1.4 Animal Roles

Objective

Students will name predators, prey, and scavengers and will explain their importance in maintaining balance within an ecosystem.

Vocabulary

predator an animal that hunts another animal for food
prey an animal that is hunted by a predator
scavenger an animal that feeds on dead or decaying animals or things

Materials

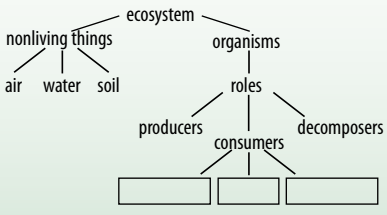
Introduction
• BLM 1.4A Animal Cards, scissors, yarn

Directed Instruction
• TM-1.1A Ecosystem

Preparation

Print **BLM 1.4A Animal Cards** for every two students. Gather SCISSORS for each student and obtain a **1** FT PIECE OF YARN for every pair. (*Introduction*)

Draw the following graphic organizer on the board. (*Directed Instruction*)



Select **TM-1.1A Ecosystem** for display. (*Directed Instruction*)

Content

God designed each kind of animal to play a part in its environment. Predators hunt for food; prey are the food hunted. Animals can be predators of one kind of animal and yet prey of another. This variation in roles helps control animal population—an important factor in the healthy balance of nature. Other animals are scavengers that feed on dead or decaying animals and plants. Without the work of these organisms, there would be a great amount of decay and disease.

Introduction

Distribute **BLM 1.4A Animal Cards**, SCISSORS, and YARN for a discovery activity. Direct pairs of students to cut out the cards and to create food chains. First, have them set the piece of yarn vertically on a desk and then have them place the card containing *grass* at the bottom of the yarn. Inform them that mice sometimes eat grass and have them place the mouse card above the grass card. Ask what card might go at the top of the yarn. (**Possible answers: snake, fox, bear**) Encourage students to use as many cards as they can to make similar food chains. Then ask which animals could either eat another animal or be eaten themselves. (**Answers will vary.**) Which type of organism is always at the bottom of a food chain? (**producer**) What question do you have about these food chains? (**Answers will vary.**)

Directed Instruction

1 Select volunteers to read one of the food chains they made during the *Introduction* activity. Write their list on the board. Read **Psalm 104:27** and discuss how God carefully designed each ecosystem to meet the needs of the animals found there.

2 Read the first paragraph on the student page together. Discuss the importance of each role animals play in the ecosystem. Ask if some animals can be both a **predator** and a **prey**. (**Yes.**) For example, state that a snake can be a predator to a mouse but prey to an owl. Allow students to give other examples from the food chains listed on the board.

Convey that a balance of each type of animal is important in an ecosystem. Without a balance, some animal groups could die from starvation, disease, loss of habitat or plant life, and overpopulation. Have students analyze the pie chart on the page. Point out that the pie chart shows all Kenyan lions but only certain subspecies of giraffes and zebras in Kenya. Discuss the effects the loss of each endangered animal subspecies would have on the ecosystem. Direct students to answer the question on the page. Then ask what might happen if there were more lions than zebras and giraffes. (**There would not be enough food for all the lions.**) What would happen if the Rothschild's giraffes died out? (**Possible answers: Lions would have less food; more zebras would become prey.**) Lions in Kenya are predicted to die out within 20 years. Inquire what might happen if there were no more lions. (**Possible answers: There might be too many zebras and giraffes competing for food and eating too many plants. Zebras and giraffes might not have enough space to live in.**)

3 Read the second page. State that some meat eaters do not eat all of what they kill. **Scavengers** like vultures, hyenas, crabs, and crayfish eat the remains. Relate that scavengers are important to an environment because

they help get rid of dead matter that would rot; they break it down into smaller pieces. Decomposers then break down decaying matter into small particles that return to the soil. Have students answer the questions and fill in the graphic organizer. Assist as needed.

4 Review the ecosystem graphic organizer on the board. Ask students to name and fill in the three roles consumers can play in the ecosystem. (**predator, prey, scavenger**) Review the definitions of each type of animal.

5 Group the class into pairs. Have each pair write the name of one predator and one prey from **TM-1.1A Ecosystem**. Choose one animal on TM-1.1A and state that it has just been eliminated from the ecosystem. Ask students to stand if this change affects an animal they had written. Encourage standing students to explain the effect. (**Possible answer: Without foxes, there would be too many rabbits and squirrels competing for food.**) Remove more animals and have students observe this dramatic effect.

6 Have students observe the discovery activity from Lesson 1.2 to record the date, time, and their observations.

Lesson Review

How are a scavenger and a decomposer similar? (**They both eat dead or decaying organisms and help keep ecosystems clean.**) How are they different? (**A scavenger breaks down decaying matter into smaller pieces; a decomposer breaks down decaying matter into particles that go into the soil.**) How do animals meet one another's needs? (**by providing food for one another, by keeping the ecosystem clean**)

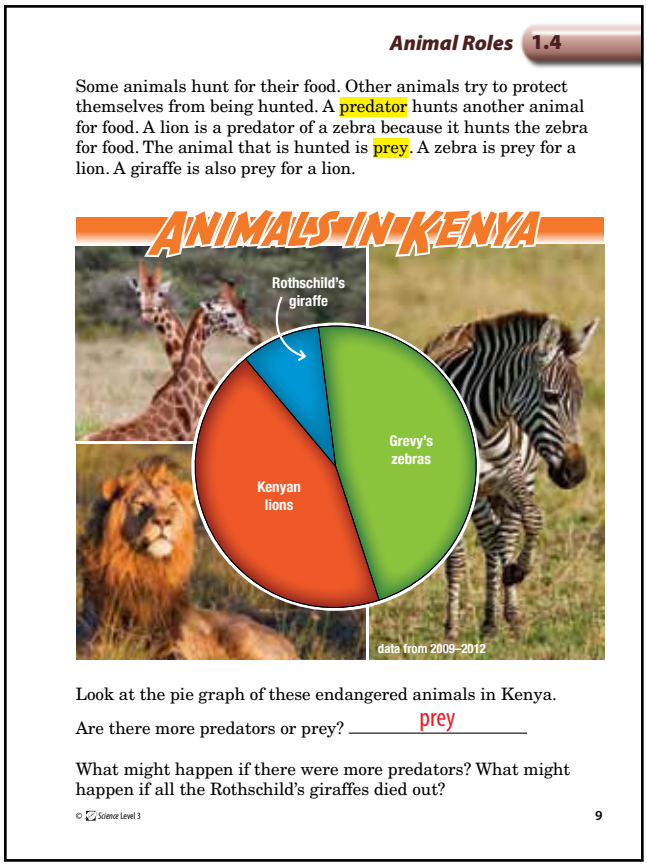
Extension

Materials

- Poster board, markers

Have students research an endangered animal and have them graph the decline of its species over several years. Direct students to write about how its extinction could affect its ecosystem.

Direct small groups of students to design a poster or a brochure to raise awareness of an endangered animal. Encourage groups to include why the animal is endangered, what would happen if it died out, and how people can help keep it alive. Have groups share their findings with another class or a group of parents. Display the poster board presentations or brochures in the classroom.



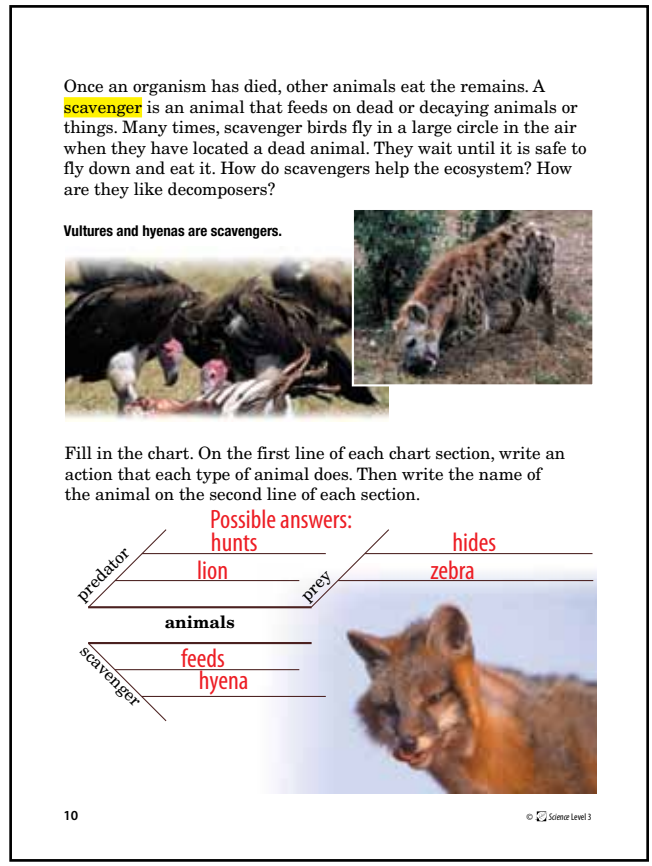
Animal Roles **1.4**

Some animals hunt for their food. Other animals try to protect themselves from being hunted. A predator hunts another animal for food. A lion is a predator of a zebra because it hunts the zebra for food. The animal that is hunted is prey. A zebra is prey for a lion. A giraffe is also prey for a lion.

Look at the pie graph of these endangered animals in Kenya.

Are there more predators or prey? prey

What might happen if there were more predators? What might happen if all the Rothschild's giraffes died out?



Once an organism has died, other animals eat the remains. A scavenger is an animal that feeds on dead or decaying animals or things. Many times, scavenger birds fly in a large circle in the air when they have located a dead animal. They wait until it is safe to fly down and eat it. How do scavengers help the ecosystem? How are they like decomposers?

Vultures and hyenas are scavengers.

Fill in the chart. On the first line of each chart section, write an action that each type of animal does. Then write the name of the animal on the second line of each section.

7.6 Tech Connect

Objective

Students will identify ways magnets are useful to people.

Materials

Introduction

- Iron or steel object, strong magnet, refrigerator magnet, large bar magnet, plastic toy car, small bar magnet, tape
- BLM 7.6A Using Magnets

Preparation

Gather an IRON OR STEEL OBJECT such as a steel toy truck, a STRONG MAGNET, a REFRIGERATOR MAGNET, and a LARGE BAR MAGNET. Obtain a PLASTIC TOY CAR and attach a SMALL BAR MAGNET to it by using TAPE. (*Introduction*)

Print **BLM 7.6A Using Magnets** for pairs of students. (*Introduction*)

Content

People use magnets for numerous applications, from holding kitchen cupboard doors shut to keeping spacecraft on course. In the kitchen, a flexible magnetic strip in the refrigerator door keeps the door sealed tightly. Most electric can openers have a small permanent magnet to lift the lids off opened cans. Tips of screwdrivers are often magnetized to hold screws in place.

Magnets are utilized in ways other than for gripping and picking up things. One of the most common uses of magnets is in electric motors. Motors produce motion by the application of magnetic force. Audio speakers reproduce sounds by vibrations created from magnetic force. There are magnets in many common household devices, including vacuum cleaners, electric mixers, toy cars, electric tools, television tubes, music players, and telephones. Computer hard drives use magnetic media to record data. Magnetic fields are also used in some commercial security systems such as those found in most libraries, where magnetized strips are placed in the bindings of books. Some medical diagnostic equipment such as magnetic resonance imagers (MRIs) employ magnetic fields to view the inside of the human body. Engineers have designed trains that work with magnetism instead of wheels and rails to lift them off the ground. These *maglev*, meaning *magnetic levitation*, trains apply the principle of magnetic repulsion to suspend the cars; they use alternating repulsion and attraction to propel the train forward along its magnetic guideway.

Introduction

Show several uses of magnets through the following demonstrations:

- Display how a magnet lifts objects by picking up an IRON OR STEEL OBJECT with a STRONG MAGNET. Ask where the force comes from to lift the object. (**from the magnet**) What force is the magnet pulling against? (**gravity, which is pulling down on the object**)
- With a REFRIGERATOR MAGNET, attach a piece of paper to a magnetic surface such as a metal desk. Ask how the paper stays attached. (**The magnetic force of the magnet presses it tightly against the magnetic surface of something like a desk.**)
- Now demonstrate your PLASTIC TOY CAR taped with a SMALL BAR MAGNET by "pushing" it with a LARGE BAR MAGNET. Ask what type of force is working here, magnetic attraction or magnetic repulsion. (**magnetic repulsion**)

Distribute **BLM 7.6A Using Magnets** to pairs of students. Ask a student to read aloud the directions. Read the first three scenarios and direct students to share their answers with a partner. Have volunteers explain their partner's answer to the class. Then direct students to read Exercise 4 and make up their own story in which a problem is solved by using a magnet. Have them share their ideas with a partner or with the class.

Directed Instruction

1 Direct students to turn to their first student page and read the first paragraph. Reiterate that the magnet holds the door tightly against the refrigerator frame so that the cold air inside will not leak out. Suggest that students try holding a paper clip close to their refrigerator door seal when they get home. Explain that the paper clip will probably stick to the seal because the seal is a magnet. Additionally, a magnet on a can opener holds the cut lid so that it does not fall into the can.

Read the second paragraph. Remind students how magnetic force produced motion with the magnet-propelled plastic toy car and other activities in this chapter. State that one of the most common uses of magnets is in electric motors. Inside a motor, magnets and electromagnets are made to attract and repel each other many times each second to produce motion. Ask students to give examples of electric motors that are in their houses. (**Possible answers: blender, mixer, refrigerator, washer, dryer, fan, computer, garage door opener**) Convey that even little electric race cars have tiny motors in them, with magnets that are tinier still!

2 Read the paragraph on the second page. Have students complete the exercises. Reiterate that an electromagnet is used in the crane cable because it is a temporary magnet. Once the electricity is switched off, whatever the electromagnet is carrying will drop, either into a pile on the ground or into a waiting freight car or truck. Point out that the maglev, or magnetic-levitation, train uses forces of magnetic attraction and repulsion to propel it down a magnetic guideway. Remind students of the activity in which they stacked ring magnets on a pencil and felt the force of the magnetic repulsion. Share that the same force is used to float the train above the ground! Ask why a compass always points north. (**The needle is a magnet that is attracted to the magnetic pole in the North.**)

Lesson Review

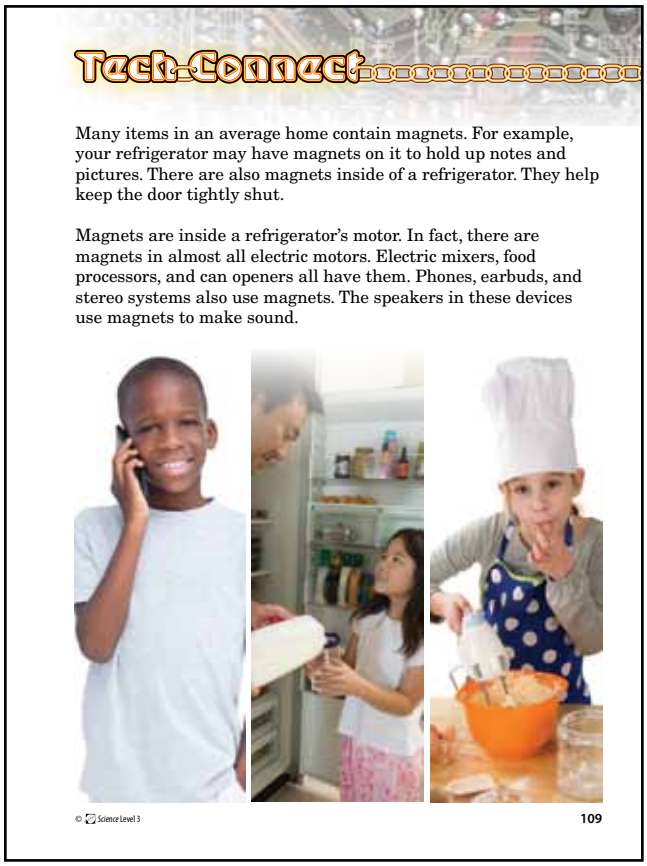
How does an electromagnet help move magnetic material? (**When it is turned on, the material sticks to it, but it releases the materials when it is turned off.**) Why can maglev trains go very fast? (**They float on magnets instead of riding on rails.**)

Extension

Materials

- BLM 7.6B Rubric: Marble Run, cardboard tubes, magnets, marbles, various items

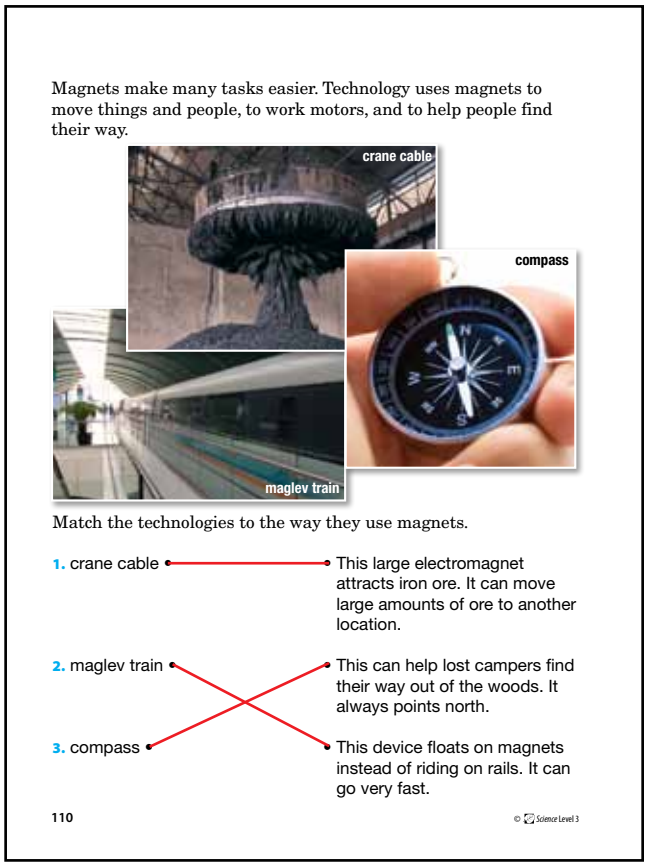
Place students into small groups and number the groups. Have groups use their knowledge of physical science to create a marble run. Direct them to use **BLM 7.6B Rubric: Marble Run** to design a run that leads the marble from a start point to a finish point. Have groups write their group number on BLM 7.6B and on their marble run. Provide cardboard tubes from paper towels or wrapping paper as the base for the run. If your classroom has a magnetic board, adhere small magnets to the tubes so the marble run can travel down the board. Provide various items as needed, such as scissors, tape, craft sticks, small boxes, and rubber bands. When groups finish, have them evaluate another groups' marble run by using BLM 7.6B.



Tech Connect

Many items in an average home contain magnets. For example, your refrigerator may have magnets on it to hold up notes and pictures. There are also magnets inside of a refrigerator. They help keep the door tightly shut.

Magnets are inside a refrigerator's motor. In fact, there are magnets in almost all electric motors. Electric mixers, food processors, and can openers all have them. Phones, earbuds, and stereo systems also use magnets. The speakers in these devices use magnets to make sound.



Magnets make many tasks easier. Technology uses magnets to move things and people, to work motors, and to help people find their way.

Match the technologies to the way they use magnets.

1. crane cable — This large electromagnet attracts iron ore. It can move large amounts of ore to another location.
2. maglev train — This device floats on magnets instead of riding on rails. It can go very fast.
3. compass — This can help lost campers find their way out of the woods. It always points north.