



Cells and Body Systems

Objectives

You will be able to

- Identify the cell membrane, cell wall, mitochondria, chloroplast, and nucleus.
- Develop and use a model to describe how cells work.
- Collaboratively plan and present a drama (skit) about cells.
- Identify main facts from a reading about cells.



How do body systems interact with each other to communicate and collaborate?

Evaluation and Feedback

To evaluate your work, you will

- Use the “Developing and Using Models” row, and “Obtaining, Evaluating, and Communicating Information” row of the Science and Engineering Practices Rubric.
- Use other criteria determined by your teacher.

Task 2: Model Structures and Functions within a Cell

As a group:

- Read “All Living Things Are Made of Cells.”
- Identify and organize facts from the reading.
- Plan and present a cell drama (skit).

Vocabulary

- carbon dioxide
- cell membrane
- cell wall
- chloroplast
- energy
- mitochondria
- multicellular organism
- nucleus
- organ
- organelle
- oxygen
- unicellular organism

Connect to the Culminating Project

Plan and organize your Activity Brochure in your Individual Project Organizer:

- Draw a model of your drama.
- Summarize your drama.
- Draw a diagram of your activity that includes a cell and how the cell works.

Part I • Read a Short Article about Cells



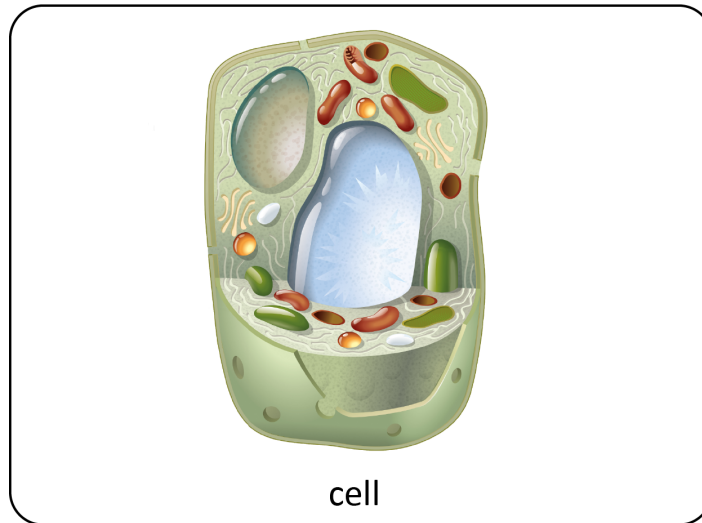
1. Read “All Living Things Are Made of Cells” out loud; the article provides an introduction to cells. Rotate the role of Reader for each paragraph.
2. As the Reader reads, decide on how to fill in the Cell Part and Function Table below. Have the Recorder fill in the table. Rotate the role of Recorder for each paragraph.
3. Copy the completed table into your science notebook.

Cell Part and Function Table

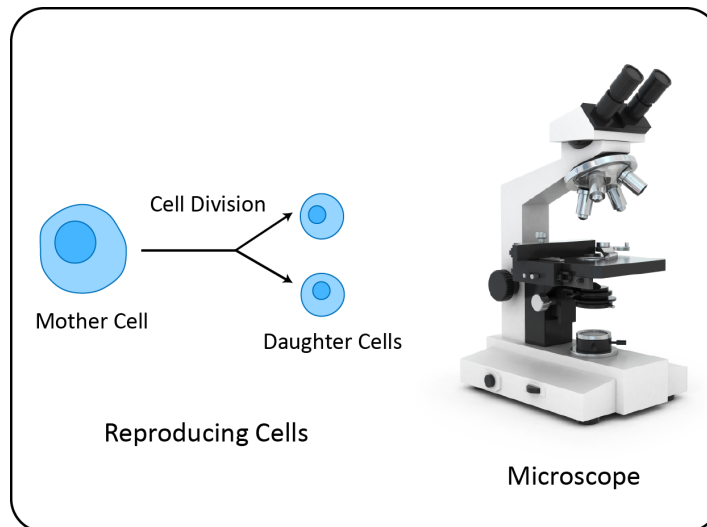
Cell Part/ Organelle	Found in Animal Cell? (Yes/No)	Found in Plant Cell? (Yes/No)	Function of Cell Part (What does each cell part do?)
cell membrane			
nucleus			
mitochondria			
chloroplast			
cell wall			

All Living Things Are Made of Cells

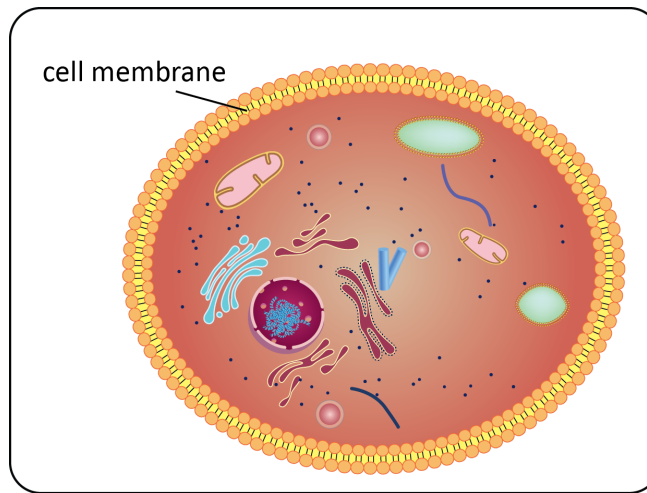
All living things, large or small, plant or animal, are made up of cells. Some living things, like bacteria, are made up of only one cell and are called unicellular organisms. Most of the living things you can see with your naked eyes, like cats and oak trees, are made up of many cells. These living things are known as multicellular organisms.



Cells are very small. Most cells can only be seen through a microscope. Cells are the smallest living units that are capable of reproducing themselves (making new cells). Each cell in your body was made from an already-existing cell.



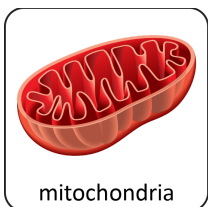
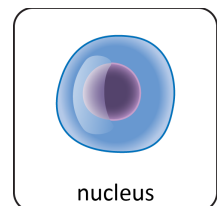
In this article, we will discuss the structures found in cells. These structures are called organelles. We will talk about how some of the organelles in both plant and animal cells work together, and what makes a plant cell different from an animal cell.

Cell Parts (Organelles)

NOTE: The cell parts shown are not drawn to scale.

All cells have a cell membrane around the outside of the cell. The cell membrane holds the cell together. The cell membrane also lets particles into and out of the cell. The particles that move into and out of the cell may be oxygen, carbon dioxide, water, and food (sugar). Not everything can pass through a cell membrane. What gets through and what does not get through the cell membrane depends on the size of the particle trying to get in and the size of the opening in the cell membrane.

Plant cells and animal cells have a nucleus. This is the cell's control center. The nucleus contains the information (DNA) needed to make messenger particles. The messenger particles tell the cell what to look like, tell the cell parts what to do, and tell the cell when to reproduce.



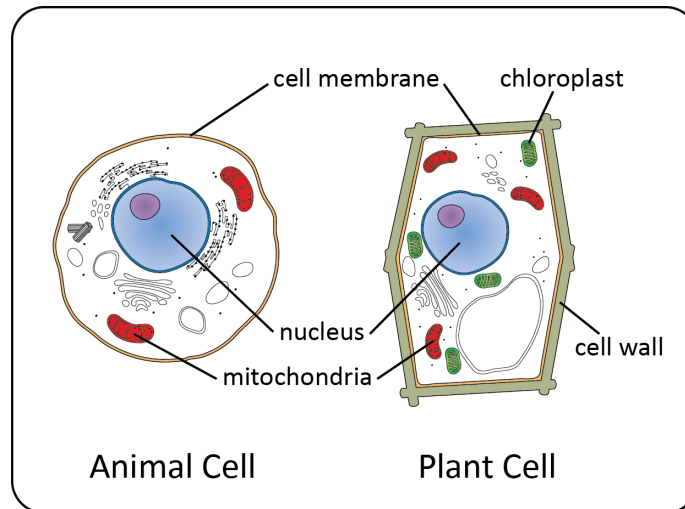
Plant cells and animal cells have mitochondria. The mitochondria take in oxygen and food (sugar) and change them into carbon dioxide, water, and energy. The carbon dioxide gas and water are waste products and leave the cell. The energy is used by the cell and the body.

There are differences between plant cells and animal cells. Animals get their food by eating it. Plants cannot hunt or eat, so plants have to make their own food. Plant cells have a special organelle, called a chloroplast, to make food (sugar). The chloroplasts trap the sun's energy. They use the sun's energy to put together carbon dioxide from the air and water to make food (sugar). They also release oxygen as a waste product. Humans and other animals eat plants for food (sugar), which the mitochondria can then change into energy.



Plant cells also have cell walls, which animal cells do not have. The cell wall is around the outside of the cell membrane. The cell wall's jobs are to give the cell support and give the cell a box-like shape.

Different cells have different jobs to do. Each cell has a size and shape that is suited to its job. Cells that do the same job combine together to form tissue, such as muscle tissue, skin tissue, bone tissue, root tissue, or leaf tissue. Groups of different types of tissues make up the organs in your body, such as your heart, liver, or lungs. A group of different organs working together to do a job make up a body system, such as the respiratory system or the digestive system. All the body systems are like members of a team whose job is to keep the living organism alive and healthy.



Part II • Model How a Cell Works

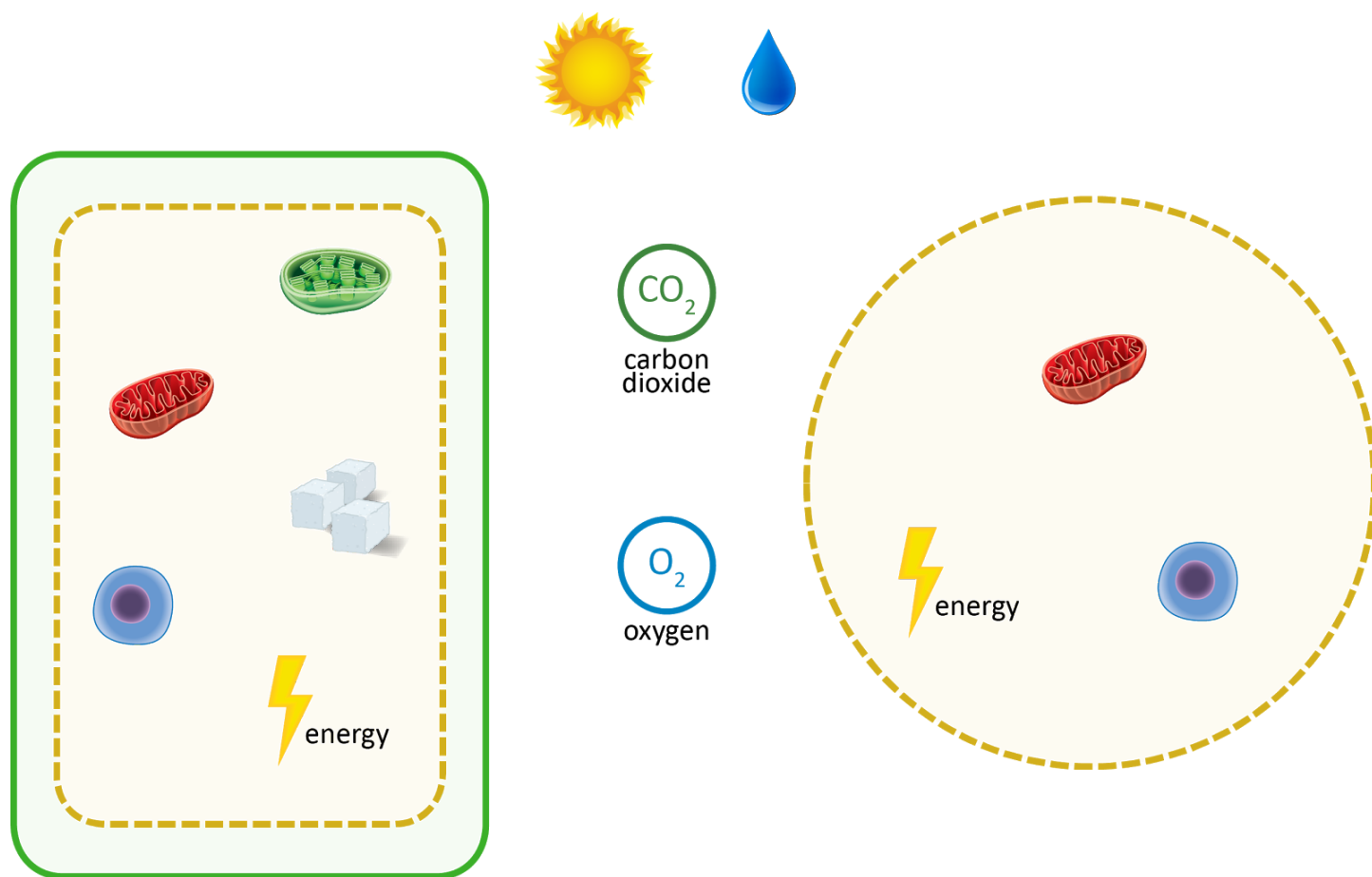
1. Watch a video about cells.
2. Using the Cell Part and Function Table and the video information, plan, practice, and present a cell drama (a skit about cells).
 - ☐ Decide whether your group wants to show how a plant cell works or how an animal cell works.
 - ☐ Identify parts of the cells (organelles).
 - ☐ In your drama, show and describe the pathway of sun, water, and gases as they
 - Move into the cell
 - Are used in the cell
 - Leave the cell
 - ☐ As other groups present their cell drama, write two comments on a sticky note. Write one positive and one constructive comment to share with the presenting group. Put your initials on your sticky note.
3. Apply your knowledge.
 - ☐ Use the cell drama and the Cell Part and Function Table to describe three ways that plant cells are unique (or different) as compared to animal cells.
 - ☐ Use the cell drama and Cell Part and Function Table to explain what would happen to a plant cell if all the mitochondria in it disappeared.



Part III • Optional: How Plant and Animal Cells Work Together Model

Follow the instructions to complete the cell model.

Step 1	Step 2	Step 3
<p>Use the following words to label the parts in both cells, where applicable:</p> <p>mitochondria cell membrane chloroplast cell wall nucleus food (sugar)</p>	<p>Draw in arrow lines:</p> <ul style="list-style-type: none"> • Sunlight, water, carbon dioxide, and oxygen are drawn outside the cell. • Draw arrows to show which of these enter and leave each type of cell. • Make sure your arrows point to or from the correct cell parts! 	<p>On the arrows write:</p> <p><i>goes in</i> and/or <i>makes</i></p>



Part IV • Connect to the Culminating Project and Assessment

Complete the Individual
Project Organizer for this task.

