

Notes for photosynthesis and respiration

- I. Photosynthesis
- A. The sun is the source of energy for photosynthesis
 - B. Photosynthesis is the process by which chloroplasts capture sunlight energy and make food for a plant**
 - C. Photosynthesis happens in two stages
 1. **Stage 1** – the phase that occurs in the light – a pigment in the chloroplast called chlorophyll captures sunlight energy
 2. **Stage 2** – carbon dioxide and water are used to make glucose and oxygen
 3. oxygen and carbon dioxide move through the stomata under the leaf
 - D. **The photosynthesis equation: $6\text{CO}_2 + 6\text{H}_2\text{O} \xrightarrow{\text{Sunlight}} \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$**
 - E. **Autotrophs** make their own food (like plants) and **heterotrophs** get their food by eating other organisms
- II. Respiration
- A. During **respiration, cells break down food molecules and convert them into energy that the cells can use called ATP (Adenosine triphosphate)**
 - B. This occurs mainly in the mitochondria of the cell**
 - C. Respiration is also known as the system whereby we breathe in oxygen into our lungs and exchange it for carbon dioxide that we exhale
 - D. Respiration in cells has two stages:
 1. **Stage 1** – in the cytoplasm, glucose is broken down into smaller molecules and a small amount of energy is released
 2. **Stage 2** - In the mitochondria, the smaller molecules combine with oxygen to produce water and carbon dioxide. This releases a large amount of energy
 - E. **The respiration equation: $\text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 \rightarrow 6\text{CO}_2 + 6\text{H}_2\text{O} + \text{ATP Energy}$**
- III. The **photosynthesis and respiration equations are essentially opposites of each other!** See the top of page 126. These two processes, photosynthesis and respiration, keep the levels of oxygen and carbon dioxide at fairly constant levels. We as humans, however, create **CO₂** in abundance and are most likely changing the planet for the worse, creating **global warming**.