

Grade 1: Body Systems

Lesson 1: Muscle and Skeleton System

Lesson 2: Circulatory System

Lesson 3: Digestive System

Lesson 4: Respiratory System

Lesson 5: Urinary System

Lesson 6: Nervous System

Objectives:

- ✓ The student will name the major organ or part for each of the six Body Systems: Muscles and Skeleton, Circulatory, Respiratory, Digestive, Urinary, and Nervous.
- ✓ The student will name one major function of each system.
- ✓ The student will name the five senses.

Materials:

- From the Kit: Skeleton, Anatomical Charts, Dimensional Man Chart
- Muscle/Skeleton System: tongue depressors, twist tie, *Sculpy* modeling clay
- Circulatory System: small table fountain pump, clear tubing, clear glass bowl, Oxygen and Carbon Dioxide cards (**See Figure 1**)
- Respiratory System: balloon, clear tubing, straw
- Digestive System: brown paper lunch sack, clear tubing, saltine crackers, tape or string
- Urinary System: 2 pink sponges, 2 pitchers, 2 clear glass bowls
- Five Senses: carrot sticks, orange slices, grapes, and/or nuts
- Drawing paper and crayons (or markers)
- The Body System Song (**See Figure 2**)

Children's Literature:

The Human Body by Edward P. Ortleb and Richard Cadice

The Wonders of Me from A to Z by Bobbie Kalman

Activity Summary:

- In this lesson students will learn the primary function of each Body System and the main parts of the body in each system.
- The students will learn the five senses and the body part associated with each of the senses.

Background information for the teacher:

Not necessary for this grade level information.

Vocabulary:

Body Systems – parts of the body that work together to do things our body needs

Circulatory – the system that moves blood all over our body

Digestive – the system that processes our food

Respiratory – the system that brings air in and out of our body

Nervous – the way messages are carried in our body

Urinary – the system for removing waste from our body

Lesson 1: Muscle System and Bone System

Engage:

1. Bring in a cut of meat (making sure there is a visible bone running through it.)
2. Show the meat to the students.
3. Ask: **“What is the red/soft part of the meat?”** (Muscle – write guesses on the board, but do not tell students if they are right or wrong.)
4. Ask: **“What is the hard part in the meat?”** (Bone – write guesses on the board, but do not tell them if they are right or wrong)
5. Ask: **“Where do you think this meat comes from?”** (Animals – Let the students guess what kind of animal.)
Ask: **“Are human muscles and bones similar to animal muscles and bones?”**

Explore (10 minutes):

1. Say: **“Tell me about the muscles and bones.”** Then draw an arm on the board. Ask: **“What is on the outside?”** (Skin.) **“What would come next, muscle or bone?”**
2. Using two tongue depressor sticks and *Sculpy* modeling clay (red) recreate a “muscle” on bone, crossing a joint. Make a hole in one end of each of the sticks, putting the sticks end to end with the hole of one stick over the hole of the other stick. Secure a “twist tie” through the holes, tying the sticks together, then open the two sticks up so they are elongated and slightly bent at the joint of the two sticks. (Imagine the elbow joint.)
3. Roll a “muscle” with the modeling clay and attach just below the top of one stick and just below the hole in the second stick.
4. Have the students explain which part is the bone and which is the muscle. Ask: **“How do you know which part is the bone (it’s hard) and which part is the muscle?”** (It’s soft.)

Explain (10-15 minutes): *(You may wish to use the Skeleton and the Muscle and Skeleton charts for this part of the lesson.)*

Ask: **“Do you know where your muscles are located? How about your bones?”** *(Yes. All over my body.)*

Ask: **“What do muscles and bones look like? Describe them.”** *(Write descriptive words on the board.)*

Ask: **“Can you find pictures of muscles and bones in the room?”** *(Show students the anatomical charts which are provided in the Kit.)*

Ask: **“What Body Systems are the muscles and bones part of?”** *(The Muscle and Skeleton Systems.)*

Tell and Show: **“The Muscle and Skeleton Systems are everywhere under the skin. Bones are the hard parts, and muscles are soft.”** *Ask the students to touch different parts of their body to feel muscles and bones. Have them describe what they feel. (Example: The upper arm has a thicker muscle. It’s not easy to feel the bone. The hands and the skull have thinner muscles, so it’s easier to feel the bone.)*

Ask: **“What do our bones and muscles help us do?”** *(Stand, run, play ball, jump rope, etc... (Think structure and strength.)* **“Imagine if we removed all our bones. What would happen to our body? Imagine if we took out all our muscles. How would our daily life change? What would your body look like?”**

Sing the muscle and skeleton lines from the “Body System Song.”

Extend (20 – 30 minutes):

Have students make their own “muscle and skeleton” arm. (Or the students may work in pairs and select a different part of the body to make a different muscle-skeleton assembly, such as the leg and knee, head and spine, thumb and hand, etc.)

Provide each student with two tongue depressors (with holes in the ends), the twist tie, and some red modeling clay. After watching your demonstration, the students can make their own “muscle arm” model. Students can use the end of a paper clip to simulate the muscle fiber striations, as shown on the chart.

Have the students show their model and tell what part of the body it is.

Evaluate: You may use the “Extend” portion of the lesson as an assessment tool as well as the overall assessment at the end of all six Body System lessons.

Lesson 2: Circulatory System

Engage:

1. Ask for two volunteers. (You may want these two volunteers to wear something special like a hat or sign so that they stand out.) One volunteer will need to hand out an “oxygen” card and wear a sign saying “heart” and the other will hand out a “carbon dioxide” card and wear a sign saying “muscle”. **(See Figure 1)**
2. Place the two volunteers on opposite sides of the room. (You may want to go to a gym or outside for more room.)
3. Now have all the remaining students form a large circle with the “oxygen” volunteer and the “carbon dioxide” volunteer on opposite sides of each other.
4. All students other than the two volunteers are going to be “blood cells.” Every blood cell from “carbon dioxide” to “oxygen” should start with a “carbon dioxide” card. When you say, “Go!” the students will need to move in the way that you say (e.g. skip, jump, hop, crawl, walk, etc...).
5. Tell students they are going to pretend to be a blood cell moving through the body. Everyone will need to move **clockwise** around the circle. When they get to the “heart” or “muscle” volunteer they will need to switch cards, taking the appropriate card from that volunteer.
6. Ask: **“When you left the “heart,” what card did you have in your hand?”** (The oxygen card.)
7. Ask: **“When you got to the “muscle,” what card did you give the muscle?”**(The oxygen card.)
8. Ask: **“What card did the “muscle” give you?”** (The carbon dioxide card.)
Ask: **“When you traveled from the muscle to the heart, what card did you give the heart?”** (The carbon dioxide card.)

Discuss and explain. Then at the end, ask: **“What system in the body are we? What did we form?”** (A circle.) Write “Circle System” on the board. Tell them this isn’t the *exact* name but it’s close. Ask for more guesses.

Explore (10 minutes):

Set up a small pump (similar to the kind used in table fountains and fish tanks) with a clear hollow plastic tube attached to the air hole in a clear glass bowl filled with water. Have the top part of the tube stick out of the water. Plug in the pump and show the students the water moving into the pump and out of the tube. This illustrates the blood moving into the heart and going out the aorta.

After the experiment ask the students to think about some answers to the following questions:

1. **“How is the pump like the heart?”** (Just like the pump makes the water move or circulate in the bowl, the heart is a pump and makes blood move or circulate in our body. The body circulates oxygen and carbon dioxide

around the body. Good blood with oxygen leaves the heart and travels to another part of the body, where the blood cell drops off the oxygen and picks up the carbon dioxide so it can return to get more oxygen. Just as you did in the previous activity, you would begin with oxygen and travel through the body like a blood cell. Next, you would drop off the oxygen and pick up the carbon dioxide. Finally you would return to drop off the carbon dioxide and pick up oxygen again.)

2. **“What Body System is the heart part of?”** (The Circulatory System.)

Explain (10 minutes):

- Ask: **“Do you know where your heart is?”** (Yes! In my chest.) Have students tell or touch where their heart is located.
- Ask: **“Is your heart right in the center of your chest?”** (No. It’s located more to the left.)
- Ask: **“What does a heart look like? Can you find a picture of the heart in the room?”** On the board write descriptive words about the heart. Then have the students find and refer to the anatomical charts of the heart.
- Say: **“Tell me what you think the heart does.”** (It moves blood around in the body.)
- Ask: **“Why does the blood need to circulate in our body?”** (Because air and oxygen is in the blood and food is in the blood. Our entire body, from our toes to our brains, needs oxygen and food.)
- **Sing** the part of the “Body System Song” about the Circulatory System.

Extend (10 minutes):

1. Tell the students to place their hands on their chest over their hearts and be VERY quiet. Next, ask them to close their eyes. Ask: **“What do you feel?”**
2. Give each student two earplugs or pieces of cotton and have them place these in their ears. Then ask the students to put the palms of their hands over their ears and try to block as much outside sound as possible. Have the students close their eyes and listen. Ask: **“What do hear?”** (Note: If you have a volunteer or parent who would be willing to help, you may want to get a stethoscope so students can really listen to their heart.)

Evaluate:

Have students draw a picture of a body and the major organ that is part of the Circulatory System. Next, have the students draw in a muscle (such as a leg muscle) and show how the Circulatory System works. You may also want to use the overall assessment at the end of all six Body System lessons.

Lesson 3: Respiratory System

Engage: Have all the students hold hands, forming a circle. (You may need to go to a gym or outside.) Explain that when you blow air through the straw they will need to **slowly separate** and **stretch out** into a **big circle**. (Tell them to pretend that you are filling the center of their circle with air and they have to slowly spread out as it fills up.) As soon as you **stop** blowing through the straw they need to **slowly come back together**-- as tightly as they can-- and to pretend they are now squeezing all the air *out* of the circle. (Remind them, however, to watch you *carefully* because when you begin blowing on the straw again they need to spread out again because you are *filling the center of the circle with air*.) After giving instructions, practice going through the activity with the students.

Ask: “**What Body System are you acting like?**” (*The Respiratory System*.)
“**What organ in that system are you supposed to be?**” (*The lungs*.)

Explore (10-15 minutes):

Put a 8” - 10” length of clear hollow tubing into the opening of a balloon. Blow air into the tube, inflating the balloon until it is full and tight. Twisting the balloon just below the tube to hold the air in, begin letting **some**, but **not all**, of the air **out** of the balloon. It should be soft, but not empty.

If possible, have the students try their own experiment by giving small groups of students their own balloon and several tubes (one for each child.) Let students assemble their own models and repeat the experiment.

Ask the students to figure out (hypothesize) how the balloon and tubes work together to resemble our Respiratory System. Have them develop their own theories about this system from the balloon and tube model. Ask:

“What happens when air is blown into the tube?” (*It fills up the balloon.*)

“What part of our Respiratory System is the balloon like?” (*The lung.*)

“When the balloon is full of air, did we just breathe IN or breathe OUT?” (*In.*)

“When we breathe INTO the balloon what happens?” (It fills with air.)

“When we let some of the air OUT, what happens to the balloon?”
(Because it now has less air the balloon is softer.)

“After the air is let out, does the balloon have ANY air still in it?”
(Yes.)

Repeat for reinforcement: ***“Filling the balloon with air is like when we breathe in. Letting some of the air out of the balloon is like when we breathe out. Our lungs ALWAYS have some air in them.”***

Ask: ***“In what ways do you think the balloon and tube are like your Respiratory System?”*** (The tube is like our windpipe and the balloon is like our lung. Air comes in our nose and goes down our windpipe into our lungs.)

Explain (15 minutes):

1. Ask: ***“Do you know where your lungs are?”*** (Yes! In my chest.)
Have students tell or touch where their lungs are.
2. Ask: ***“What is next to the lung?”*** (Your heart.)
3. Ask: ***“How many lungs do you have?”*** (Two.)
4. Ask: ***“What does a lung look like? Can you find a picture of lungs in the room?”*** Have the students locate pictures of the lung.
5. Ask: ***“Based on your experiment with the balloon, what do you think the lungs do?”*** Have some volunteer students come up to the Respiratory Chart and demonstrate the movement of air in through the mouth, down into the trachea, into the lungs, and back out again.
6. Ask: ***“What Body System are the lungs a part of?”*** (The Respiratory System.)
7. Ask: ***“Why do we need oxygen in our body?”*** (Because oxygen helps give us energy. We breathe in “good” air (oxygen) and breathe out “bad” air (carbon dioxide.)

Here are a couple of “bonus” questions:

- ❖ ***“What makes the lungs work?”*** (A muscle.)
- ❖ ***“What is the name of that muscle?”*** (The diaphragm.)
- ❖ ***“Where is it?”*** (All around the inside of the bottom of the ribcage. It is a large and very strong muscle. When you breathe using your diaphragm muscle it pushes out your belly.)

Show students where the muscle is by having them touch where their ribs come closest together in the middle of their torso. Trace the bony edge of the ribs to the sides. The diaphragm attaches on the “backside” of these ribs.

Feel the diaphragm at work: Have the students place their fingertips on the bottom of the front ribs while they breathe in and out slowly. They should be able

to feel the movement of the diaphragm muscle push down with each in-breath, and pull up into the ribcage with each out-breath.

Sing the lines from the “Body Systems Song” about the Respiratory System.

Extend (25 minutes):

1. Have the students work in PAIRS, with each pair of students standing together in lines. Have students choose which one of their pair will be the “counter” first, and who will be the “mover” (doing jumping jacks) first.
2. Have the “movers” stand far enough away from the other students that they will not touch anyone while moving.
3. Have the “counter” stand in front of the “mover” and count the number of times their partner *breathes in* for 15 seconds.
4. Ask: **“How many breaths did your partner take?”** Write that number on a paper under the heading “Before.”
5. Have the “movers” do a series of jumping jacks for three minutes, then have each “counter” count the number of breaths their partner takes at the end of the movement for the same period of time (15 seconds.)
6. Ask: **“How many breaths did your partner take?”** Record the numbers on the paper under the heading “After.” Have the “movers” place their hands over their hearts. Ask: **“What do you feel?”**
7. Have partners switch jobs and repeat the exercise.
8. Create a simple chart of the data comparing “Before” and “After.” Ask: **“Why is the number of breaths greater ‘after’ than ‘before’?”**
(*Because the lungs are taking in more oxygen. Our bodies used a lot of oxygen during the jumping jacks. When you feel your heart beating faster it is moving more blood and oxygen all through your body.*)

Evaluate:

Collect the Extend Activity. You may also do the overall evaluation at the end of all six lessons.

Lesson 4: Digestive System

Engage:

Begin by reading “What Happens to a Hamburger” by Paul Showers. For this activity you will need five empty food containers (empty boxes of cereal, crackers, etc.)

1. Ask for five volunteers. Give each of the volunteers a piece of paper on which you've written one of the following words or phrases:

LEG MUSCLES
ARM MUSCLES
HEART
LUNGS
BACK MUSCLES

2. Have each of the volunteers stand at the back of the room. When you say their name (LEG MUSCLE, HEART, etc.) have that person run to the front of the room and take an empty food container from you. (NOTE: You will be standing in front of the room with all the empty food containers in a bag.) Start running in place at a fairly fast pace and say:

"I just ate a bunch of food. I feel so good I could do ANYTHING. My LEG MUSCLES have been walking a lot today they need some ENERGY." (At this point the "leg muscle" volunteer should run up and take an empty food container from the bag.)

3. Now run a little bit SLOWER and say, ***"My ARM MUSCLES have been working hard today they need some ENERGY."*** (Now the "arm muscle" volunteer should run up and take an empty food container out of the bag.)
4. Begin slowing down a little more and say: ***"My HEART ALWAYS works hard and needs ENERGY to keep up with everything I do."*** (At this point the "heart" volunteer should run up and take an empty food container out of the bag.)
5. Slow your pace to the point that you are now walking in place and say: ***"My LUNGS also work hard every day and they need ENERGY to keep up with everything I do."*** (The "lungs" volunteer should come up and take an empty food container out of the bag.)
6. Begin walking as if you are VERY tired and can HARDLY MOVE and say: ***"I have been doing a lot of LIFTING today and my BACK MUSCLES have been working hard."*** (Have the "back muscles" volunteer run up and take the last empty container out of the bag.)
7. Finally, walk VERY SLOWLY and eventually come to a stop.
8. Ask: ***"What happened each time a muscle (organ, etc.) took a box away?"*** (The pace got slower and slower, going from a RUN to a WALK and finally to a STOP.) ***"Why?"*** (Let students guess.)

Explore: (10-15 minutes):

1. Use a model of the Digestive System to get the students thinking about how it works. Show the two unassembled pieces of the model (a brown paper lunch bag and a length of clear hollow tubing approximately 7-8 inches long) to the students. Tell them you are going to make a model of the Digestive System and you will need their help to put it together properly.
2. Say: ***“Each one of these items is part of the Digestive System. What part do you think the brown bag represents?”*** (The stomach.) ***“What does this tube do?”*** (It takes food from the mouth to the stomach. It’s called the ESOPHAGUS.)
3. Ask: ***“How does the tube (esophagus) fit with the sack (stomach)?”*** Insert the clear hollow tubing into the opening of the sack, then tie the tubing securely to the sack opening, using string or tape.
4. Ask the students to think about what happens to the food when it goes from the mouth, down the esophagus, and into the stomach.
5. Using four-five saltine crackers, break them into pieces small enough to go through the tube and into the sack. Simulate the process of chewed food going down the esophagus by putting the cracker pieces into the tube so they enter the sack. Next, demonstrate how the stomach digests food by squeezing on the sack with your hands. Do this until the cracker pieces have been squeezed into small crumbs.
6. Ask: ***“Why do we need a stomach?”*** Have the students suggest their ideas, then say, ***“The stomach makes the food much smaller so it can be turned into fuel for our bodies.”***

Explain (10 minutes):

1. Ask: ***“Do you know where your stomach is?”*** (Yes! In my belly.) Have students indicate where their stomach is.
2. Ask: ***“What does a stomach look like? Can you find a picture of the stomach in the room?”*** Have the students locate pictures of the stomach.
3. Ask: ***“What body system is the stomach part of?”*** (The Digestive System.)
4. Ask: ***“What are the parts of our Digestive System?”*** (The mouth, esophagus, and stomach.)

5. **“How does the Digestive System work?”** (*We chew food in our mouth. After we swallow the food, it goes down a tube into our stomach. Our stomach changes the food to fuel.*)
6. Ask: **“Why do we need food in our body?”** (*Give students a chance to respond.*) **“Our bodies need fuel to be healthy in order to play, learn, and do everything else we want to do. Think of putting fuel in a car. What happens when your car runs out? It quits. What happens when your body doesn’t have food? It would also quit.”**
7. Reflect and relate this to the first activity. Ask: **“What happened when I had a lot of food in my bag? Throughout the day I used my leg muscles, etc. What happened to my food/energy? What happened to the pace of my jogging when each piece of food was taken away?”**
8. **Sing** the lines from the “Body Systems Song” about the Digestive System.

Extend: (15 minutes):

Have the students “draw” a story about eating their favorite food and digesting it, showing the food being chewed in the mouth, traveling down the esophagus, and finally going into the stomach. Have the students label each part of the Digestive System (mouth, tube or esophagus, and stomach.)

Evaluate:

Collect the Extend Activity. Also do the overall evaluation at the end of all six lessons.

Lesson 5: Urinary System

Engage: (5 minutes):

(If you have access to the Kit, take the kidney out of the Human Body Model. If you do not have access to the Kit, print out a picture of a kidney or check with the high school science department. Hold it up in front of the classroom.)

Ask: **“What is this?”** (Let students guess.) Ask: **“What does it do?”** (Write guesses on the board.) Tell the students: **“This is located in your body. Where do you think it is?”** (Write guesses on the board.) Pass the kidney around.

Explore (15 minutes):

Use this model of the Urinary System to have students figure out their own understanding of the Urinary System. Ask questions to get them thinking about this as you go through each part of the demonstration.

1. Cut two large pink sponges into kidney shapes. Set out two clear bowls that are empty. Have two pitchers of water, one clean and one with some

dirt in it. One sponge should be completely dry. **Do not use the dry sponge for the water demonstration.**

2. Ask: **“What is a kidney? What does it do for our body?”** (Helps filter waste.) Show the students the filtering function of the kidney by pouring the dirty water into the sponge until the sponge is full. Squeeze the water from the dirty sponge into one of the bowls.
3. Say: **“The water in this bowl is clean. What will happen if we put clean water on our kidney sponge?”** (It will remove the dirt.) Ask: **“How does our kidney get clean water?”** (We drink lots of water every day.) **“Why is it important to drink lots of water every day?”** (Drinking water helps replenish water so the kidneys can filter out waste.)
4. Show the students what happens to the kidney when we drink water by pouring some clean water onto the sponge. Squeeze the sponge into the second bowl. The water will be less dirty than the water in the first bowl. Repeat four or five times, pouring clean water onto the sponge and squeezing it into the second bowl. The water coming out of the sponge will become increasingly cleaner.
5. Explain that a sponge is like a kidney and the dirty water is like the waste in our body that needs to be taken out. The clean water demonstrates the importance of drinking **lots** of water every day.
6. Ask: **“What happens if we don’t get enough water and other liquids every day?”** (Kidneys lose fluid and become “dry.”) Show the dry sponge to the students. Explain to the students that when the kidney does not get enough liquid it cannot do the job it is supposed to do. When the kidney is not moist and flushed with water, that is not healthy for us.

Explain (10-15 minutes):

1. Ask: **“Do you know where your kidneys are?”** (Yes. In my back.) Have students tell or touch where their kidneys are located. Point out that the kidneys are protected by the lower part of the ribcage in the back.
2. Ask: **“How many kidneys do you have?”** (Two.)
3. Ask: **“What does the kidney look like? Can you find a picture of the kidneys in the room?”** Have the students find pictures of kidneys.
4. Ask: **“What Body System are the kidneys part of?”** (The Urinary System.)
5. Ask: **“What do the kidneys do for your body?”** (They clean your blood, and maintain a balance of fluids in your body.)

6. Ask: **“Why do we need to get rid of waste and keep lots of fluid in our body?”** (To stay healthy.)
7. Ask: **“Where do we get the liquids to put in our body?”** (From what we eat and drink. Drinking lots of water is the most important way.)
8. Ask: **“Where else can we get liquids for our body?”** (By drinking fruit juices, milk, broth in soups, and from most fruits and vegetables.) Explain that fruits tend to have more water in them than vegetables, and emphasize that sodas and fruit juices are not as healthy for you as water.
9. Ask: **“What are some of your favorite juicy (or watery) fruits and vegetables?”** (Apples, oranges, grapes, melons, lettuce, green beans, greens, etc. These give your body and your kidneys water. It is important to eat and drink lots of these every day.)
10. **Sing** the lines from the “Body Systems Song” about the Urinary System.

Extend (20-30 minutes): (This can be divided into two parts and done at different times.) Have the students figure out how they can get the most (and best) liquids into their body by what they choose to eat and drink. Organize the students in small groups then give each group a large piece of paper and some drawing materials. Have groups “brainstorm” the best foods that contain the most liquid/water for the kidneys. Foods should be in **three** categories: **liquids, fruits** and **vegetables**. Draw pictures of the ones they think are the best. *(Emphasize that water is better for the kidneys than sodas, even though both are liquid.) If possible have them draw the pictures in areas of the paper labeled: FRUIT/VEGETABLE/LIQUID.

Next, have each group decide which item from each category is the best of the best and have all groups report their conclusions to the class.

Have the class mark a chart with data showing each group’s choices under each category and counting how many times a fruit or vegetable is chosen. The liquid, fruit and vegetable that has been named the most by the groups is the “Best in Class.”

Evaluate:

Collect the Extend Activity. Also do the overall evaluation at the end of all six lessons.

*Recent studies suggest that consumption of soft drinks, along with increasing the risk of weight gain and obesity, may actually increase the risk of osteoporosis as well.

Lesson 6: Nervous System

Engage: Make a brain model, simulating the weight and consistency of a real brain. Do not tell the students what you are making. Only tell them it is the weight and consistency of one of the organs in the body.

Ingredients:

- 1.5 cups (360 ml) instant potato flakes
- 2.5 cups (600 ml) hot water
- 2 cups (480 ml) clean sand
- 1 gallon zip-lock bag

Put all ingredients in a zip-lock bag and mix well. (Weight: 3 lbs. or 1.35 kg.)

Explore (10-15 minutes):

Ask: **“What does the brain do?”** Have students work in pairs or small groups to figure out what the brain does. Give the students a hint: **“Think of three things we need our brain to do.”** (*The brain controls all movement, all our senses, and our thinking. The brain does many other things but these are three very important activities.*) Have the groups share their answers.

Suggested Reading:

- “My Five Senses” by Margaret Miller
- “The Five Senses” by Herve Tullet
- “My Own Five Senses” by Giovanni Caviezel

Explain (10-15 minutes):

1. Ask: **“Do you know where your brain is?”** (*Yes! It is in my head.*)
2. Ask: **“What does the brain look like? Can you find a picture of a brain in the room?”** Have the students find a picture of the brain. (Anatomical charts are available in the Kit.) Another option for a demonstration of the brain in the skull is to break open a walnut, keeping the actual nutmeat intact (the walnut represents the brain, and the shell represents the skull.)
3. Ask: **“If the brain is in our skull, how does it tell our fingers to play the piano or text a message or tell our nose to smell peanut butter?”** (*The brain is part of an entire SYSTEM, the Nervous System, with fibers that carry messages back and forth throughout our whole body.*) Give students time to answer in their own way, then using the anatomical chart to help them visualize the process, explain:

“The Nervous System goes all over the body. It starts in the brain in your head, goes down the spinal cord in your back and then through the nerves to ALL your body parts, including the skin. The Nervous System sends messages all over the body to and from the brain. It tells our body what to do. And it tells the brain what is going on with the body.”

4. Ask: ***“Why do we need our Nervous System?”*** (It helps us think and tells our muscles what to do. It also helps us **smell** flowers, **taste** ice cream, **touch** our pet’s fur, **hear** music, and **see** trees. We call these our five senses. These are all things that make our life fun.)
5. **Sing** the Nervous System lines from the “Body System Song.”

Extend (45 minutes):

Take the children on a **Sensory Field Trip** around the school, both inside and outside:

- In the classroom, put some food items on paper towels that each child can taste (such as orange slices, grapes, carrot sticks, and/or nuts.)
- Tell the children they will be going on a “Sensory Field Trip.” Have the children take a notebook and pencil on their field trip. As scientists, they will want to record data from their trip. They can count, write or draw what they experience.
- Explain that they are to pay attention to **finding things**, using all **five senses**.
- Ask them to **remember** and **record** (by counting, writing, or drawing) as much as they can of the things they see, hear, smell, or touch, finding **at least one** item for **each** of the five senses. (NOTE: Caution the children to taste **only** the things you’ve put out for them in the classroom.)
- Make a **Sensory Chart** on the board. Draw five columns, labeling the columns with one of the senses: **Touch, Sight, Sound, Smell, and Taste**.
- Ask each child to share at least **one** thing they experienced with their senses. Write that on the board under the appropriate column.

Ask: ***“What System picks up the information and sends it to the brain?”***
(*The Nervous System.*)

Evaluate:

Collect the Extend Activity. You may also do the overall evaluation at the end of all six lessons.

Overall Evaluation:

The Evaluate Activity can be used to reinforce all the information for all the Body System lessons, and should be used at the completion of the Explore/Explain/Extend components for each individual Body System lesson. When complete, the child will have a Body System model.

Give each child a sheet of legal size paper (or just a large piece of white drawing paper or newsprint.) Instruct them to draw an outline of a child. (See Figure 2 from the Kindergarten Body System lesson for an example.)

As the children complete the lesson for each Body System, have them draw the outline for the major organ (heart, lungs, kidneys, etc.) of that Body System on colored construction paper. Next, have them cut out their drawings and glue them onto the appropriate area of their body outline. Finally, have them draw an arrow to the side and label it, along with a brief description of what the major function of that Body System is.

Optional Enrichment Activity: Body Systems Posters

Have the students work in pairs or groups to create a poster about one of the following topics:

**Muscle and Skeletal System
Circulatory System
Respiratory System
Digestive System
Urinary System
Nervous System
The Five Senses**

Students should include each of the following items on their posters:

1. A picture of the major organ for the system;
2. A picture of the system layout in the body; and
3. A picture of the system “at work” (i.e., blood moving through the heart, the stomach digesting food, etc.)

If modeling clay is available students can create models of the major organs in the system to attach to the board. Colored string and yarn can be used for the connecting tubes and pathways of the systems, such as the windpipe in the Respiratory System, the aorta in the Circulatory System, etc.

You may wish to use the Dimensional Man Chart, and the Body Organ Chart provided in the Kit for reference.

Have each student group share their work with the class.

Standards:

Frameworks: Health and Physical Education

- I. Body Systems
 1. What All Students Should Know:
 - a. The ability to live, work and play depends upon the healthy functioning of each Body System.
 2. What All Students Should Be Able To Do:
 - a. Organize data, information, and ideas about the structure and function of the body into useful forms.
 3. What All Students Should Know:
 - a. Daily activities can affect Body System functioning.
- II. The Skeletal/Muscular, Cardiovascular, Respiratory, Urinary, Digestive and Nervous Systems have basic structures and functions that enable humans to live and perform a variety of tasks.
 1. What All Students Should Be Able To Do:
 - a. Identify and describe the basic structure and function of the Circulatory, Respiratory, Urinary, Skeletal/Muscular, and Nervous Systems.
 2. What All Students Should Know:
 - a. The Skeletal System provides a framework for the body.
 - b. The Muscular System provides humans with the ability to move and perform a variety of tasks.
 - c. The Cardiovascular System includes the heart and blood vessels.
 - d. The Respiratory System, which includes the air passageways and lungs, takes in oxygen from the air, delivers it through the blood capillaries, and removes carbon dioxide from the blood.
 - e. The Urinary System is part of the Excretory System.
 - f. The Digestive System processes food into a form the body can use for growth and internal functioning.
 - g. The human brain is part of the Nervous System.

Figure 1

O_2 Oxygen	CO_2 Carbon Dioxide
O_2 Oxygen	CO_2 Carbon Dioxide

Figure 2

“The Body System Song” – By Lisa Perkins (Sung to the tune of “The Ants Go Marching”)

The Respiratory System helps me breathe, me breathe.
The Respiratory System helps me breathe, me breathe.
I need my lungs to help me breathe, I need my lungs to help me breathe,
and my lungs are part of my Respiratory System.

The Urinary System keeps my body clean, me clean.
The Urinary System keeps my body clean, me clean.
I need my kidneys, I need my kidneys, I need my kidneys to keep me clean,
and my kidneys are part of my Urinary System.

The Digestive System helps me use my food, my food.
The Digestive System helps me use my food, my food.
I need my stomach, I need my stomach, I need my stomach to use my food,
and my stomach is part of my Digestive System.

The Nervous System helps my brain to think, to think.
The Nervous System helps my brain to think, to think.
I need my brain, I need my brain, I need my brain to help me think,
and my brain is part of my Nervous System.

The Skeletal System helps my body move, to move.
The Skeletal System helps my body move, to move.
I need my bones, I need my bones, I need my bones to help me move,
and my bones are part of my Skeletal System.

The Muscular System makes my body strong, so strong.
The Muscular System makes my body strong, so strong.
I need my muscles, I need my muscles, I need my muscles to make me strong,
and my muscles are part of my Muscular System.

The Circulatory System helps me move my blood, my blood.
The Circulatory System helps me move my blood, my blood.
I need my heart, I need my heart, I need my heart to move my blood,
and my heart is part of my Circulatory System.

Figure 3

Hokey Pokey

Have the students stand and form a circle. Sing the following words to the “Hokey Pokey” and have the students use their body to do the movements in the song, putting their body parts “in” and “out.” (Teacher models and leads the movement through the song.)

You put your right foot in
You put your right foot out
You put your right foot in
And you shake it all about

You do the Hokey Pokey
And you turn yourself around
That’s what it’s all about.

Repeat song with the following:

Left foot
Leg
Arm
Nose
Ear
Tongue
Head
Whole body