

# Our Systematic Body

**Grade Level or Special Area:** 1<sup>st</sup> grade

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**Length of Unit:** Eight lessons (8 – 10 days, one day = approximately 60 minutes)

## I. ABSTRACT

This unit introduces first graders to the following body systems: skeletal, muscular, digestive, circulatory and nervous. Students will have an opportunity to participate in hands-on activities to further their understanding of these body systems. For example, they will construct their own skeleton and digestive tract and will learn to count their number of heartbeats per minute using a stethoscope. They will also learn how these body systems are ultimately dependent on one another in order to make our bodies work efficiently. A variety of assessments are used throughout this unit, and pictures and songs are added to these assessments to construct a book that students can use to prepare for a final assessment.

## II. OVERVIEW

### A. Concept Objectives

1. Students know and understand the characteristics and structure of living things, the processes of life, and how living things interact with each other and their environment. (Colorado State Science Standard #3)

### B. Content from the *Core Knowledge Sequence*

1. Body Systems (pg. 38)

### C. Skill Objectives

1. The students will identify the skeletal system as the bones and joints working together to provide support and movement for the body.
2. The students will construct a paper skeleton by attaching the skeleton at major joints.
3. The students will understand that calcium helps bones strong and will become familiar with food that contain calcium.
4. The students will know that an x-ray is what doctors use to view the skeleton inside the body.
5. The students will know that an adult skeleton has 206 bones.
6. The students will recognize the difference between a ball-and-socket and a hinge joint.
7. The students will label 15 different bones in the human skeleton.
8. The students will identify calcium phosphate as being important to keep bones strong and healthy and will list foods that contain calcium phosphate.
9. The students will predict what will happen to chicken bones when they are soaked in water and vinegar.
10. The students will see and feel the difference between the compact and spongy bone.
11. The students will understand that the skeletal and muscular systems need to work together.
12. The students will identify tendons as that which connects muscle to bone.
13. The students will view the muscles, tendons and bone using a chicken or turkey leg.
14. The students will compare the effects of using tired muscles versus rested muscles.
15. The students will begin to differentiate between voluntary and involuntary muscles.

16. The students will brainstorm a list of ways in which we can exercise our skeletal and muscular systems.
17. The students will know the path that food takes through the digestive system.
18. The students will identify the muscles that line the digestive system as being involuntary.
19. The students will know the functions of the teeth and saliva in the mouth.
20. The students will identify the small intestine as the place where nutrients enter the bloodstream.
21. The students will order the path of food through the digestive system.
22. The students will define the word digest.
23. The students will make their own digestive track out of adding machine tape and construction paper.
24. The students will identify the heart and blood vessels that run throughout the body as the circulatory system.
25. The students will know the function of arteries and veins.
26. The students will identify the heart as an involuntary muscle.
27. The students will know that the blood carries oxygen and food throughout the body.
28. The students will understand the following four parts of blood and their basic functions: red blood cells, white blood cells, plasma, and platelets.
29. The students will learn how to find their pulse and count the number of heartbeats in a minute.
30. The students will compare their number of heartbeats per minute while sitting, standing, and after running.
31. The students will identify the heartbeat as the sound that the heart makes when it pumps blood.
32. The students will list ways in which they can exercise their heart and keep it healthy.
33. The students will identify the brain, spinal cord, and nerves as the nervous system.
34. The students will know that the nerves send messages back to the brain.
35. The students will identify the backbone as the part of the skeletal system that protects the spinal cord.
36. The students will identify the brain as the control center of the body and will know that it controls all that happens in the human body.

### III. BACKGROUND KNOWLEDGE

- A. For Teachers
  1. Hirsch, Jr. E.D. *What Your First Grader Needs to Know*. New York: Dell Publishing, 1998. ISBN 0-385-31987-8.
  2. Moore, Jo Ellen. *How Your Body Works*. California: Evan-Moor Educational Publishers, 1998. ISBN 1-55799-685-7.
- B. For Students
  1. None

### IV. RESOURCES

- A. *The Human Body: Picture Cards*, by Jo Ellen Moore – These cards are optional. They can be used in every lesson, as they show detailed, colored pictures of each body system. They can be used in place of the drawings that are found in the appendixes.
- B. *The Skeleton Inside You*, by Philip Balestrino (Lesson One)
- C. *Skeletons*, by Lily Wood (Lesson Two)

- D. *I Know Where My Food Goes*, by Jacqui Maynard (Lesson Four)
- E. *A True Book: The Digestive System*, by Darlene R. Stille (Lesson Five)
- F. *Hear Your Heart*, by Paul Showers (Lesson Six)
- G. *A True Book: The Nervous System*, by Darlene R. Stille (Lesson Eight)

## V. LESSONS

### Lesson One: The Skeletal System (approximately 60-90 minutes)

#### A. *Daily Objectives*

1. Concept Objective(s)
  - a. Students know and understand the characteristics and structure of living things, the processes of life, and how living things interact with each other and their environment.
2. Lesson Content
  - a. Body Systems
  - b. Skeletal system: skeleton, bones, skull
3. Skill Objective(s)
  - a. The students will identify the skeletal system as the bones and joints working together to provide support and movement for the body.
  - b. The students will construct a paper skeleton by attaching the skeleton at major joints.
  - c. The students will understand that calcium helps keep bones strong and will become familiar with foods that contain calcium.
  - d. The students will know that an x-ray is what doctors use to view the skeleton inside a body.
  - e. The students will know that an adult skeleton has 206 bones.

#### B. *Materials*

1. *The Skeleton Inside You*, by Philip Balestrino
2. Appendices A, B, C, E, F, G, I, J, K, L, N, O, P, R, S, U, V, and X; Appendix A is the cover for the students' Body Systems Book; the remaining appendixes are the pages for this book and are to be used to assess student understanding throughout the unit-make one copy of this "book" for each student; the lessons will continue to list appendixes that will be needed, even though the book has been made
3. Appendix B, page 1 of Body Systems Book (one copy for each student)
4. Brass fasteners (13 for each student)
5. Appendix C, page 2 of Body Systems Book (make one copy for each student and copy this song onto a piece of poster board)
6. Appendix D (one copy for each student)
7. Large piece of construction paper or poster board for each student
8. Appendix E, page 3 of Body Systems Book (one copy for each student)
9. X-Ray – you can get an x-ray from a doctor's office or veterinary offices; a family from your class may also have an x-ray
10. Large piece of yellow or white butcher paper for each student (large enough so that the student's body can be traced onto the paper)
11. Clothesline (long enough to hang up each student's body cutout as indicated in the lesson)
12. Clothespins (one for each student)

#### C. *Key Vocabulary*

1. Cartilage – a tough elastic tissue forming parts of the skeleton
2. System – the body, or a number of bodily organs, functioning as a unit

- D. *Procedures/Activities*
1. Tell the students that they will be learning about five different body systems throughout this unit. Explain that a system is a name given to parts of your body that work together to perform a specific job. Tell them that the first system they will be learning about is the skeletal system.
  2. Teach them the song, "Bones." This song is from the book, *101 Science Poems & Songs for Young Learners*, by Meish Goldish. Make sure this is copied onto a piece of poster board. However, it is also located on page 2 (Appendix C) of their Body Systems Book.
  3. Further introduce the skeletal system by reading *The Skeleton Inside You*, by Philip Balestrino. The following are questions that can be asked after reading this book.
    - a. What are two main purposes for having a skeleton? (*to give you shape and help you move*)
    - b. How many bones are in an adult skeleton? (*206*)
    - c. Your ears and nose have a substance inside them that also gives them shape, but it is softer than bone. What is it? (*cartilage*)
    - d. When you have a broken bone, what does the doctor use to be able to see the bone? (*x-ray*)
    - e. Your bones need calcium. What are some foods that have calcium in them? (*green & leafy vegetables, milk, and cheese*)
    - f. What bones protect your heart and lungs? (*the ribs*)
    - g. What part of your skeleton protects your brain? (*skull*)
    - h. What is the place where two bones fit together? (*joint*)
    - i. What holds the bones together at the joints? (*ligaments*)
    - j. What is made up of 34 bones and allows you to twist and turn? (*backbone; Point out that in the song it is called the spine.*)
  4. After answering the questions, have the students feel the bones in their hands, arms and legs. Then show them a picture of an x-ray. It would be great if the students could see an x-ray that also shows a joint.
  5. Pass out Appendix D and have the students cut out the individual parts of the skeleton. Then instruct the students to put the skeleton together by matching the letters at the joints and then connecting those joints with brass fasteners. Explain to the students that the brass fasteners are acting as joints in their skeleton. However, also explain that there are many more joints in the human skeleton.
  6. When the skeletons are put together, the students can then glue the skeleton to a large piece of construction paper or poster board. They will be labeling bones, using this skeleton, in the next lesson.
  7. To prepare for the other lessons, pair up the students and have them trace the outline of each other's body onto a large piece of butcher paper. Have each student then cut out their outline and make sure their name is written somewhere on their body.
  8. For easy access of these bodies throughout the unit, run a piece of clothes line across one part of your room and hang each students' body up with a clothespin.
  9. Have each student complete page 3 (Appendix E) of their Body Systems Book. The answers for this assessment are as follows: 1. A. 206; 2. B. x-ray; 3. C. cartilage; 4. C. milk; 5. B. gives you your shape and helps you move; 6. A. joint
- E. *Assessment/Evaluation*
1. Students will be assessed based on their completion of Appendix E.

## **Lesson Two: Bones, Bones, Bones (approximately 60 minutes)**

### A. *Daily Objectives*

1. Concept Objective(s)
  - a. Students know and understand the characteristics and structure of living things, the processes of life, and how living things interact with each other and their environment.
2. Lesson Content
  - a. Body Systems
  - b. Skeletal system: skeleton, bones, skull
3. Skill Objective(s)
  - a. The students will recognize the difference between a ball-and-socket and hinge joint.
  - b. The students will label 15 different bones in the human skeleton.
  - c. The students will identify calcium phosphate as being important to keep bones strong and healthy and will list foods that contain calcium phosphate.
  - d. The students will predict what will happen to chicken bones when they are soaked in water and vinegar.
  - e. The students will see and feel the difference between the compact and spongy bone.

### B. *Materials*

1. Body cutouts from lesson one
2. *Skeletons*, by Lily Wood
3. File folder labels (15 labels for each student)
4. Appendix E – graded student copies and one overhead copy
5. Appendix F, page 4 of Body Systems Book (one copy for each student)
6. Three chicken leg bones, cleaned and dried
7. Three glass jars with lids (fill two jars with white vinegar and one with water)
8. One cross-sectional slice of a cow's femur (can usually get from the local butcher)
9. Appendix D – enlarge these parts of the skeleton and construct; place the enlarged skeleton on a bulletin board or somewhere in the room that can be easily viewed by the students
10. Type or write the names of the following bones onto individual pieces of paper or note cards: skull (cranium), spine (backbone), ribs, scapula (shoulder blade), humerus, radius, ulna, phalanges (finger bones), femur, tibia, fibula, kneecap, phalanges (toe bones), pelvis, and collarbone - these bones need to be written large enough so that the entire class can read them
11. 15 pieces of Velcro-place ½ of each piece of Velcro on the back of the note cards that contain the name of the bones; the opposite half of each piece of Velcro should be placed on the skeleton at the place that would identify the bones that were listed in #10 of this materials section

### C. *Key Vocabulary*

None

### D. *Procedures/Activities*

1. Review the previous lesson by going over Appendix E (page 3) with the students. Use the overhead copy of Appendix E to review each question.
2. Read to the students, *Skeletons*, by Lily Wood. Specific bones start being listed on page 18 of this book. As you're reading these specific parts of the skeleton, stop at each one and have the students label their own skeleton by writing the name of the bone on the file folder label and then sticking that label on or next to

the correct bone. Write the names of these skeleton parts on the board so that the students can see the correct spelling. At the end of the book, the following bones should be labeled: *skull (cranium), spine (backbone), ribs, scapula (shoulder blade), humerus, radius, ulna, phalanges (finger bones), femur, tibia, fibula, kneecap, phalanges (toe bones), pelvis, and collarbone.*

3. Ask the following questions after reading the book.
  - a. What does your skeleton do for you? (*It gives you shape and helps you move.*)
  - b. What is attached to your bones and works with them to make them move? (*muscles*)
  - c. How many bones does an adult have? (*206*) Does a baby have more or less bones? (*more*)
  - d. The outer part of the bone is called the compact bone. What is the compact bone like? (*It is hard, heavy and strong.*)
  - e. The inside of the bone is called the spongy bone. What is the spongy bone like? (*It looks like a sponge. It is lighter and has lots of spaces.*)
  - f. Are the bones in our skeleton alive or dead? (*alive*)
  - g. What are the joints called that swing back and forth in only one direction? (*hinge joints*)
  - h. What kind of joint lets your arms move in circles? (*ball-and-socket joint*)
  - i. What protects your brain? It is like a natural helmet. (*skull/cranium*)
  - j. What protects your heart and lungs? (*ribs*)
  - k. What is attached to the bones at the joints and also helps them move? (*tendons*)
  - l. How can you take care of your skeleton? (*Eat good foods such as leafy greens, broccoli, milk, cheese, and fish. Exercise.*)
4. Show the students an example of what the compact and spongy bone is like by showing them the inside of a cow's femur. Pass the bone around in a clear bag so the students can feel the difference between the outside and inside of the bone without actually having to touch the bone.
5. Then allow students to move around to show which joints in their body would be considered hinge joints. Emphasize that these joints can only move in one direction. Also show how the door to the classroom is attached to the wall by a hinge and the door can only open in one direction.
6. Then encourage the students to move their arms at the shoulder socket and their legs at the hip socket. Explain that the bones at the end of the femur and humerus are shaped like a ball, and this allows them to move in many directions.
7. Using their body cutouts from lesson one, instruct the students to choose three major bones that were discussed in today's lesson and draw those bones on their bodies. Explain that they are not expected to draw the entire skeletal system, but these bones will represent the entire skeletal system and will help them remember this system. Also explain that as they learn about other body systems, they will also draw those systems on their bodies.
8. Ask the students to recall one of the things that are needed to keep bones strong and healthy. (*calcium phosphate*) Also review with the students that this can be found in foods such as, broccoli, milk, cheese, fish and leafy green vegetables.
9. Tell the students that they will conduct an experiment using chicken bones to see what happens when calcium phosphate is taken out of a bone. (This experiment is from the book *Watch Me Grow*, by Michelle O'Brien-Palmer.)

10. First, pass the chicken bones around the classroom, allowing the students to feel the hardness of each bone. Make sure the chicken bones are thoroughly cleaned and dried. Then place each chicken bone in the three jars. Two jars should be filled with white vinegar and the third jar should be filled with water. Label the jars accordingly.
  11. Explain to the students that either the vinegar or water will cause the calcium to come out of the bone and that the bones will stay in the jars for a week. At this time, instruct the students to complete page 4 (Appendix F) from their Body Systems Book. This appendix allows them to explain the experiment and make a prediction about what will happen. The students will fill out the conclusion part of the appendix after the bones have been in the water and vinegar for one week. Allow one of the bones to stay in the vinegar for two weeks so the class can see if an extra week makes any difference.
  12. Review the location of some of the major bones by randomly passing out the names of the bones that have been placed on note cards. Then have the students who have the note cards place the names on the enlarged skeleton in the appropriate place. Involve the entire class by having them decide whether the placement is correct or needs to be moved.
  13. Have each student complete page 5 (Appendix G) from their Body Systems Book. The answers for this assessment should read in the following order: *phalanges, cranium, spongy bone, calcium, ball-and-socket, compact bone, move, femur, heart; lungs, hinge.*
- E. *Assessment/Evaluation*
1. The students will be assessed on the completion and labeling of their skeleton by using the rubric on Assessment H.
  2. The students will also be assessed based on their completion of Appendixes F and G.
  3. The students will be assessed on their body cutouts, representing the major body systems discussed, at the end of the unit using the rubric on Appendix Y.

### **Lesson Three: The Muscular System (approximately 45 – 60 minutes)**

#### A. *Daily Objectives*

1. Concept Objective(s)
  - a. Students know and understand the characteristics and structure of living things, the processes of life, and how living things interact with each other and their environment.
2. Lesson Content
  - a. Body Systems
  - b. Muscular system: muscles
  - c. Skeletal system: skeleton, bones, skull
3. Skill Objective(s)
  - a. The students will understand that the skeletal and muscular systems need to work together.
  - b. The students will identify tendons as that which connects muscle to bone.
  - c. The students will view the muscles, tendons and bone using a chicken or turkey leg.
  - d. The students will compare the effects of using tired muscles versus rested muscles.
  - e. The students will begin to differentiate between voluntary and involuntary muscles.

- f. The students will brainstorm a list of ways in which we can exercise our skeletal and muscular systems.

B. *Materials*

1. Appendix G – graded student copies and overhead copy
2. Appendix I, page 6 of Body Systems Book (one copy for each student and one overhead copy)
3. Appendix J, page 7 of Body Systems Book (one copy for each student)
4. Chart paper
5. Raw chicken or turkey leg (keep refrigerated until needed)
6. One racquetball for each student in the class or a piece of clay for each student (students can share racquetballs if you can't find enough)
7. Six note cards with the following facial expressions listed on the cards: happy, sad, frightened, surprised, bored, confused

C. *Key Vocabulary*

1. Involuntary muscles – muscles that work independently and cannot be controlled
2. Voluntary muscles – muscles that can be controlled
3. Tendons – tough, elastic tissue that connects the muscles to the bones

D. *Procedures/Activities*

1. Review the bones from the previous lesson by having the students label the enlarged skeleton as was done at the end of lesson two. Also, using an overhead copy of Appendix G, go over the sentences with the students. Have students make corrections if necessary.
2. Explain to the students that even though the skeleton does allow our bodies to move, we couldn't move our bones without our muscles. Explain that the muscles working together are called the muscular system. Show them the overhead picture of Appendix I, which depicts the muscular system. This is also page 6 of their Body Systems Book.
3. Explain to the students that the skeletal system could not work without the muscular system, and vice versa. The muscles are attached to the bones and make the bones in the skeleton move. See if they remember what connects the bones at the joints. (*tendons*) Explain that these tendons also work to attach the muscle to the bone.
4. Using a chicken or turkey leg, show them what the muscles and tendons look like. Peel off the skin and have the students look at the meat part. These are the muscles in the leg. Then peel off the muscles and find where the muscles are attached to the bone by the tendons. If you choose, you can also split your class into groups and allow them to find where the muscles are attached to the bone themselves. However, if the students touch the chicken or turkey leg, make sure they wash their hands thoroughly when finished. This idea came from the book *How Your Body Works*, by Jo Ellen Moore.
5. Encourage the students to flex the muscles in their biceps and feel the muscles, and then have them flex other muscles. Have them do some squats or lift a book above their head 20 times so that they can also feel how their muscles can become fatigued.
6. Tell the students that when muscles get tired, they are not able to work as well as when they are well rested. Have the students demonstrate this by instructing them to write their entire name on a piece of paper five times. Then have them squeeze a racquetball or piece of modeling clay at least 10 times quickly and as hard as they can. Immediately after doing this, have them write their name again five times on a separate sheet of paper. See if they can tell a difference between the first time that they wrote their name and they second time they wrote it.

Also, have them exchange papers with a partner to see if their partner can tell the difference. This idea comes from the book *Body Systems and Organs*, Karen Lee Siepak.

7. Explain to the students that the muscles they are feeling are called voluntary muscles because they can control the muscles and make them work. At this point label a piece of chart paper with the words, “Muscular System.” Draw a line with a marker down the center of the paper and write “voluntary muscles” on one side and “involuntary muscles” on the other side.
8. Explain that our body also has muscles that we have no control over. These are called involuntary muscles. Tell the students that their heart is an example of an involuntary muscle. The heart is actually one large muscle. It beats continuously and we never have to tell it to keep beating. It does it automatically. Write the word “heart” in the column labeled involuntary muscles.
9. Tell the students that there are many more involuntary muscles, but they will be discussed as they learn about other systems of the human body. As they learn about these other muscles, they will be added to the chart.
10. Ask the students what they can do to keep their skeletal and muscular system healthy. Emphasize that eating healthy foods is always important but exercise is also very important. Explain that when their bones and muscles aren’t exercised it makes them weak and they aren’t able to work as well.
11. Have the students brainstorm things that they can do to exercise their muscles. List their ideas on the board or a piece of chart paper. Make sure the students understand that exercise does make their muscles tired and not able to work as well immediately after exercise. However, after some rest, the exercise eventually makes them stronger.
12. Allow the students to have fun with the small muscles in their face by randomly having student volunteers come to the front of the room to act out one of the facial expressions from the note cards that are listed in the materials section. Have the students guess which expression the volunteer is trying to show using the small muscles in the face.
13. Wrap up the lesson by having the students draw muscles on at least two parts of their body cut outs. Again, they do not need to cover the entire body with muscles. Then have them compete page 7 (Appendix J) of their Body Systems Book. The answers for Appendix J are as follows: 1. *tendon*; 2. *involuntary*; 3. *voluntary*; 4. *answers may vary*; 5. *They become weak and tire easily*

E. *Assessment/Evaluation*

1. The students will be assessed based on their completion of Appendix J.
2. The students will be assessed on their body cutouts at the end of the unit using Appendix Y.

**Lesson Four: The Digestive System (approximately 45 – 60 minutes)**

A. *Daily Objectives*

1. Concept Objective(s)
  - a. Students know and understand the characteristics and structure of living things, the processes of life, and how living things interact with each other and their environment.
2. Lesson Content
  - a. Body Systems
  - b. Digestive system: mouth, stomach

3. Skill Objective(s)
  - a. The students will know the path that food takes through the digestive system.
  - b. The students will identify the muscles that line the digestive system as being involuntary.
  - c. The students will know the functions of the teeth and saliva in the mouth.
  - d. The students will identify the small intestine as the place where nutrients enter the bloodstream.
  
- B. *Materials*
  1. *I Know Where My Food Goes*, by Jacqui Maynard
  2. Appendix K, page 8 of Body Systems Book (one copy for each student and one overhead copy)
  3. Appendix L, page 9 of Body Systems Book (one copy for each student)
  4. Soda crackers – at least two for each student
  5. Appendix J – graded student copies and one overhead copies
  6. One clear container filled with water and marked at 1 ½ quarts
  
- C. *Key Vocabulary*
  1. Saliva – fluid secreted by the salivary glands that aids in digestion and swallowing
  
- D. *Procedures/Activities*
  1. Review the previous lesson by using the overhead copy of Appendix J to go over the questions that the students completed. Also, review the bones that were studied in lesson two by having the students match the bone names to the appropriate bone using the enlarged skeleton.
  2. Tell the students that in today’s lesson they will be learning about a new body system, the digestive system. Read *I Know Where My Food Goes*, by Jacqui Maynard and ask the following questions after reading.
    - a. Where does digestion begin? (*in the mouth*) What begins the digestion in your mouth? (*teeth, saliva*)
    - b. What does saliva do? (*It breaks down the food and makes it soft so the food can be swallowed.*)
    - c. Where does the food go after the mouth? (*down the food tube or esophagus*)
    - d. Where does the food go after the esophagus? (*into the stomach*) What happens to the food in the stomach? (*Juices in the stomach break the food up into smaller pieces. The muscles in the stomach make the food churn around.*)
    - e. Where does the food go after the stomach? (*the small intestine*) What happens to food in the small intestine? (*The good parts of the food get absorbed into the bloodstream.*)
    - f. Not all of the food goes into your blood. Where does the rest of it go? (*It goes into your large intestine and then out of your body when you use the restroom.*)
  3. Remind the students that digestion begins in the mouth. Give each student one soda cracker and instruct them to chew the cracker, without swallowing. Time their chewing so they chew for about 30 seconds.
  4. After they swallow the cracker, ask them to describe what was happening in their mouth. They should observe that their teeth grind the cracker into smaller pieces. The tongue assists in moving the food around, and the mouth also produces saliva.

5. Tell the students that their mouth starts to produce saliva even before the food is put into their mouth. They may remember from the book that the mouth actually makes about 1-½ quarts of saliva every day. Fill a clear container with 1-½ quarts of water to show the students how much saliva that actually is.
  6. Have the students chew the second cracker for 30 seconds, but this time instruct the students to pay attention to how the cracker tastes. They should notice that the cracker tastes salty at the beginning and then becomes a sweeter taste. Explain to the students that the saliva is actually breaking down the cracker into sugar.
  7. Then have the students take out their Body Systems Book and turn to page 8 (Appendix K). You should also have an overhead copy of Appendix K. Instruct the students to label the different parts of the digestive system as you demonstrate on the overhead. Begin by labeling the mouth.
  8. Then label the esophagus. Tell the students that the esophagus is also lined with muscles so it can actually be considered part of the muscular system too. Explain that the muscles work to move the food down the tube and into the stomach and that we have no control over these muscles.
  9. Remind the students of the chart that they began in yesterday's lesson about voluntary and involuntary muscles. Ask the students if the muscles of the esophagus should be written under voluntary muscles and involuntary muscles. (*Write "muscles of the esophagus" under involuntary muscles.*)
  10. Next have the students label the stomach, small intestine and large intestine on Appendix K. Explain that these are also lined with involuntary muscles that keep the food moving through the system.
  11. After labeling the parts of the digestive system, have the students complete page 9 (Appendix L) of the Body Systems Book. The answers for Appendix L are as follows: 1-d; 2-a; 3-f; 4-b; 5-e; 6-g; 7-c
- E. *Assessment/Evaluation*
1. The students will be assessed based on accurate labeling of the digestive systems parts on Appendix K.
  2. The students will be assessed based on completion of Appendix L.

**Lesson Five: Making the Digestive System (approximately 45 – 60 minutes)**

- A. *Daily Objectives*
1. Concept Objective(s)
    - a. Students know and understand the characteristics and structure of living things, the processes of life, and how living things interact with each other and their environment.
  2. Lesson Content
    - a. Body Systems
    - b. Digestive system: mouth, stomach
  3. Skill Objective(s)
    - a. The students will order the path of food through the digestive system.
    - b. The students will define the word digest.
    - c. The students will identify the muscles that line the digestive system as being involuntary.
    - d. The students will make their own digestive track out of adding machine tape and construction paper.
- B. *Materials*
1. Appendix K – overhead copy from lesson four (should already be labeled from previous lesson)

2. Appendix L – graded student copies and one overhead copy
  3. *A True Book: The Digestive System*, by Darlene R. Stille
  4. Appendix M – one copy for each student on white construction paper
  5. Appendix N, page 10 of *Body Systems Book* (one copy for each student)
  6. Each student will need: scissors, a ruler, two 9-by-12-inch sheets of pink construction paper, tape and at least sixteen feet of adding-machine tape
- C. *Key Vocabulary*  
None
- D. *Procedures/Activities*
1. Review the previous lesson by going over Appendix K with the students. This picture of the digestive system was labeled in lesson four. Use the overhead copy and a piece of paper so that the students can see only one part of the digestive system at a time. See if the students remember the pathway that food takes through the body.
  2. Also go over the questions and answers for Appendix L using an overhead copy. See if the students have any questions from Lesson Four.
  3. Explain that they will continue learning about the digestive system today and will be constructing their own digestive system to put on their body cutouts.
  4. Read aloud pages 1 – 27 in the book, *A True Book: The Digestive System*, by Darlene R. Stille. Ask the following questions after reading these pages.
    - a. What does digest mean? (*to break down*)
    - b. What happens in the first step of digestion? (*The food is ground up in the mouth.*)
    - c. What helps break down the food in your mouth? (*teeth and saliva*)
    - d. After the food is swallowed, where does it go? (*down the esophagus and into the stomach*)
    - e. Your stomach is actually a bag of what? (*muscles; Emphasize that these muscles are involuntary muscles.*)
    - f. In the stomach, what makes the food break down even more? (*digestive juices and the movement of the stomach muscles*)
    - g. What is the next part of the digestive system? (*the small intestine*)
    - h. About how long is an adult small intestine? (*20 feet*)
    - i. When in the small intestine the tiny particles of food pass through the walls to what? (*the bloodstream*)
    - j. What does food provide for us? (*energy*)
    - k. Where does the “leftover” from the small intestine travel? (*the large intestine*)
    - l. About how long is the large intestine? (*5 feet*)
  5. Have the students construct their own digestive system by using the following directions. These directions are taken from the following book: *Play and Find Out About the Human Body: Easy Experiments for Young Children*, by Janice Van Cleave.
  6. First, the students should measure and cut two strips of adding machine tape. Have them make one 8 inches long and the other 15 feet long. Obviously, the students will need to know how to measure in inches and feet. You may choose to have the students work in pairs in order to save on the materials that will be needed at one time.
  7. Have the students label the shorter strip of paper “esophagus” and the longer strip of paper “small intestine.” Explain that they are making the small intestine shorter than that of an adult small intestine because they are still children.

8. Pass out Appendix M and have the students cut out the stomach. Students may need to adjust the width on the top and bottom of the stomach to match the esophagus and small intestine.
  9. Next, instruct the students to cut the two sheets of pink construction paper in half lengthwise. They can then tape the pieces together at their short ends and have the students label this strip “large intestine.” Have the students tape the large intestine to the end of the small intestine.
  10. Have the students stretch the pieces of paper out on the floor as straight as possible so they can see how long the digestive system is. Make sure the students have their “parts” taped together in the following order: esophagus, stomach, small intestine, and large intestine.
  11. After their digestive system has been completed, the students can tape the digestive system to their body cutouts.
  12. If time, have the students review the bones of the skeleton by having them match the bones to the enlarged skeleton from lesson two.
  13. Have students complete page 10 (Appendix N) of their Body Systems Book. The sentences of this appendix should read in the following order.
    - a. *The mouth is the first step of the digestive system. Your teeth and saliva begin breaking down the food.*
    - b. *The food travels down the esophagus before entering the stomach.*
    - c. *The food empties into the stomach and is broken down by the muscles in the stomach and gastric juices.*
    - d. *In the small intestine the tiny particles of food go into the bloodstream.*
    - e. *The food that is not absorbed into the bloodstream goes through the large intestine and then out of your body.*
- E. *Assessment/Evaluation*
1. The students will be assessed based on their completion of Appendix N
  2. The students will be assessed on the systems that are put on their body cutouts at the end of the unit using Appendix Y.

### **Lesson Six: The Circulatory System (approximately 30 – 45 minutes)**

- A. *Daily Objectives*
1. Concept Objective(s)
    - a. Students know and understand the characteristics and structure of living things, the processes of life, and how living things interact with each other and their environment.
  2. Lesson Content
    - a. Body Systems
    - b. Circulatory system: heart and blood
  3. Skill Objective(s)
    - a. The students will identify the heart and the blood vessels that run throughout the body as the circulatory system.
    - b. The students will know the function of arteries and veins.
    - c. The students will identify the heart as an involuntary muscle.
    - d. The students will know that the blood carries oxygen and food throughout the body.
- B. *Materials*
1. Appendix N – graded student copies and one overhead copy
  2. *Hear Your Heart*, by Paul Showers
  3. Appendix O, page 11 of Body Systems Book (one copy for each student and one overhead copy)

4. Appendix P, page 12 of Body Systems Book (write this song on a large piece of poster board)
  5. Meat baster
  6. Pan of water
  7. Appendix Q – one copy for each student
  8. Appendix R, page 13 of Body Systems Book (one copy for each student)
- C. *Key Vocabulary*
1. Vein – any blood vessel that carries blood from some part of the body back toward the heart
  2. Artery – any blood vessel that carries blood away from the heart to other parts of the body
- D. *Procedures/Activities*
1. Review the previous lesson by using the overhead copy of Appendix N to go over the steps of digestion with the students. Give the students an opportunity to look at their own graded copy of Appendix N and make any changes if necessary.
  2. Tell the students that today they will be learning about a new body system called the circulatory system. Introduce the circulatory system by reading *Hear Your Heart*, by Paul Showers. Ask the following questions when finished.
    - a. With what instrument do doctors listen to your heart? (*stethoscope*)
    - b. How big is your heart? (*about the size of your fist*)
    - c. Your heart is actually a big \_\_\_\_\_. (*muscle; Emphasize that the heart is an involuntary muscles because we have no control over it.*)
    - d. What is happening when the heart contracts? (*It squeezes itself together and blood is pumped out of the heart.*)
    - e. What are the blood vessels called that carry blood away from the heart? (*arteries*)
    - f. When the heart expands, blood is able to flow into the heart. What blood vessels carry blood to the heart? (*veins*)
    - g. Where are the arteries and veins in your body? (*They travel throughout the entire body.*)
    - h. You can tell how fast your heart is beating by feeling your pulse. Where is one place on your body that the book says you can feel your pulse? (*on your wrist just below your thumb*)
    - i. Who has a faster heartbeat, a grown man or a baby? (*a baby*)
    - j. What would your heartbeat sound like if you listened to it through a stethoscope? (*pum-PUM, pum-PUM*)
    - k. Does your heart ever stop pumping blood? (*no*)
  3. Ask the students again what the name of the system is called that makes up the heart and the blood vessels. (*circulatory system*) Show them a picture of the circulatory system on the overhead (Appendix O). This is also page 11 of their Body Systems Book. Help them remember the name of this system by emphasizing that blood “circulates” throughout the body.
  4. Teach the students the “Heart and Blood” song and have them sing it a couple of times. This song should be written on poster board and is in their Body Systems Book (pg. 12). Ask the students the following questions:
    - a. What does the heart pump? (*blood*)
    - b. What is your heart? (*muscle; an involuntary muscle*)
    - c. What does the blood supply for us? (*oxygen*)
  5. Explain to the students that oxygen is in the air that we breathe. Oxygen goes into the bloodstream from the lungs. Also, remind the students that the vitamins

and nutrients enter the bloodstream in the small intestine. Oxygen and food travel throughout out entire body through the circulatory system. This is important because it keeps us healthy and strong.

6. Demonstrate how the heart pumps blood out of the body and takes in blood by using a meat baster and pan of water. The ball at the end of the tube represents the heart. The tube represents an artery. Fill the baster with water from the pan and show the students that when the ball is squeezed, like the heart does when it contracts, water squirts out. By leaving the end of the meat baster in the water, the students can also see how the water enters the meat baster again. In this scenario, the tube would represent a vein.
  7. Ask the students again which blood vessels carry blood away from the heart (*arteries*) and which carry blood to the heart (*veins*). Explain that veins are the blood vessels that they can see through their skin. They look blue. I've always remembered that arteries carry blood away from the heart because the words "away" and "arteries" both begin with the letter 'a'.
  8. Have the students cut out the picture of the heart on Appendix Q and paste on their body cutouts. Explain that their heart is in the center of the chest, just a little to the left. Have the students also draw some veins and arteries coming out of the heart.
  9. Have students complete page 13 (Appendix R) of their Body Systems Book. This blanks in this paragraph should be completed in the following order: *circulatory, blood vessels, muscle, arteries, veins, oxygen, food*
- E. *Assessment/Evaluation*
1. The students will be assessed based on their completion of Appendix R.
  2. The students will be assessed on the systems that are put on their body cutouts at the end of the unit using Appendix Y.

### **Lesson Seven: Lub-Dub, Lub-Dub (approximately 60 minutes)**

- A. *Daily Objectives*
1. Concept Objective(s)
    - a. Students know and understand the characteristics and structure of living things, the processes of life, and how living things interact with each other and their environment.
  2. Lesson Content
    - a. Body Systems
    - b. Circulatory system: heart and blood
  3. Skill Objective(s)
    - a. The students will understand the following four parts of blood and their basic functions: red blood cells, white blood cells, plasma, and platelets
    - b. The students will learn how to find their pulse and count the number of heartbeats in a minute.
    - c. The students will compare their number of heartbeats per minute while sitting, standing and after running.
    - d. The students will identify the heartbeat as the sound that the heart makes when it pumps blood.
    - e. The students will list ways in which they can exercise their heart and keep it healthy.
- B. *Materials*
1. Appendix P, page 12 of Body Systems Book
  2. Appendix R – graded student copies and one overhead copy

3. Stethoscopes (enough for students to work in pairs) or paper towel rolls to be used as stethoscopes
  4. Alcohol pads – if using real stethoscopes
  5. Large clock with a second hand
  6. Appendix S, page 14 of Body Systems Book
  7. Appendix T (copy these pages to make into a book for each student; the pages will need to be cut in half, collated and then stapled)
- C. *Key Vocabulary*
1. Red blood cells – cells in the bloodstream that carry oxygen
  2. White blood cells – cells in the bloodstream the fight germs
  3. Plasma – the fluid part of the blood that carries food
  4. Platelets – a substance in the blood that helps blood clot
- D. *Procedures/Activities*
1. Take time at the beginning of this lesson to review the bones that were learned in the lesson about the skeletal system. Using the enlarged skeleton from lesson two, have students match the names of the bones to their correct locations.
  2. Review the previous lesson about the circulatory system. Put up the overhead picture of the circulatory system (Appendix P) and cover up the name of the system. See if students can name the system. Then use the overhead copy of Appendix R to read the paragraph with the students. Encourage students to make corrections to their paragraph, if necessary.
  3. Tell the students that today they will be learning about how to take their pulse so they can see how many times their heart beats per minute. Also explain that they will be reading a book about the circulatory system and will be learning more about what is in their blood.
  4. Explain to the students that the heartbeat is actually the sound that their heart makes as it pumps blood out of the heart. They can feel a pulse when they feel the blood moving through an artery. They both let us know how fast our heart is beating.
  5. First, show the students how to take their pulse. To feel a pulse on the wrist, have them place the index and middle finger lightly on the wrist, just below the thumb. Another place that they can feel their pulse is on the carotid artery. This is located on either side of the neck, just below the jaw. This pulse is much stronger. However, when students feel this pulse they should use their index and middle finger and should only feel the pulse on one side of the neck at a time.
  6. After they have found a pulse, use the second hand on the clock and have them count how many beats they feel in a minute.
  7. Then have the students use the stethoscopes to hear a partner's heartbeat. If using real stethoscopes, make sure the earpieces are wiped off with an alcohol pad before being used by another person. If stethoscopes are not available, they can use paper towel rolls. Have them put one end of the roll in the middle of their partner's chest and their ear on the opposite end.
  8. First have them estimate what their heart rate will be while they are just sitting. Have them record their estimate on page 14 (Appendix S) of their Body Systems Book. Then have them record their actual heart rate. They should count the number of heartbeats for one full minute. Have the students do the same while they are standing and after running for one minute. They should also record on Appendix S.
  9. Next have the students read the paper book about the circulatory system that has been previously copied, collated and stapled for the students (Appendix T). I would suggest reading it as a whole group initially and then having them read in

partners or individually again. This, of course, will depend on how well your students are reading at the time that this unit is presented. As a class, brainstorm ways that they can exercise their heart and keep it healthy so they have ideas for completing page 7 of their Circulatory System Book. Encourage the students to illustrate the pages in the book and then answer questions located on page 15 (Appendix U) of their Body Systems Book. The answers to these questions are as follows: 1. *circulatory system*, 2. *a muscle*, 3. *red blood cells*, 4. *plasma*, 5. *platelets*, 6. *white blood cells*, 7. *arteries*, 8. *veins*

E. *Assessment/Evaluation*

1. The students will be assessed based on their completion of Appendix U.

**Lesson Eight: The Nervous System (approximately 30 – 45 minutes)**

A. *Daily Objectives*

1. Concept Objective(s)
  - a. Students know and understand the characteristics and structure of living things, the processes of life, and how living things interact with each other and their environment.
2. Lesson Content
  - a. Body Systems
  - b. Nervous system: brain, nerves
3. Skill Objective(s)
  - a. The students will identify the brain, spinal cord and nerves as the nervous system.
  - b. The students will know that the nerves send messages back to the brain.
  - c. The students will identify the backbone as the part of the skeletal system that protects the spinal cord.
  - d. The students will identify the brain as the control center of the body and will know that it controls all that happens in the human body.

B. *Materials*

1. Appendix V, page 16 of Body Systems Book (one copy for each student and one overhead copy)
2. Appendix U – graded student copies and one overhead copy
3. Appendix W – one copy for each student
4. Appendix X, page 17 of Body Systems Book (one copy for each student)
5. *A True Book: The Nervous System*, by Darlene R. Stille

C. *Key Vocabulary*

None

D. *Procedures/Activities*

1. Review the previous lesson by going over the questions on page 15 (Appendix U) using the overhead copy. Allow students to make corrections on their papers, if necessary.
2. Tell the students that although there are other systems in the human body, they will be learning about one more – the nervous system. Introduce the nervous system by reading *A True Book: The Nervous System*, by Darlene R. Stille. Read through the first paragraph on page 13 and ask the following questions when finished.
  1. What is the main part of the nervous system? (*the brain*)
  2. What protects the brain? (*skull*)
  3. What is the brain connected to? (*the brain stem and then the spinal cord*)
  4. What branches out from the spinal cord to all parts of the body? (*nerves*)

5. What are things that the brain controls automatically? (*heartbeat, food digestion, and breathing*)
  6. What does the brain look like? (*It is soft, grayish-pink and has many folds and creases.*)
3. Show the students the overhead copy of Appendix V, which show the nervous system, and have them open their Body System Books to page 16. On the overhead copy label the brain, spinal cord and nerves, having the students do the same in their book.
  4. Tell the students that the brain controls absolutely everything and is called the control center of the body. It allows you to breathe, makes your heart beat and works to make sure your food is digested without you even having to think about it. Explain to the students that all of the systems that they've learned about in this unit could not function without the brain.
  5. Also explain that the backbone protects the spinal cord, which is attached to the brain, and from the spinal cord nerves travel throughout the entire body. Nerves allow you to feel heat, cold and pressure. They also allow you to hear, see and taste. For example, when we touch a hot stove, our hand moves away very quickly. That is how quickly the nerves send a message through the spinal cord and to the brain telling it that the stove was hot and we should move our hand.
  6. Explain to the students that our brain also allows us to store a large amount of information. Play a game with the students to show how much they can store in their memory. Have the students sit in a circle for this activity. Tell the students that they will be pretending that they are going on a camping trip. Start by saying, "I'm going on a camping trip and I'm taking a pillow." Then have the student to your right in the circle say the same thing but add something else that can be taken on the camping trip. For example, he/she may say, "I'm going on a camping trip and I'm taking a pillow and a sleeping bag." This continues until everyone in the circle gets a chance to add something to the list of what will be taken on the camping trip. However, each student needs to say all of the items listed before him or her before adding another item to the list. If there were 20 students in the class, the 20<sup>th</sup> student would be testing their brain the most because that person would need to remember 20 items.
  7. Have the students cut out the brain on Appendix W and paste to their body cutouts. Then have the students draw the spinal cord coming from the brain and the nerves branching out from the spinal cord.
  8. Have the students complete the assessment about the nervous system on Appendix X. The blanks on this assessment should be completed in the following order: *nervous, brain, spinal cord, backbone, heat, messages, heart, digested, learn*
- E. *Assessment/Evaluation*
1. The students will be assessed based on the completion of Appendix X
  2. The students can now be assessed on the body systems that have been drawn and/or pasted to the body cutouts by using the rubric on Appendix Y.

## VI. CULMINATING ACTIVITY

- A. Take a field trip to the Denver Museum of Nature and Science. They have great displays of the human body systems.
- B. Have a healthy eating and exercise day. Have each student bring in a healthy food for the class to eat and lead the class in an exercise of their choice.

## **VII. HANDOUTS/WORKSHEETS**

- A. Appendix A – Body Systems Book Cover
- B. Appendix B – Skeletal System Picture
- C. Appendix C – Bones Song
- D. Appendix D – Model Skeleton
- E. Appendix E – The Skeleton Inside You
- F. Appendix F – Chicken Bone Experiment
- G. Appendix G – Skeletal System Assessment
- H. Appendix H – Skeleton Rubric
- I. Appendix I – Muscular System Picture
- J. Appendix J – Muscular System Assessment
- K. Appendix K – Digestive System Picture
- L. Appendix L – Digestive system Assessment
- M. Appendix M – Stomach
- N. Appendix N – Order the Digestive System
- O. Appendix O – Circulatory System Picture
- P. Appendix P – Heart and Blood Song
- Q. Appendix Q – Heart
- R. Appendix R – Circulatory System
- S. Appendix S – Heartbeat
- T. Appendix T – Circulatory System Book
- U. Appendix U – Circulatory System Book Questions
- V. Appendix V – Nervous System Picture
- W. Appendix W – Brain
- X. Appendix X – Nervous System Assessment
- Y. Appendix Y – Body Cutouts Rubric
- Z. Appendix Z – Final Assessment
- AA. Appendix AA – Final Assessment Test Key

## **VIII. BIBLIOGRAPHY**

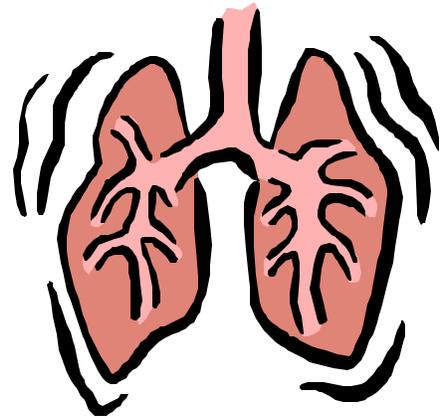
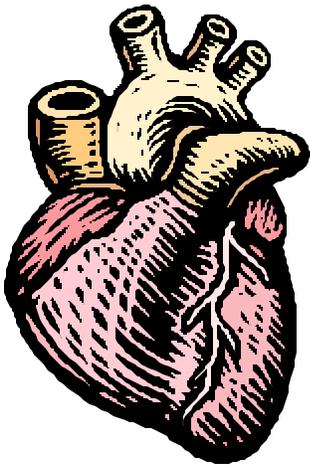
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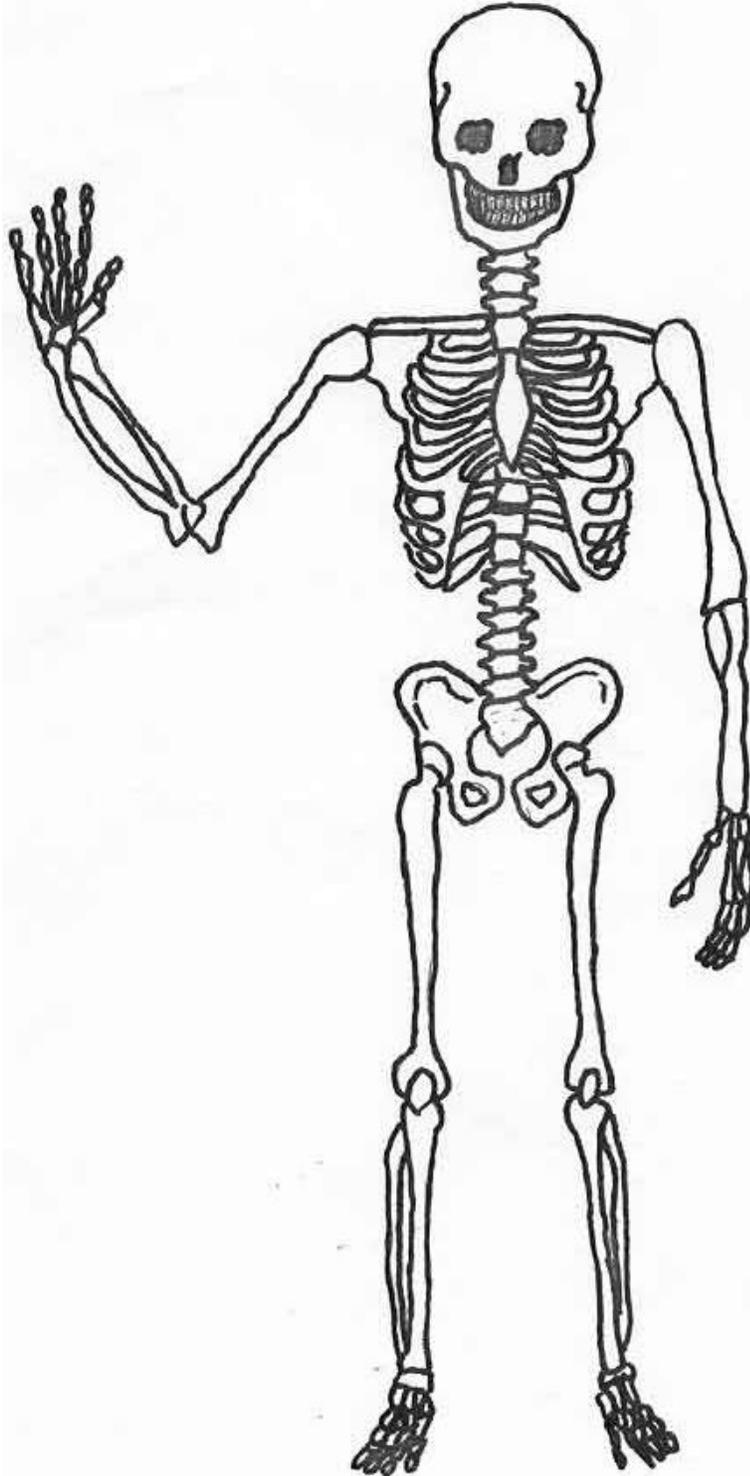
Appendix A  
Body Systems Book Cover



# Body Systems



Appendix B  
Skeletal System Picture  
**Skeletal System**



**Pg. 1**

Appendix C  
Bones Song



## Bones

(sung to "Home on the Range")

Oh, give me some bones  
That are sturdy as stones,  
That connect from my head to my toes.  
My bones help me out,  
Help my body about,  
They protect it wherever it goes!

### CHORUS:

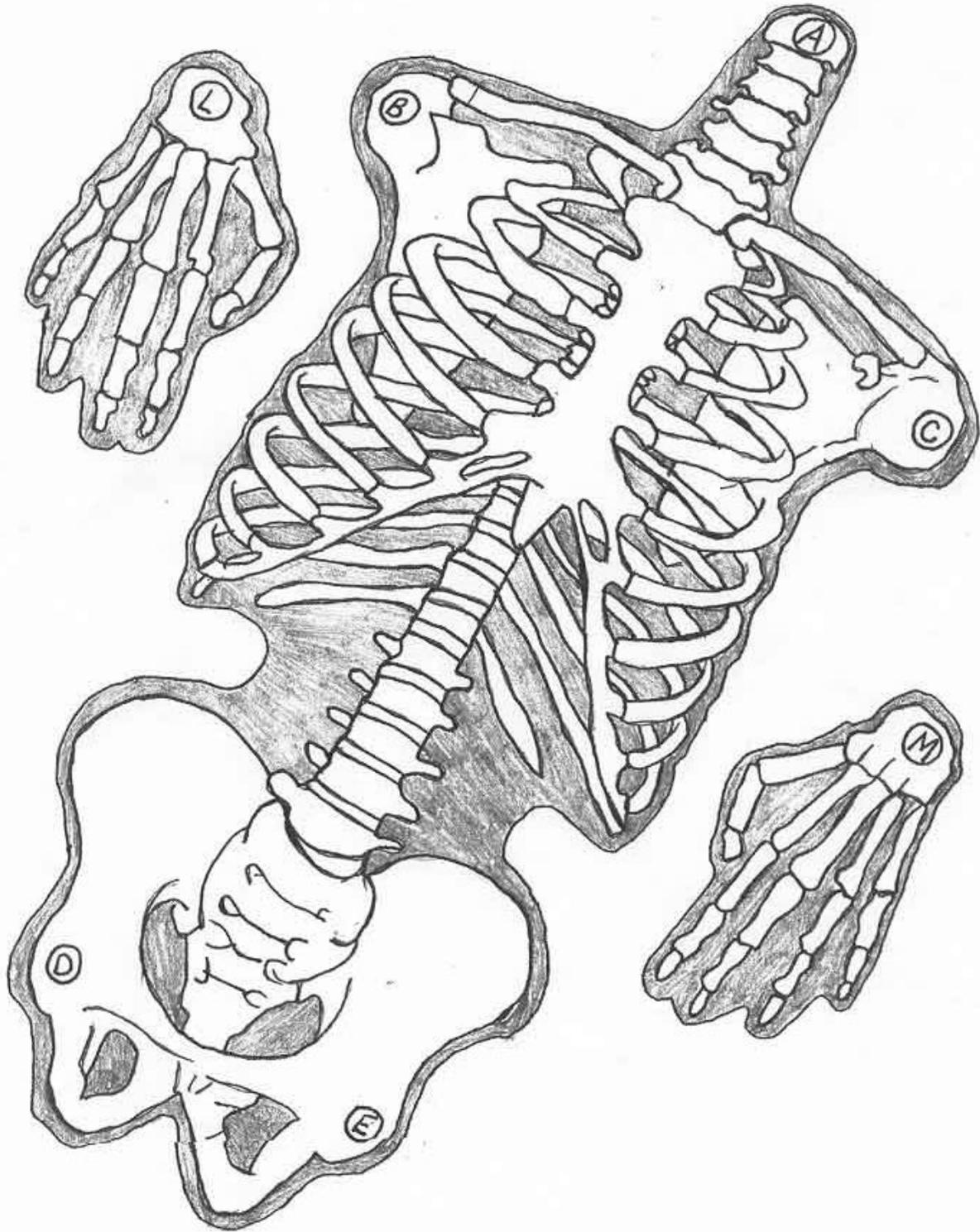
Bones, bones hard and strong,  
All connected so nothing goes wrong,  
My bones help me out,  
Help my body about,  
Bones protect me as I go along!

The bones in my spine  
Help me stand up just fine,  
While the bones in my ribs guard my heart.  
The bones in my hips  
Let me sit or do dips.  
Without bones, I would just fall apart!

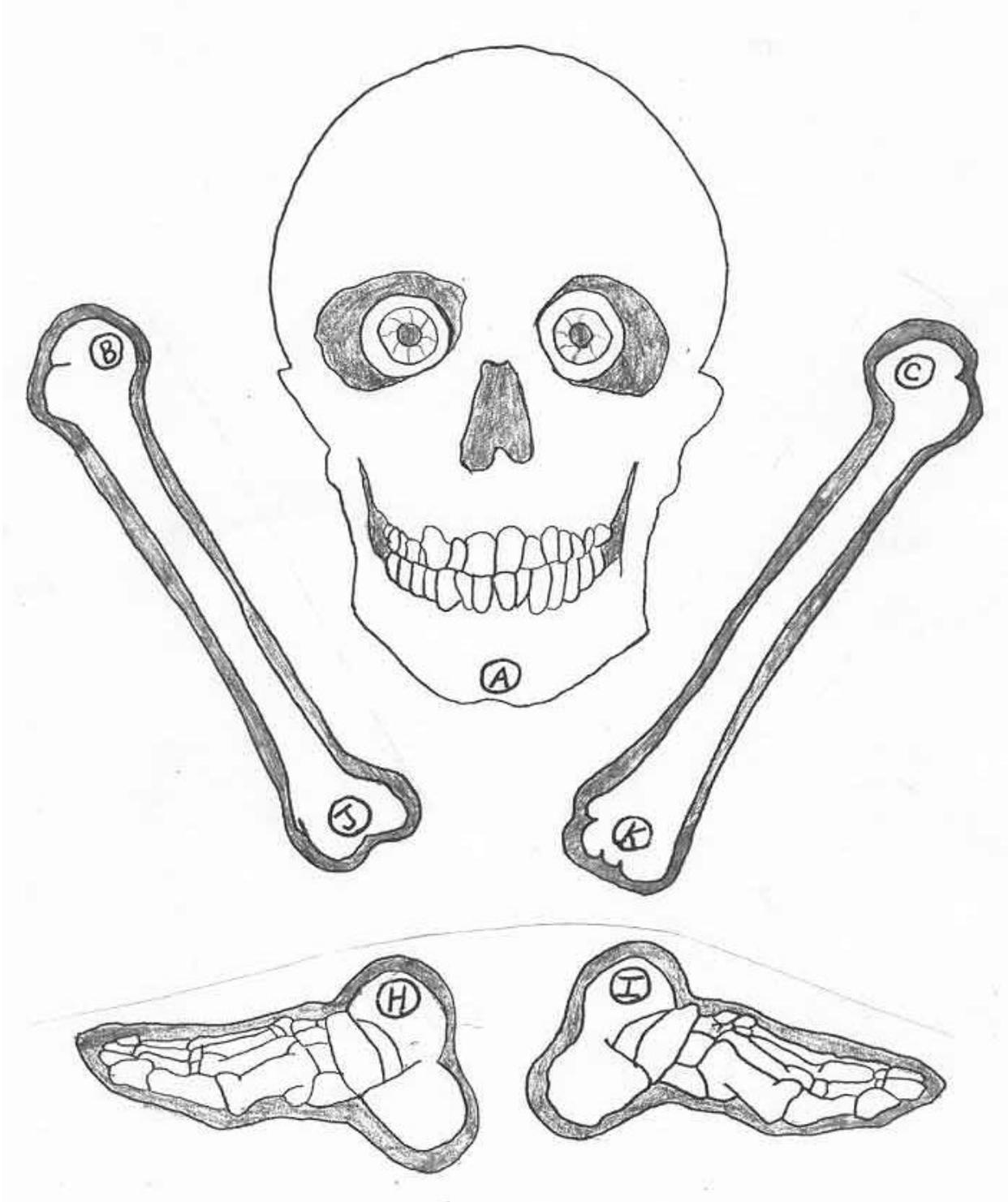
### CHORUS

Pg. 2

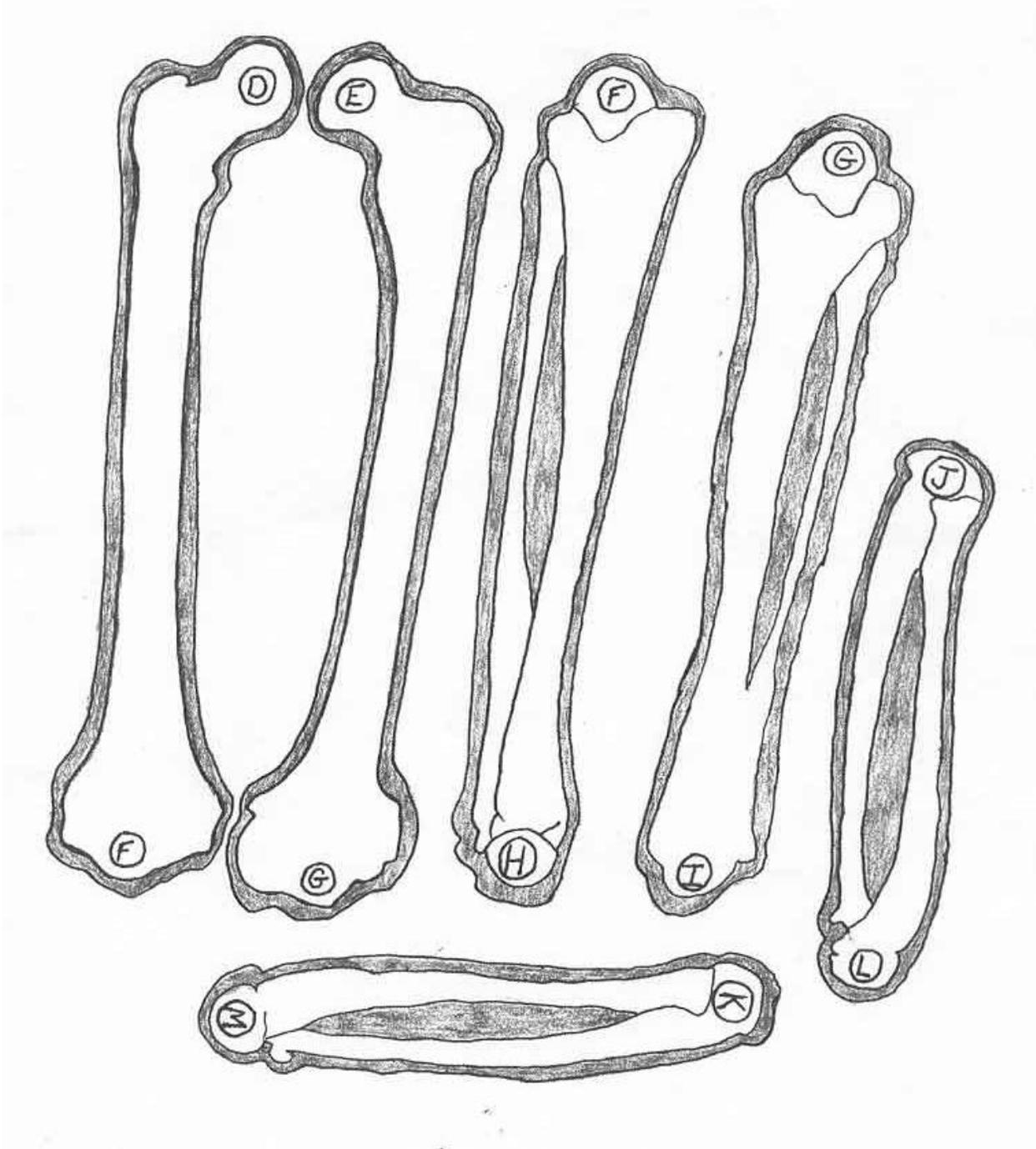
Appendix D, page 1  
Model Skeleton



Appendix D, page 2  
Model Skeleton



Appendix D, page 3  
Model Skeleton



**Appendix E**  
**The Skeleton Inside You**

**Name** \_\_\_\_\_ **Date** \_\_\_\_\_

Read each statement or question and circle the best answer.

1. There are \_\_\_\_\_ bones in the adult human body.
  - A. 206
  - B. 350
  - C. 100
  
2. A doctor uses an \_\_\_\_\_ to see the bones inside your body.
  - A. thermometer
  - B. x-ray
  - C. cast
  
3. What is in your ears and nose that is softer than bone and helps give it shape?
  - A. bone
  - B. skin
  - C. cartilage
  
4. Calcium makes your bones strong. What food would give your bones calcium?
  - A. carrots
  - B. popsicle
  - C. milk
  
5. What does your skeleton do for you?
  - A. makes you smart
  - B. gives you your shape and helps you move
  - C. helps you breathe
  
6. A \_\_\_\_\_ is where two bones join together.
  - A. joint
  - B. cartilage
  - C. muscle

**Appendix F  
Chicken Bone Experiment**

**Name** \_\_\_\_\_ **Date** \_\_\_\_\_

**1. What items did we need to conduct this experiment?**

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_

**2. How did the bones feel before they were placed in the jars?**

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**3. Do you think the vinegar or the water will take the calcium phosphate out of the bone?** \_\_\_\_\_

**4. How do you think the bone without calcium will feel after one week?**

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**CONCLUSION:**

**1. What happened to the chicken bone that was soaked in water for one week?**

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**2. What happened to the chicken bone that was soaked in vinegar for one week?**

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**Appendix G**  
**Skeletal System Assessment**

Name \_\_\_\_\_ Date \_\_\_\_\_

**Complete the following sentences by choosing the correct word using the word bank at the bottom of the page.**

1. The bones in your fingers and toes are called \_\_\_\_\_.
2. Your \_\_\_\_\_ helps to protect your brain.
3. The inside of a bone is called the \_\_\_\_\_ .  
It is lighter and has lots of spaces.
4. \_\_\_\_\_ is found in milk, cheese and fish and helps keep your bones healthy and strong.
5. The joint at your shoulder is an example of a \_\_\_\_\_ joint.
6. The \_\_\_\_\_ \_\_\_\_\_ is the outside of the bone and is very hard.
7. Your skeleton gives you your shape and helps you \_\_\_\_\_.
8. The \_\_\_\_\_ is the largest bone in the body.
9. Your rib cage protects your \_\_\_\_\_ and \_\_\_\_\_.
10. The joint at your knee is an example of a \_\_\_\_\_ joint.

---

**Word Bank**

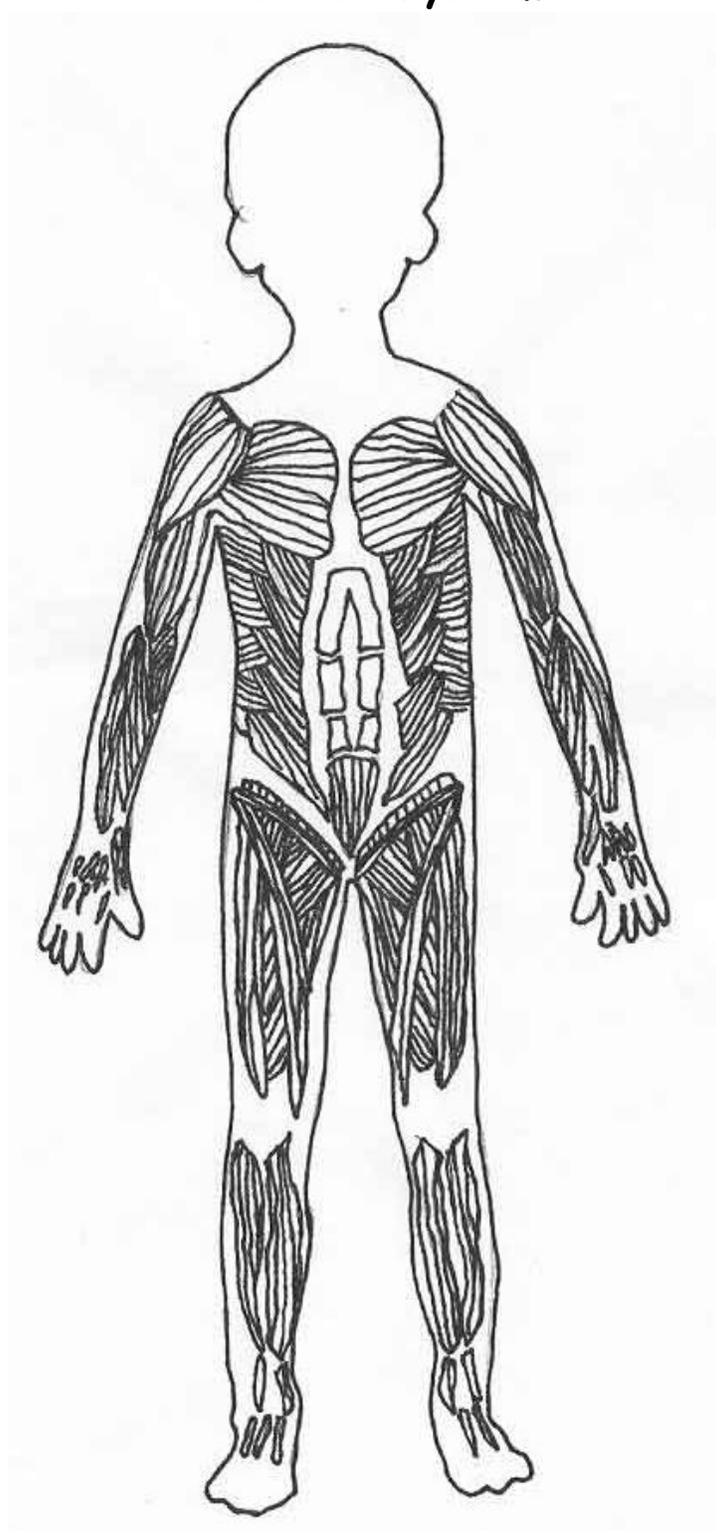
calcium	phalanges	cranium
heart	spongy bone	lungs
femur	ball-and-socket	hinge
move	compact bone	Pg. 5

**Appendix H  
Skeleton Rubric**

**Model of Skeleton Rubric**

<b>Criteria</b>				<b>Points</b>
	<b>3</b>	<b>2</b>	<b>1</b>	
<b>Construction of skeleton</b>	The student cut out all parts of the skeleton neatly and matched all joints correctly.	The student incorrectly matched 1-2 skeleton parts and/or did not neatly cut out each part.	The student incorrectly matched 3 or more skeleton parts.	_____
<b>Labeling of skeleton</b>	All parts of the skeleton are labeled correctly and are written with the correct spelling.	Up to three parts of the skeleton are labeled incorrectly and/or the spelling is incorrect.	4 or more parts of the skeleton are labeled incorrectly and/or the spelling is incorrect.	_____
<b>Neatness</b>	All labels on the skeleton are written neatly and reflect the student's best effort.	Up to 3 labels on the skeleton are illegible, and it does not reflect the student's best effort.	4 or more labels on the skeleton are illegible, and it does not reflect the student's best effort.	_____
<b>Total Points</b>	_____ →			_____
				<b>9</b>

Appendix I  
Muscular System Picture  
**Muscular System**



**Pg. 6**

Appendix J  
Muscular System Assessment



Name \_\_\_\_\_ Date \_\_\_\_\_

Read the sentence and choose the correct answer by coloring in one circle.

A \_\_\_\_\_ is what connects the muscles to the bones.

- tendon
- muscle
- rib

Your heart is an example of what type of muscle?

- voluntary
- involuntary

The muscles in your arms are what type of muscles?

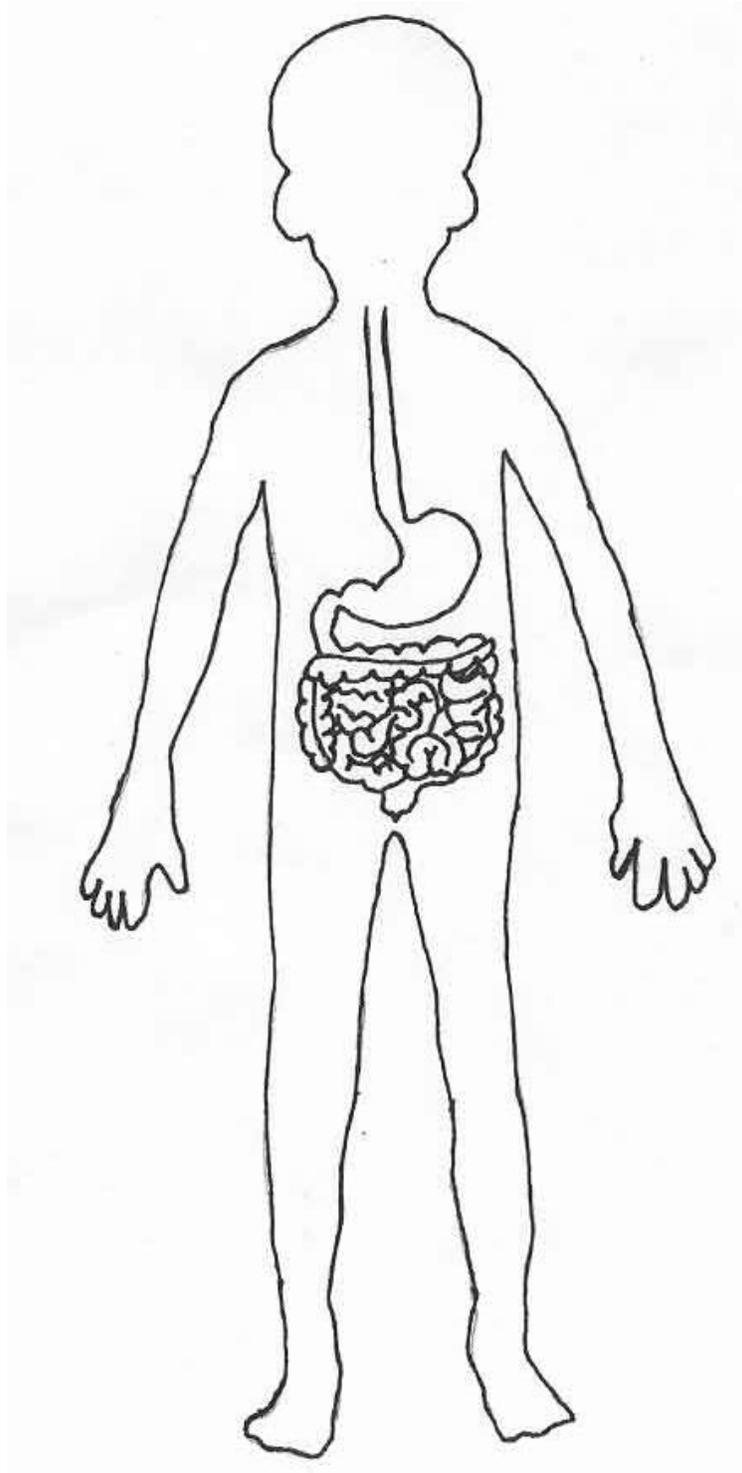
- voluntary
- involuntary

List three ways that you can exercise your muscles?

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

What happens to your bones and muscles when they are not exercised enough? \_\_\_\_\_

Appendix K  
Digestive System Picture  
**Digestive System**



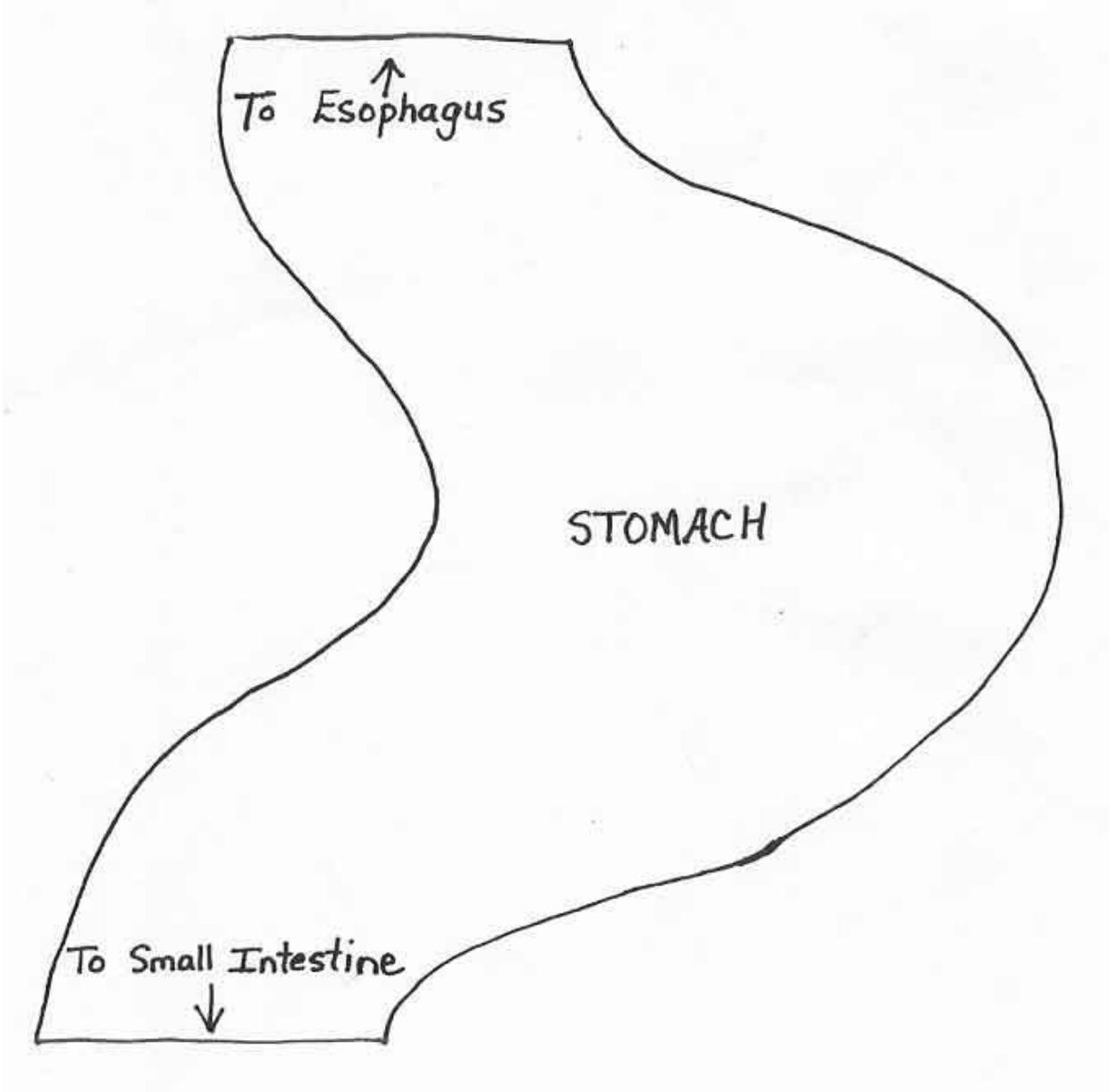
Appendix L  
Digestive System Assessment

Name \_\_\_\_\_ Date \_\_\_\_\_

Draw a line from the sentence on the left to the correct word on the right.

- |   |                    |
|---|--------------------|
| 1. This is the place where digestion begins.  | a. esophagus       |
| 2. This tube pushes the food from the mouth to the stomach.                                       | b. saliva          |
| 3. This is where food goes after leaving the stomach.   | c. involuntary     |
| 4. This helps break down food in the mouth.   | d. mouth           |
| 5. This is where the good parts of the food go when in the small intestine.                       | e. blood           |
| 6. This is where the food travels after the small intestine if it didn't go into the bloodstream. | f. small intestine |
| 7. The muscles in the digestive system are _____.   | g. large intestine |

Appendix M  
Stomach



**Appendix N**  
**Order the Digestive System**

**Name** \_\_\_\_\_ **Date** \_\_\_\_\_

1. The food empties into the stomach and is broken down by the muscles in the stomach and gastric juices.
2. The mouth is the first step of the digestive system. Your teeth and saliva begin breaking down the food.
3. The food travels down the esophagus before entering the stomach.
4. The food that is not absorbed into the bloodstream goes through the large intestine and then out of your body.
5. In the small intestine the tiny particles of food go into the bloodstream.

---

1. \_\_\_\_\_

\_\_\_\_\_

2. \_\_\_\_\_

\_\_\_\_\_

3. \_\_\_\_\_

\_\_\_\_\_

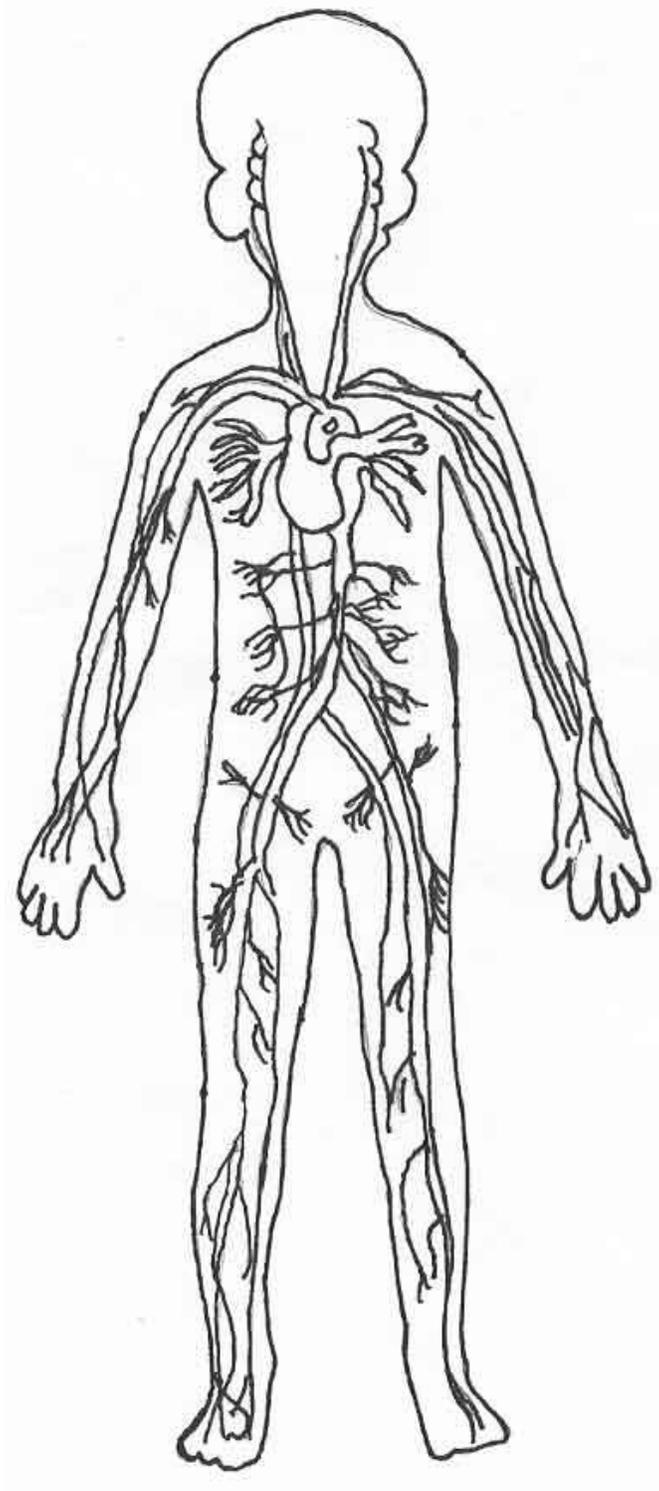
4. \_\_\_\_\_

\_\_\_\_\_

5. \_\_\_\_\_

\_\_\_\_\_

**Appendix O**  
**Circulatory System Picture**



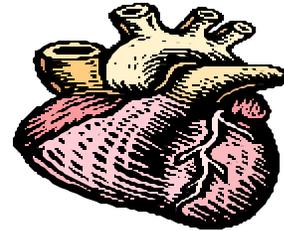
**Pg. 11**

Appendix P  
Heart and Blood Song

The following song is from the book *101 Science Poems & Songs for Young Learners*, by Meish Goldish.

## Heart and Blood

(sung to "The Ants Go Marching One By One")

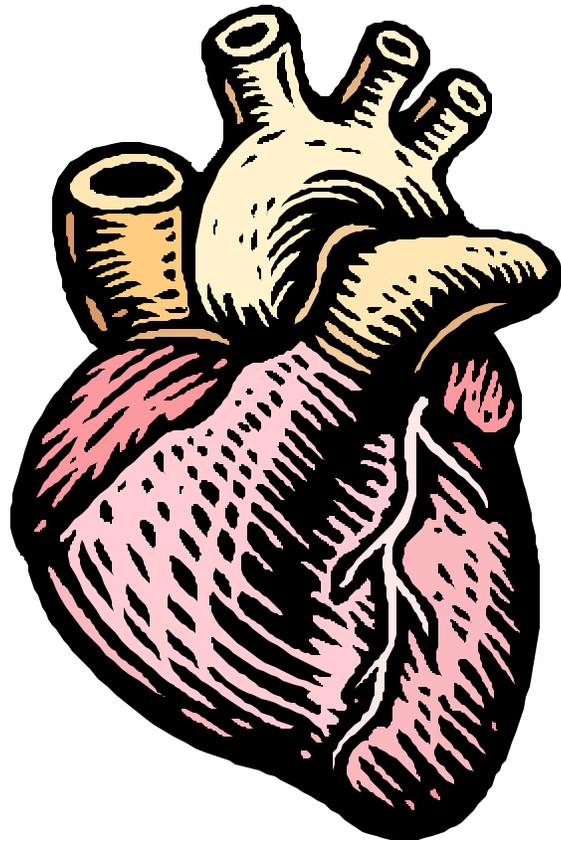


The heart is pumping blood for us,  
Hurrah, hurrah!  
The heart's a muscle fabulous,  
Hurrah, hurrah!  
The heart is pumping blood for us,  
It pumps all day without a fuss,  
And the blood goes round  
Because of our pumping heart!

The blood supplies us oxygen,  
Hurrah, hurrah!  
It's what our body needs to run,  
Hurrah, hurrah!  
The blood supplies us oxygen,  
And that's a need for everyone,  
And the blood goes round  
Because of our pumping heart!

Pg. 12

Appendix Q  
Heart



Appendix R  
Circulatory System

Name \_\_\_\_\_ Date \_\_\_\_\_

Complete the paragraph about the circulatory system by using the words at the bottom of the page.

The \_\_\_\_\_ system is made up of your heart and the \_\_\_\_\_ that travel throughout your body. Your heart is about the size of your fist and is actually a big \_\_\_\_\_. When your heart contracts it squeezes blood out of your heart. The blood vessels that carry blood away from your heart are called \_\_\_\_\_. The blood vessels that carry blood back to your heart are called \_\_\_\_\_. Blood carries \_\_\_\_\_ and nutrients from the \_\_\_\_\_ you eat throughout your body.

---

**Word Bank**

oxygen

arteries

muscle

food

blood vessels

circulatory

veins

Appendix S  
Heartbeat

Name \_\_\_\_\_ Date \_\_\_\_\_



Estimate of heartbeat  
while sitting \_\_\_\_\_

Actual heartbeat  
while sitting \_\_\_\_\_



Estimate of heartbeat  
while standing \_\_\_\_\_

Actual heartbeat  
while sitting \_\_\_\_\_



Estimate of heartbeat  
after running \_\_\_\_\_

Actual heartbeat  
after running \_\_\_\_\_

# The Circulatory System

**The heart and blood vessels make up the circulatory system.  
Blood travels through the whole body and keeps you alive.**

Pg. 1

**Appendix T, page 2  
Circulatory System Book**

**The heart is a muscle that pumps blood to every part of the body. Blood carries food and oxygen which helps keep you healthy and gives you energy.**

Pg. 2

**Arteries carry blood away from your heart. Veins carry blood back to the heart. Arteries and veins are connected by very tiny vessels called capillaries.**

Pg. 3

**Your blood has many parts. Red blood cells in your blood carry the oxygen. The white blood cells fight germs that get into your body.**

Pg. 4

**Food is carried in the blood by plasma and platelets in the blood help your blood clot. This means you will stop bleeding when you get a cut and a scab will form.**

Pg. 5

**Appendix T, page 4  
Circulatory System Book**

**Your heart is amazing. It beats all of the time without any rest. It is a very strong muscle. But like all muscles, it needs to be exercised.**

Pg. 6

**What are some things you can do to keep your heart healthy?**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

Pg. 7

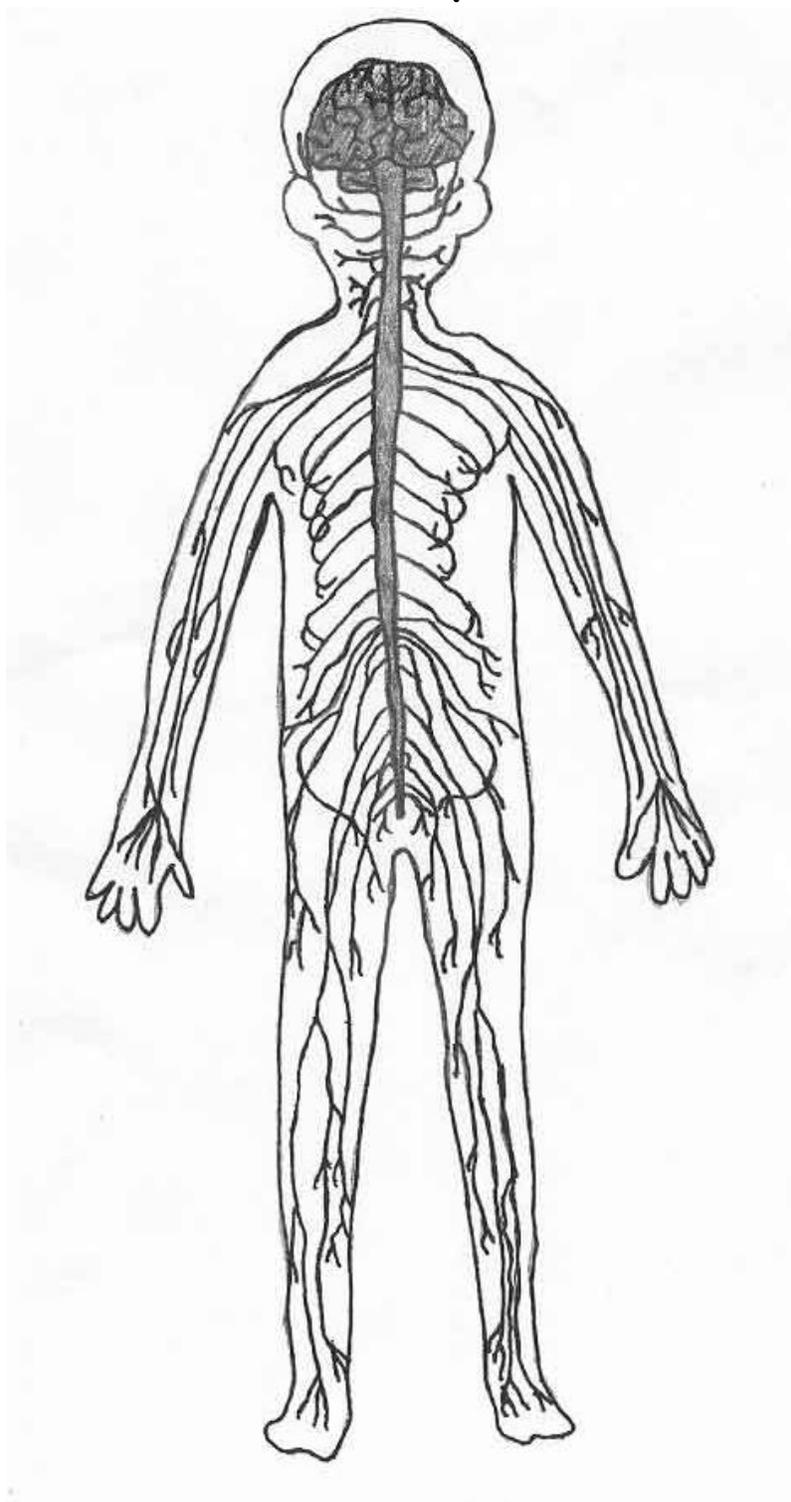
Appendix U  
Circulatory System Book Questions

Name \_\_\_\_\_ Date \_\_\_\_\_

Answer the following questions. Use the book about the circulatory system to help find the answers and use correct spelling.

1. What is the system called that is made up of the heart and blood vessels? \_\_\_\_\_
  
2. What is the heart? \_\_\_\_\_
  
3. What carries oxygen throughout the bloodstream? \_\_\_\_\_  
\_\_\_\_\_
  
4. What carries food in the bloodstream? \_\_\_\_\_
  
5. What is in your blood that helps it clot when you get a cut?  
\_\_\_\_\_
  
6. What are the cells in the blood that fight germs? \_\_\_\_\_  
\_\_\_\_\_
  
7. What blood vessels carry blood away from the heart?  
\_\_\_\_\_
  
8. What blood vessels carry blood to the heart? \_\_\_\_\_

Appendix V  
Nervous System Picture  
**Nervous System**



**Pg. 16**

Appendix W  
Brain



Appendix X  
Nervous System Assessment

Name \_\_\_\_\_ Date \_\_\_\_\_

Complete the sentences in the paragraph by using the words in the word bank.

Our brain, spinal cord and nerves make up the \_\_\_\_\_ system. The \_\_\_\_\_ is the control center of our body. It controls everything that happens in your body. The \_\_\_\_\_ is attached to the brain at the brain stem. It is protected by the \_\_\_\_\_. Nerves branch out from the spinal cord and travel throughout your whole body. These nerves allow you to feel pressure, cold and \_\_\_\_\_. The nerves send \_\_\_\_\_ back to your brain before you can even think about it. Your brain controls your beating \_\_\_\_\_, makes sure your food gets \_\_\_\_\_, and keeps you breathing. Your nervous system is amazing! And because of your amazing brain you can \_\_\_\_\_ many things.

---

**Word Bank**

**spinal cord**

**nervous**

**messages**

**backbone**

**heart**

**digested**

**heat**

**brain**

**learn**

**Appendix Y  
Body Cutouts Rubric**

Name \_\_\_\_\_ Date \_\_\_\_\_

Criteria	Points				
	Below Average	←————→			Excellent
<p align="center"><b>Skeletal System</b></p> <p>At least three bones of the skeletal system are drawn on the body. The illustration reflects the student's best work and the student is able to verbalize the body system.</p>	1	2	3	4	5
<p align="center"><b>Muscular System</b></p> <p>The student has drawn at least two muscles on the body. The illustration reflects the student's best work and the student is able to verbalize the body system.</p>	1	2	3	4	5
<p align="center"><b>Digestive System</b></p> <p>The student accurately followed the directions when cutting and constructing the digestive system. The parts of the digestive system are placed on the body in the correct order and at the correct location. The student is able to verbalize the system that it represents.</p>	1	2	3	4	5
<p align="center"><b>Circulatory System</b></p> <p>The student neatly cut out the heart and placed it in the correct location on the paper body. The student drew arteries and veins branching out from the heart. The illustration represents the student's best work, and the student is able to verbalize the body system that it represents.</p>	1	2	3	4	5
<p align="center"><b>Nervous System</b></p> <p>The student neatly cut out the brain and placed it in the correct location on the paper body. The student accurately drew the spinal cord and nerves branching out from the spinal cord. The illustration represents the student's best work, and the student is able to verbalize the body system that it represents.</p>	1	2	3	4	5

**Comments:**

Total Points \_\_\_\_\_

**25**

Appendix Z, page 1  
Final Assessment

Name \_\_\_\_\_ Date \_\_\_\_\_

Complete the sentences using the words from the word bank.

1. Your food travels from your mouth to your stomach through a long tube called the \_\_\_\_\_.
2. The bones that fit together to protect your brain are called the \_\_\_\_\_.
3. The rib cage protects your \_\_\_\_\_ and \_\_\_\_\_.
4. The blood vessels carry \_\_\_\_\_ and \_\_\_\_\_ throughout the body.
5. A \_\_\_\_\_ is where two bones fit together.
6. The \_\_\_\_\_ is the control center of the body.

Word Bank		
esophagus	joint	heart
oxygen	food	cranium
lungs	brain	

**Multiple Choice:**

1. Our skeletal system is made up of \_\_\_\_\_ bones.
  - A. 206
  - B. 350
  - C. 650
  
2. The largest, heaviest and strongest bone in the body is the
  - A. rib cage
  - B. phalanges
  - C. femur
  
3. The heart and blood vessels are part of what system?
  - A. Nervous system
  - B. Skeletal system
  - C. Circulatory system
  
4. The order that food travels through the digestive system is
  - A. stomach, small intestine, large intestine, mouth
  - B. mouth, esophagus, stomach, small intestine, large intestine
  - C. mouth, esophagus, small intestine, stomach, large intestine
  
5. Which blood cells carry oxygen throughout the body?
  - A. red blood cells
  - B. white blood cells

Appendix Z, page 3  
Final Assessment

**Multiple Choice:**

6. What system is made up of the brain, spinal cord, and nerves?
- A. Circulatory system
  - B. Muscular system
  - C. Nervous system
7. When food goes into your small intestine, the nutrients go into the \_\_\_\_\_.
- A. stomach
  - B. esophagus
  - C. blood
8. These two systems work together to allow us to move.
- A. Skeletal and Circulatory
  - B. Skeletal and Muscular
  - C. Nervous and Circulatory
9. The bones in the fingers and toes are called the \_\_\_\_\_.
- A. cranium
  - B. radius
  - C. phalanges
10. Digestion begins in the \_\_\_\_\_.
- A. stomach
  - B. mouth
  - C. large intestine

Appendix Z, page 4  
Final Assessment

**True or False**

1. \_\_\_\_\_ Our heart is an involuntary muscle.
2. \_\_\_\_\_ Saliva begins to digest food in the mouth.
3. \_\_\_\_\_ Veins carry blood away from the heart.
4. \_\_\_\_\_ You can control all of your muscles.
5. \_\_\_\_\_ Nerves send messages back to the brain.
6. \_\_\_\_\_ The joint at your knee is an example of a ball-and-socket joint.
7. \_\_\_\_\_ The joint at your shoulder is an example of a ball-and-socket joint.
8. \_\_\_\_\_ The joint at your elbow is an example of a hinge joint.

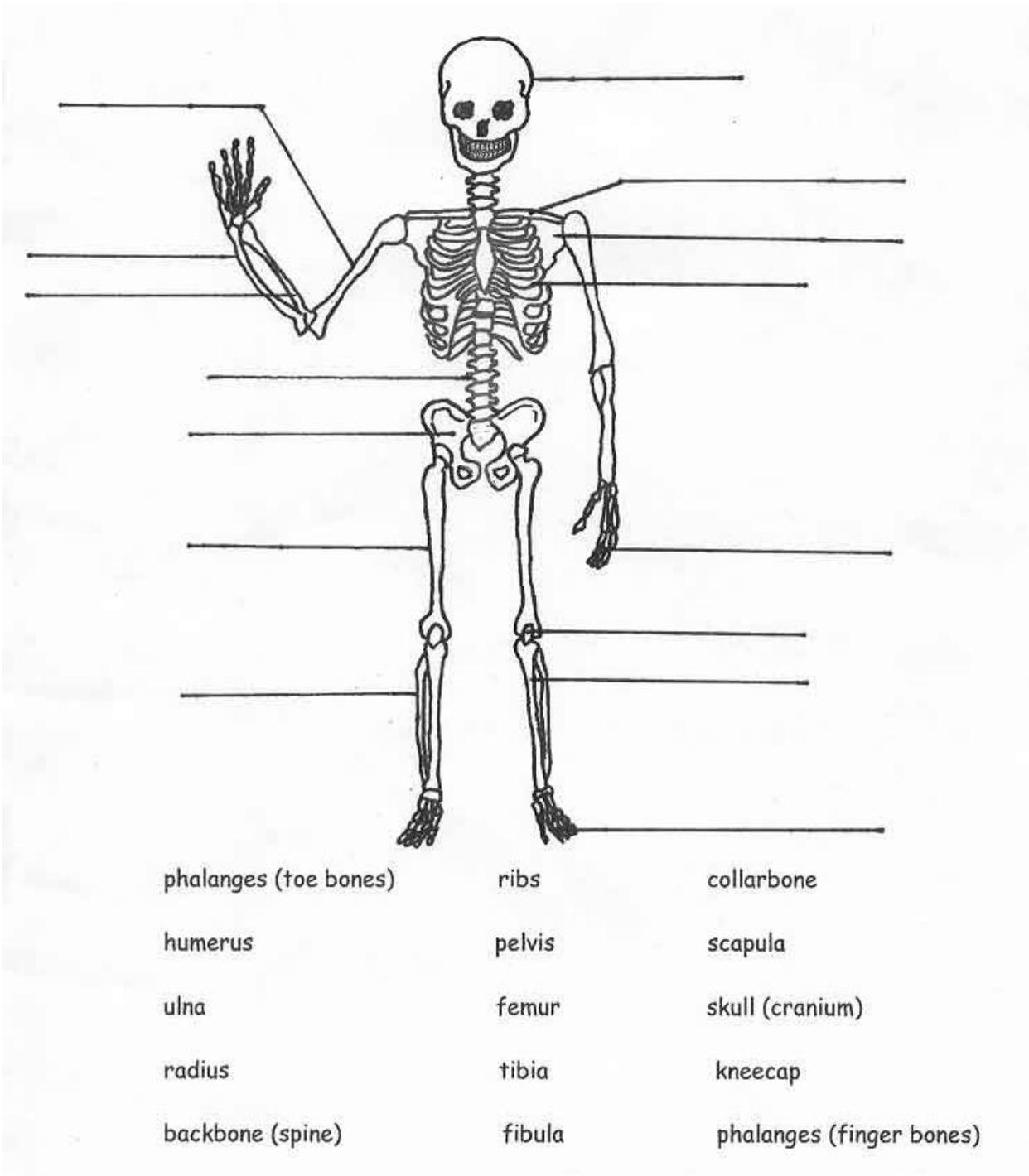
**Name two things that your brain helps you do:**

1. \_\_\_\_\_
2. \_\_\_\_\_

Note to teachers: \*\* Have the students label the skeleton on Appendix Z, page 5 using the names of the bones at the bottom of the page. Use Appendixes B, I, K, O and V for the remainder on the test. Simply copy these appendixes, taking off the name of the system at the top of the page. Write the names of the five body systems on the board and instruct them to label each page with the correct body system. Don't forget to white-out this "note" before copying the test.

**Pg. 4**

Appendix Z, page 5  
Final Assessment



**Pg. 5**  
**Appendix AA**  
**Final Assessment Test Key**

**Complete the sentences:**

1. esophagus
2. cranium
3. heart and lungs
4. oxygen and food
5. joint
6. brain

**Multiple Choice:**

1. (A) 206
2. (C) femur
3. (C) Circulatory system
4. (B) mouth, esophagus, stomach, small intestine, large intestine
5. (A) red blood cells
6. (C) Nervous system
7. (C) blood
8. (B) skeletal and muscular
9. (C) phalanges
10. (A) mouth

**True or False**

1. True
2. True
3. False
4. False
5. True
6. False
7. True
8. True