

Cycles of Matter (pages 746–751)

The Water Cycle (pages 746–747)

Key Concept: The processes of evaporation, condensation, and precipitation make up the water cycle.

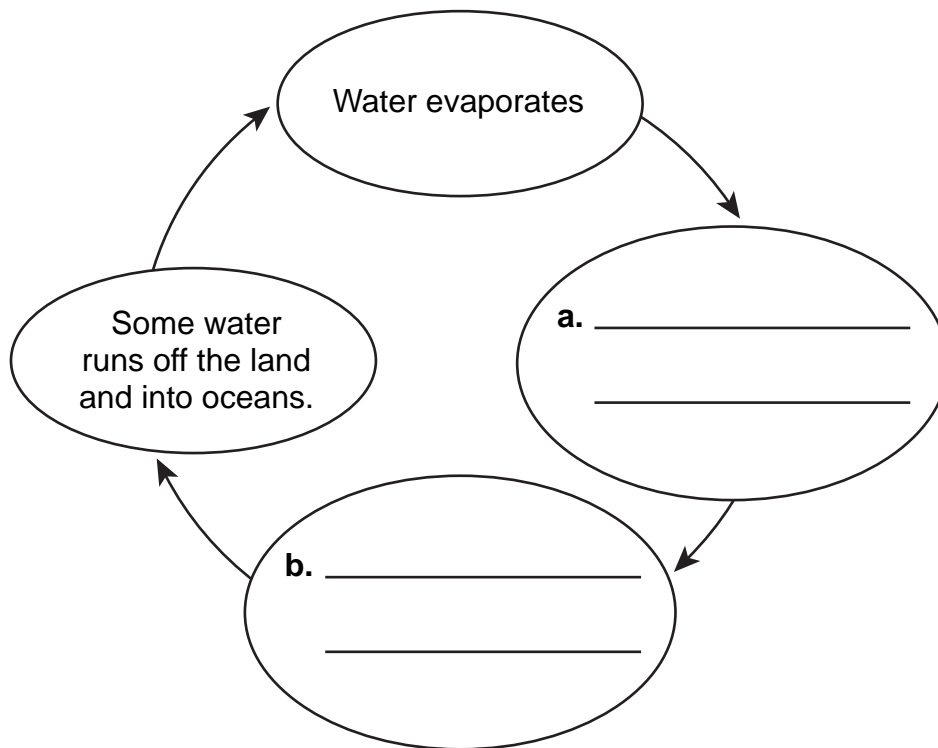
- Matter cycles over and over through ecosystems. Cycles of matter include the water cycle, the carbon and oxygen cycles, and the nitrogen cycle.
- Water moves from Earth's surface to the air and back again through the **water cycle**.
- **Evaporation** is when a liquid changes into a gas. In the water cycle, liquid water evaporates from oceans, lakes, and other bodies of water. The liquid water evaporates to form water vapor, a gas, in the atmosphere.
- **Condensation** is when a gas changes into a liquid. In the water cycle, water vapor condenses in the atmosphere into water droplets. The water droplets then collect into clouds.
- In the water cycle, the droplets of water in clouds fall back to Earth as precipitation. **Precipitation** includes rain, snow, sleet, and hail.

Answer the following questions. Use your textbook and the ideas above.

1. Circle the letter of each sentence that is true about the water cycle
 - a. The water cycle is the only cycle of matter on Earth.
 - b. Water moves from Earth's surface to the air and back again.
 - c. The water cycle includes snow and hail.

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2. Complete the diagram of the water cycle by filling in the blanks.

**The Carbon and Oxygen Cycles** (pages 748–749)

Key Concept: In ecosystems, the processes by which carbon and oxygen are recycled are linked. Producers, consumers, and decomposers play roles in recycling carbon and oxygen.

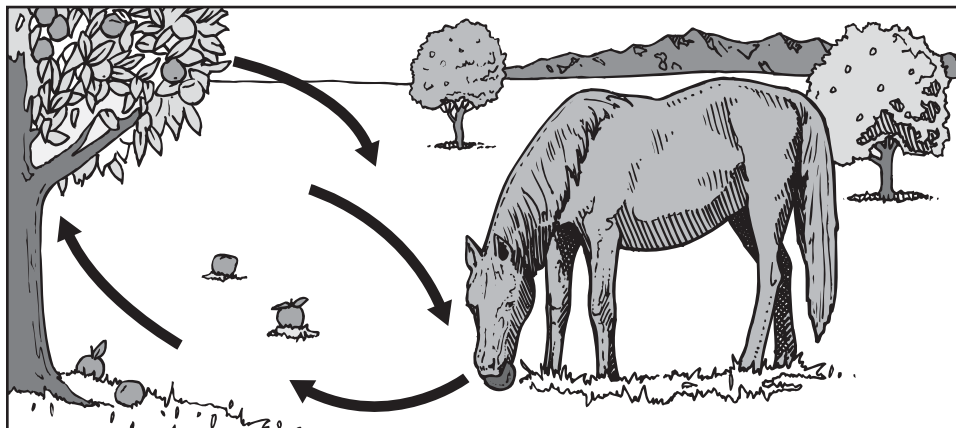
- Living things need both carbon and oxygen to live.
- In ecosystems, the carbon cycle and the oxygen cycle are closely linked together.
- In the carbon cycle, producers take in carbon dioxide from the air to use in photosynthesis. Producers, consumers, and decomposers all release carbon dioxide back into the air as a waste product.
- In the oxygen cycle, most organisms take in oxygen from the air to carry out life processes. Producers release oxygen into the air as a waste product of photosynthesis.

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Answer the following questions. Use your textbook and the ideas on page 333.

3. Is the following sentence true or false? The carbon cycle and the oxygen cycle are closely linked in ecosystems. _____

Use the picture below to answer questions 4 and 5.



4. Circle the letter of what the tree releases into the air as a waste product of photosynthesis.
- a. carbon dioxide
 - b. nitrogen
 - c. oxygen
5. Circle the letter of what the horse releases back into the air as a waste product.
- a. carbon dioxide
 - b. nitrogen
 - c. oxygen

The Nitrogen Cycle (pages 750–751)

Key Concept: In the nitrogen cycle, nitrogen moves from the air to the soil, into living things, and back into the air.

- Air is about 78 percent nitrogen gas.
- Most organisms can use nitrogen only after it has been “fixed.” Fixing nitrogen means combining it with other substances.
- Certain kinds of bacteria carry out nitrogen fixation. **Nitrogen fixation** is the process of combining nitrogen with other substances. Once nitrogen fixation occurs, organisms can use nitrogen to make compounds in their cells.
- Decomposers break apart dead organisms and animal wastes. This adds nitrogen compounds to the soil. In soil, certain bacteria break down nitrogen compounds and release nitrogen gas into the air.

Answer the following questions. Use your textbook and the ideas above.

6. The process of combining nitrogen with other substances is called nitrogen _____.
7. Circle the letter of each sentence that is true about the nitrogen cycle.
 - a. Decomposers add nitrogen compounds to the soil.
 - b. There is almost no nitrogen gas in the air.
 - c. Most organisms can use nitrogen before it has been “fixed.”