

# The Body Systems Lesson Plan

## Science Standards Addressed (From the Colorado Department of Education)

<http://www2.cde.state.co.us/scripts/allstandards/costandards.asp?stid=7&stid2=0&glid2=0>

### Standard 2-Life Science

- 7<sup>th</sup> Grade: Outcome 2: The human body is composed of atoms, molecules, cells, tissues, organs and organ systems that have special functions and interactions.
- 5<sup>th</sup> Grade: Outcome 2: Human body systems have basic structures, functions and needs.

## Reading, Writing, and Communicating Standards Addressed (From the Colorado Department of Education)

<http://www2.cde.state.co.us/scripts/allstandards/COStandards.asp?glid=6&stid2=6&glid2=7>

### Standard 3-Writing and Composition

- 6<sup>th</sup> Grade: Outcome 1: Writing informational and persuasive genres for intended audiences and purposes requires ideas, organization, and voice.
- 5<sup>th</sup> Grade: Outcome 3: The recursive writing process creates stronger informational and persuasive texts for a variety of audiences and purposes.
- 4<sup>th</sup> Grade: Outcome 3: Correct sentence formation, grammar, punctuation, capitalization and spelling are applied to make the meaning clear to the reader.

### Standard 4-Research and Reasoning

- 4<sup>th</sup> Grade: Outcome 1: Comprehending new information for research is a process undertaken with discipline both alone and within groups.

## Mathematics Standards Addressed (From the Colorado Department of Education)

<http://www2.cde.state.co.us/scripts/allstandards/COStandards.asp?glid=0&stid2=4&glid2=8>

### Standard 3-Data Analysis, Statistics, and Probability

- 6<sup>th</sup> Grade: Outcome 1: Objects in space and their parts and attributes can be measured and analyzed.

### Standard 4-Shape, Dimension, and Geometric Relationships

- 7<sup>th</sup> Grade: Outcome 2: Linear measure, angle measure, area, and volume are fundamentally different and require different units of measure.

**Objective:** Understand the how the different body systems (skeletal/muscular, circulatory, respiratory, digestive, and nervous) work and how they are related to each other. Be able to create a plan to organize thoughts and write a descriptive and detailed paragraph for each system.

### Introduction

First show students a simple machine (ie. a can opener) to show how the parts work together. Then talk about how the organs in your body work together in groups called system.

Have students read Magic School Bus Inside the Human Body and identify the body system that work together:

Ernie Endocrine  
Can Circulatory  
Never Nervous  
Remember Respiratory  
Digestive Digestive  
System Skeletal / Muscular

Have students form groups and then trace one person onto a piece of butcher paper. After covering a body system, students can add then draw that system onto the body.

### Skeletal/Muscular System

Questions for students:

Why do we have bones? Support us and protect our organs (like the rib cage and skull)

What are bones made of? Calcium

Activity:

Show them the egg that was soaking in vinegar (best if soaked overnight).

Pass around to see how soft and rubbery it is now.

Explain to them that the outside of the egg is made of calcium.

Questions: What happen to the calcium? It dissolved.

What happens when we don't get enough calcium?

Where can we get more calcium?

Show X-Ray of a broken bone. Ask students how can they protect their bones.

Bones cannot move on their own. They need muscles to move.

Show student picture of muscular system.

Question for students:

What do muscles help us do? Exercise.

Explain that one way to understand exercise is to divide physical activities into 3 categories: strength (ability to lift, pull, or push), endurance (the ability to do something for a long time), and flexibility (ability to stretch and bend)

Activities:

Strength: Push ups

Endurance: Run in place until tired.

Flexibility: V-sit

Talk about what muscles are used to do these activities.

Joints allow humans to bend, swivel, curl, pivot, and turn. Joints are points where two or more rigid bones are joined together by muscles.

Pass around an example of a hinge joint (like one that a door uses), and a ball-and-socket joint. Have students discuss the range of motion of each joint. Have students move some of the major bones in there body, such as the tibia (shinbone), the femur (thighbone), humerus (upper arm bone) and the mandible (jawbone). Ask students which joint is used to move the bone. Have students describe motion of the joint (up and down, around in a circle, etc.) and identify the kind of joint being used.

Have students read about the skeletal/muscular system.

Have students use a circle maps write down what they learned about the skeletal/muscular system. Then have them write a paragraph about the skeletal/muscular system.

Have student draw on the body a few bones (ie. rib cage, femur, etc.)

## Circulatory System

Question:

What is the largest muscle in the body? Heart,

What does the heart do? Pumps blood around the body. Pump oxygen from the lungs to body parts that need it. After the body parts use the oxygen, it releases carbon dioxide to the

Where does the blood go? Everywhere!

Activity: Find resting pulse.

On neck find pulse, count beats in 10 seconds, multiply by 6.

Then do an exercise (ie. jumping jacks or running in place) for 1 minute and then find pulse again.

Questions: Why Muscles need more oxygen, so more blood has to be pumped to them.

Alternative Activity:

Stick a toothpick in a "dime sized" lump of clay.

Place the piece of clay on the inside of their wrist.

Count how many times the toothpick moves.

Exercise.

Count how many times the toothpick moves.

Activity:

Assign students into "heart", "lungs", "blood", and "body parts" groups.

Have "blood" students start at the heart and move the "lungs".

"Lung" students will hand "blood" students a card that says oxygen.

"Blood" students return to the "heart", which pumps the "blood" to "body parts".

"Blood" students will move to "body parts".

"Body part" students can be a certain body parts, like leg muscle or brain, and act out a motion (like kick) when they receive oxygen. Then the "body parts" students give the "blood" students carbon dioxide cards.

Then "blood" students move back to the "heart", which then pumps the "blood" to the "lungs".

At the "lungs", "blood" students swap carbon dioxide cards for oxygen and then return the "heart", where the process repeats.

Have students read about the circulatory system.

Have students use a circle map write down what they learned about the circulatory system. Then have them write a paragraph about the circulatory system.

Have students draw a heart on the body with some arteries and veins.

## Respiratory System

Question: How do we get the oxygen we need? By breathing, what organ do we use? Lungs.

Lungs trade carbon dioxide with blood for oxygen, hence, why we breathe out carbon dioxide.

We breathe in oxygen through our mouth, which passes through the trachea (windpipe) into our lungs.

The lungs swap oxygen for carbon dioxide.

The diaphragm is a muscle that helps push out the lungs when they are filling up with air. The diaphragm also help let the lungs back in to squeeze out the air.

Activity: With one breath, blow the balloon as big as they can. Use a long piece of string to measure the circumference. Advanced students can determine the volume of the balloon.

Have students read about the respiratory system.

Have students use a circle maps write down what they learned about the respiratory system. Then have them write a paragraph about the respiratory system.

Have students draw mouth, trachea and lungs on the body.

### Digestive System

We need energy for moving our muscle also, how do we get the energy we need? By eating.

The digestive system breaks down the food we eat so we can use it as energy.

Go through each part of the digestive system: mouth, esophagus, stomach, small intestine, and large intestine.

The first step of the digestive system is chewing on food to break it apart. Ask students about the kinds of teeth they have and what they think they do. Explain that each set of teeth is designed for a specific purpose.

- Canines (sharp and pointy shapes used for cutting and tearing)
- Incisors (big, flat wedge shapes used for biting off food)
- Bicuspids or premolars (2-pointed shapes for grinding)
- Molars (flat, squared shapes used for grinding)

Explain that the saliva also help break down food. Saliva contains enzymes, which are molecules that help break down the food.

Food then pass through the esophagus which is a tube found in your throat.

Food's next stop is the stomach. The stomach contains acid that further break down food. Muscles move the stomach's walls to mash up the food.

Activity:

Crackers into plastic bag with orange juice. Mash the bag to simulate the stomach. Also shows the stomach is acidic and muscles moving the walls of the stomach to mash up the food.

The small intestine squeezes the food through a 20 foot long tube that is coiled up in the body. The small intestine pulls nutrients out of the food to send to the bloodstream.

The large intestine takes water out of the food and pushes out the left over waste.

Activity: Divide the class so that a group of students will form the mouth, another will be the esophagus, another will be the stomach, the small intestine, and the large intestine. The teacher will be the "food." As the food walks into the mouth, the students will have their hands clasped up and down. The food will then be twirled down the esophagus, the students line up in two lines and high five the "food" as it passes (like basketball players running onto the court before the game). The students representing the stomach will surround the food and walk in a circle as the food is bumped around. When the teacher says, "Ready" the students will pass the food into the small intestine, where the food is tugged on (representing the small intestine pulling out the nutrients). Finally what is left of the food is pushed to the large intestine, and pushed OUT! You may do this several times by allowing each group to rotate as the different organs.

Have students read about the digestive system.

Have students use a flow maps write down what they learned about the digestive system. Then have them write a paragraph about the digestive system.

Have students draw teeth, esophagus, stomach, small intestine, and large intestine on the body.

## Nervous System

Question:

What tells the body what to do? The brain and nerves.

The brain contains nerves that send messages all over the body through other nerves.

The brain is part of the central nervous system along with the spinal cord.

The spinal cord is a bundle of nerves that relay messages from the brain to different parts of the body.

Question:

What protects the brain? The spinal cord?

Activity: Have students line up. Have one student be the brain. Pass activity cards down the line, when the 'brain' is tapped on the shoulder, have the student with the card do the activity.

The brain also receives and process messages from our senses.

Question:

What are our 5 senses? Sight, touch, smell, taste, hearing.

Activity:

Talk about how some senses are related to each other.

Hand out strawberries to students, tell them to chew on it while holding their nose.

Then release their nose and describe how different the strawberry tastes.

Explain how foods can taste different when you have a cold.

Have students read about the nervous system.

Have students use a circle maps write down what they learned about the nervous system. Then have them write a paragraph about the nervous system.

Have students draw a brain, spinal cord, and some nervous on the body.

## Endocrine System

A system of glands that helps the body function.

### Major Glands of the Endocrine system

- Pituitary
- Thyroid
- Parathyroid
- Adrenal.
- Pancreas
- Ovaries
- Testes

It contains a group of glands that release hormones (special chemicals) into the body.

Controls: body temperature, sleep, hunger, growth sweat, "fight" or "flight", male or female characteristics, etc.

Have students do the "I didn't know that!" worksheet.

Have students use a circle maps write down what they learned about the endocrine system. Then have them write a paragraph about the endocrine system.

Have students draw a gland on the body.

### Selected Readings

Arnold, Caroline. The Skeletal System. Lerner Publications Company, Minneapolis. 2005  
Johnson, Rebecca L. The Muscular System. Lerner Publications Company, Minneapolis. 2005  
Storad, Conrad J. The Circulatory System. Lerner Publications Company, Minneapolis. 2005  
Jango-Cohen, Judith. The Respiratory System. Lerner Publications Company, Minneapolis. 2005  
Johnson, Rebecca L. The Digestive System. Lerner Publications Company, Minneapolis. 2005  
Riley, Joelle. The Nervous System. Lerner Publications Company, Minneapolis. 2005

### References

<http://teachers.net/lessons/posts/3434.html>

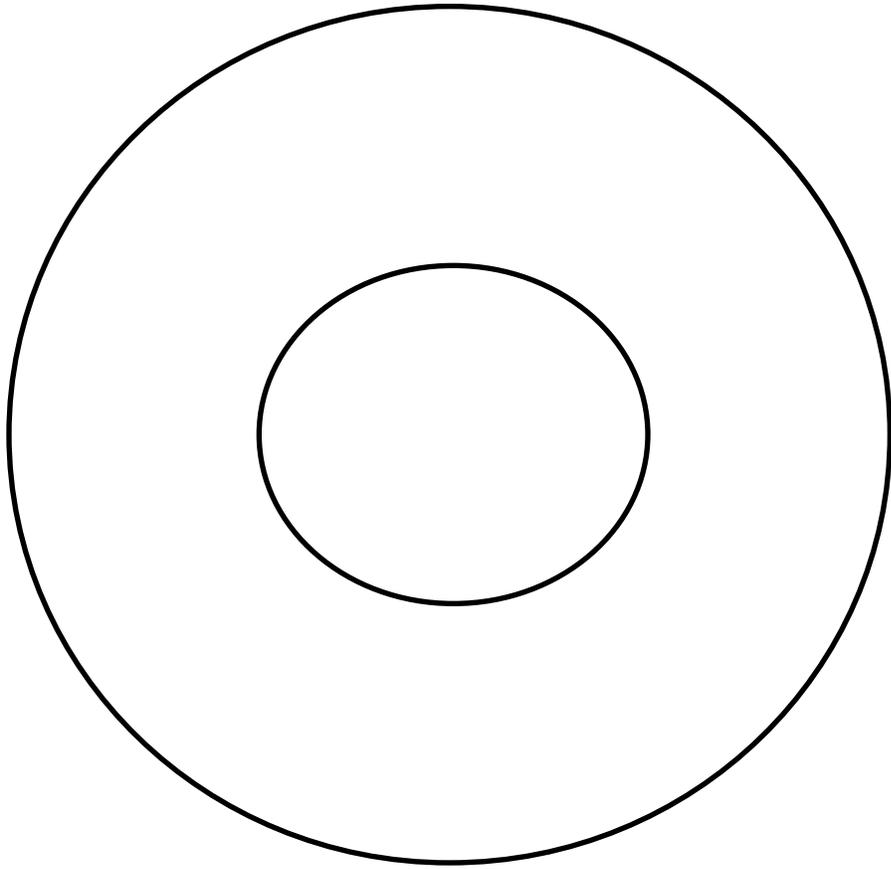
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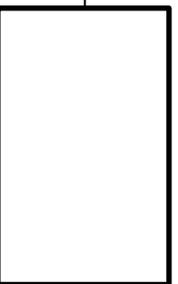
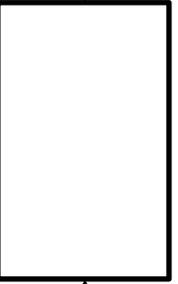
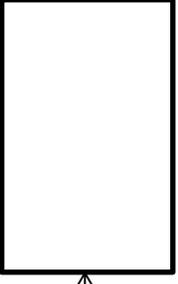
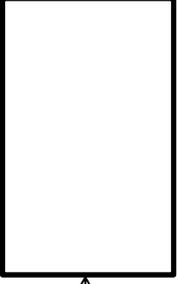
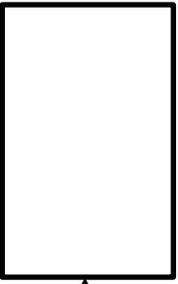
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**Circle Map**





**Flow Map**

**Name:**

**I didn't know that!**

**Please answer each question with true or false (not T or F).**

- \_\_\_\_\_ 1. Hormones can make you grow to be nine feet tall.**
- \_\_\_\_\_ 2. Hormones can affect your ability to taste salty foods.**
- \_\_\_\_\_ 3. Hormones can make you very sensitive to high-pitched sounds.**
- \_\_\_\_\_ 4. Hormones cause a young man to begin to grow facial hair.**
- \_\_\_\_\_ 5. Hormones can help fight stress.**
- \_\_\_\_\_ 6. Hormones determine what color eyes you have.**
- \_\_\_\_\_ 7. Hormones can cause you to be allergic to milk.**
- \_\_\_\_\_ 8. Hormones can make your heart beat faster when you are scared.**
- \_\_\_\_\_ 9. Hormones can soothe you.**
- \_\_\_\_\_ 10. Hormones can cause your hands to tremble when you are nervous.**
- \_\_\_\_\_ 11. Hormones affect how much energy you have.**
- \_\_\_\_\_ 12. Hormones affect how fast or slow you read.**
- \_\_\_\_\_ 13. Hormones tell your body how fast it should grow.**
- \_\_\_\_\_ 14. Hormones give you the strength and energy to fight or run when in a dangerous situation.**
- \_\_\_\_\_ 15. Hormones cause your voice to change, especially in boys.**
- \_\_\_\_\_ 16. Hormones can make twins become triplets before they are born.**
- \_\_\_\_\_ 17. Hormones tell your body how to swallow.**
- \_\_\_\_\_ 18. Hormones help control when you sleep and when you wake.**

## **I didn't know that! Key**

**True 1. Hormones can make you grow to be nine feet tall.**

**False 2. Hormones can affect your ability to taste salty foods.**

**False 3. Hormones can make you very sensitive to high-pitched sounds.**

**True 4. Hormones cause a young man to begin to grow facial hair.**

**True 5. Hormones can help fight stress.**

**False 6. Hormones determine what color eyes you have.**

**False 7. Hormones can cause you to be allergic to milk.**

**True 8. Hormones can make your heart beat faster when you are scared.**

**True 9. Hormones can soothe you.**

**True 10. Hormones can cause your hands to tremble when you are nervous.**

**True 11. Hormones affect how much energy you have.**

**False 12. Hormones affect how fast or slow you read.**

**True 13. Hormones tell your body how fast it should grow.**

**True 14. Hormones give you the strength and energy to fight or run when in a dangerous situation.**

**True 15. Hormones cause your voice to change, especially in boys.**

**False 16. Hormones can make twins become triplets before they are born.**

**False 17. Hormones tell your body how to swallow.**

**True 18. Hormones help control when you sleep and when you wake.**