Consolidate and Extend

- Have students discuss why, with reference to the carbon cycle, it is important to manage British Columbia’s forest resources.
- Have students complete the Check Your Understanding questions.

CHECK YOUR UNDERSTANDING—SUGGESTED ANSWERS

1. (a) protein; (b) carbohydrate; (c) protein; (d) lipids; (e) lipids
2. Sample answer: trees (biotic), volcanic eruptions (abiotic), animal shells (biotic), terrestrial rocks and marine sediments (both biotic and abiotic), the atmosphere (abiotic), fossil fuels (abiotic)
3. Photosynthetic marine organisms use CO₂ in photosynthesis. When CO₂ dissolves into ocean water, it is converted into a material called bicarbonate, which some organisms use to build shells.
4. Phytoplankton are important because they produce much of the world’s oxygen.
5. Trees, like other plants, take in carbon dioxide to produce sugars. Many carbohydrates are stored in their bodies. Trees absorb more carbon than they give off, and store it in their trunks, roots, and leaves, making them an important carbon reservoir. Animals such as molluscs and corals store carbon in their shells.
6. Sample answer: Coral reefs are built up of tiny marine animals that have algae living inside of them. These algae use carbon dioxide in photosynthesis and provide nutrients to the coral.
7. Fossils contain the remains of carbon-containing living organisms. Carbon in seawater also becomes incorporated into the sediments that help form fossils.
8. Photosynthesis and cellular respiration are considered complementary processes because the products of one process are the reactants of the other.
9. Photosynthesis occurs in the chloroplasts of a plant’s cells.
10. 6 CO₂ + 6 H₂O + light energy → C₆H₁₂O₆ + 6 CO₂
11. carbon dioxide gas + water + light energy produces glucose (sugar) + oxygen gas
12. 6 CO₂ + 6 H₂O + energy → C₆H₁₂O₆ + O₂, photosynthesis sugar (C₆H₁₂O₆) + oxygen gas (O₂) → carbon dioxide gas (CO₂) + water + energy; cellular respiration
13. Burning fossil fuels, burning trees, cellular respiration, volcanic activity, and clearing forests for agriculture or other uses all release carbon dioxide.
14. Decomposers break down carbon-containing compounds in dead and decaying organisms and return the carbon to the soil where it can be re-used.
15. [Diagram of the carbon cycle]
16. A
17. Clearing forests could affect the atmospheric levels of both gases because burning trees would release carbon dioxide into the air, and the loss of those trees eliminates a carbon sink. In addition, we would lose an important source of oxygen. Overall, carbon dioxide levels would rise, and oxygen levels would fall.
18. Almost all organisms require oxygen. They need oxygen to release energy from their food. Changes in the oxygen levels in the atmosphere could cause the extinction of many species.
19. Movement of water (such as waves) and the release of oxygen by aquatic plants both help to dissolve oxygen in water.
20. Phytoplankton remove atmospheric carbon dioxide during photosynthesis and incorporate the carbon into their bodies. Marine organisms that feed on the phytoplankton receive this stored carbon.