**Introduction to Cells Guided Notes**

**History of Cells: First Sighting**

In 1665, Robert Hooke used a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to examine a thin slice of cork. What he saw looked like small \_\_\_\_\_\_\_\_\_. Hooke called them “\_\_\_\_\_\_\_\_\_” because they looked like small rooms.

First Living Cells

In 1673, Anton Von Leeuwenhoek (a Dutch microscope maker) was first to view \_\_\_\_\_\_\_\_\_\_\_\_ cells. Leeuwenhoek used a simple handheld microscope to view tiny organisms in pond water and scraping from his \_\_\_\_\_\_\_\_\_\_\_\_.

Plants and Animals

In 1838, a German botanist named Matthias Schleiden concluded that all \_\_\_\_\_\_\_\_\_\_ were made of cells. In 1839, a German zoologist named Theodore Schwann concluded that all \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ were made of cells.

Cell Division

In 1855, a German medical doctor named Rudolph Virchow used a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to observe cells \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. He reasoned that all cells must come from other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cells by cell division.

**Cell Theory**

The cell theory summarized all scientific knowledge about cells into 3 statements.

1. All living \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are made of \_\_\_\_\_\_\_\_\_\_

2. \_\_\_\_\_\_\_\_ cells are created by old cells \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ into two

3. Cells are the basic \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ units of life.

**Theory vs. Law**

Theory

 -Accepted as \_\_\_\_\_\_\_\_\_\_\_\_ due to large amounts of empirical evidence. Tested \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and verified multiple times by groups of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. More complex and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than a scientific law. Examples include evolution, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ General Theory of Relativity.

Law

 -Accepted as true due to large amounts of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ evidence. It sometimes can be described in mathematical equations. Simple, \_\_\_\_\_\_\_\_\_\_, universal and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. It describes a single \_\_\_\_\_\_\_\_\_\_\_\_\_ in comparison to a theory that usually involves many factors. Examples include the Law of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, Newton’s laws of Motion.

**Science vs. Pseudoscience**

Science

 -Willingness to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ with evidence. Ruthless peer review, takes account of all new \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. It invites criticism and has verifiable \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. It limits claims of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and has accurate measurements.

Pseudoscience

 -“Fake \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. It has \_\_\_\_\_\_\_\_\_\_ ideas, no peer review, selects only \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ discoveries, sees criticism as conspiracy and claims widespread usefulness, and contains “ball-park” \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Unicellular and Multicellular Life**

Unicellular life -composed of once \_\_\_\_\_\_\_\_\_\_. These are small things like \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Multicellular life-composed of many cells. All plants and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are multicellular and are eukaryotic.

**Eukaryotic and Prokaryotic Cells**

Scientists believe that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cells in the form of bacteria were the first life forms on Earth. They are considered “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_” and originated about 3.5 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ years ago. That’s two billion years earlier than \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cells and billions of years before our earliest ancestors, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Endosymbiotic Theory**

-First postulated by Lynn Margulis in 1967. “Endo” means within. In endosymbiosis, cells are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ but not digested. Cells live together is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ benefitting relationship, or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The mitochondria of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ evolved from aerobic bacteria living within their \_\_\_\_\_\_\_\_\_\_\_ cell. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of red algae, green algae and plants evolved from endosymbiotic \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Eukaryotic vs. Prokaryotic Cells**

Eukaryotes

-Typically 10-100 micrometers in diameter with a true nucleus. When cell wall is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, it’s chemically simple. They have membrane bound organelles. DNA is stored in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in eukaryotic cells are composed of several filaments and are far more \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Prokaryotes

-Typically 0.2-2.0 micrometers in diameter. No nuclear membrane or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Cell wall is usually present; chemically \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-typical bacterial cell wall includes peptidoglycan-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and sugars. DNA floats in an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ manner and flagella is present but very \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.