**Photosynthesis and Cellular Respiration Review Name:**

1. Explain ocean acidification.

Carbon dioxide in the atmosphere dissolves into the ocean causing the ocean to become more acidic

1. Why is carbon so important to living things? (4 macromolecules)

Carbon is found in protein, carbohydrates, lipids (fat), and nucleic acids… The 4 main macromolecules that make up living things

1. Where in the cycle does CO2 get released into the atmosphere?

Through respiration and combustion primarily.

1. How has the carbon cycle changed since the industrial revolution?

Industrial revolution brought fossil fuel burning machines.. the beginning of factories, cars, and modern society. Since the industrial revolution, that amount of carbon stored as CO2 gas in the atmosphere has increased drastically, which also means the amount of CO2 dissolved in the ocean has increased. The amount of carbon stored in fossil fuels has decreased, because we have taken a lot of that carbon containing fossil fuel out of the ground and burned it up.

1. Name at least 4 carbon reservoirs.

Fossil fuels, atmosphere, plants, animals, ocean, soil (all of the things you have labelled on your carbon cycle and also in your data table from the carbon cycle activity on the computer)

1. How could a carbon atom inside of fossil fuel become part of an animal?

There are many ways this can happen the fossil fuel must first be burned which would move the carbon to the atmosphere.. it could be taken in by plants, the plant could be eaten by an animal OR it could be burned, dissolve into the ocean, be taken in by a plant, the plant could be eaten by an animal.. you an choose any logic path through the carbon cycle the only thing you need to watch out for is: make sure you don’t say that the animal is going to take it out of the air the soil etc. it must get it from a plant.

1. Light energy is converted to chemical energy in what process?

Photosynthesis- light energy from the sun is changed into chemical energy stored in glucose. The energy is held in the bonds between the atoms that make up the glucose molecule. When energy is held in bonds we call it chemical energy.

1. Where in a plant does photosynthesis take place?

Photosynthesis occurs primarily in leaves. On a cellular level, it takes place within organelles in the cells called chloroplasts. The reason for this is that chloroplasts contain chlorophyll- the pigment that is capable of absorbing the suns energy.

1. What is the green pigment in plants that is capable of absorbing the sun's energy?

Chlorophyll- found in chloroplasts- the site of photosynthesis… just in case you didn’t read it up above : )

1. Where do plants get the carbon dioxide needed to perform photosynthesis?

From carbon dioxide gas in the air. This carbon dioxide gas can be taken in through a stoma (stomata is plural). Remember that carbon is important for all living things because it is found in nearly every molecule that makes up a living organism. The same is true for plants. They get their MASS from carbon by taking it out of the air. They use the suns energy to bond these carbons together (in the form a glucose, a 6 carbon sugar).

1. What are the inputs and outputs of photosynthesis?

Inputs: carbon dioxide, water

Outputs: glucose, oxygen

1. Write the chemical equation for photosynthesis.

CO2 + H2O ------> C6H12O6 + O2. The arrow represents that a chemical reaction is taking place. The suns energy is not a product or a reactant, rather it is the energy to make this process occur.

1. What happens to the glucose that is made during photosynthesis?

Some of it is used right away for energy. Some of it is stored in the plant for later use in the form of glucose or starch. This is where the plant gets its mass.

1. Plants do cellular respiration as well. When do you suppose cellular respiration is happening in plants?

All the time. You would be able to detect it at night more because at night they are NOT doing photosynthesis so the only thing they are doing is respiration, which means they are only putting out C02 and you could detect that as we have in the lab

1. What special adaptations might plants that live in the shade have and how would this help them in regards to photosynthesis?

Larger leaves = more area to collect sunlight, more chloroplasts, etc.

Taller stems= closer to the sun

I would accept any logical answer

1. What is ATP, and how is it similar to a rechargeable battery?

Adenosine Triphosphate. It contains 3 phosphate groups (the part that looks like a tail). These phosphates are highly unstable next to each other. This means that there is lots of energy to be released when the bond on the last phosphate is broken to release it. ATP is known as the energy currency (money) for all living things. ADP stands for adenosine diphosphate. This is what we call it when there are only two phosphate groups. This is the ‘uncharged’ version of the molecule.

1. What are the inputs and outputs of cellular respiration?

Inputs: glucose, oxygen

Outputs: Carbon dioxide, water, ATP

1. Write the chemical equation for cellular respiration.



1. What causes cramps during exercise?

Cramps are caused by a build up of lactic acid in your muscle tissue. This occurs when there is a lack of oxygen and cellular respiration cannot take place (glycolysis still occurs since it doesn’t require oxygen). In this anaerobic environment, lactic acid fermentation takes place, producing the lactic acid that gives you cramps.

1. What are the 3 stages of respiration? Where do they occur? What is produced from each stage?

Glycolysis occurs in the cytoplasm in your cells- 2 pyruvic acids, 2 ATP and 2 NADH are produced

Krebs Cycle takes place in the mitochondrial matrix within the mitochondria in your cells- Carbon dioxide, 2 ATP, 8 NADH, and 2 FADH are produced

Electron Transport Chain takes place in the inner mitochondrial membrane- Water, and 32-34 ATP are produced

1. Which of these require oxygen?

Krebs Cycle and Electron Transport Chain

1. What organisms perform cellular respiration?

All living life forms do *some form* of respiration. Aerobic respiration is what *most* life forms use. This includes plants, animals, most bacteria, and most fungi. Some bacteria ONLY do anaerobic respiration. Some bacteria and yeast do both. For example, brewers yeast (used in cooking) perform alcoholic fermentation as well as aerobic respiration.

1. Which stage of cellular respiration produces the most ATP?

Electron Transport Chain

1. Throughout cellular respiration NADH is produced. What is this good for?

During the electron transport chain, each NADH is used to make 3 ATP. Even though NADH doesn’t seem useful at first, this is where we end up getting MOST of our ATP from.

1. Where do you get the glucose and oxygen needed to perform cellular respiration?

You get glucose from the food you eat. You get oxygen from the air by breathing in. For this reason, breathing and eating are extremely closely related. When your food is broken down the glucose from your food is absorbed by the blood stream, then taken into cells where it can be used for respiration. The whole reason you breath is to bring in oxygen for cellular respiration, and take out the toxic byproduct (carbon dioxide).

1. What is an anaerobic bacteria?

Anaerobic= no oxygen. So, an anaerobic bacteria is one which performs anaerobic respiration. The two types of anaerobic respiration are alcoholic fermentation and lactic acid fermentation.