**Objective 41-43 Video Notes**

**Levels of Organization, Cell Theory, and Reproduction**

**Objective 41: I can describe the hierarchical organization of multicellular organisms**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: Cells that perform specific functions in multicellular organisms (muscle cells, skin cells, brain cells – all have different functions and jobs)

* + - Cells are the smallest unit of LIVING things.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ : A group of specialized \_\_\_\_\_\_\_\_\_\_\_\_\_ working together for a specific function.

* Examples:
	+ Muscle Tissue
	+ Nervous Tissue
	+ Connective Tissue
	+ Epithelial tissue

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ : A group of similar \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that perform a similar, specific, and often complex function

* Examples
	+ Heart
	+ Liver
	+ Kidneys
	+ Brain
	+ Stomach
	+ Skin

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ : A group of\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that work together to perform a major function

* Examples:
	+ Nervous System
	+ Circulatory System
	+ Respiratory System
	+ Digestive System
	+ Excretory System
	+ Immune System
	+ Muscular System
	+ Skeletal System
	+ Endocrine System

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: Several \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ working together to perform life functions make up a multi-cellular organism.

Hierarchy of Multicellular Organisms

* + - Specialized Cells
		- Tissues
		- Organs
		- Organ Systems
		- Organism

**Scientists that contributed to the Cell Theory:**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ –1665 discovered cells by looking at a slice of \_\_\_\_\_\_\_\_\_\_\_\_ under the microscope. He described the cells as tiny boxes or honeycomb. He thought they only existed in plants and fungus.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: 1673 – observed \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ under a hand held microscope and discovered single-celled organisms. He called them “animalcules”. He also observed the blood cells from fish, birds, frogs, dogs, and humans and found cells were found in animals AND plants.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, 1838- German Botanist, concluded that all \_\_\_\_\_\_\_\_\_parts are made of \_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 1839- German physiologist, who was a close friend of Schleiden, stated that all \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are composed of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 1858-, German physician, concluded that cells \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Obj 42: I can explain the 3 parts of the cell theory.**

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Schleiden & Schwann)(1838-39)
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Schleiden & Schwann)(1838-39)
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Virchow)(1858)

**Objective 43: I can describe sexual and asexual reproduction**

Sexual Reproduction – 2 parents: Our bodies create sex cells (egg and sperm) through a process called **\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

* Sexual reproduction produces offspring that are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from their parents.

Asexual Reproduction - produces offspring that are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the parent cell.

* The cells in our bodies reproduce asexually. Our body cells duplicate themselves in a process called **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Other forms of asexual reproduction include

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ : unicellular organisms divides into 2 equal parts (amoeba)
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: parent plants send out “runners” to grow more identical plants (strawberries and poplar trees)
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: the parent produces an outgrowth or bud which detaches and becomes a new individual (hydra, yeast, coral)
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: spores are released and become new plants (sporozoa, ferns)
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: when parts of an organism can regrow missing parts or become new organisms if the injury is severe (star fish and sponges)



* mitosis produces \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* meiosis produces \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The cells created from **mitosis** are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(46 chromosomes)

The cells created from **meiosis** are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(23 chromosomes)

* **Diploid (2n)** – two of each type of chromosome (in homologous pair – carry the same trait)
* **Haploid (n)** – one of each type of chromosome

Human cells have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ chromosomes.

* Therefore, the diploid number (2n) of chromosomes in humans is 46. (MITOSIS)
* The haploid number (n) of chromosomes in humans is 23.(MEOSIS)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ occurs in normal \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cells (i.e. skin cells),

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_occurs in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cells (i.e. sperm and egg) only.