



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.



Prokaryotic and Eukaryotic Cells

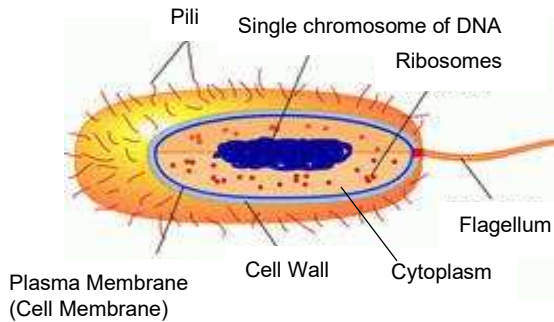
Biology

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 prokaryotic cells. A bacterial infection (most likely Streptococcus) resulted in the death of Dr. Vierling’s first wife in 1792. Let’s take a closer look at how prokaryotic cells like bacteria compare with eukaryotic cells such as those in plants and animals.

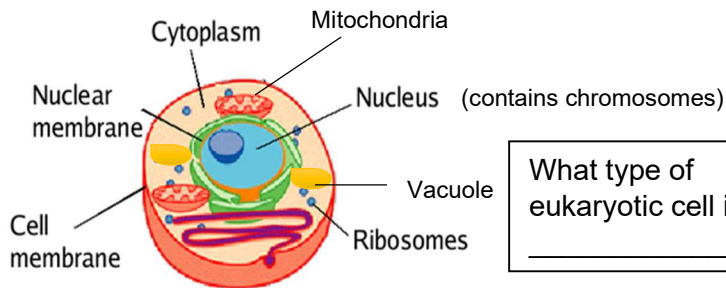
Identify and use the diagrams below to help you complete the graphic organizer on the next page.

PROKARYOTE

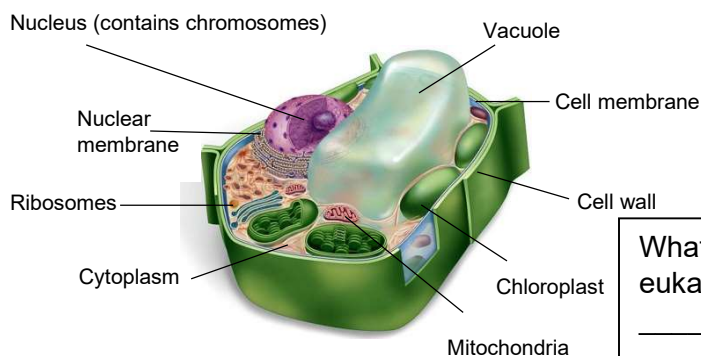


What type of prokaryotic cell is this?

EUKARYOTES



What type of eukaryotic cell is this?



What type of eukaryotic cell is this?

Prokaryotic and Eukaryotic Cells, p. 2

Biology, Graphic Organizer

Student Name: _____ Date: _____

Eukaryotic Cells

List the organelles that are in ALL eukaryotic cells.

Prokaryotic Cells

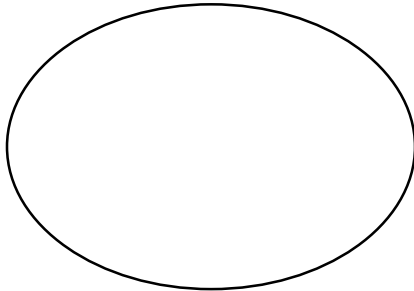
List the organelles that are in prokaryotic cells.

Animal Cells

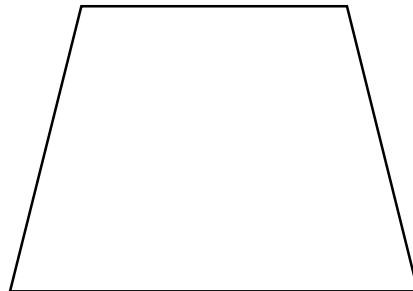
Plant Cells

Bacterial Cells

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



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



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



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



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.