

EOC Review Part 3

Cellular Basis of Life

What does the term “membrane-bound organelles mean?” What cell type are they found in?

Cell parts that have unique functions (e.g., nucleus, mitochondria, chloroplasts, ER), surrounded by a lipid bilayer. They are found in eukaryotic cells only.

What are the three parts of cell theory?

1. All living things are made up of cells. 2. All cells come from pre-existing cells. 3. Cells are the basic unit of life.

What is the function of the cell membrane?

It is a semi-permeable barrier that allows only certain molecules in & out of the cell.

Complete the table below.

Cell Part	Structure Description	Function
Nucleus	Large organelle; surrounded by a double membrane	Contains DNA
Cell Membrane	Surrounds all cells; made out of a phospholipid bilayer	Regulates passage of materials into and out of the cell
Cell wall	Made out of cellulose; contains lignin in woody plant tissues	Provide structure and support
Mitochondrion	Kidney-bean shaped organelle with a double membrane	Powerhouse of cell; site of Krebs' Cycle and Electron Transport Chain in ATP synthesis (aerobic respiration)
Vacuole	Large single organelle in plants; many small organelles in animals	Storage
Chloroplast	Green organelle with a double membrane	Site of photosynthesis
Ribosome	Non-membrane bound structure; made out of protein and rRNA	Site of protein synthesis
Flagellum	Long protein structure found attached to the outside of the cell membrane	Cell locomotion

Which organelles/structures are found only in animal cells?

Centrioles

Which organelles/structures are found only in plant cells?

Cell wall, large central vacuole, chloroplast

What organelle is very plentiful in muscle cells in order to provide the energy for movement?

Mitochondrion

Put the following in order from smallest (1) to largest (4):

Organ systems

Cells

Organs

Tissues

_____ 4

_____ 1

_____ 3

_____ 2

What are the reactants and products for each of these?

Process	Reactant(s)	Product(s)
Photosynthesis	Water, Carbon dioxide (and sunlight)	Glucose, Oxygen
Aerobic respiration	Glucose, Oxygen	Water, Carbon Dioxide, 36ATP
Anaerobic respiration	Glucose	Carbon dioxide, ethanol/lactic acid, 2 ATP

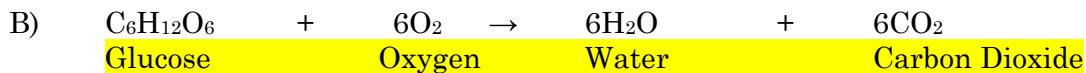
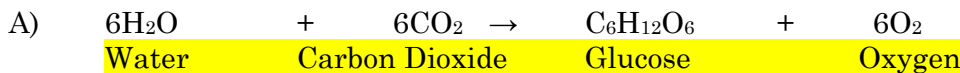
What are the three steps to aerobic respiration?

Glycolysis, Krebs's Cycle, Electron Transport Chain.

Give some examples of what ATP energy is used for.

Making proteins, replicating DNA, cell responses, protein pumps, muscle contraction, everything

Label the following molecules in these equations (water, glucose, oxygen, carbon dioxide).



What happens during anaerobic cellular respiration?

Fermentation is when cells convert sugar to ATP in the absence of oxygen

Describe the structure and function of enzymes, and explain their importance in biological systems.

Folded protein fits like a "lock and key" to substrate. Speeds up chemical reactions (combining or breaking down substances) that would otherwise be too slow for life functions.

Explain why the enzyme can be used over and over.

They are not changed by the reaction they catalyze.

How do extreme pH and temperature extremes affect enzymes?

(What is denaturation?)

High/low pH and high temperature denatures proteins. Low temperatures slow down proteins. Denaturation is when a protein unfolds (loses its shape).

All (save for a few) enzymes end in what suffix?

-ase

Label the picture (right) with the following enzymatic reaction:

Substrate, Product(s), Enzyme-substrate complex, Enzyme

See diagram to right.

In the first graph, at what temperature does the enzyme work best?

37°C

At what temperature does this enzyme start to denature?

40°C

How can you tell?

The line on the graph starts to decrease, showing a decrease in action of the protein. This means that the proteins are losing their shape.

In the second graph, which enzyme (X or Y) would be used in acidic conditions, and how can you tell?

X -- pH below 7 is acidic (enzyme Y works best above 7)

