

## Short Answers

3. Eutrophication – it is like when an area, maybe a lake, is covered with algae which lead to sunlight not being able to get into the lake which then leads to the ecosystem dying down. Humans can lead to eutrophication if they were to use too much nitrogen based fertilizer, which then might sink into the water supply and speeds up the growth of the algae.

Biomagnification - this is the concentration of toxins in an organism as a result of its ingesting other plants or animals in which the toxins are more widely dispersed. As defect moves up in the food web, the defect gets increased. For example, if a small animal, like a mouse that eats a poison grain or grass, well not the mouse has that toxin in it. Humans may end up interacting with the biomagnification in our environment by different every day actions like getting gas or even washing cars.

Invasive Species – this is when a species from another region or area is brought into an area that it has not earlier existed. One example can be when something has been delivered from another country and it has also transferred a new type of bug that is new to this territory, which means that this new bug is now invading a new region.

Acid Deposition - also known as acid rain is when rain or any other type of precipitation is acidic, which means that it has higher levels of hydrogen ions. This is caused by discharges of sulfur dioxide and nitrogen dioxide, which react with the water molecules in the atmosphere to produce acids.

6. Food Supply - squirrels that work together to gather food have more food than a lone squirrel would have and more likely to be healthy and survive.

Available Mate – can send off pheromones and will have ready mated to extend population.

Protection – gazelles in the wild are together because together they can keep a better lookout for predators and if in a group, predators might not try to attack that much.

7. Parts of photosynthesis were unknown. So marked one of the molecules with radioisotopes to keep track of the progress in the cells.
8. Polar Molecule – the H<sup>+</sup> and oxygen atoms are charged in the compound.

High Surface Tension – since it has a negative and positive end it can continuously connect with each other even after break.

It is good at breaking things like salt apart because of the positive and negative ends. And because it can connect and disconnect it is able to flow evenly. The H<sup>+</sup> of the also gives it the ability to make hydrogen bonds.

9. Both plant and animal cells have mitochondria that are needed for ATP production. They both are also eukaryotic cells as they have a nucleus with a membrane and does not have the DNA floating around in the cytoplasm. They also have rough and smooth ER to make proteins and carbs. They also both have cell walls and large vacuoles. One big different among the two is that an animal cell does not have a chloroplast because only plants do photosynthesis.

10. In the fluid mosaic model, there is a phosphate compound attached to a carbon compound<sup>®</sup>. The phosphate is hydrophilic and likes water and is on the outside of the membrane. The rest of the membrane is hydrophobic and is on the inside to stay away from water. It is called a mosaic because like a mosaic that is made up of many different parts, the plasma membrane is made up of many different integral proteins.

11. Hypertonic – is when the concentration has a higher solution concentration and less water concentration. Since the concentration of water is higher in the cell, that means that there is a net movement of water from the inside of the cell to the outside of the cell, which causes the cell to shrink because the internal pressure decreases.

Hypotonic – is when the concentration has a lower solute concentration and more water concentration. For a plant cell, the solution has a higher concentration of water and lower concentration of solutes, so since the concentrations are the way they are there is a net movement of water from outside going into the cell. The cell gains water and swells which increases the internal pressure causing it to burst.

Isotonic – is a solution in which the water molecule and solute molecule are equal in concentration. For a plant cell, water diffuses into and out of the cell at equal rates, thus the cells retain their normal shape.

12. Endocytosis – is a process that uses energy which cells absorb different molecules, such as proteins, by engulfing them. All cells of the body use this process because most substances that are important to them are large polar molecules that are not able to pass through the hydrophobic plasma or cell membrane.

13. Active Transport – uses ATP to pump molecules against the concentration gradient. The transport occurs from a low concentration of solute to high concentration of solute and it requires cell energy. The Importance of the active transport is because in eukaryotic cells, amino acids, sugars and lipids needs an entrance to the cell by the protein pumps, which require active transport.

Passive Transport – is the movement of molecules down the concentration gradient and it goes from high to low concentration so that it keeps equilibrium within the cell. This process does not require cell energy to function. The importance of passive transport is that it maintains equilibrium within the cell. Wastes, such as carbon dioxide and water, are excreted.

- 14.** The ATP cycle is a process in which energy is used and stored in a human body. There are two types of energy, kinetic and potential, due to the position. ATP is made through chemosmosis.  $H^+$  enters the membrane and increases the concentration gradient. Then the  $H^+$  passes through the ATP synthase, creating an ATP with each passing  $H^+$ .

## Essays

### Enzymes:

The function of an enzyme is to either break apart or build a specific compound that they are able to do those specific things on. There are any different enzymes that work for different parts in the body, for example, there is a specific enzyme that breaks apart lactose. Enzymes are considered globular proteins. They receive a substrate, or a compound that they are about to break apart or build up, as well as an H<sup>+</sup> so that it could perform hydrolysis to break apart or build the substrate. If the body wants to stop the production of that specific enzyme then it attaches what's called an inhibitor, which is a molecule that binds to the enzyme to decrease the specific activity, and changes the shape of the substrate reception area so that it is not able to receive the substrate. Enzymes are able to work best when they are around body temperature. If they are around a warmer or colder temperature too much, it can cause the enzymes to denature. Over a period of time, denaturing can also occur. When the protein is in a straight line, it is known as the primary structure. If the protein were to coil and twist, it is known as the secondary structure. If the proteins were to coil, twist, and wrap around itself into a globular structure, it would be known as the tertiary structure. If proteins are added to the tertiary structure, then the quaternary structure is composed.

### Photosynthesis:

- a) Inside of the thylakoids, e<sup>-</sup> is energized and causes it to move along the cell membrane. As it moves along more and more hydrogen is pushed into the membrane. It then reaches photosynthesis I which energizes it again and passes it through the ATP synthase to store energy to make the light independent reaction occur. In the light independent reaction, carbon turns into CO<sub>2</sub> and is joined together, then broken apart many times by the ATP, NADPH<sup>+</sup> was created during the initial process. After "rotating" around 6 times, a glucose is formed. Oxygen is small by product because the chloroplast breaks up H<sub>2</sub>O so that it can have an e<sup>-</sup> for photosynthesis II. Carbonlyase is used to get CO<sub>2</sub> from the atmosphere.
- b) In CAM photosynthesis, CO<sub>2</sub> is collected at night so the plants water loss is minimized. It differs only in that it gathers CO<sub>2</sub> at night and not in the day. Plants in dry-warm areas use C4 photosynthesis so that they do not lose too much water and die. They just store the CO<sub>2</sub> in compounds overnight and in the morning use the same process as C3 to make glucose.
- c) In C4 photosynthesis, it is similar to C# photosynthesis except for the fact that C4 uses a rubisco to gather CO<sub>2</sub> rather than carbonlyse. Plants use this because CO<sub>2</sub> is harder to gather and the rubisco is good at gathering it.