**2.1 Characteristics of Cells**

Discovery of Cells

* First discovered in 1665 by \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_.
* Using a microscope, he saw little boxes in a slice of cork.
* He named them \_\_\_\_\_\_\_\_\_\_\_\_\_.
* Anton van-Leeuwenhoek was the first person to see \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cells
* He saw one-celled organisms in a drop of pond water
* He called them animalcules. (We now call them protists.)

The Cell Theory

1. All known \_\_\_\_\_\_\_\_\_\_ things are made up of \_\_\_\_\_\_\_\_\_\_\_.
2. The cell is the basic \_\_\_\_\_\_\_\_ of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and function in all living things.
3. All cells come from other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cells.

**2.2 Cell Structures**

\_\_\_\_\_\_\_\_\_\_ are the basic unit of living things; the \_\_\_\_\_\_\_\_\_\_\_ unit that can carry out all of the functions of life. Cells contain special \_\_\_\_\_\_\_\_\_\_\_ that carry out the functions of life. The tiny structures are called \_\_\_\_\_\_\_\_\_\_\_\_\_.

Cell Organelles—the parts inside a \_\_\_\_\_\_\_\_\_\_\_\_

* they carry out \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (jobs) inside the cell

Nucleus—the “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ center of the cell”; Directs all cell \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* Usually the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ organelle to see under a microscope
* Cells with a nucleus (plant cells and animal cells) are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and those without a nucleus (bacteria) are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Nuclear Membrane--\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the nucleus

* Controls what goes \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and out of the nucleus

Inside the Nucleus

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – structures in the nucleus made of DNA
* \_\_\_\_\_\_\_\_\_\_\_ – long, threadlike, material that contains the instructions for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the cell does

Cell Membrane—a thin, flexible \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that surrounds a cell

* Controls what goes \_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_the cell
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and supports the cell

Cytoplasm—a thick \_\_\_\_\_\_\_\_\_-\_\_\_\_\_\_\_\_\_\_\_ substance inside the cell

* Fills the space \_\_\_\_\_\_\_\_\_\_\_\_\_\_ all the cell parts and gives the cell its shape

Endoplasmic Reticulum—a.k.a. “ER” \*2 types \_\_\_\_\_\_\_\_\_\_\_\_ ER and \_\_\_\_\_\_\_\_\_\_\_\_ ER

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ materials around the cell

Ribosomes-- make \_\_\_\_\_\_\_\_\_\_\_\_\_--the “building blocks” of cells

* Smallest and most \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ organelles
* Proteins are very important for many of the cell’s \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (including cell transport—what can go into or out of a cell)

Golgi Apparatus—sends \_\_\_\_\_\_\_\_\_\_\_\_\_\_ to where they are needed

Lysosomes—break down food, cell\_\_\_\_\_\_\_\_\_\_ , and old, worn-out \_\_\_\_\_\_\_\_\_\_\_\_

* These materials are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and used again

Mitochondria—the “\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ of the cell”

* Cellular \_\_\_\_\_\_\_\_\_\_\_\_\_\_ occurs here to release \_\_\_\_\_\_\_\_ for the cell to use to make materials and move them around

Vacuoles-- \_\_\_\_\_\_\_\_\_\_\_\_\_ containers for water, food, and wastes

* Vacuoles are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in plant cells than they are in animal cells

There are some structures that are unique to \_\_\_\_\_\_\_\_ (or only found in plants).

Cell Wall

* Found only in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and bacterial cells
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_ , protective barrier that protects and supports the cell
* Found \_\_\_\_\_\_\_\_\_\_\_ of the cell membrane of plant and bacterial cells

Chloroplasts

* Found only in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cells
* Contains the green pigment \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Where\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ takes place

Differences in Cells

* Usually the shape of a cell is related to its \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (job)
* Plant cells have a \_\_\_\_\_\_-like shape and animal cells do \_\_\_\_\_ have a particular shape
* Plant cells have some structures that animal cells do not – \_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_ and chloroplasts
* A plant cell usually has one large \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and an animal cell usually has several small ones

Which organelle directs all cell activities?

Which organelle controls what goes into or out of the cell?

Which organelle controls what goes into and out of the nucleus?

What substance contains the instructions for everything the cell does?

\*\*For the Cell City Project: The functions of the organelles inside a cell can be compared to the functions of the places found in a city. Think about what each part of the cell does and then write it next to the “City Part.”

Cell Parts City Parts

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Highway or road system

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Energy plant (Georgia Power)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Waste disposal/recycling center

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Air and lawns

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Post Office or UPS

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Solar energy plants/panels

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Water tower

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Blueprints of the city

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Rolled up blueprints

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Lumber or brick yard (Home Depot)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ City Hall

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ City Hall fence with security guards

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ City wall or border of protection

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Fence surrounding the city with security guards