

CELLS ALIVE! WEBQUEST

Name: _____

Go to this website: www.cellsalive.com

Objectives: Understand the relative sizes of objects, including the cell, sketch and identify the function of cell structures; compare eukaryote to prokaryote cells; compare plant and animals cells

Part A: "HOW BIG IS A...."

Click on the HowBig? link on the left side of the webpage.

Instructions: Look at the objects that can be found on the head of a pin. Zoom in and out to determine which object is the smallest, then slowly zoom out so you can see how other objects compare.

1. If you zoom all the way in, what is the smallest object on the head of the pin? _____
2. Zoom out a little farther, what is the hook shaped object you see? _____
3. Compare each of the following objects on the pin, circle the one that is larger for each pair.
 - a) baker's yeast **or** e. coli
 - b) lymphocyte **or** ragweed
 - c) red blood cell **or** staphylococcus
 - d) ragweed **or** dust mite
4. In the photo below, there is a line that says 200 nanometers. This is used to help you determine how big an object is. It works similar to the way a map works. The line represents 200 nanometers, but the object itself is bigger.

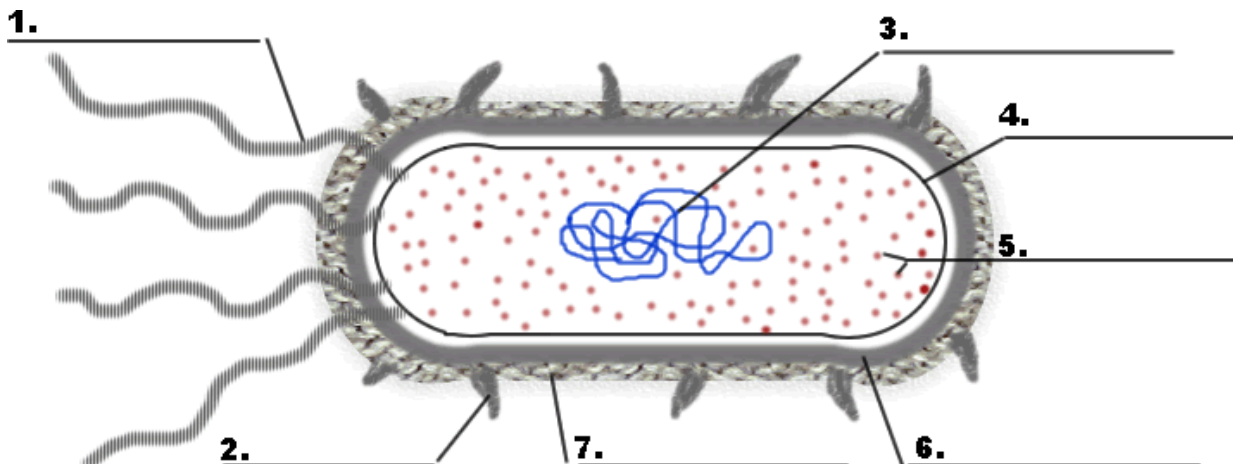


How big is it? _____

Part B – Bacteria Cell Model

Click on the Cell Models link on the left side of the webpage.

Locate the image of a bacterial cell model and label the image below.



Part C – Animal Cell Model

Locate the image of the animal cell model and click through each of the parts and read their descriptions.

Use the information to answer the questions and make sketches of the cell organelles.

1. Rough ER

3. Centrosome

2. Mitochondrion

4. Microtubules

5. What do the mitochondrion do? _____

6. How big are the mitochondrion? _____

7. What is the function of the golgi apparatus? _____

8. What structure is found on the rough ER that is not on the smooth ER? _____

9. Where is the nucleolus found? _____

10. What is the function of the nucleolus? _____

11. What is the function of the cytoskeleton? _____

12. What is inside nucleus that is responsible for providing the cell with its characteristics? _____

Part D – Plant Cell Model

Locate the image of the plant cell model and click through each of the parts and read their descriptions. Use the information to answer the questions.

13. What structure takes up the majority of the center space within the plant cell? _____

14. What is its primary function of the structure? _____

14. What part of the plant cell gives it is green color? _____

15. How many of these structures are visible on the plant diagram? _____

Part E – Plant vs. Animal Cell

Compare/contrast the plant and animal cell by filling in the following graphic organizer. Use the characteristics listed in the table below. Write the appropriate characteristics in the correct section of graphic organizer. Please “bullet” the characteristics so they are easily distinguishable.

Nucleus	Chloroplast	Cell Membrane	Cell Wall	Cytoplasm
Mitochondria	Ribosomes	DNA	<i>Large</i> central vacuole	Eukaryotic cells
Can perform photosynthesis	Can <u>NOT</u> photosynthesize	More circular in shape	Can perform cellular respiration	More square/rectangular in shape

Compare and Contrast Chart Graphic Organizer

Item #1 _____

Item #2 _____

How are they alike?

How are they different?

Part F - Comparing Cells

Use what you know about each type of cell (reference pictures if needed), and place a check in the box if the cell has that characteristic or structure.

	Bacteria	Plant	Animal
Cell Wall			
Cell Membrane			
Nucleus			
Cytosol			
Central Vacuole			
Chloroplast			
Mitochondria			

Part G – Cells Reading

(Annotate the text. Remember to circle and define unknown words and underline important concepts.)

On our planet Earth, life comes in a variety of forms. We have identified about 2 million species of animals (such as elephants), 270,000 types of plants (such as sunflowers), 5,000 kinds of bacteria (such E. coli), 80,000 different protists (such as algae), and 72,000 assorted fungi (such as mushrooms). What do all these organisms or living things have in common? They are made of the same thing - the cell. Some like animals and plants consist of many or even billions of cells, while others, like protists and bacteria, are unicellular.

Robert Hooke was the first scientist to solve this great mystery of life. When he observed a thin slice of cork under a microscope in 1663, he noted that the cork looked like hundreds of tiny boxes or a honeycomb. Hooke called these tiny boxes "cells", which means "little rooms" in Latin. What Hooke did not realize at the time is that he was actually looking at the walls or outer layers of cells, not inside cells themselves. Nearly two hundred years had elapsed before any scientist made any new, significant break-through. The hard work put in by several scientists of the 19th century derived the Cell Theory:

- All living things are made of one or more cells.
- Cells are the basic units of life.
- All cells come from existing cells.

Today, we know that a thin sheet, called a cell membrane, separates one cell from another. We also know that there are two types of cells: prokaryotic cells and eukaryotic cells. Two important factors set these two groups of cells apart. The first is the existence of a nucleus, and the second is an organelle surrounded by a membrane. A nucleus is a special membrane-covered organelle inside a cell where the cell's DNA or genetic material resides, and an organelle is a structure inside a cell that enables the cell to grow, live, and reproduce. Some organelles have membranes around them, but others do not.

A prokaryotic cell has neither a nucleus nor any membrane-covered organelle. In other words, its DNA and organelles have no individual membranes surrounding them. Of all the living things, only bacteria are prokaryotic cells. A eukaryotic cell, on the contrary, has a nucleus to protect its DNA. Furthermore, all the organelles inside a eukaryotic cell are enclosed by their own membranes. Animals, plants, protists, and fungi are eukaryotic cells.

Use your annotated text to answer the following questions:

1. How many types of organisms are there on Earth?
 - a. Five
 - b. over two million
 - c. two hundred thousand
 - d. approximately four thousand
2. Robert Hooke discovered cells in the 18th century.
 - a. true
 - b. false
3. Which of the following is not considered a living thing?
 - a. soil
 - b. oak trees
 - c. sharks
 - d. pandas
4. Which of the following about the cell theory is correct?
 - a. the cell theory asserts that all cells come from existing cells.
 - b. the cell theory states that all cells contain a nucleus.
 - c. the cell theory was established in 1665 by Robert Hooke.
 - d. the cell theory says that a cell membrane separates one cell from another.
5. Which of the following about a nucleus is true?
 - a. a nucleus is the cell's DNA/
 - b. a nucleus is a membrane-covered organelle inside a prokaryotic cell when its DNA resides.
 - c. a nucleus is a membrane-covered organelle inside a eukaryotic cell where its DNA resides.
 - d. a nucleus is also known as a cell membrane.
6. All organelles have membranes around them.
 - a. true
 - b. false
7. Which of the following organisms are prokaryotes?
 - a. portabella mushroom
 - b. rose
 - c. butterfly
 - d. e. coli
8. What does the word 'cell' mean in Latin?
 - a. a membrane
 - b. a honeycomb
 - c. a little room
 - d. a nucleus
9. Which of the following best describes a eukaryotic cell?
 - a. it can be found in our bodies
 - b. it does not have a nucleus
 - c. it does not have a membrane-covered organelle
 - d. it does not have DNA
10. Cells are the basic units of life.
 - a. true
 - b. false