

Name: _____ Class: _____ Date: _____

Cell Comparison Lab

Cells are considered to be the building block of life. All functions that are performed by living organisms can be also be performed by their individual cells. By studying the anatomy of different types of cells, microbiologists can determine much about their way of life.

Prokaryotic Cells

Prokaryotes are the smallest and simplest type of living cells. Besides the size difference, how are prokaryotic cells different than eukaryotic cells?

What is one example of a prokaryotic organism?

Prokaryotic cells share many of the same characteristics. Describe the function of each of the following structures found in prokaryotes:

Plasma membrane –

Nucleoid –

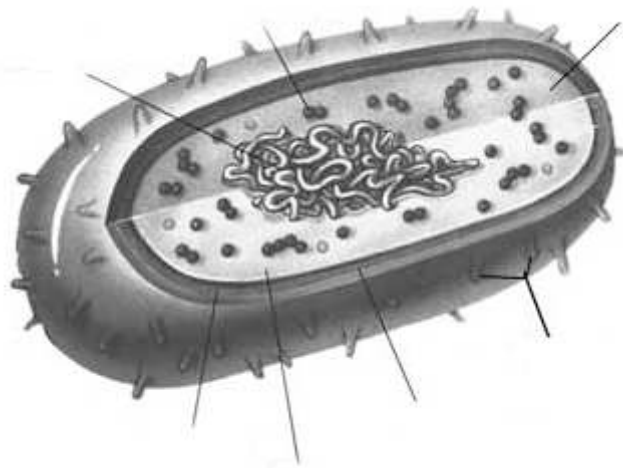
Pili –

Cell Wall –

Ribosomes –

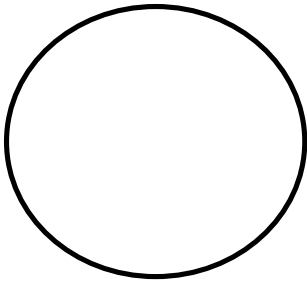
Cytoplasm –

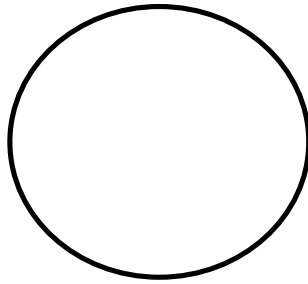
Label each of the structures on the diagram of the bacteria below.

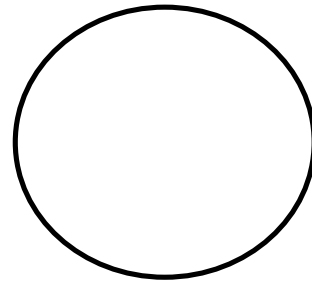


Prepared Bacteria Slides

Take a prepared bacteria slide and place it under the microscope. Focus the microscope under high power. Scan through the slide and locate the three different shapes of bacteria. Draw a sample of bacteria from each shape below.



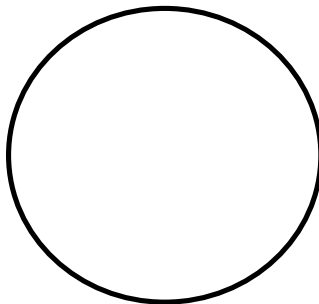




Rod-shaped bacteria are named **bacillus**, sphere-shaped **coccus**, and spiral shaped **spirilla**. Label each of your drawings above with the correct term to indicate shape.

Yogurt Bacteria

Place a dab of yogurt on a microscope slide. Mix this yogurt with a drop of water, place a coverslip on top, and place the slide under the microscope. Focus the microscope under high power and draw the bacteria you see:



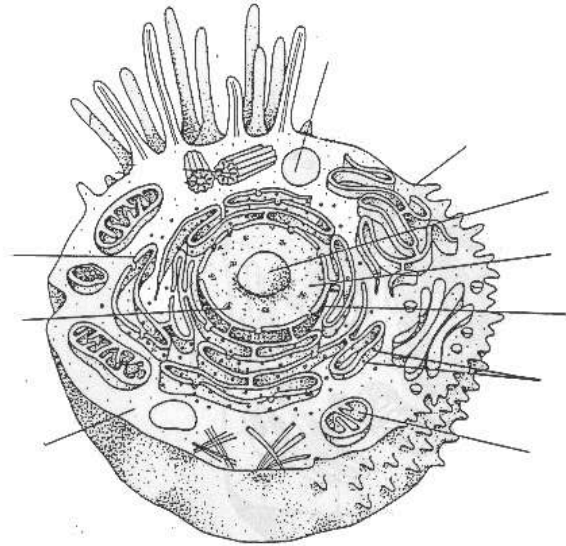
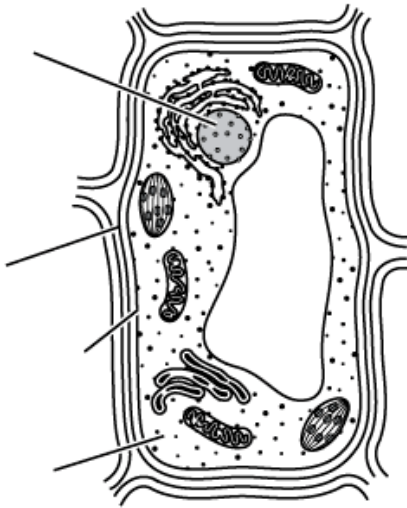
What shape are these bacteria?

One of the most common strains of bacteria found in yogurt is *Lactobacillus acidophilus*. What three characteristics about the bacteria can be found within its scientific name?

Eukaryotic Cells

The cells of all multicellular organisms are eukaryotic. What structures are found within the cells of eukaryotes that are not found within prokaryotes?

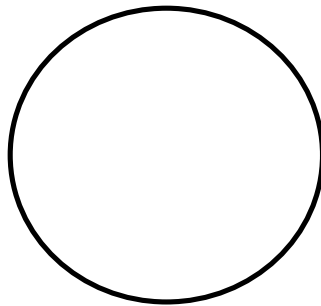
Label each of the structures on the diagrams below.



What structures are found in plant cells but not animal cells?

Elodea Plant Cells

1. Remove a leaf from a sprig of an Elodea plant. Place this leaf in a drop of water on a microscope slide. Make sure the top surface of the leaf is facing up. Add a coverslide, ensuring that the leaf does not dry.
2. Microscopically examine the leaf under high power. Sketch what you see.

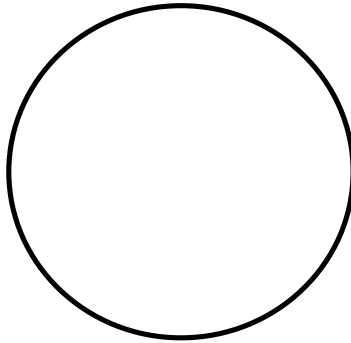


3. Label any visible structures inside the plant cells. These should include chloroplasts, the cell wall, and the plasma membrane.
4. How many chloroplasts do you estimate are in an average *Elodea* cell?
5. What is the three-dimensional shape of the *Elodea* cells?
6. Are the chloroplasts located centrally or towards the perimeter of each cell?

7. The large, clear central region of each cell is actually the **central vacuole**. This mostly contains water. Label it on your sketch above.
8. Add a drop of iodine to your *Elodea* slide. Try to locate a nucleus, which is usually located near the cell wall. Add it to your sketch and label.

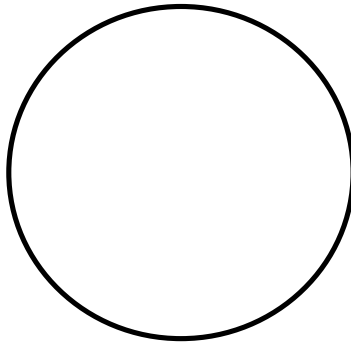
Onion Cells

1. Take a small piece of onion and remove the thin epidermis layer.
2. Place this tissue on a microscope slide with a drop of water.
3. Add one drop of methylene blue stain. Allow the onion to sit for 3-5 minutes.
4. Examine the onion epidermis under the microscope. Cover with a cover slip.
5. Microscopically examine the epidermis under high power. Sketch what you see. Label any visible organelles or other structures.



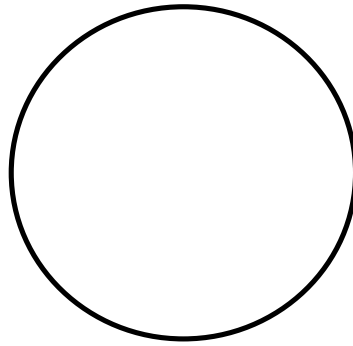
Potato Cells

1. Using a scalpel, cut a very thin slice of potato. (The potato slice should be thin enough to be translucent.)
2. Place this tissue on a microscope slide with a drop of water. Cover with a cover slip.
3. Microscopically examine the potato under high power. Sketch what you see. Label any visible organelles or other structures.



4. Remove the cover slip. Add one drop of iodine to the slide. Replace the cover slip.

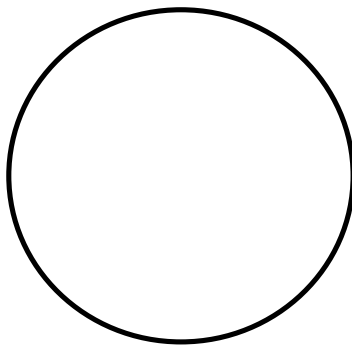
5. Microscopically examine the stained potato under high power. Sketch what you see. Label any visible organelles or other structures.



The structures that have been stained by the iodine are storage organelles called **amyloplasts**. Based on the reaction with iodine, what biological molecule is stored within these amyloplasts?

Human Cheek Cells

1. Using a toothpick, gently scrape the inside of your mouth around your cheek.
2. Place a drop of water on a microscope slide. Stir the toothpick in the water drop.
3. Add a drop of methylene blue stain and cover with a cover slip.
4. Microscopically examine the cells under high power. Sketch what you see. Label any visible organelles or other structures.



5. What type of junction is holding your cheek cells together so well that only a few came loose on the toothpick?