

ACTIVITY 1-3: Energy for Living Things

We learned in Activity 1-2 that glucose is a kind of food that contains energy. Living things obtain the energy in glucose by the process of respiration. When respiration uses oxygen (O₂), the process is called **aerobic respiration**. The products of aerobic respiration are carbon dioxide (CO₂), water (H₂O), and energy for the living thing to use.

About one-fifth of air is oxygen. Animals that live on land get oxygen from the air. Some animals have lungs that absorb oxygen from the air.

Some oxygen from the air is dissolved in the water of rivers, lakes, and oceans. Animals that live in water use the oxygen dissolved in the water. The gills of a fish, for example, are able to absorb dissolved oxygen from the water. Some organisms can release energy from glucose and other foods without using oxygen. Such organisms are called **anaerobic organisms**. The process is called **anaerobic respiration**. This process produces very little energy. But it is enough energy for organisms such as yeast and bacteria.

Yeast produces **alcohol** and **carbon dioxide** during anaerobic respiration. Yeast is used in baking bread. The carbon dioxide, which is a gas, makes bread dough rise. Yeast is also used in making alcoholic beverages such as wine and beer. This process is called **fermentation**.

Some bacteria produce **lactic acid** by anaerobic respiration and fermentation. Certain kinds of bacteria are used to make yogurt, which is a kind of fermented milk. The lactic acid gives yogurt its sour taste.

Decide whether each statement is true or false. Write T or F on the line next to each statement. If the statement is false, correct the underlined word or words.

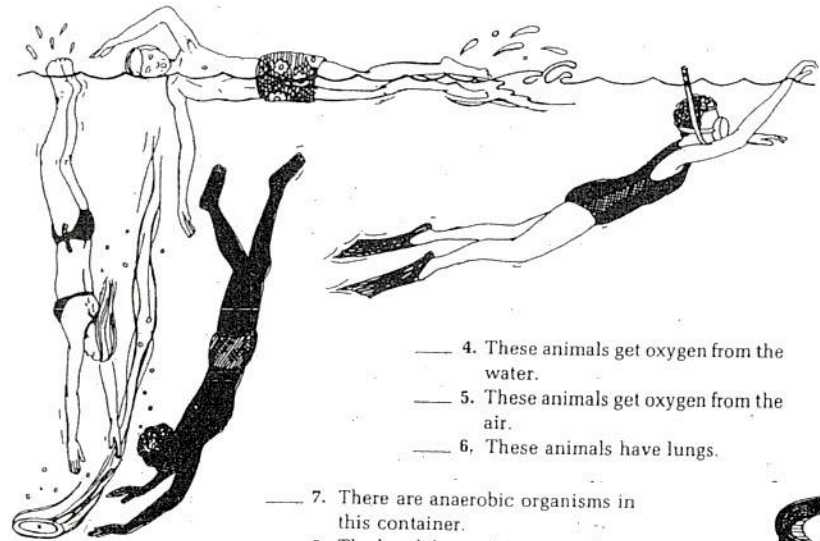
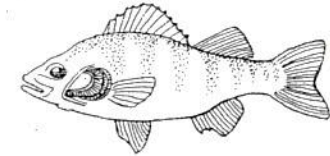
- ____ 1. The process by which organisms use oxygen and release energy is called aerobic fermentation.
- ____ 2. Organisms that do not use oxygen in respiration are called anaerobic organisms.
- ____ 3. Two waste products of aerobic respiration are water and alcohol.
- ____ 4. Yeast produces alcohol by fermentation.
- ____ 5. Oxygen is the gas that makes bread rise.

Unscramble the letters to form science words used in this lesson and write the words on the lines. Then write the number of the word on the line next to its definition.

- | | |
|-----------------------|--|
| 1. rentameftion _____ | ____ a. Gas used for aerobic respiration |
| 2. noxegy _____ | ____ b. A waste product of aerobic respiration |
| 3. baronicae _____ | ____ c. Yeast breaking down sugar in grapes |
| 4. localho _____ | ____ d. Organism that does not use oxygen in respiration |
| 5. ratew _____ | ____ e. Produced by yeast during |

There are three statements next to each picture. Decide whether each statement is true or false. Write T or F on the line before each statement.

- ____ 1. This animal uses oxygen dissolved in water.
- ____ 2. This animal uses gills to absorb oxygen.
- ____ 3. This is an anaerobic organism.



- ____ 4. These animals get oxygen from the water.
- ____ 5. These animals get oxygen from the air.
- ____ 6. These animals have lungs.
- ____ 7. There are anaerobic organisms in this container.
- ____ 8. The breakdown of sugar in the milk produces an acid with a sour taste.
- ____ 9. The breakdown of the sugar in the milk produces carbon dioxide and water.



- ____ 10. The process that made this beverage is called fermentation.
- ____ 11. In this process, yeast is an anaerobic organism.
- ____ 12. This process is a kind of respiration that produces much energy.

