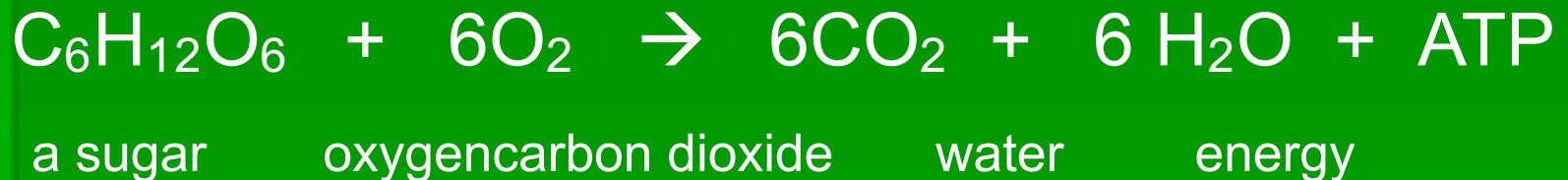


Biology Chapter 4

Section 4 – Overview of Cellular Respiration

Key Concept: The overall process of cellular respiration converts sugar into ATP using oxygen.

- **Cellular Respiration** – the process of using oxygen to produce ATP by breaking down carbon-based molecules



- Cellular respiration is an aerobic process – it needs oxygen to happen
- Makes most of the ATP that a cell needs
- Takes place in the mitochondria
- Before cellular respiration can happen, food has to be broken into smaller molecules like glucose

Glycolysis – breaks glucose into 2 molecules that each have 3 carbons

- Glycolysis is anaerobic – it does not need oxygen
- Takes place in the cytoplasm of the cell
- The products of glycolysis (the 3-carbon molecules) enter the mitochondria and are used in cellular respiration

There are 2 main parts of cellular respiration:

- Stage 1: Krebs Cycle – uses the molecules from glycolysis to produce a small amount of ATP and other molecules that carry energy to the next part of cellular respiration
- carbon dioxide is a waste product of this process

- Stage 2: Electron Transport - energy carrying molecules from glycolysis and the Krebs cycle are moved through a chain of proteins and large numbers of ATP molecules are produced
- oxygen enters the process and is used to make water molecules
- heat and water are released as waste products

- Cellular Respiration is like a mirror image of photosynthesis.
- Photosynthesis makes sugars and cellular respiration breaks down sugars
- The chemical equations of the 2 processes are basically opposites.