

Principles of Ecology

Section 3 Cycling of Matter

Main Idea _____ **Details** _____

Scan the titles, boldfaced words, pictures, figures, and captions in Section 3. Write two facts you discovered about animals as you scanned the section.

1. **Accept all reasonable responses.**

2. _____

Review Vocabulary

cycle

Use your book or dictionary to define cycle. Then give an example of a cycle.

a series of events that occur in a regular repeating pattern;
examples of cycles will vary

New Vocabulary

matter

Use your book or dictionary to define each vocabulary term.

anything that takes up space and has mass

nutrient

a chemical substance that an organism must obtain from its environment to sustain life and to undergo life processes

biogeochemical cycle

the exchange of matter through the biosphere, which involves living organisms, geological processes, and chemical processes

nitrogen fixation

the process of capture and conversion of nitrogen into a form that is usable by plants

denitrification

a process in which some soil bacteria convert fixed nitrogen compounds back into nitrogen gas, which returns to the atmosphere

Section 3 Cycling of Matter (continued)

Main Idea _____

Details _____

Cycles in the Biosphere

I found this information on page _____.

SE, pp. 45–49
RE, pp. 19–22

Create *minimodels for each cycle of matter in nature. Use words or pictures to sketch a simple example for each type of cycle to show the movement of matter. Accept all reasonable models.*

<p>A. The Water Cycle Models should show water falling from clouds as precipitation, moving through the earth and water table back into lakes and oceans, and evaporating again. Models may include tree transpiration.</p>	<p>B. The Carbon Cycle Models should show plants using carbon dioxide to make sugars, animals eating the sugars, respiration, and combustion putting carbon into the air. Models may also show the long-term carbon cycle in which organic matter is buried and converted to fossil fuels. Carbon dioxide is released when fossil fuels are burned.</p>
<p>C. The Nitrogen Cycle Models should show bacteria fixing nitrogen from the air into the soil, plants using it, animals eating plants and making the nitrogen into proteins. Animals make urine that goes into soil, die, and decay back into soil. They may show bacteria putting nitrogen from soil back into air.</p>	<p>D. The Phosphorus Cycle (short-term and long-term) Short-term models should show soil to plants to animals to decay and back to soil. Long-term models should show rocks dissolving into the water table and precipitating back onto the rocks.</p>

Section 3 Cycling of Matter (continued)

Main Idea _____ **Details** _____

Describe each of the cycles in nature. Identify where each cycle is found, how organisms use them, and what key words relate to them.

	Water	Carbon/ oxygen	Nitrogen	Phosphorus
Where found	underground, in the atmosphere, and on Earth's surface	in all living things, in the atmosphere	in the atmosphere; in plants	cell compounds; in Earth's crust
How used	basis of life for all living things	to life processes; make up molecules such as carbon dioxide and sugar	to produce proteins; in chemical fertilizers	make up bones and teeth
Key words in the cycle	evaporating, water vapor, precipitation, transpiration	photosynthesis, cellular respiration, fossil fuel, calcium carbonate	nitrogen fixation, nitrates, decomposers, ammonia, denitrification	decomposers, weathering, erosion, phosphates

SUMMARIZE

Analyze current farming practices that are designed to make the best use of energy flow in ecosystems and cycles of matter.

Accept all reasonable responses. Fertilizers replace nitrogen, phosphorus, and other minerals that are lost from the soil when vegetable matter is harvested and removed. Pesticides and herbicides try to stop insects from eating crops, and other plants from stealing the nutrients in the soil from the crop. Greenhouses are used to make the most of the Sun's energy.