

## HOME WORK 3.1: CELL THEORY

### KEY CONCEPT

*Cells are the basic unit of life.*

### VOCABULARY

cell theory	organelle	eukaryotic cell
cytoplasm	prokaryotic cell	

**MAIN IDEA:** Early studies led to the development of the cell theory.

**Match each scientist in the table with the statement listed below that describes what he did to help develop the cell theory.**

- A. concluded that animals and, in fact, all living things are made of cells.
- B. was the first to identify cells and name them.
- C. proposed that all cells come from other cells.
- D. concluded that plants are made of cells.
- E. observed live cells and observed greater detail.

Scientist	Write the <u>Statement</u> that Completes the Sentence (see lettered choices above)
1. Hooke	
2. Leeuwenhoek	
3. Schleiden	
4. Schwann	
5. Virchow	

**Study Guide 3.1 *continued***

**Circle the word that best completes the statement about cell theory.**

6. The cell theory states that:
- i. All organisms are made of *organelles* / *cells*.
  - ii. All existing cells are produced by other *living* / *dead cells*.
  - iii. The *atom* / *cell* is the most basic unit of life.
7. Cell theory is one of the great unifying theories of *biology* / *chemistry*.

**MAIN IDEA:** Prokaryotic cells lack a nucleus and most internal structures of eukaryotic cells.

8. For each of the following cell characteristics, place a check mark [ ✓ ] in the appropriate box or boxes to indicate whether it is a characteristic of eukaryotic cells, prokaryotic cells, or both.

<b>Characteristic</b>	<b>Eukaryotic cells</b>	<b>Prokaryotic cells</b>
Surrounded by a cell membrane		
Contains cytoplasm		
Contains a nucleus		
Contains membrane-bound organelles		
Tends to be microscopic in size		
Either single-celled or multicellular		
Only single-celled		

**Vocabulary Check**

**Fill in the blank with the word or phrase that best completes the sentence.**

9. The jellylike substance that contains dissolved molecular building blocks and, in some types of cells, organelles, is called \_\_\_\_\_.
10. \_\_\_\_\_ cells have no nucleus.

### REINFORCEMENT 3.1 : CELL THEORY

**KEY CONCEPT** Cells are the basic unit of life.

The invention of the microscope in the late 1500s revealed to early scientists a whole new world of tiny cells. Most cells are so small that they cannot be seen without a microscope. The discoveries of scientists from the 1600s through the 1800s led to the cell theory, which is a unifying concept of biology. The **cell theory** has three major principles:

- All organisms are made of cells.
- All existing cells are produced by other living cells.
- The cell is the most basic unit of life.

All cells can be divided into two major groups: **prokaryotic cells** or **eukaryotic cells**.

The main differences between the two kinds of cells are in their structure:

- Eukaryotic cells have a nucleus defined by a membrane, while prokaryotic cells have no nucleus.
- In eukaryotic cells, the DNA, or genetic information, is found in the nucleus. In prokaryotic cells, the DNA is found in the **cytoplasm**, the jellylike substance that fills both types of cells.
- Eukaryotic cells have **organelles**, structures that perform jobs for a cell. Most organelles are surrounded by membranes. Prokaryotic cells do not have organelles surrounded by membranes.

Prokaryotic cells make up organisms called prokaryotes. All prokaryotes are tiny and consist of single cells. Bacteria are prokaryotic cells. Eukaryotic cells make up eukaryotes. You are a eukaryote, as are plants and some types of single-celled organisms. All multicellular organisms, or organisms that have many cells, are eukaryotes.

1. What is the smallest, most basic unit of life?

\_\_\_\_\_

2. Where is the DNA in a prokaryote? in a eukaryote?

\_\_\_\_\_

3. Why would you need a microscope to see a prokaryotic organism?

\_\_\_\_\_

4. A friend tells you he read somewhere that rotting garbage can turn into maggots, which are fly larvae, and the maggots then can grow into adult flies. What part of the cell theory could you use to refute his claim?

\_\_\_\_\_

## SECTION QUIZ 3.1: CELL THEORY

**Choose the letter of the best answer.**

- \_\_\_\_\_ 1. Which invention played the biggest role in the discovery of cells by early scientists?
- magnifying glass
  - lens
  - eyeglasses
  - compound microscope
- \_\_\_\_\_ 2. The cell theory states that all organisms are made of cells; cells are the most basic unit of life; and
- all existing cells form by free-cell formation.
  - all cells are eukaryotic.
  - all existing cells are produced by other living cells.
  - all cells have a nucleus.
- \_\_\_\_\_ 3. What is the term for the jellylike substance that is contained inside the cell membrane?
- cytoplasm
  - DNA
  - organelle
  - nucleus
- \_\_\_\_\_ 4. Unlike a eukaryotic cell, a prokaryotic cell does not have
- DNA.
  - a cell membrane.
  - cytoplasm.
  - a nucleus.
- \_\_\_\_\_ 5. Specialized structures that work together inside a cell are called
- organelles.
  - prokaryotes.
  - eukaryotes.
  - nuclei.