

Body Science: Cell Theory (3rd-5th Grades) Pre-Visit Activities

Vocabulary List and Student Definitions (elementary level):

- **Cell:** basic unit of life, too small to see with the naked eye
- **Tissue:** group of cells in a living organism
- **Organ:** a complete and independent part of a plant or animal that has a specific function
- **System:** a combination of related parts organized into a whole grouping
- **Microscope:** a device that uses a lens to produce a greatly magnified image of an object too small to see with the naked eye
- **Skeleton:** the framework of bones of an animal
- **Muscle:** a fleshy bundle of fibers that makes up body tissue producing movement
- **Bone:** hard, white structure that is spongy in the center; part of the skeletal system that provides shape and support in vertebrate animals
- **Brain:** control center of the nervous system, connected to the spinal cord
- **Heart:** a muscle that pumps blood around the body; major organ of the circulatory system

Teacher Background and Supporting Information

- I. What are Body Systems?
 - a. **Body Systems** make up the structure and organization of the complex anatomy of living things. Here we highlight a few of the human body systems:
 - i. **Muscular system** – There are over 650 muscles in our bodies.
 1. What is a **muscle**?
 - a. A fleshy bundle of fibers usually attached to a bone. Every movement we make is the work of a muscle.
 - b. Muscles are the organs of the muscular system that work together to support our bones and allow us to move.
 - ii. **Skeletal System** – There are 206 bones in the adult human body. We are born with more but they fuse together over time, such as the bones of our skull. Almost half (about 100) make up our hands and feet.
 1. What is a **bone**?
 - a. Bones have a hard, white coating but are made of a spongy material inside, called **marrow**. Marrow is in the center of bones. Blood vessels also flow throughout bones. Bone marrow makes blood cells for your body.
 - b. Bones give our body shape and support.
 - c. What might we look like without any bones? Bones work together with muscles to allow movement of our bodies.
 - iii. **Digestive System** – We all know that food is fuel for our bodies. But before food can be used by our bodies, it needs to be broken into simple chemicals through digestion. The organs of the

digestive system help to breakdown food so that nutrients can pass to all of our cells.

1. Digestive System pathway

- a. Mouth – Saliva and chewing begin to break food into small pieces.
- b. Esophagus (food tube) – Once food is swallowed, it travels through the esophagus, which leads to the stomach.
- c. Stomach – The stomach contains a strong acid (stomach or gastric acid) that breaks down food.
- d. Small and Large Intestine – Most of the nutrients from food are absorbed by the intestines and then passed onto the bloodstream.
- e. Food that isn't absorbed then leaves our bodies through excretion (urine and feces).

iv. **Nervous System** – The nervous system is made up of the **brain, spinal cord** and **nerves**. The brain is the control center of the body and all messages are passed through nerves (along the brain and spinal cord), like messages passed through a telephone or internet wire. Information about our surroundings is sent to the brain from our sensory organs (eyes, ears, skin, tongue, and nose). Our brain processes the information and tells our bodies how to act to our surroundings.

v. **Circulatory System** – The **heart** is the major organ of this system. The heart works to pump blood through arteries and veins to all parts of our bodies. The blood circulates throughout our bodies and carries nutrients, heat, and chemicals to all of our tissues and organs. It also takes away waste, such as carbon dioxide. Blood has three main types of cells – red blood cells, white blood cells, and platelets. Red blood cells help to carry the nutrients to all parts of our body. White blood cells fight germs, to keep from getting sick. Platelets, made in the marrow, help with clotting, so we don't lose a lot of blood when we get hurt.

vi. ****These are some of our body systems. All of our body systems work together. If one were to stop working, it would affect other systems too. Think of each system as a team with a special job, but all the teams have to work together in order to get the whole job done.**

II. What is the Cell Theory?

a. Each **body system** is made of different **organs**, each having a specific job. If we were to look closer at the organs we would see that they are made of different types of materials, called **tissues**. If we look even closer (under a microscope) we would see that each tissue is made of **cells**.

b. What is a cell?

- i. **Cells** are the building blocks to *all* living organisms. Every living organism is made of cells – animals, plants, fungi, bacteria, etc.
- ii. Cells are so small that we cannot see them without the help of a **microscope**. When cells join together they make something bigger. They make **tissues**. When tissues join together they make **organs**. When organs work together they make up a **system**.

cells → tissues → organs → systems

- iii. Cells contain all of the information necessary to build tissues, organs, and systems that make up an entire organism. Our bodies are made of billions of cells. Cells grow, make new cells, and eventually die. We are always making new cells, as well as losing old cells.

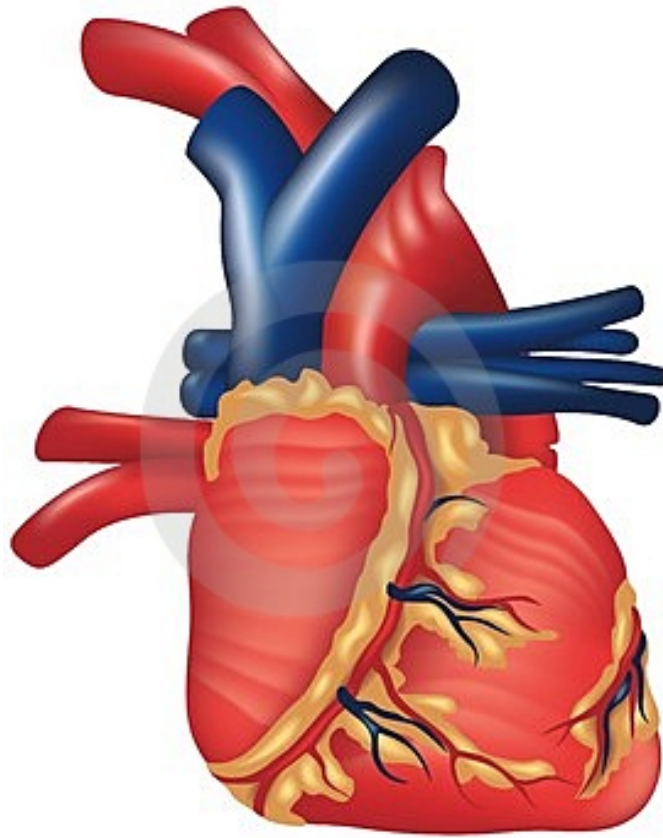
Student Activities

1. Create life size body maps by having students trace their own bodies onto butcher paper. Have them draw, paint, or cut and paste major organs. Have them label each organ and body parts.
2. Visit the following site and click on the appropriate grade level:
 - a. <http://classroom.jc-schools.net/sci-units/cells.htm>
 - i. Students will identify that all living things are made of cells.
 - ii. Students will investigate the structure and function of cells and cell parts.
3. Visit the following site:
 - a. <http://www.sciencenetlinks.com/interactives/systems.html>
 - i. Students will match body organs to the matching body system

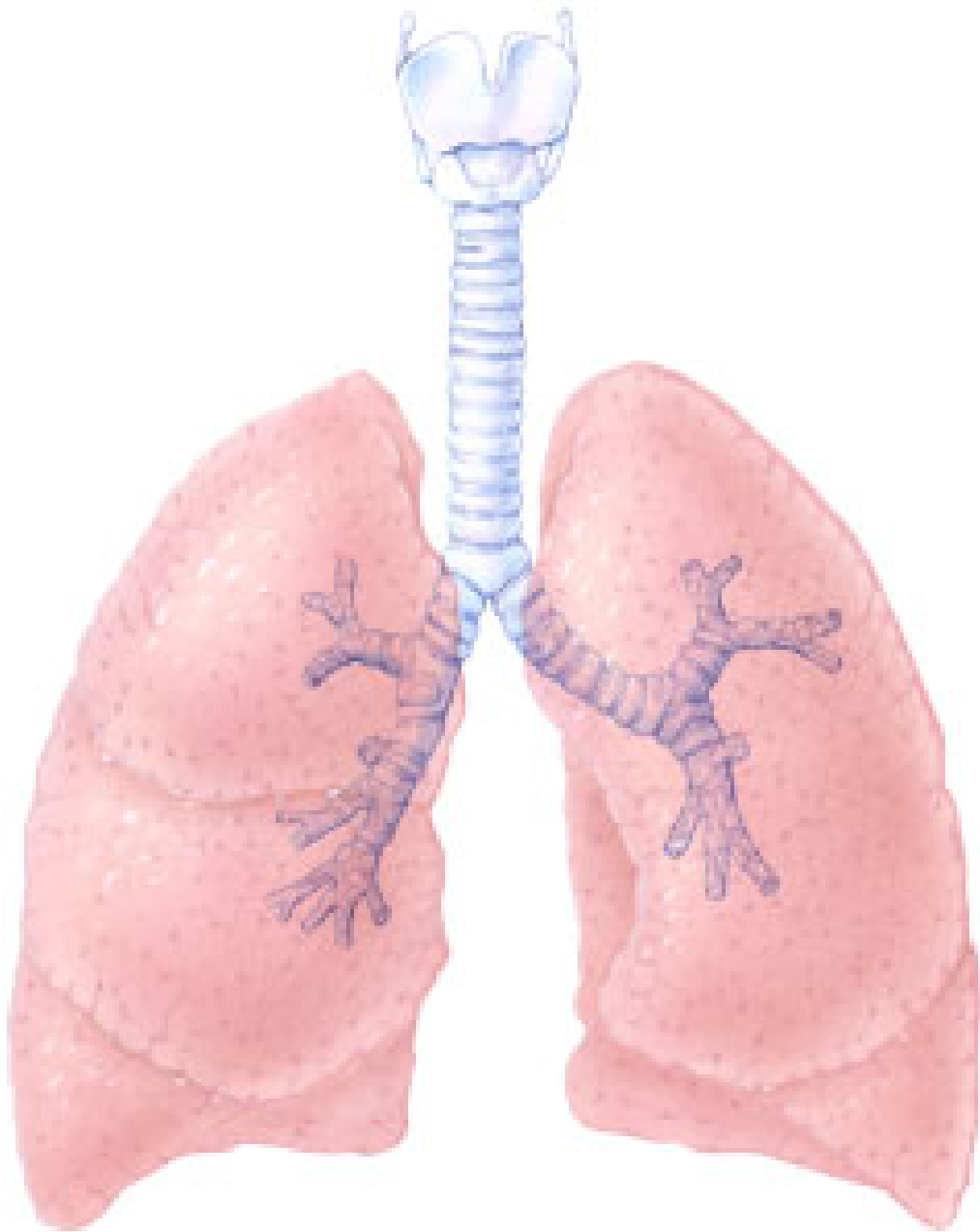
Brain Template:



Heart Template:



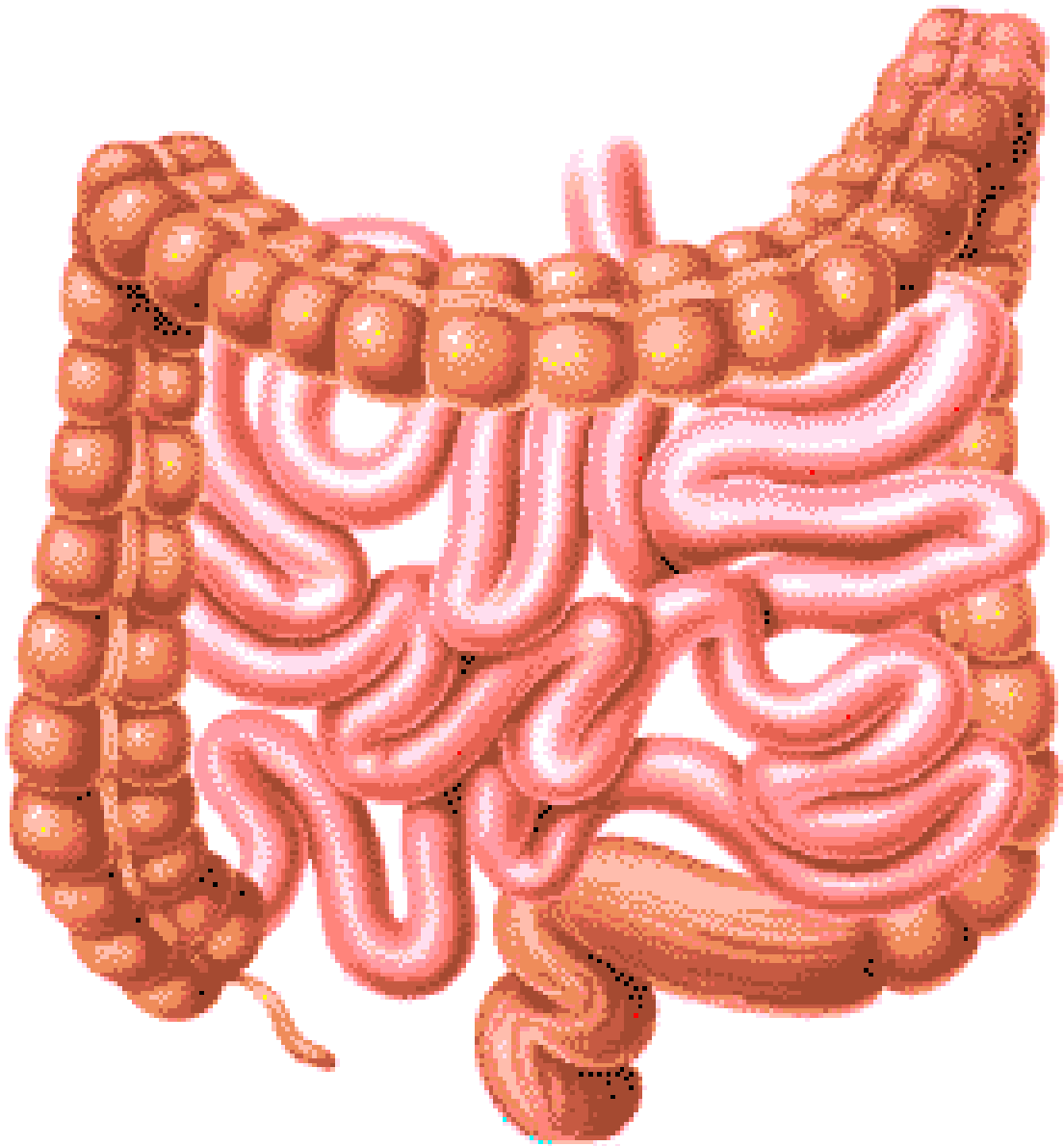
Lung Template:



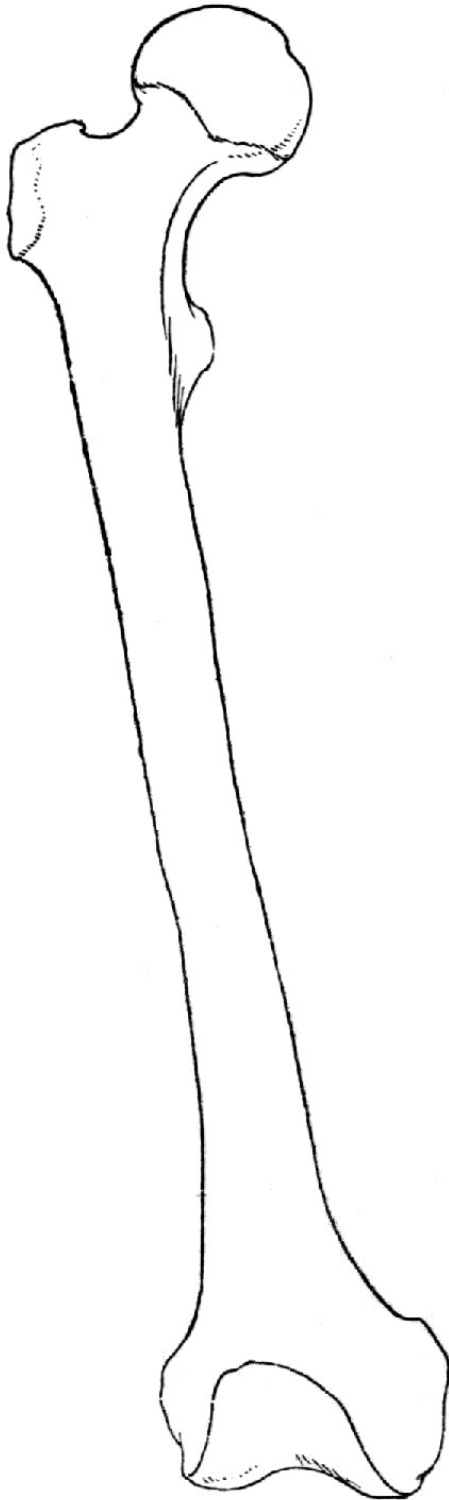
Stomach Template:



Large and Small Intestine Template:



Bone Template:



Muscle Template:

