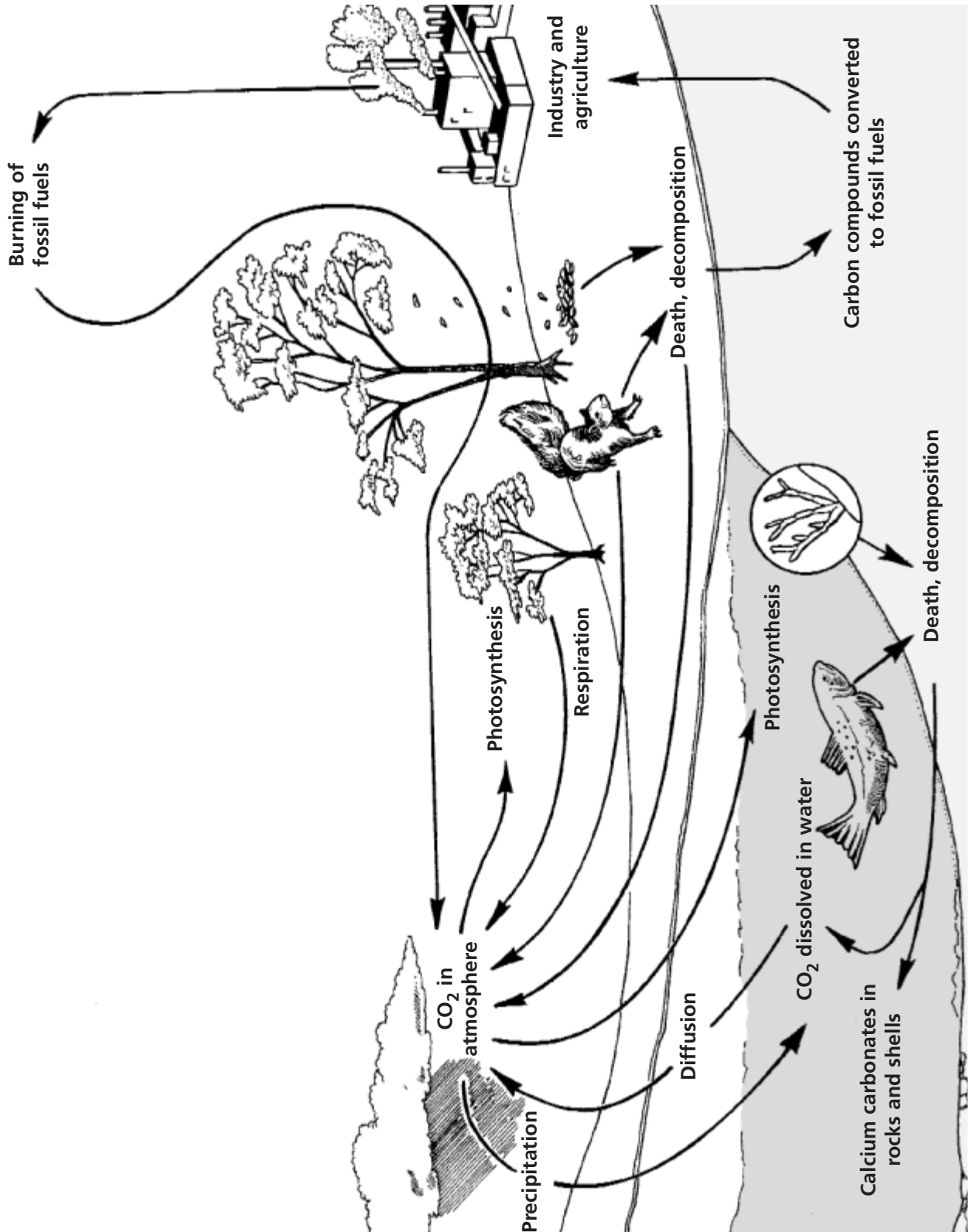


Master 1

The Carbon Cycle

Reteaching Skills

Use with Chapter 2, Section 2.2



Worksheet

1

The Carbon Cycle**Reteaching Skills***Use with Chapter 2, Section 2.2*

1. What is the process by which plants convert carbon dioxide into energy-rich carbon compounds?

2. Explain what can happen over millions of years to the carbon compounds in organisms that die and decompose.

3. What processes in the transparency release carbon dioxide into the atmosphere?

4. Identify the two major reservoirs of carbon dioxide on Earth.

5. What are the forms in which carbon is found in the oceans?

6. How do plants and animals help to maintain a balance of carbon dioxide in the atmosphere?

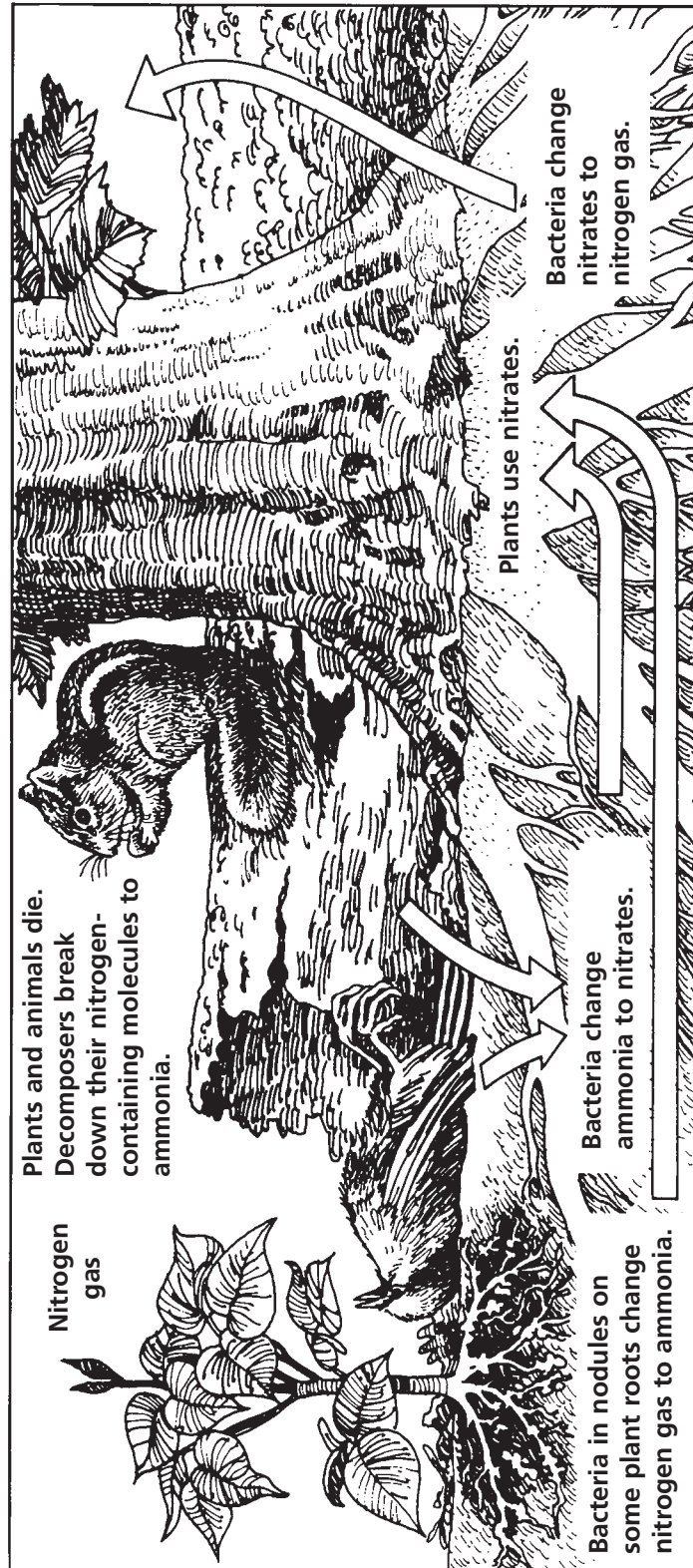
7. Atmospheric carbon dioxide produces a so-called “greenhouse effect” by trapping heat near Earth’s surface. What human activities might tend to increase the greenhouse effect?

Master 2

The Nitrogen Cycle

Reteaching Skills

Use with Chapter 2, Section 2.2



Worksheet

2

The Nitrogen Cycle

Reteaching Skills

Use with Chapter 2, Section 2.2

1. What percent of the air consists of nitrogen gas?

2. Bacteria in root nodules change nitrogen gas into what form?

3. What is the role of decomposers in the nitrogen cycle?

4. How do plants obtain the nitrogen they need?

5. How do herbivores obtain the nitrogen they need?

6. How do other animals obtain the nitrogen they need?

7. According to the transparency, how is nitrogen returned to the atmosphere?

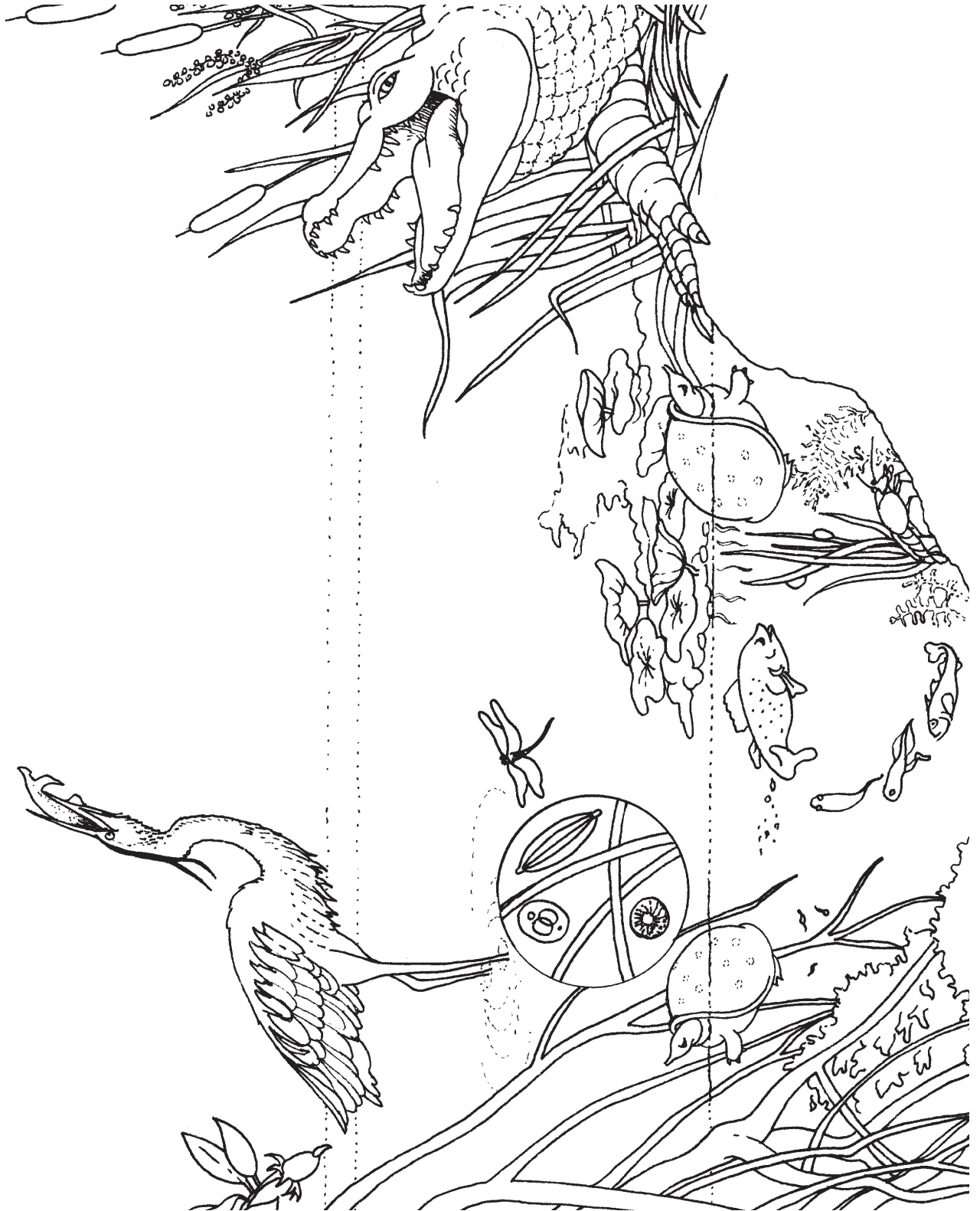
8. What would be the impact on the nitrogen cycle if there were a decrease in decomposition in a given ecosystem?

**Master
3**

Trophic Levels

Reteaching Skills

Use with Chapter 2, Section 2.2



Copyright © Glencoe/McGraw-Hill, a division of The McGraw-Hill Companies, Inc.

Worksheet 3

Trophic Levels

Reteaching Skills

Use with Chapter 2, Section 2.2

Define each type of organism listed in the chart and write the name of a representative organism shown in the transparency.

Type of Organism	Definition	Representative Organism
1. autotroph		
2. heterotroph		
3. herbivore		
4. carnivore		
5. omnivore		

6. What are decomposers? To which trophic level(s) do they belong?

7. Explain why a food chain can have no more than five links.

8. Explain the difference between a food chain and a food web.

9. In Africa, Nile crocodiles can often be seen lying in the sun, their jaws held open. Small white egrets perch on the crocodiles' backs or hop in and out of their mouths. The birds also peck at the crocodile's teeth, feeding upon the scraps of food embedded there. Although crocodiles do eat some birds, they do not eat the egrets.

a. What is the term for the relationship between the crocodiles and the egrets?

b. Explain this relationship.

1 ■ The Carbon Cycle

Use with Chapter 2, Section 2.2

Purpose

- To review the cycling of carbon through an ecosystem
- Skill: Sequencing

Teaching Suggestions

- Project the base transparency and challenge students to identify the processes by which carbon cycles through water, air, and land. Then superimpose the overlay to provide reinforcement or corrections for students' responses.
- Point out that volcanoes release large amounts of carbon dioxide into the atmosphere when they erupt.
- Emphasize that the carbon cycle, like the other biochemical cycles, helps to maintain the balance of life on Earth.

Extension: Debate

- Have students research and debate the effects of the global buildup of carbon dioxide in the atmosphere.

Answers to Student Worksheet

1. photosynthesis
2. They may be converted into fossil fuels.
3. respiration, decomposition, diffusion of carbon dioxide from water to the atmosphere, burning of fossil fuels
4. the air and the oceans
5. Carbon is found as dissolved carbon dioxide, as carbon compounds in the bodies of fish and other marine organisms, and as calcium carbonate in rocks and shells.
6. Plants remove carbon dioxide from the atmosphere through the process of photosynthesis; plants and animals return carbon dioxide to the atmosphere through the process of respiration.
7. the destruction of plants, especially forests; the burning of fossil fuels to produce energy for industry, agriculture, and transportation

2 ■ The Nitrogen Cycle

Use with Chapter 2, Section 2.2

Purpose

- To review the cycling of nitrogen through an ecosystem
- Skill: Sequencing

Teaching Suggestions

- Project the transparency and encourage students to trace the pathways of nitrogen in the nitrogen cycle.
- Discuss the nitrogen cycle as a series of chemical changes.
- Emphasize the critical role of bacteria in the cycling of nitrogen.

Extension: Experiment

- Obtain peanuts or clover seeds for students to grow. Have students pull the seedlings from the soil to observe the nodules on their roots in which bacteria fix nitrogen. Students may wish to design an experiment in which they test the effect of clover plants or other legumes on the quality of soil.

Answers to Student Worksheet

1. 78%
2. ammonia
3. Decomposers break down nitrogen-containing molecules in dead organisms to ammonia.
4. Bacteria in the soil convert ammonia to nitrates, which plants can use to make nitrogen-containing molecules.
5. Herbivores obtain nitrogen from the nitrogen-containing molecules in the plants they eat.
6. Other animals obtain nitrogen from the nitrogen-containing molecules in the animals they eat.
7. Bacteria change nitrates in the soil into nitrogen gas.
8. Less nitrogen would be cycled to organisms and to the atmosphere.

3 ■ Trophic Levels

Use with Chapter 2, Section 2.2

Purpose

- To examine the trophic levels in an ecosystem
- Skill: Sequencing

Teaching Suggestions

- Present the base transparency and discuss the autotrophs that make up the first trophic level.
- Present the first overlay and discuss the first-order heterotrophs, or herbivores, that make up the second trophic level.
- Present the second overlay and discuss the second-order heterotrophs, or carnivores, that make up the third trophic level.
- Present the third overlay and discuss the third-order heterotrophs. These carnivores feed on second-order heterotrophs and make up the fourth trophic level.

Extension: Challenge

- Have students discuss to which trophic levels humans belong.

Answers to Student Worksheet

1. organism that uses the sun's energy or chemical energy to make nutrients; plants, algae, microscopic photosynthetic organisms
2. organism that feeds on other organisms for nutrients and energy; all organisms except those that are autotrophs
3. animal that feeds only on plants; small fish, snails, tadpoles
4. animal that feeds only on other animals; heron, alligator, large fish, crayfish, dragonfly
5. animal that feeds on both plants and other animals; turtle
6. Decomposers are organisms that break down and absorb nutrients from dead organisms. They feed on organisms at every trophic level.
7. As energy passes from one link of a food chain to the next, some of the energy is lost as heat. By the time the energy reaches the fifth link, very little of it is left.
8. A food chain shows how energy and matter pass in sequence from one organism to another. A food web illustrates the complex relationships that exist among organisms that belong to more than one food chain.
9. **a.** mutualism; **b.** In a mutualistic relationship, both animals benefit. The crocodiles get their teeth cleaned, and the egrets get a food supply and possibly protection from predators.