Lesson 12

I. Oxidation

A. The process by which a substance combines with oxygen.

B. Two forms of oxidation:

1. **combustion**
2. **cellular respiration**

II. Combustion

A. A <u>rapid</u> form of oxidation that <u>releases heat</u> and sometimes light

1. **produces waste product**

Organic Material $+O_2 \rightarrow CO_2 + H_2O$ **+energy**

III. Cellular respiration

A. The process by which glucose combines with oxygen to produce energy, carbon dioxide and water.

$$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$$

Glucose + oxygen → carbon dioxide + water + energy

B. Energy is produced slowly for life activities.

1. some of the heat is used to maintain body temp.
2. perspiration, exhalation are waste products

C. Breathing and Respiration

1. Oxygen enters the alveoli when you inhale
2. Oxygen diffuses from the alveoli into capillary, where it is carried by (hemoglobin molecules on) red blood cells
3. Oxygen travels through the heart and pumped to a body cell, where it diffuses through a membrane, going to a mitochondria (organelle)for cellular respiration.
4. Oxygen reacts with glucose (from your digestive system) in the mitochondria in several steps using enzymes. This

is called cellular respiration.

5. Energy is released. It is stored as ATP until needed for movement or other functions.
6. Carbon dioxide and water are released also.
7. Carbon dioxide from the cell diffuses across the membrane into a capillary and travels through the heart where is pumped to back to the lungs.
8. It diffuses into the alveoli, where it is expelled from the body when you exhale.