

Cell Structures & Functions Notes

OVERVIEW

- Pro vs Eu

- Prokaryotes

- Genetic material _____ in a nucleus
- _____ complicated and _____ than eukaryotic cells
- EX: _____
- Structure:
 - _____ complicated
 - No _____
 - Basic structure

- Eukaryotes

- Genetic material is _____ in a nucleus and _____ from the rest of the cell
- _____ complex and _____ than prokaryotic cells
- EX: _____
- Structure:
 - Has a _____ and _____
 - More complex and has organelles

- What are Cells?

- Every organ in our body performs a variety of _____
- Every organ is composed of _____
 - A tissue is a group of _____

- Functions of Cells

- Structure & Support

- Cells provide structure and support for organisms just like _____

- Growth

- In complex organisms, the tissues grow by _____
- Cells are responsible for growth of the organism
 - This is called _____

- Transport

- Passive transport = _____
- Active transport = _____

- Energy Production

- In plants, energy comes from the process of _____
- In animals, energy comes from _____
 - *Breathing in oxygen and breathing out carbon dioxide*

- Metabolism

- Cells are responsible for the chemical reactions that _____

- Reproduction

- Cells help in reproduction by the process of _____ and _____
 - *We'll discuss these two more later*

Cell Structures & Functions Notes

• Cell Theory

- Cell theory has three principles:

- All organisms are _____
- All existing cells are produced by _____
- The cell is the most basic _____

• REFLECTION

- What are some functions of cells? _____

- What are the three rules of cell theory?

- _____
- _____
- _____

NUCLEUS

• Nucleus

- Structure

- _____ is the double membrane that surrounds nucleus
- _____ are dotted around the nuclear envelope to allow _____

- Function

- _____ OF THE CELL!!!
- Contains almost ALL of the cell's _____
- DNA is found on the _____, which contain genetic info

• Nucleolus

- Structure

- Small, dense region in the _____
 - Similar to the _____

- Function

- Where the _____ are made
 - Ribosomes = site where _____ are made

• Nucleoplasm

- Structure

- _____ substance within the nuclear envelope

- Function

- Holds everything in place within the _____

• Endoplasmic Reticulum (ER)

- Rough ER

- Structure

- Group of membranes that work together to _____, _____, and _____ lipids and proteins
- _____ on surface to assemble proteins
- Connected to nuclear envelope to _____

- Function

- Site where _____ are made, along with proteins to export
 - Lipids = fatty compounds that help with storing _____, absorbing _____, and making _____

Cell Structures & Functions Notes

- **Smooth ER**

- Structure

- Membrane system (layers)
- NO _____ on surface

- Function

- Creation of _____ and _____
- Detoxifies _____ and _____ in the cell
- Phospholipids = the _____ of the cell
 - *Choose what can pass in and out of the cell*

- **REFLECTION**

- What are the five parts of the nucleus that we discussed? What are the functions of each?

-

-

-

-

-

ORGANIZATION

- **Cell Wall**

- Structure

- Lies on the _____ of the cell membrane
- NOT found in _____

- Function

- Provides _____ and _____ for the cell

- **Cell Membrane**

- Structure

- Double _____ (two layers)
- _____ structure
 - Forms a strong barrier between the cell and its surroundings

- Contains _____ (guardians) to allow proteins in and out of the cell

- Function

- Provides support and protection for the cell
- _____ what enters and exits the cell

- **Cytoplasm**

- Structure

- Thick, _____ solution that fills the cell
- Contained within the _____

Cell Structures & Functions Notes

- Function
 - Holds _____ of the cell in place
 - Protects _____ from damage

● REFLECTION

- What is the difference between the cell membrane and the cell wall? _____

- What is the function of the cytoplasm? _____

ORGANELLES

● Mitochondria

- Structure
 - Enclosed by two _____
 - Contains its own _____
- Function
 - Converts chemical energy in food into materials easier for the cell to use
 - This is called _____

● Lysosomes

- Structure
 - Small sac that is filled with _____
- Function
 - Breaks down _____, _____, and _____ into small molecules to be used around the cell
 - AKA the “_____ crew”

● Golgi Apparatus

- Structure
 - Stack of closely packed together membranes
- Function
 - _____, _____, and _____ proteins and other materials from the ER for storage in the cell or to be released
 - It puts the finishing touches on _____

● Vacuole

- Structure
 - Plant cells have one _____
 - Animal cells have _____
- Function
 - Stores _____, _____, _____, and _____

● Chloroplast

- Structure
 - Stack of membranes inside (like _____)
 - Contains own genetic info (similar to the _____)
 - Contains green pigment called _____
 - NOT found in _____

Cell Structures & Functions Notes

- Function
 - Captures energy from the sun and changes it into food for plants
 - This process is called _____

● REFLECTION

- What are the five main organelles that we discussed? What are their functions for each?

- _____
- _____
- _____
- _____
- _____

MITOSIS VS. MEIOSIS

● Mitosis

- Process where a single cell divides into two _____
 - These cells are called _____
- Steps:
 - 1) _____
 - Chromosomes condense
 - Nucleus starts breaking down
 - 2) _____
 - Chromosomes condense more
 - Centrosomes move toward opposite sides of the cell
 - 3) _____
 - Chromosomes are lined up
 - Each sister chromatid is attached on opposite sides
 - 4) _____
 - Sister chromatids become chromosomes
 - Fibers lengthen, making the cell longer
 - 5) _____
 - Nuclear envelope surround each set of chromosomes
 - 6) _____
 - Daughter cells separate and form new cells

● Meiosis

- Process where a single cell divides _____ to produce _____
 - Contains _____ of the original amount of genetic information
- Steps: Phase 1
 - 1) _____
 - Chromosomes condense
 - Nucleus starts breaking down

Cell Structures & Functions Notes

- 2) _____
 - Tetrads align in center of cell
 - Attach to fibers
- 3) _____
 - Sister chromosomes separate
- 4) _____
 - Nuclear envelope reforms and nucleus appear in each side
- 5) _____
 - Daughter cells splits and form two new cells
- Steps: Phase 2
 - 1) _____
 - Chromosomes condense
 - Nucleus starts breaking down
 - 2) _____
 - Sister chromatids align in center
 - Attach to fibers
 - 3) _____
 - Sister chromatids separate
 - 4) _____
 - Nuclear envelope reforms and nucleus appear in each side
 - 5) _____
 - 2 diploid cells (2 daughter cells) split off to form 4 haploid cells
- **REFLECTION**
 - In your own words, describe the difference between mitosis and meiosis....
