.
- a) Demonstrate progress toward the use of all critical elements in locomotor, non-locomotor, and manipulative skill combinations in dynamic environments, modified sports activities, small-sided games, and lifetime activities, including overhand and underhand throwing and catching, execution to a target with accuracy, hand dribbling with non-dominant/dominant hand at various speeds and control to open spaces, consecutive volleying with a partner over a net or against a wall with proper force, striking a ball with short- and long-handled implements while stationary or moving with the proper force, direction, and accuracy, dribbling and passing a soccer ball with the dominant foot with varying speed while moving to open spaces with proper control and accuracy.
 - b) Create and perform an educational gymnastic sequence that combines three or more of the following movements: traveling, rolling, balancing, and other types of weight transfer, with smooth transitions and changes of direction, shape, speed, and flow.
 - c) Create and perform individual or group rhythm/dance sequences.
 - d) Perform multicultural and social dances.
 - e) Create and perform a jump rope routine/challenge (self-turn, long rope, or jump bands).

Essential Understandings	Essential Knowledge and Skills
Manipulative and movement skills can be broken down into smaller parts/critical elements to improve proficiency. Developmentally appropriate movement includes performance of all critical elements. Manipulative skills are performed in isolation, and then in more complex and dynamic environments within	In order to meet these standards, it is expected that students will <ul style="list-style-type: none"> • demonstrate critical elements in dynamic situations for overhand and underhand throw

Essential Understandings	Essential Knowledge and Skills
<p>modified sports activities, small-sided games, and lifetime activities. (5.1.a)</p> <ul style="list-style-type: none"> • Manipulative skills in more complex and dynamic environments include overhand and underhand throw and catch, execution to a target with accuracy, dribbling with hands and feet at varying speeds, consecutive striking and volleying with a partner over a net or against a wall with proper force, striking a ball while stationary and moving, and passing a soccer ball with the dominant foot with varying speed. <ul style="list-style-type: none"> ○ Overhand throw <ul style="list-style-type: none"> ▪ Side of body set up toward target; ▪ Non-throwing hand toward target; ▪ Throwing arm way back; ▪ Step to target with opposite foot; ▪ Rotate hips during throw; ▪ Weight shifts from back to front foot; ▪ Throwing arm follows through to target with wrist to opposite knee. ○ Toss, underhand throw, to partner <ul style="list-style-type: none"> ▪ Face the target; ▪ Eye on target; ▪ Use a backward-forward arm swing (tick-tock swing); ▪ Step with opposite foot as tossing/throwing/rolling arm moves forward; ▪ Release ball between knee and waist level during upward swing for throw; ▪ Bend at hip (roll); ▪ Release ball under knee for roll; ▪ Follow through with hand pointing to the target. ○ Catch from throw 	<ul style="list-style-type: none"> and catch, execution to a target, hand dribble, foot dribble, consecutive striking and volleying with a partner over a net or against a wall, and striking a ball while stationary and moving (5.1.a); • demonstrate moving to open space between players as appropriate in a variety of activities (5.1.a); • demonstrate accuracy using manipulatives in a variety of activities (5.1.a); • demonstrate use of more or less force for accuracy of manipulatives in a variety of activities (5.1.a); • demonstrate accuracy, direction, and use of force to strike an object with a pre-determined purpose (placement to a target or general area) (5.1.a); • create and perform an educational gymnastic sequence, including traveling, rolling, and weight transfer, with smooth transitions, balance, and changes of direction, shape, speed, and flow (5.1.b); • create and perform individual or group rhythm/dance sequences, including multicultural and social dances (5.1.c, 5.1.d); • create and perform a jump rope routine/challenge using long/short jump

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ▪ Watch the ball all the way into the hands; ▪ Places body in the path of the object; ▪ Extend arms outward to reach for ball; ▪ Thumbs in for catch above the waist; ▪ Thumbs out for catch at or below the waist; ▪ One foot slightly in front of the other (balanced stance); ▪ Catch with hands only; no cradling against the body; ▪ Pull the ball in to the body as the catch is made; ▪ Relax and absorb the force of the object. ○ Volley with a partner or wall <ul style="list-style-type: none"> ▪ Set up square to partner/wall; ▪ Opposite foot forward; ▪ Tick-tock swing movement with volleying hand; ▪ Contact ball with palm; ▪ Contact occurs at waist level; ▪ Follow through upward; ▪ Track the ball with eyes; ▪ Move body into position for receiving ball from partner/wall; ▪ Continuous volley. ○ Strike a ball with short-handled implement <ul style="list-style-type: none"> ▪ Shake hands with the paddle; ▪ Soft squeeze grip; ▪ Firm wrist; ▪ Contact occurs at waist level; ▪ Hit with a flat surface of implement; ▪ Follow through upward; ▪ Track the ball with eyes; ▪ Move body into position for next contact. 	<p>ropes and jump bands (5.1.e).</p> <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OPEN Online Physical Education Network Health Smart Virginia PE Central Dynamic PE ASAP</p>

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Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ Strike a ball with long-handled implement <ul style="list-style-type: none"> ▪ Non-dominant hand grips the bottom of the implement with dominant hand stacked above (line of knuckles); ▪ Side to target (non-throwing arm closest to target); ▪ Knees slightly bent; ▪ Eyes follow ball from start to finish; ▪ Step to target in opposition; ▪ Throwing arm way back; ▪ Weight transfer from back foot to front foot; ▪ Rotate hips; ▪ Follow through with wrist to opposite knee. ○ Dribble (foot) <ul style="list-style-type: none"> ▪ Knees slightly bent; ▪ Contact the ball with shoelaces, inside of the foot, or outside of foot; ▪ Contact behind the center of the ball; ▪ Ball stays close to feet/soft touches when moving throughout space; ▪ Ball moves forward; ▪ Eyes looking forward in direction of travel; ▪ Tap ball with both feet. ○ Pass/kick to a partner <ul style="list-style-type: none"> ▪ Non-kicking foot beside the ball; ▪ Use inside of foot; ▪ Step to the target; ▪ Contact behind the center of the ball; ▪ Firm and controlled pass; ▪ Passing leg follows through toward target/partner. 	

Essential Understandings	Essential Knowledge and Skills
<p>Movement in dynamic situations requires appropriate speed, accuracy, force, and control. (5.1.a)</p> <ul style="list-style-type: none"> • Speed is the rate of motion and ability to move swiftly. • Accuracy is the quality of being precise or the ability to get an object where it is intended to go. • Accuracy is affected by the ability to use more or less force as needed for an intended target or outcome. • Using increased force (hard) with manipulatives may include throwing for a farther distance or striking harder to make the ball go farther. • Using decreased force (soft) with manipulatives may include throwing easier over a shorter distance or to improve accuracy to a target. • Control includes ability to use more or less force as needed for intended target or outcome. <p>Spatial awareness is knowing where the body is in space in relation to objects and other people. Moving to open spaces and closing space between players can provide a strategic advantage. (5.1.a)</p> <p>Critical elements of manipulative skills can be used to create a strategic advantage. (5.1.a)</p> <ul style="list-style-type: none"> • Accuracy requires precision of movement with the critical elements of skills, such as follow through and aim in the desired direction when throwing to a target. <p>Movement proficiency includes maintaining balance in a variety of movements, such as traveling, rolling, and weight transfer, during an educational gymnastics sequence. Maintaining balance allows for smooth transitions and changes of</p>	

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Essential Understandings	Essential Knowledge and Skills
<p>direction, shape, speed, and flow within movement sequences. (5.1.b)</p> <p>Movement competency involves patterns. Patterns are present in individual and group rhythm/dance sequences, including multicultural and social dances. (5.1.c, 5.1.d)</p> <p>Jumping rope helps with cardiorespiratory endurance, strengthening the heart, and helps with coordination. Jump rope activities include a variety of types of jumps with short ropes, long ropes and jump bands. (5.1.e)</p>	

Anatomical Basis of Movement

- 5.2 The student will apply anatomical knowledge and movement strategies in complex movement activities.
- a) Identify the major components of the cardiorespiratory, vascular, muscular, and skeletal systems.
 - b) Apply knowledge of skeletal and muscular systems to accurately describe a variety of specific movements, such as a ball strike, overhand throw, or running.
 - c) Understand the concept of flexibility as it relates to bones, muscles, and joints.

Essential Understandings	Essential Knowledge and Skills
<p>Review cardiorespiratory system components and all major muscles and bones and their locations on the body from previous grade levels. (5.2.a)</p> <ul style="list-style-type: none"> • Cardiorespiratory system <ul style="list-style-type: none"> ○ Heart ○ Lungs ○ Blood vessels • Vascular system <ul style="list-style-type: none"> ○ Veins ○ Arteries • Muscular system <ul style="list-style-type: none"> ○ Bicep ○ Triceps ○ Deltoid ○ Abdominal ○ Gluteal ○ Quadriцеп ○ Hamstring • Skeletal system <ul style="list-style-type: none"> ○ Skull ○ Ribs 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • identify/label components of cardiorespiratory, vascular, muscular, and skeletal systems (5.2.a); • describe a variety of specific movements, including the body systems, bones, and muscles involved in the movement (5.2.b); • describe and demonstrate how flexibility relates to different bones, muscles, and joints (5.2.c). <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OPEN Online Physical Education Network Health Smart Virginia PE Central Dynamic PE ASAP KidsHealth.org</p>

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- Spine
- Sternum
- Humerus
- Radius
- Ulna
- Phalanges
- Patella
- Femur
- Tibia
- Fibula

Body systems work together to produce movement.

- Running involves leg muscles and bones quadriceps, hamstrings, femur, tibia, fibula, and patella.
- Abdominals, vertebrae, and arms help provide balance; arm swing helps provide momentum using biceps, triceps, humerus, ulna, radius, and phalanges in the hands.
- Lungs provide oxygen to the heart so that blood vessels can carry oxygen and energy to the muscles being used. (5.2.b)

Flexibility includes muscles, bones and joints working together to help the body move through a full range of motion. (5.2.c)

Fitness Planning

- 5.3 The student will use personal fitness assessment data to enhance understanding of physical fitness.
- a) Identify methods for evaluating and improving personal fitness, such as health-related criterion-referenced tests, heart rate, accelerometer, and pedometer data.
 - b) Compare and analyze personal fitness data to health-related criterion-referenced standards (e.g., Virginia wellness-related fitness FitnessGram standards, Centers for Disease Control and Prevention guidelines) to assess levels of personal fitness and identify strengths and weaknesses.
 - c) Explain the FITT (frequency, intensity, time, and type) principles and its relationship to a personal fitness plan.
 - d) Calculate the resting, activity, and recovery heart rate and calculate heart rate during various physical activities.
 - e) Explain the relationship between heart rate and cardiorespiratory fitness.

Essential Understandings	Essential Knowledge and Skills
<p>Methods for evaluating and improving personal fitness may include various sources of data such as health-related criterion referenced tests, heart rate, accelerometer, and pedometer data. (5.3.a)</p> <p>SMART goals can be used to target and improve one or multiple areas of health-related fitness. (5.3.b)</p> <p>Personal fitness planning should include a SMART goal (based on data) for at least one health-related component of fitness, activities that will address the goal, a log of activities inside and outside school, a plan to reassess fitness levels (post-data), and reflection of goal progress/attainment. (5.3.b)</p> <p>The FITT principle—frequency, intensity, time, and type of exercise—is a “formula” for planning what kind of physical activity/activities, how often to do the activities, how hard to do them, and for how long to meet fitness goals. (5.3.c)</p>	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • identify methods for evaluating and improving personal fitness (5.3.a); • create a personal fitness plan for at least one health-related component of fitness, including baseline fitness data, a SMART goal, activities that will address the goal, a log of activities inside and outside school, reassessment data (post-data) and reflection of goal progress/attainment (5.3.b); • identify and explain each part of the FITT principle; • apply the FITT principle when creating a SMART goal and wellness plan (5.3.c); • calculate resting heart rate and heart rate

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • The FITT principle can be used to design a personal fitness plan for achieving a SMART goal (5.3.c). <p>Heart rate can be used to help determine personal fitness levels. (5.3.d)</p> <ul style="list-style-type: none"> • As a person’s cardiorespiratory fitness levels increase, their heart rate (and resting heart rate) will decrease. • Resting heart rate should be taken after 10 minutes of rest using the radial or carotid artery (be cautious to not press too hard on the carotid artery). Activity heart rate may be taken at different points of time during exercise/activity. <p>In general, a lower heart rate at rest indicates more efficient heart function and better cardiorespiratory fitness. (5.3.e)</p> <ul style="list-style-type: none"> • Note: resting heart rates of above 100 or below 60 (unless the person is a trained athlete) may indicate an underlying problem. 	<p>during a variety of activities manually or using heart rate monitor (5.3.d);</p> <ul style="list-style-type: none"> • explain the relationship between heart rate and cardiorespiratory fitness (5.3.e); • determine activities that may result in a higher active heart rate, perform those activities and then measure active heart rate to determine accuracy of prediction (5.3.e). <p>Additional resources: Health Smart Virginia American Heart Association OpenPhySED</p>

Social and Emotional Development

- 5.4 The student will participate in establishing and maintaining a safe environment for physical activities.
- a) Create and implement safety rules and responsibilities for one or more activities.
 - b) Describe and demonstrate respectful behavior in physical activity settings.
 - c) Implement etiquette for at least two activities.
 - d) Identify how engaging in physical activity can improve mental health and reduce stress.
 - e) Explain the importance of inclusion in physical activity settings.
 - f) Participate in developing classroom activities led by the teacher that promote feelings of inclusion, which supports feelings of acceptance, belonging, and all students being valued.

Essential Understandings	Essential Knowledge and Skills
<p>Rules for activities/games allow for safe participation, safe learning, and inclusion of all students.</p> <ul style="list-style-type: none"> • Examples: everyone taking a turn to strike/volley an object; consequence – not taking turns results in the other team getting the ball.) (5.4.a) <p>Safety rules for activities may include rules for equipment (distribution, use, and collection), use of space (boundaries, spatial awareness, and moving in personal and general space), and activity-specific rules. (5.4.a.)</p> <p>Respectful behavior in physical activity settings includes proper etiquette, safety and inclusion of all students. (5.4.b)</p> <p>Etiquette is the rules indicating the proper and polite way to behave. Examples:</p> <ul style="list-style-type: none"> • appropriate speed of play • shaking hands/giving high fives • congratulating other team at the end of a game • participating in the correct order, taking turns. (5.4.c) 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • design a game or activity that facilitates feelings of acceptance, belonging, and value and must provide rules, safety guidelines, and etiquette (5.4.a, 5.4.f); • describe and demonstrate respectful behavior used in all physical activity settings (5.4.b); • implement etiquette for two activities (5.4.c); • describe how physical activity at a variety of intensity levels can improve mental health and reduce the effects of stress (5.4.d); • explain the importance of understanding and accepting differences (5.4.e).

Essential Understandings	Essential Knowledge and Skills
<p>Physical activity can be used to improve mood and reduce stress levels. Reduction in stress levels may be evident in slowed heart rate, calm breathing, and ability to think and communicate clearly. (5.4.d)</p> <p>Some methods of reducing stress include</p> <ul style="list-style-type: none"> • Taking deep breaths • Making sure to get enough sleep • Going outside for a walk • Using a reflective journal <p>Inclusion can be defined as being a part of a group or a part of something. Inclusion can also be defined as learning to live together, treasuring diversity, and sharing gifts and abilities. (5.4.e)</p> <ul style="list-style-type: none"> • Inclusion is a subjective, personal experience. • Physical activity is important for everyone. Seeing and respecting each other’s capabilities and abilities helps to learn from others, understand and appreciate others, and build community. <p>Respectful behaviors may include (5.4.e)</p> <ul style="list-style-type: none"> • trying to learn something from others • showing interest and appreciation for other people's cultures and backgrounds • not insulting, teasing, or making fun of others • actively listening to others when they speak • being considerate of other's likes and dislikes • not talking about others behind their backs • being sensitive to the feelings of others 	<p>Additional resources:</p> <p>OPEN Online Physical Education Network</p> <p>Health Smart Virginia</p> <p>PE Central</p> <p>EverFi</p> <p>KidsHealth.org</p>

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Essential Understandings	Essential Knowledge and Skills
All students, regardless of ability, when possible, should be included in physical activity settings. When rules and etiquette are created with inclusion in mind and followed by all participants, students can feel safer and more included in activities. (5.4.f)	

Energy Balance

- 5.5 The student will identify and explain the nutrition component and activity guidelines for energy balance.
- a) Explain Recommended Dietary Allowance (RDA).
 - b) Explain that there are different RDAs for children, teens, and adults.
 - c) Explain the purpose of vitamins and minerals.
 - d) Describe how the body uses each macronutrient (fat, protein, carbohydrates).
 - e) Evaluate components of food labels for a variety of foods, including macronutrients, RDA, and portion size.
 - f) Explain that physical activity guidelines recommend 60 minutes of moderate to vigorous physical activity (MVPA) every day.

Essential Understandings	Essential Knowledge and Skills
<p>RDA (Recommended Dietary Allowance) is the average daily level of intake sufficient to meet the nutrient requirements of nearly all (97%-98%) healthy people issued by the Food and Nutrition Board of the Institute of Medicine, National Academy of Sciences. (5.5.a)</p> <p>RDA varies by age for children, teens, and adults. Variations are needed to help infants, children, and teens maintain calorie balance to support normal growth and development without promoting excess weight gain. (5.5.b)</p> <p>Vitamins and minerals are considered essential nutrients the body needs in order to function properly. (5.5.c)</p> <ul style="list-style-type: none"> • Vitamins and minerals boost the immune system, support normal growth and development, and help cells and organs do their jobs. • Choosing healthy foods is especially important because the body needs a variety of vitamins and minerals to grow and stay healthy. • Eating a mix of foods from all five food groups is the best way to get all the vitamins and minerals you need each day. Fruits and vegetables, whole grains, low-fat dairy products, lean meats, fish, and poultry are 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • explain RDA (Recommended Dietary Allowance) (5.5.a); • explain that there are different RDA recommendations for children, teens, and adults (5.5.b); • explain the purpose of vitamins and minerals (5.5.c); • describe how the body uses each macronutrient (5.5.d); • evaluate food labels for a variety of foods, to include macronutrients, RDA, and portion size (5.5.e); • describe the recommended physical activity guidelines for youth (5.5.f); • describe MVPA and its effect on the physical activity guidelines (5.5.f).

Essential Understandings	Essential Knowledge and Skills
<p>the best choices for getting the nutrients your body needs.</p> <p>Macronutrients are nutrients the body needs in larger amounts to function properly and include fat (avocados, walnuts), protein (eggs, beans fish), and carbohydrates (oatmeal, bread, pasta.) (5.5.d)</p> <ul style="list-style-type: none"> • Carbohydrates provide sugar needed for energy; sugar from carbohydrates is broken down into glucose; glucose is released into the bloodstream for energy for the body; limited amounts of carbohydrates can be stored. • Fat is used for energy; any unused energy is stored; the body can store unlimited amounts of fat. • Protein is broken down into amino acids, used to build muscle, and to make other proteins that are essential for the body to function. • Each macronutrient provides the body a different amount of energy (calories) per gram. <p>Food labels help us evaluate the macronutrients, RDA, and portion sizes of the foods we consume (5.5.e):</p> <ul style="list-style-type: none"> • Food labels indicate the serving size and number of servings included. • All nutrient amounts listed on the label are based on one serving size. It is important to note that a lot of packaged foods contain multiple serving sizes. • The top section of the label contains product-specific information: serving size, calories, and nutrient information for fat, cholesterol, sodium, carbohydrates, protein, vitamin D, calcium, iron, and potassium, and % Daily Value (%DV), the percentage of the daily value for each nutrient in a serving of the food. Daily values are reference amounts (expressed in grams, milligrams, or micrograms) of nutrients to 	<p>Additional resources:</p> <p>SHAPE America National Standards and Grade-Level Outcomes</p> <p>KidsHealth.gov</p> <p>Health Smart Virginia</p> <p>MyPlate.gov</p> <p>OpenPhyzed</p> <p>Physical Activity Guidelines for Americans, 2nd ed.</p>

Essential Understandings	Essential Knowledge and Skills
<p>consume/not to exceed each day.</p> <ul style="list-style-type: none"> • Bottom section contains a footnote that explains the % Daily Value and gives the number of calories used for general nutrition advice. <p>In addition to maintaining a healthy eating pattern, regular physical activity is one of the most important things Americans can do to improve their health.</p> <p>(5.5.f)</p> <ul style="list-style-type: none"> • Physical Activity Guidelines for Americans released by the U.S. Department of Health and Human Services recommend that youth, ages 6 to 17 years, need at least 60 minutes of physical activity every day, including aerobic, muscle-strengthening, and bone-strengthening activities. • Most of the 60 minutes should be moderate to vigorous aerobic physical activity (MVPA.) 	

GRADE SIX

Students in grade six apply fundamental skills and knowledge of anatomical structures and movement principles to build movement competence and confidence through acquisition, performance, and refinement of skills. Cooperative and competitive small-group games are appropriate as well as outdoor pursuits, fitness activities, dance and rhythmic activities, aquatics, individual performance activities, and sports (net/wall, striking/fielding, and goal/target), with an emphasis on developing skills and tactical understanding. Students use feedback to initiate and maintain practice to improve skill performance. Students assess their health-related fitness status and set reasonable and appropriate goals for development, maintenance, and improvement. Students in grade six will explain the connection between energy balance and nutrition guidelines, meal planning, and heart rate. Social interaction becomes more complex as peer pressure becomes increasingly pronounced, affecting individual performance. Students solve problems and make responsible decisions as they work together. They identify and seek opportunities to participate in regular physical activity at school and outside the school environment.

Motor Skill Development

- 6.1 The student will demonstrate all critical elements in movement forms in various activities and demonstrate the six components of skill-related fitness.
 - a) Combine and apply manipulative skills into small-sided games for overhand and underhand throwing and catching, throwing and catching to a target with accuracy and control, and hand and/or foot dribbling with accuracy at varying speeds while applying spatial awareness within partner and small-group modified game-play.
 - b) Combine and apply the manipulative skills of volleying with a partner over a net or against a wall with changes in force, accuracy, and direction into small-sided games.
 - c) Combine and apply the manipulative skills of striking/batting an object with a short and long implement with changes in force, accuracy, direction in small-sided games.
 - d) Combine and apply manipulative skills in small-sided games, dribbling/passing a soccer ball with accuracy at varying speeds while applying spatial awareness to a partner or within a small group.
 - e) Create and perform a movement sequence in a jump rope or dance activity.
 - f) Demonstrate and apply the six components of skill-related fitness (i.e., agility, balance, coordination, power, reaction time, and speed).
 - g) Demonstrate basic offensive and defensive strategies in noncomplex, modified, and small-sided activities.

Essential Understandings	Essential Knowledge and Skills
<p>Motor skill development includes combining locomotor and manipulative skills and applying the skills to ever-changing physical activity/game situations.</p> <ul style="list-style-type: none"> Combine overhand and underhand throwing and catching, execution to a target, hand and/or foot dribbling, volleying/striking and/or batting ball skills with changes in direction, speed, patterns, pathways, and spatial relationships and apply to partner and small-group modified game-play that includes dynamic and unpredictable situations. (6.1.a, 6.1.b, 6.1.c, 6.1.d) <p>Movement competency involves patterns.</p> <ul style="list-style-type: none"> Student-created individual or group rhythm/jump rope/dance sequences that include a beginning and ending counts for 4/8, variety of skills/movements, and changes in directions or pathways. (6.1.e) <p>Skill-related fitness components increase one’s ability to perform in various activities and leads to good overall health. (6.1.f)</p> <ul style="list-style-type: none"> Agility: the ability to move quickly and easily; quick change of direction. Balance: stability produced by even distribution of weight; muscles tense to keep the body in a balanced position. Coordination: the harmonious functioning of parts for effective results; it takes eye-hand coordination to strike an object. Power: physical might; the ability to act or produce an effect; kicking a ball for distance. Reaction time: the time required for a subject to initiate a prearranged response to a defined stimulus; the time between hearing a whistle and starting to run or the time between seeing a ball being thrown to a place out of reach and moving to catch it. 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> demonstrate manipulative skills and movement sequences in partner and small-group modified game-play (6.1.a); analyze movement situations for changes in force, direction, speed, accuracy, and pathways to improve performance (6.1.b, 6.1.c); demonstrate spatial awareness in partner and small-group modified game play (6.1.d); student-created and performance of movement sequences in a jump rope, rhythmic, or dance activity (6.1.e); identify the six components (i.e., agility, balance, coordination, power, reaction time, and speed) of skill-related fitness (6.1.f); describe basic offensive and defensive strategies (6.1.g); demonstrate offensive strategies without defensive pressure (6.1.g); demonstrate defensive strategies during small-group/modified game play (6.1.g). <p>Additional resources: SHAPE America National Standards and Grade-</p>

<ul style="list-style-type: none">• Speed: the rate of motion; the ability to move swiftly. <p>Movement situations can be evaluated for direction, speed, accuracy, and pathways to improve performance. (6.1.d)</p> <ul style="list-style-type: none">• Example: Intercepting a pass (thrown, kicked, or bounced) between players requires knowledge of the direction of the pass, how fast to move to intercept before it gets to the teammate, where to be to intercept it, and the pathway to intercept (forward, sideways, diagonal.) <p>Spatial awareness allows people and objects to move safely through the environment. (6.1.d)</p> <p>Basic offensive and defensive skills will increase success during non-complex, modified, and small-sided game play activities. (6.1.g)</p> <ul style="list-style-type: none">• Offensive skills include moving to open spaces, give and go, fakes, pivots, changing speed/direction, positioning in front of defender closer to a teammate, communicating with teammates, and continually moving/not standing still.• Defensive skills include ready position (knees slightly bent, hinge at the hip), reducing space, positioning between the person with the ball and another player on offense, positioning between offense and goal, positioning to defend a particular player on offense or to defend an area of the field of play, player-to-player defense, and transitioning from offense to defense quickly.• Non-complex, modified games break games into their simplest format and then build on the basics, increasing in complexity as students' skill levels advance.• Small-sided game play activities are games that use a smaller number of players per team (3 v 3 or 5 v 5), which allows each player more time with direct participation to advance their skills.	<p>Level Outcomes</p> <p>OPEN Online Physical Education Network</p> <p>Health Smart Virginia</p> <p>PE Central</p> <p>Dynamic PE ASAP</p>
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Anatomical Basis of Movement

- 6.2 The student will apply both movement principles and concepts including the knowledge of anatomical structures to movement-skill performance.
- a) Refine and adapt individual and group activity skills by applying concepts of relationships, effort, spatial awareness, direction, speed, accuracy, and pathways to improve performance.
 - b) Apply knowledge of the skeletal system by identifying major joints, associated bones, and types of joints, including ball-and-socket, and hinge joint.

Essential Understandings	Essential Knowledge and Skills
<p>Relationships, effort, spatial awareness, direction, speed, accuracy, and pathways affect performance. (6.2.a)</p> <ul style="list-style-type: none"> • Relationships: connections and effects of movements (throwing a ball with accuracy, leading a running teammate, and enough force to ensure teammate can catch the ball). • Effort: the work done to achieve a particular end/result, genuine attempt/try. • Spatial awareness: knowing where the body is in space in relation to objects and other people; ability to move with and around others and objects. • Direction: the path along which something travels. • Speed: the rate of motion; the ability to move swiftly. • Accuracy: the quality of being precise; the ability to get an object where it is intended to go. • Pathways: straight, curved, zigzag, diagonal. <p>Muscles contract to produce movement at joints. Joints are the connections between two bones. (6.2.b)</p> <ul style="list-style-type: none"> • Ball-and-socket joint: rounded surface of one bone moves within a depression on another bone; hip (head of femur and depression of pelvis); 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • refine and adapt individual and group activity skills by applying concepts of relationships, effort, spatial awareness, direction, speed, accuracy, and pathways to improve performance (6.2.a); • apply knowledge of the skeletal system by identifying major joints, associated bones, and types of joints, including ball-and-socket, and hinge joint. (6.2.b) <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OPEN Online Physical Education Network Health Smart Virginia PE Central Dynamic PE ASAP KidsHealth.org</p>

2022 Physical Education Standards of Learning Curriculum Framework

Essential Understandings	Essential Knowledge and Skills
<p>shoulder (humerus, scapula, clavicle).</p> <ul style="list-style-type: none"> • Hinge joint: backward and forward swing motion; joints between bones of the fingers (phalanges); ankle (fibula, tibia, and talus of the foot); elbow (ulna and humerus); knee (femur, tibia, and patella). 	

Fitness Planning

- 6.3 The student will apply skills of measurement, analysis, goal setting, problem solving, and decision making to improve or maintain physical fitness.
- a) Create a basic personal fitness plan for at least one health-related component of fitness, including baseline fitness data, a SMART goal, activities that will address the goal, a log of activities inside and outside school, reassessment data (post-data) and reflection of goal progress/attainment.
 - b) Identify resources, including available technology, to evaluate, monitor, and record activities for fitness improvement.
 - c) Calculate resting, active, and recovery heart rate during a variety of physical activities, and identify the relationship between heart rate and rate of perceived exertion (RPE) levels.
 - d) Describe how being physically active improves physical and mental health.
 - e) Interpret fitness data, comparing individual scores to health-related criterion-referenced standards (Virginia wellness-related fitness standards, FitnessGram, Centers for Disease Control and Prevention guidelines).
 - f) Create and implement an activity plan to meet the Centers for Disease Control and Prevention’s Physical Activity Guidelines for Americans and identify the necessary safety precautions for participation.
 - g) Describe a rate of perceived exertion scale.

Essential Understandings	Essential Knowledge and Skills
<p>Self-assessments allow you to determine the factors that you can alter when creating a personal fitness plan to make changes toward a healthy lifestyle and fitness goals. (6.3.a)</p> <p>SMART goals clarify exactly what to do and the measures needed to improve and maintain your fitness level and plans. (6.3.a)</p> <ul style="list-style-type: none"> • Specific: Goals are straightforward and detail what is to be accomplished. • Measurable: Goals must be able to be measured for improvement (how much, how many, how will you know the goal is accomplished?). • Attainable: Goals require effort beyond what already has been achieved. • Realistic: Goals need to be achievable and reachable. • Timely: Goals should have a time element attached to keep you on track 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • create a basic personal fitness plan for at least one health-related component of fitness, including baseline fitness data, a SMART goal, activities that will address the goal, a log of activities inside and outside school, reassessment data (post-data) and reflection of goal progress/attainment (6.3.a); • identify resources, including available technology (e.g., heart rate monitors,

Essential Understandings	Essential Knowledge and Skills
<p>to accomplish in a given time period.</p> <p>Physical fitness can be evaluated through a variety of methods including measurements and assessment tools, criterion-referenced health-related fitness standards, and available technology to evaluate, monitor, and record activities for fitness improvement. (6.3.b)</p> <p>Heart rate can be used to help determine personal fitness levels. The more fit a person is, the more quickly the heart will recover after strenuous physical activity. (6.3.c)</p> <ul style="list-style-type: none"> • Resting heart rate (RHR) is best taken after 10 minutes of rest. • Active heart rate can be taken at multiple points during the activity and include being taken immediately after stopping the activity. • Recovery heart rate is the decrease in heart rate that occurs one minute after maximal exercise. A faster decrease in heart rate is associated with individuals with higher levels of fitness. <p>Regular participation in physical activity in childhood is associated with a decreased cardiovascular risk in youth and adulthood. (6.3.d)</p> <p>Physical activity helps to maintain weight; reduce high blood pressure; reduce the risk for type 2 diabetes, heart attack, stroke, and several forms of cancer; reduce arthritis pain and associated disability; reduce the risk for osteoporosis and falls; and reduce symptoms of depression and anxiety. (6.3.d)</p> <p>Comparing individual scores to health-related criterion-referenced standards (Virginia wellness-related fitness standards, FitnessGram, CDC guidelines) assists in the analysis, goal setting, problem-solving, and decision making needed</p>	<p>pedometers) to evaluate, monitor, and record activities for fitness improvement (6.3.b);</p> <ul style="list-style-type: none"> • calculate resting, active, and recovery heart rate during a variety of physical activities and identify the relationship between heart rate and rate of perceived exertion (RPE) levels (6.3.c); • describe how being physically active leads to a healthy body (6.3.d); • interpret fitness data, comparing individual scores to health-related criterion-referenced standards (Virginia wellness-related fitness standards, FitnessGram, CDC guidelines) (6.3.e); • Create and implement an activity plan to meet the Centers for Disease Control and Prevention’s Physical Activity Guidelines for Americans and identify the necessary safety precautions for participation (6.3.f); • describe a rate of perceived exertion scale (6.3.g). <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes KidsHealth.gov Health Smart Virginia</p>

Essential Understandings	Essential Knowledge and Skills
<p>to improve or maintain physical fitness. (6.3.e)</p> <ul style="list-style-type: none"> • FitnessGram standards for the healthy fitness zones. <ul style="list-style-type: none"> ○ Scores are evaluated against criterion-referenced standards, called Healthy Fitness Zones. These zones are established to indicate levels of fitness corresponding with health. Standards have been set for boys and for girls based on age and what is optimal for good health. The use of health-related criteria helps to minimize comparisons between children and emphasizes personal fitness for health, rather than goals based solely on performance. <p>Setting goals is a fundamental component to long-term success and preparing a written plan can improve your adherence to safely execute the plan. (6.3f)</p> <p>Activity plans follow fitness and physical activity safety precautions. (6.3.f)</p> <p>Perceived exertion is how hard a person feels like their body is working. A rate of perceived exertion (RPE) scale is a way of measuring the intensity of physical activity. Scales may range from five to 20 levels. (6.3.g)</p> <p>Example (variation of Borg scale):</p> <ul style="list-style-type: none"> • Level 1 – Very light activity (watching TV) • Level 2 – Light activity (can maintain for hours, easy to breathe) • Level 3 – Moderate activity (breathing heavily, somewhat comfortable) • Level 4 – Vigorous activity (borderline uncomfortable, short of breath) • Level 5 – Very hard activity (difficult to maintain exercise intensity, barely breathe) • Level 6 – Max effort activity (almost impossible to keep going, out of breath) 	<p>MyPlate.gov OpenPhySED Physical Activity Guidelines for Americans, 2nd ed. Healthy Children.org</p>

Social and Emotional Development

- 6.4 The student will demonstrate and apply skills of communication, conflict resolution, and cooperation to achieve individual and group goals that apply to working independently and with others in physical activity settings.
- a) Demonstrate effective communication and creative thinking skills to solve problems, make decisions and resolve conflict with others and promote safe participation in physical activities.
 - b) Compare and critique rules, safety procedures, and etiquette for two different physical activities.
 - c) Develop an improvement plan for a self-selected physical activity, discuss the challenges faced, and reflect on how these challenges were overcome.
 - d) Describe the benefits of competitive and non-competitive physical activities.
 - e) Demonstrate integrity and apply rules/etiquette for a team-building activity.
 - f) Participate in developing student-led classroom activities that promote feelings of inclusion, which supports feelings of acceptance, belonging, and being valued, for all students.

Essential Understandings	Essential Knowledge and Skills
<p>To maintain a positive learning environment, students must demonstrate effective communication skills, be safe, cooperative, and positively solve problems. (6.4.a)</p> <p>Effective communication</p> <ul style="list-style-type: none"> • Listen with eyes and ears. • Be clear when describing a demonstration or when giving feedback. • Keep information short and simple. <p>Creative thinking skills</p> <ul style="list-style-type: none"> • Ability to come up with new solutions to problems. <p>Problem-solving</p> <ul style="list-style-type: none"> • Identify/define the problem. • Generate several solutions. • Evaluate the pros and cons of each solution. • Choose a solution. • Implement, document, and reflect on the solution. <p>Conflict resolution skills</p>	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • demonstrate effective communication and creative thinking skills to solve problems, make decisions and resolve conflict with others and promote safe participation in physical activities (6.4.a); • compare and critique rules, safety procedures, and etiquette for two different physical activities (6.4.b); • develop an improvement plan for a self-selected physical activity, discuss the challenges faced, and reflect on how these challenges were overcome (6.4.c); • describe the benefits of competitive and

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Able to reduce own stress quickly – calming oneself before addressing the conflict. • Be emotionally aware of yourself and the other person – how are you feeling, how is the other person feeling. • State what the conflict is about <ul style="list-style-type: none"> ○ Communication skills ○ Listening carefully to others ○ Speaking directly to each other ○ Speaking honestly, and kind • Proposing solutions or compromises. • Agree on a solution or compromise to try. <p>Decision-making skills</p> <ul style="list-style-type: none"> • Identify the decision to be made. • List all the possible options. • Evaluate the pros and cons of each option, using criteria such as: <ul style="list-style-type: none"> ○ Is this option healthful and does it reflect my beliefs and values? ○ Is this option legal? ○ Is this option safe? ○ Is this option respectful to myself and my family? ○ Is this option responsible? • Make your decision based on the evaluation of each option. • Reflect on the decision that was made. <p>Rules promote the safety of the players and the integrity of the game. (6.4.b)</p> <ul style="list-style-type: none"> • Safety rules for activities may include rules for equipment (distribution, use, and collection), use of space (boundaries, spatial awareness, and moving in personal and general space), and activity-specific rules. 	<p>non-competitive physical activities (6.4.d);</p> <ul style="list-style-type: none"> • demonstrate integrity and apply rules/etiquette for a team-building activity (6.4.e); • participate in developing student-led classroom activities that promote feelings of inclusion, which supports feelings of acceptance, belonging, and being valued, for all students. (6.4.f) <p>Additional resources: OPEN Online Physical Education Network Health Smart Virginia PE Central EverFi KidsHealth.org</p>

Essential Understandings	Essential Knowledge and Skills
<p>Safety procedures and etiquette allow for safe participation, safe learning, and inclusion of all students. (6.4.b)</p> <ul style="list-style-type: none"> Etiquette is the rules indicating the proper and polite way to behave (e.g., shaking hands/giving high fives/congratulating other teams at the end of a game). <p>Learning and practicing self-management skills and determination can help individuals develop a new way of thinking when developing an improvement plan for a personally challenging skill or activity. (6.4.c)</p> <p>Reflecting on performance can assist in developing a plan for improvement. (6.4.c)</p> <p>Non-competitive physical activities allow success without any losers, with teammates learning that the cooperative process is what is important. (6.4.d)</p> <p>Competitive physical activities that allow individuals to work as a decision-making team that takes risks, makes decisions, succeeds, and sometimes fails will prepare individuals to be confident adults, able to make decisions and work well within a group. (6.4.d)</p> <p>Participation in physical activities/sports can provide an opportunity for developing an understanding and respect for differences among people. (6.4.e)</p> <p>A responsible participant views behaving well and including others as important as playing safely. (6.4.e, 6.4.f)</p> <p>Integrity is the quality of being honest and fair. Integrity in physical activity</p>	

Essential Understandings	Essential Knowledge and Skills
<p>settings allow for inclusive, fair, and safe participation for all participants (6.4.f)</p> <ul style="list-style-type: none"> Inclusive practices and safe participation strategies may include adapting rules to accommodate a variety of abilities, eliminating or adding time, modifications to an activity (e.g., use a beach ball for volleyball), and changing or eliminating scoring. (6.4.f) 	

Energy Balance

- 6.5 The student will explain the relationship between energy balance and nutrition guidelines, meal planning, and exercise intensity.
- a) Create a one-day meal and snack plan based on Recommended Dietary Allowance (RDA), portions, hydration, and sugar.
 - b) Describe the relationship between resting heart rate and exercise intensity.
 - c) Explain the effects of physical activity guidelines on energy expenditure.

Essential Understandings	Essential Knowledge and Skills
<p>Meals and snacks, including beverages, should meet Recommended Dietary Allowance (RDA) for portions and meet hydration needs. RDA information is available at the National Institutes of Health (NIH) Office of Dietary Supplements website: https://ods.od.nih.gov/HealthInformation/Dietary_Reference_Intakes.aspx. (6.5.a)</p> <ul style="list-style-type: none"> • Recommended Dietary Allowance (RDA): The recommended minimum amount of a nutrient needed for good health. <p>Planning healthy meals will help the body grow and develop normally and increase overall health and wellness. (6.5.a)</p> <p>Energy for movement comes from the food we eat (animal and plant sources), which provides energy-rich nutrients. (6.5.a)</p> <p>Resting pulse is a valuable metric to not only determine your fitness level but your cardiovascular health. (6.5.b)</p> <p>Exercise heart rate and resting heart rate can be used to help determine personal fitness levels. (6.5.b)</p> <ul style="list-style-type: none"> • In general, a lower heart rate at rest indicates more efficient heart function and better cardiorespiratory fitness. 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • create a one-day meal and snack plan based on Recommended Dietary Allowance (RDA), portions, hydration, and sugar (6.5.a); • describe the relationship between resting heart rate and exercise intensity (6.5.b); • explain the effects of physical activity guidelines on energy expenditure. (6.5.c) <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes KidsHealth.gov Health Smart Virginia MyPlate.gov OpenPhySED Physical Activity Guidelines for Americans, 2nd ed. American Heart Association</p>

Essential Understandings	Essential Knowledge and Skills
<p>Intensity level descriptions help a person understand what level of physical activity they are engaged in. (6.5.b)</p> <ul style="list-style-type: none"> In general, the higher your heart rate during physical activity, the higher the exercise intensity. The American Heart Association generally recommends a target heart rate of moderate exercise intensity: 50% to about 70% of your maximum heart rate; and vigorous exercise intensity: 70% to about 85% of your maximum heart rate. <p>Energy expenditure is the energy, in the form of calories, a person uses for everyday tasks. (6.5.c)</p> <p>Physical activity increases the number of calories your body uses for energy or “burns off.” (6.5.c)</p> <ul style="list-style-type: none"> Physical activity guidelines: 150 minutes of moderate-intensity aerobic activity, 75 minutes of vigorous-intensity aerobic activity, or an equivalent mix of the two each week. Strong scientific evidence shows that physical activity can help maintain a healthy weight over time. 	

GRADE SEVEN

Students in grade seven continue to develop competence in modified versions of various games/sports, rhythmic, and recreational activities. They vary movement during dynamic and unpredictable game situations. Recreational pursuits become an additional curriculum option, broadening lifelong physical activity options. The ability to analyze skill performance through observing and understanding critical elements (small, isolated parts of the whole skill or movement) is increasingly apparent, as is the application of basic scientific principles of anatomical structures, movement principles, energy balance, and personal fitness. Students relate the importance of physical activity to health, focusing particularly on weight and stress management. Students understand strategies to achieve and maintain personal fitness standards and create plans by setting reasonable and appropriate goals for improvement or maintenance of health-related fitness. Students continue to develop social skills and cooperative behaviors by demonstrating problem solving, conflict resolution, communication skills, appropriate etiquette, integrity, and respect for others.

Motor Skill Development

- 7.1 The student will demonstrate competence and apply movement concepts in modified versions of various game/sport, rhythmic, dance, lifetime, and recreational activities.
- Demonstrate and apply developmentally appropriate movement forms and skill combinations competently in a variety of cooperative and tactical activities that include dynamic and unpredictable situations.
 - Demonstrate offensive and defensive strategies and tactics, including creating open space, skilled movement, speed, accuracy, and selection of appropriate skills/tactics to gain an offensive or defensive advantage through modified games/sports.
 - Demonstrate basic abilities and safety precautions in recreational pursuits (e.g., inline skating, orienteering, hiking, cycling, ropes courses, backpacking, canoeing, rock climbing).
 - Identify and demonstrate dance steps selected by the teacher or student in folk, social, multicultural, contemporary, and line dances.
 - Describe and demonstrate how movement is stabilized, including balance (center of gravity and center of support) and planes of motion.
 - Demonstrate the progression of learning (practice, self or peer assess, correct, practice at a higher level, and reassess) for a specific skill or movement.

Essential Understandings	Essential Knowledge and Skills
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Essential Understandings	Essential Knowledge and Skills
<p>Motor skill development includes combining and applying movement and manipulative skills to changing physical activity/game situations. (7.1.a)</p> <p>Movement forms and skill combinations include developmentally appropriate performance of all critical elements. (7.1.a)</p> <p>Cooperative activities put an emphasis on team building, communication, and trust. (7.1.a)</p> <p>Tactical activities may include small-sided, modified games and sports that may include offense and defense that include dynamic and unpredictable situations. (7.1.a)</p> <p>Offensive strategies may include creating open space, skilled movement, speed, accuracy, communication, and creativity. (7.1.b)</p> <ul style="list-style-type: none"> • Creating open space: knowing where the body is in space in relation to objects and other people and moving at an angle or cutting back to provide an opportunity for a pass. • Skilled movement: the ability to move efficiently. • Direction: the path along which something moves. • Speed: the rate of motion; the ability to move swiftly. • Accuracy: the quality of being precise; the ability to get an object where it is intended to go. • Communication: the ability to deliver and receive valuable information. • Creativity: the ability to produce novel solutions in game situations. <p>Offensive tactics include the selection of appropriate skills and strategies to gain an offensive advantage. (7.1.b)</p>	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • demonstrate and apply developmentally appropriate movement forms and skill combinations competently in a variety of cooperative and tactical activities that include dynamic and unpredictable situations (7.1.a); • demonstrate offensive and defensive strategies and tactics, including creating open space, skilled movement, speed, accuracy, and selection of appropriate skills/tactics to gain an offensive or defensive advantage through modified games/sports (7.1.b); • demonstrate basic abilities and safety precautions in one or more recreational activities (7.1.c); • identify and demonstrate a variety of rhythmic patterns/movements (7.1.d); • describe and demonstrate how movement is stabilized in each plane of motion (7.1.e); • demonstrate the learning progression for a specific skill or movement (7.1.f). <p>Additional resources: SHAPE America National Standards and Grade-</p>

Essential Understandings	Essential Knowledge and Skills
<p>Modified games/sports break games into their simplest format and then build on the basics, increasing in complexity as students’ skill levels advance. (7.1.b)</p> <p>Recreational activities provide individual, dual, and group opportunities for competitive and non-competitive physical activities (e.g., in-line skating, orienteering, hiking, cycling, ropes courses, backpacking, rowing, canoeing, and rock climbing.) (7.1.c)</p> <p>Safety precautions, such as a proper warm-up and cool-down procedures, affect performance and prevent injury in recreational pursuits. (7.1.c)</p> <p>Correct techniques in outdoor activities help ensure the safety of self and others. (7.1.c)</p> <p>Dance and/or rhythms can provide opportunities for personal enjoyment, self-expression, challenge, and social interaction. (7.1.d)</p> <p>Movement competency involves patterns. (7.1.d)</p> <ul style="list-style-type: none"> • Rhythm activities may include folk, social, world, country, square, contemporary, and line dances. <p>Stability increases in a movement with lower center of the body, the larger the base of support, and the closer the center of the body is to the base of support. (7.1.e)</p> <p>Balance is a static and dynamic process that makes it possible for the body to maintain its center of gravity over its base of support. (7.1.e)</p> <ul style="list-style-type: none"> • Center of gravity: a balance point or that point about which a body would 	<p>Level Outcomes</p> <p>OPEN Online Physical Education Network</p> <p>Health Smart Virginia</p> <p>PE Central</p> <p>Dynamic PE ASAP</p>

Essential Understandings	Essential Knowledge and Skills
<p>balance without a tendency to rotate</p> <ul style="list-style-type: none"> Center of support: the area beneath a person that includes every point of contact that the person makes with the supporting surface. These points of contact may be body parts (e.g., feet or hands), or they may include objects like crutches or a chair when a person is sitting in it. <p>Movement is stabilized in three planes of motion: (7.1.e)</p> <ul style="list-style-type: none"> Frontal plane: the front and back halves of the body; side-to-side movements. Sagittal plane: the right and left halves of the body; forward and backward movements. Transverse plane: the top and bottom halves of the body; twisting movements. <p>Incorporating all planes of movement into your activity time will increase your range of motion, prevent injuries, and provide greater stability for your body. (7.1.e)</p> <p>Movement learning progression includes practice, self-assessment or peer assessment, correct movement/skill components, practice at a higher level, and reassess. (7.1.f)</p> <p>Self-assessments/peer assessments allow students to detect, analyze and correct errors in personal movement patterns. (7.1.f)</p>	

Anatomical Basis of Movement

- 7.2 The student will understand and apply movement principles and concepts and knowledge of major body structures.
- Identify the “core muscles,” including pelvic, lower back, hips, gluteal muscles, and abdomen, and explain their role in stabilizing movement.
 - Apply biomechanical principles (e.g., center of gravity, base of support) to understand and perform skillful movements.
 - Describe the anatomical planes of motion in which movement occurs, including sagittal plane, frontal plane, and transverse plane.
 - Analyze skill patterns and movement performance of self and others, detecting and correcting mechanical errors for selected movements.
 - Apply knowledge of anatomy and joint types to accurately describe skill- and fitness-based movements, such as throwing/catching, striking, lunges and push-ups.

Essential Understandings	Essential Knowledge and Skills
<p>Core muscles act to stabilize the spine, providing firm support for all movement. (7.2.a)</p> <ul style="list-style-type: none"> Core muscles include the pelvis, lower back, hips, gluteal muscles, and abdomen. Core muscles are important muscles for support and holding the body upright. Strong core muscles support proper posture and alignment. <p>The structure and function of the muscular system assists in physical performance and stabilization of movement. (7.2.a)</p> <ul style="list-style-type: none"> Muscles pull on bones to cause movement. Muscles work in pairs. Muscles work by contracting and relaxing. <p>Balance works with all movements. (7.2.b)</p> <ul style="list-style-type: none"> Center of gravity: a balance point or that point about which a body would balance without a tendency to rotate. 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> identify core muscles and explain their role in stabilizing movement (7.2.a); apply biomechanical principles to understand and perform skillful movements (7.2.b); describe the three planes of motion in which movement occurs (7.2.c); analyze skill patterns and the movement performance of self and others, detecting and correcting mechanical errors (7.2.d); describe the anatomy and joint types required to accurately perform a skill or fitness-based movement (7.2.e).

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Center of support: the area beneath a person that includes every point of contact that the person makes with the supporting surface; these points of contact may be body parts (e.g., feet or hands) or they may include things like crutches or a chair when a person is sitting in it. <p>Skillful movements use balance, stability, force, and proper form, including athletic position, reaction, and body position while in motion. (7.2.b)</p> <ul style="list-style-type: none"> • Balance: even distribution of weight, allowing one to stay upright and steady. • Stability: the ability to be stable or firmly fixed. • Force: strength or energy caused by movement. • Proper form: moving the body through slow controlled movements to prevent injury. • Athletic position: upright position usually involving a slight hip hinge and bent knees that allows an individual to move in any direction as quickly as possible. • Reaction: the ability to quickly respond to external stimuli. • Body position: alignment of body in relation to movements and external stimuli. <p>Planes of motion include the frontal, sagittal, and transverse planes. (7.2.c)</p> <ul style="list-style-type: none"> • Frontal plane: the front and back halves of the body; side-to-side movements. • Sagittal plane: the right and left halves of the body; forward and backward movements. • Transverse plane: the top and bottom halves of the body; twisting movements. 	<p>Additional resources:</p> <p>SHAPE America National Standards and Grade-Level Outcomes</p> <p>OPEN Online Physical Education Network</p> <p>Health Smart Virginia</p> <p>PE Central</p> <p>Dynamic PE ASAP</p> <p>KidsHealth.org</p>

2022 Physical Education Standards of Learning Curriculum Framework

Essential Understandings	Essential Knowledge and Skills
<p>Incorporating all three planes of movement into mobility time increases range of motion, prevent injuries, and provide greater stability for the body. (7.2.c)</p> <p>Critical elements and biomechanical principles (balance, planes of movement) can be used to analyze skill patterns and movement performance. (7.2.d)</p> <p>Different anatomy and joint types are required to perform various skill and fitness-based movements (e.g., throwing/catching, striking, lunges, and pushups). (7.2.e)</p>	

Fitness Planning

- 7.3 The student will apply concepts and principles of training and fitness-planning skills to improve physical fitness.
- a) Identify safe practices for improving physical fitness.
 - b) Complete a self-assessment of health-related fitness and develop a comprehensive personal fitness plan, including SMART (specific, measurable, attainable, realistic, timely) goals, an action plan that incorporates the FITT (frequency, intensity, time, and type of exercise) principle and to meet the Centers for Disease Control and Prevention’s Physical Activity Guidelines for Americans, timeline, documentation of activities inside and outside school, roadblocks/barriers and solutions, midyear and end-of-year assessments, and reflection on progress for improving at least two self-selected components of health-related fitness.
 - c) Identify and apply concepts of fitness improvement using various resources, including available technology, to evaluate, monitor, and record activities for a fitness plan.
 - d) Calculate resting, activity, and recovery heart rate and describe its relationship to aerobic fitness.
 - e) Describe the differences between aerobic and anaerobic activities and provide three examples of each.
 - f) Explain the role of perseverance in achieving fitness goals.

Essential Understandings	Essential Knowledge and Skills
<p>The risk of injury can be reduced by performing appropriate amounts of activity and setting appropriate personal goals. (7.3.a)</p> <p>Safe practices for improving physical fitness may include (7.3.a)</p> <ul style="list-style-type: none"> • Warm up and cool down properly • Use/wear appropriate equipment for activity and for safety • Vary activities to reduce the risk of overuse injuries • Stay hydrated (water is best unless the activity is strenuous or long) • Be aware of weather • Use appropriate pacing (not too hard or too fast) • Balance types of activities • Rest • Consult with a coach/teacher or exercise specialist. 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • identify safe practices for improving physical fitness (7.3.a); • complete a self-assessment of health-related fitness and develop a comprehensive personal fitness plan (7.3.b); • identify and apply concepts of fitness improvement using various resources, including available technology, to evaluate, monitor, and record activities for a fitness plan (7.3.c); • calculate resting, active, and recovery heart rate and describe its relationship to aerobic

Essential Understandings	Essential Knowledge and Skills
<p>Fitness planning includes self-assessment of the health-related components of fitness and development and implementation of a personal fitness plan. (7.3.b)</p> <ul style="list-style-type: none"> • Health-related components of fitness: <ul style="list-style-type: none"> ○ Muscular strength: the ability to exert a maximal amount of force for a short period of time, such as lifting weights. ○ Muscular endurance: the ability of a muscle to repeatedly exert force against resistance. ○ Flexibility: the ability of a joint to move through a full range of motion. ○ Cardiovascular endurance: the ability of the heart, lungs, and blood vessels to deliver oxygen to working muscles. ○ Body composition: the components that make up a person’s body weight (percentages of fat, bone, water, and muscle in the human body). <p>SMART goal setting provides focused, realistic, and measurable goals and objectives for improving and/or maintaining at least two self-selected components of health-related fitness. (7.3.b)</p> <ul style="list-style-type: none"> • Specific: Goals are straightforward and detail what is to be accomplished. • Measurable: Goals must be able to be measured for improvement (how much, how many, how will you know the goal is accomplished?). • Attainable: Goals require effort beyond what already has been achieved. • Realistic: Goals need to be achievable and reachable. • Timely: Goals should have a time element attached to keep you on track to accomplish in a given time period. <p>Creating an action plan that incorporates the FITT (frequency, intensity, time, and type of exercise) principle sets guidelines to apply when developing fitness plan action steps to become or remain physically fit. (7.3.b)</p>	<p>fitness (7.3.d);</p> <ul style="list-style-type: none"> • describe the difference between aerobic and anaerobic capacity and provide examples of each (7.3.e); • explain the role of perseverance in achieving fitness goals (7.3.f). <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes KidsHealth.gov Health Smart Virginia MyPlate.gov OpenPhyzed Physical Activity Guidelines for Americans, 2nd ed. Healthy Children.org</p>

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Frequency: how often you exercise. • Intensity: how hard you exercise. • Time: how long you exercise. • Type: what kind of exercise you do. <p>A timeline for goal achievement and for activities helps hold one accountable. (7.3.b)</p> <p>Recording/documenting, monitoring, and evaluating activities are important to meeting personal goals. (7.3.b)</p> <p>Documentation of activities inside and outside school, including plans for roadblocks/barriers and solutions, helps when reassessing progress mid-year and at the end of the year. (7.3.b)</p> <p>Reflection on progress at reassessment milestones allows changes to be made to the fitness plan as needed. (7.3.b)</p> <p>Fitness improvement can be evaluated through a variety of resources, including available technology to evaluate, monitor, and record activities for fitness. (7.3.c)</p> <ul style="list-style-type: none"> • Technology available to monitor and record – pedometers, heart rate monitors, apps; • Exercise journal – how you feel before, during, and after activity, energy level, successes and challenges, rate of perceived exertion. <p>Heart rate can be used to help determine personal fitness levels. (7.3.d)</p> <p>Individuals within the healthy range in aerobic capacity will recover quicker after</p>	

Essential Understandings	Essential Knowledge and Skills
<p>aerobic activity. (7.3.d)</p> <ul style="list-style-type: none"> • Resting heart rate (RHR) is best taken after 10 minutes of rest. • Active heart rate can be taken at multiple points during activity and include being taken immediately after stopping activity. • Recovery heart rate is the decrease in heart rate that occurs one minute after maximal exercise. A faster decrease in heart rate is associated with individuals with higher levels of fitness. <p>The body responds differently based on the demands placed on it by physical activity. (7.3.e)</p> <ul style="list-style-type: none"> • Anaerobic capacity (without oxygen) is activity in which the body incurs an oxygen debt during short-duration maximal exercise such as lifting a weight; lactic acid is the byproduct. • Aerobic capacity (with oxygen) is the body’s ability to consume oxygen during exercise such as running and biking; it provides energy at a slower rate for long-term exercise. <p>Perseverance contributes to the accomplishment of fitness goals. (7.3.f)</p> <ul style="list-style-type: none"> • Perseverance is the continued effort to do or achieve something despite difficulties, failure, or opposition; the quality that allows someone to continue trying to do something even though it is difficult. 	

Social and Emotional Development

- 7.4 The student will demonstrate and apply skills to work independently and with others in physical activity settings.
- a) Apply safety procedures, rules, and appropriate etiquette in physical activity settings by self-officiating modified physical activities/games.
 - b) Create guidelines and demonstrate how to solve problems and resolve conflicts in activity settings.
 - c) Explain the importance of cooperating with classmates, and demonstrate supportive behaviors that promote feelings of inclusion and safety of others.
 - d) Describe and demonstrate strategies for dealing with stress, such as deep breathing, guided visualization, and aerobic exercise.
 - e) Demonstrate effective communication skills by providing feedback to a peer, using appropriate tone, and other communication skills.
 - f) Identify positive mental and emotional aspects of participating in a variety of physical activities.
 - g) Describe how participation in physical activities creates enjoyment, reduces stress, and improves mental and emotional wellness.
 - h) Identify specific safety concerns associated with at least one activity that includes rules, equipment, and etiquette.
 - i) Identify and describe instances that do not support feelings of inclusion (e.g., marginalization).

Essential Understandings	Essential Knowledge and Skills
<p>Participation in physical activities can provide an opportunity for developing an understanding and respect for differences among people. (7.4.a)</p> <p>Self-officiating may include following safety procedures, calling own violations and implementing consequences, helping teammates follow safety procedures, rules and etiquette, settling questions/conflicts/problem solving with other players, and consulting with the teacher as needed for clarification/additional guidance. (7.4.a)</p> <ul style="list-style-type: none"> • Self-officiate: a physical activity officiated by the players, on the honor system, rather than by an outside observer such as a referee. • Etiquette: promotes acceptable actions, behavior, or conduct within an activity. Elements: <ul style="list-style-type: none"> ○ Be kind 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • apply safety procedures, rules, and appropriate etiquette in physical activity settings by self-officiating modified physical activities/games (7.4.a); • create guidelines and demonstrate how to solve problems and resolve conflicts (7.4.b); • explain the importance of cooperating with classmates and demonstrate supportive behaviors that promote inclusion and safety of others (7.4.c); • describe and demonstrate strategies for

<ul style="list-style-type: none"> ○ Be courteous ○ Be respectful <p>To maintain a positive learning environment, students must use communication skills to solve problems and resolve conflicts that arise. (7.4.b)</p> <ul style="list-style-type: none"> • Problem-solving <ul style="list-style-type: none"> ○ Identify/define the problem. ○ Generate several solutions. ○ Evaluate the pros and cons of each solution. ○ Choose a solution. ○ Implement, document, and reflect on the solution. • Conflict resolution skills <ul style="list-style-type: none"> ○ Able to reduce own stress quickly (calming oneself before addressing the conflict) ○ Be emotionally aware of yourself and the other person (How are you feeling? How is the other person feeling?) ○ State the conflict ○ Propose solutions or compromises ○ Agree on a solution or compromise to try • Communication skills <ul style="list-style-type: none"> ○ Listening carefully to others ○ Speaking directly to each other ○ Speaking honestly, and with kindness <p>A responsible participant views behaving well and including others as important as playing safely. (7.4.c)</p> <p>All classmates should have a safe learning environment and the opportunity for</p>	<ul style="list-style-type: none"> managing stress (7.4.d); • demonstrate effective communication skills (7.4.e); • identify positive mental, social, and emotional aspects of participating in physical activities (7.4.f); • describe how participation in physical activities creates enjoyment, reduces stress, and improves mental/emotional wellness (7.4.g); • identify safety concerns (rules, equipment, etiquette) associated with at least one activity (7.4.h); • identify and describe instances that do not support feelings of inclusion (e.g., marginalization) (7.4.i). <p>Additional resources: OPEN Online Physical Education Network Health Smart Virginia PE Central EverFi KidsHealth.org</p>
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safe participation. (7.4.c)

- Supportive behaviors may include listening, helping, encouraging, ensuring everyone is included, taking turns, following rules, and modifying rules as needed for inclusion.

Stress is necessary for creativity, learning, and survival. It's only harmful when it becomes overwhelming and interrupts the healthy state of equilibrium that the nervous system needs to maintain. (7.4.d)

- Stress: the body's reaction to a change that requires a physical, mental, or emotional adjustment or response.

Effectively dealing with stress means to activate the body's natural relaxation response by practicing relaxation techniques. (7.4.d)

- Relaxation techniques:
 - Breathing meditation: deep breathing
 - Progressive muscle relaxation: systematically tense and relax different muscle groups in the body
 - Body scan meditation: focus on the sensations in each part of your body
 - Mindfulness: staying calm and focused in the present moment
 - Visualization: imagining a scene in which you feel at peace
 - Yoga: moving and stationary poses, combined with deep breathing
 - Tai chi: a self-paced, non-competitive series of slow, flowing body movements
 - Rhythmic/aerobic exercise (such as running, walking, rowing, or cycling): engaging in the present moment, focusing your mind on how your body feels right now

Physical activity can help with managing stress. (7.4.d)

When done in the right way and with the right intentions, feedback communication is the avenue to performance greatness. (7.4.e)

- Feedback: supports the development of self-regulated learning, critical thinking, and reciprocal learning
 - Two corrections at the most should be identified for feedback
 - Should be specific and meaningful
 - Given with the goal of improvement
 - Timely
 - Honest
 - Respectful
 - Clear
 - Issue-specific
 - Objective
 - Supportive
 - Motivating
 - Action-oriented
 - Solution-oriented

Effective communication gives you the best chance of successfully delivering your message. (7.4.e)

- Positive and respectful ways to communicate include talking at an appropriate tone, waiting for a turn to speak, allowing others to provide feedback, and using appropriate body language (eye contact, gestures).
- Verbal communication: the use of words to send an oral or written message. Verbal communication skills may include being friendly, thinking before speaking, being clear, focusing on body language, and being an active listener.
- Nonverbal communication includes facial expressions, body language,

<p>gestures, and tone and voice volume. Nonverbal communication skills may include making eye contact, facial expressions, gestures (nodding), posture, tone of voice, and volume of voice.</p> <p>Exercise/physical activity improves mental health by reducing anxiety, depression, and negative mood and by improving self-esteem and cognitive function. (7.4.f)</p> <p>Exercise has been found to alleviate symptoms such as low self-esteem and social withdrawal. (7.4.f)</p> <p>Exercise enhances mood and overall well-being, provides opportunities to connect with family and friends, enjoy the outdoors, unwind, meet new people with similar interests, exercising with others can be motivating, sense of belonging, and opportunities to develop social skills. (7.4.f)</p> <p>Participation in physical activities creates enjoyment when engaging in activities that a person likes to do and participate with people they enjoy. (7.4.g)</p> <p>Physical activity causes the release of endorphins in the brain, a chemical that triggers a positive feeling in the body, the body’s natural “feel good” chemicals also help to reduce/relieve pain and stress. (7.4.g)</p> <p>Safety concerns should include activity-specific rules, equipment, and etiquette. (7.4.h)</p> <ul style="list-style-type: none">• Etiquette is a diplomatic code of conduct that promotes a decorum of socially responsible and polite behaviors (e.g., shaking hands/giving high fives/congratulating other teams at the end of a game). <p>Creating opportunities that allow everyone to participate and succeed contributes</p>	
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<p>to an inclusive environment. (7.4.i)</p> <ul style="list-style-type: none">• Inclusion: feeling a sense of belonging, acceptance, and value<ul style="list-style-type: none">○ Belonging: feeling needed, important, and respected within the group○ Accepted: being welcomed into the class’s community○ Valued: knowing you are worthy and desirable• Marginalization: treatment of a person or group as insignificant or peripheral	
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Energy Balance

- 7.5 The student will describe rate of perceived exertion and nutrients (energy) needed for a variety of activities and explain the importance of sleep for energy balance.
- Explain the connection between an RPE scale and heart rate, and the body’s response to physical activity.
 - Define and describe the anaerobic and aerobic energy systems.
 - Identify the nutrients needed for optimal aerobic and anaerobic capacity and for muscle strength and endurance.
 - Calculate resting heart rate (RHR) and describe its relationship to aerobic fitness and an RPE scale.
 - Explain the effects of sleep on energy balance.

Essential Understandings	Essential Knowledge and Skills
<p>Rate of perceived exertion (RPE) is a way of measuring physical activity intensity level. Scales may range from five to 20 levels. (7.5.a)</p> <p>Example (variation of Borg scale):</p> <ul style="list-style-type: none"> Level 1 – Very light activity (watching TV) Level 2 – Light activity (can maintain for hours, easy to breathe) Level 3 – Moderate activity (breathing heavily, somewhat comfortable) Level 4 – Vigorous activity (borderline uncomfortable, short of breath) Level 5 – Very hard activity (difficult to maintain exercise intensity, barely breathe) Level 6 – Max effort activity (almost impossible to keep going, out of breath) <p>The RPE scale relies on bodily sensations during exercise, such as muscular fatigue, increased sweating, and increased breathing rate and heart rate. (7.5.a, 7.5.d)</p> <p>Using the RPE scale helps you recognize your body’s signs of exertion and modify your normal workout intensity. (7.5.a)</p>	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> explain the connection between an RPE scale and heart rate, and the body’s response to physical activity (7.5.a); define and describe the anaerobic and aerobic energy systems (7.5.b); identify the nutrients needed for optimal aerobic and anaerobic capacity and muscle strength and endurance (7.5.c); calculate resting heart rate (RHR) and describe its relationship to aerobic fitness and an RPE scale (7.5.d); explain the effects of sleep on energy balance (7.5.e). <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes</p>

Essential Understandings	Essential Knowledge and Skills
<p>Anaerobic and aerobic respiration are ways your body converts food into energy so that your brain, muscles, and other organs can function normally. (7.5.b)</p> <p>In aerobic exercise, oxygen is used to create a metabolic reaction in cells. This reaction produces the cellular energy required for the body to move. (7.5.b)</p> <p>During anaerobic exercise, the body requires immediate energy. The body relies on stored energy sources, rather than oxygen, to fuel itself. (7.5.b)</p> <ul style="list-style-type: none"> • Anaerobic exercise includes breaking down glucose stored in the body, which provides energy from 6 up to 90 seconds. <p>The body uses different pathways to create energy from macronutrients (carbohydrates, proteins, and fats.) (7.5.c)</p> <ul style="list-style-type: none"> • Most energy is derived from the breakdown of carbohydrates and fats, the two main energy nutrients used during exercise. <p>For optimal aerobic and anaerobic capacity, the body needs to break down carbohydrates and convert it to glycogen, so it can be used as energy or fuel. (7.5.c)</p> <p>Aerobic processes in cellular respiration can only occur if oxygen is present. (7.5.c)</p> <ul style="list-style-type: none"> • When a cell needs to release energy, it initiates a chemical exchange that launches the breakdown of glucose. This sugar is carried through the blood and stored in the body as a fast source of energy. The breakdown of glucose releases carbon dioxide, a byproduct that needs to be removed from the body. <ul style="list-style-type: none"> ○ Aerobic exercise conditions enable you to exercise for long periods 	<p>KidsHealth.gov</p> <p>Health Smart Virginia</p> <p>MyPlate.gov</p> <p>OpenPhyzed</p> <p>Physical Activity Guidelines for Americans, 2nd ed.</p>

Essential Understandings	Essential Knowledge and Skills
<p>of time, potentially benefiting from the sustained energy expenditure (i.e., calories burned).</p> <ul style="list-style-type: none"> ○ With aerobic training, you become much more efficient at using fat as an energy source for exercise. This allows muscle and liver glycogen to be used at a slower rate. <p>Anaerobic energy processes do not use oxygen. (7.5.c)</p> <ul style="list-style-type: none"> • In anaerobic exercise, glycogen, from carbohydrates, is used as fuel. However, there is not enough oxygen in the system to fully break it down. <ul style="list-style-type: none"> ○ Lactic acid is a byproduct of an anaerobic process. Lactic acid which builds up in muscle cells as aerobic processes fail to keep up with energy demands. ○ Lactic acid leads to fatigue and muscle soreness that can be recovered from by breathing in more oxygen and through the circulation of blood. These processes help carry the lactic acid away. <p>Resting heart rate (RHR) can be used to help determine personal fitness levels including cardiovascular health. (7.5.d)</p> <p>In general, a lower heart rate at rest indicates more efficient heart function and better aerobic/cardiorespiratory fitness. (7.5.d)</p> <ul style="list-style-type: none"> • Resting heart rate (RHR) is best taken after 10 minutes of rest. <p>Monitoring your heart rate, and comparing to an RPE scale, will allow you to track the changes taking place in your cardiovascular system as you move toward aerobic fitness. (7.5.d)</p> <p>Energy balance is the balance between calories consumed (energy in) and calories expended (energy out), which helps maintain a healthy body weight.</p>	

2022 Physical Education Standards of Learning Curriculum Framework

Essential Understandings	Essential Knowledge and Skills
<p>(7.5.e)</p> <p>Short sleep (less than recommended/sleep deficit) is associated with weight gain due to increased food intake, decreased energy expenditure, and changes in levels of appetite-regulating hormones. (7.5.e)</p> <p>Transitioning from an insufficient to adequate/recovery sleep schedule can lead to decreased energy intake, especially of fats and carbohydrates, and lead to weight loss. (7.5.e)</p>	

GRADE EIGHT

Students in grade eight demonstrate competence in skillful movement in modified, dynamic game/sport situations and in a variety of rhythmic and recreational activities. They transition from modified versions of movement forms to more complex applications across all types of activities. The grade-eight student applies knowledge of major body structures to explain how body systems interact with and respond to physical activity and how structures help the body create movement. Students will explain the relationship between nutrition, activity, and body composition to deepen understanding of energy balance. They will demonstrate socially responsible behavior as they show respect for others, make reasoned and appropriate choices, resist negative peer pressure, and exhibit integrity and fair play to achieve individual and group goals in the physical activity setting. Students are able to set goals, track progress, and participate in physical activities to improve health-related fitness. They have a repertoire of abilities across a variety of game/sport, dance, and recreational pursuits and begin to develop competence in specialized versions of lifelong game/sport activities.

Motor Skill Development

- 8.1 The student will apply and demonstrate movement concepts and skills in small-sided games/sports, rhythmic, dance, lifetime, and recreational activities.
- a) Demonstrate and apply movement forms to a variety of cooperative and tactical activities that include dynamic and unpredictable situations with a focus on defensive strategies, including reducing space, transitioning from offense to defense quickly, and selecting appropriate tactics to gain a defensive advantage.
 - b) Create a rhythmic movement or dance sequence to music as an individual or in a group.
 - c) Demonstrate skill-related components of fitness (agility, balance, coordination, power, reaction time, and speed) specific to various activities.
 - d) Demonstrate and explain the role of balance (center of support, center of gravity, and planes of motion) in a variety of activities.
 - e) Demonstrate physiological principles of warm-up, cool down, overload, specificity, and progression to improve performance.
 - f) Demonstrate the use of technology tools to analyze and improve performance.
 - g) Analyze movement performance/progressions (i.e., practice, self or peer assess, correct, practice at a higher level, and reassess) of a specific skill and use feedback to learn or improve the movement skills of self and others.

Essential Understandings	Essential Knowledge and Skills
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Essential Understandings	Essential Knowledge and Skills
<p>Motor skill development includes combining and applying movement and manipulative skills to changing physical activity/game situations. (8.1.a)</p> <p>Cooperative activities put an emphasis on team building, communication, and trust. (8.1.a)</p> <p>Tactical activities may include small-sided, modified games and sports that may include offense and defense that include dynamic and unpredictable situations. (8.1.a)</p> <ul style="list-style-type: none"> • Defense is the action of preventing an opposing team/opponent from scoring. Defensive strategies include defensive body positioning (lowering center of gravity, arms out), reducing space, use of sidelines, transitioning from offense to defense quickly, communicating with teammates, covering an individual opponent or area of the field of play, and selecting appropriate tactics to gain defensive advantage • Offensive skills include moving to open spaces, give and go, fakes, pivots, changing speed/direction, positioning in front of defender closer to a teammate, communicating with teammates, and continually moving/not standing still. <p>Dance and/or rhythms can provide opportunities for personal enjoyment, self-expression, challenge, and social interaction. (8.1.b)</p> <p>Movement competency involves patterns. (8.1.b)</p> <ul style="list-style-type: none"> • Student-created individual or group rhythmic movement sequence may include a beginning, ending, change in direction and pathways, and variety of skills/movements to counts of 4/8. 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • demonstrate and apply movement forms in cooperative and tactical activities with a focus on defensive strategies (8.1.a); • create a rhythmic movement sequence to music (8.1.b); • demonstrate skill-related components of fitness in a variety of activities (8.1.c); • demonstrate the role of balance in a variety of activities and/or planes of movement (8.1.d); • explain the role of balance in a variety of activities/planes of movement (8.1.d); • demonstrate warm-up, cool down, overload, specificity, and progression (8.1.e); • demonstrate the use of technology tools to analyze and improve performance (8.1.f); • analyze movement performance and use feedback to learn or improve the movement skills of self-and/or others (8.1.g). <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OpenPhySED Health Smart Virginia PE Central</p>

Essential Understandings	Essential Knowledge and Skills
<p>Skill-related fitness components increases one’s ability to perform in various activities and leads to good overall health. (8.1.c)</p> <ul style="list-style-type: none"> • Agility: the ability to move quickly and easily; quick change of direction. • Balance: stability produced by even distribution of weight; muscles tense to keep the body in a balanced position. • Coordination: harmonious functioning of parts for effective results; it takes eye-hand coordination to strike an object. • Power: physical might; the ability to act or produce an effect; kicking a ball for distance. • Reaction time: the time required for a subject to initiate a prearranged response to a defined stimulus; the time between hearing a whistle and starting to run or the time between seeing a ball being thrown to a place out of reach and moving to catch it. • Speed: the rate of motion; the ability to move swiftly <p>Balance is a static and dynamic process that makes it possible for the body to maintain its center of gravity over its base of support. (8.1.d)</p> <ul style="list-style-type: none"> • Center of gravity: a balance point or that point about which a body would balance without a tendency to rotate. • Center of support: the area beneath a person that includes every point of contact that the person makes with the supporting surface; these points of contact may be body parts (e.g., feet or hands) or they may include things like crutches or a chair when a person is sitting in it. <p>The lower the center of the body, the larger the base of support, the closer the center of the body is to the base of support, the more stability increase. (8.1.d)</p> <p>Movement is stabilized in three planes of motion. (8.1.d)</p>	<p>Dynamic PE ASAP</p>

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Frontal plane: the front and back halves of the body; side-to-side movements. • Sagittal plane: the right and left halves of the body; forward and backward movements. • Transverse plane: the top and bottom halves of the body; twisting movements. <p>Warming up and cooling down may help reduce risk of injury and improve athletic performance. (8.1.e)</p> <ul style="list-style-type: none"> • Warm-up: pumps nutrient-rich, oxygenated blood to muscles as it speeds up heart rate and breathing and raising body temperature, preparing the body for activity. A good warm-up should last five to 10 minutes and work all major muscle groups; start activity/exercise slowly, then pick up the pace. Warming up may help reduce muscle soreness and lessen risk of injury. • Cool down: after a workout, five to 10 minutes cooling down through a sequence of slow movements; helps prevent muscle cramps and dizziness while gradually slowing breathing and heart rate; gradual recovery of pre-exercise heart rate and blood pressure. <p>Improvements in performance depend upon the training principles of overload, specificity, and progression. (8.1.e)</p> <ul style="list-style-type: none"> • Specificity: desired adaption occurs in response to specific stress placed upon the body; exercise/activity needs to match desired outcome. • Overload: stress must be applied beyond that which the body is accustomed to; increase workload (added weight, time, intensity, and/or repetitions). • Progression: once the body has adapted to a level of stress, additional 	

Essential Understandings	Essential Knowledge and Skills
<p>stress is needed; progressively or gradually increase workload.</p> <p>Technology can be used to provide opportunities to analyze movement, monitor progress toward motor skill and fitness goals, and assess learning/improvement. (8.1.f)</p> <p>Technology used to analyze and improve performance may include devices with video capability, apps with frame-by-frame and coaching markings, heart rate monitors, pedometers, and GPS-capable devices for speed and distance. (8.1.f)</p> <p>Movement-learning progression includes practice, self-assessment or peer assessment, correct movement/skill components, practice at a higher level, and reassessment. (8.1.g)</p> <p>Self-assessments/peer assessments allow students to observe specific skills to detect, analyze, and correct errors in personal movement patterns. (8.1.g)</p> <p>Feedback motivates, reinforces, and speeds learning. Feedback may be oral, written, or visual and should include specifics about what is being done well (in relation to critical elements) and what can be done to improve, and suggestions for ways to improve through practice. (8.1.g)</p>	

Anatomical Basis of Movement

- 8.2 The student will apply movement principles and concepts and apply knowledge of major body structures to explain how body systems interact with and respond to physical activity and movement.
- a) Explain how body systems interact with one another during physical activity.
 - b) Identify and describe biomechanical principles (e.g., spin, rebound, effects of levers, force, motion, rotation, and energy) to understand skillful movements.
 - c) Explain how offensive and defensive tactics and strategies are used to gain an advantage in games and sports.
 - d) Analyze performance in a variety of selected skills/activities using movement concepts of agility, power, coordination, reaction time, speed, force, motion, rotation, and energy of self and partner.
 - e) Analyze movement progressions (i.e., practice, self or peer assess, correct, practice at a higher level, and reassess) of a specific skill and use feedback to improve the movement skills of self and/or others.
 - f) Describe the effects of physical activity and exercise on the body, including cardiorespiratory, muscular, and nervous systems.
 - g) Apply knowledge of anatomy to accurately describe movements in relation to type of joint and associated movement/motion, associated bones and muscles, and type of muscle contraction.

Essential Understandings	Essential Knowledge and Skills
<p>Body systems interact during physical activity. (8.2.a, 8.2.f)</p> <ul style="list-style-type: none"> • The heart, which is part of the circulatory system, does not beat unless the brain, which is part of the nervous system, tells it to. • The muscular system needs the respiratory and circulatory systems to supply energy in the form of oxygen and nutrients. • Vigorous exercise stimulates the endocrine system, which causes the release of endorphins, which improve the mood and induce a feeling of calmness. <p>When the body is moving or producing movement, it obeys the same physical laws and biomechanical principles that apply to all types of motion. (8.2.b)</p> <ul style="list-style-type: none"> • Spin is created when a ball or any object is subjected to an external force creating a force couple. Topspin tends to shorten the flight of the ball, 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • explain how body systems interact with one another during physical activity (8.2.a); • identify and describe biomechanical principles to understand skillful movements (8.2.b); • explain how offensive tactics and strategies are used to gain an advantage in games and sports (8.2.c); • analyze performance in a variety of selected skills/activities using movement

Essential Understandings	Essential Knowledge and Skills
<p>which dips sharply at the end of its flight. Backspin also shortens the flight of the ball, which falls more slowly at the end of the flight. Sidespin makes the ball curve left or right in the direction of the spin.</p> <ul style="list-style-type: none"> • Rebound (Newton’s Third Law): An object, when struck, will rebound in the opposite direction with the same amount of force with which it was hit. • Effects of levers: The bones of the body are levers as well as a stiff, straight object that can be used to lift weight, increase force, or create speed (example: bicep curl. The pivot point is the elbow, the lever is the lower arm/forearm, and the weight is the resistance. The force of the contraction of the muscles of the upper arm pulls up on the lever (lower arm/forearm), and arm and weight move up. • Force: a push or a pull; Newton’s Laws of Motion. • Motion: the process of moving or being moved. • Rotation: the action of rotating around an axis or center. • Energy: the capacity for doing work; energy in moving objects. <p>Offensive tactics involve the strategies or players that are used in an attempt to score in a game. (8.2.c)</p> <ul style="list-style-type: none"> • Offensive tactics include moving to open spaces, give and go, fakes, pivots, changing speed/direction, positioning in front of defender closer to a teammate, communicating with teammates, and continually moving/not standing still. <p>Defensive tactics involve the strategies or players that prevent the other team from scoring. (8.2.c)</p> <ul style="list-style-type: none"> • Defensive tactics include defensive body positioning (lowering center of gravity, arms out), reducing space, use of sidelines, transitioning from 	<p>concepts (8.2.d);</p> <ul style="list-style-type: none"> • analyze movement progressions (practice, self-assessment or peer assessment, correct, practice at a higher level, and reassessment) of a specific skill and use feedback to improve the movement skills of self and/or others (8.2.e); • describe how physical activity and exercise affects the cardiorespiratory system (8.2.f); • describe the effects of physical activity and exercise on the body, including cardiorespiratory, muscular, and nervous systems (8.2.f); • apply knowledge of anatomy to accurately describe movements in relation to type of joint and associated movement/motion, associated bones and muscles, and type of muscle contraction. (8.2.g) <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OPEN Online Physical Education Network Health Smart Virginia PE Central Dynamic PE ASAP KidsHealth.org</p>

Essential Understandings	Essential Knowledge and Skills
<p>offense to defense quickly, communicating with teammates, covering an individual opponent or area of the field of play, and reacting to gain defensive advantage.</p> <p>The ability to analyze components of a skill and movement concepts can result in improvement of self and/or others. (8.2.d)</p> <ul style="list-style-type: none"> • Movement performance examples using movement concepts: <ul style="list-style-type: none"> ○ Force: varies returns in net/wall games. ○ Agility: changing directions to hit a tennis ball. ○ Coordination: using the hands and eyes in a basketball dribble is called hand-eye coordination. ○ Speed: relying on speed to gain advantage, such as a basketball player making a fast break to perform a layup or a football player outrunning the defense to receive a pass. ○ Power: a combination of speed and muscular strength, such as a volleyball player moving quickly to the net and lifting their bodies high into the air. ○ Reaction time: to reach or respond quickly to what is seen, heard or felt. An example is stealing a base in baseball. <p>Movement learning progression includes practice, self-assessment or peer assessment, correct movement/skill components, practice at a higher level, and reassessment. (8.2.e)</p> <p>Self-assessments/peer assessments allow students to observe specific skills to detect, analyze, and correct errors in personal movement patterns. (8.2.e)</p> <p>Feedback motivates, reinforces, and speeds learning. Feedback may be oral,</p>	

Essential Understandings	Essential Knowledge and Skills
<p>written, or visual and should include specifics about what is being done well (in relation to critical elements) and what can be done to improve, and suggestions for ways to improve through practice. (8.2.e)</p> <p>Physical activity and exercise affect all major body systems. (8.2.f)</p> <ul style="list-style-type: none"> • Physical movement: stronger bones and muscles; promotes development of motor skills, joint flexibility, balance, coordination. • Body systems: improves muscle strength, endurance, delivers oxygen and nutrients to tissues from increased heart rate and respiration, helps cardiovascular system be more efficient, boosts energy; better sleep. • Brain development: movement/exercise increases heart rate, which pumps more oxygen to the brain, supplying brain cells with oxygen; promotes the production of new brain cells by the release of hormones; and aids in creating new synapses/new connections; improves thinking, cognition, and judgment skills. <p>Muscles move bones by working in pairs at joints. Flexors contract to bend a limb at the joint and then the flexor relaxes while the extensor contracts to straighten the limb at the same joint. (8.2.g)</p> <ul style="list-style-type: none"> • Joints and movements <ul style="list-style-type: none"> ○ Ball and socket: rounded surface of one bone moves within a depression on another bone; hip (head of femur and depression of pelvis); shoulder (humerus, scapula, clavicle); movement: flexion/extension. ○ Pivot: cervical vertebrae allows the head to from move side to side; the radius, ulna, and humerus allow for twist motion (movement of arm for forehand and backhand swing); movement: rotation of one bone around another. 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ Hinge: backward and forward swing motion; joints between bones of the fingers (phalanges); ankle (fibula, tibia, and talus of the foot); elbow (ulna and humerus); knee (femur, tibia, and patella); movement: flexion/extension. Example: arm bend at elbow. Type of joint: hinge; movement/motion: flexion/extension; bones: humerus, radius, ulna; muscles: biceps and triceps. The biceps contract while the triceps relaxes to bend the arm up, then the biceps relax and the triceps contracts to return the arm to the straight position. 	

Fitness Planning

- 8.3 The student will apply self-assessment skills and use technology to create and implement a personal fitness plan to improve or maintain personal fitness.
- a) Complete a self-assessment of current fitness levels and develop a comprehensive personal fitness plan, including SMART (specific, measurable, attainable, realistic, timely) goals, an action plan that incorporates the FITT (frequency, intensity, time and type of exercise) principle, a timeline, documentation of activities inside and outside school, roadblocks/barriers and solutions, midyear and end-of-year assessments, and reflection on progress for improving at least three components of health-related fitness.
 - b) Describe how an RPE scale can be used to adjust workout intensity during physical activity.
 - c) Use a variety of resources, including available technology tools and prior fitness data, to evaluate, monitor, and record activities for personal fitness improvement.
 - d) Create and implement an activity plan (that includes warm-up, cool-down and appropriate intensity levels) applying specificity, overload, and progression, and identify safety precautions to meet the Centers for Disease Control and Prevention’s Physical Activity Guidelines for Americans.
 - e) Describe the body’s physiological responses to warm-ups and cool downs.
 - f) Identify activities that use the anaerobic and aerobic energy systems.
 - g) Demonstrate perseverance in achieving fitness goals.

Essential Understandings	Essential Knowledge and Skills
<p>Fitness planning includes self-assessment of the health-related components of fitness and development and implementation of a personal fitness plan. (8.3.a)</p> <ul style="list-style-type: none"> • Health-related components of fitness <ul style="list-style-type: none"> ○ Muscular strength: the ability to exert a maximal amount of force for a short period of time, such as lifting weights. ○ Muscular endurance: the ability of a muscle to repeatedly exert force against resistance. ○ Flexibility: the ability of a joint to move through a full range of motion. ○ Cardiovascular endurance: the ability of the heart, lungs, and blood 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • complete a self-assessment of current fitness levels and develop a comprehensive personal fitness plan (8.3.a); • describe how a rate of perceived exertion (RPE) scale can be used to adjust workout intensity (8.3.b); • use a variety of resources to evaluate,

Essential Understandings	Essential Knowledge and Skills
<p>vessels to deliver oxygen to working muscles.</p> <ul style="list-style-type: none"> ○ Body composition: the components that make up a person’s body weight (percentages of fat, bone, water, and muscle in the human body). <p>Fitness planning includes:</p> <ul style="list-style-type: none"> • SMART (specific, measurable, attainable, realistic, timely) goals for improving and/or maintaining self-selected components of health-related fitness based on self-assessment of health-related components of fitness (using technology as appropriate) • An action plan that incorporates SOP (specificity, overload, and progression) training principles • An action plan that incorporates the FITT (frequency, intensity, time, and type of exercise) principle • A warm-up and cool down • Timeline for goal achievement and for activities • Documentation of activities inside and outside school using technology tools • Plan addresses/plans for roadblocks/barriers and solutions • Reassessment at mid-year and end-of-year • Reflection on progress at reassessment milestones and make changes to plan as needed. (8.3.a, 8.3.c, 8.3.d) <p>Perceived exertion is how hard a person feels like their body is working. Rate of perceived exertion (RPE) is a way of measuring physical activity intensity level. Scales may range from five to 20 levels. (8.3.b)</p> <p>Example (variation of Borg scale):</p> <ul style="list-style-type: none"> • Level 1 – Very light activity (watching TV) 	<p>monitor, and record activities for fitness improvement (8.3.c);</p> <ul style="list-style-type: none"> • create and implement an activity plan (that includes a warm-up, cool down, and appropriate intensity levels) applying specificity, overload, and progression, and identify safety precautions to meet the Centers for Disease Control and Prevention’s Physical Activity Guidelines for Americans (8.3.d); • describe the body’s physiological responses to warm-ups and cool downs (8.3.e); • identify activities that use the anaerobic and aerobic energy systems (8.3.f); • demonstrate perseverance in achieving fitness goals. (8.3.g) <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes KidsHealth.gov Health Smart Virginia MyPlate.gov OpenPhySED Physical Activity Guidelines for Americans, 2nd ed. Healthy Children.org</p>

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Level 2 – Light activity (can maintain for hours, easy to breathe) • Level 3 – Moderate activity (breathing heavily, somewhat comfortable) • Level 4 – Vigorous activity (borderline uncomfortable, short of breath) • Level 5 – Very hard activity (difficult to maintain exercise intensity, barely breathe) • Level 6 – Max effort activity (almost impossible to keep going, out of breath) <p>Fitness improvement can be evaluated through a variety of resources, including available technology, to evaluate, monitor, and record activities for fitness. (8.3.c)</p> <ul style="list-style-type: none"> • Technology available to monitor and record: pedometers, heart rate monitors, apps • Exercise journal: how you feel before, during, and after activity, energy level, successes and challenges, rate of perceived exertion <p>Selection of a measurement method of personal fitness depends on the purpose of the evaluation and what is being measured. (8.3.c)</p> <p>Combining the SOP principles will ensure that you are not only doing the right exercises but also doing them at a resistance, speed, and frequency that will force your body to adapt. (8.3.d)</p> <p>Activity planning based on Centers for Disease Control and Prevention’s Physical Activity Guidelines for Americans for 60 minutes of physical activity a day should include: (8.3.d)</p> <ul style="list-style-type: none"> • SMART goal(s) based on self-assessment of current physical activity levels 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Action plan strategies that include activities inside and outside school seven days a week and that includes warm-up, cool down, and appropriate intensity levels • Safety precautions for activities • Documentation of activities • Reflection of goal attainment. <p>The body has a physiological response to warm-ups and cool downs. (8.3.e)</p> <ul style="list-style-type: none"> • Effects of warm-ups: <ul style="list-style-type: none"> ○ Dilates the capillaries and raises the pulse rate, which enables more blood and oxygen to be available for the muscles. ○ Raises body temperature, which enhances the rate of ATP conversion. ○ Prepares muscles to operate over their full range. ○ Reduces the risk of injury. ○ Produces hormones like epinephrine, endorphins, growth hormone and testosterone, all of which increase the energy available for your workout. • Effects of cool downs: <ul style="list-style-type: none"> ○ Reducing to lighter exercises will help with the removal of lactic acid. ○ Prevents blood pooling that causes dizziness. ○ Stretching improves flexibility. ○ Slow down the heart rate. ○ Slows down the blood flow. ○ Slows down nervous system activity. ○ Helps minimize muscle fatigue and soreness. <p>Anaerobic exercise is typically used in non-endurance sports to build power and by body builders to build muscle mass. (8.3.f)</p>	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Examples of anaerobic exercise: <ul style="list-style-type: none"> ○ Weightlifting ○ Sprinting and jumping ○ Any exercise that consists of short-exertion, high-intensity movement <p>Aerobic exercise includes any type of exercise but typically those performed at moderate levels of intensity for extended periods of time that maintain an increased heart rate. (8.3.f)</p> <ul style="list-style-type: none"> • Examples of aerobic exercise: <ul style="list-style-type: none"> ○ Walking ○ Running ○ Swimming ○ Cycling ○ Rowing <p>Having perseverance will help a person achieve their fitness goals. (8.3.g)</p> <ul style="list-style-type: none"> • Perseverance strategies <ul style="list-style-type: none"> ○ Set realistic goals (SMART goals) ○ Be persistent ○ Celebrate your successes ○ Create your non-negotiables (do away with excuses) ○ Monitor your progress 	

Social and Emotional Development

- 8.4 The student will describe and apply social and safety skills to achieve individual and group goals in physical activity settings.
- a) Describe and demonstrate best practices for participating safely in physical activity, exercise, and dance (e.g., injury prevention, proper alignment, hydration, use of equipment, implementation of rules, sun protection).
 - b) Describe and demonstrate appropriate encouragement and feedback to peers without prompting from the teacher.
 - c) Identify and demonstrate proper etiquette, respect for others, integrity, effective communication, problem-solving skills, conflict-resolution skills, self-management and teamwork skills while engaging in cooperative and dynamic physical activity and/or social dance.
 - d) Identify and demonstrate self-awareness in selecting stress-reducing activities (e.g., yoga, Pilates, tai chi).
 - e) Apply relationship skills and strategies (e.g., trust, compassion, empathy) that promote team/group dynamics and inclusion.
 - f) Analyze the proper use of equipment and self-management skills in relation to safety in physical activity.
 - g) Analyze and compare social and emotional benefits of participation in various activities.
 - h) Identify opportunities for social interaction through physical activity in the community.
 - i) Develop plans to enhance inclusion and reduce social exclusion/marginalization.

Essential Understandings	Essential Knowledge and Skills
<p>While there is a risk of injury with any type of physical activity, the benefits of staying active far outweigh the risks. (8.4.a)</p> <p>Safety practices for physical activity should include proper warm-up and cool down, safety equipment, injury prevention, proper alignment, hydration, use of equipment, implementation of rules, and sun protection. (8.4.a)</p> <ul style="list-style-type: none"> • Guidelines for safe physical activity: <ul style="list-style-type: none"> ○ Understand the risks but be confident that physical activity is safe for most individuals. ○ Choose types of physical activity that are appropriate for your current fitness level and health goals. ○ Increase physical activity gradually over time whenever more activity is necessary to meet health goals. 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • describe and demonstrate best practices for participating safely in physical activity, exercise, and dance (8.4.a); • describe appropriate encouragement and feedback to peers (8.4.b); • identify and demonstrate proper etiquette, respect for others, integrity, and teamwork while engaging in physical activity and/or social dance (8.4.c); • identify and demonstrate basic movements

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ Be protected by using appropriate gear and sports equipment, looking for safe environments, and following rules and procedures. Examples: Policies that promote the use of bicycle helmets reduce the risk of head injury among cyclists. Rules against diving into shallow water at swimming pools prevent head and neck injuries. ○ Making good choices about when, where, and how to be active reduces possible injuries and adverse events can be prevented. Example: During very hot and humid weather, lessen the chances of dehydration and heat stress by: <ul style="list-style-type: none"> ▪ Exercising in the cool of early morning as opposed to midday heat; ▪ Switching to indoor activities (playing basketball in the gym rather than on the playground); ▪ Changing the type of activity (swimming rather than playing soccer); ▪ Lowering the intensity of activity (walking rather than running). ○ Paying close attention to rest, shade, drinking enough fluids, and other ways to minimize effects of heat. ○ If you have chronic conditions or symptoms, consult your health care provider about the types and amounts of activity that is appropriate. <p>Appropriate encouragement and feedback should include positive specific comments about what a peer is doing well, specific comments that may help a peer improve skill/play, and effective verbal and nonverbal communication skills (8.4.b)</p> <p>Etiquette is a code of conduct based on a set of societal rules that act as a catalyst for positive human interactions (e.g., shaking hands/giving high</p>	<ul style="list-style-type: none"> used in stress-reducing activities (8.4.d); ● apply relationship skills and strategies that promote team/group dynamics and inclusion (8.4.e); ● analyze the proper use of equipment and self-management skills used to be safe in physical activities (8.4.f); ● analyze and compare social and emotional benefits of participation in a variety of activities (8.4.g); ● identify opportunities for social interaction through physical activity in the community (8.4.h); ● develop plans to enhance inclusion and reduce social exclusion/marginalization (8.4.i). <p>Additional resources: OPEN Online Physical Education Network Health Smart Virginia PE Central EverFi KidsHealth.org</p>

Essential Understandings	Essential Knowledge and Skills
<p>fives/congratulating other team at the end of a game). (8.4.c)</p> <p>Respecting others may include (8.4.c)</p> <ul style="list-style-type: none"> • Showing interest and appreciation for other people’s cultures and backgrounds • Not insulting, teasing, or making fun of people • Listening to others when they speak • Being considerate of people’s likes and dislikes • Not talking about people behind their backs • Being sensitive to other people’s feelings. <p>Integrity is the quality of being honest and fair. Integrity in physical activity settings allows for inclusive, fair, and safe participation for all participants. (8.4.c)</p> <p>Teamwork skills may include communication, conflict resolution, decision making, problem solving, and self-management skills (8.4.c)</p> <ul style="list-style-type: none"> • Problem-solving <ul style="list-style-type: none"> ○ Identify/define the problem. ○ Generate several solutions. ○ Evaluate the pros and cons of each solution. ○ Choose a solution. ○ Implement, document, and reflect on the solution. • Conflict resolution skills <ul style="list-style-type: none"> ○ Capable of managing stress while remaining calm (calming oneself before addressing the conflict). ○ Being emotionally aware of yourself and the other person (How are you feeling? How is the other person feeling?) 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ Stating the conflict. ○ Proposing solutions or compromises. ○ Agreeing on a solution or compromise to try. • Communication skills <ul style="list-style-type: none"> ○ Listening carefully to others. ○ Speaking directly to each other. ○ Speaking honestly, and with kindness. • Decision-making skills <ul style="list-style-type: none"> ○ Identify the decision to be made. ○ List all the possible options. ○ Evaluate the pros and cons of each option. ○ Make your decision based on the evaluation of each option. ○ Reflect on the decision that was made. • Self-management skills <ul style="list-style-type: none"> ○ Maintaining self-control. ○ Respecting the rights and feelings of others. <p>Physical activity is an effective means of reducing stress. Stress-reducing activities may include: (8.4.d)</p> <ul style="list-style-type: none"> • Yoga: mind-body exercises that include deep breathing, flexibility, strength, balance, coordination, and relaxation • Pilates: low-impact flexibility, muscular strength, and endurance movements that emphasizes postural alignment, core strength, and muscle balance • Tai chi: low-impact, slow-motion continuous movements, described as meditation in motion. <p>A responsible participant views behaving well and including others as important</p>	

Essential Understandings	Essential Knowledge and Skills
<p>as playing safely. This includes displaying: (8.4.e)</p> <ul style="list-style-type: none"> • Trust: having confidence in one another • Compassion: recognizing others’ distress and having a desire to alleviate it • Empathy: being aware of and sensitive to others’ thoughts, feelings, and experiences <p>Team-building activities are simulating problem-solving tasks designed to help group members develop their capacity to work effectively together. (8.4.e)</p> <p>Group dynamics describes the way members of a group interact with one another. (8.4.e)</p> <p>Supportive behaviors may include listening, helping, encouraging, ensuring everyone is included, taking turns, following rules, and modifying rules as needed for inclusion. (8.4.e, 8.4.i)</p> <p>Using self-management skills and equipment properly allows for safe participation in physical activities. (8.4.f)</p> <ul style="list-style-type: none"> • Self-management skills: problem-solving, flexibility, honesty, communication, confidence, integrity <p>Exercise/physical activity improves mental health by reducing anxiety, depression, and negative mood and by improving self-esteem and cognitive function. Exercise has also been found to improve feelings such as low self-esteem and social withdrawal. (8.4.g)</p> <p>Physical activity also causes the release of endorphins in the brain, a chemical</p>	

Essential Understandings	Essential Knowledge and Skills
<p>that triggers a positive feeling in the body, the body’s natural “feel good” chemicals also help to reduce/relieve pain and stress. (8.4.g)</p> <p>Exercise enhances mood and overall well-being, provides opportunities to connect with family and friends, enjoy the outdoors, unwind, and meet new people with similar interests. Exercising with others can be motivating, create a sense of belonging, and provide opportunities to develop social skills. (8.4.h)</p> <p>Participation in physical activities creates enjoyment when engaging in activities that a person likes to do and participate with people they enjoy. (8.4.h)</p> <p>Opportunities for social interaction through physical activity in the community may include parks and recreation centers, youth leagues, faith community activities, and youth activities and clubs. (8.4.h)</p> <p>Creating opportunities that allow everyone to participate and succeed contributes to an inclusive environment. (8.4.i)</p> <ul style="list-style-type: none"> • Inclusion: Feeling a sense of belonging, acceptance, and value. <ul style="list-style-type: none"> ○ Belonging: feeling needed, important, and respected within the group ○ Accepted: being welcomed into the class’s community ○ Valued: knowing you are worthy and desirable • Marginalization: treatment of a person or group as insignificant or peripheral 	

Energy Balance

- 8.5 The student will explain the relationship of caloric intake, caloric expenditure, and body composition.
- a) Describe the relationship between inadequate caloric intake and health risk factors.
 - b) Explain the role of energy balance in weight management and body composition.
 - c) Describe types of body-composition measures.

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- d) Explain a rate of perceived exertion (RPE) scale and how it relates to energy expenditure.
- e) Create a one-day energy balance plan, including meals, snacks and physical activity, based on Recommended Dietary Allowance (RDA).

Essential Understandings	Essential Knowledge and Skills
<p>Inadequate caloric intake may affect growth and development and increase the risk of chronic disease, including obesity. (8.5.a)</p> <p>Energy balance is the balance between calories consumed (energy in/caloric intake) and calories expended (energy out/caloric expenditure). (8.5.b)</p> <p>Body composition is the components that make up a person’s body weight (percentages of fat, bone, water, and muscle in the human body). (8.5.b)</p> <p>Moderate to vigorous physical activity (MVPA) contributes to balancing the energy from calories consumed to help maintain weight. (8.5.b)</p> <p>Energy balance in children supports natural growth without promoting excess weight gain. (8.5.b)</p> <p>Many factors influence body composition, including gender, age, diet, activity level, and genetics. (8.5.c)</p> <p>Body composition analysis is an important part of fitness assessment because it shows how much your body weight is fat and lean muscle mass. (8.5.c)</p> <ul style="list-style-type: none"> • Body-composition measures <ul style="list-style-type: none"> ○ Body mass index (BMI) based on height and weight; a high BMI can be an indicator of a high percentage of body fat; can be used to screen for weight categories that may lead to health problems, but it is not 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • describe the relationship between inadequate caloric intake and health risk factors (8.5.a); • explain the role of energy balance in weight management and body composition (8.5.b); • describe types of body-composition measures (8.5.c); • explain a rate of perceived exertion (RPE) scale (8.5.d); • explain how RPE relates to energy expenditure (8.5.d); • create a one-day energy balance plan based on Recommended Dietary Allowance (RDA) and physical activity guidelines (8.5.e). <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OpenPhySED Health Smart Virginia PE Central KidsHealth.gov MyPlate.gov</p>

Essential Understandings	Essential Knowledge and Skills
<p>diagnostic of the body fitness or health of an individual (CDC)</p> <ul style="list-style-type: none"> ○ Skinfold calipers: measure the thickness of subcutaneous fat at three or seven different sites on the body ○ Body circumference measurements: may include neck, waist, and hips ○ Bioelectrical impedance analysis: a person places their hands on a device that runs a small current of electricity through the body for about 20 seconds to gauge body composition ○ Waist Hip Ratio: calculated by dividing waist measurement by hip measurement; $WHR = \text{waist circumference} / \text{hip circumference}$ ○ Waist circumference ○ Technologies are available for wearable (wrist) devices that measure body composition <p>Rate of perceived exertion (RPE) is a way of measuring physical activity intensity level. Intensity levels are part of the FITT principle for meeting personal fitness and exercise goals. Scales may range from five to 20 levels. (8.5.d)</p> <p>Example (variation of Borg scale):</p> <ul style="list-style-type: none"> • Level 1 – Very light activity (watching TV) • Level 2 – Light activity (can maintain for hours, easy to breathe) • Level 3 – Moderate activity (breathing heavily, somewhat comfortable) • Level 4 – Vigorous activity (borderline uncomfortable, short of breath) • Level 5 – Very hard activity (difficult to maintain exercise intensity, barely breathe) • Level 6 – Max effort activity (almost impossible to keep going, out of breath) <p>Using the rate of perceived exertion (RPE) scale helps you to recognize your body’s signs of exertion and to modify your workout intensity. (8.5.d)</p>	<p>Physical Activity Guidelines for Americans, 2nd ed. American Heart Association</p>

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • The more intense an exercise is and/or the longer the duration of exercise, the greater the energy expended per minute, which has a greater influence on weight loss. <p>Personalized meal plans are based on Recommended Dietary Allowance (RDA) for your age, sex, height, weight, and physical activity level. (8.5.e)</p> <p>When creating a one-day energy balance plan, consider all meals and snacks as well as incorporating 60 minutes of physical activity. (8.5.e)</p> <ul style="list-style-type: none"> • ChooseMyPlate.gov provides tools to personalize your RDA when creating a plan for energy balance. 	

GRADE NINE

Students in grade nine complete the transition from modified versions of movement forms to more complex applications across all types of physical activities. This may include fitness activities, dance and rhythmic activities, aquatics, individual performance activities, and games and sports (net/wall, striking/fielding, and goal/target). Students demonstrate the ability to use basic skills, strategies, and tactics in a variety of lifetime physical activities. Students demonstrate more specialized knowledge in identifying and applying key movement concepts and principles. Students will explain the importance of energy balance and the nutritional needs of the body to maintain optimal health and prevent chronic disease. They self-assess their skill performance and develop a personal physical activity program aimed at improving motor skills, movement patterns, and strategies essential to performing a variety of physical activities. They apply their understanding of personal fitness to lifelong participation in physical activity. Students demonstrate independence in making choices, respecting others, avoiding conflict, resolving conflicts appropriately, and using elements of fair play and ethical behavior in physical activity settings. Students demonstrate the knowledge, skills, and abilities required to plan for and improve components of fitness and achieve and maintain a health-enhancing level of personal fitness.

Motor Skill Development

- 9.1 The student will perform all basic movement skills and demonstrate movement and biomechanical principles in a variety of activities that may include outdoor pursuits, fitness activities, dance and rhythmic activities, aquatics, individual performance activities, and games and sports (net/wall, striking/fielding, and goal/target[s]).
- a) Demonstrate proficiency and refinement in locomotor, non-locomotor, and manipulative skills through appropriate activities (e.g., orienteering, rock climbing, cycling, disc golf, lifetime activities, fitness activities, dance and rhythmic activities, aquatics, individual performance activities, games and sports [net/wall, striking/fielding, and goal/target]).
 - b) Design, implement, evaluate, and modify a practice plan for a self-selected skill, including the motor learning process of analysis of performance, application of principles of movement and training, goal setting, and improvement of personal skills through practice, correction, practicing at a higher level, and reassessment.

Essential Understandings	Essential Knowledge and Skills
Motor skill development includes combining and applying movement and manipulative skills to changing physical activity/game situations. (9.1.a) <ul style="list-style-type: none"> • Proficiency and refinement include performance of all critical elements 	In order to meet these standards, it is expected that students will <ul style="list-style-type: none"> • demonstrate proficiency (all critical elements)

Essential Understandings	Essential Knowledge and Skills
<p>required by the activity, exercise or dance.</p> <ul style="list-style-type: none"> ○ Activities may include small-sided modified games, modified sports, and other physical activities (e.g., orienteering, rock climbing, cycling, disc golf, lifetime activities, fitness activities, dance and rhythmic activities, aquatics, individual performance activities, games and sports [net/wall, striking/fielding, and goal/target]). ○ Critical elements may include proper grip/use of equipment, proper form/body positioning, balance, coordination, adequate speed/intensity of movement, opposition, footwork, and passing/receiving skills. ○ See K.1, 1.1, 2.1, 3.1, 4.1 and 5.1 for specific critical elements for locomotor, non-locomotor, and manipulative skills. <p>Movement/motor learning progression includes analysis of current performance, development of a personalized practice plan for improvement that includes SMART goal setting, application of principles of movement and training, and planning for amount of time and activities needed for practice, correction, practicing at a higher level, and reassessment. (9.1.b)</p> <ul style="list-style-type: none"> • Evaluation of performance can come from oneself, peers or a specialist such as a coach or teacher and can include skills checklists, verbal or written feedback, and formal analysis of task performance. • Goal setting should take the form of SMART goal setting in order to be specific, measurable, achievable, realistic and time-sensitive. 	<p>in a variety of activities (9.1.a);</p> <ul style="list-style-type: none"> • evaluate performance of a variety of locomotor, non-locomotor, and manipulative skills using a skills checklist (9.1.a, 9.1.b); • analyze current performance for a variety of locomotor, non-locomotor, and manipulative skills (9.1.a, 9.1.b); • design, implement, evaluate, and modify a practice plan for a self-selected skill using SMART goal-setting methods (9.1.b); • apply principles of movement and training to a personal practice plan (9.1.b); • produce written and oral feedback on a variety of tasks/activities (9.1.b); • identify activities needed for practice within a personal fitness plan (9.1.b). <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OpenPhyzed Health Smart Virginia PE Central Dynamic PE ASAP</p>

Anatomical Basis of Movement

- 9.2 The student will explain the structures and functions of the body and how they relate to and are affected by human movement.
- a) Analyze and evaluate proficient and efficient movement in relation to how movement is directed, including the type of muscle action that directs a movement (concentric, eccentric, and isometric), the direction the body part moves relative to its joints (abduction, adduction, flexion, and extension), and planes of motion.
 - b) Describe the relationship between the endocrine system and the body’s metabolic response to short- and long-term physical activity.
 - c) Explain the body’s response to the principles of specificity, overload, and progression (SOP) in relation to frequency, intensity, time, and type of exercise (FITT).
 - d) Explain the anaerobic respiration (ATP-PC and lactic acid system) and aerobic respiration systems used for energy during activity.
 - e) Analyze movement performance and use feedback to learn or to improve the movement skills of self and others.
 - f) Apply the concepts and principles of levers, force, motion, and rotation to a variety of activities.
 - g) Apply biomechanical principles of balance, energy, and types of muscle contractions to a variety of activities.

Essential Understandings	Essential Knowledge and Skills
<p>When the body is moving or producing movement, it obeys the same physical laws that apply to all types of motion. The type of muscle action and the direction a body part moves in relation to its joints is important for proficient and efficient movement. (9.2.a)</p> <ul style="list-style-type: none"> • Muscle actions: <ul style="list-style-type: none"> ○ Concentric contraction (positive contraction): Contraction that shortens the muscle as it acts against a resistive force (biceps curl: biceps muscles shorten as the weight is pulled toward the body). ○ Eccentric contraction (negative contraction): Contraction that lengthens the muscle as it produces force (lowering the weight during biceps curl lengthens the bicep muscles as the weight is lowered back to a resting position; force is produced by the biceps to allow for a controlled return to a resting position as opposed to allowing gravity 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • evaluate different types of muscle contractions (concentric, eccentric, and isometric) (9.2.a); • evaluate planes of motion within different physical movements to identify proficient and efficient movement (9.2.a); • demonstrate how the body moves relative to its joints while participating in physical activities (9.2.a); • explain how types of muscle contractions and force are used to improve skills and

Essential Understandings	Essential Knowledge and Skills
<p>to pull the weight down)</p> <ul style="list-style-type: none"> ▪ How much time is spent in each phase (concentric and eccentric contractions) will affect results. Concentrating on eccentric contractions at higher weights is referred to as negative training. ▪ Isometric muscle contraction without appreciable shortening or change in distance between its origin and insertion. <ul style="list-style-type: none"> • Movement of body part in relation to its joints: <ul style="list-style-type: none"> ○ Abduction: Muscle contraction without appreciable shortening or change in distance between its origin and insertion. ○ Adduction: Movement of a body part toward the median plane (of the body, in the case of limbs; of the hand or foot, in the case of digits). ○ Flexion: Bending movement around a joint in a limb (such as knee or elbow) that decreases the angle between the bones of the limb at the joint. ○ Extension: An unbending movement around a joint in a limb that increases the angle between the bones of the limb at the joint. • Planes of motion <ul style="list-style-type: none"> ○ Sagittal plane: Vertical plane passing from the rear (posterior) to the front (anterior), dividing the body into left and right halves. It is also known as the anteroposterior plane. Most sport and exercise movements that are almost two-dimensional, such as running, long jumping, biking and rowing, take place in this plane. ○ Frontal plane: Vertical and passes from left to right, dividing the body into posterior and anterior halves (front and back). When moving along this plane, we are moving toward or away from the midline. Adduction and abduction are movements along this plane. 	<p>performance (9.2.a);</p> <ul style="list-style-type: none"> • explain metabolism and the body’s metabolic response to exercise (9.2.b); • apply and explain how the body makes energy to move in activity of short duration and activity of long duration (9.2.b); • explain the body’s response to the principles of specificity, overload, and progression (SOP) in relation to frequency, intensity, time, and type of exercise (FITT) (9.2.c) ; • explain the anaerobic respiration and aerobic respiration systems used for energy during activity (9.2.d); • provide evidence of the use of feedback to learn or to improve the movement skills (9.2.e); • demonstrate how to provide feedback to help others learn or improve movement skills (9.2.e); • analyze the performance of a peer and provide appropriate and meaningful feedback to help them learn or improve a skill (9.2.e); • demonstrate efficient body movements along the correct planes of the body (9.2.f);

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ Transverse plane: Divides the body into top (superior) and bottom (inferior) halves. Any time we rotate a joint we are moving along the transverse plane. • Efficient movement can be exemplified by, but not limited to <ul style="list-style-type: none"> ○ technique and fitness in running; ○ quickness and effort in tennis; ○ speed and control in a golf swing. • Analyzing movement example (9.2.a) <ul style="list-style-type: none"> ○ Tennis serve <ul style="list-style-type: none"> ▪ Ball toss with non-dominant hand: concentric contraction of the deltoid as the arm/ball is raised, abduction and flexion at the shoulder ball and socket joint; after ball is released: eccentric contraction of deltoid, adduction and extension of the shoulder joint; motion occurs in the sagittal plane. ▪ Racquet swing: occurs in the transverse plane (twisting motion); involves hinge joints – knees and elbow, ball and socket joints – hips and shoulders, condyloid synovial (also called ellipsoidal) joint (modified ball and socket that allows for circular motion, flexion, and extension) – wrist; abduction and adduction and flexion and extension occur during joint movements for a tennis serve. <p>Multiple body systems are involved in producing energy during physical activity. The endocrine system consists of glands and organs. It uses hormones to control the body’s metabolism. (9.2.b)</p> <ul style="list-style-type: none"> • The endocrine system releases hormones into the bloodstream. This lets the hormones travel to cells in other parts of the body. • Hormones help control mood, growth and development, the way our 	<ul style="list-style-type: none"> • apply the concept of force, motion, and rotation during a physical activity and explain its effect on performance (9.2.f); • explain how levers, types of muscle contractions, and force are used to improve skills and performance (9.2g); • analyze movement performance and identify anatomical movements around the planes of the body (9.2g); • demonstrate the use of levers, force, motion, and rotation in a variety of activities (9.1.f). <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OPEN Online Physical Education Network Health Smart Virginia PE Central Dynamic PE ASAP KidsHealth.org</p>

Essential Understandings	Essential Knowledge and Skills
<p>organs work, <i>metabolism</i>, and reproduction.</p> <ul style="list-style-type: none"> • The endocrine system includes multiple glands and organs. <ul style="list-style-type: none"> ○ Hypothalamus: located in the lower-central part of the brain; links the endocrine system and nervous system; hypothalamus regulates the pituitary gland ○ Pituitary: gland at the base of the brain; often called the “master gland” ○ Thyroid: in the front part of the lower neck; releases hormones that control the rate at which cells burn fuels from food to make energy ○ Parathyroids: four tiny glands attached to the thyroid; releases hormone that controls the level of calcium in the blood. ○ Adrenals: on the kidneys ○ Adrenal cortex: releases hormones that help control salt and water balance, the body’s response to stress, metabolism, the immune system, and sexual development and function ○ Adrenal medulla: releases epinephrine (aka adrenaline), which increases blood pressure and heart rate when the body is under stress ○ Pineal body/gland: in the middle of the brain; secretes melatonin (hormone that helps regulate sleep) ○ Reproductive glands (ovaries, testes) ○ Pancreas: makes insulin and glucagon, hormones that control the level of glucose (sugar) in the blood ○ Insulin helps keep the body supplied with stores of energy. The body uses this stored energy for exercise and activity, and helps organs function properly <p>Metabolism is the breakdown of food (chemical reactions of the body cells) and its transformation into energy. (9.2.b)</p>	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Digestive system uses enzymes to break down proteins into amino acids, turn fats into fatty acids, and turn carbohydrates into simple sugars (glucose). The body uses sugar/glucose, amino acids, and fatty acids as energy sources. These compounds are absorbed into the blood, which carries them to the cells. • Metabolism consists of anabolism (the buildup of substances) and catabolism (the breakdown of substances). <p>The intensity and duration of exercise determines which fuel source is used: (9.2b, 9.2.d)</p> <ul style="list-style-type: none"> • Fat metabolism is a slow process and so can only be used as fuel for exercise at less than 60% VO₂ max. • Carbohydrate is a much faster fuel source and so can be used for exercise up to 80% VO₂ max (in trained individuals). • Carbohydrate stores within the muscle and liver can fuel exercise for up to 80 minutes. As carbohydrate stores lower, the body has to rely more and more on fat stores. • Onset of exercise: breakdown of muscle glycogen stores to produce glucose for anaerobic glycolysis. • Blood flow to muscle is increased, allowing for increased uptake of glucose by muscle. • Exercising at about half the maximum aerobic capacity requires a 50/50 mixture of glucose and free fatty acids, with amino acid oxidation still supplying 1-2% of the energy. • Exercising at higher levels, about 75% of maximum aerobic capacity or greater, muscles become progressively more dependent on glucose oxidation rather than on fatty acid oxidation (National Center for Biotechnology Information). 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Body stores calories (a calorie is a unit that measures how much energy a particular food provides to the body). Calories that are not used by the body for functions and through exercise are stored primarily as fat which can lead to overweight and obesity. <p>A metabolic response is any reaction by the body to a specific influence or impact. Metabolism is a general term describing the organic process in any cellular structure. (9.2.b)</p> <ul style="list-style-type: none"> • A metabolic response can occur with respect to individual cells, a gland, an organ, or a process such as the cardiovascular system. • Metabolism is often understood in terms of the metabolic rate, which is the amount of energy expended by the body in a given period. • Metabolism is also a variable in the assessment of human performance. • Metabolic function is subject to such individual factors as age, heredity, gender, level of physical fitness and others. The body may exhibit a metabolic response to any type of external factor or change. <p>Changes in the physical intensity or duration of activity will generate a metabolic response. (9.2.b)</p> <ul style="list-style-type: none"> • This response is particularly evident when assessing the nature of muscle composition in an athlete. • When an athlete seeks to improve endurance ability, the training program will correspondingly focus on endurance exercise. • The muscle groups involved in the generation of power in the exercise, each with a set pattern of distribution between fast-twitch and slow-twitch fibers, will respond by making a slight adaptation in which more fast-twitch fibers are used for the muscle. 	

Essential Understandings	Essential Knowledge and Skills
<p>The principles of overload, specificity and progression are highly interconnected and are reciprocally dependent on each other in order to see performance improvement. (9.2.c)</p> <ul style="list-style-type: none"> • Specificity: desired adaption occurs in response to specific stress placed upon the body (FITT) • Overload: stress must be applied beyond that which the body is accustomed to; increase workload (added weight, time (FITT), intensity (FITT), and/or repetitions (or how often FITT)) • Progression: Once the body has adapted to a level of stress, additional stress is needed; progressively or gradually increase workload (frequency, intensity, and time can impact progression, FITT). <p>To improve fitness or skill performance, the body must be overloaded in a safe and progressive manner. (9.2.c)</p> <p>Two respiration systems are used by the body for energy and the systems are dependent upon the duration of the activity. (9.2.d)</p> <ul style="list-style-type: none"> • Anaerobic respiration system (ATP-PC and Lactic Acid System; works without oxygen; adenosine triphosphate [ATP – energy carrying molecule] and phosphocreatine [PC]) <ul style="list-style-type: none"> ○ To immediately meet the sudden higher energy demand, stored ATP is the first energy source. This lasts for approximately 2 seconds. ○ The ATP-PC system can only last 8-10 seconds before PC stores are depleted. ○ The lactic acid system (anaerobic glycolysis) must then take over as the predominant source of energy production; high intensity (but sub-maximal) exercise can last for between 3 and 5 minutes using this system. 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ If the exercise continues at a high intensity, oxygen is not available at a fast enough rate to allow aerobic metabolism to take over. The production of lactic acid will reach the point where it interferes with muscular function; this is called the lactate threshold. ○ Muscles begin to fatigue when ATP resynthesizes can no longer match demand. • Aerobic respiration system <ul style="list-style-type: none"> ○ Also known as aerobic glycolysis: breakdown of carbohydrates to produce ATP; slow, uses carbohydrates or fat (carbohydrates and fats are only burned in presence of oxygen); needs oxygen to produce ATP; sustained energy; longer-duration, lower-intensity after anaerobic systems have fatigued; long-term steady paced exercise and day-to-day activities; produced large amounts of energy at the lowest intensity. <p>Feedback is important to master advanced skills. (9.2.e)</p> <ul style="list-style-type: none"> • Feedback is useful when it is focused on the goal of the skill and is specific, objective and provided in terms understood by the recipient of the feedback. Feedback is goal-referenced; tangible and transparent; actionable; user-friendly (specific and personalized); timely; ongoing; and consistent. • When analyzing movements, divide the movement performance into three phases: <ul style="list-style-type: none"> ○ Preparatory: Movements that prepare, such as a backswing in golf or tennis. ○ Execution: <ul style="list-style-type: none"> - Force-producing movements, such as the forward motion of the tennis forehand shot. 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> - Critical instant, the point of contact or the release, such as the moment of contact in the tennis serve or the takeoff in the long jump. o Follow-through: Body movements after the execution where the movement slows down, such as the high leg lift after kicking a goal or the golf club after the ball is struck. • Note: movement skill phases may not all fit neatly into three phases and additional phases may be devised or added. <p>When the body is moving or producing movement, it obeys the same physical laws that apply to all types of motion. Biomechanics is the field of sports science that applies the laws of mechanics and physics to human performance to gain a greater understanding of forces and the effects of those forces on and within the human body, and therefore improve physical performance of a skill or activity.</p> <p>(9.2.f)</p> <ul style="list-style-type: none"> • Levers – Consist of a pivot point (fulcrum), lever arm, and weight/resistance. <ul style="list-style-type: none"> o Example of lever in sport is the use of a tennis racket. The player’s hand is the pivot point/fulcrum, the lever arm is the racket, and the resistance is the ball. The longer the racket, the more force you can exert on the ball. • Force is strength or energy exerted; force causes movement. • Newton’s laws of motion <ul style="list-style-type: none"> o Inertia: An object at rest or in motion will stay in that state until acted upon by a force strong enough to change its state of motion. Example: <ul style="list-style-type: none"> ▪ Tennis serve: tennis ball does not leave the hand unless force is applied to toss it upward; the tossed ball moves upward until gravity (force) or a racquet strike (force) is applied to change the 	

Essential Understandings	Essential Knowledge and Skills
<p>direction of the tossed ball.</p> <ul style="list-style-type: none"> ○ Acceleration/Momentum: acceleration of an object is directly proportionate to the amount of force applied and moves in the direction in which the force is applied. Example: <ul style="list-style-type: none"> ▪ The speed of a served tennis ball will vary according to the amount of force applied to the ball with the racquet and according to the weight of the ball (on a humid day, the ball absorbs moisture and will need additional force to achieve the desired speed/acceleration of a tennis ball compared with a tennis ball used on a dry/low-humidity day). Professional tennis players achieve service speeds of 120-150 mph. ○ Action and reaction: For every action there is an equal and opposite reaction. Example: <ul style="list-style-type: none"> ▪ Force that the ball exerts on the racket is equal and opposite of the force that the racket exerts on the ball. • Rotation: the action or process of rotating on or as if on an axis or center; a force must produce a torque to change the rotation of a body, which changes its angular momentum. Example: <ul style="list-style-type: none"> ○ Backspin on a tennis ball (strike below the center of the mass) keeps the ball’s trajectory low, tends to move the ball right to left and stays low when it bounces. ○ Topspin on a tennis ball (strike above the center of the mass; racquet moves from low to high; windshield wiper motion) rotates the ball forward in the air, increasing the speed of the ball and causing it to dip toward the ground. This decreases the distance traveled (hits the ground sooner) and increases its speed as it hits the ground, travels faster and low to the ground. 	

Essential Understandings	Essential Knowledge and Skills
<p>Biomechanical principles of balance and strength are crucial to the performance of motor skills. (9.1.g)</p> <ul style="list-style-type: none"> • Balance: an even distribution of weight that enables someone or something to remain upright while remaining stable and achieving equilibrium. The ability to maintain the body’s center of gravity within the limits of stability as determined by the base of support. (9.2.g) <ul style="list-style-type: none"> ○ Center of gravity is the point at which all of the body’s mass and weight are equally balanced or equally distributed in all directions (in the body it is slightly higher than the waist). ○ An individual’s limits of stability is the distance outside their base of support that they can go without losing control of the center of gravity. ○ Base of support: The surface supporting the body and points of contact with that surface (when standing, the position of the feet on the ground). ○ The lower the center of gravity to the base of support, the greater the stability. ○ The nearer the center of gravity to the center of the base of support, the more stable the body. ○ Stability is increased with the number of points of contact (two feet vs. one foot). ○ Dynamic activities can also be described as those that cause the center of gravity to move in response to muscular activity. 	

Fitness Planning

- 9.3 The student will evaluate current fitness behaviors and demonstrate achievement and maintenance of a health-enhancing level of personal fitness by designing, implementing, self-assessing, and modifying a personal fitness program.
- a) Demonstrate program-planning skills by assessing and analyzing personal fitness levels, setting goals, devising strategies, making timelines for a personal physical fitness plan, and evaluating the components and progress of the personal fitness plan.
 - b) Apply the FITT (frequency, intensity, time, type of exercise) principle and other principles of training, such as specificity, overload, and progression, in accordance with personal goals to the personal fitness plan.
 - c) Explain the characteristics, including scientific principles and concepts, of safe and appropriate muscular-stretching, muscular-strengthening, and cardiorespiratory exercise programs to improve the health-related components of fitness.
 - d) Calculate and explain the relationship between resting heart rate, target heart rate, recovery heart rate, blood pressure, training zones, and exercise intensity, including measurement devices (e.g., heart rate monitors, pedometers, accelerometers) to meet exercise and personal fitness goals.
 - e) Demonstrate appropriate techniques and describe the benefits of resistance-training activities, machines, and/or free weights.
 - f) Use the scientific process to analyze and compare resources, including available technology, to evaluate, monitor, and record activities for fitness improvement.
 - g) Identify types of strength exercises (isometric, concentric, eccentric) and stretching exercises (static, proprioceptive neuromuscular facilitation, dynamic) for personal fitness development (e.g., strength, endurance, range of motion).
 - h) Define and describe terms and activities associated with fitness, including *set*, *repetition*, *isometric*, *isotonic*, *isokinetic*, *core*, and *upper-body exercises* and *lower-body exercises*.
 - i) Apply physiological principles of warm-up, cool down, overload, specificity, and progression.

Essential Understandings	Essential Knowledge and Skills
<p>Physical literacy includes the ability to plan, implement, evaluate, and modify a personal, goal-driven fitness plan that enables students to achieve and maintain the level of fitness needed to meet their personal goals for various work-related, sport, and leisure activities. (9.3.a)</p> <p>Health-related fitness components provide information about a person’s overall physical health. (9.3.a)</p>	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • evaluate personal fitness levels and analyze the results to determine areas to improve/maintain. (9.3a); • create SMART personal fitness goals based on fitness assessment data results (9.3a);

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Cardiorespiratory endurance: the ability of the cardiovascular system (heart, blood, blood vessels) and respiratory system (lungs, air passages) to deliver oxygen and other nutrients to the working muscles and to remove wastes. Tests that involve running (e.g., 20-meter shuttle run test), cycling and swimming can be used to measure this fitness component. Activities vary in intensity level: <ul style="list-style-type: none"> ○ Light activities are physical activities that involve large muscle groups. While engaging in light activities, people begin to notice their breathing, but they can still talk fairly easily. ○ Moderate activities are physical activities that cause breathing and heart rate to increase. People engaging in moderate activities can hear themselves breathe, but they can still talk. ○ Vigorous activities are physical activities that cause breathing and heart rate to increase to a higher level, making it difficult to talk. • Muscular strength is the ability of a muscle or a group of muscles to exert force for a brief period of time. Strength of different muscles can be measured by having a person perform weightlifting exercises and determining the maximum amount of weight the person can lift. A person’s strength can be expressed as absolute strength (the actual weight lifted) or as relative strength (the weight lifted, divided by the person’s body weight). • Muscular endurance is the ability of a muscle or a group of muscles to sustain repeated contractions or to continue applying force against a fixed object. Push-ups and curl-ups are often used to test muscular endurance. The person’s endurance is expressed as the number of repetitions completed without stopping for a set period of time (often one minute). • Flexibility is the ability to move joints through their full range of motion. The sit-and-reach test is a good measure of flexibility of the lower back 	<ul style="list-style-type: none"> • create and implement personal physical fitness plans (9.3.a); • apply FITT and SOP to personal physical fitness plans (9.3.b); • explain the characteristics of safe and appropriate muscular-stretching, muscular-strengthening, and cardiorespiratory exercise programs (9.3.c); • calculate resting heart rate, target heart rate, recovery heart rate, and blood pressure (9.3.d); • explain the relationship between heart rate, training zones, and exercise intensity, including a variety of measures (9.3.d,f); • explain the effects of heart rate, training zones, and exercise intensity on meeting personal fitness goals (9.3d); • demonstrate appropriate techniques for resistance-training activities, machines, and/or free weights (9.3.e); • understand how to use the scientific process to analyze my fitness improvement (9.3.f); • identify and demonstrate types of strength exercises and stretching exercises (9.3.g); • define and describe terms and activities associated with fitness (9.3.h); • describe the physiological principles for warm-up, cool down, specificity, overload,

Essential Understandings	Essential Knowledge and Skills
<p>and the backs of the upper legs (hamstrings). A person’s flexibility is usually expressed in how far a joint can be moved or the degrees through which a joint can be moved.</p> <ul style="list-style-type: none"> • Body composition refers to the makeup of the body in terms of lean mass (muscle, bone, vital tissue and organs) and fat mass. Good body composition has strong bones, adequate skeletal muscle size, a strong heart, and a low amount of fat mass. Regular physical activity and exercise will help decrease body fat and increase or maintain muscle mass, increase bone mass and improve heart function. Although body composition entails muscle, bone and fat, it is often expressed only as percentage of body fat. Many types of tools can be used to assess body composition, including skinfold calipers, bioelectrical impedance analyzers (found in many weigh scales), body mass index (BMI), underwater weighing, and dual energy X-ray absorptiometry. Improving in these four health-related fitness areas will increase lean body mass (stronger bones and muscle) and decrease fat mass and therefore significantly affect body composition. Improvements will also reduce risk of disease and improve work capacity. <p>Personal fitness planning includes: (9.3.a)</p> <ul style="list-style-type: none"> • assessing and analyzing personal fitness levels; • setting SMART goals for improvement and/or maintenance; • creating strategies to achieve goals and monitor progress; • plan for reassessing, evaluating, and reflecting on progress of goals; • revising plan strategies as needed; • applying FITT and SOP to plan. <p>The principles of specificity, overload, and progression (SOP) are highly interconnected and are reciprocally dependent on one another. (9.3.b)</p>	<p>and progression. (9.3.i);</p> <ul style="list-style-type: none"> • perform a proper warm-up and cool down in the personal fitness plan (9.3.i); • demonstrate specificity, overload, and progression (SOP) in the personal fitness plan (9.3i). <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes KidsHealth.gov Health Smart Virginia MyPlate.gov OpenPhyzed Physical Activity Guidelines for Americans, 2nd ed. Healthy Children.org</p>

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Specificity: desired adaption occurs in response to specific stress placed upon the body; exercise/activity needs to match desired outcome. • Overload: stress must be applied beyond that which the body is accustomed to; increase workload (added weight, time, intensity, and/or repetitions). • Progression: once the body has adapted to a level of stress, additional stress is needed; progressively or gradually increase workload. <p>The FITT principles for improvement of personal fitness are important when developing a personal fitness plan. (9.3.b)</p> <ul style="list-style-type: none"> • FITT principle <ul style="list-style-type: none"> ○ Frequency: How often; commonly measured in days per week. For each component of health-related fitness, a safe frequency is three to five times a week. ○ Intensity: How hard; commonly measured in intensity levels. Intensity can be measured in different ways, depending on the connected health-related component. For example, monitoring heart rate is one way to gauge intensity during aerobic endurance activities. ○ Time: How long; commonly measured in minutes/hours. Time varies depending on the health-related fitness component targeted. For example, flexibility or stretching may take 10-30 seconds for each stretch, while the minimum time for performing aerobic activity is 15 minutes of continuous activity. ○ Type: What kind; measured in specific health-related component of fitness. For example, an individual wishing to increase arm strength must exercise the triceps and biceps, while an individual wishing to increase aerobic endurance needs to jog, run, swim, or perform some 	

Essential Understandings	Essential Knowledge and Skills
<p>other aerobically challenging activity.</p> <ul style="list-style-type: none"> • Personal fitness planning includes: (9.3.b) <ul style="list-style-type: none"> ○ assessing and analyzing personal fitness levels; ○ setting SMART goals for improvement and/or maintenance; ○ creating strategies to achieve goals and monitor progress; ○ plan for reassessing, evaluating, and reflecting on progress of goals; ○ revising plan strategies as needed; ○ applying the FITT and SOP principles to plan. <p>Muscular-stretching raises the body’s internal temperature through light physical activity before engaging in activity. (9.3.c)</p> <ul style="list-style-type: none"> • Active stretch: the person stretching applies the force of the stretch • Passive: resistance by a chair, towel, machine or a partner provides the force of the stretch; carries some risk • Static: slow and constant with end position held; caution is exercised with proper technique • Ballistic: bouncing-type movement; not recommended for health-related fitness • Dynamic: flexibility during sport-specific movements; avoids bouncing, such as a track sprinter performing long walking strides for a warmup focused on hip extension. • Reflex-assisted: such as plyometric; higher injury risk, not recommended for health-related fitness. • Proprioceptive neuromuscular facilitation (PNF): Technique that combines passive and isometric stretching; a muscle group is passively 	

Essential Understandings	Essential Knowledge and Skills
<p>stretched, then contracts isometrically against resistance while in the stretched position and then is passively stretched again through the resulting increased range of motion; use of a partner to provide resistance against the isometric contraction and then later to passively take the joint through its increased range of motion. May be done without a partner, such as using a towel; muscles need to be warmed up first.</p> <p>Muscular strengthening and cardiorespiratory exercises are important when improving overall fitness. (9.3.c)</p> <ul style="list-style-type: none"> • Muscular strengthening <ul style="list-style-type: none"> ○ Training or resistance training: systematic program of exercises designed to increase an individual’s ability to resist or exert force. (9.3e,g) ○ Free weights, weight machines, resistance bands, plyometric exercise, callisthenic exercises, Pilates, yoga, martial arts, circuit training (large muscles before small muscles, alternate push and pull, alternate upper body and lower body), pyramid training and negative training. ○ Safety: clothing, footwear, equipment, spotters, technique. • Cardiorespiratory exercise <ul style="list-style-type: none"> ○ FITT principle; heart rate: VO₂max; RPE ○ Recovery time between workouts should include sufficient rest, rehydration, and restoring fuel sources. ○ Long, slow-distance training: About 80% of maximum heart rate (70% VO₂max); the person is able to talk and exercise without respiratory distress. ○ Pace/tempo training: steady or threshold training for 20-30 minutes; intermittent pace/tempo training – intensity is same as steady 	

Essential Understandings	Essential Knowledge and Skills
<p>threshold but shorter intervals of time with brief recovery periods.</p> <ul style="list-style-type: none"> ○ Interval training: Intensity close to VO₂max; workout intervals between 3 and 5 minutes; rest intervals at equal/equivalent time; stressful and should be performed sparingly; benefits increased VO₂max and anaerobic metabolism <p>Personal fitness goals may be evaluated using a variety of measures. (9.3.d)</p> <ul style="list-style-type: none"> • Heart rate is most frequently used for gauging exercise intensity due to the relationship between heart rate and oxygen consumption (VO₂max is a measure of the body’s ability to extract and use oxygen during exercise). • Training zones may be characterized by the level of intensity (using a RPE scale) or percentage of maximal heart rate range. <ul style="list-style-type: none"> ○ Perceived exertion is how hard a person feels like their body is working. Rate of perceived exertion (RPE) is a way of measuring physical activity intensity level. Scales may range from five to 20 levels. Example (variation of Borg scale): <ul style="list-style-type: none"> ▪ Level 1 – Very light activity (seated) ▪ Level 2 – Light activity (can maintain for hours, easy to breathe, walking) ▪ Level 3 – Moderate activity (breathing heavily, somewhat comfortable; skipping, galloping) ▪ Level 4 – Vigorous activity (borderline uncomfortable, short of breath; jogging/running) ▪ Level 5 – Very hard activity (difficult to maintain exercise intensity, barely breathe, running/sprinting) ▪ Level 6 – Max effort activity (almost impossible to keep going, out of breath, sprinting) 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Measures <ul style="list-style-type: none"> ○ Heart rate monitors (two types): wireless chest/arm straps that use an electrical pulse to read heart rate (tend to be more accurate) and wrist-based/headphones trackers that use optical technology (light). Both can send continuous data to a monitor (watch/phone). Other heart rate monitors and technology may be available. ○ Pedometers: tracks steps taken by indicating each time the wearer’s hips move; some models can track foot movement via a GPS tracker or built-in sensors on your phone. ○ Accelerometers: measure acceleration; able to capture intensity of physical activity; able to distinguish between walking and running; can separate human movement from mechanical vibration such as riding in a car (9.3.d). <p>Heart rate and blood pressure are indicators of cardiovascular fitness. (9.3.a, 9.3.d)</p> <ul style="list-style-type: none"> • Resting heart rate: Best taken after 10 minutes of rest. To check pulse at the wrist, place two fingers between the bone and the tendon over the radial artery, which is located on the thumb side of the wrist. When pulse is felt, count the number of beats in 15 seconds. Multiply this number by four to calculate beats per minute. Resting heart rate normally ranges from 60-100 beats/min. In general, resting heart rate is an indication of efficient heart function and better cardiovascular fitness. A trained athlete may have a resting heart rate closer to 40. • Target heart rates: active heart rate can be taken at multiple points during activity and include being taken immediately after stopping activity. Help to determine appropriate intensity levels for exercise. By keeping the 	

Essential Understandings	Essential Knowledge and Skills
<p>target heart rate in check, a person is able to avoid under or over training and able to avoid overexertion. Exercise programs may be characterized by the level of intensity or percentage of maximal heart rate range (maximum heart rate is 220 minus a person’s age). (Target Heart Rate Zone information [https://www.heart.org/en/healthy-living/fitness/fitness-basics/target-heart-rates]) Some drugs and medications or medical conditions may affect heart rate, resulting in having a lower maximum heart rate and target zone. Health care provider should be consulted.</p> <ul style="list-style-type: none"> • Recovery heart rate: Recovery heart rate is the decrease in heart rate that occurs one minute after maximal exercise. Faster decreases in heart rate are associated with higher levels of fitness. • Blood pressure: measure of the force of blood pushing against blood vessel walls; high blood pressure indicates that the heart is working harder to get blood out to the body; normal is less than 120/80; measured with a blood pressure cuff (sphygmomanometer) – a rubber cuff and a gauge. Works by inflating a cuff around the upper arm to temporarily stop the flow of blood in an artery. As air is slowly released from the cuff, the device records the pressure at which blood begins to flow again. Blood pressure is recorded as two measurements: <ul style="list-style-type: none"> ○ The first number is the systolic pressure. Systolic pressure represents the peak blood pressure that occurs when the heart contracts. ○ The second number is the diastolic pressure. Diastolic pressure represents the lowest blood pressure that occurs when the heart relaxes between beats. ○ Note: Teachers may want to connect with their school nurses, public health nurses or nurse training programs in their school or in their area to support instruction of blood pressure. 	

Essential Understandings	Essential Knowledge and Skills
<p>Appropriate techniques for resistance-training activities, machines, and/or free weights will be determined by activities selected. Focus should be on proper ergonomics/body positioning, equipment-related safety, and skill/capacity of individual students. Note; teachers may need to set appropriate weight limits. (9.3.e)</p> <p>It is important to use the scientific process to evaluate resources and technology in the fitness industry. (9.3.f)</p> <p>A variety of strength and stretching exercises can improve/maintain fitness levels. (9.3.g)</p> <ul style="list-style-type: none"> • Appropriate techniques for resistance-training activities are crucial to avoid injury and improve fitness levels. • Activities, whether using resistance bands, free weights, apps or media (videos) should match student interest, fitness level, activity level, and experience and should provide student choice; caution should be exercised when implementing any new techniques. <p>There is a wide range of terms and activities associated with fitness. (9.3.h) Examples include, but are not limited to:</p> <ul style="list-style-type: none"> • <i>Set</i>: a group of consecutive reps for any exercise. • <i>Repetition (rep)</i>: One completion of an activity or exercise • <i>Isometric</i>: muscle contraction in which the muscles length does not change • <i>Isotonic</i>: muscle contraction in which the muscles length does change • <i>Isokinetic</i>: muscular contraction in the absence of significant resistance, with marked shortening of muscle fibers and without great increase in muscle tone. 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • <i>Core</i>: refers to muscles that are the central part of the body; muscles of the upper and lower torso, around the spine and pelvic muscles (back, side, pelvic and buttock muscles); includes the rectus abdominis, transversus abdominis, obliques, trapezius, latissimus dorsi, spinal erector, gluteus maximus, pectoralis major and deltoid; provide stability, able to flex, side bend and rotate the trunk; protect abdominal organs. • Upper-body exercises train the following muscle groups to some degree – chest, back, shoulders, biceps, triceps. • Lower-body exercises train the following muscle groups to some degree – quadriceps, hamstrings, calves, lower back, abdominals. <p>Warming up and cooling down may help reduce risk of injury and improve athletic performance. (9.3.i)</p> <ul style="list-style-type: none"> • Warm-up: pumps nutrient-rich, oxygenated blood to muscles as it speeds up heart rate and breathing and raising body temperature, preparing the body for activity. A good warm-up should last five to 10 minutes and work all major muscle groups; start activity/exercise slowly, then pick up the pace. Warming up may help reduce muscle soreness and risk of injury. • Cool down: after a workout, five to 10 minutes cooling down through a sequence of slow movements; helps prevent muscle cramps and dizziness while gradually slowing breathing and heart rate; gradual recovery of pre-exercise heart rate and blood pressure. <p>Improvements in performance depend upon the training principles of specificity, overload, and progression (SOP). (9.3.i)</p> <ul style="list-style-type: none"> • Specificity: desired adaption occurs in response to specific stress placed upon the body; exercise/activity needs to match desired outcome 	

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Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none">• Overload: stress must be applied beyond that which the body is accustomed to; increase workload (added weight, time, intensity, and/or repetitions)• Progression: once the body has adapted to a level of stress, additional stress is needed; progressively or gradually increase workload	

Social and Emotional Development

- 9.4 The student will explain and demonstrate the skills needed to be safe, responsible, and respectful in all physical activity settings.
- a) Identify and demonstrate proper etiquette, respect for the differences of others, integrity, safety and teamwork while engaging in a variety of activities.
 - b) Explain the effects of sports and activities in developing respect for the unique characteristics, differences and abilities of peers.
 - c) Apply conflict-resolution skills in physical activity settings.
 - d) Identify an opportunity for social support in a self-selected physical activity.
 - e) Apply communication skills and strategies that promote positive team/group dynamics.
 - f) Apply problem-solving and critical-thinking skills in physical activity settings, both as an individual and in groups.
 - g) Apply best practices for participating safely in physical activity, exercise, and dance (e.g., injury prevention, proper alignment, hydration, use of equipment, implementation of rules, sun protection).
 - h) Analyze and compare psychological benefits derived from various physical activities (e.g., decreased stress and anxiety, increased self-esteem, increased mental alertness, improved mood).
 - i) Develop and analyze activities to determine areas of exclusion and inclusion.

Essential Understandings	Essential Knowledge and Skills
<p>Social and emotional development and teamwork skills include respecting the rights and feeling of others while being sensitive and responsive to the well-being of everyone involved. (9.4.a)</p> <ul style="list-style-type: none"> • Leadership skills that contribute to teamwork include integrity, open and honest communication, active listening, empathy, trustworthiness, flexibility, relationship building, and respect for the differences and safety of others. • Etiquette is the proper and acceptable action, behavior, or conduct within an activity or setting. • Integrity is often linked to sportsmanship within physical education activities and involves doing the “right thing” even when no one else is watching. • Teamwork and leadership qualities are important outside the physical 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • describe and demonstrate leadership skills that contribute to teamwork while participating in a variety of physical activities, exercise and dance (9.4.a); • create a list explaining proper etiquette for the PE setting (9.4.a); • explain how participation in sports, dance, and physical activities can build an individual’s character (9.4.b); • apply appropriate conflict-resolution skills in a variety of physical activity, exercise

Essential Understandings	Essential Knowledge and Skills
<p>education classroom and often lead to opportunities to further demonstrate maturity and responsibility.</p> <p>Accepting others’ ideas, cultural diversity, and body types is important to building a diverse community, team, or group. (9.4.b)</p> <ul style="list-style-type: none"> • Sharing ideas and respecting others leads to a more inclusive environment with positive group dynamics. • Modifying activities, rules, or equipment may be necessary to improve success rate and build skill for all individuals within a group or team. <p>Conflict is normal and inevitable, occurring in various settings throughout life experiences, and requires intentional positive resolution strategies. (9.4.c)</p> <ul style="list-style-type: none"> • Conflict resolution skills include: <ul style="list-style-type: none"> ○ Discuss problem without blame. ○ Active listening. ○ Identify and clarify issues and needs. ○ Brainstorm solutions and compromises. ○ Choose and apply a solution. ○ Evaluate the solution (9.4.c, 9.4.f). • Nonproductive/nonconstructive methods of handling conflict include criticism of others, blaming others, hurtful words, and/or hurtful actions. (9.4.c) <p>Physical activities, exercise and dance can provide social supports by meeting new people, engaging in similar interests with others, building collaboration and cooperation, and improving community wellness. (9.4.d)</p> <p>Supporting others and being encouraged by others serves as a positive influence on self-efficacy and social/emotional wellness for both parties. (9.4.d)</p>	<p>and dance settings (9.4.c);</p> <ul style="list-style-type: none"> • demonstrate social support of classmates within the PE setting by regularly encouraging and motivating peers (9.4.d); • demonstrate leadership and communication skills/strategies during a variety of physical activity, exercise and dance (9.4.e); • apply problem-solving and critical-thinking skills to complete cooperative/team-building activities (9.4.f); • analyze an activity, exercise or dance and create rules to promote safety for all participants (9.4.g); • analyze and compare social, emotional, and mental benefits derived from physical activities, exercise, and dance (9.4.h); • modify the rules, equipment, or strategies/procedures of a selected activity, exercise, or dance in order to promote inclusion and positive group dynamics (9.4.i). <p>Additional resources: OPEN Online Physical Education Network Health Smart Virginia PE Central</p>

Essential Understandings	Essential Knowledge and Skills
<p>Communication skills/strategies are key to all social interactions, including physical activities, exercise, and dance. (9.4.e)</p> <ul style="list-style-type: none"> • Methods of communication include: <ul style="list-style-type: none"> ○ Verbal: sharing of information/relaying a message between two or more people that uses sounds, signs, and/or language; either oral or written; spoken word; either face-to-face or electronically. ○ Nonverbal: sending and receiving wordless messages; body movements/body language, such as facial expressions, body posture, gestures, eye contact, way, tone of voice, touch. ○ Visual: visual aids such as signs, graphics, drawings, design, color, graphs, charts. ○ Active listening: pay attention to the speaker; avoid being distracted; show you are listening, smile, nod; provide feedback – restate what you heard, ask questions; defer judgment – don’t interrupt; respond with respect. <p>Effective participation in physical activity, exercise, and dance requires critical thinking, both as an individual and within a group. (9.4.f)</p> <ul style="list-style-type: none"> • Critical-thinking skills allow someone to make logical and informed decisions to the best of their ability and is the intentional application of higher-order thinking. • Skills include observation, analysis, interpretation, inference, self-regulation, open-mindedness, reflection, evaluation, explanation, decision making, and problem-solving. <p>Knowledge and understanding of the environment, participant skill level/ability, and level of conditioning is key to planning a safe activity, exercise, or dance session. (9.4.g)</p>	<p>EverFi KidsHealth.org</p>

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Maintaining safe environments, adequate physical conditioning, proper body alignment/form, and following rules and procedures helps reduce injury during activity, exercise, and dance. • During very hot and humid weather, lessen the chances of dehydration and heat stress by <ul style="list-style-type: none"> ○ Exercising at a cooler time of the day. ○ Switching to indoor activities. ○ Changing the type or intensity of activity. ○ Providing adequate fluids, rest breaks, and shade as needed. • Use proper protection for sun exposure such as sunscreen, hat, clothing that protects from UV rays, and sunglasses. • Appropriate and properly fitted equipment for an activity may range from general items of clothing or footwear to special protective suits or apparatus, such as a mouthguard or shin guards. • Seek training and coaching for activities that involve advanced skills. <p>Physical activity and exercise can positively affect mental health, decrease stress, improve mood, and make individuals feel more connected to their community. (9.4.d, 9.4.h)</p> <p>Selection and participation in physical activities, exercise, and dance that one enjoys helps promote social, emotional, and mental wellness. (9.4.h)</p> <ul style="list-style-type: none"> • Social and emotional benefits/supports of participation in physical activities may include: <ul style="list-style-type: none"> ○ Improved mental health and mood. ○ Reduced risk of depression and anxiety. ○ Development of higher self-esteem and body image. ○ Development of basic motor skills needed for day-to-day life. 	

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Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ Effective promotion of mutual understanding and empathy. ○ Growth of character and social skills like teamwork, cooperation and leadership. ○ Ability to handle winning and losing while being a good sport. ○ Development of resiliency. <p>A supportive, inclusive environment includes access to learning and the curriculum with the best approach to ensure learning physically, socially, and emotionally. This could include: speed of play, differentiated instruction, autonomy supported instruction, demonstrations, use of tools/modified equipment, peer/partner opportunities, etc. (9.4.i)</p> <ul style="list-style-type: none"> • Modifying activities, rules, or equipment may be necessary to improve the success rate and build skill for all individuals within a group or team. 	

Energy Balance

- 9.5 The student will explain the importance of energy balance and evaluate current caloric intake and caloric expenditure to maintain optimal health and prevent chronic disease.
- a) Explain the body’s physiological response to sugar, sodium, and fat.
 - b) Assess and analyze current energy balance, including intake and expenditure, activity levels, food choices, and amount of sleep.
 - c) Explain body composition, using body mass index (BMI) and other measures, the variety of body types, and healthy body weight.
 - d) Design and implement a plan to maintain an appropriate energy balance for a healthy, active lifestyle, including a balanced intake, expenditure (levels of intensity), and sleep.

Essential Understandings	Essential Knowledge and Skills
<p>The body needs sugar, sodium, and fat in appropriate quantities to function properly. (9.5.a)</p> <ul style="list-style-type: none"> • Sugar is a carbohydrate; the body processes table sugar (empty calories) and sugar in fruit (nutrients, fiber, lower calories) the same way. Sugar digestion begins in the mouth, but most occurs in the small intestine, where enzymes break sugar down to monosaccharides that are carried to the liver where it is converted to glucose. Glucose is used for energy or stored for later use. Glucose is an important and necessary fuel for the body; the liver and kidneys produce it naturally. The hormone insulin is released from cells located in the pancreas and regulates how much sugar circulates in the bloodstream. Insulin speeds up the transfer of sugar from blood and delivers it to muscle, liver, and fat tissues to be used as fuel or stored for the body to use later. If a person does not have enough insulin, sugar accumulates in the bloodstream and a person has diabetes. If not burned, excess sugar turns to fat, which is difficult to burn off because it takes a lot of energy. • Sodium, found in salt, is an electrolyte. Kidneys maintain the balance of electrolytes and water by regulating the fluids that are taken in and passed 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • explain the body’s physiological response to sugar, sodium, and fat (9.5.a); • maintain a food log, exercise log, and sleep log in order to assess and analyze current energy balance, including sleep requirements (9.5.b); • explain body composition, measurement of body composition, body types, and healthy body weight (9.5.c); • differentiate between body composition and body weight, and explain the correlation between the two measurements (9.5.c); • design and implement a personalized nutrition, exercise, and sleep plan to maintain an appropriate energy balance and promote wellness (9.5.d).

Essential Understandings	Essential Knowledge and Skills
<p>out of the body. If this balance is disturbed, muscles, nerves, and organs won't function correctly because the cells can't generate muscle contractions and nerve impulses. Too little salt results in hyponatremia, which can happen when a person sweats excessively. Too much sodium results in hypernatremia; blood volume can increase, making the heart pump harder and is linked to high blood pressure. Dietary guidelines recommend less than 2,300 milligrams of sodium per day (less than half a teaspoon).</p> <ul style="list-style-type: none"> • Fat transfers vitamins A, D, E, and K in the blood that are needed for growth and healthy skin. Fat takes longer to digest than carbohydrates or proteins, which helps to satisfy hunger longer than other nutrients. Foods high in fat are usually high in calories; consuming excess amounts of fats increases the risk of unhealthful weight gain and obesity. Fats take more energy to burn. <p>The key to achieving and maintaining a healthy weight isn't about short-term dietary changes. It's about a lifestyle that includes healthy eating, regular physical activity, and balancing the calories you consume with the calories your body uses. (CDC) (9.5.b)</p> <ul style="list-style-type: none"> • Energy balance: includes food calories taken into the body through food and drink (energy in) and calories used for daily energy requirements (energy out). Daily energy requirements include the amount of energy required for body maintenance at rest, physical activity and movement, and for food digestion, absorption, and transport. • Physical activity guidelines: 60 minutes per day; weekly: 150 minutes of moderate-intensity aerobic activity, 75 minutes of vigorous-intensity aerobic activity, or an equivalent mix of the two each week. • Sleep: Teenagers should get eight to 10 hours of sleep each night. (CDC) 	<p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OpenPhySED Health Smart Virginia PE Central KidsHealth.gov MyPlate.gov Physical Activity Guidelines for Americans, 2nd ed. American Heart Association</p>

Essential Understandings	Essential Knowledge and Skills
<p>(9.5.b)</p> <p>Body composition is the ratio of body fat to lean body tissue, including muscle, bone, water, and connective tissue. (9.5.c)</p> <ul style="list-style-type: none"> • There is not an ideal weight for everyone; weight ranges should take into account age, gender, height, body type, growth rate, metabolic rate, and activity level. • Body type is determined by heredity. <ul style="list-style-type: none"> ○ Mesomorph: characterized by low-to-medium percentage of body fat, medium-to-large bone size and a large amount of muscle mass and size; muscular and broader shoulders ○ Endomorph: characterized by high percentage of body fat, large bone size, and a small amount of muscle mass and size; rounder and broader hips ○ Ectomorph: characterized by low percentage of body fat, small bones size, and a small amount of muscle mass and size; slender and tall • Body-composition measures vary widely in methodology and accuracy. (9.5.c) <ul style="list-style-type: none"> ○ Body mass index (BMI) is based on height and weight; a high BMI can be an indicator of high body fatness; it can be used to screen for weight categories that may lead to health problems but it is not diagnostic of the body fatness or health of an individual (CDC) (http://www.cdc.gov/healthyweight/assessing/bmi/index.html). ○ Skinfold calipers: measure the thickness of subcutaneous fat at three or seven different sites on the body. Accuracy is determined by hydration levels and the competence/experience of measurer. ○ Body circumference measurements: may include neck, waist, and hips. Does not account for body type differences. 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ Bioelectrical impedance analysis: a person places their hands on a device that runs a small current of electricity through the body for about 20 seconds to gauge body composition. Accuracy depends upon hydration levels and the sensitivity of the device. ○ Underwater weighing: the most accurate method for measuring body composition. Underwater weighing involves submerging a person in a tank of water and having them expel the air out of the lungs. This method is not easy to administer and can be very expensive. Error of underwater weighing is 2-2.5%. <p>Creation and implementation of an energy balance plan requires an understanding of one’s nutritional/energy needs, exercise/activity needs, and sleep requirements to ensure optimal health and wellness. (9.5.b, 9.5.d).</p>	

GRADE TEN

Students in grade ten are proficient in fundamental movement skills and skill combinations and are competent in self-selected physical activities that they are likely to pursue throughout life including outdoor pursuits, fitness activities, dance and rhythmic activities, aquatics, selected individual performance activities, and net/wall and target games. They understand and apply concepts and principles of mechanics and anatomy in relation to human movement and apply the concepts and principles of the body’s metabolic response to short-term and long-term physical activity. Students are good leaders and good followers; they respect others and anticipate and avoid unsafe physical activity situations. They develop the ability to understand and they anticipate how physical activity interests and abilities change across a lifetime. Students demonstrate competency in lifelong physical activities and plan, implement, self-assess, and modify a personal fitness plan. Students are prepared to lead a physically active lifestyle.

Motor Skill Development

- 10.1 The student will demonstrate proficiency and apply the concepts and principles of exercise physiology, biomechanics, and anatomy in lifetime activities that may include outdoor pursuits, fitness activities, dance and rhythmic activities, aquatics, selected individual performance activities, and net/wall and target games in at least two self-selected, lifelong, skill-related physical activities.
- a) Demonstrate skill attainment in one or more lifetime activities.
 - b) Apply and demonstrate knowledge of how movement is created, directed, and stabilized in one or more lifetime activities.
 - c) Identify and demonstrate movement activities in each plane of motion (frontal, sagittal, and transverse) and activities that occur in multiple planes.
 - d) Demonstrate appropriate and proper use of equipment in one or more lifetime activities.

Essential Understandings	Essential Knowledge and Skills
<p>Skill attainment includes demonstration of all critical skill components and proficiency in application of skills and strategies specific to selected activities. Lifetime activities dependent upon activities offered to or selected by students. (10.1.a)</p> <p>Note: Lifetime activities are dependent upon activities offered to or selected by students.</p>	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • demonstrate skill attainment in at least two lifetime activities (10.1.a); • apply and demonstrate knowledge of how movement is created, directed, and stabilized (10.1.b);

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Lifetime activities can be broken down in three categories: individual activities, dual activities, and team activities <ul style="list-style-type: none"> ○ Individual activities may include, but are not limited to: golf, yoga, cycling, hiking/backpacking, orienteering, rock climbing, rowing, canoeing or other paddle sports, swimming, jogging, walking, Pilates, dance, archery, weightlifting, tai chi, and skating. ○ Dual activities may include, but are not limited to: tennis, table tennis, badminton, pickleball, racquetball, squash, bocce ball, skating, tai chi, tennis, and bowling. ○ Team activities may include, but are not limited to: volleyball, basketball, softball, handball, ultimate frisbee, hockey, flag football. <p>Lifetime recreational pursuits can increase self-esteem, reduce substance abuse, build family bonds and promote volunteerism. (10.1.a)</p> <ul style="list-style-type: none"> • Benefits derived from outdoor pursuits: <ul style="list-style-type: none"> ○ Self-confidence: Students with limited physical skills can experience swift success in outdoor pursuits that leads them to believe in their ability to succeed. <ul style="list-style-type: none"> ▪ Example: Planning a travel route that is efficient and enjoyable for everyone. By understanding a map’s contours, students can not only avoid potential hazards (e.g., moving water, exposure to lightning) but conserve energy by avoiding unnecessary elevation gain or loss. By matching the difficulty of the route to the abilities of the group, the student supports the group while also experiencing a sense of accomplishment. Acquiring a new technical skill empowers and encourages continued involvement in an activity. Students are better poised to take on new challenges when they feel genuinely capable as a result of gaining new 	<ul style="list-style-type: none"> • describe dynamic and unpredictable movement experiences (10.1.b); • define concentric, eccentric, and isometric movements and provide examples of each (10.1.b); • discuss how technological advances (such as “coaches’ eye,” or motion capture) can be used by students to apply and demonstrate/document how movement is created, directed, and stabilized in an activity (10.1.b); • identify and demonstrate movement activities in each plane of movement and activities that occur in multiple planes (10.1.c); • define planes of motion and provide examples of movement activities in each plane (10.1.c); • identify and demonstrate movements within specific sport that occur in singular and multiple planes (10.1.c); • demonstrate movement patterns of athletes in all three planes of motion during their sport (10.1.c); • plan for and practice multiple training exercises that occur in all three planes of motion to decrease potential injury (10.1.c); • demonstrate appropriate and proper use of

Essential Understandings	Essential Knowledge and Skills
<p>proficiencies.</p> <ul style="list-style-type: none"> ○ Mutual support: The emphasis on working together and respecting others necessitates a combination of interpersonal skills and appropriate communication. <ul style="list-style-type: none"> ▪ Example: Rock climbing involves cohesiveness and trust between climber and belayer. Good belayers provide climbers with the reassurance to push their physical limits by giving them the knowledge that they can do so without worry. Outdoor pursuits develop enthusiastic and contributing group members who view their roles as an important component of an effective team. ○ Fitness: There are different types of fitness in outdoor pursuits. <ul style="list-style-type: none"> ▪ Cycling up a steep incline provides the steady, sustained exercise recommended for cardiorespiratory endurance and weight control. ▪ Bouldering demands power, agility, and flexibility and involves certain skills that can compensate for insufficient power (e.g., relying more on the legs than the arms or using techniques for shifting weight and resting. ▪ Cycling can be adapted to individual fitness levels. ○ Excitement and fun: Whether perceived or real, an element of risk adds to the excitement of outdoor experiences. When students learn to cope successfully with risks, many of them become more autonomous and self-sufficient. (10.1.a) <ul style="list-style-type: none"> ▪ For example: caving often includes squeezing through cramped, shadowy passages that may be steep or slippery. This task can help students learn how to cope with fears and anxieties. If an activity isn't enjoyable, however, students will not willingly experience more of it. (10.1.a) ○ Wonder of nature: Although climbing high peaks presents important 	<p>equipment (10.1.d);</p> <ul style="list-style-type: none"> • identify safety equipment in activities and provide examples (10.1.d). <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OpenPhySED Health Smart Virginia PE Central Dynamic PE ASAP</p>

Essential Understandings	Essential Knowledge and Skills
<p>challenges, an equally valuable experience may be sitting still in a quiet place away from the usual distractions and listening to the breeze or observing a vast landscape or delicate flower. (10.1.a)</p> <p>Movement is created by agility, power, coordination, reaction time, speed, force, motion, rotation and energy. (10.1.b)</p> <ul style="list-style-type: none"> • Movement is directed by the type of muscle action that directs a movement (concentric, eccentric and isometric), the direction the body part moves relative to its joints (abduction, adduction, flexion and extension), levers, force, rotation, motion, and energy. • Movement is stabilized by balance (center of gravity and center of support, muscle actions) and planes of motion (sagittal plane – flexion and extension; frontal plane – adduction and abduction; transverse plane – internal and external rotation; multi-plane movements). <p>All movement occurs within planes of motion (frontal, sagittal, and transverse). Some activities, such as running, occur in multiple planes. (10.1.c)</p> <ul style="list-style-type: none"> • The sagittal plane is a vertical plane passing from the rear (posterior) to the front (anterior) dividing the body into left and right halves. It is also known as the anteroposterior plane. Movements that involve forward and backward motion are sagittal plane movements. <ul style="list-style-type: none"> ○ Flexion and extension take place in the sagittal plane. ○ Rolling a bowling ball, sit-ups, and bicep curls are examples of exercises that occur in this plane. • The frontal plane is also vertical and passes from left to right, dividing the body into posterior and anterior halves. It is also known as the coronal or the mediolateral plane. <ul style="list-style-type: none"> ○ Abduction and adduction is often in the frontal plane. 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ Jumping jacks, spinal lateral flexion, and moving laterally through space are examples of exercises that occur in this plane. • The transverse/horizontal plane divides the body into top (superior) and bottom (inferior) halves. Any rotation in a joint, such as twisting movements, occur in this plane. <ul style="list-style-type: none"> ○ Rotation (internal, external, and twisting), pronation, and supination occur in the transverse plane. ○ Twisting lunges, side plank with rotation, and clamshells are examples of exercises that occur in this plane. • Running is an example of an activity that occurs in three planes. <ul style="list-style-type: none"> ○ Sagittal: Flexion occurs in the legs at the beginning of the swing phase of running, when the limb is moving forward. Extension occurs in the stance limb, reaching its full extension. ○ Frontal: Abduction and adduction are the movements. Observing the waistline, abduction is movement away from the middle line of the body, and adduction is movement toward-the middle line. Frontal plane movement is also seen in the rear foot when the shoe strikes the ground; this is termed ankle inversion and eversion. ○ Transverse: Rotation occurs in this plane between the pelvis, rib cage and shoulders. <p>Appropriate and proper use of equipment is dependent upon activities. (10.1.d)</p> <ul style="list-style-type: none"> • Equipment for an activity may range from general items of clothing to special protective suits or apparatus and items for safety. • It is essential to use the correct equipment and to make sure it is in good condition. • Identifying proper equipment for lifetime activities is necessary for safe participation. 	

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Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none">• Wearing a proper fitting helmet for different activities such as cycling, rock climbing, and canoeing is imperative.	

Anatomical Basis of Movement

- 10.2 The student will apply knowledge of biomechanics and anatomy and analyze and evaluate the ability to move proficiently and efficiently in lifetime activities.
- Explain how the body responds to energy needs for anaerobic and aerobic activities, including fast and slow-twitch muscle fibers, and anaerobic respiration (ATP-PC and lactic acid system) and aerobic respiration.
 - Analyze movement activities for component skills and movement patterns for one or more lifetime activities.
 - Identify and explain the relationship of opposing muscle groups (agonist/antagonist).
 - Explore common musculoskeletal injuries and the role of ergonomically correct movement for injury prevention.
 - Explain and demonstrate ergonomically correct form in strength and conditioning activities.

Essential Understandings	Essential Knowledge and Skills
<p>The body responds to energy needs for anaerobic and aerobic activities, including fast- and slow-twitch muscle fibers, and anaerobic respiration (ATP-PC and lactic acid system) and aerobic respiration. (10.2.a)</p> <p>The body responds to anaerobic exercise in multiple phases: (10.2.a)</p> <ul style="list-style-type: none"> To immediately meet the sudden higher energy demand, stored ATP is the first energy source. This lasts for approximately 2 seconds. The ATP-PC system can only last 8-10 seconds before PC stores are depleted. The lactic acid system (anaerobic glycolysis) must then take over as the predominant source of energy production; high-intensity (but sub-maximal) exercise can last for between 3 and 5 minutes using this system. Anaerobic respiration transfers a relatively small amount of energy from glucose to cells. If the exercise continues at a high intensity, oxygen is not available at a fast enough rate to allow aerobic metabolism to take over. The production of lactic acid will reach the point where it interferes with muscular function; this is called the lactate threshold. (10.2.a) 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> explain how the body responds to energy needs for anaerobic and aerobic activities, including fast- and slow-twitch muscle fibers, and anaerobic respiration (ATP-PC and lactic acid system) and aerobic respiration (10.2.a); explain the difference between fast- and slow-twitch muscle fibers and provide examples (10.2.a); discuss anaerobic and aerobic activities with examples (10.2.a); explain the bodies response to anaerobic and aerobic exercise (10.2.a); define and explain <i>aerobic respiration</i> and <i>anerobic respiration</i> (10.2.a); define <i>cellular respiration</i> (10.2.a);

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • The process by which organisms break down glucose into a form that the cell can use as energy is cellular respiration. (10.2.a) • Muscles begin to fatigue when ATP resynthesizes and can no longer match demand. <p>The body responds to aerobic exercise differently than anaerobic exercise. (10.2.a)</p> <ul style="list-style-type: none"> • Due to the necessity of oxygen being present for aerobic metabolism, the first few minutes of low- to moderate-intensity exercise are powered by anaerobic metabolism. • Continued low- to moderate-intensity exercise is then fueled by carbohydrate and fat stores using aerobic metabolism. • Aerobic respiration uses oxygen to convert glucose into carbon dioxide and water, producing large amounts of ATP. • The intensity and duration of exercise determines which fuel source is used: <ul style="list-style-type: none"> ○ Fat metabolism is a slow process and so can only be used as fuel for exercise at less than 60% VO₂ max. ○ Carbohydrates are a much faster fuel source and can be used for exercise up to 80% (in trained individuals). ○ Carbohydrate stores within the muscle and liver can fuel exercise for up to 80 minutes. As carbohydrate stores get lower, the body has to rely more and more on fat stores. • The intensity of exercise, which can be maintained, drops as fat cannot supply the amount of energy. • Fast-twitch muscle fibers contract relatively rapidly, used especially in actions requiring maximum effort of short duration, such as sprinting. • Slow-twitch muscle fibers contract relatively slowly and are resistant to 	<ul style="list-style-type: none"> • explain the bodies choice in fuel sources (10.2.a); • explain the bodies choice in fuel sources during moderate activities, intense activities, shorter duration activities, longer duration activities (10.2.a); • analyze movement activities for component skills and movement patterns (10.2.b); • define the phases of movement (preparatory, execution, follow-through) (10.2.b); • demonstrate the phases of movement (preparatory, execution, follow-through) (10.2.b); • identify phases of movement in activity (10.2.b); • identify and explain the relationship of opposing muscle groups (10.2.c); • explain how agonist muscles bring about movement (10.2.c); • identify agonist muscles (10.2.c); • explain how antagonist muscles slow down or stop movement (10.2.c); • identify antagonist muscles (10.2.c); • explain the contraction and relaxation of muscles and identify antagonistic pairs (bicep versus triceps) (10.2.c); • explain how synergist muscles help create a range of movements (10.2.c);

Essential Understandings	Essential Knowledge and Skills
<p>fatigue.</p> <p>Movement can be analyzed by dividing the phases. (10.2.b)</p> <ul style="list-style-type: none"> • Preparatory: movements that prepare, such as a backswing in golf or tennis. • Execution: <ul style="list-style-type: none"> ○ Force-producing movements, such as the forward motion of the tennis forehand shot. ○ Critical instant, the point of contact or the release, such as the moment of contact in the tennis serve. • Follow-through: Body movements after the execution where the movement slows down, such as the movement of the golf club after the ball is struck. • Movement skill phases may not all fit neatly into three phases and additional phases may be devised or added. Example: The long jump may also be divided into: preliminary movements; run-up; takeoff and landing. <p>Muscles work in antagonistic pairs called agonists and antagonists to create movement. (10.2.c)</p> <ul style="list-style-type: none"> • Agonist: (Prime movers) muscles that are associated with motion itself by shortening with a concentric contraction to produce a movement. Also referred to as prime movers, because they are the muscles that are primarily responsible for generating the movement. • Antagonistic: muscles that are associated with motion itself by lengthening with an eccentric contraction to produce a movement. • Example: Throwing—The triceps act as an agonist, extending the elbow to accelerate the ball. As the elbow approaches full extension, the biceps act as an antagonist to slow down elbow extension and bring it to a stop, thereby protecting elbow structures from internal impact. 	<ul style="list-style-type: none"> • explain the benefit of a resistance program that includes activities for opposing muscle groups (10.2.c); • explore the types of musculoskeletal disorders that occur in the workplace and the role of ergonomics (10.2.d); • identify musculoskeletal injuries and understand early identification of repetitive motion problems (10.2.d); • identify types of ergonomically correct movements for injury prevention (10.2.d); • explain the ergonomics of strength and conditioning activities (10.2.e). <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OPEN Online Physical Education Network Health Smart Virginia PE Central Dynamic PE ASAP KidsHealth.org</p>

Essential Understandings	Essential Knowledge and Skills
<p>Ergonomically correct movement helps prevent common musculoskeletal injuries. (10.2.d)</p> <ul style="list-style-type: none"> • The Department of Labor’s Bureau of Labor Statistics defines musculoskeletal disorders (MSDs) as musculoskeletal system and connective tissue diseases and disorders when the event or exposure leading to the case is bodily reaction (e.g., bending, climbing, crawling, reaching, twisting), overexertion, or repetitive motion. MSDs do not include disorders caused by slips, trips, falls, or similar incidents. Examples of MSDs include sprains, strains, and tears, back pain, carpal tunnel syndrome, and hernia. (CDC) • Ergonomics is the science of fitting workplace conditions and job demands to the capability of the working population. The goal of ergonomics is to reduce stress and eliminate injuries and disorders associated with the overuse of muscles, bad posture, and repeated tasks. A workplace ergonomics program can aim to prevent or control injuries and illnesses by eliminating or reducing worker exposure to risk factors. Risk factors include awkward postures, repetition, material handling, force, mechanical compression, vibration, temperature extremes, glare, inadequate lighting, and duration of exposure. For example, employees who spend many hours at a workstation may develop ergonomic-related problems resulting in musculoskeletal disorders (MSDs). <p>Ergonomically correct form can be applied to strength and conditioning activities to ensure correct body posture, ensuring that too much force or repetition/overuse is not occurring, and fitting the activity to the person. (10.2.e)</p>	

Fitness Planning

- 10.3 The student will demonstrate the ability to apply basic principles of training and scientific concepts and principles to evaluate current fitness behaviors and identify strategies needed for health-enhancing fitness for the present and into adulthood.
- a) Construct a fitness and activity plan for the present and the future (postsecondary education, college/career) to address the health-related components of fitness.
 - b) Identify the key factors an informed fitness consumer must evaluate to make critical and effective decisions when purchasing fitness products and/or services.
 - c) Identify fitness needs to prevent health concerns in the present and into the future.
 - d) Identify the effects of life choices, economics, motivation, accessibility, exercise adherence, and participation in physical activity in college or career settings.
 - e) Describe components of health-related fitness in relation to one career goal.
 - f) Explain the effects of physical activity on emotional and social well-being for the present and into the future.
 - g) Apply rate of perceived exertion (RPE) and pacing to a conditioning plan that meets the needs of one or more lifetime activities.
 - h) Design and implement a program for strength and conditioning.

Essential Understandings	Essential Knowledge and Skills
<p>Physical activity refers to the guideline of 60 minutes a day of moderate to vigorous physical activity. Health-related fitness is linked to fitness components that may lower risks, such as high blood pressure, diabetes, or low back pain. (10.3.a)</p> <ul style="list-style-type: none"> • Aerobic fitness: the ability of the heart and lungs to deliver blood to muscles. • Muscular strength and endurance: enough to do normal activities easily and protect the low back. • Flexibility: the ability to move joints through their proper range of motion. • Body composition: the ratio of body fat to lean body tissue, including muscle, bone, water and connective tissue. <p>Addressing fitness components and planning for activity needs beyond high school should include how/where to access fitness and physical activities, the needs of the individual for the postsecondary environment. (i.e., college, career, and work-related</p>	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • create a fitness and activity plan for the present and the future to address the health-related components of fitness (10.3.a); • identify the components of fitness (10.3.a); • describe how the components of fitness relate to postsecondary work environment (10.3.a); • identify the key factors an informed fitness consumer must evaluate to make

Essential Understandings	Essential Knowledge and Skills
<p>needs, such as a job that requires standing or sitting most of the day or work requiring physical demands) (10.3.a,10.3.e)</p> <ul style="list-style-type: none"> • Aerobic fitness: the ability of the heart and lungs to deliver blood to muscles. • Muscular strength and endurance: critical to health and the ability to carry out daily activities, such as performing household tasks (yard work, carrying groceries) or job-related tasks (lifting or moving heavy objects). • Flexibility: for good joint function as well as being able to walk, lift, and step normally. The ability to move a joint through its normal range of motion is affected by the condition of the joint itself (for example: arthritis). A short (tight) muscle limits the joint’s ability to move normally. If the hamstrings are too short, they limit the ability of the pelvis to tilt, which directly affects the lower (lumbar) spine and can lead to low back pain. • Body composition: BMI measure is related to the risk of disease and death. The score is valid for men and women, but it does have some limitations. It may overestimate body fat in athletes and others who have a muscular build. It may underestimate body fat in older persons and others who have lost muscle mass. <p>A consumer is someone who purchases and uses economic goods. When a person purchases and uses products for physical fitness or physical activity, the person becomes a fitness consumer. (10.3.b)</p> <p>A fitness consumer should conduct research to understand the functions of the goods being purchased to improve or maintain their physical fitness levels. (10.3.b)</p> <p>A fitness consumer should consider the following before making purchases: (10.3.b)</p> <ul style="list-style-type: none"> • How will the goods being purchased affect the consumer’s fitness goals and needs? 	<p>critical and effective decisions when purchasing fitness products and/or services;</p> <ul style="list-style-type: none"> • use a variety of resources to analyze current fitness and activity level (10.3.b); • identify fitness needs to prevent health concerns in the present and into the future (10.3.c); • identify the effects of life choices, economics, motivation, accessibility, exercise adherence, and participation in physical activity in college or career settings (10.3.d); • describe components of health-related fitness in relation to one career goal (10.3.e); • explain the effects of physical activity on emotional and social well-being for the present and into the future (10.3.f); • apply rate of perceived exertion (RPE) and pacing to a conditioning plan that meets the needs of one or more lifetime activities (10.3.g); • design and implement a program for strength and conditioning (10.3.h). <p>Additional resources: SHAPE America National Standards and Grade-</p>

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • How will the consumer use the equipment and how often? • Do the goods/equipment being purchased meet the consumer’s physical needs (for example, does the machine fit a consumer that is over 6 feet tall)? • Does the consumer have enough space for the goods being purchased to exercise safely? • Is the consumer getting the best price on the features they need? <p>Low-tech goods and technology-based devices and applications can be used to analyze, monitor, and improve fitness and activity levels without overpaying. (10.3.b)</p> <ul style="list-style-type: none"> • Pedometers: track steps taken by indicating each time the wearer’s hips move. Some models can track foot movement via a GPS tracker or built-in sensors on a phone. • Heart rate monitors: There are two types: wireless chest/arm straps that use an electrical pulse to read heart rate (tend to be more accurate) and wrist-based/headphones trackers that use optical technology (light). Both can send continuous data to a monitor (watch/phone). Other heart rate monitors and technology may be available. • Accelerometers: measure acceleration; able to capture intensity of physical activity; able to distinguish between walking and running; can separate human movement from mechanical vibration, such as riding in a car. • Variety of apps for watches and phones. • Calculator sites, such as: <ul style="list-style-type: none"> ○ BMI: https://www.cdc.gov/healthyweight/bmi/calculator.html ○ Calories burned: http://www.acefitness.org/acefit/healthy_living_tools_content.aspx?id=9 ○ One repetition maximum, or 1RM, in weight training: http://www.acefitness.org/acefit/healthy_living_tools_content.aspx?id=8 <p>Regular exercise helps control blood pressure, body weight, and cholesterol levels;</p>	<p>Level Outcomes</p> <p>KidsHealth.gov</p> <p>Health Smart Virginia</p> <p>MyPlate.gov</p> <p>OpenPhyzed</p> <p>Physical Activity Guidelines for Americans, 2nd ed.</p> <p>Healthy Children.org</p>

Essential Understandings	Essential Knowledge and Skills
<p>decreases the risk for hardening of the arteries, heart attack, stroke, arthritis, and diabetes; improves digestion; helps to manage stress; aids in better sleep; and is good for managing low-back pain. Anyone can be at risk for chronic disease; however, some people are more at risk due to heredity (received from a parent or ancestor by genetic transmission) or because a condition is familial (tending to occur in more members of a family than expected by chance alone). (10.3.c)</p> <ul style="list-style-type: none"> • Risks with aging include falling, which can be reduced with balance and strength training. Balance training can include backward walking, sideways walking, heel walking, toe walking, practicing standing from a sitting position, and activities such as tai chi and yoga. Strong leg and hip muscles help to reduce the risk of falls, a cause of considerable disability among older adults. Resistance training at least two days per week, making sure to exercise all major muscle groups through a full range of motion and ending each workout with stretching exercises to help maintain mobility and range of motion, can decrease risk for injury. • Adults older than 50 who do not perform resistance training lose nearly one-quarter pound of muscle mass per year. Because muscle mass is directly related to how many calories your body burns each day, resistance training is important for weight management. <p>According to the CDC, physical activity is one of the best things people can do to improve their health. It is vital for healthy aging and can reduce the burden of chronic diseases and prevent early death. Active people generally live longer and are at less risk for serious health problems like heart disease, type 2 diabetes, obesity, and some cancers. For people with chronic diseases, physical activity can help manage these conditions and complications. Physical activity matters because (10.3.d):</p> <ul style="list-style-type: none"> • One in 2 adults live with a chronic disease. • Only half of adults get the physical activity they need to help reduce and 	

Essential Understandings	Essential Knowledge and Skills
<p>prevent chronic diseases.</p> <ul style="list-style-type: none"> • Getting enough physical activity could prevent 1 in 10 premature deaths. • Over \$1 billion annually in healthcare costs are associated with inadequate physical activity. • Physical activity has positive physical, emotional, social, and mental effects for children, adults, and healthy aging. • Work force effects: absenteeism and lost productivity from employee illness, injury, obesity or chronic conditions. One study reports that obesity alone has been estimated to cost employers almost \$2,500 per employee per year, including direct medical expenditures and absenteeism (Steps to Wellness—Physical Activity in the Workplace; CDC). • Building active, safe, and walkable communities help increase retail activity and employment, increase property values, reduce healthcare costs, improve safety, and positively influence the workforce (fewer sick days). <p>Physical activity that includes all health-related components of fitness are important throughout life. Career choices may increase a need/focus on a particular area, such as a position that requires lifting heavy objects. In addition to aerobic fitness, muscular strength and endurance and flexibility have increased importance to ensure the strength to lift objects, maintain mobility and flexibility throughout repeated motions, ensure proper ergonomics (body positioning), protect the low back, and body composition/healthy weight to perform work activities. (10.3.e)</p> <p>Social and emotional benefits/supports of participation in physical activities may include but are not limited to: (10.3.f)</p> <ul style="list-style-type: none"> • Improves mental health and mood. • Reduces the risk of depression and anxiety. • Develops higher self-esteem and body image. 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Helps develop basic motor skills needed for day-to-day life. • Effective in promoting mutual understanding and empathy. • Builds character: social skills like teamwork, cooperation, and leadership. • Ability to handle winning and losing while being a good sport. • Develops resiliency. <p>Pacing is needed to avoid fatigue before the end of an activity (e.g., jogging three miles). It is a strategy by which effort is managed during exercise based on a goal and the demands of the task; time per distance. Pacing strategies may include time, heart rate, and level of intensity/using an RPE scale. (10.2.g)</p> <ul style="list-style-type: none"> • Perceived exertion is how hard a person feels like their body is working. Rate of perceived exertion (RPE) is a way of measuring physical activity intensity level. Scales may range from five to 20 levels. Example (variation of Borg scale): <ul style="list-style-type: none"> ○ Level 1 – Very light activity (seated). ○ Level 2 – Light activity (can maintain for hours, easy to breathe; walking). ○ Level 3 – Moderate activity (breathing heavily, somewhat comfortable; skipping, galloping). ○ Level 4 – Vigorous activity (borderline uncomfortable, short of breath; jogging/running). ○ Level 5 – Very hard activity (difficult to maintain exercise intensity, barely breathe; running/sprinting). ○ Level 6 – Max effort activity (almost impossible to keep going, out of breath; sprinting). <p>Design and implement a program for strength and conditioning. (10.2.h)</p> <ul style="list-style-type: none"> • Strength training is exercise that uses resistance (weights, bodyweight) to boost muscle mass, reduce fat percentage, strengthen bones and muscle. 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none">• Conditioning activities usually target the whole body to strengthen, shape, and tone; may include flexibility, strength and resistance training; conditioning activities may involve higher repetitions with primary goal of improving cardiovascular system.	

Social and Emotional Development

- 10.4 The student will demonstrate appropriate behaviors in all physical activity settings and the social skills needed to be a contributing member of society.
- a) Explain the importance of and demonstrate effective communication skills in physical activity settings.
 - b) Explain the importance of and apply relationship and conflict resolution skills and social awareness for current and future health and fitness.
 - c) Identify and avoid prejudices and biases in physical activity settings.
 - d) Explain the importance of understanding cultural diversity for personal health and fitness.
 - e) Evaluate opportunities for social interaction and social support in a self-selected physical activity or dance.
 - f) Apply stress-management strategies (e.g., mental imagery, relaxation techniques, deep breathing, aerobic exercise, meditation) to reduce stress.
 - g) Explain the mental and emotional benefits of mind-body exercise/activities (e.g., yoga, Pilates, tai chi).
 - h) Identify ways to promote equity and inclusion and embrace diversity in a physical activity setting.

Essential Understandings	Essential Knowledge and Skills
<p>Leadership and communication skills ensure inclusive and safe participation in physical activities. (10.4.a)</p> <ul style="list-style-type: none"> • Leadership skills include integrity, open and honest communication, active listening, empathy, trustworthiness, commitment, critical and creative thinking, flexibility, relationship building, dependability, time management, and ability to inspire and convince others. • Communication skills/strategies may include: <ul style="list-style-type: none"> ○ Verbal: sharing of information/relaying a message between two or more people that uses sounds, signs and/or language; either oral or written; spoken word; either face-to-face or electronically. (10.4.a) ○ Nonverbal: sending and receiving wordless messages; body movements/body language, such as facial expressions, body posture, gestures, eye contact, way, tone of voice, and touch. ○ Visual: visual aids, such as signs, graphics, drawings, design, color, 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • explain the importance of and demonstrate effective communication skills in physical activity settings (10.4.a); • explain the importance of and apply relationship and conflict resolution skills and social awareness for current and future health and fitness (10.4.b); • describe the role of critical thinking for current and future health and fitness (10.4.b); • identify and avoid prejudices and biases in physical activity setting (10.4.c);

Essential Understandings	Essential Knowledge and Skills
<p>graphs, charts.</p> <ul style="list-style-type: none"> ○ Active listening: pay attention to the speaker, avoid being distracted; show you are listening, smile, nod; provide feedback – restate what you heard, ask questions; defer judgment – don’t interrupt; respond with respect. <p>Critical thinking and problem solving are essential for health and fitness, from setting goals and developing plans and strategies to accessing accurate and reliable information and evaluating resources for providers of health services and products. (10.4.b)</p> <p>Worksite audits may be beneficial to identify specific improvements that would improve the health and overall quality of the workspace. (10.4.b)</p> <p>Physical activity settings need to be evaluated for safety that includes effects on appropriate safety equipment, proper skills needed for the activity and environment, weather-related concerns, proper activity equipment, access to guides for outdoor pursuits, specialized trainers, and physical safety (e.g., use of sidewalks, traffic, bike lanes, free of debris and obstacles, lighting, and access to assistance if needed). (10.4.b)</p> <p>Prejudice is defined by the Merriam-Webster dictionary as, “injury or damage resulting from some judgment or action of another in disregard of one’s rights.” (Prejudice definition and meaning, Merriam-Webster) (10.4.c)</p> <p>Bias is defined as, “an inclination of temperament or outlook, <i>especially</i> a personal and sometimes unreasoned judgment.” (Bias definition and meaning, Merriam-Webster) (10.4.c)</p>	<ul style="list-style-type: none"> • explain the importance of understanding cultural diversity for personal health and fitness (10.4.d); • evaluate opportunities for social interaction and social support in a self-selected physical activity or dance (10.4.e); • explain how participation in physical activities develop social connections (10.4.e); • apply stress-management strategies (e.g., mental imagery, relaxation techniques, deep breathing, aerobic exercise, meditation) to reduce stress (10.4.f); • explain the mental and emotional benefits of mind-body exercise/activities (e.g., yoga, Pilates, tai chi) (10.4.g); • Identify ways to promote equity and inclusion and embrace diversity in a physical activity setting (10.4.h). <p>Additional resources: OPEN Online Physical Education Network Health Smart Virginia PE Central EverFi KidsHealth.org</p>

Essential Understandings	Essential Knowledge and Skills
<p>Prejudice and bias can occur in physical activity settings because people may have preconceived and false notions of what individuals or groups of people can and cannot do. Incidents of prejudice and bias in sport and physical activity can isolate members or groups within a community. Students should work to include all members of the community, regardless of race, sex, sexual orientation, weight, height, and/or disability, for example. (10.4.c)</p> <p>Students belong to various cultures, such as family, gender, teams, faith community, school, grade level, school classes, ethnicity, and interest groups/clubs. Understanding cultural diversity is important for all aspects of health, fitness, and life. (10.4.d)</p> <ul style="list-style-type: none"> • Culture: the beliefs, customs, and arts of a particular society, group, place, or time. • Cultural diversity: ethnic, gender, racial, and socioeconomic variety in a situation, institution, or group; the coexistence of different ethnic, gender, racial, and socioeconomic groups within one social unit (dictionary.com). • All of the significant differences between people, including perceptions of differences that need to be considered in particular situations and circumstances. Often the most significant differences are the least obvious, such as thinking styles or beliefs and values. <p>Physical activities, such as group exercise classes, recreation leagues, and jogging/biking offer an opportunity to socialize and develop friendships. (10.4.e)</p> <ul style="list-style-type: none"> • Community resources for accessing physical activity or dance opportunities (parks and recreation facilities, faith community, recreation leagues, associations and organizations). • Identify current and future activities and how those activities may help 	

Essential Understandings	Essential Knowledge and Skills
<p>students develop positive social relationships, now and into the future.</p> <p>Stress-management strategies may include: (10.4.f)</p> <ul style="list-style-type: none"> • Relaxation techniques. • Breathing meditation: Deep breathing. • Progressive muscle relaxation: Systematically tense and relax different muscle groups in the body. • Body scan meditation: Focus on the sensations in each part of the body. • Mindfulness: Staying calm and focused in the present moment. • Visualization: Imagining a scene in which you feel at peace. • Rhythmic exercise (such as running, walking, rowing, or cycling): Engaging in the present moment, focusing your mind on how the body feels right now. • Social support and self-care (CDC) <ul style="list-style-type: none"> ○ Eat a healthy, well-balanced diet. ○ Exercise regularly. ○ Get plenty of sleep. ○ Give yourself a break if you feel stressed out (listen to music, take a walk). ○ Maintain a normal routine. ○ Stay active. You can take your mind off your problems by helping a neighbor, volunteering in the community, even taking the dog on a long walk. <p>Mind-body exercise/activities may include: (10.4.g)</p> <ul style="list-style-type: none"> • Yoga: a system of exercises; a series of moving and stationary poses and postures, combined with deep breathing, which help improve strength, flexibility and balance. 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Pilates: a series of fluid movements performed in a precise manner, accompanied by specialized breathing techniques and intense mental concentration. • Tai chi: A Chinese form of exercise that uses very slow and controlled movements; it involves the practice of various postures; movements are continuous and serve to relax and align the body. <p>Creating an inclusive culture for physical education/school and physical activity in the community helps every student learn to lead a healthy and active lifestyle and have a sense of belonging, acceptance, and value (CDC). (10.4.h)</p> <ul style="list-style-type: none"> • Strategies for inclusion may include: <ul style="list-style-type: none"> ○ modifying/adapting the equipment, rules, environment, activity ○ creating a welcoming/inclusive environment, one that supports, uplifts, and promotes feelings of belonging, acceptance, and value ○ Understanding that diversity includes the effects of unequal power relations on the development of group identities and cultures ○ Respectfully expressing curiosity about the history and lived experiences of others and the exchange ideas and beliefs in an open-minded way ○ Interacting comfortably and respectfully with all people, whether they are similar to or different from oneself. <p>A supportive, inclusive environment includes access to learning and the curriculum with the best approach to ensure learning physically, socially, and emotionally. This could include but are not limited to: (10.4.h)</p> <ul style="list-style-type: none"> • speed of play • differentiated instruction • autonomy supported instruction 	

2022 Physical Education Standards of Learning Curriculum Framework

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none">• demonstrations, use of tools/modified equipment• peer/partner opportunities	

Energy Balance

- 10.5 The student will explain the importance of energy balance and evaluate current caloric intake and caloric expenditure to maintain optimal health and prevent chronic disease for the present and into adulthood.
- a) Analyze the relationships among physical activity, nutrition, body composition, and sleep that are optimal for personal health and/or for participation in lifetime activities.
 - b) Evaluate current activity and intensity levels.
 - c) Evaluate current caloric expenditure and intake needs.
 - d) Evaluate current sleep needs.
 - e) Evaluate the caloric intake needs for before, during, and after lifetime activities.
 - f) Explain energy balance (caloric expenditure vs. caloric intake) in relation to changing needs from adolescence through adulthood.
 - g) Explain the potential consequences of energy imbalance (e.g., over-exercising, under eating, over-eating, sedentary lifestyle).
 - h) Explain the role of perseverance and tenacity in achieving lifelong energy balance.

Essential Understandings	Essential Knowledge and Skills
<p>Each person may have different needs for calories and exercise. A healthy lifestyle requires balancing foods you eat, beverages you drink, adequate sleep, stress management, and the amount of activity in your daily routine (CDC). (10.5.a)</p> <ul style="list-style-type: none"> • Regular exercise helps control blood pressure, body weight, and cholesterol levels; decreases the risk for hardening of the arteries, heart attack, stroke, arthritis, and diabetes; improves digestion, helps to manage stress, aids in better sleep and is good for managing low-back pain. • A healthy eating plan emphasizes fruits, vegetables, whole grains, and fat-free or low-fat milk and milk products; includes lean meats, poultry, fish, beans, eggs, and nuts; is low in saturated fats, trans fats, cholesterol, salt (sodium), and added sugars; and stays within daily calorie needs. • Body composition: A high amount of body fat can lead to weight-related diseases and other health issues. Being underweight is also a health risk. 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • analyze the relationships among physical activity, nutrition, body composition, and sleep that are optimal for personal health and/or for participation in lifetime activities (10.5.a); • evaluate current activity and intensity levels (10.5.b); • evaluate current caloric expenditure and intake needs (10.5.c); • evaluate current sleep needs (10.5.d); • evaluate the caloric intake needs for before, during, and after lifetime activities.

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Sleep is a powerful regulator of appetite, energy use, and weight control. Sleep deprivation can inhibit one’s ability to lose weight even while exercising and eating well. <p>Physical activity guidelines: 60 minutes per day; weekly: 150 minutes of moderate-intensity aerobic activity, 75 minutes of vigorous-intensity aerobic activity, or an equivalent mix of the two each week. (10.5.b)</p> <ul style="list-style-type: none"> • Use the rate of perceived exertion (RPE) scale and determine workout intensity. • Perceived exertion is how hard a person feels like their body is working. RPE is a way of measuring physical activity intensity level. Scales may range from five to 20 levels. <ul style="list-style-type: none"> ○ Example (variation of Borg scale): <ul style="list-style-type: none"> ▪ Level 1 – Very light activity (seated) ▪ Level 2 – Light activity (can maintain for hours, easy to breathe, walking) ▪ Level 3 – Moderate activity (breathing heavily, somewhat comfortable; skipping, galloping) ▪ Level 4 – Vigorous activity (borderline uncomfortable, short of breath; jogging/running) ▪ Level 5 – Very hard activity (difficult to maintain exercise intensity, barely breathe, running/sprinting) ▪ Level 6 – Max effort activity (almost impossible to keep going, out of breath, sprinting) <p>Expenditure and intake needs vary with age and physical activity levels. (10.5.c)</p> <p>Refer to Dietary Guidelines for Americans (https://www.dietaryguidelines.gov/) for adolescent and adult guidelines for caloric expenditure and intake. Also see</p>	<p>(10.5.e);</p> <ul style="list-style-type: none"> • explain energy balance (caloric expenditure versus caloric intake) in relation to changing needs from adolescence through adulthood (10.5.f); • explain the potential consequences of energy imbalance (e.g., over-exercising, under eating, over-eating, sedentary lifestyle) (10.5.g); • explain the role of perseverance and tenacity in achieving lifelong energy balance (10.5.h). <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OpenPhySED Health Smart Virginia PE Central KidsHealth.gov MyPlate.gov Physical Activity Guidelines for Americans, 2nd ed. American Heart Association</p>

Essential Understandings	Essential Knowledge and Skills
<p>the DRI Calculator for Healthcare Professionals tool that calculates daily nutrient recommendations based on the Dietary Reference Intakes (DRIs) established by the Health and Medicine Division of the National Academies of Sciences, Engineering, and Medicine. The data represents the most current scientific knowledge on nutrient needs; however, individual requirements may be higher or lower than DRI recommendations. (https://www.nal.usda.gov/fnic/dri-calculator/index.php) (10.5.c)</p> <p>Guidelines for sleep: teens 13-18 should get eight-10 hours per 24 hours of sleep; adults 18-60 should get seven or more hours per night (CDC). (10.5.d)</p> <ul style="list-style-type: none"> • Stimulants like coffee and energy drinks, alarm clocks, and external lights (including those from electronic devices) interfere with our “circadian rhythm,” or natural sleep/wake cycle. • A good night’s sleep improves learning. Sleep is involved in the healing and repair of heart and blood vessels. The right amount of sleep reduces heart rate and blood pressure. Getting enough sleep helps a person function productively/safely throughout the day. People who are sleep deficient are less productive at work/school. They take longer to finish tasks, have a slower reaction time and make more mistakes. Consult a primary care physician or a sleep professional to determine the underlying cause, if experiencing symptoms such as: sleepiness during the day or when you expect to be awake and alert, snoring, leg cramps or tingling, gasping or difficulty breathing during sleep, prolonged insomnia or another symptom that is preventing you from sleeping well. <p>Evaluate the caloric intake needs for before, during, and after lifetime activities. (10.5.e)</p> <ul style="list-style-type: none"> • Pre-lifetime physical activity: <ul style="list-style-type: none"> ○ Good supply of protein for tissue repair one to two hours before 	

Essential Understandings	Essential Knowledge and Skills
<p>activity. A lifetime activity that has a lot of cardio requires more carbohydrates than protein. Carbohydrates are metabolized into glucose (energy) very quickly, so they should be consumed 30-60 minutes before an activity.</p> <ul style="list-style-type: none"> • During physical lifetime activity: <ul style="list-style-type: none"> ○ Add protein and fiber to deliver a steadier supply of energy throughout the activity. • After a lifetime physical activity: <ul style="list-style-type: none"> ○ Go for carbohydrates to replace the energy in depleted muscles. Protein, though, is almost equally important in sealing in your physical activity benefits and promoting recovery. <p>Explain energy balance (caloric expenditure versus caloric intake) in relation to changing needs from adolescence through adulthood. (10.5.f)</p> <p>Refer to Dietary Guidelines for Americans (10.5.f) (https://www.dietaryguidelines.gov/) for adolescent and adult guidelines for caloric expenditure and intake. Also see the DRI Calculator for Healthcare Professionals tool that calculates daily nutrient recommendations based on the Dietary Reference Intakes (DRIs) established by the Health and Medicine Division of the National Academies of Sciences, Engineering, and Medicine. The data represents the most current scientific knowledge on nutrient needs; however, individual requirements may be higher or lower than DRI recommendations. (https://www.nal.usda.gov/fnic/dri-calculator/index.php) (10.5.f)</p> <p>Energy imbalance may include (10.5.g)</p> <ul style="list-style-type: none"> • Taking in more calories than expending results in a caloric surplus; this can result in muscle gain, fat gain, or both. 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • When calories taken in equals calories expended, the result is maintenance; everything stays the same • Expending more calories than calories taken in results in a caloric deficit (negative energy balance); this can result in fat loss, muscle loss, or both. <ul style="list-style-type: none"> ○ The effects of a negative energy balance (more out than in) include: Decline in metabolism, decreases in bone mass, reductions in thyroid hormones, reductions in testosterone levels, inability to concentrate and a reduction in physical performance. ○ Excessive amounts of physical activity can lead to injuries, menstrual abnormalities, and bone weakening. ○ Signs of over-exercise may include delayed recovery time, depression, insomnia, disinterest in exercise, mood changes, fatigue. <p>Explain the role of perseverance and tenacity in achieving lifelong energy balance. (10.5.h)</p> <p>People’s needs, interests, and circumstances change over a lifetime. Achieving a lifestyle that includes healthy eating, regular physical activity, and balancing calories consumed with calories the body uses takes an ongoing commitment, perseverance and tenacity. (10.5.h)</p> <ul style="list-style-type: none"> • Perseverance is the “continued effort to do or achieve something despite difficulties, failure, or opposition.” (https://www.merriam-webster.com/dictionary/perseverance) • Tenacity is the state or quality of being tenacious: “persistent in maintaining, adhering to, or seeking something valued or desired.” (https://www.merriam-webster.com/dictionary/tenacious) 	

GRADE ELEVEN/TWELVE (ELECTIVE)

Elective physical education courses provide students with the opportunity to participate in physical activities for specific purposes. Students in elective physical education demonstrate the knowledge and understanding necessary to analyze movement performance in an activity of choice using scientific principles, and implement effective practice procedures for skillful performance in specialized movement forms. Students apply advanced movement-specific information so that they develop the ability to learn, self-assess, and improve movement skills independently. Options for offering specialized-movement courses can be configured by quarter, by semester, or on a full-year basis. Students should be offered the opportunity to self-select an activity throughout the course. Students will select areas of concentration to study.

Examples of activity choices:

- aerobics
- aquatics (swimming, kayaking, canoeing)
- cycling
- dance
- individual sports
- lifelong activities
- outdoor pursuits
- Pilates
- self-defense
- skating
- team sports
- weight management
- weight training/conditioning

Motor Skill Development

- 11/12.1 The student will study in-depth and demonstrate mastery of movement skills and patterns in at least one lifetime physical activity per nine-week period.
- a) Demonstrate mastery in all basic skills and movement patterns required for the selected activity and the ability to use the skills with consistency in the appropriate setting.
 - b) Identify and apply appropriate skill practice and strategies of the selected activity at an advanced level.
 - c) Demonstrate advanced movement patterns in at least one self-selected movement or activity.
 - d) Demonstrate the ability to use combined movement skills and strategies in self-selected movement activities.
 - e) Analyze movement activities to identify component skills and movement patterns.
 - f) Conduct observations and skill analyses of others to improve skill performance.
 - g) Create practice and game plans for optimal performance of movement patterns in self-selected sport/activity from the perspective of a coach, personal trainer, athlete, or other sport-related role.
 - h) Select and apply appropriate practice procedures to learn skills and movement patterns in activities of personal interest.
 - i) Apply appropriate strategies during performance, including offensive and defensive strategies, game-specific situational strategies, and strategies for working more effectively with team members/partners.

Essential Understandings	Essential Knowledge and Skills
<p>Skill mastery includes demonstration of all critical skill components and proficiency in the application of skills and strategies specific to selected activities. Lifetime activities depend upon activities offered to or selected by students. (11/12.1.a)</p> <p>Movement/motor learning progression includes analysis of current performance, development of a personalized practice plan for improvement that includes SMART goal setting, application of principles of movement and training, and planning for amount of time and activities needed for practice, correction, practicing at a higher level, and reassessment. (11/12.1.b)</p>	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • demonstrate mastery in all basic skills and movement patterns (11/12.1.a); • identify and apply appropriate skill practice and strategies (11/12.1.b); • demonstrate advanced movement patterns (11/12.1.c); • demonstrate the ability to use combined movement skills and strategies (11/12.1.d); • analyze movement activities to identify

Essential Understandings	Essential Knowledge and Skills
<p>Advanced movement patterns include consistency of skill demonstration and the ability to adapt/react to changing/unpredictable game situations. (11/12.1.c)</p> <p>Combination movements can involve all three of the non-locomotor, locomotor, and object control movements together. Pairing combined movement skills with specific strategies creates a desired outcome in self-selected movement activities. (11/12.1.d)</p> <p>When analyzing movements, divide the movement performance into three phases:</p> <ul style="list-style-type: none"> • Preparatory: movements that prepare, such as a backswing in golf or tennis. • Execution: <ul style="list-style-type: none"> ○ Force-producing movements, such as the forward motion of the tennis forehand shot. ○ Critical instant, the point of contact or release, such as the moment of contact in the tennis serve or the takeoff in the long jump. • Follow-through: body movements after the execution where the movement slows down, such as the high leg lift after kicking a ball or the golf club after the ball is struck. • Movement skill phases may not all fit neatly into three phases, and additional phases may be devised or added. (11/12.1.e, 11/12.1.f) <p>Feedback is important to master advanced skills. Feedback is useful when it is focused on the goal of the skill and is specific, objective, and provided in terms understood by the recipient of the feedback. (11/12.1.f; also refer to 11/12.1.e)</p> <p>Practice and game planning can vary based on the perspectives of the person</p>	<p>component skills and movement patterns (11/12.1.e);</p> <ul style="list-style-type: none"> • conduct observations and skill analyses of others to improve skill performance (11/12.1.f); • create practice and game plans for optimal performance of movement patterns from the perspective of a coach, personal trainer, athlete, or other sport-related role (11/12.1.g); • select and apply appropriate practice procedures to learn skills and movement patterns (11/12.1.h); • apply appropriate strategies during performance (11/12.1.i). <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OpenPhySED Health Smart Virginia PE Central Dynamic PE ASAP</p>

Essential Understandings	Essential Knowledge and Skills
<p>making the plans. (11/12.1.g)</p> <ul style="list-style-type: none"> • Coach: impacts to planning may include preseason versus season, skills of all players and skills players need to develop, player injuries, conditions (facility and environmental/weather-related), individual and group/team skills and strategies, team building, teamwork and communication, and game-specific skills and strategies • Personal trainer: focused on the personal health, fitness goals, and safety of individuals or small groups • Athlete: focused on maintenance and improvement of personal skills; personal fitness goals. <p>Learning skills and movement patterns begins with accessing resources for the proper ways to perform the skills, such as a coach, teacher, or other professional (in person or through media). Engage in deliberate practice that focuses on the specific skills and application of the skills. Use video or professionals to analyze ongoing skill development. (11/12.1.h; also refer to 11/12.1.b)</p> <p>Game/activity-specific strategies and communication are dependent upon the selected activity. (11/12.1.i)</p>	

Anatomical Basis of Movement

11/12.2 The student will apply knowledge of body systems and movement principles, and concepts that aid in the improvement of movement skills and performance to specialized movement forms.

- a) Explain and apply biomechanical and physiological principles that aid in the improvement of skills and performance in specialized movement forms, including laws of motion, leverage, balance, weight transfer, speed, timing, accuracy, force, cardiac output, maximal oxygen consumption (VO₂ max), energy systems (aerobic and anaerobic), heart rate (resting, target, and recovery), caloric cost of activity, muscle contraction, static versus dynamic flexibility, and muscular strength versus muscular endurance.
- b) Analyze performance to identify physiological and biomechanical deficiencies including self-evaluation, peer evaluation, and teacher evaluation.
- c) Explain the rules, safety protocols, relevant markings/lines for the field of play, offensive and defensive tactics, and common penalties and violations for selected activities.
- d) Design, justify, and evaluate warm-up and cool-down sequences for selected activities.
- e) Apply the FITT (frequency, intensity, time, and type of exercise) principle to improve skill performance.
- f) Apply the specificity, overload, and progression (SOP) principle to the design and performance of a physical activity program to achieve physical benefits.
- g) Analyze feedback about personal performance to improve skills including self-evaluation, peer evaluation, and teacher evaluation.

Essential Understandings	Essential Knowledge and Skills
<p>Biomechanical and physiological principles that aid in the improvement of skills and performance include: (11/12.2.a)</p> <ul style="list-style-type: none"> • Newton’s laws of motion <ul style="list-style-type: none"> ○ Inertia: An object at rest or in motion will stay in that state until acted upon by a force strong enough to change its state of motion. ○ Acceleration/momentum: Acceleration of an object is directly proportionate to the amount of force applied and moves in the direction in which the force is applied. ○ Action and reaction: For every action there is an equal and opposite 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • explain and apply biomechanical and physiological principles that aid in the improvement of skills and performance in specialized movement forms, including the laws of motion, leverage, balance, weight transfer, speed, timing, accuracy, force, cardiac output, maximal oxygen

Essential Understandings	Essential Knowledge and Skills
<p>reaction.</p> <ul style="list-style-type: none"> • Leverage: The bones of the body are levers as well as a stiff, straight object that can be used to lift weight, increase force, or create speed. • Balance: even distribution of weight that enables someone or something to remain upright while remaining stable and achieving equilibrium. The ability to maintain the body’s center of gravity within the limits of stability as determined by the base of support. <ul style="list-style-type: none"> ○ Center of gravity is the point at which all of the body’s mass and weight are equally balanced or equally distributed in all directions (in the body it is slightly higher than the waist). ○ An individual’s limits of stability are the points outside the base of support that they can go without losing control of the center of gravity. ○ Base of support: the surface supporting the body and points of contact with that surface (when standing, the position of the feet on the ground). ○ The lower the center of gravity to the base of support, the greater the stability. ○ The nearer the center of gravity to the center of the base of support, the more stable the body. ○ Stability is increased with the number of points of contact (two feet versus one foot). ○ Dynamic activities can also be described as those that cause the center of gravity to move in response to muscular activity. • Weight transfer: weight is moved from one supporting foot or other body part partially or fully to another foot or other body part, such as from the rear leg/foot in a golf backswing to the front left/foot in the downswing/follow through. 	<ul style="list-style-type: none"> • consumption (VO2 max), energy systems (aerobic and anaerobic), heart rate (resting, target, and recovery), caloric cost of activity, muscle contraction, static versus dynamic flexibility, and muscular strength versus muscular endurance (11/12.2.a); • analyze performance to identify physiological and biomechanical deficiencies, including self-evaluation, peer evaluation, and teacher evaluation (11/12.2.b); • explain the rules, safety protocols, relevant markings/lines for the field of play, offensive and defensive tactics, and common penalties and violations for selected activities (11/12.2.c); • design, justify, and evaluate warm-up and cool-down sequences for selected activities (11/12.2.d); • apply the FITT (frequency, intensity, time, and type of exercise) principle to improve skill performance (11/12.2.e); • apply the specificity, overload, and progression (SOP) principle to the design and performance of a physical activity program to achieve physical benefits (11/12.2.f); • analyze feedback about personal

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Speed: rate of motion; the ability to move swiftly. • Timing: the ability to coincide movements in relation to external factors; a combination of decision-making, coordination, and reaction time which gets the player in the right place at the right time (TopEnd Sports and Science). • Accuracy: requires precision of movement with the critical elements of skills, such as follow-through and aim in the desired direction when throwing to a target; affected by the ability to use force as needed for an intended target or outcome. • Force: strength or energy exerted; force causes movement. • Cardiac output: the amount of blood the heart pumps in one minute; dependent upon heart rate, contractility, preload, and afterload (“Understanding Cardiac Output”; doi: 10.1186/cc6975). • Maximal oxygen consumption/uptake (VO₂ max): measurement of the maximum amount of oxygen a person can use during exercise; used to establish aerobic endurance/cardiovascular fitness; the greater the VO₂ max, the more oxygen a person’s body can consume and the more effectively the body can use that oxygen to generate the maximum amount of ATP energy (https://www.healthline.com/health/vo2-max#about-vo%E2%82%82-max). • Two respiration systems are used by the body for energy, and the systems are dependent upon the duration of the activity. <ul style="list-style-type: none"> ○ Anaerobic respiration system (ATP-PC and lactic acid system; works without oxygen; adenosine triphosphate [ATP – energy carrying molecule] and phosphocreatine [PC]) <ul style="list-style-type: none"> ▪ To immediately meet the sudden higher energy demand, stored ATP is the first energy source. This lasts for approximately two seconds. 	<p>performance to improve skills, including self-evaluation, peer evaluation, and teacher evaluation. (11/12.2.g)</p> <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OPEN Online Physical Education Network Health Smart Virginia PE Central Dynamic PE ASAP KidsHealth.org</p>

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ▪ The ATP-PC system can only last eight to 10 seconds before PC stores are depleted. ▪ The lactic acid system (anaerobic glycolysis) must then take over as the predominant source of energy production; high-intensity (but sub-maximal) exercise can last for between three and five minutes using this system. ▪ If the exercise continues at a high intensity, oxygen is not available at a fast enough rate to allow aerobic metabolism to take over. The production of lactic acid will reach the point where it interferes with muscular function; this is called the lactate threshold. ▪ Muscles begin to fatigue when ATP resynthesis can no longer match demand. ○ Aerobic respiration system, aka aerobic glycolysis: breakdown of carbohydrates to produce ATP; slow, uses carbohydrates or fat (carbohydrates and fats are only burned in presence of oxygen); needs oxygen to produce ATP; sustained energy; longer-duration, lower-intensity after anaerobic systems have fatigued; long-term steady paced exercise and day-to-day activities; produces large amounts of energy at the lowest intensity • Heart rate (resting, target, and recovery) <ul style="list-style-type: none"> ○ Resting heart rate: In general, resting heart rate is an indication of efficient heart function and better cardiovascular fitness. A trained athlete may have a resting heart rate closer to 40. It is best taken after 10 minutes of rest. ○ Target heart rates: Active heart rate can be taken at multiple points during an activity and include being taken immediately after stopping the activity. It helps to determine appropriate intensity levels for 	

Essential Understandings	Essential Knowledge and Skills
<p>exercise. By keeping the target heart rate in check, a person can avoid under- or over-training and is able to avoid overexertion. Exercise programs may be characterized by the level of intensity or percentage of maximal heart rate range (maximum heart rate is 220 minus a person’s age). (Target Heart Rate Zone information [https://www.heart.org/en/healthy-living/fitness/fitness-basics/target-heart-rates]) Some drugs and medications or medical conditions may affect heart rate, resulting in having a lower maximum heart rate and target zone. A healthcare provider should be consulted.</p> <ul style="list-style-type: none"> ○ Recovery heart rate: the decrease in heart rate that occurs one minute after maximal exercise. Faster decreases in heart rate are associated with individuals with higher levels of fitness. • Caloric cost of activity: net energy consumed by an activity (various charts available online, such as Harvard Health chart, for calories burned in 30 minutes of different activities for three different body weights). • Types of muscle contractions <ul style="list-style-type: none"> ○ Isometric: the length of the muscle does not change. ○ Isotonic: the length of the muscle does change. ○ Eccentric: an isotonic contraction where the muscle lengthens. ○ Concentric: an isotonic contraction where the muscle shortens. • Muscular stretching: Be sure to raise the body’s internal temperature through light physical activity before engaging in stretching activities. <ul style="list-style-type: none"> ○ Static: slow and constant with end position held; caution is exercised with proper technique. ○ Dynamic: flexibility during sport-specific movements, such as a track sprinter performing long walking strides for a warmup; focus on hip extension. • Muscular strength: maximum force that muscles can exert in a single 	

Essential Understandings	Essential Knowledge and Skills
<p>effort, including getting up out of a chair and lifting /moving heavy objects.</p> <ul style="list-style-type: none"> • Muscular endurance: the ability to sustain or repeat muscular activity over time, including running, biking, and walking. <p>Analyzing performance of self and others can indicate physiological and biomechanical deficiencies. Applying movement principles can aid in the improvement and performance of the chosen activity. (11/12.2.b; refer to 11/12.1.e-f and 11/12.2.a-b)</p> <p>Rules, safety protocols, relevant markings/lines for the field of play, offensive and defensive tactics, and common penalties and violations are dependent upon the selected activities. (11/12.2.c)</p> <p>Proper and comprehensive warm-up and cool-down protocols are essential to short-term exercise performance, as well as long-term injury prevention and general physical health. Warm-ups and cool-downs should include components that are aligned with the physical demands of the selected activity. (11/12.2.d)</p> <ul style="list-style-type: none"> • Warm-up: pumps nutrient-rich, oxygenated blood to muscles as heart rate, breathing, and body temperature increases, preparing the body for activity. • Cool-down: gradually slows breathing and heart rate; gradual recovery of pre-exercise heart rate and blood pressure. <p>FITT principle—frequency, intensity, time, and type of exercise—is a “formula” for planning physical activity/activities (i.e., how often to do the activities, how hard, and for how long to meet goals). (11/12.2.e)</p>	

Essential Understandings	Essential Knowledge and Skills
<p>The principles of specificity, overload, and progression (SOP) are highly interconnected and are reciprocally dependent on each other. (11/12.2.f)</p> <ul style="list-style-type: none"> • Specificity: desired adaption occurs in response to specific stress placed upon the body; exercise/activity needs to match desired outcome. • Overload: stress must be applied beyond that which the body is accustomed to; increase workload (added weight, time, intensity, and/or repetitions). • Progression: once the body has adapted to a level of stress, additional stress is needed; progressively or gradually increase workload. <p>To improve skills, feedback about personal performance is an essential factor affecting motor skill development. Feedback has been defined as an action taken by an agent (e.g., teacher and student) to deliver information about one or more aspects of student performance (“The effects of feedback interventions on performance: A historical review, a meta-analysis, and a preliminary feedback intervention theory,” doi: 10.1037/0033-2909.119.2.254; “The power of feedback,” doi: 10.3102/003465430298487). Use this feedback to guide and improve future performance by looking at the components of that performance and adjusting/modifying as needed. (11/12.2.g)</p>	

Fitness Planning

- 11/12.3 The student will design, implement, and evaluate a personal fitness program for self, a college student, or an employee in a selected field of work.
- a) Assess individual level of health-related fitness using a variety of appropriate measures (e.g., criterion-referenced wellness tests, FitnessGram) and technology (heart-rate monitors, pedometers, accelerometers, and bioelectrical impedance).
 - b) Evaluate and adjust activity levels to meet the Centers for Disease Control and Prevention’s Physical Activity Guidelines for Americans.

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- c) Design and critique a personal fitness program, using available technology (e.g., electronic portfolios, tracking applications) and resources, to improve or maintain personal fitness levels in relation to the five components of fitness.
- d) Explain the physical and mental (emotional, social) benefits of physical fitness for lifelong health and wellness.
- e) Create personal fitness plans for a variety of situations (e.g., injury, aging) based on goals.
- f) Identify and evaluate community resources for selected physical and/or lifetime activities, including recreation centers, local fitness centers, adult leagues, and other fitness clubs/groups.
- g) Identify barriers to physical activity, including those related to time, motivation, or energy, skill confidence, fear of injury, resources, and social influences/peer pressure, and identify strategies to overcome these barriers.
- h) Evaluate and apply scientific evidence to make critical decisions when purchasing fitness products and/or services.

Essential Understandings	Essential Knowledge and Skills
<p>Criterion-referenced wellness tests emphasize a health criterion—health outcomes or health risks; scores/standards set by determining the point or level on which a fitness parameter is associated with an increased risk of a disease outcome or risk factors of disease. (Norm-referenced tests compare students’ performance to peers and emphasize peak performance; dependent on population; https://www.cooperinstitute.org/vault/2440/web/files/785.pdf) (11/12.3.a)</p> <p>Health-related fitness measures using technology may include</p> <ul style="list-style-type: none"> • Heart rate monitors: Two types: wireless chest/arm straps that use an electrical pulse to read heart rate (tend to be more accurate) and wrist-based/headphones trackers that use optical technology (light). Both can send continuous data to a monitor (watch/phone). Other heart rate monitors and technology may be available. • Pedometers: track steps taken by indicating each time the wearer’s hips move. Some models can track foot movement via a GPS tracker or built-in sensors on a phone. • Accelerometers: measure acceleration; able to capture intensity of physical activity; able to distinguish between walking and running; can 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • use criterion-referenced wellness tests and technology to assess their individual level of health-related fitness (11/12.3.a); • evaluate and adjust activity levels (11/12.3.b); • use assessment results to design and critique a personal fitness program (11/12.3.c); • explain the physical and mental (emotional, social) benefits of physical fitness (11/12.3.d); • create fitness plans for a variety of individuals or situations (11/12.3.e); • identify and evaluate community resources for physical activities (11/12.3.f); • identify barriers and strategies to overcome barriers to physical activity (11/12.3.g);

Essential Understandings	Essential Knowledge and Skills
<p>separate human movement from mechanical vibration, such as riding in a car.</p> <ul style="list-style-type: none"> • Bioelectrical impedance analysis: A person places their hands on the electrodes of a device for about 20 seconds. It runs an imperceptible level of electrical current through the body. The flow of the current is affected by the amount of water in the body. The device measures how this signal is impeded through different types of tissue. Tissues that contain large amounts of fluid and electrolytes, such as blood, have high conductivity, but fat and bone slow the signal down. Because BIA determines the resistance to flow of the current as it passes through the body, it provides estimates of body water from which body fat is calculated using selected equations. <p>Physical activity guidelines – 60 minutes per day; weekly: 150 minutes of moderate-intensity aerobic activity, 75 minutes of vigorous-intensity aerobic activity, or an equivalent mix of the two each week. (CDC) (11/12.3.b)</p> <p>Health-related fitness components provide information about a person’s overall physical health. (11/12.3.c)</p> <ul style="list-style-type: none"> • Health-related fitness components include cardiorespiratory endurance, flexibility, muscular strength and endurance, and body composition. • Personal fitness planning includes <ul style="list-style-type: none"> ○ assessing and analyzing personal fitness levels ○ setting SMART goals for improvement and/or maintenance ○ creating strategies to achieve goals and monitor progress <ul style="list-style-type: none"> ▪ applying FITT and SOP principles ○ making timelines to achieve goals ○ plan for reassessing, evaluating, and reflecting on progress of goals 	<ul style="list-style-type: none"> • evaluate and apply scientific evidence to make critical decisions when purchasing fitness products and/or services. (11/12.3.h) <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes KidsHealth.gov Health Smart Virginia MyPlate.gov OpenPhyseed Physical Activity Guidelines for Americans, 2nd ed. Healthy Children.org</p>

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ revising plan strategies as needed. <p>Regular exercise helps control blood pressure, body weight, and cholesterol levels; decreases the risk for hardening of the arteries, heart attack, stroke, arthritis, and diabetes; improves digestion, helps to manage stress, aids in better sleep and is good for managing low-back pain. Anyone can be at risk for chronic disease; however, some people are more at risk due to heredity (received from a parent or ancestor by genetic transmission) or because a condition is familial (tending to occur in more members of a family than expected by chance alone). (11/12.3.d)</p> <p>Social and emotional benefits/supports of participation in physical activities may include: (11/12.3.d)</p> <ul style="list-style-type: none"> • Improved mental health and mood. • Reduced risk of depression and anxiety. • Development of higher self-esteem and body image. • Development of basic motor skills needed for day-to-day life. • Effective promotion of mutual understanding and empathy. • Development of character; social skills like teamwork, cooperation, and leadership. • An ability to win and lose while being a good sport. • Development of resiliency. <p>Fitness plans should be based on individual goals and desired outcomes with planning for appropriate activities and strategies to address potential barriers to success. Plans should include pre- and post-assessment opportunities. (11/12.3.e)</p> <p>Community resources for physical activities may include recreation centers, park</p>	

Essential Understandings	Essential Knowledge and Skills
<p>and recreation agencies, fitness centers, adult leagues, online communities, and other fitness clubs/groups. These resources can be evaluated on the quantity and quality of services provided as well as equitable access and mechanisms to ensure safety for community members. (11/12.3.f)</p> <p>Successful planning for lifelong physical activity includes identifying barriers and developing strategies to overcome barriers, such as time (using time management skills, sticking to a routine), motivation (having goals, having an exercise partner), energy (making appropriate nutrition choices), skill confidence (time for practice, access to a trainer/coach), fear of injury (using appropriate equipment, addressing safety, staying fit), resources (planning in advance, being innovative), and social influences/peer pressure (being goal oriented, perseverance, planning time). (11/12.3.g)</p> <p>Becoming an informed consumer of fitness products and services is essential for health and safety in a market where there are many fitness claims available to consumers. Fitness products can include equipment, technology, performance clothing, consumables, supplements, or creams. Fitness services can include personal trainers, diet plans, classes, gym memberships etc. Informed fitness consumers should consider the following:</p> <ul style="list-style-type: none"> • Personal goals: level of commitment • Lifestyle habits: time and space • Advertising claims and discrepancies • Alignment between fitness product and personal goals • Financial costs and effects 	

Social and Emotional Development

- 11/12.4 The student will evaluate and implement a safe environment for skill practice and play and demonstrate social competency skills for lifetime activity participation.
- a) Evaluate, create, and implement a growth mindset plan for increasing self-efficacy.
 - b) Demonstrate appropriate etiquette as a participant and spectator in physical activity/sport.
 - c) Demonstrate proper care of athletic/activity equipment.
 - d) Demonstrate safe behavior when participating in or watching physical activity/sport.
 - e) Explain and demonstrate leadership skills of critical thinking, creative thinking, communication, collaboration, and citizenship skills.
 - f) Demonstrate the ability to work cooperatively to accomplish a group goal.
 - g) Advocate for a rule change or modification in a sport or activity to facilitate safety or the inclusion of individuals from the point of view of an athlete, coach, parent, or referee.
 - h) Demonstrate respect for differences among people in physical activity settings.
 - i) Develop and demonstrate strategies for inclusion of persons of diverse backgrounds and identify personal, cultural, and linguistic assets in setting collective goals.
 - j) Identify ways that physical activities can provide positive social interaction, such as the benefits of team involvement and an individual’s role as a positive member of a group.
 - k) Create and implement a strategy to promote peer involvement in physical activity, such as a social-networking campaign or a video.
 - l) Describe and demonstrate behaviors that support an inclusive environment, where a sense of belonging, acceptance, and value is available to all students.

Essential Understandings	Essential Knowledge and Skills
<p>Growth mindset is the underlying belief you have about learning and intelligence. If you believe you can get smarter, more effort is put into achievement. To improve, use prompts such as, “I can learn to do anything I want...,” “Challenges help me to grow,” and “My effort and my attitude determine my abilities.” (11/12.4.a)</p>	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • evaluate, create, and implement a growth mindset plan for increasing self-efficacy (11/12.4.a); • demonstrate appropriate etiquette

Essential Understandings	Essential Knowledge and Skills
<p>Etiquette refers to unwritten rules or customs and requires key virtues such as respect, responsibility, integrity, and fairness (e.g., shaking hands/giving high fives/congratulating the other team at the end of a game, speaking respectfully as a spectator). (11/12.4.b)</p> <p>Proper care of athletic/activity equipment should include appropriate use and cleaning per manufacturers’ instructions. (11/12.4.c)</p> <p>Safe behavior when participating in or watching physical activity/sport helps to ensure the safety of everyone. (11/12.4.d)</p> <p>Leadership skills include:</p> <ul style="list-style-type: none"> • Problem-solving skills <ul style="list-style-type: none"> ○ Identify the problem. ○ Analyze the problem. ○ Generate potential solutions. ○ Select and plan the solution. ○ Implement the solution. • Communication skills/strategies <ul style="list-style-type: none"> ○ Verbal: sharing of information/relaying a message between two or more people that uses sounds, signs and/or language; oral or written; spoken word; face-to-face or electronically. ○ Nonverbal: sending and receiving wordless messages; body movements/body language, such as facial expressions, body posture, gestures, eye contact, way, tone of voice, and touch. ○ Visual: visual aids, such as signs, graphics, drawings, design, color, graphs, and charts. ○ Active listening– pay attention to the speaker, avoid being distracted; 	<p>(11/12.4.b);</p> <ul style="list-style-type: none"> • demonstrate proper care of athletic/activity equipment (11/12.4.c); • demonstrate safe behavior when participating in or watching physical activity/sport (11/12.4.d); • explain and demonstrate leadership skills (11/12.4.e); • demonstrate the ability to work cooperatively to accomplish a group goal (11/12.4.f); • advocate for a rule change or modification in a sport or activity (11/12.4.g); • demonstrate respect for differences among people (11/12.4.h); • develop and demonstrate strategies for inclusion of persons of diverse backgrounds and abilities and identify individual assets in setting collective goals (11/12.4.i); • identify ways that physical activities can provide positive social interaction (11/12.4.j); • create and implement a strategy to promote peer involvement in physical activity (11/12.4.k); • describe and demonstrate behaviors that

Essential Understandings	Essential Knowledge and Skills
<p>show you are listening, smile, nod; provide feedback – restate what you heard, ask questions; defer judgment – don’t interrupt; respond with respect.</p> <ul style="list-style-type: none"> • Conflict resolution skills <ul style="list-style-type: none"> ○ Discuss problem without blame. ○ Active listening. ○ Identify and clarify issues and needs. ○ Brainstorm solutions. ○ Choose and apply a solution. ○ Evaluate the solution. • Cooperation skills <ul style="list-style-type: none"> ○ Following rules ○ Encouraging others ○ Complimenting others ○ Controlling temper ○ Wanting everyone to play well and succeed ○ Working together toward a common goal ○ Helping classmates/teammates ○ Playing under control ○ Sharing ○ Showing concern for teammates/classmates’ feelings (11/12.4.f) <p>Inclusion: the action or state of including or of being included within a group or structure. Advocating for modifications or rule adjustments can be incorporated into physical activity opportunities. (11/12.4.g)</p> <p>Ways to respect people who are different from us:</p> <ul style="list-style-type: none"> • Try to learn something from the other person. 	<p>support an inclusive environment. (11/12.4.l)</p> <p>Additional resources: OPEN Online Physical Education Network Health Smart Virginia PE Central EverFi KidsHealth.org</p>

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Show interest and appreciation for other people’s cultures and backgrounds. • Don’t insult people, tease them, or make fun of them. • Listen to others when they speak. • Be considerate of people’s likes and dislikes. • Don’t talk about people behind their backs. • Be sensitive to other people’s feelings. <p>(Adapted from Elkind+Sweet Communications/Live Wire Media) (11/12.4.h)</p> <p>Creating an inclusive culture for physical education and physical activity helps every student learn to lead a healthy and active lifestyle (CDC). Strategies for inclusion may include modifying/adapting the equipment, rules, environment, or activity; creating a welcoming/inclusive environment, one that supports and uplifts everyone; and providing meaningful learning and participatory experiences. (11/12.4.i)</p> <p>Physical activities can provide positive social interaction by meeting new people, engaging in similar interests with others, and experiencing teamwork and cooperation. Team involvement helps to develop self-esteem, self-confidence, competence, caring, character, connections, and skills including communication and relationship building. (11/12.4.j)</p> <p>Strategies to promote peer involvement in physical activity may include low-/no-cost activities, where to access activities, providing competitive and non-competitive activities, and differentiating activities for a variety of abilities. (11/12.4.k)</p>	

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A supportive, inclusive environment includes access to learning and the curriculum with the best approach to ensure learning physically, socially, and emotionally. This could include speed of play, differentiated instruction, autonomy-supported instruction, demonstrations, use of tools/modified equipment, peer-partner opportunities, etc. (11/12.4.1)	

Energy Balance

- 11/12.5 The student will explain the importance of energy balance and demonstrate understanding of the nutritional needs of the body to maintain optimal health and prevent chronic disease for a lifetime.
- a) Analyze the relationships among physical activity, nutrition, body composition, and sleep that are optimal for personal health and/or for participation in a self-selected physical activity.
 - b) Analyze current and future nutritional and physical activity needs in relation to changes in growth/aging.
 - c) Explain the benefits of nutrient-dense, low-sodium foods versus high-calorie, empty calorie, and high-sodium foods.
 - d) Analyze current and future sleep needs for positively influencing academic, career success, and mental health.
 - e) Apply rate of perceived exertion and pacing to a conditioning plan that meets the needs of a self-selected physical activity.
 - f) Explain energy balance in terms of caloric intake and expenditure in relation to changing lifestyle needs from adolescence to adulthood.
 - g) Compare caloric expenditure while sitting and standing.

Essential Understandings	Essential Knowledge and Skills
<p>Each person may have different needs for calories and exercise. A healthy lifestyle requires balancing the foods you eat, beverages you drink, adequate sleep, stress management, and the amount of activity in your daily routine. (CDC) (11/12.5.a)</p> <ul style="list-style-type: none"> • Regular exercise helps control blood pressure, body weight, and cholesterol levels; decreases the risk for hardening of the arteries, heart attack, stroke, arthritis, and diabetes; improves digestion, helps to manage stress, aids in better sleep, and is good for managing low-back pain. • A healthy eating plan emphasizes fruits, vegetables, whole grains, and fat-free or low-fat milk and milk products; includes lean meats, poultry, fish, beans, eggs, and nuts; is low in saturated fats, trans fats, cholesterol, salt (sodium), and added sugars; and stays within daily calorie needs. • Body composition: A high amount of body fat can lead to weight-related diseases and other health issues. Being underweight is also a health risk. • Sleep is a powerful regulator of appetite, energy use, and weight control. 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • analyze the relationships among physical activity, nutrition, body composition, and sleep (11/12.5.a); • analyze current and future nutritional and physical activity needs in relation to changes in growth/aging (11/12.5.b); • explain the benefits of nutrient-dense, low-sodium foods versus high-calorie, empty calorie, and high-sodium foods (11/12.5.c); • analyze current and future sleep needs (11/12.5.d); • apply rate of perceived exertion and pacing to a conditioning plan (11/12.5.e);

Essential Understandings	Essential Knowledge and Skills
<p>Sleep deprivation can inhibit one’s ability to lose weight even while exercising and eating well.</p> <p>Physical activity guidelines (https://health.gov/our-work/physical-activity/current-guidelines) (11/12.5.b)</p> <ul style="list-style-type: none"> • Ages 6-17: moderate- and vigorous-intensity physical activity for periods of time that add up to 60 minutes (one hour) or more each day. This activity should include aerobic activity as well as age-appropriate muscle- and bone-strengthening activities. • Adults: 150-300 minutes of moderate-intensity aerobic physical activity each week; muscle-strengthening activities also provide health benefits and are an important part of an adult’s overall physical activity plan. <p>Expenditure and intake needs vary with age and physical activity levels. Refer to Dietary Guidelines for Americans (https://www.dietaryguidelines.gov/) for adolescent and adult guidelines for caloric expenditure and intake. Also see the DRI Calculator for Healthcare Professionals tool that calculates daily nutrient recommendations based on the Dietary Reference Intakes (DRIs) established by the Health and Medicine Division of the National Academies of Sciences, Engineering, and Medicine. The data represents the most current scientific knowledge on nutrient needs; however, individual requirements may be higher or lower than DRI recommendations (https://www.nal.usda.gov/fnic/dri-calculator/index.php). (11/12.5.b)</p> <p>Nutrient-dense foods are high in nutrients but relatively low in calories. (11/12.5.c)</p> <ul style="list-style-type: none"> • Nutrient-dense foods contain vitamins, minerals, complex carbohydrates, lean protein, and healthy fats. 	<ul style="list-style-type: none"> • explain energy balance in relation to changing lifestyle needs from adolescence to adulthood (11/12.5.f); • compare caloric expenditure while sitting and standing. (11/12.5.g) <p>Additional resources: OpenPhySED Health Smart Virginia PE Central KidsHealth.gov MyPlate.gov Physical Activity Guidelines for Americans, 2nd ed. American Heart Association</p>

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Examples of nutrient-dense foods include fruits and vegetables, whole grains, low-fat or fat-free milk products, seafood, lean meats, eggs, peas, beans, and nuts. • Vegetables, fruits, and grains offer important vitamins and minerals to keep the body healthy. Most of these foods have little fat. They also have no cholesterol. • Fruits, vegetables, and grains are also a source of fiber, and eating more fiber may lower cholesterol and blood sugar. <p>Guidelines for sleep: Teens 13-18 should get eight to 10 hours per 24 hours of sleep; adults 18-60 should get seven or more hours per night. (CDC) (11/12.5.d)</p> <ul style="list-style-type: none"> • Stimulants like coffee and energy drinks, alarm clocks, and external lights (including those from electronic devices) interfere with our “circadian rhythm,” or natural sleep/wake cycle. • A good night’s sleep improves learning. Sleep is involved in healing and repair of heart and blood vessels. Adequate sleep reduces heart rate and blood pressure and helps a person function productively/safely throughout the day. People who are sleep deficient are less productive at work/school. They take longer to finish tasks, have a slower reaction time and make more mistakes. Consult a primary care physician or a sleep professional to determine the underlying cause if experiencing symptoms such as sleepiness during the day or when you expect to be awake and alert, snoring, leg cramps or tingling, gasping or difficulty breathing during sleep, prolonged insomnia, or another symptom that is preventing you from sleeping well. <p>Pacing is needed to avoid fatigue before the end of an activity (e.g., jogging three miles); strategy by which effort is managed during exercise based on a goal and</p>	

Essential Understandings	Essential Knowledge and Skills
<p>demands of the task; time per distance. Pacing strategies may include time, heart rate, and level of intensity/using a RPE scale. (11/12.5.e)</p> <ul style="list-style-type: none"> • Perceived exertion is how hard a person feels like their body is working. Rate of perceived exertion (RPE) is a way of measuring physical activity intensity level. Scales may range from five to 20 levels. Example (variation of Borg scale): <ul style="list-style-type: none"> ○ Level 1 – Very light activity (seated) ○ Level 2 – Light activity (can maintain for hours, easy to breathe, walking) ○ Level 3 – Moderate activity (breathing heavily, somewhat comfortable; skipping, galloping) ○ Level 4 – Vigorous activity (borderline uncomfortable, short of breath; jogging/running) ○ Level 5 – Very hard activity (difficult to maintain exercise intensity, barely breathe, running/sprinting) ○ Level 6 – Max effort activity (almost impossible to keep going, out of breath, sprinting) <p>Energy expenditure is the sum of the basal metabolic rate (BMR, the amount of energy expended while at complete rest), the thermic effect of food (TEF, the energy required to digest and absorb food), and the energy expended in physical activity. (11/12.5.f-g)</p> <ul style="list-style-type: none"> • Energy is needed to keep the heart beating and organs functioning, maintenance of body temperature, muscle contraction, and growth. • An average adult will use around 1.1 calories (kcal) each minute just maintaining these functions. • BMR differs from one person to the next, both within a population and between population groups. 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ Infants and young children tend to have a proportionately high BMR for their size due to their rapid growth and development. ○ Men usually have a higher BMR than women because they tend to have more muscle. ○ Older adults usually have a lower BMR than younger people because their muscle mass tends to decrease with age. <ul style="list-style-type: none"> • The BMR accounts on average for about three-quarters of an individual’s energy needs. See 11/12.5.c. <p>While staying active is the best way to burn calories, you may be able to improve your health by simply spending more time standing than sitting each day. (11/12.5.g)</p> <ul style="list-style-type: none"> • Standing burns more calories than sitting (“What to Know About Standing to Burn Calories.” • Standing has less possible health risks compared to sitting all day each day. • While this may not help you lose a significant amount of weight, it can certainly help you maintain your current weight and reduce certain health risks. 	

PERSONAL FITNESS I/II (ELECTIVE)

Personal Fitness is an elective physical education course that focuses on fitness, strength training, physical conditioning, and lifetime health concepts, activities and knowledge to promote health and wellness. This course is structured to develop individualized knowledge of weight training and physical conditioning for the beginning student and the advanced student. The course requires mastery of training principles and a thorough understanding of fitness center safety rules prior to participation in weight room laboratory experiences. The course content is presented so that teachers may select strategies and instructional techniques designed to improve muscular strength and endurance, flexibility, and cardiorespiratory endurance. Students will gain the necessary information and skills to plan and implement a personal fitness and conditioning program that includes skill- and health-related fitness components to achieve and maintain a health-enhancing level of physical fitness for a lifetime. Various training models will be presented that allow for flexibility of instruction among diverse student needs. Students will continue to implement and modify personal fitness and conditioning programs.

Motor Skill Development

- PF.1 The student will demonstrate mastery of movement skills and patterns used to perform a strength training, physical conditioning, and fitness-based activities.
- Demonstrate proficiency in personal fitness-related skills (strength training, physical conditioning, and fitness activities) through the execution of appropriate basic and advanced skills, use of knowledge related to an activity to enhance performance, development of motor skills for a high level of participation, consistent and correct performance of skills, understanding motor cues, appropriate spotting techniques, how to correct performance problems, displaying effort to learn and apply new skills, participating confidently with peers, applying skills to the development of a personal fitness program, possessing necessary physical fitness for moderate to vigorous participation, and correct selection of appropriate exercises based on personal goals and ability.
 - Explain the importance of and demonstrate proficiency in activities that contribute to improvement of each component of health-related and skill-related fitness.
 - Explain the relationship between health-related fitness activities and health problems, such as cardiovascular disease, obesity, and joint pain.
 - Demonstrate activities that contribute to the improvement of each component of skill-related fitness.

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- e) Demonstrate correct techniques, form, and exercise procedures when performing strength training, physical conditioning, and fitness activities and exercises.
- f) Describe and demonstrate assessment activities that contribute to the development and improvement of health- and skill-related fitness components and personal fitness goals.
- g) Apply movement principles and concepts to skill performance of strength training, physical conditioning, and fitness activities.

Essential Understandings	Essential Knowledge and Skills
<p>Proficiency includes consistent, correct performance of all critical elements and safety practices for skills and activities. (PF.1.a)</p> <ul style="list-style-type: none"> • Strength training activity skills may include: <ul style="list-style-type: none"> ○ Free weight activities ○ Olympic lifts ○ Dumbbell/kettlebell activities ○ Manual resistance activities ○ Resistance band activities ○ Resistance machines • Physical conditioning and fitness activities may include: <ul style="list-style-type: none"> ○ Speed and agility activities ○ Endurance activities ○ Flexibility activities ○ Plyometric activities • Activities to apply knowledge of strength training, physical conditioning and fitness activities may be self-selected (i.e., individual, dual, team activities) <p>Health-related and skill-related fitness components provide information about and contribute to a person’s overall physical health. (PF.1.b)</p> <ul style="list-style-type: none"> • Health-related fitness components may include cardiorespiratory 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • demonstrate proficiency in strength training, physical conditioning, and fitness activities (PF.1.a) <ul style="list-style-type: none"> ○ analysis and performance of basic and advanced skills in strength training, personal conditioning, and fitness activities, including component skills and movement patterns applicable to skill performance ○ performance of spotting techniques ○ for a selected activity, evaluate skill performance, correct performance problems, select appropriate exercises to improve performance ○ demonstrate confident participation with peers; • explain the importance of and demonstrate proficiency in activities for each component of health-related and skill-related fitness

Essential Understandings	Essential Knowledge and Skills
<p>endurance, flexibility, muscular strength and endurance, and body composition.</p> <ul style="list-style-type: none"> • Skill-related fitness components include <ul style="list-style-type: none"> ○ Agility: the ability to move with quick, easy grace; quick change of direction ○ Balance: stability produced by even distribution of weight; muscles tense to keep the body in a balanced position ○ Coordination: harmonious functioning of parts for effective results; it takes eye-hand coordination to strike an object ○ Power: physical might; the ability to act or produce an effect; kicking a ball for distance ○ Reaction time: the time required for a subject to initiate a prearranged response to a defined stimulus; time between hearing a whistle and starting to run or time between seeing a ball being thrown to a place out of reach and moving to catch it ○ Speed: the rate of motion; ability to move swiftly <p>According to the Centers for Disease Control and Prevention (CDC), physical activity is one of the best things people can do to improve their health. It is vital for healthy aging and can reduce the burden of chronic diseases and prevent early death. Active people generally live longer and are at less risk for serious health problems like heart disease, type 2 diabetes, obesity, and some cancers. For people with chronic diseases, physical activity can help manage these conditions and complications. (PF.1.c)</p> <p>Improving each component of skill-related fitness may include (PF.1.d)</p> <ul style="list-style-type: none"> • Speed and agility activities • Endurance activities 	<p>(PF.1.b);</p> <ul style="list-style-type: none"> • explain the relationship between health-related fitness activities and health problems (PF.1.c); • demonstrate activities that contribute to improvement of each component of skill-related fitness (PF.1.d); • demonstrate correct techniques, form, and exercise procedures when performing strength training, physical conditioning, and fitness activities and exercises (PF.1.e); • describe and demonstrate assessment activities that contribute to the development and improvement of health- and skill-related fitness components and personal fitness goals (PF.1.f); • apply movement principles and concepts to skill performance of strength training, physical conditioning, and fitness activities. (PF.1.g) <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OpenPhySED Health Smart Virginia PE Central Dynamic PE ASAP</p>

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Flexibility activities • Plyometric activities • Reaction time activities. <p>Proficiency includes consistent, correct performance of all critical elements and safety practices (including spotting techniques) for skills and activities. (PF.1.e)</p> <ul style="list-style-type: none"> • Strength training activity skills may include: <ul style="list-style-type: none"> ○ Free weight activities ○ Olympic lifts ○ Dumbbell/kettlebell activities ○ Manual resistance activities ○ Resistance band activities ○ Resistance machines • Physical conditioning and fitness activities may include: <ul style="list-style-type: none"> ○ Speed and agility activities ○ Endurance activities ○ Flexibility activities ○ Plyometric activities • Component skills and movement patterns may include: <ul style="list-style-type: none"> ○ Squat ○ Lunge ○ Push ○ Pull ○ Bend ○ Twist <p>Assessments for personal fitness and health- and skill-related fitness components should be criterion-referenced, medically supported assessments. (PF.1.f)</p>	<p>CDC</p>

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Assessments may include <ul style="list-style-type: none"> ○ Cooper Institute (FitnessGram) ○ ACE Group Fitness Instructor Fitness Assessment Protocols ○ Mayo Clinic <p>Movement principles may include hinge, plank, push, pull, squat, lunge, and rotation. These movements—either alone or in combination—are the basis of all movement. Movement principles may also include balance, stability, force, and form. (PF.1.g)</p> <p>Movement concepts may include body awareness, spatial awareness, effort awareness, and relationship to/with objects, people and space or locomotor, non-manipulative, and manipulative skills. (PF.1.g)</p>	

Anatomical Basis of Movement

PF.2 The student will describe major body systems and explain the effects of physical activity on the systems.

- a) Describe the muscular system, including identification of the major muscles/muscle groups of the body and their function.
- b) Describe exercises/activities that increase the strength and flexibility of the muscular system.
- c) Describe the cardiovascular system, including identification of organs and their functions.
- d) Explain the effects of physical activity and training on the muscular and cardiovascular systems.

Essential Understandings	Essential Knowledge and Skills
<p>The muscular system is made up of cardiac (heartbeat), smooth (circulation, digestion, breathing), and skeletal (mobility, stability, posture) muscle. Smooth and cardiac muscles are involuntary, and skeletal muscles are voluntary (can consciously control) (“9 Functions of the Muscular System,” Healthline). There are 600 muscles in the body. Skeletal muscle major groups include (PF.2.a):</p> <ul style="list-style-type: none"> • Back: erector spinae, latissimus dorsi • Chest: pectoralis major, teres major, diaphragm • Arms and shoulders: biceps brachii, triceps brachii, trapezius, rhomboideus major and minor, pectoralis minor, pectoralis major, deltoid, rotator cuff muscles (subscapularis, supraspinatus, infraspinatus and teres minor) • Abdominals: rectus abdominis, external oblique, internal oblique, transversus abdominus • Legs: quadriceps (rectus femoris, vastus lateralis, vastus medialis, vastus intermedius), hamstrings (long head of the biceps femoris, short head of the biceps femoris, semitendinosus, and semimembranosus), gastrocnemius, tibialis anterior, soleus • Buttocks: gluteus maximus, medius, and minimus <p>Exercises/activities that increase the strength and flexibility of the muscular system may include cycling, running, dance, push-ups, curl-ups, planks, squats,</p>	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • identify the major muscles/muscle groups of the body and their function (PF.2.a); • describe exercises/activities that increase the strength and flexibility of the muscular system (PF.2.b); • identify the organs of the cardiovascular system and their functions (PF.2.c); • explain the effects of physical activity and training on the muscular and cardiovascular systems. (PF.2.d) <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OPEN Online Physical Education Network Health Smart Virginia PE Central Dynamic PE ASAP KidsHealth.org</p>

Essential Understandings	Essential Knowledge and Skills
<p>lunges, lifting weights, kettlebells, resistance bands, yoga, and Pilates. (PF.2.b)</p> <p>The cardiovascular system is sometimes called the blood-vascular, or the circulatory, system. It consists of the heart, which is a muscular pumping device, and a closed system of vessels called arteries, veins, and capillaries. Blood contained in the circulatory system is pumped by the heart around a closed circle or circuit of vessels as it passes again and again through the various “circulations” of the body. Blood carries oxygen and nutrients the organs need to work properly; and blood also carries carbon dioxide to the lungs so that it can be released out of the body through exhaling. (NIH National Heart, Lung, and Blood Institute) (PF.2.c)</p> <ul style="list-style-type: none"> • The heart is located in the center of the chest, near the lungs. It has four hollow heart chambers surrounded by muscle and other heart tissue. Four chambers include <ul style="list-style-type: none"> ○ Right and left atrium at the top ○ Right and left ventricle on the bottom that pump blood out of the heart • The chambers are separated by heart valves, which make sure that the blood keeps flowing in the right direction. Valves allow blood to flow out of a chamber and close to allow the chamber to refill with blood. Valves include: <ul style="list-style-type: none"> ○ Tricuspid valve, which separates right atrium and right ventricle. It acts like a door between the atrium and ventricle to prevent blood from flowing backward into the atrium. ○ Pulmonary valve, which separates the right ventricle and pulmonary artery. The pulmonary artery carries blood to the lungs to drop off carbon dioxide and pick up oxygen. ○ Aortic valve, which separates the aorta from the left ventricle, where blood is carried to the lungs to drop off carbon dioxide and pick up 	

Essential Understandings	Essential Knowledge and Skills
<p>oxygen.</p> <ul style="list-style-type: none"> o Mitral valve, which separates the left atrium and left ventricle and acts like a door between the atrium and ventricle to prevent blood from flowing backward into the atrium. • Adding oxygen to blood <ul style="list-style-type: none"> o Oxygen-poor blood from the body enters the heart through two large veins called the superior vena cava and the inferior vena cava. The blood enters the heart’s right atrium and is pumped to the right ventricle, which pumps the blood to the lungs. o The pulmonary artery then carries the oxygen-poor blood from the heart to the lungs. The lungs add oxygen to the blood. The oxygen-rich blood returns to the heart through the pulmonary veins. o Oxygen-rich blood from the lungs then enters the left atrium and is pumped to the left ventricle. The left ventricle generates the high pressure needed to pump the blood to the whole body through blood vessels. o When blood leaves the heart to go to the rest of the body, it travels through a large artery called the aorta. • The heart is a muscle that needs blood to get oxygen and nutrients. Coronary arteries branch off from the aorta so that oxygen-rich blood is delivered to the heart as well as the rest of the body. • Interruptions, blockages, or diseases that affect how the heart or blood vessels pump blood can cause complications such as heart disease or stroke. <p>Physical activity and training affect the muscular system. (PF.2.d)</p> <ul style="list-style-type: none"> • Aerobic exercise mainly uses slow-twitch muscles, and the availability of oxygen prevents the buildup of lactic acid. This typically does not result 	

Essential Understandings	Essential Knowledge and Skills
<p>in substantial muscle fatigue in the short term.</p> <ul style="list-style-type: none"> • Anaerobic exercise mainly uses fast-twitch muscle fibers, and in the short term, muscle can become fatigued and sore because of impaired blood flow, ion imbalance within the muscle, nervous fatigue, loss of desire to continue exercising, and, most importantly, the accumulation of lactic acid in the muscle. Muscle soreness, once thought to be due to lactic acid accumulation, has more recently been attributed to small tearing of the muscle fibers caused by eccentric contraction. (https://courses.lumenlearning.com/fitness/chapter/effect-of-exercise-on-muscles/) • Long-term effects of physical activity on the muscular system includes building and strengthening muscles, which can protect the bones from injury, and supporting and protecting joints affected by arthritis. Strong muscles also give stability and improve balance and coordination. Exercise improves blood supply to the muscles and increases their capacity to use oxygen. <p>Effects of physical activity on the cardiovascular system (“Exercise and the Heart,” Johns Hopkins). (PF.2.d)</p> <ul style="list-style-type: none"> • Improves muscles’ ability to pull oxygen out of the blood, reducing the need for the heart to pump more blood to the muscles • Reduces stress hormones that can put an extra burden on the heart • Works like a beta blocker to slow the heart rate and lower blood pressure • Increases high-density lipoprotein (HDL), or “good,” cholesterol and helps control triglycerides • Lowers blood pressure • Lessens risk of developing diabetes • Maintains healthy body weight 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none">• Reduces inflammation throughout the body.	

Fitness Planning

PF.3 The student will create a personal fitness and conditioning program for skill- and health-related components of fitness.

- a) Design, monitor, assess, and modify a personal fitness and physical conditioning program that includes skill- and health-related fitness components to achieve and maintain a health-enhancing level of physical fitness for a lifetime.
- b) Apply principles of training (specificity, individualization, progressive overload and variation) for planning and modifying levels of physical activity in personal fitness and physical conditioning plans.
- c) Evaluate strength-training programs and design a personal strength-training program.
- d) Analyze different activities and sports for their contributions to the development of specific health- and skill-related fitness components.
- e) Use technology to assess, improve, and maintain personal health- and skill-related fitness levels.
- f) Evaluate fitness and physical conditioning programs, products, and services to become an informed consumer.
- g) Compare and evaluate competing arguments related to fitness products and services.

Essential Understandings	Essential Knowledge and Skills
<p>For skill- and health-related fitness components, see PF.1.b. (PF.3.a)</p> <p>Personal fitness/physical conditioning planning should include (PF.3.a)</p> <ul style="list-style-type: none"> • assessing and analyzing personal fitness levels • setting SMART goals for improvement and/or maintenance • creating strategies to achieve goals and monitor progress <ul style="list-style-type: none"> ○ applying FITT and SOP to plan • making timelines to achieve goals • creating a plan for reassessing, evaluating, and reflecting on progress of goals • revising plan strategies as needed. <p>The principles of specificity, overload, and progression (SOP) are highly interconnected and are reciprocally dependent on one another. (PF.3.b)</p> <ul style="list-style-type: none"> • Specificity: Desired adaption occurs in response to specific stress placed 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • plan (assess, set goals, action steps), implement, and monitor (modify as needed) a personal fitness and physical conditioning program that includes health- and skill-related components (PF.3.a); • apply principles of training for personal fitness and physical conditioning plans (PF.3.b); • evaluate strength-training programs (PF.3.c); • design a personal strength training program (PF.3.c); • analyze how different activities/sports

Essential Understandings	Essential Knowledge and Skills
<p>upon the body; exercise/activity needs to match desired outcome.</p> <ul style="list-style-type: none"> • Individualization: Training should be adjusted according to each individual’s characteristics and needs, such as age, gender, body composition, training age, injury history, what a person is training for, what goals does the person have. • Progressive overload: Stress must be applied beyond that which the body is accustomed to; gradually increase the weight, frequency, or number of repetitions in your strength training routine. • Progression: Once the body has adapted to a level of stress, additional stress is needed; progressively or gradually increase workload. • Variation: the manipulation of various training variables (i.e., adding variety or a different training stimulus); change an exercise (or use a derivative of an existing exercise); manipulate load and volume (reps, sets); ROM; and speed of movement <p>Evaluate strength-training programs and design a personal strength training program.</p> <ul style="list-style-type: none"> • Strength training programs may include (PF.3.c): <ul style="list-style-type: none"> ○ Free weight activities ○ Olympic lifts ○ Dumbbell/kettlebell activities ○ Manual resistance activities ○ Resistance band activities ○ Resistance machines <p>Sport analysis example (tennis) (PF.3.d):</p> <ul style="list-style-type: none"> • Health-related fitness components <ul style="list-style-type: none"> ○ Cardiorespiratory endurance: continuous sprinting/movement 	<p>develop health- and skill-related fitness components (PF.3.d);</p> <ul style="list-style-type: none"> • use technology to assess, improve, and maintain personal health- and skill-related fitness levels (PF.3.e); • evaluate fitness and physical conditioning programs, products, and services (PF.3.f); • research and evaluate claims and outcomes for fitness products and services. (PF.3.g) <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes KidsHealth.gov Health Smart Virginia MyPlate.gov OpenPhyzed Physical Activity Guidelines for Americans, 2nd ed. Healthy Children.org</p>

Essential Understandings	Essential Knowledge and Skills
<p>throughout games, sets</p> <ul style="list-style-type: none"> ○ Muscular strength and endurance: force needed for serves and strokes; strength/endurance for continuous sprinting/movement throughout games and sets, stability for continuous changing body positions ○ Flexibility: for the different strokes, change of direction, change of speed, reach, changing body positions ○ Body composition: overall demands of aerobic and anaerobic needs, continuous movements, changes in direction, changes in body position <ul style="list-style-type: none"> • Skill-related fitness components <ul style="list-style-type: none"> ○ Agility: moving quickly; quick changes of direction ○ Balance: stability for all body positions, for strokes and movements ○ Coordination: eye-hand coordination to strike an object; changing movements and body positions ○ Power: hitting a ball for speed, distance, placement; power needed by legs for quick movements ○ Reaction time: the time between seeing a ball being hit by an opponent and moving to a position to strike/return the ball ○ Speed: change of directions and movements <p>Technology may include: (PF.3.e)</p> <ul style="list-style-type: none"> • Heart rate monitors: Two types: wireless chest/arm straps that use an electrical pulse to read heart rate (tend to be more accurate) and wrist-based/head phones trackers that use optical technology (light). Both can send continuous data to a monitor (watch/phone). Other heart rate monitors and technology may be available. • Pedometers: track steps taken by indicating each time the wearer’s hips move; some models can track foot movement via a GPS tracker or built-in sensors on your phone. 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Accelerometers: measure acceleration; able to capture intensity of physical activity; able to distinguish between walking and running; can separate human movement from mechanical vibration, such as riding in a car. • Bioelectrical impedance analysis: A person places hands on a device for about 20 seconds that runs a small current of electricity through the body to gauge body composition. • Variety of applications for devices to track/monitor for progress. <p>Programs, products, and services can be evaluated for the needs of an individual, intended outcomes, research-based results, medically appropriate (includes accommodations for a variety of needs, cost, time, ease of implementation, needed equipment), access to equipment/facilities, need for professional oversight or monitoring, and benefits and challenges. (PF.3.f)</p> <p>Fitness products and services should be researched using multiple valid and reliable resources (online, user reviews, professionals in the field) to analyze claims and outcomes. (PF.3.g)</p>	

Social and Emotional Development

PF.4 The student will demonstrate social-competency skills in physical activity settings.

- a) Explain and demonstrate appropriate etiquette that exhibits respects for self and others within school and recreational fitness activity settings.
- b) Demonstrate safe practices, rules, and procedures in a physical activity setting.
- c) Explain the importance of inclusive and helpful behaviors in school and recreational fitness activity settings that promote feelings of belonging, acceptance, and value.

Essential Understandings	Essential Knowledge and Skills
<p>Etiquette is defined as the rules indicating the proper and polite way to behave (e.g., shaking hands/giving high fives/congratulating the other team at the end of a game; wiping off equipment after use in a facility; taking turns with facility equipment; being mindful of others waiting to use equipment; appropriate clothing for activity/facility). (PF.4.a)</p> <p>Safe practices may include using appropriate safety equipment, proper skills needed for the activity and environment, weather-related concerns, proper equipment for the activity, access to guides for outdoor pursuits, specialized trainers, physical safety—use of sidewalks, traffic, bike lanes, free of debris and obstacles, lighting—and access to assistance if needed. Rules and procedures are dependent upon activities selected. (PF.4.b)</p> <p>Creating an inclusive culture for physical education/school and physical activity in the community helps every student learn to lead a healthy and active lifestyle and have a sense of belonging, acceptance and value (CDC).</p> <ul style="list-style-type: none"> • Strategies for inclusion may include modifying/adapting equipment, rules, environment, activity <p>Creating a welcoming/inclusive environment, one that supports, uplifts, and promotes feelings of belonging, acceptance, and value. (PF.4.c)</p>	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • explain and demonstrate appropriate etiquette for school and recreational fitness activities (PF.4.a); • demonstrate safe practices, rules, and procedures (PF.4.b); • explain the importance of inclusive and helpful behaviors in school and recreational fitness activity settings that promote feelings of belonging, acceptance, and value. (PF.4.c) <p>Additional resources: OPEN Online Physical Education Network Health Smart Virginia PE Central EverFi KidsHealth.org</p>

Energy Balance

PF.5 The student will explain energy balance in relation to health-enhancing nutritional and activity practices.

- a) Analyze nutrient needs and sound nutritional practices associated with physical activity and fitness.
- b) Analyze the consequences and risks associated with an inactive lifestyle.
- c) Analyze the benefits gained from participation in strength training, conditioning, and fitness programs.
- d) Explain the role of nutrition and fitness in relation to weight management.
- e) Evaluate the risks of performance-enhancing (ergogenic) supplements.
- f) Explain the potential consequences of energy imbalance (e.g., over-exercising, under eating, over-eating, sedentary lifestyle).

Essential Understandings	Essential Knowledge and Skills
<p>Expenditure and intake needs vary with age and physical activity levels. Refer to Dietary Guidelines for Americans for adolescent and adult guidelines for caloric expenditure and intake. Also see DRI Calculator for Healthcare Professionals tool that calculates daily nutrient recommendations based on the Dietary Reference Intakes (DRIs) established by the Health and Medicine Division of the National Academies of Sciences, Engineering, and Medicine. The data represents the most current scientific knowledge on nutrient needs; however, individual requirements may be higher or lower than DRI recommendations. (PF.5.a)</p> <p>According to the CDC, physical activity is one of the best things people can do to improve their health. It is vital for healthy aging and can reduce the burden of chronic diseases and prevent early death. Active people generally live longer and are at less risk for serious health problems like heart disease, type 2 diabetes, obesity, and some cancers. For people with chronic diseases, physical activity can help manage these conditions and complications. Physical activity matters because (PF.5.b):</p> <ul style="list-style-type: none"> • 1 in 2 adults live with a chronic disease. • Only half of adults get the physical activity they need to help reduce and prevent chronic diseases. 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • analyze nutrient needs and sound nutritional practices associated with physical activity and fitness (PF.5.a); • analyze the consequences and risks associated with an inactive lifestyle (PF.5.b); • analyze the benefits gained from participation in strength training, conditioning, and fitness programs (PF.5.c); • explain the role of nutrition and fitness in relation to weight management (PF.5.d); • evaluate the risks of performance-enhancing (ergogenic) supplements (PF.5.e); • explain potential consequences of energy imbalance including over-exercising, under eating, over-eating, and sedentary lifestyle. (PF.5.f)

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Getting enough physical activity could prevent 1 in 10 premature deaths. • Over \$100 billion annually in healthcare costs are associated with inadequate physical activity. • Physical activity has positive physical, emotional, social, and mental wellness effects for children, adults, and healthy aging. • Work force effects: absenteeism and lost productivity from employee illness, injury, obesity or chronic conditions. One study reports that obesity alone has been estimated to cost employers almost \$2,500 per employee per year, including direct medical expenditures and absenteeism (Steps to Wellness– Physical Activity in the Workplace; CDC). • Building active, safe, and walkable communities may help increase retail activity and employment, increase property values, reduce healthcare costs, improve safety, and positively influence the workforce (fewer sick days). <p>For benefits gained from participation in strength training, conditioning, and fitness programs. See PF.2.d. (PF.5.c)</p> <p>According to the CDC (“Healthy Weight, Nutrition, and Physical Activity”), the key to achieving and maintaining a healthy weight isn’t about short-term dietary changes. It’s about a lifestyle that includes healthy eating, regular physical activity, and balancing calories consumed with the calories the body uses. When it comes to weight loss, there’s no lack of fad diets promising fast results. But such diets limit nutritional intake, can be unhealthy, and tend to fail in the long run. Safe ways to help manage weight include getting optimal sleep, reducing stress, maintaining healthy eating habits (eating more fruits and vegetables), and regular physical activity. (PF.5.d)</p>	<p>Additional resources:</p> <p>SHAPE America National Standards and Grade-Level Outcomes</p> <p>OpenPhySED</p> <p>Health Smart Virginia</p> <p>PE Central</p> <p>KidsHealth.gov</p> <p>MyPlate.gov</p> <p>Physical Activity Guidelines for Americans, 2nd ed.</p> <p>American Heart Association</p>

Essential Understandings	Essential Knowledge and Skills
<p>Appearance and performance enhancing drugs (APEDs) are most often used by to improve appearance by building muscle mass or to enhance athletic performance. Although they may directly and indirectly have effects on a user’s mood, they do not produce a euphoric high, which makes APEDs distinct from other drugs, such as cocaine, heroin, and marijuana. However, users may develop a substance use disorder, defined as continued use despite adverse consequences. Anabolic-androgenic steroids, the best-studied class of APEDs, can boost a user’s confidence and strength, leading users to overlook the severe, long-lasting, and in some cases, irreversible damage they can cause. They can lead to early heart attacks, strokes, liver tumors, kidney failure, and psychiatric problems. In addition, stopping use can cause depression, often leading to resumption of use. Because steroids are often injected, users who share needles or use nonsterile injecting techniques are also at risk for contracting dangerous infections such as viral hepatitis and HIV (NIDA). (PF.5.e)</p> <p>Energy imbalance results from consuming too many or too few calories for what is needed for daily activities. (PF.5.f)</p> <ul style="list-style-type: none"> • Two important consequences of energy imbalance for adolescents are obesity (excessive energy intake and/or insufficient energy output) and undernutrition (insufficient intake of both calories and specific nutrients and/or excessive energy output). Note: Obesity can also be caused by genetic predisposition, family history of obesity, individual metabolism, and behavioral factors. • Over exercising can result in (Are you getting too much exercise?) <ul style="list-style-type: none"> ○ Being unable to perform at the same level ○ Needing longer periods of rest ○ Feeling tired ○ Being depressed 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ Having mood swings or irritability ○ Having trouble sleeping ○ Feeling sore muscles or heavy limbs ○ Getting overuse injuries ○ Losing motivation ○ Getting more colds ○ Losing weight ○ Feeling anxiety • Under eating: consuming fewer calories than their body needs to function correctly. This can have a severe effect on energy levels, causing feelings of physical tiredness and mental fatigue, which may impair a person’s daily functioning. (Nine signs and symptoms of under eating) • Overeating may (7 Harmful Effects of Overeating) <ul style="list-style-type: none"> ○ Promote excess body fat ○ Disrupt hunger regulation ○ Increase disease risk ○ Impair brain function ○ Cause nausea and indigestion ○ Cause excessive gas and bloating ○ Cause sleepiness (sluggish or tired) • A sedentary lifestyle can increase all causes of mortality, double the risk of cardiovascular diseases, diabetes, and obesity, and increase the risks of colon cancer, high blood pressure, osteoporosis, lipid disorders, depression and anxiety. (Physical inactivity a leading cause of disease and disability, warns WHO) 	

FITNESS INSTRUCTOR (ELECTIVE)

The purpose of the Fitness Instructor elective course is to provide students with the knowledge, skills, and experience needed to become certified in personal training, strength and physical conditioning, group fitness, or in other health fitness specialty areas. Students will learn to develop individualized programs with goals that are based on factors that affect one's overall health, including genetic and chronic health conditions, sports injuries, age and gender, level of fitness, and lifestyle factors. Students will gain knowledge and skills to help improve posture, movement, flexibility, balance, core function, cardiorespiratory fitness, and muscular endurance and strength. Students will learn business skills, including effective communication, leadership skills, marketing strategies, consumer advocacy, résumé writing, and interviewing skills. Students will also earn a certification in CPR and AED.

Motor Skill Development

- FI.1 The student will demonstrate mastery of the movement skills and patterns used to perform strength-training, conditioning, and fitness activities.
- a) Demonstrate correct movement skills and patterns for strength-training, physical conditioning, and fitness activities.
 - b) Analyze movement activities for component skills and movement patterns.
 - c) Describe and demonstrate activities specific to improving the skill-related components of fitness.
 - d) Define and identify *activities of daily living* (ADL) as the tasks of everyday life.
 - e) Apply movement skills and patterns to functional fitness activities that support ADL.
 - f) Identify and describe advanced resistance-training techniques.
 - g) Apply principles of exercise progression to improve fitness.
 - h) Demonstrate correct and safe techniques and form when performing strength-training, physical conditioning, and fitness activities and exercises.
 - i) Demonstrate the proper use of fitness equipment, selectorized weight machines, and free weights.
 - j) Demonstrate safety protocols and procedures for strength-training, physical conditioning, and fitness activities.
 - k) Identify contraindications to advanced resistance-training techniques.
 - l) Identify and describe factors that influence participation in physical activity and adherence to an exercise program.
 - m) Explain principles that result in behavior change.
 - n) Describe psychological factors that may influence a person's adherence to an exercise program.
 - o) Identify and apply strategies to increase adherence in an exercise program.

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- p) Explain the role of the personal trainer in promoting an individual’s adherence to an exercise program.
- q) Identify and explain considerations for special populations.

Essential Understandings	Essential Knowledge and Skills
<p>Strength training activity skills may include (FI.1.a):</p> <ul style="list-style-type: none"> • Free weight activities • Olympic lifts • Dumbbell/kettlebell activities • Manual resistance activities • Resistance band activities • Resistance machines <p>Physical conditioning and fitness activities may include (FI.1.a):</p> <ul style="list-style-type: none"> • Speed and agility activities • Endurance activities • Flexibility activities • Plyometric activities <p>Component skills and movement patterns may include (FI.1.b):</p> <ul style="list-style-type: none"> • Squat • Lunge • Push • Pull • Bend • Twist <p>Skill-related fitness components include (FI.1.c):</p> <ul style="list-style-type: none"> • Agility: the ability to move with quick, easy grace; quick change of direction. 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • demonstrate correct movement skills and patterns for strength-training, physical conditioning, and fitness activities (FI.1.a); • use video to analyze movement activities for component skills and movement patterns (FI.1.b); • describe and demonstrate activities specific to improving skill-related components of fitness (FI.1.c); • define and identify <i>activities of daily living</i> (ADL) (FI.1.d); • apply movement skills and patterns to functional fitness activities that support ADL (FI.1.e); • identify and describe advanced resistance-training techniques (FI.1.f); • apply principles of exercise progression to improve fitness (FI.1.g); • demonstrate correct and safe techniques and form when performing strength-training, physical conditioning, and fitness activities and exercises (FI.1.h); • demonstrate the proper use of fitness

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Balance: stability produced by even distribution of weight; muscles tense to keep the body in a balanced position. • Coordination: harmonious functioning of parts for effective results; it takes eye hand coordination to strike an object. • Power: physical might, ability to act or produce an effect; kicking a ball for distance. • Reaction time: the time required for a subject to initiate a prearranged response to a defined stimulus; the time between hearing a whistle and starting to run or time between seeing a ball being thrown to a place out of reach and moving to catch it. • Speed: the rate of motion, ability to move swiftly. <p>Activities of daily living (ADL): basic tasks of everyday life, such as eating, bathing, dressing, and transferring (FI.1.d).</p> <p>Movement skills and patterns used in ADL include (FI.1.e):</p> <ul style="list-style-type: none"> • Bending/raising and lifting/lowering movements (e.g., squatting) • Single-leg movements • Pushing movements in vertical/horizontal planes and resultant movement • Pulling movements in vertical/horizontal planes and resultant movement • Rotational movements <p>Advanced resistance-training techniques may include (FI.1.f):</p> <ul style="list-style-type: none"> • Olympic lifts: two exercises, the snatch and the clean and jerk, performed in the modern Olympic program • Plyometric exercises: a system of exercise in which the muscles are repeatedly stretched then suddenly contracted; explosive exercise used to develop muscular power, such as chops, throws, push-ups, twists, jumps 	<ul style="list-style-type: none"> equipment, selectorized weight machines, and free weights (FI.1.i); • demonstrate safety protocols and procedures for strength-training, physical conditioning, and fitness activities (FI.1.j); • identify contraindications to advanced resistance-training techniques (FI.1.k); • identify and describe factors that influence participation in physical activity and adherence to an exercise program (FI.1.l); • explain principles that result in behavior change (FI.1.m); • describe psychological factors that may influence a person’s adherence to an exercise program (FI.1.n); • identify and apply strategies to increase adherence in an exercise program (FI.1.o); • explain the role of the personal trainer in promoting an individual’s adherence to an exercise program (FI.1.p); • select one or more special populations and identify and explain considerations for exercise/physical activity. (FI.1.q) <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OpenPhySED</p>

Essential Understandings	Essential Knowledge and Skills
<p>(depth jumps, multiple jumps, lateral jumps)</p> <ul style="list-style-type: none"> • Pyramid training: training methodology in which high-repetition, lower-weight sets are paired with high-weight, lower-repetition sets <ul style="list-style-type: none"> ○ Ascending: weight is increased and repetitions decrease each set ○ Descending: weight is decreased and repetitions increase each set ○ Triangle: weight increases as reps decrease, then weight decreases as reps increase each set • Super sets: performing multiple exercises with little to no rest between <ul style="list-style-type: none"> ○ Compound sets: two-plus exercises for the same muscle group performed in succession ○ Isolation sets: exercises for two different muscle groups combined in a superset <p>Principle of progression: to effectively improve fitness, an individual must apply an optimal level of overload within a certain time period. (FI.1.g)</p> <ul style="list-style-type: none"> • Active recovery: low-intensity activities completed during recovery periods to speed up the recovery process. • Passive recovery: completely resting during scheduled recovery periods. • Ten percent rule: To meet optimal levels of overload, it is recommended to increase the frequency, intensity, or duration by no more than 10% per week. <p>Correct and safe techniques and form when performing strength-training, physical conditioning, and fitness activities and exercises should include consistent, correct performance of all critical elements and safety practices for skills and activities. (FI.1.h)</p> <p>Proper use of fitness equipment, selectorized weight machines, and free weights</p>	<p>Health Smart Virginia PE Central Dynamic PE ASAP</p>

Essential Understandings	Essential Knowledge and Skills
<p>may include following manufacturer guidelines, classroom procedures and protocols (for use and cleaning), and using equipment for intended purposes only. (FI.1.i)</p> <p>Safety protocols and procedures for strength-training, physical conditioning, and fitness activities include proper form, technique, and use, and following classroom procedures. (FI.1.j)</p> <p>Contraindication is any condition that renders some particular movement, activity, or treatment improper or undesirable. Contraindications for participation in advanced resistance training may include (FI.1.k):</p> <ul style="list-style-type: none"> • Pain • Inflammation • Severe cardiac diseases • Cardiac symptoms such as chest pain (angina) or arrhythmias • Hypertension > 160/105 • Inability to perform basic resistance-training techniques • Lack of muscular strength (Squat 1RM of less than 1.5 times body weight; Bench press 1RM of less than 1-1.5 times body weight) • Low levels of skill-related fitness • Deconditioned <p>Factors that may influence participation in physical activity and adherence to an exercise program may include (FI.1.l):</p> <ul style="list-style-type: none"> • Personal attributes: <ul style="list-style-type: none"> ○ Activity history: past program participation is the most reliable predictor of current participation. ○ Demographic variables: adherence is related to education, income, 	

Essential Understandings	Essential Knowledge and Skills
<p>age, and gender; lower activity levels are seen in individuals with older age, lower education, and lower income; men demonstrate more adherence to exercise programs than women.</p> <ul style="list-style-type: none"> ○ Health perception: An individual’s perception of their own health is a factor in exercise adherence because individuals that perceive themselves to be healthier tend to demonstrate more adherence. ○ Health status: individuals with chronic illness are less likely to adhere to an exercise program. ○ Knowledge, attitudes, and beliefs: The more knowledge an individual has, the more likely they will adhere to an exercise program; individuals with an internal locus of control, or belief that internal or personal factors control events or outcomes, are more likely to adhere to an exercise program. • Environmental factors: <ul style="list-style-type: none"> ○ Access to facilities: An individual is more likely to adhere to an exercise program if the facility is conveniently located near a person’s home or work. ○ Time: Individuals that have the perception that there is not enough time to participate in physical activity are less likely to adhere to an exercise program. ○ Social support: Individuals with support from family and friends are more likely to adhere to an exercise program. • Physical-activity factors: <ul style="list-style-type: none"> ○ Intensity: individuals participating in vigorous-intensity exercises are much more likely to drop out of the physical activity program; individuals participating in moderate-intensity programs are more likely to adhere to the exercise program. ○ Injury: Individuals that experience injury are less likely to adhere to 	

Essential Understandings	Essential Knowledge and Skills
<p>an exercise program.</p> <ul style="list-style-type: none"> • Feedback: <ul style="list-style-type: none"> ○ Intrinsic: information individuals provide to themselves based on their own sensory systems; adherence to an exercise program is dependent on intrinsic feedback. ○ Extrinsic: feedback provided from outside sources, including coaches or other fitness professionals; early in an exercise program, extrinsic feedback is key to program adherence. <p>Transtheoretical Model of Behavior Change stages of change (FI.1.m):</p> <ul style="list-style-type: none"> • Precontemplation: unaware that a behavior change is needed • Contemplation: considering a behavior change • Preparation: starting behavior change; inconsistent patterns of change • Action: consistent behavior change; <6 months after starting change • Maintenance: regular change in behavior; change becomes part of lifestyle; >6 months after starting change <p>Psychological factors that may influence a person’s adherence to an exercise program may include (FI.1.n):</p> <ul style="list-style-type: none"> • Motivation: an individual’s motivation correlates with their adherence to an exercise program. • Self-motivation: reflective of one’s ability to set goals, monitor progress, and self-reinforce; shows a positive relationship with adherence to an exercise program. • Self-efficacy: an individual’s belief in their capacity to execute behaviors necessary to produce specific performance attainments; individuals with high levels of self-efficacy are more likely to adhere to an exercise program. 	

Essential Understandings	Essential Knowledge and Skills
<p>Processes of change: providing a process to move from one stage to the next; interventions necessary (ACE TTM). (FI.1.n)</p> <ul style="list-style-type: none"> • Self-efficacy: development of the belief that an individual can master the behavior change. • Decisional balance: development of an understanding that the behavior change will benefit the individual. • Operant conditioning: process by which behaviors are influenced by their consequences (positive and negative). • Shaping: process of using reinforcements to gradually achieve a target behavior. • Observational learning: learning which occurs through observing the behaviors of others. • Cognitions and behavior: the influence a person’s beliefs have on their behaviors. <p>Adherence Strategies (FI.1.o)</p> <ul style="list-style-type: none"> • Stimulus control: making adjustments to the environment to increase the likelihood of engagement in a behavior (e.g., changing a schedule to include workout times, laying out exercise clothes before bed, choosing a fitness location between home and school/work) • Written agreements and behavior contracting: specific written agreements outlining the roles and behaviors of all involved in the behavior change. • Individualized goal setting: Goals must be effectively written and tailored to the individual to elicit changes in behavior (e.g., SMART goal). <p>The personal trainer can promote an individual’s adherence to an exercise program through program design; effective communication and role clarity; goal</p>	

Essential Understandings	Essential Knowledge and Skills
<p>setting; and developing contracts or agreements. (FI.1.p)</p> <p>Considerations for special populations may include the following. Note: All individuals must obtain physician clearance before beginning any exercise program. (FI.1.q)</p> <ul style="list-style-type: none"> • Arthritis: focus on duration rather than intensity, ensure proper body alignment and exercise technique, and put all joints through full range of motion (ROM) at least once daily; avoid exercise during periods of inflammation for rheumatoid arthritis patients. • Asthma: medical clearance required; ensure rescue medication is available at all times; avoid asthma triggers prior to exercise; gradual and prolonged warm-up and cool down; gradually increase intensity. • Cancer (“Nutrition and Physical Activity Guidelines for Cancer Survivors,” http://onlinelibrary.wiley.com/doi/10.3322/caac.21142/full): Obtain physician clearance before any exercise program; gradual build-up focusing more on duration than intensity; light to moderate intensity; resistance-training activities using low weights for 10-15 repetitions; proper warm-up and cool down; individuals with low white blood cell counts should avoid exercising in public gyms; encourage proper nutrition and hydration; monitor for swollen ankles, unexplained weight gain, and/or shortness of breath at rest or with limited exertion; people should not exercise within two hours of chemotherapy or radiation. • Cardiovascular disease: All individuals with coronary artery disease (CAD) should have a physician-supervised maximal graded exercise test to determine functional capacity to establish safe exercise levels; heart rates should not exceed training targets, rate of perceived exertion (RPE) should not exceed 11-14 on the Borg scale (6-20 scale). • Chronic Fatigue Syndrome: use a 1:3 exercise-to-rest ratio; limit 	

Essential Understandings	Essential Knowledge and Skills
<p>deconditioned individuals to ADL; develop low-intensity activities.</p> <ul style="list-style-type: none"> • Diabetes: Monitor blood glucose levels and avoid exercise if fasting glucose levels are ≥ 250 mg/dL and ketosis is present or if blood glucose levels are > 300 mg/dL and no ketosis is present; avoid injecting insulin into the primary muscle groups that will be used during exercise; avoid exercise during peak insulin activity; exercise at the same time daily to establish a consistent routine; ensure that individuals with diabetes exercise with a partner and wear a medical ID; focus on hydration. • Dyslipidemia: Individuals with dyslipidemia may also have other risk factors for cardiovascular diseases; fitness professionals should follow physician recommendations in the development of an exercise plan; individuals that do not exhibit any other risk factors may follow age-specific guidelines. • Fibromyalgia: Discuss exercise goals and obtain medical clearance from physician prior to starting an exercise program; low-impact, low-intensity activities (9-13 RPE on Borg scale) with intensity levels lowered during periods of flare-up; warm-water exercise is especially beneficial. • Hypertension: Participation in 30 minutes of regular exercise five times per week; aerobic activities supplemented with low-intensity resistance-training; avoid isometric training and teach proper technique and breathing; monitor blood pressure during and after bouts of exercise. • Low-back pain: Specific low-back exercises supplemented with aerobic activity for cardiorespiratory health; ensure proper form and alignment; focus on good posture. • Metabolic syndrome: medical clearance prior to starting a program; exercise program should be designed around guidelines for treatment of overweight and obese individuals; aerobic modes of activity including walking, elliptical training/ergometers, stationary cycling, and other non- 	

Essential Understandings	Essential Knowledge and Skills
<p>weight bearing activities such as aquatic exercise are recommended.</p> <ul style="list-style-type: none"> • Older adults: decrease in maximum heart rate, muscle mass, basal metabolic rate, balance, and coordination are common in older adults; older adults should consult a physician prior to starting an exercise program; older adults without other underlying factors can follow age-specific guidelines. • Osteoporosis: weight-bearing and resistance activities with intensities that stimulate bone adaptation; avoid spinal flexion, jumping, high-impact aerobics, abducting or adducting legs against resistance • Peripheral Vascular Disease (PVD): complete medical evaluation with a medical professional; walking that is short in duration and includes multiple opportunities for rest; general, non-impact conditioning activities with an RPE of 9-13 on the Borg scale. • Pre- and postnatal/pregnant women with preeclampsia, vaginal bleeding, premature rupture of membranes, or risk factors for pre-term labor should not exercise. • Pregnant women who have a doctor’s permission to exercise should follow the following guidelines: <ul style="list-style-type: none"> ○ Use light to moderate intensity; avoid activities that require extensive running, hopping, skipping, jumping, or bouncing, deep-knee bends, full sit-ups, double-leg raises, and contact sports; women should obtain medical clearance to begin exercise postpartum and should begin slowly and work to increase duration. • Stroke: Focus on optimizing activities of daily living (ADL) to regain balance, coordination, and functional independence; light to moderate intensity activities focusing on gait, balance, and coordination, such as walking, bicycle ergometer, water, and weight-supported treadmill activities. 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Weight management: low to moderate levels of intensity; dose-response relationship states the more exercise done the greater the response; recommended at least 150-200 minutes of physical activity/week. • Youth: obtain medical clearance and parental consent; proper supervision; ensure facility is safe for children prior to use; avoid single maximal lifts or sudden explosive movements; avoid competition with children; teach children how to breathe properly; allow for appropriate rest (at least two minutes between each exercise); encourage nutrition, hydration, and proper communication 	

Anatomical Basis of Movement

- FL.2 The student will apply knowledge of anatomy and movement principles and concepts to skill performance in strength training, conditioning, and fitness activities.
- a) Identify the planes of motion and types of movement that occur in the frontal, sagittal, and transverse planes.
 - b) Define common anatomical terms.
 - c) Identify the major bones of the skeletal system.
 - d) Identify and describe the types of joints, including hinge and multiaxial (ball and socket).
 - e) Explain muscle structure and function, including major muscles of the body, terms related to muscles, and muscle origins and insertions.
 - f) Explain movements that result based on muscle origin and insertion.
 - g) Explain how muscles contract, including agonist and antagonist movements in relation to muscle contraction.
 - h) Identify and explain curvatures of the spine.
 - i) Perform and analyze postural evaluation of another individual.
 - j) Perform and analyze movement evaluation for stability and mobility of the joints of another individual.
 - k) Perform and analyze flexibility evaluation of another individual.
 - l) Perform and analyze balance and core-strength evaluations of another individual.
 - m) Identify contraindications to assessments of movement.
 - n) Perform assessments to evaluate the health-related components of fitness.
 - o) Perform assessments to evaluate the skill-related components of fitness.
 - p) Identify contraindications to health-related and skill-related fitness assessments.
 - q) Identify and explain different methods for determining body composition.
 - r) Explain the benefits and challenges of different methods for determining body composition.
 - s) Differentiate between recommendations for physical activity and training principles to meet goals for general health benefits, weight management, fitness improvements, and athletic performance enhancement.
 - t) Explain the effects of acute and chronic exercise on aerobic and anaerobic energy systems.
 - u) Explain the body's response to cardiorespiratory exercise.
 - v) Explain the body's response to resistance training.
 - w) Explain the body's response to warm-up and cool-down.
 - x) Explain blood-pressure response related to acute exercise, chronic exercise, and changes in posture.

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- y) Explain reversibility or deconditioning and the effect on fitness and performance.
- z) Define common musculoskeletal injuries.
- aa) Compare and contrast muscle fatigue and delayed onset muscle soreness (DOMS) with musculoskeletal injury/overuse.
- bb) Explain inflammatory response and the healing process.
- cc) Identify and describe upper-extremity injuries.
- dd) Identify and describe lower-extremity injuries.
- ee) Identify and explain exercise modifications appropriate when participant is injured.

Essential Understandings	Essential Knowledge and Skills
<p>Planes of motion and types of movement that occur in each plane. (FI.2.a)</p> <ul style="list-style-type: none"> • Sagittal plane is a vertical plane passing from the rear (posterior) to the front (anterior) dividing the body into left and right halves. It is also known as the anteroposterior plane. Most sport and exercise movements that are almost two-dimensional, forward and backward movements, such as running and long jumping, take place in this plane. Flexion and extension take place in the sagittal plane. • Frontal plane is also vertical and passes from left to right, dividing the body into posterior and anterior halves. It is also known as the coronal or the mediolateral plane. Abduction and adduction is often in the frontal plane; side-to-side movements. • Transverse/horizontal plane divides the body into top (superior) and bottom (inferior) halves. Twisting movements; any time there is rotation in a joint. <p>Anatomical terms (FI.2.b):</p> <ul style="list-style-type: none"> • Abduction: movements away from the midline of the body • Adduction: movements toward the midline of the body • Circumduction: a combination of flexion, extension, abduction, and adduction; circular movement; performed at shoulder, hip, wrist, and 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • identify the planes of motion and types of movement that occur in the frontal, sagittal, and transverse planes (FI.2.a); • define common anatomical terms (FI.2.b); • identify the major bones of the skeletal system (FI.2.c); • identify and describe the types of joints, including hinge and multiaxial (ball and socket) (FI.2.d); • explain muscle structure and function, including major muscles of the body, terms related to muscles, and muscle origins and insertions (FI.2.e); • explain movements that result based on muscle origin and insertion (FI.2.f); • explain how muscles contract, including agonist and antagonist movements in relation to muscle contraction (FI.2.g);

Essential Understandings	Essential Knowledge and Skills
<p>ankle (e.g., tennis overhead serve)</p> <ul style="list-style-type: none"> • Distal: distant from the main mass of the body (e.g., the hands are at the distal end of the arms) • Dorsiflexion: flexion of the ankle joint in an upward direction • Extension: movement which increases the angle between the bones of a joint • External rotation: rotation away from the center of the body • Flexion: movement that decreases the angle between the bones of a joint • Hyperextension: extension that increases the angle between bones of a joint to a point which is greater than normal • Inferior: low, or lower, in body position • Internal rotation: rotation toward the center of the body • Lateral: farthest away from the midline of the body (e.g., the lateral collateral ligament of the knee is on the outside of the knee) • Medial: closest to the midline of the body (e.g., the medial collateral ligaments of the knee are on the inside of the knee) • Plantar flexion: flexion of the ankle joint in a downward direction • Pronation: internal rotation of the forearm or foot; pronation of the forearm/wrist will result in the thumb being medial; pronation of the foot will result in weight being borne on the medial part of the foot • Proximal: closest to the main mass of the body (e.g., the shoulder joint is at the proximal end of the arms) • Rotation: movement around a central axis • Superior: high, or higher, in body position • Supination: external rotation of the forearm or foot; supination of the forearm/wrist will result in the thumb being lateral (carrying a cup of soup); supination of the foot will result in weight being borne on the lateral part of the foot. 	<ul style="list-style-type: none"> • identify and explain curvatures of the spine (FI.2.h); • perform and analyze postural evaluation of another individual (FI.2.i); • perform and analyze movement evaluation for stability and mobility of the joints of another individual (FI.2.j); • perform and analyze flexibility evaluation of another individual (FI.2.k); • perform and analyze balance and core-strength evaluations of another individual (FI.2.l); • identify contraindications to assessments of movement (FI.2.m); • perform assessments to evaluate the health-related components of fitness (FI.2.n); • perform assessments to evaluate the skill-related components of fitness (FI.2.o); • identify contraindications to health-related and skill-related fitness assessments (FI.2.p); • identify and explain different methods for determining body composition (FI.2.q); • explain the benefits and challenges of different methods for determining body composition (FI.2.r); • differentiate between recommendations for physical activity and training principles to meet goals for general health benefits,

Essential Understandings	Essential Knowledge and Skills
<p>Major bones of the skeletal system (FI.2.c):</p> <ul style="list-style-type: none"> • Skull: cranium, mandible, maxilla • Shoulder girdle: clavicle, scapula • Arm: humerus, radius, ulna • Hand: carpals, metacarpals, phalanges • Chest: sternum, ribs • Spine: cervical vertebrae (7), thoracic vertebrae (12), lumbar vertebrae (5), sacrum (5 vertebrae fused together), coccyx • Pelvis: ilium, ischium, pubis • Leg: femur, tibia, fibula, patella • Ankle: talus, calcaneus • Foot: tarsals, metatarsals, phalanges <p>Types of joints (FI.2.d):</p> <ul style="list-style-type: none"> • Hinge: joint in which movement is restricted to only one plane; allows for flexion/extension movements (e.g., elbow, knee) • Multiaxial (ball and socket): joint in which a spherical head lies in a socket, allowing for multidirectional movement; allows for flexion/extension, abduction/adduction, and rotation movements (e.g., shoulder, hip) • Pivot: cervical vertebrae allows head to move side to side; radius and ulna and humerus allow for twist motion (movement of arm for forehand and backhand swing); movement: rotation of one bone around another <p>Muscles function to produce force and motion; muscles move bones by working in pairs; and muscles provide stability by tensing to keep the body in a balanced position. (FI.2.e)</p> <ul style="list-style-type: none"> • Muscle structure 	<p>weight management, fitness improvements, and athletic performance enhancement (FI.2.s);</p> <ul style="list-style-type: none"> • explain the effects of acute and chronic exercise on aerobic and anaerobic energy systems (FI.2.t); • explain the body’s response to cardiorespiratory exercise (FI.2.u); • explain the body’s response to resistance training (FI.2.v); • explain the body’s response to warm-up and cool-down (FI.2.w); • explain blood-pressure response related to acute exercise, chronic exercise, and changes in posture (FI.2.x); • explain reversibility or deconditioning and the effect on fitness and performance (FI.2.y); • define common musculoskeletal injuries (FI.2.z); • compare and contrast muscle fatigue and delayed onset muscle soreness (DOMS) with musculoskeletal injury/overuse (FI.2.aa); • explain inflammatory response and the healing process (FI.2.bb); • identify and describe upper-extremity injuries (FI.2.cc); • identify and describe lower-extremity

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ Actin: thin protein filament that works with myosin to cause muscles to contract ○ Epimysium: connective tissue surrounding muscle ○ Fasciculi: bundles of muscle fibers ○ Motor neuron: a nerve cell that causes the muscles to produce movement ○ Motor units: one motor neuron and all of the muscle fibers that it innervates ○ Muscle fibers: cylindrical muscle cell that contracts when stimulated ○ Myofibril: contractile unit of a muscle fiber, containing contractile proteins actin and myosin ○ Myosin: thick protein filament that works with actin to cause muscle contraction ○ Sarcomere: functional segment of a myofibril which shortens in a concentric muscle contraction ○ Sliding filament theory: method by which muscles contract; release of energy causes myosin filaments to pull actin filaments and the Z line inward toward the H zone of the sarcomere to cause muscle to contract and generate force • Major muscles of the body (FI.2.e): <ul style="list-style-type: none"> ○ The muscular system is made up of cardiac (heartbeat), smooth (circulation, digestion, breathing), and striated or skeletal (mobility, stability, posture) muscle. Smooth and cardiac muscles are involuntary, and skeletal muscles are voluntary (can consciously control) (“9 Functions of the Muscular System,” Healthline). There are 600 muscles in the body. ○ Skeletal muscle major groups include 	<p>injuries (FI.2.dd);</p> <ul style="list-style-type: none"> • identify and explain exercise modifications appropriate when participant is injured (FI.2.ee). <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OPEN Online Physical Education Network Health Smart Virginia PE Central Dynamic PE ASAP KidsHealth.org</p>

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ▪ Back: erector spinae, latissimus dorsi ▪ Chest: pectoralis major, teres major, diaphragm ▪ Arms and shoulders: biceps brachii, triceps brachii, trapezius, rhomboideus major and minor, pectoralis minor, pectoralis major, deltoid, rotator cuff muscles (subscapularis, supraspinatus, infraspinatus and teres minor) ▪ Abdominals: rectus abdominis, external oblique, internal oblique, transversus abdominus ▪ Legs: quadriceps (rectus femoris, vastus lateralis, vastus medialis, vastus intermedius), hamstrings (long head of the biceps femoris, short head of the biceps femoris, semitendinosus, and semimembranosus), gastrocnemius, tibialis anterior, soleus ▪ Buttocks: gluteus maximus, medius, and minimus • Terms related to muscles (FL.2.e): <ul style="list-style-type: none"> ○ Agonist muscle: muscle causing the body to move (e.g., biceps brachii in a biceps curl movement) ○ Antagonist muscle: muscle lengthening causing body to move (e.g., triceps brachii in a biceps curl movement) ○ Atrophy: decrease in muscle mass ○ Concentric contraction: contraction in which force causes muscle to shorten and change the angle of a joint ○ Eccentric contraction: muscle elongates while under tension due to an opposing force greater than the muscle generates ○ Hypertrophy: increase in muscle mass ○ Hyperplasia: increase the number of muscle cells present in tissue ○ Insertion: distal attachment point of a muscle; tends to be the 	

Essential Understandings	Essential Knowledge and Skills
<p>more mobile structure of which the muscle is attached</p> <ul style="list-style-type: none"> ○ Isometric contraction: muscular force precisely matches the load, and no movement results ○ Origin: proximal attachment point of a muscle; tends to be the more stationary structure of which the muscle is attached <p>Movements result based on muscle origin and insertion. When muscle contracts, the attachment points are pulled closer together; when it relaxes, the attachment points move apart. (e.g., the point of origin of the biceps brachii is the scapula, which stays stationary while the biceps contracts, while the point of insertion is the radius, which is moved to reduce the angle of the elbow when the biceps contracts.) (FI.2.f)</p> <p>Muscles can pull bones. They cannot push bones, so muscles work in pairs: agonist muscle (muscle causing the body to move [e.g., the biceps brachii in a biceps curl movement]) and antagonist muscle (muscle lengthening causing the body to move [e.g., the triceps brachii in a biceps curl movement]). (FI.2.g)</p> <p>Curvatures of the spine include (FI.2.h):</p> <ul style="list-style-type: none"> • Kyphosis: excessive outward curvature of the spine, which causes a hunching of the back • Lordosis: excessive inward curvature of the spine • Scoliosis: abnormal lateral curvature of the spine <p>Muscle Imbalances:</p> <ul style="list-style-type: none"> • Kyphosis/lordosis: <ul style="list-style-type: none"> ○ Facilitated/hypertonic (shortened): hip flexors, lumbar extensors, anterior chest/shoulders, latissimus dorsi, neck 	

Essential Understandings	Essential Knowledge and Skills
<p style="padding-left: 40px;">extensors</p> <ul style="list-style-type: none"> ○ Inhibited (lengthened): hip extensors, external obliques, upper-back extensors, scapular stabilizers, neck flexors • Flat back: <ul style="list-style-type: none"> ○ Facilitated/hypertonic (shortened): rectus abdominus, upper-back extensors, neck extensors, ankle plantarflexors ○ Inhibited (lengthened): iliacus/psoas major, internal oblique, lumbar extensors, neck flexors • Sway back: <ul style="list-style-type: none"> ○ Facilitated/hypertonic (shortened): hamstrings, upper posterior obliques, lumbar extensors, neck extensors ○ Inhibited (lengthened): iliacus/psoas major, rectus femoris, external oblique, upper back extensors, neck flexors <p>Postural evaluations may include the Plumb Line Assessment. (FI.2.i)</p> <p>Plumb Line Assessment: A static assessment in which a fitness professional/observer uses a centered line to look at alignment in the frontal, sagittal, and transverse planes to note asymmetries.</p> <ul style="list-style-type: none"> • Frontal Plane <ul style="list-style-type: none"> ○ Anterior view: Position the plumb line with the feet equidistant from line, using the inside of the heels as a point of reference; an individual with good posture will have the line pass equidistant between the feet and ankles and will intersect the pubis, umbilicus, sternum, chin, maxilla (face), and forehead. ○ Posterior view: Position the plumb line behind the client with the line equidistant from the inside of the heels; an 	

Essential Understandings	Essential Knowledge and Skills
<p>individual with good posture will have the line bisecting the sacrum and overlapping with the spinous processes of the vertebrae.</p> <ul style="list-style-type: none"> • Sagittal Plane <ul style="list-style-type: none"> ○ Position the individual between the plumb line and a wall with individual facing sideways and line immediately anterior to the lateral malleolus (ankle); with good posture, the plumb line will pass through the anterior third of the knee, the greater trochanter of the femur, and the acromioclavicular joint, and will pass slightly anterior to the mastoid process of the temporal bone (in line with, or slightly behind the earlobe). <p>Postural Deviations</p> <ol style="list-style-type: none"> 1. Ankle pronation/supination and the effect on tibial and femoral rotation <ul style="list-style-type: none"> - Pronation with internal rotation: places additional stresses on knee ligaments; eversion of calcaneus; tightens calf muscles and may limit dorsiflexion - Supination with external rotation: tightness of gluteal muscles 2. Hip adduction <ul style="list-style-type: none"> - Progressively lengthens and weakens adductor muscles 3. Pelvic tilting <ul style="list-style-type: none"> - Anterior pelvic tilt: indicative of tight hip flexors and erector spinae muscles; indicative of a sedentary lifestyle - Posterior pelvic tilt: indicative of an overdominant rectus abdominus and tight hamstrings 4. Shoulder positioning and the thoracic spine <ul style="list-style-type: none"> - Non-level shoulders: indicative of tight upper trapezius muscles, levator scapulae, rhomboids 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> - Asymmetry to midline: indicative of tight lateral trunk flexors - Protracted (forward and rounded shoulders): indicates tight serratus anterior, anterior scapulo-humeral muscles, and upper trapezius - Medially rotated humerus: indicates tightness in pectoralis major, latissimus dorsi, and subscapularis - Kyphosis and depressed chest: indicates tightness in shoulder adductors, pectoralis minor, rectus abdominus, and internal obliques <p>5. Head position</p> <ul style="list-style-type: none"> - Forward head position (ear forward of acromioclavicular joint or cheekbone anterior to collarbone in sagittal view): indicates tightness in cervical spine extensors, upper trapezius, and levator scapulae <p>Movement evaluation for stability and mobility of various joints may include the following: (FL.2.j).</p> <ul style="list-style-type: none"> • Bend and lift screen: The individual will bend and lift at the ankle, knee, and hip to pick up two dowels/broomsticks from the floor, measuring symmetrical lower-body extremity mobility and stability and upper-body stability <ul style="list-style-type: none"> - Lack of foot stability indicates tight soleus, lateral gastrocnemius, and peroneals; indicates weak medial gastrocnemius, gracilis, Sartorius, and tibialis group. - Inward-moving knees indicate tight hip adductors and tensor fascia latae; indicate weak gluteal muscles. - Lateral shifting to one side indicates a dominance and muscle imbalance due to potential lack of stability in lower extremity during joint loading. - Heels lifting from the floor indicates tight plantar flexors. - Movement being initiated at the knees indicates quadriceps and hip 	

Essential Understandings	Essential Knowledge and Skills
<p>flexor dominance and insufficient activation of gluteal muscles.</p> <ul style="list-style-type: none"> - Being unable to achieve parallel between tibia and torso indicates poor mechanics and a lack of dorsiflexion due to tight plantar flexors. - Hamstrings contacting calves indicates muscle weakness and poor mechanics. - Excessively arched back indicates tightness in hip flexors, back extensors, and latissimus dorsi; indicates weakness in rectus abdominus, gluteal muscles, and hamstrings. - Rounded back indicates tightness in latissimus dorsi, teres major, pectoralis major and minor muscles; indicates weakness in upper back extensors. - Downward-facing head indicates increased hip and trunk flexion. - Upward-facing head indicates compression and tightness in cervical extensor region. <ul style="list-style-type: none"> • Hurdle step screen: The individual will step and raise one heel to and over a string placed at a height of the middle of the tibia to assess the mobility of one limb and the stability of the contralateral limb, while maintain hip and torso stabilization. <ul style="list-style-type: none"> - Lack of foot stability indicates tight soleus, lateral gastrocnemius, and peroneals; indicates weak medial gastrocnemius, gracilis, Sartorius, tibialis group, gluteal group; indicates inability to control internal rotation. - Inward moving knees indicate tight hip adductors and tensor fascia latae; indicate weak gluteal muscles. - Hip adduction indicates tight hip adductors and tensor fascia latae; indicates weak gluteal muscles. - Inward rotation of the hip indicates tight internal rotators and weak external rotators. 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> - A lateral torso tilt indicates a lack of core stability. - A lack of ankle dorsiflexion indicates tight ankle plantarflexors and weak ankle dorsiflexors. - A limb deviating from the sagittal plane indicates tight raised-leg hip extensors and weak raised-leg hip flexors. - A hiking of the raised hip indicates tight stance-leg hip flexors. - An anterior tilt with forward torso lean indicates tight stance-leg hip flexors and weak rectus abdominus and hip extensors. - A posterior tilt with hunched torso indicates tight rectus abdominus and hip extensors and weak stance-leg hip flexors. • Shoulder push stabilization screen: The individual will execute several push-ups to full arm extension to examine stabilization of the scapulothoracic joint and core control during closed kinetic chain movements. <ul style="list-style-type: none"> - Winging in the scapula indicates an inability of the serratus anterior, trapezius, levator scapula, and rhomboids to stabilize the scapulae against the rib cage. - Collapsing of the low back indicates a lack of core, abdominal, and low-back strength. • Thoracic spine mobility screen: The individual will sit with a dowel/broomstick across the shoulders and will rotate bilaterally to examine the bilateral mobility of the thoracic spine. <ul style="list-style-type: none"> - A bilateral discrepancy can indicate biomechanical issues, such as a side dominance, differences in paraspinal development, and issues with torso rotation (possibly associated with some hip rotation). <p>Performance of multiple flexibility evaluations of another individual may include: (FI.2.k).</p>	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Thomas test: Assesses the length of muscles involved in hip flexion (hip flexors/iliopsoas and rectus femoris) through moving from a sitting position to a laying position while pulling one thigh toward the chest. <ul style="list-style-type: none"> - Observations include whether the back of the lowered thigh touches the table, whether the knee of the lowered leg achieves 80 degrees of flexion, and whether the knee remains aligned straight or falls into internal or external rotation. • Passive straight-leg raise (PSL): Assesses the length of the hamstrings by attempting to lift one leg from a lying position to a 90-degree position; inability to reach at least 80 degrees indicates tight hamstrings. • Shoulder flexion/extension assessment: Assesses shoulder flexion and extension through an individual lying flat on the back with elevated knees and moving the arms simultaneously into shoulder flexion and down to the ground (flexion); the individual will lay prone and bring the shoulders into extension while lifting arms off the floor (extension). <ul style="list-style-type: none"> - Inability to flex to 170 degrees or discrepancies in limbs indicates tightness in pectoralis major and minor, latissimus dorsi, teres minor, rhomboids, and subscapularis. - Inability to extend to 50 degrees or discrepancies between limbs indicates tightness in pectoralis major, abdominals, subscapularis, anterior deltoid, coracobrachialis, and biceps brachii. • Internal/external rotation assessments: Assess the internal (medial) and external (lateral) rotation of the humerus at the shoulder joint through rotating the shoulders while laying down and with arms bent at elbow. <ul style="list-style-type: none"> - Inability to externally rotate the forearms to the floor (90 degrees) overhead indicates potential tightness in subscapularis as well as tightness in the joint capsule and ligaments. - Inability to internally rotate the forearms forward to 70 degrees 	

Essential Understandings	Essential Knowledge and Skills
<p>indicates potential tightness in infraspinatus and teres minor, as well as tightness in the joint capsule and ligaments.</p> <ul style="list-style-type: none"> • Apley’s scratch test: Assesses simultaneous movements of the shoulder girdle (scapulothoracic and glenohumeral joints). Shoulder flexion, external rotation, and scapular abduction are measured by the individual raising one arm overhead, bending the elbow, and reaching behind the head with palms inward in an attempt to touch the medial border of the contralateral scapula, or to touch the vertebrae as low as possible. Shoulder extension, internal rotation, and scapular adduction are measured by the individual reaching an arm behind the lat and rotating the arm inward with the palm facing outward in an attempt to touch the inferior angle of the contralateral scapula, or to reach up the spine as far as possible <ul style="list-style-type: none"> - Inability to reach specific landmarks indicates a need for further evaluation to determine the source of the limitation. <p>Balance and core-strength evaluations of another individual may include: (FI.2.1)</p> <ul style="list-style-type: none"> • Sharpened Romberg Test: An assessment in which an individual stands with one foot in front of the other, with arms crossed and eyes closed in order to assess static balance by standing with a reduced base of support while removing visual sensory information; the individual will be timed, and a time of less than 30 seconds is indicative of inadequate static balance and postural control. • Stork-Stand Balance Test: An assessment in which an individual stands in a stork position with the heel elevated; meant to assess static balance. <p>Rating scale:</p> <ul style="list-style-type: none"> - Excellent: <ul style="list-style-type: none"> ○ Female: > 30 seconds 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ Male: > 50 seconds - Good: <ul style="list-style-type: none"> ○ Female: 25-30 seconds ○ Male: 41-50 seconds - Average: <ul style="list-style-type: none"> ○ Female: 16-24 seconds ○ Male: 31-40 seconds - Fair: <ul style="list-style-type: none"> ○ Female: 10-15 seconds ○ Male: 20-30 seconds - Poor: <ul style="list-style-type: none"> ○ Female: < 10 seconds ○ Male: < 20 seconds <p>Contraindications to assessments of movement may include movement assessment, such as pain, inability to complete the assessment, and low levels of health-related fitness/deconditioned. (FI.2.m) Also refer to FI.2.j.</p> <p>Assessments to evaluate the health-related components of fitness may include: (FI.2.n)</p> <ul style="list-style-type: none"> • Criterion-referenced fitness assessments, such as the FitnessGram assessments. • Cardiorespiratory assessments, such as the YMCA Submaximal Step Test, YMCA Bike Test, Submaximal Talk Test, VT2 Threshold Test, Rockport Fitness Walking Test, and/or the 1.5 Mile Run Test. <ul style="list-style-type: none"> ○ YMCA Submaximal Step Test: The individual will step up and down a 12-inch step at a rhythm of 96 beats per minute. At the conclusion, the individual will take their pulse for one minute, indicating relative 	

Essential Understandings	Essential Knowledge and Skills
<p>levels of cardiorespiratory fitness.</p> <ul style="list-style-type: none"> • Muscular endurance assessments, such as the push-up test, curl-up test, and body-weight squat test. • Muscular strength assessments, such as the 1 repetition max (1RM), 3RM, and estimated 1RM strength assessments. • Body composition assessments (e.g., bioelectrical impedance analysis, BMI, skinfold measures). <p>Assessments to evaluate the skill-related components of fitness may include: (FI.2.o)</p> <ul style="list-style-type: none"> • Agility assessments (e.g., shuttle run, pro agility run, Illinois agility run) • Balance assessments (e.g., Romberg test) • Coordination assessments (e.g., stick test) • Power assessments, (e.g., vertical jump and broad jump) • Reaction time assessments (e.g., ruler drop test) • Speed assessments (e.g., 40-yard dash, 100-meter dash) <p>Contraindications to health-related and skill-related fitness assessments may involve exertion (cardiorespiratory, muscular strength, muscular endurance). (FI.2.p)</p> <ul style="list-style-type: none"> • Onset of angina or chest pain • Significant drop in systolic blood pressure • Significant increase in diastolic blood pressure • Excess fatigue • Subject requests to stop <p>Different methods for determining body composition may include: (FI.2.q)</p> <ul style="list-style-type: none"> • Bioelectrical impedance analysis (BIA) 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Body mass index (BMI) • Dual-energy X-ray absorptiometry (DEXA) • Hydrostatic weighing • Near-infrared interactance • Skinfold measurements • Waist-to-hip ratio (WHR) • Whole-body air displacement plethysmography (Bod Pod) <p>Benefits and challenges of different methods for determining body composition: (FI.2.r)</p> <ul style="list-style-type: none"> • Bioelectrical impedance analysis (BIA): a simple, non-invasive technique that uses electrical conductivity to estimate lean body mass. This test is dependent upon hydration status because muscle holds most of the water in the body; so, the more muscle, the better the conduction. The error of bioelectrical impedance is 3-3.5%. BIA can be done using a device in a fitness setting; however, more accurate whole-body machines are found only in laboratory settings. • Body mass index (BMI): The ratio of height to weight; easy to complete; does not take into account lean mass and fat mass. • Dual-energy X-ray absorptiometry (DEXA): A whole-body scanning system that delivers low-radiation X-ray to determine bone and soft-tissue mass; very accurate, yet found only in laboratory settings. • Hydrostatic weighing: A measurement that determines body fat through submerging an individual in water and measuring water displacement; seen as the gold standard of body composition measures, yet found primarily in laboratory settings. • Near-infrared interactance: The measurement of tissue composition through use of near-infrared light, usually at the biceps brachii. Easy to 	

Essential Understandings	Essential Knowledge and Skills
<p>use in a fitness setting; however, it is not seen to be as accurate as laboratory techniques.</p> <ul style="list-style-type: none"> • Skinfold measurements: The use of a caliper to pinch a fold of skin and fat at several sites on the body (see Jackson-Pollock for measurement sites), with measurements plugged in to an equation to calculate body fat percentage; easy to use in a fitness setting and provides accurate measurements as long as the individual taking the measurements has been properly trained in this method. • Waist-to-hip ratio (WHR): The measurement of the difference in body circumference at the waist and hip; ratios indicative of higher circumference in the waist are indicative of greater health risks. <p>To meet goals for general health benefits, weight management, fitness improvements, and athletic performance enhancement, refer to FI.1.q to differentiate between recommendations for physical activity and training principles. (FI.2.s)</p> <p>To explain the effects of acute and chronic exercise on aerobic and anaerobic energy systems, review the previous year’s content and vocabulary as appropriate, including: (FI.2.t)</p> <ul style="list-style-type: none"> • An acute bout of exercise increases cardiac output, blood flow, blood pressure, circulation, respiration. • Long-term adaptive responses include hypertrophy of the cardiac muscle fibers (i.e., increases in the size of each fiber). This hypertrophy increases the muscle mass of the ventricles, permitting greater force to be exerted with each beat of the heart. Increases in the thickness of the posterior and septal walls of the left ventricle can lead to a more forceful contraction of the left ventricle, thus emptying more of the blood from the left ventricle 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • The musculoskeletal system is to define and move the body. To provide efficient and effective force, muscle adapts to demands. Refer to FI.2.e to review muscle fiber types. • Skeletal muscle is composed of two basic types of muscle fibers distinguished by their speed of contraction—slow-twitch and fast-twitch. <ul style="list-style-type: none"> ○ Slow-twitch muscle fibers contain a large number of capillaries, mitochondria (which transform energy from food into adenosine triphosphate [ATP], or cellular energy), and myoglobin (which allows for improved delivery of oxygen). ○ Fast-twitch muscle fibers generally contain fewer capillaries, mitochondria, and myoglobin—they have a lower capacity to use oxygen and fatigue quickly. • Major metabolic pathways involved in energy production include: <ul style="list-style-type: none"> ○ The ATP-PCr system provides energy from the ATP stored in all of the body’s cells. PCr, also found in all cells, is a high-energy phosphate molecule that stores energy. As ATP concentrations in the cell are reduced by the breakdown of ATP to adenosine diphosphate (ADP) to release energy for muscle contraction, PCr is broken down to release both energy and a phosphate to allow reconstitution of ATP from ADP. This process describes the primary energy system for short, high-intensity exercise, such as a 40- to 200-meter sprint; during such exercise, the system can produce energy at very high rates, and ATP and PCr stores, which are depleted in 10-20 seconds, will last just long enough to complete the exercise. At high rates of work, the active muscle cell’s oxygen demand exceeds its supply. The cell must then rely on the glycolytic energy system to produce ATP in the absence of oxygen (i.e., anaerobically). This system can only use glucose, available in the blood plasma and stored in both muscle and 	

Essential Understandings	Essential Knowledge and Skills
<p>the liver as glycogen.</p> <ul style="list-style-type: none"> ○ The glycolytic energy system is the primary energy system for all-out bouts of exercise lasting from 30 seconds to two minutes, such as an 800-meter run. The major limitation of this energy system is that it produces lactate, which lowers the pH of both the muscle and blood. Once the pH drops below a value of 6.4 to 6.6, enzymes critical for producing energy are no longer able to function, and ATP production stops. ○ The oxidative energy system uses oxygen to produce ATP within the mitochondria, which are special cell organelles within muscle. This process cannot generate ATP at a high enough rate to sustain an all-out sprint, but it is highly effective at lower rates of work (e.g., long distance running). ATP can also be produced from fat and protein metabolism through the oxidative energy system. Typically, carbohydrate and fat provide most of the ATP; under most conditions, protein contributes only 5 to 10 percent at rest and during exercise. ○ Adequate fluid intake during exercise sessions is critical to prevent impairments induced by dehydration from endurance, muscular power, and/or strength exercises. <p>Cardiorespiratory exercise has a profound effect on physical and mental health. The body’s response to cardiorespiratory exercise is predictable to the increased demands of exercise. With few exceptions, the cardiovascular response to exercise is directly proportional to the skeletal muscle oxygen demands for any given rate of work, and oxygen uptake (VO₂) increases linearly with increasing rates of work. (FI.2.u) The body’s physiological, physical, and performance-based response to cardiorespiratory training includes the points below. Also refer to FI.2.t.</p>	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Stronger and more efficient heart, improved ability to pump blood (enhanced cardiac output) • Reduced risk of heart disease, obesity, or diabetes • Lower resting heart rate • More efficient breathing, stronger respiratory muscles • Improved oxygen transport and ability of muscles to use oxygen • Reduced cholesterol levels and blood pressure • Improved fuel supply (improved ability to use fatty acids, sparing muscle glycogen stores) • Improvement in mental alertness, tolerance to stress, ability to relax and sleep • Reduced tendency for depression and anxiety • Increase in lean body mass and metabolic rate <p>The body’s physiological, physical, and performance-based response to resistance training includes (FI.2.v):</p> <ul style="list-style-type: none"> • Improved cardiovascular efficiency • Beneficial endocrine (hormone) and serum lipid (cholesterol) adaptations • Increased bone density • Increased metabolic efficiency (metabolism) • Increased tissue (muscle, tendons, ligaments) tensile strength • Increased cross-sectional area of muscle fibers • Decreased body fat • Increase neuromuscular control (coordination) • Increased endurance, strength, and power <p>A warm-up is generally described as preparing the body for physical activity while the cool-down is to provide the body with a smooth transition from</p>	

Essential Understandings	Essential Knowledge and Skills
<p>exercise back to a steady state of rest. It can be general in nature or more specific to the activity. (FI.2.w)</p> <ul style="list-style-type: none"> • The purpose of the warm-up period is to increase heart and respiration rates, increase tissue temperature, and psychologically prepare the individual for higher training intensities. A warm-up should last between five and 10 minutes, depending on the goals and objectives of the participant. • The purpose of the cool-down is to reduce heart and breathing rates, gradually cool body temperature, return muscles to their optimal length-tension relationships, and prevent venous pooling of blood in the lower extremities. A cool-down of five to 10 minutes provides the body with an essential transition from exercise back to rest. <p>Blood-pressure response related to acute exercise, chronic exercise, and changes in posture include systolic blood pressure increasing linearly with increases in exercise intensity. In a healthy person with a “normal” systolic pressure of 120 mmHg, vigorous aerobic fitness training can increase systolic pressure to 180 mmHg and take 10-20 minutes to return to resting levels. The higher the intensity of exercise, the greater the rise in heart rate will be and consequently the larger the increase in systolic blood pressure. With most types of exercise, there is minimal change in diastolic blood pressure. (FI.2.x)</p> <p>Explain reversibility or deconditioning and the effect on fitness and performance. (FI.2.y)</p> <ul style="list-style-type: none"> • Reversibility means that an athlete can lose the effects of training when they stop and can gain the effects when they begin to train again. • Deconditioning, or detraining, occurs once an individual stops exercising and can be affected by age, fitness level, how long the individual has been exercising, and the type of exercise the individual was doing and at what 	

Essential Understandings	Essential Knowledge and Skills
<p>level</p> <ul style="list-style-type: none"> • Cardiovascular (aerobic) gains made with exercise: notably the heart’s ability to pump blood more efficiently, the muscles’ improved capacity to process oxygen, and the body’s enhanced ability to use carbohydrates for fuel. • Even two weeks of detraining can lead to a significant decline in cardio fitness, according to the American College of Sports Medicine. Not exercising for two to eight months leads to loss of virtually all fitness gains. In general, the loss of aerobic capacity occurs more rapidly than declines in muscle strength. <p>A musculoskeletal injury affects the body’s muscular or skeletal system and interferes with the body’s ability to move freely and without pain. Common musculoskeletal injuries include (FI.2.z):</p> <ul style="list-style-type: none"> • Ankle sprains • Knee injuries involving ligaments • Low-back injuries • Shoulder injuries • Other injuries • Past surgeries <p>Delayed onset muscle soreness (DOMS) is exercise-related muscle pain. It develops after excessive and unaccustomed exercise and can cause tiny, microscopic tears in your muscle fibers. It is particularly prevalent if that exercise has an eccentric component during which the muscle exerts force while lengthening, as can happen when a person runs down a steep hill or lowers a weight from a fully flexed to a fully extended position (e.g., the two-arm curl). Overuse or overtraining is the excessive frequency, volume, or intensity of</p>	

Essential Understandings	Essential Knowledge and Skills
<p>training, resulting in fatigue (which is also caused by a lack of proper rest and recovery). Overtraining may reduce the response of T-lymphocytes, decrease antibody synthesis, and contribute to adverse effects on the immune system. (FI.2.aa)</p> <p>The inflammatory response is triggered by damage to living tissues. Your body responds to the damage from excessive and unaccustomed exercise by activating the body’s pain receptors and initiates a protective mechanism, increasing muscle tension or causing a muscle spasm. The healing process takes time and can include lower-intensity recovery movements, topical analgesics, cold bath, warm bath, anti-inflammatory foods, or massage. (FI.2.bb)</p> <p>Common upper-extremity injuries include muscle strains, ligament sprains, pectoralis major tendon ruptures, distal biceps tendon ruptures, and chronic shoulder pain. While each injury is unique in its specific anatomic location and mechanism, each is preventable with proper exercise technique, safety, and maintenance of muscle balance. (FI.2.cc)</p> <ul style="list-style-type: none"> • Low-back injuries can cause decreased neural control to stabilizing muscles of the core, resulting in poor stabilization of the spine. This can further lead to dysfunction in the upper and lower extremities. • Shoulder injuries cause altered neural control of the rotator cuff muscles, which can lead to instability of the shoulder joint during functional activities. <p>Common lower-extremity injuries that result from human movement imbalances can include repetitive hamstring strains, groin strains, patellar tendonitis (jumper’s knee), plantar fasciitis (pain in the heel and bottom of the foot), and posterior tibialis tendonitis (shin splints). While each injury is unique in its</p>	

Essential Understandings	Essential Knowledge and Skills
<p>specific anatomic location and mechanism, each is preventable with proper exercise technique, safety, and maintenance of muscle balance. Balance training programs are frequently used to help prevent lower extremity injuries. (FI.2.dd)</p> <ul style="list-style-type: none"> • Ankle sprains have been shown to decrease the neural control to the gluteus medius and gluteus maximus muscles. This, in turn, can lead to poor control of the lower extremities during many functional activities, which can lead to injury. • Knee injuries involving ligaments can cause a decrease in the neural control to muscles that stabilize the patella (kneecap) and lead to further injury. Knee injuries that are not the result of contact (noncontact injuries) are often the result of ankle or hip dysfunctions, such as the result of an ankle sprain. <p>Appropriate modifications for an injured participant may be based on many factors such as the location of the injury, the movement patterns involved, joint angles, weight bearing or not, and/or the original program structure. (FI.2.ee)</p>	

Fitness Planning

- FI.3 The student will plan and describe a personalized fitness and conditioning program for others that includes skill-related and health-related fitness components to achieve and maintain a health-enhancing level of physical fitness for a lifetime.
- a) Identify the components of a health/medical history.
 - b) Identify the limitations of a health/medical history.
 - c) Identify the common signs and symptoms of cardiovascular, metabolic, or pulmonary diseases.
 - d) Conduct a health and exercise history with another individual.
 - e) Develop SMART fitness goals with another individual based on fitness assessments and personal desired outcomes.
 - f) Apply the FITT (frequency, intensity, time, and type of exercise) principles to improve or maintain cardiovascular and musculoskeletal fitness in healthy adults, seniors, youth, adolescents, and pregnant women.
 - g) Develop functional programming for stability, mobility, and movement.
 - h) Develop a resistance-training program with appropriate progressions.
 - i) Develop a cardiorespiratory training program with appropriate progressions.
 - j) Evaluate fitness programming for others to determine effectiveness.
 - k) Identify contraindications of cardiorespiratory exercise.
 - l) Define and explain exercises to improve range of motion, including dynamic stretching, passive stretching, proprioceptive neuromuscular facilitation (PNF), and partner stretching.
 - m) Identify contraindications of range of motion exercises.
 - n) Describe different forms of mind-body exercise (e.g., yoga, Pilates, tai chi).
 - o) Identify indications for use of mind-body exercise.
 - p) Identify contraindications for mind-body exercise.

Essential Understandings	Essential Knowledge and Skills
<p>Obtaining a participant’s medical history is vitally important because it provides information about known or suspected chronic disease, such as coronary heart disease, high blood pressure, or diabetes. A medical history provides information about the client’s past and current health status, as well as any past or recent injuries, surgeries, or other chronic health conditions. Identify</p>	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • identify components of health/medical history (FI.3.a); • identify limitations of health/medical history

Essential Understandings	Essential Knowledge and Skills
<p>components of health/medical history. (FI.3.a)</p> <p>Identify limitations of health/medical history. (FI.3.b)</p> <ul style="list-style-type: none"> • PAR-Q: The Physical Activity Readiness Questionnaire is designed to determine the safety or possible risk of exercising for a client based on the answers to specific health history questions. <p>Identify signs and symptoms common for cardiovascular, metabolic, or pulmonary diseases. (FI.3.c)</p> <ul style="list-style-type: none"> • Cardiovascular disease <ul style="list-style-type: none"> ○ Heart attack: Chest pain or discomfort, upper back or neck pain, indigestion, heartburn, nausea or vomiting, extreme fatigue, upper body discomfort, dizziness, and shortness of breath. ○ Arrhythmia: Fluttering feelings in the chest (palpitations). ○ Heart failure: Shortness of breath, fatigue, or swelling of the feet, ankles, legs, abdomen, or neck veins. • Metabolic syndrome: defined as the presence of at least three of these components: elevated waist circumference, elevated triglycerides, reduced high-density lipoprotein cholesterol, high blood pressure, and elevated fasting blood glucose. • Pulmonary disease <ul style="list-style-type: none"> ○ Chronic obstructive pulmonary disease (COPD) refers to a group of diseases that cause airflow blockage and breathing-related problems. It includes emphysema and chronic bronchitis. Symptoms of COPD include frequent coughing or wheezing, excess phlegm, mucus, or sputum production, shortness of breath, and trouble taking a deep breath. <p>Refer to FI.3.a and FI.3.b to conduct a health and exercise history with another</p>	<p>(FI.3.b);</p> <ul style="list-style-type: none"> • identify signs and symptoms common for cardiovascular, metabolic, or pulmonary diseases (FI.3.c); • conduct health and exercise history with another individual (FI.3.d); • develop SMART fitness goals with another individual based on fitness assessments and personal desired outcomes (FI.3.e); • apply FITT principle to improve or maintain cardiovascular and musculoskeletal fitness in healthy adults, seniors, youth, adolescents, and pregnant women (FI.3.f); • develop functional programming for stability, mobility, and movement (FI.3.g); • develop a resistance-training program with appropriate progressions (FI.3.h); • develop a cardiorespiratory-training program with appropriate progressions (FI.3.i); • evaluate fitness programming for others to determine effectiveness (FI.3.j); • identify contraindications of cardiorespiratory exercise (FI.3.k); • define and explain exercises to improve range of motion, including dynamic stretching, passive stretching, proprioceptive neuromuscular facilitation (PNF), and partner stretching (FI.3.l);

Essential Understandings	Essential Knowledge and Skills
<p>individual. (FI.3.d)</p> <p>A SMART goal is a best practice framework for setting goals: they are specific, measurable, achievable, realistic/relevant and time-bound to clarify exactly what will be required for achieving success and to be able to share that clarification with others based on individual fitness assessments and personal desired outcomes. (FI.3.e)</p> <p>The FITT principle is a set of rules that dictates the frequency, intensity, type and time of exercise. The FITT principle varies based on different groups and populations. (FI.3.f)</p> <ul style="list-style-type: none"> • Seniors <ul style="list-style-type: none"> ○ F: 3-5 days/week ○ I: 40-85% of VO2 Max ○ T: 30-60 minutes/day with 8-10 minute bouts ○ T: Stationary or recumbent cycling, aquatic exercise, treadmill with hand support ○ Physiological considerations and implications for training include: <ul style="list-style-type: none"> ▪ Maximal oxygen uptake and exercise heart rate decrease with increasing age; initial exercise workloads should be low and progress gradually. ▪ Percentage of body fat will increase, and bone mass and lean body mass will decrease with increasing age; resistance exercise is recommended, with lower initial weights and slower progression. ▪ Balance, gait, and neuromuscular coordination may be impaired; exercise options should be chosen and progressed to safeguard against falls. ▪ There is a higher rate of diagnosed and undetected heart disease in 	<ul style="list-style-type: none"> • identify contraindications of range of motion exercises (FI.3.m); • describe different forms of mind-body exercise (e.g., yoga, Pilates, tai chi) (FI.3.n); • identify indications for use of mind-body exercise (FI.3.o); • identify contraindications for mind-body exercise. (FI.3.p) <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes KidsHealth.gov Health Smart Virginia MyPlate.gov OpenPhySED Physical Activity Guidelines for Americans, 2nd ed. Healthy Children.org</p>

Essential Understandings	Essential Knowledge and Skills
<p>the elderly; knowledge of pulse assessment during exercise is critical.</p> <ul style="list-style-type: none"> ▪ Pulse irregularity is more frequent: careful analysis of medication use and possible exercise side effects <ul style="list-style-type: none"> • Youth/Adolescents <ul style="list-style-type: none"> ○ F: 5-7 days/week ○ I: Moderate to vigorous ○ T: 60 minutes/day ○ T: walking, jogging, running, games, activities, sports, water activity, resistance training ○ Special considerations: progression should be based on postural control and not on the amount of weight. • Pregnant Women <ul style="list-style-type: none"> ○ F: 3-5 days/week ○ I: Physician’s advice ○ T: 15-30 minutes/day ○ T: low-impact, walking, stationary cycling, water activity ○ Physiologic considerations: <ul style="list-style-type: none"> ▪ Contraindications include persistent bleeding in the second to third trimester, medical documentation of incompetent cervix or intrauterine growth retardation, pregnancy-induced hypertension, preterm rupture of membrane, or preterm labor during current or prior pregnancy. ▪ Decreased oxygen available for aerobic exercise. ▪ Posture can affect blood flow to the uterus during vigorous exercise. ▪ Even in the absence of exercise, pregnancy may increase metabolic demand by 300 kcal per day to maintain energy 	

Essential Understandings	Essential Knowledge and Skills
<p>balance.</p> <ul style="list-style-type: none"> ▪ High-risk pregnancy considerations include individuals older than 35, a history of miscarriage, diabetes, thyroid disorder, anemia, obesity, and a sedentary lifestyle. <p>Functional programming is an approach to training used a little or a lot to increase strength, correct imbalances, improve movement quality, and gain comfort and confidence in positions. (FI.3.g)</p> <p>To develop a resistance-training program with appropriate progressions, the following concepts are key to understanding (FI.3.h):</p> <ul style="list-style-type: none"> • Acute variables: important components that specify how each exercise is to be performed • Repetition (or “rep”): one complete movement of a single exercise; each phase of training has specific goals and requires a specific number of repetitions • Sets: a group of consecutive repetitions • Training intensity: an individual’s level of effort, compared with their maximal effort, which is usually expressed as a percentage • Repetition temp: the speed with which each repetition is performed • Rest interval: the time taken to recuperate between sets • Training volume: amount of physical training performed within a specified period • Training frequency: the number of training sessions performed during a specified (usually one week) • Training duration: the timeframe of a workout or the length of time spent in one phase of training • Exercise selection: the process of choosing appropriate exercises for a 	

Essential Understandings	Essential Knowledge and Skills
<p>client’s program</p> <ul style="list-style-type: none"> • Training plans: the specific outline, created by a fitness professional to meet a client’s goals, that details the form of training, length or time, future changes, and specific exercises to be performed • Annual, monthly, weekly plan • Various resistance-training modalities include: <ul style="list-style-type: none"> ○ Strength machines, free weights, cable machines, resistance bands, medicine ball, kettlebell, body weight, suspension body weight, stability ball, BOSU ball, vibration <p>Cardiorespiratory training programs need appropriate progressions through various stages to achieve optimal levels of physiologic, physical, and performance adaptations. Key elements include (FI.3.i):</p> <ul style="list-style-type: none"> • Rate of progression: critical to helping clients achieve personal health and fitness goals in the most efficient and effective use of time and energy without resulting in injury. • Each cardio-respiratory session should include a warm-up phase, conditioning phase, and a cool-down phase. • Methods of prescribing exercise intensity <ul style="list-style-type: none"> ○ Maximal oxygen consumption (VO₂ max): the highest rate of oxygen transport and use achieved at maximal physical exertion. ○ Oxygen uptake reserve (VO₂R): the difference between resting and maximal or peak oxygen consumption. ○ Peak Metabolic Equivalent (MET) Method: METs describe the energy cost of physical activity as multiples of metabolic rate. ○ Peak Maximal Heart Rate (MHR) Method: a formula not meant to design a cardio program (220 minus client’s age). ○ HR Reserve (HRR) Method (Karvonen method): establishing training 	

Essential Understandings	Essential Knowledge and Skills
<p>intensity based on the difference between a client’s predicted maximal heart rate and their resting heart rate.</p> <ul style="list-style-type: none"> ○ Ratings of Perceived Exertion Method: a subjective rating scale of perceived exertion used to express or validate how hard a client feels they are working during exercise. ○ Talk Test Method: the ability to speak during activity can identify exercise intensity and ventilatory threshold. <ul style="list-style-type: none"> • Enjoyment of the mode or type of cardio activity selected. <p>Evaluation for effectiveness of a fitness program will follow a process similar to one used to create an initial fitness program. (FI.3.j)</p> <ul style="list-style-type: none"> • First revisit the goals or objectives of the workout program. • Next determine whether any goals have been met by the program, and which goals may be outstanding or not attained. • Discussion with the individual/client should focus on their opinion relating to the pros, cons, and personal adherence to the program that is being followed currently. • Evaluation of the individual’s current fitness levels and areas of improvement needed may be obtained by completing testing on cardiovascular fitness, muscular strength and functional strength. • Once all information has been obtained, a new or modified fitness program can be established using a template that will address any weaknesses or areas needing improvement for the individual/client. • Fitness programming may require a Corrective approach, a Performance approach, or a more Generalized approach but must be driven by the needs and compliance of the individual/client. • Regular evaluation and appropriate modification of fitness programming is key to meeting goals. 	

Essential Understandings	Essential Knowledge and Skills
<p>Contraindications of cardiorespiratory exercise can include (FI.3.k):</p> <ul style="list-style-type: none"> • Pain • Inflammation • Severe cardiac diseases • Cardiac symptoms such as chest pain (angina) or arrhythmias • Hypertension > 160/105 • Chest pain • Deconditioned • Postural considerations such as: <ul style="list-style-type: none"> ○ Upper Crossed Syndrome ○ Lower Crossed Syndrome ○ Pronation Distortion Syndrome <p>Exercises that improve range of motion, may include (FI.3.l):</p> <ul style="list-style-type: none"> • Dynamic stretching is the use of movement to stretch muscles before exercise and relies on momentum to engage the muscles, rather than holding a stretch at a standstill. • Static stretching is stretching to the farthest point and holding the stretch. • Passive stretching (while also being a static stretch), where an external force is created by an outside force, such as a partner. • Proprioceptive neuromuscular facilitation (PNF) involves stretching and contracting the muscle group to be stretched so muscles are stretched and under tension. Then the individual contracts the stretched muscle group for 5-6 seconds while a partner applies sufficient resistance to inhibit movement. The contracted muscle group is then relaxed and a controlled stretch is applied for 20-30 seconds. 	

Essential Understandings	Essential Knowledge and Skills
<p>Contraindications of range of motion exercises include (FI.3.m):</p> <ul style="list-style-type: none"> • Healing from an injury • Soft tissue trauma • DOMS • Deconditioned <p>Instruction on mind-body exercises that combine body movement, mental focus, and controlled breathing to improve strength, balance, flexibility, and overall health are helpful in reducing stress, creating a sense of calm, decreasing chronic pain, and improving sleep patterns. Experience yoga, Pilates, and martial arts (such as tai chi, tae kwon do, and qi gong) are the most commonly known types of physical activity classified as mind-body exercises. (FI.3.n)</p> <ul style="list-style-type: none"> • Yoga is a type of exercise in which you move your body into various positions to become more fit or flexible, to improve your breathing, and to relax your mind. • Pilates is a system of exercises, using special apparatus, designed to improve physical strength, flexibility, and posture, and enhance mental awareness. • Tai chi is a Chinese martial art and form of stylized, meditative exercise, characterized by methodically slow circular and stretching movements and positions of bodily balance. <p>Identify indications for use of mind-body exercise. (FI.3.o)</p> <ul style="list-style-type: none"> • Chronic diseases and conditions such as Parkinson’s Disease, Cardiovascular Disease, Alzheimer’s Disease, Migraine headaches, epilepsy, stroke, neuropathy, and ADHD have shown positive changes in postural stability, blood pressure, vital capacity, flexibility, pain management and aerobic capacity as a result of regular mind-body exercise. (NIH PUB MED or doi: 10.1212/01.wnl.0000314667.16386.5e) 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Mind-body exercise often produces a decrease in mental/emotional and physiological symptoms associated with various diseases/conditions. • Mental clarity and emotional resilience has also shown improvement among those with mild mental or emotional disabilities. • In the generally healthy population, mind-body exercise improves overall flexibility, core strength, focus and mood, along with decreased levels of stress and increased capacity to manage stress. <p>Mind-body exercise is generally safe with the exception of a few contraindications that include (FL.3.p):</p> <ul style="list-style-type: none"> • When practiced appropriately, yoga has no known side effects. One should exercise caution when attempting new postures. Certain postures, particularly headstands, should not be attempted during pregnancy or by patients with hypertension or heart disease. Individuals with diabetes, hernias, bone cancer, or a history of eye, ear, or brain problems should consult with their healthcare providers prior to beginning any yoga program. • Individuals with epilepsy or schizophrenia should avoid practicing meditation and exercises requiring altered levels of consciousness because of reports of grand mal seizures in the former and acute psychotic events in the latter. • No known side effects or contraindications have been identified with Qigong or tai chi; however, individuals with bone tumors or those with severe bone osteoporosis should contact their healthcare providers prior to attempting any type of exercise. 	

Social and Emotional Development

FI.4 The student will accept responsibility for taking a leadership role as well as demonstrate the ability to follow, in order to accomplish group goals.

- a) Define and explain *cultural competence* and its importance in developing rapport with another individual.
- b) Demonstrate effective teaching techniques for working with individuals of different learning styles, motivation levels, and physical activity levels.
- c) Explain learning styles and instructional strategies, including visual, auditory, and kinesthetic.
- d) Demonstrate effective and varied teaching techniques for a variety of exercises.
- e) Demonstrate and explain how to respond in an emergency situation.
- f) Identify signs of cardiac emergency.
- g) Demonstrate CPR and AED procedures for adults and children.
- h) Identify emergency situations requiring first aid.
- i) Demonstrate first-aid techniques used in emergency situations.
- j) Identify and describe universal precautions and personal protection used during CPR and first aid.

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<p>Cultural competence describes the ability of an individual or organization to interact effectively with people of different cultures. Cultural competence improves sustainability by reinforcing the value of diversity, flexibility, and responsiveness in addressing the current and changing needs of clients, communities, and the personal fitness training environments. (FI.4.a)</p> <p>Individual learning style refers to the preferential way in which a person absorbs, processes, comprehends and retains information.</p> <ul style="list-style-type: none"> • Explore intrinsic motivators that may include fascination with the subject, a sense of its relevance to life and the world, a sense of accomplishment in mastering it, and a sense of calling to it. • Intrinsic motivation can be long-lasting and self-sustaining when compared to extrinsic motivators that may include following doctors' or 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • define and explain cultural competence and its importance in developing rapport with another individual (FI.4.a); • demonstrate effective teaching techniques for working with individuals of different learning styles, motivation levels, and physical activity levels (FI.4.b); • explain learning styles and instructional strategies, including visual, auditory, and kinesthetic (FI.4.c); • demonstrate effective and varied teaching

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<p>family members’ advice.</p> <p>Deep learners respond well to the challenge of mastering a difficult and complex subject and are intrinsically motivated students. Everybody learns differently. (FI.4.b, FI.4.c, FI.4.d)</p> <p>Client safety is a top priority. Develop an emergency action plan (EAP) that includes the identification of an emergency response team (ERT), is specific to each fitness venue, and reflects the following important considerations related to managing emergency situations (FI.4.e):</p> <ul style="list-style-type: none"> • emergency personnel • emergency communication • emergency equipment • medical emergency transportation. <p>Common cardiac emergencies include cardiac arrest and a heart attack. Cardiac arrest is when a person’s heart stops beating. A heart attack, also called a myocardial infarction, happens when a part of the heart muscle doesn’t get enough blood. The more time that passes without treatment to restore blood flow, the greater the damage to the heart muscle. The major symptoms of a heart attack are: (FI.4.f)</p> <ul style="list-style-type: none"> • Chest pain or discomfort. Most heart attacks involve discomfort in the center or left side of the chest that lasts for more than a few minutes or that goes away and comes back. The discomfort can feel like uncomfortable pressure, squeezing, fullness, or pain. • Feeling weak, light-headed, or faint. You may also break out into a cold sweat. • Pain or discomfort in the jaw, neck, or back. 	<p>techniques for a variety of exercises (FI.4.d);</p> <ul style="list-style-type: none"> • demonstrate and explain how to respond in an emergency situation (FI.4.e); • identify signs of cardiac emergency (FI.4.f); • demonstrate CPR and AED procedures for adults and children (FI.4.g); • identify emergency situations requiring first aid (FI.4.h); • demonstrate first-aid techniques used in emergency situations (FI.4.i); • identify and describe universal precautions and personal protection used during CPR and first aid (FI.4.j); • describe the mental wellness supports available for individuals in the community (FI.4.k); • analyze and explain the benefits of exercise to alleviate stress and support mental wellness of individuals (FI.4.l). <p>Additional resources: OPEN Online Physical Education Network Health Smart Virginia PE Central EverFi KidsHealth.org</p>

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> • Pain or discomfort in one or both arms or shoulders. • Shortness of breath. This often comes along with chest discomfort, but shortness of breath also can happen before chest discomfort. <p>Adult and child cardiopulmonary resuscitation (CPR) and the use of an automated external defibrillator (AED): CPR should follow current guidelines as set by the International Liaison Committee on Resuscitation/American Heart Association (guidelines are reviewed and revised every five years). (FI.4.g)</p> <p>Emergency situations requiring first aid may include choking, bleeding, contusions, fractures, or anaphylactic shock. (FI.4.h)</p> <p>Demonstrate first-aid techniques used in emergency situations. (FI.4.i)</p> <ul style="list-style-type: none"> • Choking can occur at any time and requires immediate action. <ul style="list-style-type: none"> ○ Conscious choking victims require the responder to perform five back blows, then five abdominal thrusts repeatedly to the victim until the object is forced out, the person can cough forcefully or breathe, or the person becomes unconscious. (American Red Cross Choking Guidelines) ○ Once the person becomes unconscious, ensure that 911 has been called and follow the procedures for CPR. (FI.4.g) • Bleeding is a common situation requiring first aid. <ul style="list-style-type: none"> ○ Non-life-threatening bleeding is characterized as a minor wound with slowly trickling or oozing blood. This type of bleeding is controlled with direct pressure over the wound using a sterile or clean gauze/cloth. Once the bleeding is controlled, clean the area with sterile water and apply a bandage to the wound. ○ Potentially life-threatening bleeding is characterized as a significant 	

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<p>wound with steady, dark-colored blood flow. This type of bleeding is controlled with direct pressure over the wound and additional pressure applied to a pulse point above or proximal to the wound. The wound will likely require a pressure dressing which applies continuous pressure over the bleeding site and may require sutures or closure by a physician. All large wounds should be evaluated by medical personnel and be monitored for infection.</p> <ul style="list-style-type: none"> ○ Life-threatening bleeding is characterized by a large, full-thickness wound which has injured or severed a major vein or an artery. This wound results in a spurting or pulsating bright red bleeding. This wound will require the use of a tourniquet to slow or stop the bleeding. A tourniquet is any straplike material that can be tightly applied proximal to or above the wound to slow blood flow to the area. This type of wound requires calling 911. Monitor the victim for signs of shock. ○ Do not apply direct pressure to any wound that could be superficial to an associated bone injury/fracture. ○ Nosebleeds are commonly seen during physical activity due to direct blows to the nose/face or simply from changes in temperature or pressure in the environment. Treatment for a nosebleed is similar to any other wound. Pressure is applied to the nostrils using clean/sterile cloth or gauze. Keep the person sitting upright and leaning slightly forward. Do not lean the head back or lay the victim down. If the bleeding is more difficult to stop, application of ice to the nose can sometimes help. If the nosebleed is not controlled within 15 minutes, seek medical assistance. • Contusions are bruises to bone and soft tissue caused by a direct blow to the area. 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ Characterized by pain, discoloration, and swelling in the area of the direct blow; bruises are easy to assess. ○ Application of an ice pack or cold compress to the area within the first 24-36 hours of the injury will help reduce the pain and inflammation. ○ Ice should be applied to an area for 10-15 minutes every one to two hours. Continuous application of ice is not necessary. ○ If the discoloration or pain is immediate or excessive, damage to underlying tissue/bone may be significant, seek medical assistance. • Fracture is the medical term used to diagnose a broken bone. A fracture and a break are the same injury. <ul style="list-style-type: none"> ○ Injury to a bone that produces a “crack, snap, or pop” sound could potentially result in a fracture. ○ If there is significant pain over a bone or inability to bear weight or pressure to a body part, a fracture should be suspected. ○ Immobilize the body part by applying a rigid material (splint) to the injury and cover the joints above and below the suspected injured bone. ○ Apply a sling, use crutches, or help the person in any movement so that further injury to the area is avoided. ○ Monitor for signs of shock. ○ If the injury is to a major bone such as the femur, humerus, pelvis, or if the victim is in excessive pain, call 911. ○ If the injury is to a smaller bone, such as a finger, toe, foot, or hand bone and the victim is stable, transport by private vehicle can be initiated. • Anaphylaxis is a severe, potentially life-threatening allergic reaction causing shock, which is when blood pressure suddenly drops and the airways narrow, causing breathing restrictions. 	

Essential Understandings	Essential Knowledge and Skills
<ul style="list-style-type: none"> ○ Causes of anaphylaxis include foods (nuts, eggs, wheat), insect venom (bee sting), latex, and some medications. ○ The only effective treatment for anaphylaxis is epinephrine injection and follow-up care in the emergency department. This requires calling 911. ○ An Epi-Pen is a single-dose of epinephrine used to treat anaphylaxis and can be used easily by any layperson, including self-injection. <p>Universal precautions refer to the practice, in medicine, of avoiding contact with patients’ bodily fluids by means of the wearing of nonporous articles such as medical gloves and face shields during CPR and first aid. (FI.4.j)</p> <p>Social and emotional networks can strongly influence behaviors and beliefs. People who are trying to change their exercise behavior and who have strong social support fare better. The following are various supports available for individuals (FI.4.k):</p> <ul style="list-style-type: none"> • Instrumental support: tangible, practical factors (i.e., transportation, babysitter, spotter, etc.) • Emotional support: expressed through encouragement, caring, empathy, and concern; enhances self-esteem and reduces anxiety. • Information support: directions, advice, suggestions, feedback regarding progress. • Companionship support: availability of family, friends, co-worker(s), other group(s). <p>Stress is the outcome of challenging situations that can cause physical symptoms, such as headaches and stomachaches. Exercise has been shown to be effective at reducing stress and can lead to immediate and long-term results. Other well-</p>	

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Essential Understandings	Essential Knowledge and Skills
documented mental wellness benefits include promoting a positive mood, improving sleep, and reducing depression and anxiety. (FI.4.1)	

Energy Balance

FL.5 The student will explain energy balance.

- a) Identify and explain dietary guidelines based on USDA recommendations.
- b) Identify macronutrients used by the body for energy.
- c) Identify the number of kilocalories found in macronutrients that provide energy.
- d) Explain energy balance and relationship to weight gain, weight loss, or weight maintenance.
- e) Explain lipid and lipoprotein profiles.
- f) Explain the influences of nutrition and physical activity on lipid and lipoprotein profiles.
- g) Explain the importance of hydration.
- h) Explain how to maintain hydration in a physically active individual, including effective methods to rehydrate after exercise.
- i) Identify and describe common supplements and ergogenic aids used by individuals in training programs.
- j) Explain potential risks, benefits, and contraindications associated with use of supplements and ergogenic aids.
- k) Explain the relationship between body composition and health.
- l) Define terms related to body composition, including *body mass index (BMI)*, *lean body mass*, and *fat mass*.
- m) Explain influences on body composition, including diet, exercise, and behavior modification.
- n) Identify and explain inappropriate weight-loss methods.
- o) Identify and explain eating disorders including anorexia nervosa and bulimia nervosa.
- p) Explain the female athlete triad.

Essential Understandings	Essential Knowledge and Skills
<p>Dietary guidelines reflect the current body of nutrition science, help health professionals and policymakers guide Americans to make healthy food and beverage choices, and serve as the science-based foundation for vital nutrition policies and programs across the United States. (FL.5.a) (https://www.dietaryguidelines.gov/)</p> <p>A macronutrient is an essential nutrient used by the body for energy that has a large minimal daily requirement, including proteins, fats, carbohydrates, and</p>	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • identify and explain dietary guidelines based on USDA recommendations (FL.5.a); • identify macronutrients used by the body for energy (FL.5.b); • identify the number of kilocalories found in macronutrients that provide energy (FL.5.c);

Essential Understandings	Essential Knowledge and Skills
<p>water. (FI.5.b)</p> <p>A calorie (or thermochemical calorie) is a unit of energy. There are 1,000 calories in a kilocalorie. The number of calories a person needs depends on their age, height, weight, gender, and activity level. People who consume more calories than they burn off in normal daily activity or during exercise are more likely to be overweight. One gram of fat contains nine calories. Protein and carbohydrates contain four calories per gram. (FI.5.c)</p> <p>Instruction includes an explanation that energy balance is the relationship between “energy in” (food calories taken into the body through food and drink) and “energy out” (calories being used in the body for our daily energy requirements). (FI.5.d)</p> <p>This relationship, which is defined by the laws of thermodynamics, dictates whether weight is lost, gained, or remains the same. According to these laws, energy is never really created, and it’s never really destroyed. Rather, energy is transferred between entities. We convert potential energy that’s stored within our food (measured in calories, or kcals) into three major “destinations”: work, heat and storage. (FI.5.d)</p> <p>Resting metabolic rate refers to the minimal amount of caloric energy required to maintain basic physiological needs, such as breathing, heart rate, thinking, and sleeping. (FI.5.d)</p> <p>Lipid profile is a pattern of lipids in the blood. A lipid profile usually includes the levels of total cholesterol, high-density lipoprotein (HDL) cholesterol, triglycerides, and the calculated low-density lipoprotein (LDL) cholesterol.</p>	<ul style="list-style-type: none"> • explain energy balance and relationship to weight gain, weight loss, or weight maintenance (FI.5.d); • explain lipid and lipoprotein profiles (FI.5.e); • explain the influences of nutrition and physical activity on lipid and lipoprotein profiles (FI.5.f); • explain the importance of hydration (FI.5.g); • explain how to maintain hydration in a physically active individual, including effective methods to rehydrate after exercise (FI.5.h); • identify and describe common supplements and ergogenic aids used by individuals in training programs (FI.5.i); • explain potential risks, benefits, and contraindications associated with use of supplements and ergogenic aids (FI.5.j); • explain the relationship between body composition and health (FI.5.k); • define terms related to body composition, including <i>body mass index</i> (BMI), <i>lean body mass</i>, and <i>fat mass</i> (FI.5.l) • explain influences on body composition, including diet, exercise, and behavior modification (FI.5.m); • identify and explain inappropriate weight-loss methods (FI.5.n);

Essential Understandings	Essential Knowledge and Skills
<p>(FI.5.e)</p> <p>Lipoproteins are molecules that have a globular shape and are a combination of lipid and protein. (FI.5.e)</p> <p>Total blood cholesterol as a measure of the cholesterol components LDL (low-density lipoprotein) cholesterol, HDL (high-density lipoprotein) cholesterol, and VLDL (very low-density lipoprotein, which is the triglyceride-carrying component of lipids). Explain that triglycerides are the chemical form in which most fat exists in food and the body. Triglycerides are mostly carried in VLDL and chylomicrons. VLDL comes from the liver and also has cholesterol. Chylomicrons come from dietary fat. (FI.5.e)</p> <p>Along with cholesterol, triglycerides form plasma lipids. Excess triglycerides in plasma have been linked to the occurrence of coronary artery disease in some people. Like cholesterol, increases in triglyceride levels can be detected by plasma measurements. These measurements should be made after an overnight food and alcohol fast. (FI.5.e)</p> <p>The standard clinical approach for reducing cardiovascular disease risk due to dyslipidemia is to prescribe changes in diet and physical activity and individualized physical activity programs to enhance lipid lipoprotein profiles by reducing triglycerides (TG), increasing HDL, and lowering LDL/HDL for clients. (FI.5.f)</p> <p>Good hydration means getting the right amount of water before, during, and after exercise. Water regulates your body temperature and lubricates your joints. It helps transport nutrients to give you energy and keep you healthy. Your body cannot perform at its highest level if you are not hydrated. Dehydration happens</p>	<ul style="list-style-type: none"> • identify and explain eating disorders, including anorexia nervosa and bulimia nervosa (FI.5.o); • explain the female athlete triad. (FI.5.p) <p>Additional resources: SHAPE America National Standards and Grade-Level Outcomes OpenPhySED Health Smart Virginia PE Central KidsHealth.gov MyPlate.gov Physical Activity Guidelines for Americans, 2nd ed. American Heart Association</p>

Essential Understandings	Essential Knowledge and Skills
<p>when your body does not have as much water as it needs to function properly. (FI.5.g)</p> <p>Hydration: Fluids help prevent dehydration. When we are physically active, our bodies sweat to help cool us down. Electrolytes such as sodium are also lost in our sweat. For this reason, many sports drinks contain a mix of water and electrolytes. The presence of these electrolytes also helps the water to diffuse through the small intestine and back into the body. (FI.5.h)</p> <p>The DSHEA defines dietary supplements as a substance that completes or makes an addition to daily dietary intake. Dietary supplements are an umbrella for a wide range of products, including weight loss pills and substances that promise to increase physical performance. (FI.5.i)</p> <p>Ergogenic aids are classified as nutritional, pharmacologic, physiologic, or psychological. Methods to enhance athletic performance range from use of accepted techniques, such as carbohydrate loading, to illegal and unsafe approaches, such as use of anabolic/androgenic steroids. (FI.5.i)</p> <p>Dietary supplements used to prevent or treat a specific health problem or enhance exercise and athletic performance come in a variety of forms, including tablets, capsules, liquids, powders, and bars. Many of these products contain numerous ingredients in varied combinations and amounts. Among the more common ingredients are amino acids, protein, creatine, and caffeine. (FI.5.j)</p> <p>Because the Food and Drug Administration (FDA) does not need to approve dietary supplements before being sold, the sole responsibility for determining the safety and effectiveness of a dietary supplement falls on the company that manufactures and markets the supplement. (FI.5.j)</p>	

Essential Understandings	Essential Knowledge and Skills
<p>There is no substitute for an appropriate training regimen and attitude, nor is there a magic pill that creates a world-class athlete out of anyone. If deciding to explore the possible use or supplements or ergogenic aid, ask three simple questions: Does it work? Is it safe? Is it ethical and legal? (FI.5.j)</p> <p>Benefits of having a healthy body composition: (FI.5.k)</p> <ul style="list-style-type: none"> • Normal blood pressure level • Improved quality of sleep • Improved mood and self-confidence • Increased energy and endurance throughout the day • Reduced pain in joints, hips, and lower back • Improved blood circulation, leading to lower risk for heart disease • Higher fertility rates and lower risk for pregnancy-related complications • Improved breathing, respiration, and lung function • Improved glucose tolerance and insulin sensitivity <p>Review factors that can lead to altered body composition: (FI.5.k)</p> <ul style="list-style-type: none"> • Lack of exercise and physical activity • Eating large portion sizes and overeating in general • High-fat, high-sugar diet • Lack of whole foods in the diet, such as fruits, vegetables, nuts, seeds, legumes • Excessive alcohol intake. <p>Body mass index (BMI) is a measure of body fat based on height and weight. (FI.5.l)</p> <ul style="list-style-type: none"> • Lean body mass refers to all of your body components except fat. It includes your body’s water, bone, organs, and muscle content. However, 	

Essential Understandings	Essential Knowledge and Skills
<p>when it comes to weight management and body composition, fat-free mass refers primarily to muscle mass.</p> <ul style="list-style-type: none"> • Fat mass is total body fat and can be measured with dual energy absorptiometry or bioelectrical impedance techniques. <p>Influences on body composition include gender, age, diet, activity level, and genes. (FI.5.l)</p> <ul style="list-style-type: none"> • Men tend to have more muscle mass than women, and women tend to have more fat mass than men. • As people age, lean muscle mass decreases, making it somewhat more difficult to maintain optimal body composition. <p>There are barrier(s) to making positive behavior changes. These may include but are not limited to: (FI.5.m)</p> <ul style="list-style-type: none"> • Lack of self-motivation • Busy schedule • Lack of time • Lack of support from others (family, friends, spouse, colleagues) • Home environment • Physical barriers such as a disability or injury <p>Starvation, fasting, or very-low-calorie diets are inappropriate weight-loss methods that can include the following risks (FI.5.n):</p> <ul style="list-style-type: none"> • Increased risk of malnutrition • Poor energy and inability to complete the essential fitness program • A behavioral “pendulum” swing; an inability to reintroduce “forbidden foods” in a moderate manner • Other side effects: fatigue, constipation, nausea, diarrhea, gallstones. 	

Essential Understandings	Essential Knowledge and Skills
<p>Anorexia nervosa is a psychological and possibly life-threatening eating disorder defined by an extremely low body weight relative to stature, extreme and needless weight loss, illogical fear of weight gain, and distorted perception of self-image and body. (FI.5.o)</p> <p>Bulimia nervosa is a psychological and possibly life-threatening eating disorder in which people (bulimics) consume large amounts of food (binge) and then trying to rid themselves of the food and calories (purge) by fasting, excessive exercise, vomiting, or using laxatives. (FI.5.o)</p> <p>The female athlete triad is an interrelationship of menstrual dysfunction, low energy availability (with or without an eating disorder), and decreased bone mineral density. (FI.5.p)</p> <ul style="list-style-type: none"> • It is relatively common among young women participating in sports. • Diagnosis and treatment of this potentially serious condition is complicated (https://dx.doi.org/10.1177%2F1941738112439685). 	

Professional Responsibilities

- FI.6 The student will identify and explain professional and legal responsibilities to manage a personal business and be employed as a personal fitness instructor.
- a) Identify and explain requirements to become a certified personal fitness instructor and maintain certification, including certification requirements, requirements to maintain certification, and resources for professional development to increase knowledge and skill and maintain certification.
 - b) Identify and explain the role, scope of practice, and code of ethics of a personal fitness instructor.
 - c) Identify and describe the professional responsibilities of a personal fitness instructor.
 - d) Identify and describe necessary facility maintenance.
 - e) Explain and describe appropriate inspection and care of equipment to maintain safety and maximize use.
 - f) Identify and describe appropriate facility supervision to maintain safety of users.
 - g) Identify and describe legal considerations of working as a personal fitness instructor.

Essential Understandings	Essential Knowledge and Skills
<p>There are various credentialing bodies in the health and fitness industry. One example is National Academy of Sports Medicine (NASM). To be an NASM-certified personal trainer (CPT), an individual must take a course and pass an exam on personal training topics, including anatomy, physiology, and fitness basics. NASM CPTs are required to recertify every two years by earning 1.9 continuing education units (CEUs). (FI.6.a)</p> <p>The role, scope of practice, and code of ethics of a personal fitness instructor may vary based on the credentialing body. NASM’s Code of Professional Conduct includes (FI.6.b):</p> <ul style="list-style-type: none"> • Maintain competencies through continuing education • Adhere to safe and ethical training practices • Adhere to strict facility maintenance • Understand scope of practice of the role and professional limitations of a 	<p>In order to meet these standards, it is expected that students will</p> <ul style="list-style-type: none"> • identify and explain requirements to become a certified personal fitness instructor and maintain certification, including certification requirements, requirements to maintain certification, and resources for professional development to increase knowledge and skill and maintain certification (FI.6.a); • identify and explain the role, scope of practice, and code of ethics of a personal fitness instructor (FI.6.b); • identify and describe the professional

Essential Understandings	Essential Knowledge and Skills
<p>personal trainer (i.e., referral to registered dietitians, shall not diagnose or treat an injury or illness etc.)</p> <ul style="list-style-type: none"> • Adhere to professionalism and ethical business practices <ul style="list-style-type: none"> ○ Liability insurance ○ Record keeping ○ Medical clearance ○ Physical appearance and attire ○ Timeliness ○ Sexual harassment awareness ○ Client confidentiality <p>Professional responsibilities of a personal fitness instructor with NASM are to uphold the highest level of professional and ethical conduct, which includes information from FI.6.a-b. NASM-CPTs are health and fitness professionals who are responsible for performing individualized assessments and design safe, effective, and individualized exercise and conditioning programs that are scientifically valid and based on clinical evidence for clients who have no medical or special needs. They provide guidance to help clients achieve their personal health, fitness, and performance goals via the implementation of exercise programs, nutritional recommendations, and suggestions for lifestyle modification. (FI.6.c)</p> <p>Identify and describe necessary facility maintenance. (FI.6.d)</p> <ul style="list-style-type: none"> • Maintaining a clean and orderly facility is necessary to encourage regular use of the facility and to reduce liability. • Ensure that all pathways are clear of debris and equipment is properly stored to prevent injury. • Specific areas for designated activities, such as powerlifting heavy 	<p>responsibilities of a personal fitness instructor (FI.6.c);</p> <ul style="list-style-type: none"> • identify and describe necessary facility maintenance (FI.6.d); • explain and describe appropriate inspection and care of equipment to maintain safety and maximize use (FI.6.e); • identify and describe appropriate facility supervision to maintain safety of users (FI.6.f); • identify and describe the legal considerations of working as a personal fitness instructor. (FI.6.g) <p>Additional resources: Health Smart Virginia</p>

Essential Understandings	Essential Knowledge and Skills
<p>weights or swinging kettlebells, are well-marked.</p> <ul style="list-style-type: none"> • Proper floor coverings are present to prevent falls, damage to the floor from weights, or injury to individuals exercising. • Materials used in the facility should meet local health code for fitness facility requirements and be easy to clean. • All surfaces and floors must be cleaned daily at minimum and more frequently based upon higher use. <p>Explain and describe appropriate inspection and care of equipment to maintain safety and maximize use. (FI.6.e)</p> <ul style="list-style-type: none"> • Ability to inspect and maintain fitness equipment and physical activity surroundings to ensure safety is necessary to reduce injury and reduce liability. • All equipment should be inspected daily for proper function and cleanliness. Equipment should always work optimally and never partially. • The following areas should be inspected daily: <ul style="list-style-type: none"> ○ Electrical equipment (e.g., treadmills, bikes, audio/video equipment) should have cords free of damage and be plugged into appropriately loaded outlets. ○ Cables, pulleys, straps, and bands should be solid, with no fraying, and properly seated in machines where applicable. ○ Metal weights, plates, and bars should be free from cracks and rust. ○ All benches and racks must be properly installed, properly bolted together, and have proper padding to protect the user. • Equipment manufacturers will provide recommendations for proper solutions and materials used to clean the equipment used. • Users should be instructed on how to wipe down or clean equipment after each use. Facility managers should ensure that the equipment is 	

Essential Understandings	Essential Knowledge and Skills
<p>thoroughly cleaned/disinfected several times per day, depending upon use.</p> <p>Appropriate facility supervision to maintain safety of users includes the following (FI.6.f):</p> <ul style="list-style-type: none"> • Educating clients and enforcing policies regarding the safe and proper use of equipment and facilities • Instructing clients on basic exercise physiology and informing them as to proper lifting and exercise technique • Ability to teach and demonstrate the use of resistance training equipment (e.g., weight machines, free weights, small apparatuses, resistance tubing, others) using proper exercise form and technique. <p>There are many legal considerations of working as a personal fitness instructor, which may include the following (FI.6.g):</p> <ul style="list-style-type: none"> • Act of omission: Failing to act responsibly. Example: A trainer who fails to spot a client who is lifting a considerable amount of weight. • Act of commission: Performing an act or allowing an individual to perform an act that causes harm. Example: A trainer who asks a client to perform a squat jump, knowing that the client has a knee injury. • Liability waivers potentially provide protection for trainers, in the event a client suffers an injury, preventing the client from recovering for damages. <p>General liability insurance is specific to the industry and protects in the case of injury due to slips and falls in fitness facilities.</p>	