Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_\_\_\_\_\_\_

**Date Assigned: Jan 14, 2016. Due date: January 19, 2016.**

**PHOTOSYNTHESIS AND CELLULAR RESPIRATION**

**STUDY GUIDE**

1. Explain the role of the following organelles in photosynthesis and/or cellular respiration:
2. Chloroplast

Chloroplast is the organelle in which a photosynthesis takes place. This happens when H2O are CO2 exposed to sunlight and a chemical reaction takes place. This chemical reaction has transforms the H2O and CO2 into glucose and oxygen.

1. Mitochondria

Mitochondria is the organelle that transforms glucose and O2 into ATP (energy), H2O and CO2

1. Where does most energy on Earth originate?

The Sun

1. Name the organisms in which cellular respiration takes place

Mitochondria

1. Describe what happens in photosynthesis.

This only happens in autotrophs. H2O enters the chloroplast through the roots (and sometimes stoma) and CO2 enters the chloroplast by passing through the stoma. Then, when the chlorophyll absorbs the Sun’s energy, a chemical reaction takes place and yields glucose (C6H12O6) and O2.

1. Describe what happens in cellular respiration.

This happens in all living organsims (autotrophs and heterotrophs). Glucose (C6H12O6) produced during photosynthesis and O2 (usually acquired through breathing) enter the mitochondria. Since glucose is not usable energy, the mitochondria transform the glucose into ATP, a usable form of energy, and release H2O and CO2 back into the atmosphere and the cycle starts over again.

1. Write the equation for photosynthesis and label both raw materials and products.

Light

6H2O + 6CO2 C6H12O6 + 6O2

Products

Raw Materials

1. Write the equation for cellular respiration and label both raw materials and products.

C6H12O6 + 6O2 6H2O + 6CO2 + ATP (energy)

Products

Raw Materials

1. Describe the similarities and differences in the two equations.

|  |  |
| --- | --- |
| Similarities | Differences |
| 1. The raw materials for photosynthesis are part of the products for cellular respiration 2. The raw materials for cellular respiration are the products for photosynthesis 3. Cellular respiration takes place in autotrophs and heterotrophs | 1. Light is the catalyst for photosynthesis, no light=no photosynthesis but you do not need light for cell respiration 2. Photosynthesis only takes place in autotrophs |

1. Describe how gas exchange happens in a leaf.

Gases enter the leaf through the stomata (stoma) which is found on the bottom of the leaf.

CO2 during photosynthesis enters through stomata.

O2 during cellular respiration enters through stomata.

O2 during photosynthesis exits through stomata.

1. What is necessary for photosynthesis to take place?

Sunlight, CO2 and H20

1. The Industrial Revolution is when humans began burning carbon fuels. Describe what happened to the amount of carbon dioxide when we began this era?

Fossil fuels and carbon fuels are the same thing. In 6th grade we learned that burning fossil fuels emits carbon dioxide into the air.

The Industrial Revolution is when the United States industry began to take the place of agriculture. This means the U.S. began manufacturing products like steel and the automobile. In order to manufacture products, you must burn fossil fuels (usually coal or petroleum). This means the amount of carbon dioxide in the air began to increase.

1. Diagram an energy flow (food chain) and label producers, autotrophs and heterotrophs.

