UNIT OVERVIEW

The world is made up of many different kinds of habitats. Each one has a distinct blend of environmental factors, including latitude, elevation, climate, land features, water features, plant life, and animal life. The organisms that live in each habitat are specially adapted to live there and are interdependent. Over time, habitats can change due to natural forces and human actions. The Habitats/Environment unit helps students understand how and why habitats differ and provides a starting point for students to explore some of the many fascinating habitats in the natural environment.

Certain reading resources are provided at three reading levels within the unit to support differentiated instruction. Other resources are provided as a set, with different titles offered at each reading level. Dots on student resources indicate the reading level as follows:

- low reading level
- middle reading level
- high reading level

THE BIG IDEA

Plants and animals, including humans, each live in a habitat. When a habitat changes, the organisms that live within it must either adapt or move out of it in order to survive. Only those organisms that successfully adapt will survive and pass their genes to future generations within the habitat. Human activity can have considerable effects on natural habitats. Taking action to protect a habitat from harmful changes could provide a healthy and sustainable environment for many species in the future.

Other topics

This unit also addresses topics such as: life in a rainforest, urban habitats, the effect of algal blooms, camouflage, and extreme habitats.

SPARK

The spark is designed to get students thinking about the unit's topics and to generate curiosity and discussion.

Materials

- (optional) variety of stuffed animals or animal photo cards

Activity

Ask a few students to briefly describe where they live. Then ask students to describe where several animals live, such as a lizard, a blue jay, a salmon, and a monkey. Discuss the fact that every animal needs a home and lives in a certain place for important reasons. Ask students whether they know any words for a natural area that provides an animal's home *(habitat* or *environment).*

If you have brought in a variety of stuffed animals, present them now; otherwise, simply ask students to brainstorm a list of about ten animals. Assign or place students into groups. Challenge each group to decide where each animal would choose to live if it had to live at the school. Give an example to get students started.

> **Think-aloud:** *If I were a giraffe, I would probably want to live on the playground because there I would have room to walk around and eat leaves off trees. If I were indoors, I would always have to bend my neck!*

Once groups have discussed which school habitat each of the animals might prefer, ask students to share and discuss their ideas. You can extend the activity to include plant habitats by asking where certain plants would grow best at the school.

Below are questions to spark discussion.

> *What factors did you consider when you chose a habitat for each animal?*
>
> *Which animal would be best suited to actually live at the school? Why?*
>
> *Were there any animals that you could not find a suitable habitat for at the school? If so, why couldn't they live here?*
>
> *If you chose the same habitat for more than one animal, what does that tell you about those animals?*
>
> *Would certain animals only want to live here at certain times of year? Why?*
>
> *How would the animals you discussed have to change if they actually lived at our school?*

Use this activity to begin an introductory discussion about habitats and the environment. Explain that all plants and animals live somewhere, and there are reasons they live where they do. Throughout the unit, students will learn more about why living things are found in certain habitats and how they adapt to the environment around them.

Many of the unit's vocabulary terms are related to the spark activity and can be introduced during the spark. For vocabulary work, see the Vocabulary section in this *Unit Guide*.

PRIOR KNOWLEDGE

Invite students to explain their understanding of what a habitat is and to identify any familiar habitats. Show students a globe or world map. Then discuss what students know about different regions of the world and the living things found in each region.

Probing Questions to Think About

Use the following questions to have students begin thinking of what they know about habitats.

- Do wild penguins live near here? Why or why not?
- How are the animals that live in our area different from the animals that live in another part of the world?
- How are the plants that live in our area different from the plants that live in another part of the world?
- Have you ever been somewhere with a high elevation? How is a place with a high elevation different from a place with a low elevation?
- What is the difference between weather and climate?
- How do plants and animals depend on each other?
- What does it mean to *adapt?*
- What do you think of when you hear the word *environment?* How is it different from and similar to a *habitat?*

Tell students they will learn more about these topics soon.

UNIT MATERIALS

Each unit provides a wide variety of resources related to the unit topic. Students may read books and other passages, work in groups to complete hands-on experiments and investigations, discuss science ideas as a class, watch videos, complete writing tasks, and take assessments.

Resources are available for printing or projecting, and many student resources are also available for students to access digitally on Kids A–Z.

Selected unit resources are available in more than one language.

For a complete list of materials provided with the unit, see the Habitats/Environment unit page on the Science A–Z website.

VOCABULARY

Use the terms below for vocabulary development throughout the unit. They can be found in boldface in the *Nonfiction Book*, the *Quick Reads*, and/or other unit resources. These terms and definitions are available on *Vocabulary Cards* for student practice. Additional vocabulary lists are provided in the teaching tips for *Investigation Packs* and *FOCUS Books*.

Core Science Terms

These terms are crucial to understanding the unit.

adaptation	a change in an organism or species that allows it to survive better in its environment
atmosphere	a layer of gases surrounding a planet, star, or moon
climate	the weather conditions in an area over a long period of time
elevation	the height of land above sea level
environment	all the living and non-living parts of Earth
erosion	the gradual wearing away of rock or soil by water, wind, or ice
habitat	the place in which a plant or animal lives and receives what it needs to survive
hibernate	to go into a state of deep sleep, often during winter
interdependent	relying on each other
latitude	a measure of how far a place is from the equator
migrate	to move from one habitat or region to another at a certain time each year
offspring	an animal's young
pollution	harmful material in the air, in water, or on the ground
survive	to stay alive; to continue to exist

Other Key Science Terms

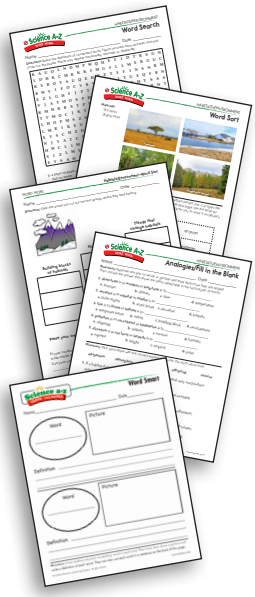
The following vocabulary is not essential for comprehending the unit but may enrich students' vocabulary.

building block	an important part that helps form a whole thing or a whole idea
environmental	relating to the environment or to concerns about how to protect the environment
equator	an imaginary line that circles Earth halfway between the poles
polar	relating to areas of a planet, star, or moon near the north or south pole
rainforest	a dense forest, usually in a tropical area, that receives a lot of rain and contains diverse animal and plant life

savanna	a flat grassland with few trees
temperate forest	a forest in a part of the world with moderate temperatures
tropical	having a hot, humid climate typical of latitudes near the equator
tundra	a cold, treeless, arctic region where the ground is always frozen
urban	relating to a city or town
weather	a description of the temperature, clouds, rain, wind, and other conditions in the air

Vocabulary Activities

You may choose to introduce all the terms that will be encountered in the unit before assigning any of the reading components. *Vocabulary Cards* with the key science terms and definitions are provided. Dots on the cards indicate the reading levels of the *Nonfiction Book* or the *Quick Reads* in which each term can be found. If all level dots appear, the term may come from another resource in the unit. Students can use these cards to review and practice the terms in small groups or pairs. The cards can also be used for center activity games such as Concentration.



The *Word Work* activity sheets offer fun puzzles and practice with key vocabulary terms from the unit. For further vocabulary practice and reinforcement, you can choose from the vocabulary *Graphic Organizers*. To build customized vocabulary lessons with terms related to the topic, see Vocabulary A-Z.

Students can use the *Word Smart* vocabulary *Graphic Organizer* to organize information on the science terms. You may want to assign each student one to three words to share his or her *Word Smart* knowledge with classmates. Students who have the same word should first compare their *Word Smart* sheets with each other and then report to the larger group.

The science terms can be used in oral practice. Have students use each term in a spoken sentence.

As students read, encourage them to create a science dictionary by recording new vocabulary terms and definitions in their *SAZ Journal*.

BACKGROUND AND MISCONCEPTIONS

Use this section as a resource for more background knowledge on unit content and to clarify the content for students if misconceptions arise. Refer to Using the Internet below for more ways to extend the learning.

Q: *Does the word* environment *always refer to issues related to protecting the natural world?*

A: No, not always. Students may confuse the study of the environment with environmentalism. The word *environment* generally refers to the surroundings in which a living thing lives and operates. For example, "Many tree frogs thrive in a humid environment." The words *environmental* and *environmentalism* often relate to efforts to protect the natural environment. For example, "The environmental tourists helped clean up the habitat of the Galapagos tortoise." In order to understand and take action on important issues concerning the planet—pollution, overpopulation, energy shortages, and the like—it is helpful to first understand the natural environment and how its components are interconnected.

Q: *Is climate the same as weather?*

A: Weather describes the atmospheric conditions in a location over a short period of time, while climate describes the prevailing weather conditions over a long period of time. Climate is a more useful way to describe a habitat than weather because it's a characteristic that stays similar from one year to the next, as opposed to weather, which varies from day to day.

Q: *Does every plant and animal live in one distinct habitat?*

A: Some do and others do not. Numerous types of plants and animals have adapted to live in several different environments. For example, deer can be found in cold, high-elevation forests as well as hot, low-lying canyons. Migrating birds often call several different habitats home during different times of the year. For these reasons, organisms are often not classified by their habitat but rather by other characteristics. However, some organisms have such specialized requirements that they are only found in a certain habitat. The saguaro cactus, for example, lives only in the Sonoran Desert of the United States and Mexico. It requires minimal freezing in winter and grows best on hillsides in this warm, dry climate.

Q: *Are polar bears the only living things in Arctic regions?*

A: Certainly not! While polar bears may be the highest-profile creatures in the Arctic, plenty of other land and marine animals live in this habitat, including caribou, rabbits, seals, and whales. Also, many plant species have adapted to Arctic conditions, including lichens and some flowering plants.

Q: *Are all deserts hot and barren?*

A: Actually, not all deserts are hot, and many are teeming with life. A desert is defined by its annual precipitation, not its temperature. For this reason, Antarctica is classified as a desert, though it clearly does not have a hot climate. Deserts often have dramatic swings in daily temperatures, so the nights can actually be quite cold. And deserts can have an amazing level of biodiversity, despite what some old Western movies would have us believe.

Q: *Do organisms adapt intentionally?*

A: No. Organisms do not control how they adapt. Adaptations occur randomly over time and may or may not provide a helpful behavioral or physical change that allows for a successful response to environmental demands. Many adaptations result from mutations that lead to a better chance for survival. An individual organism may exhibit a new behavior due to environmental circumstances—such as a bear eating potato chips if they're available—but it is not considered an adaptation unless the whole population has adopted the behavior.

Q: *I know people can cause habitats to change. Have people ever caused any species to become extinct? If so, how?*

A: People have contributed to the extinction of many species, including China's Yangtze River dolphin, the dodo, the Tasmanian wolf, Stellar's sea cow, ground sloths, and thousands of others. These species could not adapt to the changes that people wrought in their environments, including hunting, polluting, competing for the same food sources, and forcing species out of their habitats.

Q: *Do living things only consist of plants, fish, birds, amphibians, reptiles, and mammals?*

A: No. While these organisms may be what students think of first—and all of these are living things—there are many others, such as insects, worms, crustaceans, fungi, protozoa, and bacteria.

Q: *Are wildfires always harmful to habitats?*

A: No, not always. Certainly, some wildfires can cause great harm to habitats by killing inhabitants, removing natural resources, and filling the air with particulates. But fires are also a natural and important part of many ecosystems. Some plants require periodic fires in order to release their seeds or to thin out a forest canopy so light can reach the areas below and foster new growth. Many animal species are also adapted to wildfires. While individual members of a species may perish in a fire, the species as a whole may benefit if the fire creates a better balance among plant and animal species.

EXTENSION ACTIVITIES

Using the Internet

Most search engines will yield many results when the term *habitat* or *environment* is entered. For better results, search for information on a specific type of habitat, or pair one of the above terms with a geographical region or an animal or plant species. Be aware that some sites may not be educational or intended for the elementary classroom. More specific inquiries are recommended, such as:

- habitat of Alaska king salmon
- How are elevation and climate related?
- Where do coconuts grow?
- environmental issues for children
- black bear habitat
- What lives in wetlands?
- bird interdependence
- fish adaptations

Projects and Activities

- **Field Trip/Guest:** Bring students to a national or state park, nature preserve, or other natural area to learn about the flora and fauna that live there, along with any environmental issues these organisms are facing. If a trip is not feasible, invite a naturalist to speak to the class about a particular habitat.
- **Research/Project:** Challenge students to research a plant or animal species with which they are unfamiliar. Then have them create a shoebox diorama showing the organism in its natural habitat.
- **Writing:** Prepare several cards with names of familiar animals and another set of cards with types of habitats. Have each student draw one card of each type and then write a humorous tale about an animal that has to live in a new habitat. (If the cards drawn match an animal to its real habitat, have the student redraw.) For extensive writing instruction, visit Writing A-Z.
- **Arts:** Have the class vote on one or more types of habitat themes to use in decorating the classroom, including the door. Students might build three-dimensional models, make cutouts on butcher paper, hang posters, or bring in real items found in the habitat(s).
- **Project:** Put students in groups and have them invent a game for the class to play that involves habitats. Examples could include a board game in which animals have to avoid risks in their habitat, a role-playing guessing game, or a variation on a common sport.
- **Community Service:** Provide students with opportunities to take part in an effort to protect endangered species.

- **Research:** Help students conduct research to compare how one animal or plant species has adapted to living in two different habitats (for example, a desert coyote versus an arctic coyote).
- **Research/Home Connection:** Students can conduct research as a family/home project or in the library/media center to extend the learning about a topic in one of the *Quick Reads* or other unit resources.