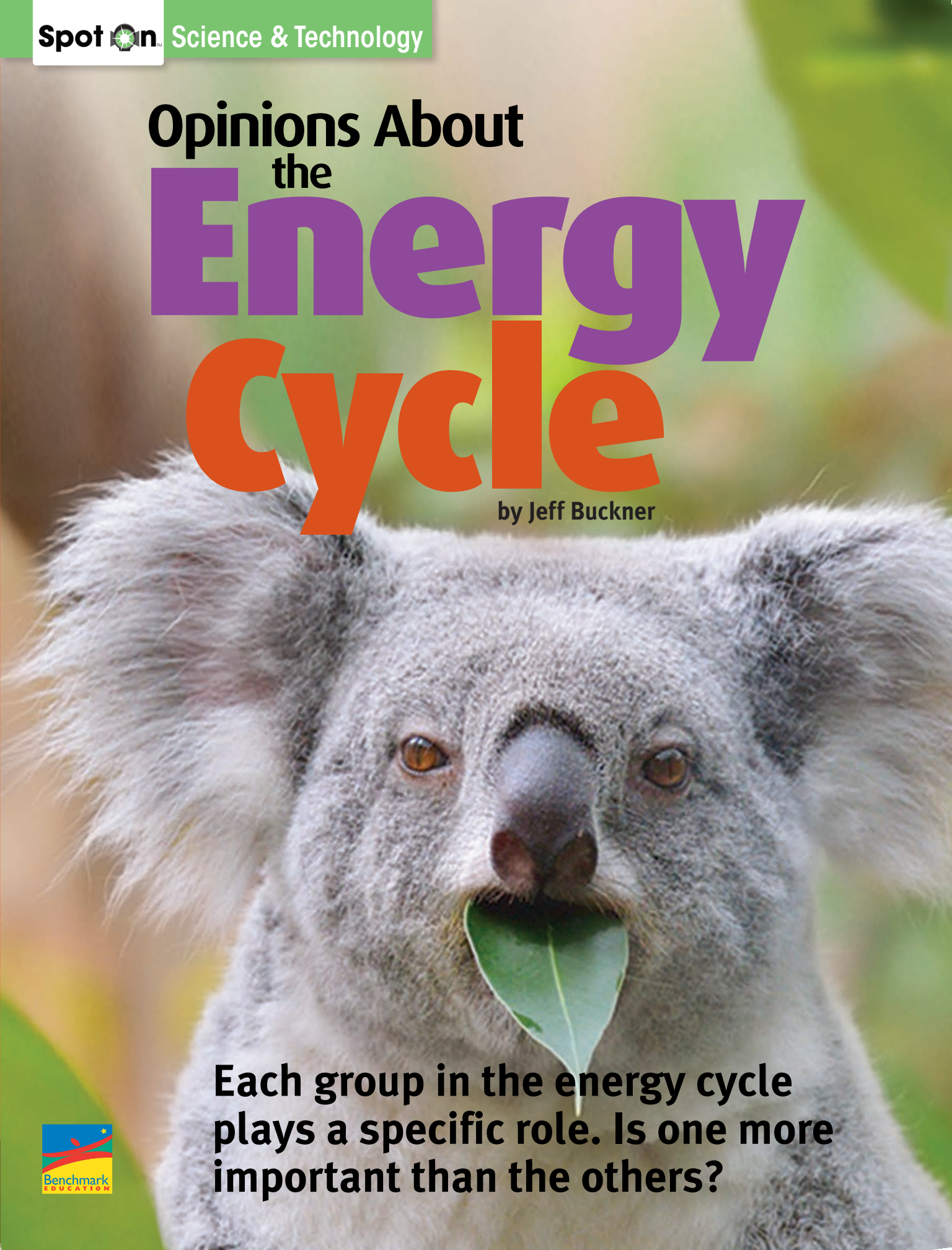
Spot On Science & Technology

Opinions About the Energy Cycle

by Jeff Buckner



Each group in the energy cycle plays a specific role. Is one more important than the others?

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Energy

What is invisible but gives strength to all living things on Earth? Energy! Without energy, people, animals, and plants would not have the strength they need to grow, move, or simply stay alive. Even the tiniest **organisms** that people cannot see without a microscope need energy to survive.

Living things get the energy they need by eating food. For example, people who run often prepare for a big race by eating a healthy meal. They may even eat a small snack in the middle of the race—as they run! Why? Running requires a lot of energy, and people get energy from food.

▼ **This snack will give a runner enough energy to finish the race.**

All living things fit into three different groups depending on how they get energy. The three groups are **producers**, **consumers**, and **decomposers**. These three groups make up the energy cycle—or the way energy flows on Earth.

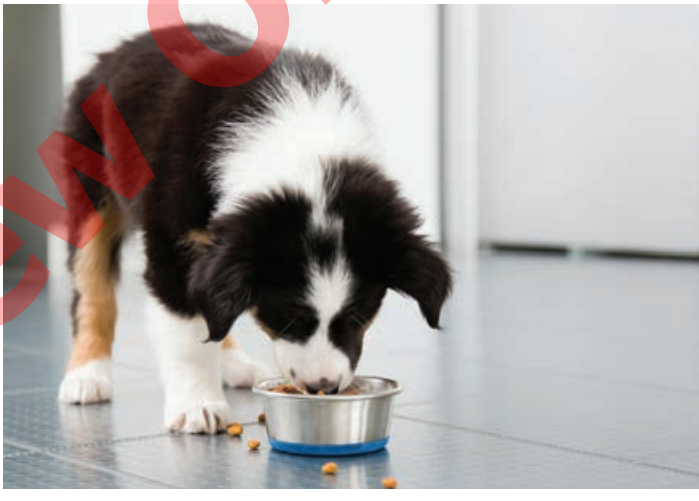
Producers include almost every kind of plant. Producers use energy from the sun to make their own food.

Consumers cannot produce their own food. To get energy, they eat producers or other consumers, or both. People fit into this group. So do other animals that eat plants or meat.

Decomposers feed on dead plants and animals in the wild. Fungi, some bacteria, and some worms are decomposers.

All groups perform important functions. Read the following informational chapters to learn more about each group's role in the energy cycle. Then read three opinion texts. Each gives evidence to support a different opinion about why one group in the energy cycle is more important than the others.

▲ A tomato plant is a producer.



▲ A dog is a consumer.

▲ This earthworm is a decomposer.

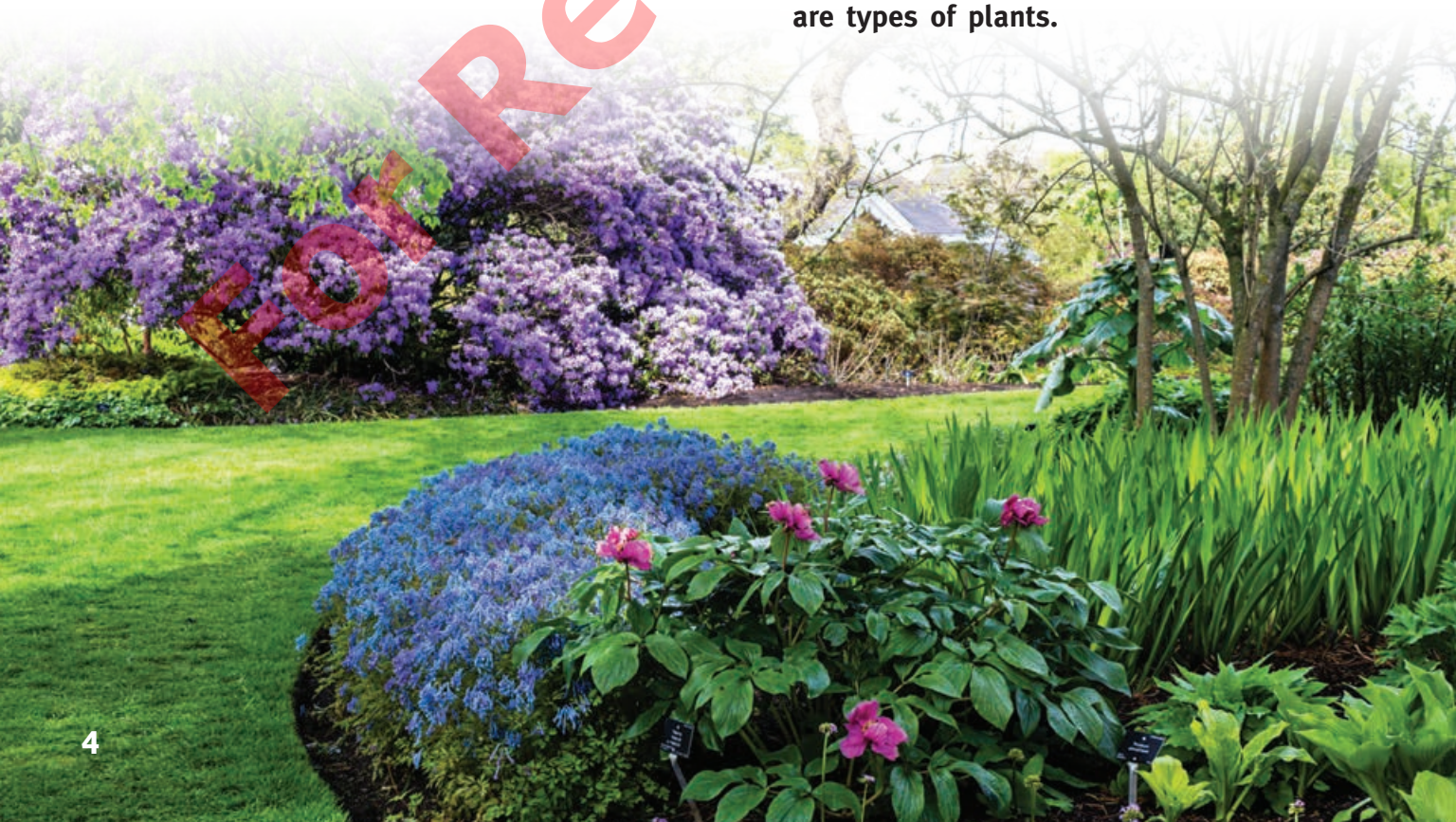
Producers

Producers make, or produce, their own food. Most producers are plants. The food they make gives them energy to grow. Plants store leftover "food" or energy as starch in their cells. This energy is then passed on and used by animals that eat plants.

Plants make their own food through a process called photosynthesis. This word can be broken down into two smaller parts—*photo*, which comes from the Greek word for "light," and *synthesis*, which means "a combination of different things."

Plants combine sunlight, water, and carbon dioxide (a colorless gas in the air) to make their own food. A substance in the plant called chlorophyll helps the plant absorb the sunlight. It also makes the plant green.

▼ **Bushes, flowers, trees, and grass are types of plants.**

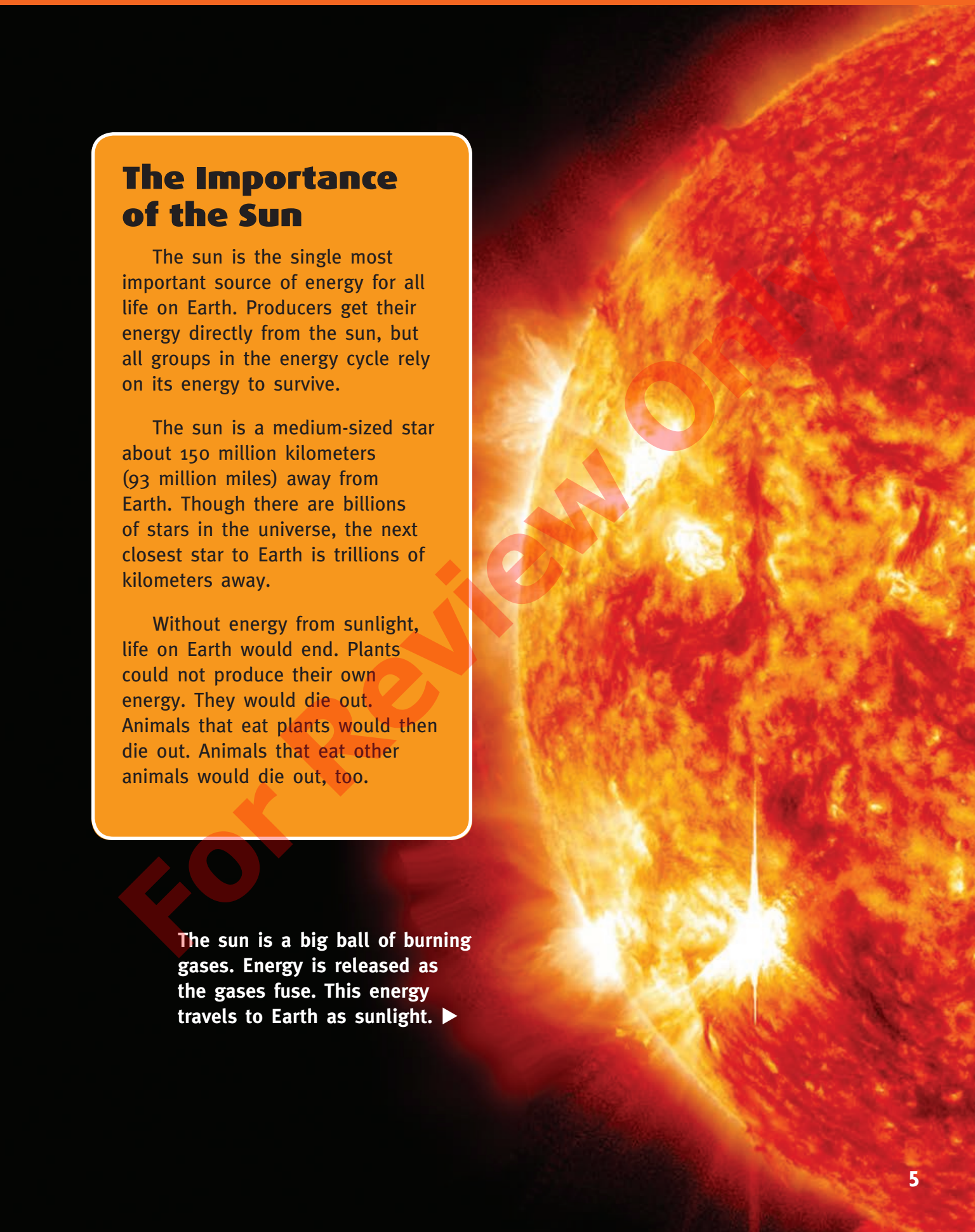


The Importance of the Sun

The sun is the single most important source of energy for all life on Earth. Producers get their energy directly from the sun, but all groups in the energy cycle rely on its energy to survive.

The sun is a medium-sized star about 150 million kilometers (93 million miles) away from Earth. Though there are billions of stars in the universe, the next closest star to Earth is trillions of kilometers away.

Without energy from sunlight, life on Earth would end. Plants could not produce their own energy. They would die out. Animals that eat plants would then die out. Animals that eat other animals would die out, too.



The sun is a big ball of burning gases. Energy is released as the gases fuse. This energy travels to Earth as sunlight. ▶

Gases, Water, and Nutrients

Where do plants get carbon dioxide? From the air. All animals that walk or swim breathe out carbon dioxide, providing it to plants that need the gas to make food during photosynthesis.

Carbon dioxide, which is deadly to humans in large amounts, enters plants through very tiny holes on the undersides of leaves. A study conducted at Michigan State University shows that 4,033 square meters (one acre) of corn can absorb more than 16,300 kilograms (36,000 pounds) of carbon dioxide from the air each year.

Plants get the water they need from the soil they grow in. The water in the soil is from rain or from a hose, sprinkler, or other irrigation system. The water in the soil is absorbed by a plant's roots and then travels up into the plant.

Plants also need minerals—not for photosynthesis, but to be healthy. They get these **nutrients** from the soil. Minerals enter a plant through its roots and travel with the water up into the plant. Photosynthesis and minerals allow a plant to grow from a tiny seed into a thriving, lush plant.

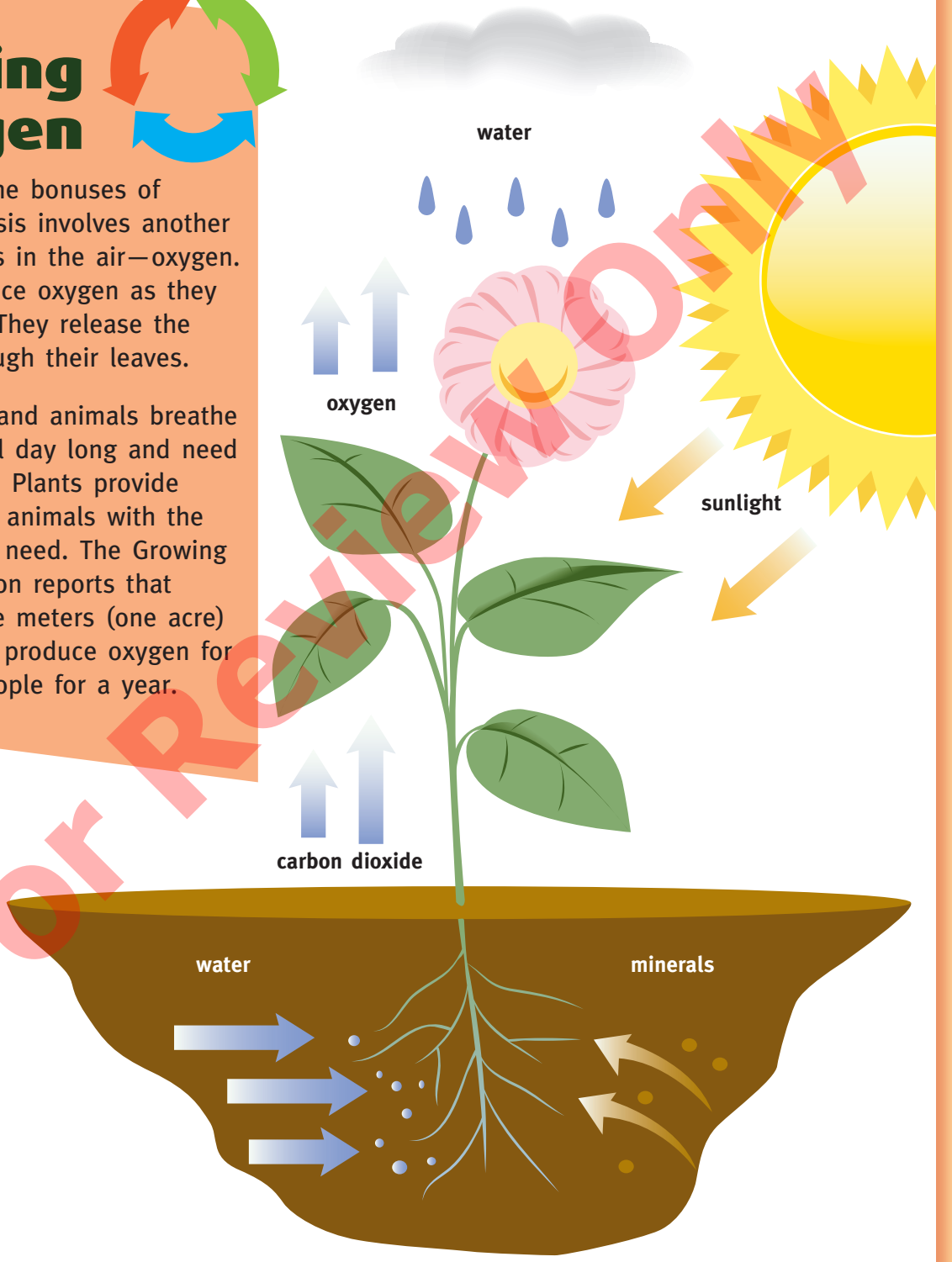
▼ **Corn grows from a seed into a mature plant in 60 to 100 days.**

Photosynthesis

Making Oxygen

One of the bonuses of photosynthesis involves another colorless gas in the air—oxygen. Plants produce oxygen as they make food. They release the oxygen through their leaves.

Humans and animals breathe in oxygen all day long and need it to survive. Plants provide humans and animals with the oxygen they need. The Growing Air Foundation reports that 4,033 square meters (one acre) of trees can produce oxygen for about 18 people for a year.



Consumers

▲ A lion hunts a zebra in the grasslands of Africa.

Consumers cannot produce their own food using the sun's energy. Therefore, they must eat—or consume—producers or other consumers. This is how they absorb the energy they need to stay alive.

Animals, including people, are consumers. As consumers chew and digest the food they eat, it is broken down into smaller and smaller pieces. The energy stored in these tiny pieces can be used right away for energy or stored in the consumer's cells for later.

There are three kinds of consumers—**herbivores**, **carnivores**, and **omnivores**.

▼ A desert tortoise is a herbivore. It eats wildflowers, grasses, and cacti.

Herbivores

Herbivores are consumers that eat only plants. Herbivores get the energy they need to live from nutrients found in plant life. A wide range of living things on land and in water are herbivores. Without them, plant life on Earth would take over, upsetting the balance of nature.

Some herbivores eat only one kind of plant. Koalas, for example, eat only the eucalyptus plant. They eat about 1.4 kilograms (3 pounds) of the plant every day, notes Encyclopedia Britannica. Herbivores that eat only one type of plant can have difficulty surviving if that plant becomes scarce or dies out.

Other herbivores eat a variety of plants. For instance, grasshoppers are not at all picky. They eat corn, wheat, grass, tree leaves, and more.

▼ **Grasshoppers live on all continents except Antarctica.**

Koalas live in the eucalyptus forests of Australia.