Cellular Structure & Function

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Period:\_\_\_\_\_Date:\_\_\_\_\_\_\_\_\_

**\_\_\_\_\_\_\_ – the basic unit of life!**

**I. Basic HISTORY:**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_living thing-from the tiniest bacterium to the largest whale-is made of one or more cells!
* Before the seventeenth century, no one knew that \_\_\_\_\_\_\_\_\_\_\_\_existed.
* Most cells are too \_\_\_\_\_\_\_\_\_\_to be seen with the\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Not discovered until after the invention of the\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_in the early 17th century.

**II. IMPORTANT SCIENTISTS:**

* A Dutch drapery storeowner\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, became the \_\_\_\_\_\_\_\_\_\_ person to OBSERVE and DESCRIBE MICROSCOPIC ORGANISMS and LIVING CELLS.

* 1665: the English Scientist \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_used a microscope to examine a thin slice of \_\_\_\_\_\_\_\_\_\_\_and described it as consisting of "a great many little boxes". It was after his observation that Hooke called what he saw "cells". They looked like "little boxes" and reminded him of the small rooms in which monks lived. So he called them "\_\_\_\_\_\_\_\_\_\_\_\_".

* 1824: the French scientist **Henri Dutrochet** concluded that \_\_\_\_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_\_\_ tissue were always made up of cells

* 1831: **Robert Brown** named the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* In 1838: German Botanist **Matthias Schleiden** concluded that all\_\_\_\_\_\_\_\_\_\_ are made of cells

* 1839: German Zoologist **Theodor Schwann** reported that \_\_\_\_\_\_\_\_\_\_\_are also made of cells
* 1845: **Felix Dujardin**- studied the living cell and noted it contained a material called\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* In 1855: German Physician **Rudolf Virchow** induced that ALL cells come from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_cells.
* The COMBINED work of **Schleiden**, **Schwann**, and **Virchow** make up what is now known as the modern\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

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**III. The Cell Theory Consists of 3 Principles:**

1. All living things are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of one or more\_\_\_\_\_\_\_\_\_\_\_\_.
2. \_\_\_\_\_\_\_\_\_\_are the basic units of \_\_\_\_\_\_\_\_\_\_\_\_and **\_\_\_\_\_\_\_\_\_\_\_**in an organism.
3. Cells come \_\_\_\_\_\_\_\_\_\_from the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**of\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_cells.

**IV. TWO TYPES of CELLS:**

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_= cells that contain a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 ~Ex: \_\_\_\_\_\_\_\_\_\_\_\_, fish, mammals, \_\_\_\_\_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_= cell that \_\_\_\_\_\_\_\_\_\_\_\_\_\_a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 ~Ex: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_organisms such as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and their relatives

**V. CELL DIVERSITY:**

* Not all cells are\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Cells within the same organism show enormous diversity in\_\_\_\_\_\_\_\_\_\_\_, **\_\_\_\_\_\_\_\_\_\_**, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

o Your body contains at least \_\_\_\_\_\_\_\_\_\_\_different cell types!

**VI. CELL SIZE**:

* A few types of cells are large enough to be seen by the \_\_\_\_\_\_\_\_\_\_\_\_\_\_eye.

o \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_is the\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cell in the body, and can be seen without the aid of a microscope.

* Most cells are visible only with a\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

* **Most cells are small for 2 reasons:**

1. Cells are limited in size by the \_\_\_\_\_\_\_\_\_\_\_\_\_between their \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and their \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

* + As a cell’s size increases, its volume increases much faster than its surface area. (see picture below)

2. The cell’s nucleus (the brain) can only control a certain amount of living, active cytoplasm.



**VII. CELL SHAPE:**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of shapes.



* The \_\_\_\_\_\_\_\_\_\_\_\_\_\_of the cell depends on its

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* Ex: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_that carry information from your toes to your brain are long and threadlike.

* Ex: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_are shaped like round disk that can squeeze through tiny blood vessels.

**VIII. CELLULAR ORGANIZATION:**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_are made up of many

cells, each of which is specialized to perform a distinct function.

o Digestion, movement, respiration, filtering, etc…

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_DO NOT carry out ALL life functions, but rather depend on each other
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_= a group of cells functioning together to perform and activity
	+ Ex: muscle and nerve tissues
	+ Ex: Plant tissues = stem and root
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_= groups of two or more tissues that function together
* Stomach, leaf of a plant
* Cooperation among organs makes life functions within an organism efficient
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = groups of organs that work together for a common function
	+ Ex: circulatory system = heart, blood vessels, blood
	+ Ex: digestive system = stomach, esophagus, intestines
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = a single living thing
	+ If multicellular, most have groups of organ systems

SUMMARY \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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