



Lesson #1: I Sing the Body Electric

Chapter One

In school, Cristina's fourth-grade teacher, Ms. Jefferson, has introduced a year-long theme for the class: Super Health, Super You! Ms. Jefferson knows that her students come from diverse backgrounds and may have different ideas about health, exercise, and nutrition. She wants to give them all a foundational understanding of what constitutes good health. The class picks a new topic for each lesson, exploring how their bodies work and what makes them healthy.

For the first lesson, the class decides to look at human anatomy and systems of the body. Mrs. Jefferson has a life-sized model of a human skeleton set up in the corner. Her teacher invites students to come up in groups to investigate the skeletal structure, and name the major bones of the arms, legs, and cranium. Cristina is excited to share what she learns with her family because of the health challenges her mother and grandmother face.

Lesson Overview

In this lesson, students are introduced to the parts of the body. Looking at human anatomical structures — skin, skeleton, muscles, and organs — they begin to investigate how the body works. They build understanding of how the parts of the body to create a system that works to keep them alive and healthy.

At different points in the lesson, students may be tempted to share personal information regarding their own health or that of others in their families. As always, be sure to follow school or district policies about the sharing of personal information about minors.

Content Areas

Life Sciences and Health Education

Activity Duration

1-2 60-minute class periods

Grade Level

Grades 3-5



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Essential Questions

- What are the functions of the skeleton and muscles?
- What are the internal parts of the body and what are their functions?
- How do the body parts work together?
- What constitutes a healthy body?

Objectives

Student will:

- Analyze the structure and functions of the human body
- Explain why it is important that the systems of the body work properly independently and as a team
- Make connections between understanding the body and personal health

Materials

- Writing materials (paper and pencils or pens, journal, or tablet)
- Body Investigation Sheets: Each student in a group needs his or her own copy
 - Skeleton and Muscles
 - Heart and Lungs
 - Stomach, Intestines, and Bladder
 - Liver, Kidneys, and Pancreas
 - Brain and Central Nervous System
- Model of human skeleton (if available)
- Overhead transparencies: skeleton (bones and muscles), organs, body structures
 - Possible sources include Science textbooks, library books, diagrams found online
- White index cards (one per partner group)
- Access to the internet
- Color stickers or sticky notes



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Optional Resources

- KidsHealth: How the Body Works
- Live Science: The Human Body: Anatomy, Facts & Functions
- EasyScienceForKids: Human Body
- KidsConnect: The Human Body

Vocabulary

- Skeleton
- Muscles
- Heart
- Lungs
- Stomach
- Intestines
- Bladder
- Liver
- Kidneys
- Pancreas
- System
- Brain and Central Nervous System
- Circulatory System
- Digestive System
- Respiratory System
- Urinary System
- Skeletal System
- Muscular System



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Background Information for the Teacher

The body is the structure of a human being. It is made up of many organs and systems that are self-regulating. Each component of the body has an independent role in regulating the body. When combined with the others, these organs and systems allow our hearts to beat and circulate blood, our lungs to breathe, our limbs to move and, generally, enable our bodies to function. The brain and central nervous system automatically regulate our body's internal systems, and allow us to move, respond, and function.

The human body has five vital organs that are essential for survival – the brain, heart, kidneys, liver, and lungs.

- **Brain** – Our body's command center; sends and received signals to other organs throughout the nervous system. We rely on our brains for thoughts and feelings, memories, and how we experience and perceive the world around us.
- **Heart** – Pumps blood throughout the body
- **Kidney** – Removes waste and extra fluid from the blood. They remove urea from the blood and combine it with water (and other substances) to make urine.
- **Liver** – Filters blood, breaks down drugs, removes toxins from harmful chemicals, produces bile (among many other jobs)
- **Lungs** – Removes oxygen from the air we inhale and send it to the cells in our bloodstream; expels carbon dioxide when we exhale

Each of our organs is part of a larger system, each working together to keep the body alive and functioning properly.

- **Nervous System** - Controls both voluntary and involuntary actions; sends signals to different parts of the body. The central nervous system includes the brain and spinal cord. The peripheral nervous system consists of nerves that connect every other part of the body to the central nervous system
- **Circulatory System** – Moves blood, nutrients, oxygen, carbon dioxide, and hormones around the body; consists of the heart, blood, blood vessels, arteries and veins



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- **Digestive System** - Consists of a series of connected organs that allow the body to break down and absorb food and remove waste; includes the mouth, esophagus, stomach, small intestine, large intestine, rectum, and anus. The liver and pancreas also play a role
- **Respiratory System** - Allows us to take in vital oxygen and expel carbon dioxide in a process we call breathing; consists mainly of the trachea, the diaphragm, and the lungs
- **Urinary System** – Helps eliminate a waste product called urea from the body. System includes two kidneys, two ureters, the bladder, two sphincter muscles, and the urethra.
- **Skeletal System** – Supports the body; consists of 206 bones connected by tendons, ligaments, and cartilage. It helps us move, produce blood cells, and store calcium.
- **Muscular System** – Aids in movement, blood flow, and other bodily functions; consists of about 650 muscles.
- **Integumentary System** – Protects us from the world around us, defending us against bacteria, viruses, and other pathogens, regulates body temperature, and eliminates waste through sweat; consists of the skin, the largest organ, as well as hair and nails.

Often, our body signals us when these systems are out-of-sync to signal stress or disease. For example, in the case of a cold or flu, we may experience symptoms like sneezing, coughing, or difficulty breathing, indications from our respiratory system that something is not right. After eating a bad meal, a stomach ache, vomiting or cramps may signal an upset in the gastrointestinal system. Often, when we feel like something's just "coming on," we may feel low energy, lethargic, and tired.



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Procedure

1. Ask students to share what they know about the parts of the body, including where they are and what they do, and what their bodies need to stay alive and healthy. Be sure to note misconceptions so they can be addressed as students move through the lessons. Ask students why it might be important for us to know the parts of our bodies and how our bodies work. Read aloud the first part of Cristina's story.
2. Explain to students that they are about to work together to explore the different parts of the body and find out what they do. Their journey will start with the skeleton and include many organs of the human body.
3. Divide students into teams and distribute the Body Investigation Sheets. Ask each team to gather information about the assigned parts of the body (listed below) and record their information on their sheets. Explain to students that they will have about 30 minutes to gather the following information (younger students may need more time and support):
 - Where is it?
 - What does it do?
 - **Team 1:** General structure of the skeleton and muscles
 - **Team 2:** Heart and lungs
 - **Team 3:** Stomach, intestines, and bladder
 - **Team 4:** Liver, kidneys, and pancreas
 - **Team 5:** The brain and central nervous system

Instructional Options:

- *Have students work on a laptop or computer to research teacher-approved websites or resources, or allow them to read age-appropriate classroom or library books.*
- *Consider assigning roles to students, such as reporter, recorder, and time keeper.*
- *When selecting research materials, keep in mind the age and grade level of your students. Consider using a textbook from your grade or another, if appropriate and available.*
- *For younger students, consider printing out resources to allow more time for reading and discussion.*



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4. Allow students time to collaborate on their exploration. As they work, circulate throughout the room to offer support and guidance and to remind them, if needed, about the purpose of their work.
5. Once teams have completed working, have each group present their findings to the whole group. Ask students to share what new information they learned about their bodies. Be sure to correct any major misconceptions.
6. Explain to students that their body is made up of many parts and each of those parts has a specific job. But they must also work with the other parts of the body for the body to stay alive and healthy. This means the body is a system. Explain that a system is a set of separate parts that work together as a whole. Ask students if they can think of examples of other systems. (Possible answers may include a car, a sports team, a family, or a computer.)
7. Ask students if they can identify any ways different parts of their bodies work together. Briefly discuss how the vital organs interact to perform necessary survival functions. For example, our muscles send signals to the brain, which then sends a message about how to move. The heart pumps blood through the circulatory system to all the organs, including the brain. The skeletal system protects key organs; the skull protects the brain, and the rib cage protects the heart.
8. Have students apply their current understanding of how their body works as a system. Read aloud some of the following scenarios and ask students to identify the body systems at work:
 - You and your family have been busy preparing a big, dinner for a special occasion. The smells are amazing, and once the food is ready you eat until you are full! What body systems are at work?
 - You are on the basketball court playing with your friends. You get the ball on the re-bounce and dribble down the court to make a basket! Which systems in your body are involved? What role do they play?
 - Your best friend is allergic to spring grasses and comes to school even though she has a scratchy throat, watery eyes, and runny nose. What systems are not functioning correctly? How has the system broken down?



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- You've got a test on the book you're reading in school, including multiple choice, spelling and vocabulary, and a short essay question. It's the first test this school year. You decide to read the assigned section again, write down answers to the questions at the end of each chapter, and check it against the story. You also write down vocabulary on index cards to memorize the words and spelling. What systems are at work?
9. What do you think might happen if one or more of the systems in your body are not working properly? How do you know?
10. Close the lesson by telling students they will continue to follow Cristina's story as they learn more about their bodies and how to make choices that keep their bodies healthy.

Cristina Shares: Why Healthy Body Systems Matters

As soon as Cristina learns that a broken system was a symptom of illness, she had an insight: maybe the problems her mother and grandmother were having had something to do with body systems! And, because of the way healthy systems are self-regulating, maybe there are ways to get those systems working better together. She is determined to learn more about it.

Celebration Extension

In this program, students learn a great deal about how their bodies work and how to exercise the power of personal decision-making to help keep them in balance. Through the lens of diabetes, they build understanding of how body systems can malfunction and the importance of eating whole, healthy foods to help achieve and maintain a healthy lifestyle. As part of a DIY project, students plant, grow, and harvest their own garden. When your students have completed this program, consider holding a special event for students to celebrate! Invite family and friends to join students for a creative presentation of all they've learned and, if possible, share part of their harvest in a community feast! Throughout the program, we will provide suggestions along the way for how to prepare for the special event. Engage students in the planning and encourage them to make it their own!

For this activity, have students collaborate to plan how they will share what they've learned about the body – organs, systems, and how they all work together to make our body function properly. Encourage students to use a creative approach. For example, they could choose to use music, video, poems, role play, illustrations, diagrams, or stories to share the information with others.

Suggested time for presentation: 3-5 minutes



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National Standards

NGSS

- LS1.B: Growth and Development of Organisms
- LS3.B: Variation of Traits

National Health Standards

- Standard 1: Students will comprehend concepts related to health promotion and disease prevention to enhance health.

CCSS

- CCSS.ELA-Literacy.RL.3.4 Determine the meaning of words and phrases as they are used in a text.
- RI.3.2 Determine the main idea of a text; recount the key details and explain how they support the main idea.
- W.4.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly



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Names: _____

Body Investigation Sheet: Skeleton and Muscles

Draw your organ(s) where they are in the body. Pay attention to the size in relation to the body.



What Does it Do?



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Names: _____

Body Investigation Sheet: Heart and Lungs

Draw your organ(s) where they are in the body. Pay attention to the size in relation to the body.



What Does it Do?



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Names: _____

Body Investigation Sheet: Stomach, Intestines, and Bladder

Draw your organ(s) where they are in the body. Pay attention to the size in relation to the body.



What Does it Do?



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Names: _____

Body Investigation Sheet: Liver, Kidneys, and Pancreas

Draw your organ(s) where they are in the body. Pay attention to the size in relation to the body.



What Does it Do?

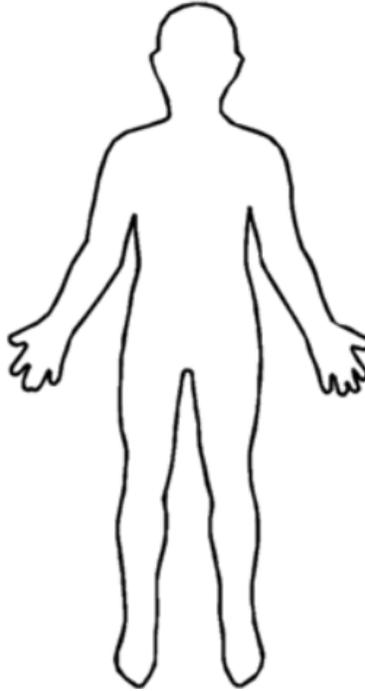


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Names: _____

Body Investigation Sheet: Brain and Central Nervous System

Draw your organ(s) where they are in the body. Pay attention to the size in relation to the body.



What Does it Do?