



# OLD SALEM EXPLORATORIUM

## LESSON PLAN

**Subject:** Grade 7 Science

**Lesson:** Send for the Doctor!

**Standard Addressed:** Compare the structures and functions of plant and animal cells, including major organelles. (NC.7.L.1.2)

**Objectives:**

- Students will be able to compare bacteria, plant, and animal cells.
- Students will be able to analyze how organelles within all three cell types are the same and different.

**Materials Needed:**

- Device for showing *Send for the Doctor!* video
- “Comparing Cells” activity

**Outline:**

- Prior to this lesson, students should know that all living things are composed of cells and that there are different organelles in a cell.
- Show the video.
- Discuss the activity prompt and review the diagrams of the three different types of cells.
- Students finish the activity independently or with a partner. (Please note that there are two versions of the activity; one provides more guidance by using sentence starters and the correct number of blanks for student answers.)

**Take It Further:** Students research the history of the microscope and make a timeline showing the invention and improvement of microscopes through the years.

**Cross-Curriculum Connection:** Students design a 3D representation of one of the cell types using only materials that would have been thrown away or recycled.





# OLD SALEM EXPLORATORIUM

## LESSON PLAN

**Subject:** Biology

**Lesson:** Send for the Doctor!

**Standard Addressed:** Compare prokaryotic and eukaryotic cells in terms of their general structures and degree of complexity. (NC.Bio.1.1.2)

**Objectives:**

- Students will be able to compare prokaryotic and eukaryotic cells.
- Students will be able to infer that prokaryotic cells are less complex than eukaryotic cells.

**Materials Needed:**

- Device for showing *Send for the Doctor!* video
- “Prokaryotic and Eukaryotic Cells” activity

**Outline:**

- Prior to this lesson, students should be able to identify the structures in eukaryotic cells (both plant and animal).
- Show the video.
- Discuss the activity prompt and review the diagrams of the prokaryotic and eukaryotic cells.
- Students finish the activity independently or with a partner.

**Take It Further:** Students research the history of the microscope and make a timeline showing the invention and improvement of microscopes through the years.

**Cross-Curriculum Connection:** Students design a 3D representation of either a prokaryotic or eukaryotic cell using only materials that would have been thrown away or recycled.



## Comparing Cells

Grade 7 Science

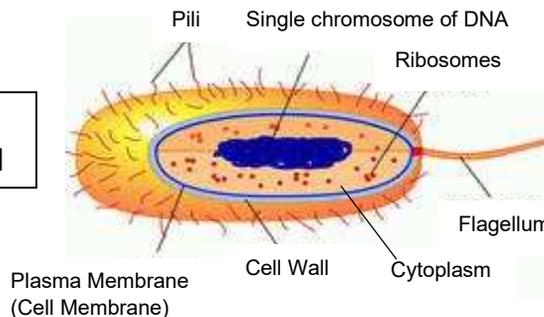
Student Name: \_\_\_\_\_ Date: \_\_\_\_\_

We learned from our 1802 visit to Salem that epidemics and pandemics were occurring then as they do now. Some of these diseases were caused by viruses, while others were caused by bacteria.

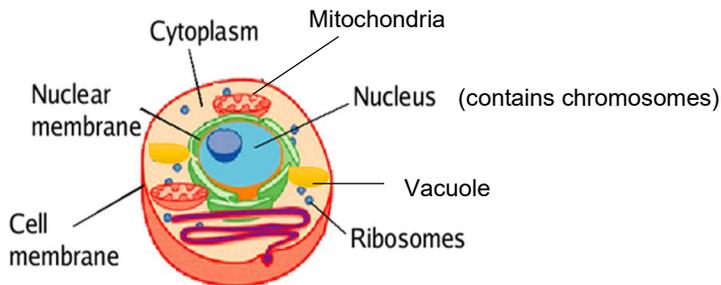
Bacteria are organisms made up of only one cell. Let's compare bacteria with a plant and an animal cell.

Use the diagrams below to help you complete the graphic organizer on the next page.

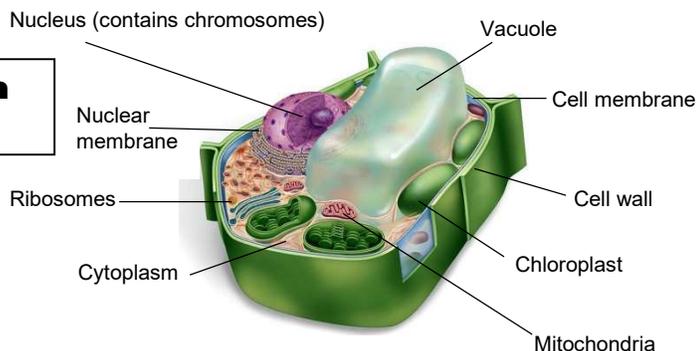
**Diagram of a  
Bacterial Cell**



**Diagram of an  
Animal Cell**



**Diagram of a  
Plant Cell**



## Comparing Cells, page 2

Grade 7 Science, Graphic Organizer A

Student Name: \_\_\_\_\_ Date: \_\_\_\_\_

<p>How are they alike?</p> <p>Both have</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>and</p> <p>_____</p>	<p>How are they different?</p> <p>Only plant cells have</p> <p>_____</p> <p>and</p> <p>_____</p>	<p>How are they alike?</p> <p>Both have</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>and</p> <p>_____</p>	<p>How are they different?</p> <p>Only plant cells have</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>and _____</p> <p>Only bacterial cells have _____</p> <p>and _____</p> <p>_____</p>
<b>Animal Cells</b>	<b>Plant Cells</b>	<b>Plant Cells</b>	<b>Bacterial Cells</b>
<p>How are they alike?</p> <p>Both have</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>and</p> <p>_____</p>		<p>How are they different?</p> <p>Only animal cells have</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>and _____</p> <p>Only bacterial cells have _____</p> <p>_____</p> <p>and _____</p>	

What organelles are found in animal, plant, and bacterial cells?

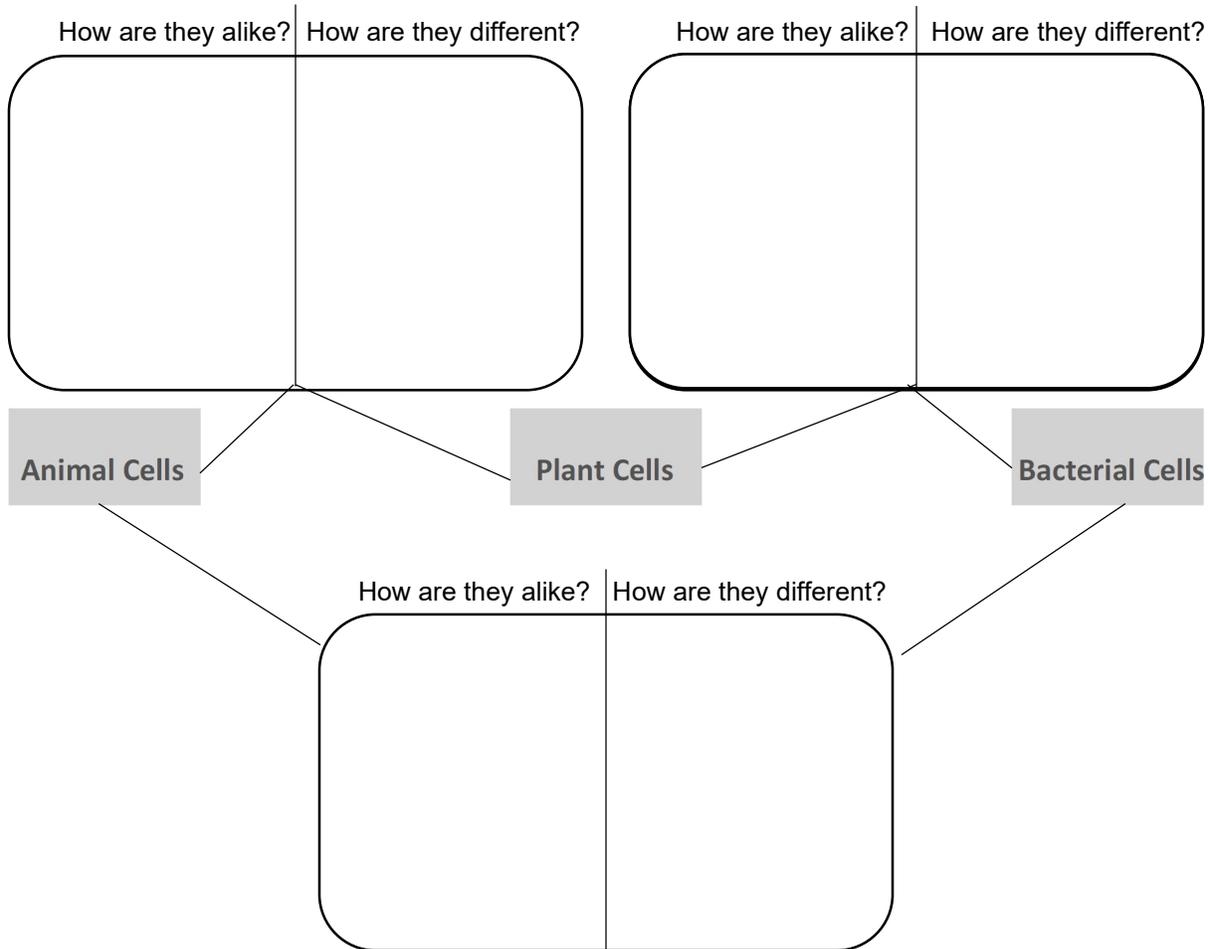
\_\_\_\_\_

and \_\_\_\_\_

**Comparing Cells, page 2**

Grade 7 Science, Graphic Organizer B

Student Name: \_\_\_\_\_ Date: \_\_\_\_\_



What organelles are found in animal, plant, and bacterial cells?

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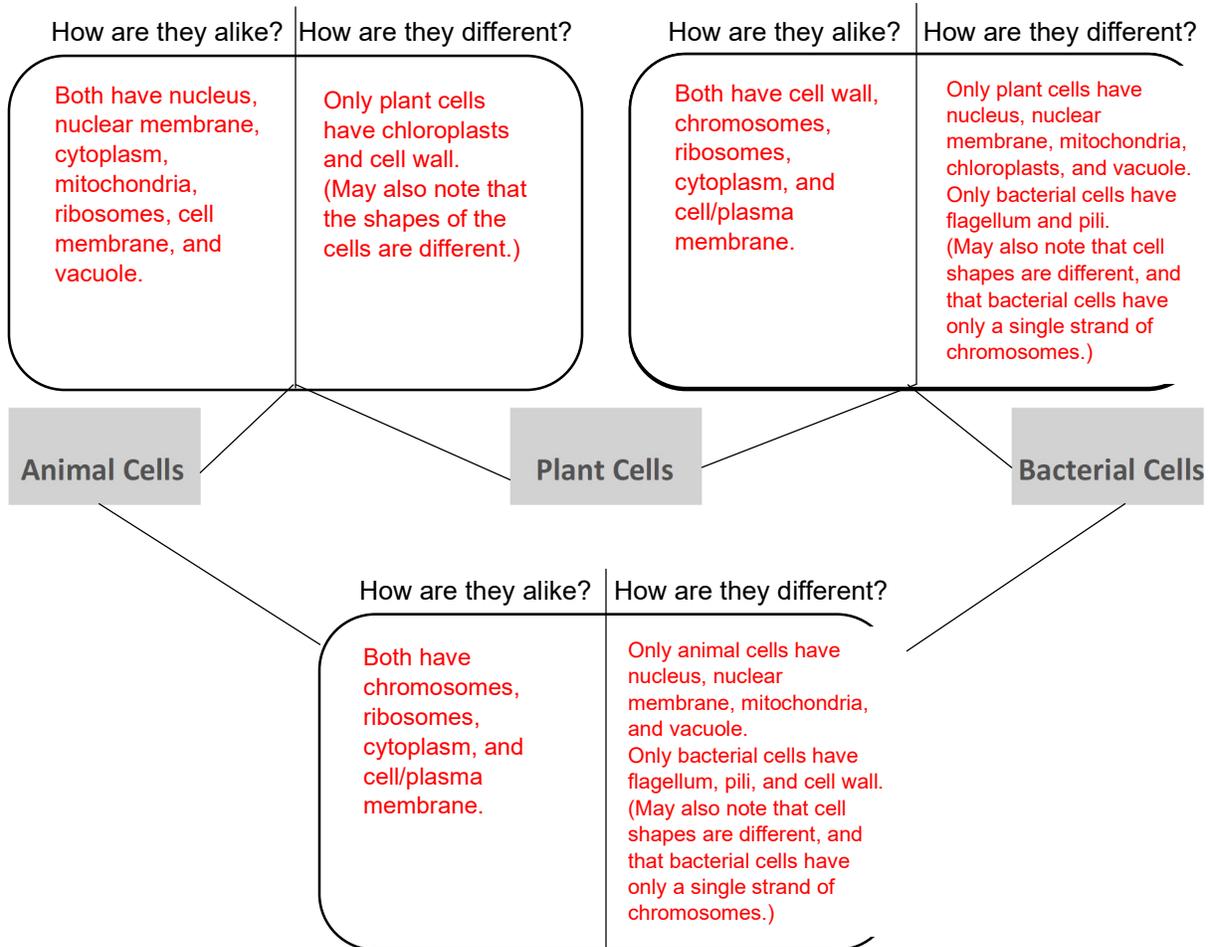
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## Comparing Cells

Grade 7 Science

### ANSWER KEY



What organelles are found in animal, plant, and bacterial cells?

Chromosomes, cytoplasm, and cell/plasma membrane

# Prokaryotic and Eukaryotic Cells

Biology

## ANSWER KEY

### Eukaryotic Cells

List the organelles that are in ALL eukaryotic cells.

Nucleus, nuclear membrane, cytoplasm, mitochondria, ribosomes, cell membrane, vacuole

### Prokaryotic Cells

List the organelles that are in prokaryotic cells.

Single chromosome of DNA, ribosomes, flagellum, cell wall, plasma membrane, pili

Animal Cells

Plant Cells

Bacterial Cells

Compare and contrast **animal** and **plant** cells.

Both animal and plant cells have nuclei, nuclear membranes, cytoplasm, mitochondria, ribosomes, cell membranes, and vacuoles. Animal cells do not have chloroplasts or cell walls. Animal cells are spherical, while plant cells are more rectangular. Plant cells have a single, large vacuole, while animal cells have multiple, smaller vacuoles.

Compare and contrast **plant** and **bacterial** cells.

Both plant and bacterial cells have cell walls, cell/plasma membranes, cytoplasm, ribosomes, and chromosomes. Plant cells do not have flagellum or pili. Bacterial cells do not have a nucleus, nuclear membrane, mitochondria, chloroplasts, or vacuole. Plant cells are rectangular, while bacterial cells are shaped more like a capsule.

Compare and contrast **animal** and **bacterial** cells.

Both animal and bacterial cells have cell/plasma membranes, cytoplasm, ribosomes, and chromosomes. Animal cells do not have a cell wall, flagellum or pili. Bacterial cells do not have a nucleus, nuclear membrane, mitochondria, or vacuole. Animal cells are spherical, while bacterial cells are shaped more like a capsule.

What can you infer about the differences between prokaryotic and eukaryotic cells?

Prokaryotic cells are not as complex as eukaryotic cells. (They do not have as many organelles.) Because prokaryotes are unicellular, they must have some mechanism (like a flagellum) for movement from place to place. Eukaryotic cells contain genetic material (DNA) on chromosomes in a nucleus, while prokaryotic cells have only a single chromosome and it is not bound by a membrane.