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Chapter 1 Questions

Question: 1. What are the properties and processes we associate with life?

Answer: Order - Organization of all living things.

Regulation - Process of mechanisms regulating an organisms internal environment, helping the organism sustain its life.

Growth and Development - Information carried by genes, controls an organisms pattern of growth and development.

Energy Utilization - Organisms taking in energy and using it to perform activities.

Response to the Environment - Organisms responding to environmental stimuli.

Reproduction - Process of organism producing their own kind.

Evolution - Reproduction stimulates the capacity of populations to evolve over time.

Question: 2. What are the three domains of life?

Answer: The three domains of life are Bacteria, Archae, and Eukarya.

- In the Domain Eukarya there are kingdom Plantae, kingdom Fungi, kingdom Animalia, and protists which have multiple kingdoms.

Question 3. What are Darwin's three facts concerning natural selection?

Answer: Fact 1: <u>Overproduction and Competition</u>: States any population of a species has the potential to produce more offspring than the environment can possibly support with resources such as food and shelter.

Fact 2: <u>Individual Variation</u>: States individuals in a population of any species <u>vary</u> in many inherited traits.

The Inescapable Conclusion: <u>Unequal Reproductive Success</u>: Individuals with traits best suited for their local environment have the greatest reproductive success. Same success can be passed to offspring to inherit.

Question 4. Define natural selection. ~~and~~

Answer: Natural selection: "Unequal reproductive success" as Darwin called it, and the product of natural selection is adaption (accumulation of favorable variations in a population over time).

Example: Beetles (pg. 11)
Beetles come in various shades, and when it comes to elimination, lighter beetles are spotted easily by birds. Which leaves the darker beetles left to make

more dark colored beetles rather than light colored beetles, since there are more darker colored beetles to reproduce their own kind.

Question: 5. Describe the differences between artificial selection and natural selection.

Answer: Artificial selection: Process in which two organisms of the same species are brought together, but have different traits. Those organisms reproduce organisms with a mixture of traits from their parents, and they share the same ancestors.

Natural selection: Process in which reproduction occurs naturally, not forcefully like artifical selection to make a certain breed.

Question 6: Define science, and what are the parts of the scientific method?

Answer: Science- A way of knowing, one that is based on inquiry.

Parts

Observation: To reach a general conclusion.
Question: To try to figure out what's wrong or happening.
Hypothesis: To state what is occuring in the problem or experiment.
Prediction: Your thinking of why something is happening
Experiment: What procedures you took.
Predicted Result: What you think should happen.

Ch. 2-

1. What are the different types of chemical bonding and how do they work?
2. Why do chemical reactions occur?
3. What are isotopes?
4. What is the structure of an atom?

1. Chemical- attractions that hold atoms together

   Ionic- attraction between two opposite charged ions

   Covalent- when two atoms share 1 or more pairs of outer shell electrons

   Hydrogen- weak attractions between polar molecules

2. Chemical reactions occur because of changes in the chemical composition of matter.

3. Isotopes have the same number of protons are elements that have the same number of protons and electrons but neutrons are different. They have different masses.

4. Atoms have a nucleus and within are protons, electrons, and neutrons. They have an outer shell which hold electrons which are negatively charged.

Midterm Review
Chapter 3

Questions

The Molecules of Life

① Why are carbons so versatile as molecular ingredients?
② What is the relationship between the number of electrons in an atom and its bonding ability?
③ Why must atoms or molecules be arranged a certain way?
④ What do polysaccharides do?
⑤ What is a peptide bond?

① Has 2 empty electron spaces, allowing many combinations w/ many ~~mole~~ dif. molecules.

② Its bonding ability depends on the number of electrons it has

③ ~~If the~~ *Structure = Function*

④ Used to store energy for later use makes cellular structures
Ex: Starch, Glycogen

⑤ A bond between adjacent amino acids

Chapter 4

1. Process of manufacturing and distributing cellular products? Including E.R., Golgi, Lysosomes, Vacuoles.

- Starts in the endoplasmic reticulum, one of the main manufacturing facilities within a cell. Has two parts which are rough E.R. and smooth E.R.

- Rough E.R. produces two main types of protcins: membrane protcins and secretory proteins.

- Rough E.R. makes new membranes and secrete to the fluid outside the cell.

- Other products are brought to different locations by transport vesicles.

- Smooth E.R. - In this e.r. many enzymes are made.

- The Golgi Apparatus recieves, stores, and distributes chemical products for the cell.

- Lysosomes take products given to it and makes energy for the cell.

- Vacuoles have a variety of functions.

- Vacuoles include ~~one~~ contractile vacuoles that expel water from fresh water protists, and central vacuoles of plant cells.

~~2. How do energy conversions between chloroplasts and mitochondria work?~~

2. How do Chloroplasts and Mitochondria make energy?

- Chloroplasts make energy ~~By~~ with the organelles located inside such as the stroma and granum.

- Stroma is the fluid located in chloroplast

- In the stroma, granum are located. Grana are solar power packs for chloroplasts. These trap light energy and convert it to chemical energy.

- In mitochondrion there is a fluid called matrix.

- The envelopes surrounding the matrix are cristae.

- Cristae maximize ATP output to make more energy.

3. DNA genes in the nucleus controling cells?

- DNA had already programed the cell to work properly.

4. Similarities/ Differences in Eukaryotic and Prokaryotic cells.

Prokaryotic Cells	Eukaryotic Cells
- ~~House~~ Bacteria and archea	- Protists, plants, fungi, animals
- Smaller	- Several membrane enclosed organelles
- Older in evolutionary sense	- Houses most of DNA cells
- Structurally simpler	- Membrane-bound organelles
- Lacks internal structures surrounded by membrane	- more complex
- Lacks nucleus.	- larger
	- has a nucleus

5. How do cells maintain their shape?

- Cells have an infrastructure called the cytoskeleton.

- Cytoskeleton contains several fibers.

- One important type of fibers is microtubes which have straight tubes composed of tubulins.

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Christian San Pedro

Chapter 5

1. whats the difference between passive transport and facilitated diffusion, active transport?
2. isotonic, hypertonic, hypotonic?
3. osmoregulation?
4. Signal transduction pathway?
5. inhibitors prevent enzyme activity but why do they? are they some sort of disease or factor?
6. What does feed back regulation do?

1. active requires energy - higher ^ concentration of solute
   passive doesn't require - equilibrium
   facilitated diffusion - it allows only certain things to diffuse through a passage portion.
2. isotonic - equal solute concentration
   hypertonic - higher concentration of solute
   hypotonic - lower concentration of solute
4. signal transduction pathway. - relays a signal and responds to it into chemicals that function in the cell
3. osmoregulation - control of water balance
5. They make the enzyme stop making things if there is enough
6.

Chapter 6 -

1. What is the difference between aerobic and anaerobic?
2. How do redox reactions apply to cellular respiration?
3. What are the overall reactants for cellular respiration?
4. What are the stages and how are they linked together?
5. How does fermentation occur?

1. Aerobic requires oxygen and anaerobic does not.

2. During redox reactions, glucose is oxidized to carbon dioxide and oxygen is goes through reduction and becomes water. These are neccessary factors of cell respiration.

3. The reactants of cellular respiration are glucose, oxygen, carbon dioxide, water, and ATP.

4. Glycolysis occurs in the cytosol then is transported to the mitochondria where it goes through the Citric Acid Cycle then carried by NADH to the electron transport chain.

5. Fermentation is the harvest of food energy.

Midterm Review
Chapter 7

Questions

Photosynthesis

① What is a short summary of an electron's transport cycle through photosynthesis?
② What's the difference between the NADPH and NADP+?
③ Describe the Calvin Cycle and the procession of electrons.
④ How do the electrons react to sunlight during photosynthesis? (on a molecular level)
⑤ Name location(s) where ATP is made during photosynthesis.

① ~~Gets separated from wat~~ Starts from water, then to the photosystem, ~~electron transport chain~~ electron transport chain, accepted by an acceptor, NADPH, thylakoid membrane (made ATP), Calvin Cycle.

② NADPH - has electrons
NADP+ - carries no electrons

③ Nine ATP + 6 carriers + 3CO_2 (from air) go into the Calvin Cycle, they go around + make a 3-carbon sugar, ~~2x Glucose~~ goes round 2x + becomes glucose.

④ They pick up energy; get to their most excited stage.

⑤ ~~light reaction~~, During the light reaction

Midterm Review
Chapter 4

Questions

A Tour of The Cell

① What is the whole detailed process of manufacturing and distributing cellular products? Including E.R, Golgi, Lysosomes, + Vacuoles.

Starts in endoplasmic reticulum (main manufacturing facility); 2 parts of e.R (rough + smooth); Rough e.r makes 2 types of proteins (secretory + membrane); Makes new membranes + secretes fluids outside of the cell; Other products are brought to other locations by transport vesicle (membranous spheres that bud from the e.r); Smooth e.r is where many enzymes are built

② ~~What kinds of microscopes are used to see specific cells?~~

③ How do energy conversions between chloroplasts and mitochondria work?

④ How do genes in the nucleus control cells?
DNA already has set program for cells.

⑤ Function of nucleus in cells associated w/ DNA
Carries all the genetic

~~⑥ Endocytosis~~

Midterm Review
Chapter 5

Questions

The Working Cell

① Facilitated diffusion, active transport, + passive transport; differences?

Active
End up w/ a higher solute concent

Passive
End up w/ Equilibrium

Facilitated
Only lets certain things in

② Difference between isotonic, hypertonic, + hypotonic

Hypertonic
Higher con.

Hypo
Lower con.

Isotonic
Equal con.

③ What does a signal transduction pathway do?
Relays the signal + converts it to chemical forms that can function within the cell

④ What is osmo regulation?
Control of water balance.