**CELL THEORY, MICROSCOPES, AND MICROORGANISMS TEST STUDY GUIDE**

**CELL THEORY**

What are the three parts of cell theory?

* All living things are composed of cells
* Cells are the basic unit of structure and function in living things
* All cells are produced form other cells

Who are the 5 main scientists we discussed and what were their contributions?

* Robert Hooke – One of the first people to observe cells (that are no longer living)
* Anton van Leeuwenhoek – First person to observe living cells
* Matthias Schleiden – Concluded that all plants are made of cells
* Theodor Schwann – Concluded that all plants are made of cells
* Rudolph Virchow – Proposed that new cells are formed only from existing cells

**MICROSCOPES**

Know the microscope parts and functions (do not need to write anything here)

How do you calculate the total magnification of a compound microscope?

* Multiple the magnification of the ocular lens with the magnification of the objective lens

What is resolution?

* The ability to clearly distinguish the individual parts of an object. The sharpness of an image.

**MICROORGANISMS**

What is the difference between prokaryotic and eukaryotic cells?

* Prokaryotic cells do NOT contain a nucleus while eukaryotic cells do contain a nucleus

What is the difference between animal-like and plant-like protists (use the works autotrophs and heterotrophs to explain)

* Animal-like protists are heterotrophic in that they cannot make their own food while plant-like protists are autotrophic meaning they can make their own food usually through photosynthesis

Are bacteria unicellular or multicellular?

* Unicellular

Do bacteria have a nucleus?

* No

Do protists have a nucleus?

* Yes

What is the function of a food vacuole?

* Digest food

What is the function of a contractile vacuole?

* Remove excess water

**Amoebas**

Is the amoeba an animal-like or plant-like protest? Explain.

* Animal-like. It cannot make its own food.

What is phagocytosis?

he process by which pseudopodia extend out and wrap around a food particle

What structure does the amoeba use to move? Briefly explain how this structure works.

* Pseudopods. The cytoplasm pushes towards the cell membrane causing its body to extend and creep along

How does the amoeba reproduce?

* Asexual reproduction (offspring arise from a single organism, and inherit the genes of that parent only), rarely sexual reproduction (two parents contribute genetic information to produce unique offspring).

**Euglena**

What two structures do euglenas have that help them produce their own food by photosynthesis? Briefly explain the function of these two structures.

* Eyespot which helps find light and chloroplasts which help trap light for photosynthesis

What structure does the amoeba use to move? Briefly explain how this structure works.

* Flagella – long-whip like/tail-like structure that move back and form

How does the euglena reproduce?

* Asexual reproduction

**Paramecium**

What structure does the paramecium use to move? Briefly explain how this structure works.

* Cillia – Hair-like structures that move in a back-and-forth motion at about 40-60 times per second

Explain how paramecium consumes food all the way until the waste is released.

* Paramecium use their cilia to sweep food into their oral groove. The food is digested in the food vacuole and undigested food particles are eliminated through the anal pore

Explain the function of the nuclei (both the macronucleus and micronucleus) in a paramecium

* The micronucleus is used only during reproduction. The macronucleus controls cell activities such as breathing, building proteins, and digestion.

How does the paramecium reproduce? What is conjugation?

* Sexual and Asexual reproduction. Conjugation is when paramecium produce sexually, two paramecium lie side by side and join at the mouth pore in order to exchange DNA within the micronucleus

**Volvox**

Describe how individual volvox calls work together to make sure the colony has food.

* Individual volvox cells are held together by a cytoplasmic substance that allows the cells to work and move together. The cells are able to point their flagella in the same direction to move wherever they need to go such as in the direction of sunlight in order to be able to do photosynthesis

What structure does the volvox use to move? (How many does each cell have?) Briefly explain how this structure works.

* Each volvox cell has 2 flagella that are whip-like or tail-like structures that move back and forth

What two structures do volvox have that help them produce their own food by photosynthesis? Briefly explain the function of these two structures.

* Eyespot which helps find light and chloroplasts which help trap light for photosynthesis

How does the volvox reproduce?

* Through sexual or asexual reproduction. There are a limited number of cells in the volvox that are dedicated to reproduction. Some of these cells can be male and others can be female.