Name: _____ Date: Copy Class Period: _____

# Cell Biology

## Introduction to Cells

*Read pages 151-152 to answer the following questions.*

1. All life forms on our planet are made of CELLS.

2. Microscope observations of organisms led to the DISCOVERY OF THE BASIC CHARACTERISTICS COMMON TO ALL LIVING THINGS.

3. What is the name of the scientist who observed cells using a microscope for the first time? ROBERT HOOKE. What year? 1665

4. What was the total magnification of his microscope? 30x

5. Which scientist discovered living organisms in pond water? ANTON VAN LEEUWENHOEK.

6. What did he call these "tiny animals"? ANIMALCULES

7. What total magnification did he use for this observation? 300x

8. In 1838, Matthias Schleiden concluded that cells make up every part of a PLANT.

9. In 1839, Theodor Schwann discovered that ANIMALS are also made of cells.

10. In 1858, Rudolph Virchow proposed that CELLS COME ONLY FROM THE DIVISION OF EXISTING CELLS.

11. List the three parts of the cell theory.

**Cell Theory**

- ALL LIVING THINGS ARE MADE UP OF ONE OR MORE CELLS.
- CELLS ARE THE BASIC UNITS OF STRUCTURE AND FUNCTION IN ORGANISMS.
- ALL CELLS ARISE FROM EXISTING CELLS.

*Video: Assignment Discovery: Cells (8 minutes)*

*Read page 153 and answer the following questions.*

1. A cell's SHAPE reflects the cell's FUNCTION.

2. There are at least 200 different types of cells.

3. The human body is made of about 100 TRILLION cells.

4. All substances that enter or leave a cell must pass through the SURFACE OF THE CELL (CELL MEMBRANE).

5. Cell size is limited by a cell's SURFACE AREA -TO- VOLUME RATIO.

6. Cells with GREATER surface area-to-volume ratios can exchange substances more efficiently.

7. Larger cells have SHAPES that increase the surface area available for exchange.

*Balloon Demonstration*

*Read pages 154-155 and answer the following questions.*

1. All cells have a CELL MEMBRANE, CYTOPLASM, RIBOSOMES, and DNA.

2. The cell's outer boundary that acts as a barrier between the outside environment and the inside of the cell is called the CELL MEMBRANE.

3. The CYTOPLASM includes this fluid (cytosol) and almost all of the structures suspended in the fluid.

4. The cellular structures where proteins are made are called RIBOSOMES.

5. Genetic material called DNA provides the instructions for making proteins, regulates cellular activities, and enables cells to reproduce.

6. An organism that is a single prokaryotic cell is called a PROKARYOTE.

7. An example of an organism that is a prokaryote is a BACTERIA.

8. An organism that is made of one or more than one eukaryotic cell is called a

EUKARYOTE.

9. Because of their COMPLEX ORGANIZATION, eukaryotic cells can carry out more specialized functions than PROKARYOTIC cells can.

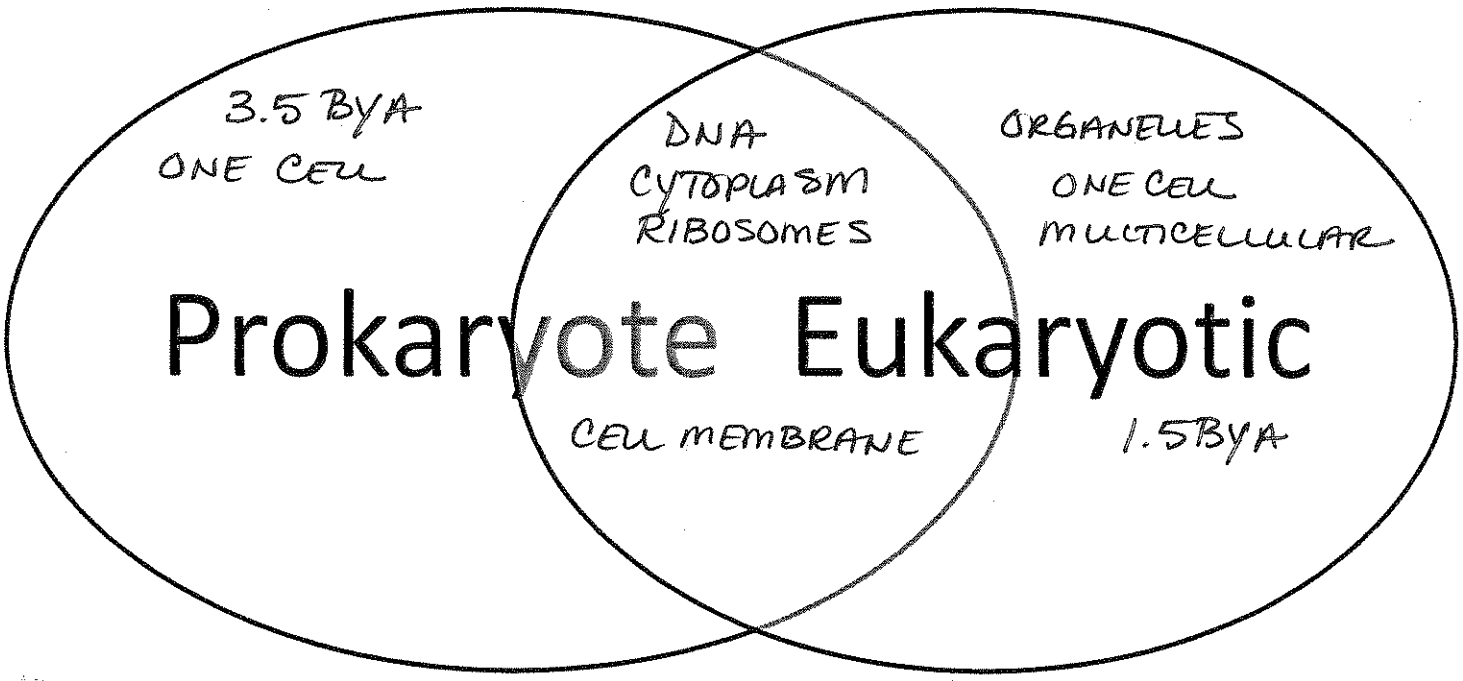
10. In a eukaryotic cell, the DNA is housed in an internal compartment called a NUCLEUS.

11. A structure that carries out specific activities inside of a eukaryotic cell is called an

ORGANELLE.

12. Use the word bank provided to complete the Venn Diagram below.

| Word Bank | | | |
|---|---|---|---|
| DNA | 3.5 BYA | ribosomes | cell membrane |
| cytoplasm | one cell | multicellular | 1.5 BYA |
| organelles | | | |



*Read pages 157-163 and answer the following questions.*

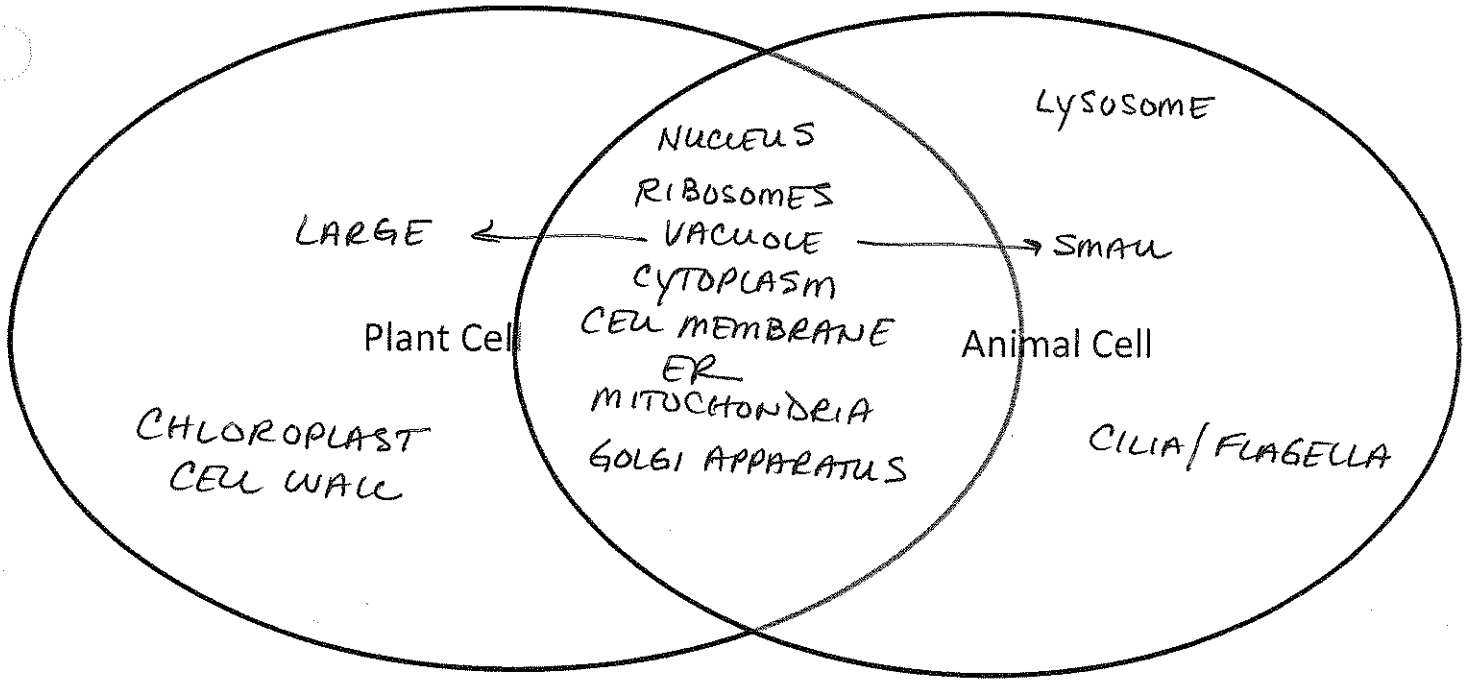
| CELL PART | FUNCTION IN THE CELL | SIMILAR TO... | EUKARYOTIC /PROKARYOTIC? |
|---|---|---|---|
| Nucleus | control center for the cell; contains DNA | CASTLE; BRAIN | EUK. |
| Cell Membrane | outer surface of the cell; protects contents of cell; made of lipids | SUBMARINE | EUK & PROK. |
| Cytoplasm | everything between the cell membrane and the nucleus | JELLO MOLD | EUK & PROK. |
| Ribosomes | where proteins are made | FACTORY | EUK & PROK |
| Mitochondria | where food is converted into energy for the cell; powerhouse | POWER HOUSE<br>WEIGHT ROOM | EUK |
| Chloroplast | where food is made (carbohydrates) | KITCHEN | EUK - PLANT ONLY |
| Endoplasmic Reticulum (Smooth/Rough) | where materials go to be transported through the cell; highway system | HIGHWAY | EUK |
| Golgi Apparatus | packages and labels materials to be shipped to other parts of the cell or outside of the cell; post office | POST OFFICE | EUK |
| Lysosome | where waste is broken down before it is sent out of the cell | GARBAGE DISPOSAL | EUK - ANIMAL ONLY |
| Vacuoles | where water, nutrients, and waste is stored until it can be used or sent out of the cell | STORAGE FACILITY;<br>WAREHOUSE | EUK<br>SMALL - ANIMAL<br>LARGE - PLANT |

| | | | |
|---|---|---|---|
| Cell wall | provides strength and support for cells | BRICKS ON A BUILDING | EUK - PLANT ONLY |
| Cilia | hair-like structure that helps cell with movement | TINY HAIR | EUK - ANIMAL ONLY |
| Flagella | tail-like structure that helps cell with movement | TAIL | EUK - ANIMAL ONLY |

*Cell Parts Flash Cards*

12. Use the word bank provided to complete the Venn Diagram below.

| Word Bank | | | |
|---|---|---|---|
| nucleus | vacuole | ER | cell wall |
| lysosome | cytoplasm | mitochondria | cilia/flagella |
| ribosomes | cell membrane | chloroplast | Golgi apparatus |




*Animal & Plant Cell Coloring Sheets*

*Edible Cell Project*