Answer Key

Directed Reading A

SECTION: THE CYCLES OF MATTER

1. water cycle
2. evaporation
3. condensation
4. precipitation
5. runoff
6. groundwater
7. transpiration
8. It helps transport nutrients, transport wastes, and regulate temperature.
9. C
10. D
11. C
12. Plants use it to make sugars.
13. Answers may vary. Sample answer: During decomposition, substances break down into simpler molecular substances. Combustion: A substance burns.
14. Answers may vary. Sample answer: During combustion, a substance burns.
15. nitrogen cycle
16. nitrogen fixation
17. to build proteins and DNA for new cells
18. Bacteria in soil and plant roots perform most nitrogen fixation.
19. Plant roots take up nitrogen from the soil.
20. by eating plants or organisms that eat plants
21. Nitrogen is released into the soil.
22. D
23. by water

SECTION: ECOLOGICAL SUCCESSION

1. Most were dead but still standing.
2. B
3. D
4. pioneer species
5. lichens
6. insects
7. primary succession
8. hundreds or thousands of years
9. B
10. C
11. B
12. a slow-growing species that is well-adapted to an area over time
13. Answers may vary. Sample answer: Biodiversity makes a community better able to survive disturbances such as insect invasion or disease.
14. They can live together in the same area over time.

Directed Reading B

SECTION: THE CYCLES OF MATTER

1. C
2. C
3. D
4. A
5. B
6. runoff
7. groundwater
8. B
9. C
10. C
11. A
12. decomposition
13. combustion
14. C
15. C
16. B
17. B

SECTION: ECOLOGICAL SUCCESSION

1. D
2. B
3. B
4. D
5. D
6. A
7. D
8. B
9. D
10. D
11. C

Vocabulary and Section Summary

SECTION: THE CYCLES OF MATTER

1. evaporation: the change of a substance from a liquid to a gas
2. condensation: the change of state from a gas to a liquid
3. precipitation: any form of water that falls to the Earth's surface from the clouds
4. decomposition: the breakdown of substances into simpler molecular substances
5. combustion: the burning of a substance

SECTION: ECOLOGICAL SUCCESSION

1. succession: the replacement of one type of community by another at a single place over a period of time

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2. pioneer species: a species that colonizes an uninhabited area and that starts a process of succession

Section Review

SECTION: THE CYCLES OF MATTER

1. Sample answer: Evaporation is a change from liquid to gas, but condensation is the opposite change—from gas to liquid.
2. Sample answer: Decomposition is the breakdown of dead materials by organisms, but combustion is the breakdown of materials by burning.
3. B
4. Sample answer: In the water cycle, water falls to Earth's surface as precipitation. Some water reenters the atmosphere by evaporation from the surface and by transpiration from plants. Water condenses and falls as precipitation. Precipitation may run off and be stored in rivers, lakes, oceans, and groundwater.
5. Sample answer: The carbon cycle starts with photosynthesis in plants. Then, carbon moves through other living things such as animals and microorganisms. Some carbon moves from organisms into the air or soil through respiration, decomposition, or combustion.
6. 78 gal/d × 3.8 L/gal × 365 d/y = 108,186 L/y = 110,000 L/y
7. Student drawings should resemble the cycle diagrams in this section. Lines should be drawn connecting related parts, such as air (atmosphere), soil, animals, and plants (which play a role in each cycle). Also, students should note that decomposition plays a role in both the carbon and nitrogen cycles.
8. Sample answer: Animals might get calcium by chewing on bones; weather might break down bones and release the calcium back into the soil or water.

SECTION: ECOLOGICAL SUCCESSION

1. Sample answer: Succession is a slow change in species in one place over a long time.
2. A
3. Sample answer: First, fast-growing weeds such as crab grass invade; then, new weeds such as horseweed appear; next several shrubs and trees might start to grow; and eventually a forest may develop.
4. Sample answer: The community of cactuses and bushes in the Sonoran Desert is an example of a mature community. This community developed slowly as those organisms that were long-lived and well-adapted to the desert survived.
5. 739,000 ÷ 2,200,000 = 0.3359 or about 34%
6. Sample answer: A rain forest has high biodiversity, and a parking lot has low biodiversity.
7. Sample answer: Soil formation must occur before plants with roots can grow and continues even after a community has developed. Soil formation never stops because leaves, tree branches, and dead organisms contribute to the soil when they decompose.

Chapter Review

1. decomposition
2. succession
3. evaporation
4. Combustion
5. precipitation
6. condensation
7. C
8. B
9. A
10. C
11. C
12. D
13. B
14. D
15. Sample answer: streams, ditches and rivers, lakes
16. solid (ice), liquid, and gas (vapor)
17. Animals obtain carbon from the food they eat. Then, they give off carbon dioxide through respiration and contribute carbon to the soil through feces and decomposition.
18. Humans have the same roles animals do and also cause the release of carbon dioxide into the atmosphere through the combustion of fossil fuels.

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