Cells Unit Notes

New Area of Focus: What does it mean to be living?

- Organism – Any ___________ thing

- Characteristics of living things
- Made of __ __ __ __ __ Elements

SPONCH

25 of the elements are essential for _____.
SPONCH elements are the most ___________ important.

- Percentage of SPONCH elements in living things.
  - S. Sulfur Trace
  - P. Phosphorus 1.0%
  - O. __________ 65.0%
  - N. Nitrogen 3.3%
  - C. Carbon 18.5%
  - H. __________ 9.56%
  - Other (Trace) 3.0%

- Made of ___________.
- Moves.
● Responds to a ____________.
● Uses ____________.
● Adjusts to ____________.
  ● Maintains ____________ body conditions.
  ● Maintains homeo__________.
● Reproduces.
● Grows and ____________.
  ● Grow-To increase in ____________.
  ● Develop-To change in ____________.
● Adapts to ____________.
  ● Evolves / Inherits ____________ that promote survival.
● Has a life span.

● In Science theory
  ● Abiogenesis explains the origin of ____________.
  ● ____________ explains how life changes once it exists.
  ● The two are different.

● Needs of Living Things
  ● Energy – Supplied by the ________ (most of the time) and stored in food. TINSTAAFL!
  ● Oxygen – To burn the food in cells. (__________)
  ● Water – To keep things _____________ in and out of cells. (Universal Solvent)
  ● Minerals- For proper chemical ______________.
NEW AREA OF FOCUS: CELLULAR BIOLOGY

• Form Follows Function: Parts of the cell are shaped to perform a particular ____________.

• Cells are the ____________ and ____________ units of all living organisms
  • Humans have ___ - ___ Trillion – Multicellular
  • Some Protista have 1 – Uni____________

• Modern Cell ____________
  • The ________ is basic unit of structure and function
  • Living things are ________ of cells
  • All cells come from ________________ cells.
  • Cells contain ________________ information
- All cells are similar in ____________________
- Energy ______ of life occurs in cells

- There are two types of cells.
  - Pro__________
  - Eu__________

- Prokaryotic cells
  - No nuclear ________________
  - Genetic materials is free in ________________
  - No membrane-bound ____________.
  - Most primitive type of cell (appeared about ______ billion years ago)

- Eukaryotic Cells
  - Nuclear membrane ________________ genetic material
  - Numerous membrane-bound ________________
  - Appeared approximately ______ billion years ago
  - ________________ internal structure
Protoplastm – All contents of the cell

Cytoplasm

- All areas outside of ________________.
- Area outside of organelles is called ______________.
- Rich chemical fluid that helps breakdown ______________for use.
- Moves materials through cell (food and waste)

**CELL WALL**
- Found in __________ and __________ and Fungi.
- Made of ________________ (permeable)
- ________________ plant

**Plasma Membrane**

- Made of a phosphor__________ bilayer
- Phospholipids have two ends, one of which is hydro__________, or attracted to water,
and one of which is hydro__________, or repelled by water.

- The cell membrane is selectively ___________. Some things can enter some can’t.
- Cell Membrane controls ________________ (cellular traffic) in and out the cell.

**P________________________ transport** - movement of molecules from a ________ crowded to a ______ crowded area **WITHOUT** the use of energy.

**Diffusion:** Random ________________ of molecules.
- From______ to ______concentrations
- Molecules are trying to reach ________________.

**Osmosis:** the movement of water through a ________-permeable membrane.

- **Permeable:** Has large holes in it to let ________________ pass through.
  - Semi-permeable - Some things can enter
  - Impermeable - ____________ can enter

- Hypotonic Solution: A solution that contains _______ solute (more ___________) compared to the cytoplasm of the cell.
- Water moves ______ the cell to equal out concentrations. The cell swells
- Hypertonic Solution: Concentration of the cell is ___________ than outside of the cell.
  - Water moves ______ of the cell to try to even out the concentration. Cell Shrinks (Plasmolysis)
- Isotonic Solution: The cell has an ______________ proportion of concentration with the area surrounding.
  - Water continually ________ in and out to keep concentration even.

- Active transport –
  - Movement of molecules from a ______ crowded to a _____ crowded area
  - Requires the use of ___________
  - Proteins can do this
  - Also called reverse ___________

■ Endo______________: (Endo - means to bring in)
Energy requiring process where cell engulfs particle.
Phagocytosis: Type of endocytosis. Membrane surrounds large particles (_____)

Pinocytosis: Membrane surrounds a__________

Transmembrane Protein Receptor Mediated Endocytosis: _________ receptors facilitate endocytosis.

Exocytosis: (Exo - means to take out) Cell _________ particle. Uses ___________.
Cellular ______________: A membrane-bound compartment or structure in a cell that performs a special ______________.

They... Support, __________ (make materials), ____________ material, communicate, and transport materials within the cell.

- The Nucleus
- ____________ organelle in the cell (dark spot)
Contains information (DNA)
DNA transcription to Translation to Proteins
- Chromosomes/
- Composed of
- Thicken for cellular
- Set number per species.
- Humans have chromosomes (23 pairs).

Nucleolus
- Round dark spot shape in .
- Only when cell is not dividing.
- Contains for protein manufacturing.
- Makes that travel out of nucleus

Nuclear Membrane
- Surrounds .
- Composed of layers
- Numerous for nuclear traffic.
Rough ___________________ reticulum (E.R. for short)
- Maze-like network fused to nuclear membrane.
- Goes from nucleus to cell _____________.
- Stores, separates, and serves as cell's ____________ system
- Ribosomes attach to and make ____________.
Smooth E.R.

- Makes __________(fats) and ___________.
- Regulates _____________ production.
- Synthesizes sugars “Gluconeogenesis”
- Detoxifies ____________
- Stores important ______________
Ribosomes

- Each cell contains ________________
- Amino Acids: The building blocks of proteins. 20 variations
- Composes ______% of cell's mass
- Most are embedded in ______________________________. Some free in cytoplasm.
- Site of Protein ________________
- Mini protein making factories
- Proteins (ONCH) are very important to our cells and body.
- DNA makes ___________, RNA has information to make ________________.
- Ribosomes and mRNA

Protein Synthesis: The process in which the _____________ code carried by messenger RNA
directs cellular organelles called ribosomes to produce _____________ from amino acids.

Proteins Synthesis Animation
● To make proteins
● R______________ are units that help read RNA
● RNA is the information code that tells the type of proteins to be made.
● Protein synthesis is the process of making

Golgi Apparatus
● ________________ packaging plant and other macromolecules.
● Sends_________________ of macromolecules to destination in cell.
● Composed of numerous layers forming a ______.
● Enzymes and contents of ________________ are made here.

Lysosomes
● Has Digestive _____________ / enzymes in a sac
• Digestive organelle, ________________ old cell parts.
• ________________ down proteins, lipids, and carbohydrates, and bacteria.
• ________________ undigested material to cell membrane for removal.
• Cell breaks down if lysosome ________________

Cytoskeleton, microtubules, microfilaments
• Composed of ________________
• ________________ cell and provides shape
• Aids ________________ of materials in and out of cells
• Flagellum is made of microtubules

Centrioles
• Look like __________ nuggets (Paired)
• Made of _____ tubes
• Aid in cell division (______________)

Plastids (AKA Chloroplast)
• Organelle in ________________
• Contain the ________________ pigment chlorophyll
• Has stacks called Thyla_________
• Do photosynthesis (Make the ____________)
• Has its own unique _____.


Photosynthesis – Plants make________ from sunlight. Light energy is turned into ________ energy (sugars – carbon based).

6CO2 + 6____ + light energy = C6H12O6 + 6____

Photosynthesis
● Produces ____________ from energy.
● Occurs only in cells with _____________.
● ____________ is produced.
● ____________ is used.
● ____________ dioxide is used.
● Occurs in ____________.
Mitochondria

- Large organelle that makes _________ for the cell. (ATP)
- Has folds (surface area) called _________
- _____ membranes
- Recycles ___________, produces urea
- Has its own _________. Reproduce independently from cell.

Cellular Respiration: Processes whereby certain organisms obtain ___________ from organic molecules.

Cellular Respiration

- C6H12O6 + 6____ = 6CO2 + 6______ + released energy.

Respiration

- Burns __________ for energy.
- Energy is released.
- Occurs in most cells.
- __________ is used.
- __________ is produced.
- ___________dioxide produced.
- Occurs in ________ and light.
The carbon dioxide oxygen _______________.
● Plant uses carbon dioxide and produces ___________ (photosynthesis).
● Animal uses oxygen and produces ________________________(respiration).

● Vacuoles
● Membrane-bound sacs for ________, digestion, and waste removal
● Very _________ in plant cell
● Create __________ pressure in plants
● Contains food and ___________ solution
● Contractile vacuoles for water removal (in unicellular organisms) + locomotion.
SAVE THESE NOTES FOR THE HOMEWORK WHICH IS DUE SHORTLY!

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