

Introducing Habitats

An Introduction to Diverse Environments

Children have a natural curiosity about the world around them. From the barren Arctic tundra to the lush tropical rain forest, habitats of the Earth are unique. Whether a habitat is in a distant land or one's own backyard, it houses a complex web of life and resources. By using the *Introducing Habitats* Teacher Guide, you have an opportunity to tap into high student interest while exposing students to broader concepts about habitats and the environment.

Participation in these lessons will lead students to make global connections and understand higher-level concepts such as photosynthesis and adaptation. Students will explore the natural world and its habitats. They will gain a broader understanding of science as they consider the interplay between environments and living things.

The lesson plans in this guide are tailored for grades 1–3 and can be used together or independently. Each lesson plan is designed to stand alone. As such, they do not have to be used in sequential order. Subject areas include biology, ecology, geography, writing, mathematics, and art. Helpful reproducible worksheets and rubrics appear at the end of the guide. The book titles in the series include:

The Antarctic Habitat

Land Habitats

The Arctic Habitat

A Rainforest Habitat

Backyard Habitats

A Savanna Habitat

The Desert Habitat

Underground Habitats

A Forest Habitat

Water Habitats

A Grassland Habitat

A Wetland Habitat

As students investigate the topics addressed in the guide and become more aware of different environments, they will sharpen their critical thinking skills to work towards creative solutions to worldwide problems. We invite you to jump in and ask questions with your class as you have fun learning more about habitats.

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National Standards Correlation

Lesson Plan Title	Correlation to National Standards
<p>Where Do I Live?</p>	<p>Geography The geographically informed person knows and understands characteristics and spatial distribution of ecosystems on Earth's surfaces.</p> <p>Mathematics Students should be able to apply and adapt a variety of appropriate strategies to solve problems.</p> <p>Science Students should develop understanding of the characteristics of organisms. Students should develop understanding of organisms and environments.</p>
<p>Living or Non-Living?</p>	<p>Language Arts Students should develop reading comprehension skills. Students should develop their ability to express themselves orally.</p> <p>Science Students should develop understanding of the characteristics of organisms. Students should develop understanding of organisms and environments.</p>
<p>Yum, Sun Food!</p>	<p>Mathematics Students should apply appropriate techniques, tools, and formulas to determine measurements.</p> <p>Science Students should develop understanding of the characteristics of organisms. Students should develop understanding of organisms and environments. Students should develop abilities necessary to do scientific inquiry.</p>
<p>Are You Hungry?</p>	<p>Language Arts Students use a variety of technological and information resources to gather and synthesize information and to create and communicate knowledge. Students should develop their ability to express themselves orally.</p> <p>Science Students should develop understanding of the characteristics of organisms. Students should develop understanding of organisms and environments.</p>

Lesson Plan Title	Correlation to National Standards
Power ON!	<p>Language Arts Students should develop reading comprehension skills.</p> <p>Science Students should develop understanding of the characteristics of organisms. Students should develop understanding of organisms and environments.</p>
Hide and Seek	<p>Language Arts Students should develop reading comprehension skills.</p> <p>Science Students should develop understanding of the characteristics of organisms. Students should develop understanding of organisms and environments.</p>
My Perfect Animal	<p>Geography The geographically informed person knows and understands the changes that occur in the meaning, use, distribution, and importance of resources.</p> <p>Language Arts Students should apply strategies to comprehend and interpret texts. Students use the writing process to communicate for a specific purpose.</p> <p>Science Students should develop understanding of the characteristics of organisms. Students should develop understanding of organisms and environments.</p>
The Knowledge Ball	<p>Geography The geographically informed person knows and understands characteristics and spatial distribution of ecosystems on Earth’s surfaces.</p> <p>Language Arts Students should develop their communications skills in reading, writing, and speaking.</p> <p>Science Students should develop understanding of the characteristics of organisms. Students should develop understanding of organisms and environments.</p>

For state specific educational standards, please visit <http://www.crabtreebooks.com/>.

Overview and Scope of Lesson Plan Activities

Lesson Plan Title	Subject Areas	Major Concepts
Where Do I Live?	Geography Science	<ul style="list-style-type: none"> • characteristics of ecosystems • habitats • land and water animals
Living or Non-Living?	Art Science	<ul style="list-style-type: none"> • drawing representations • characteristics of living/non-living things
Yum, Sun Food!	Math Science Writing	<ul style="list-style-type: none"> • measurement • photosynthesis • summarizing information
Are You Hungry?	Science Speaking Writing	<ul style="list-style-type: none"> • characteristics and needs of organisms • carnivore, herbivore, omnivore • researching and summarizing information
Power ON!	Reading Science	<ul style="list-style-type: none"> • transfer of energy in a habitat • research skills
Hide and Seek	Art Science	<ul style="list-style-type: none"> • camouflage • drawing representations
My Perfect Animal	Art Geography Science Speaking	<ul style="list-style-type: none"> • creating imaginative artwork • characteristics of habitats • changes in environments and organisms • oral presentation
The Knowledge Ball	Science Speaking Writing	<ul style="list-style-type: none"> • characteristics of habitats • answering questions • summarizing and organizing information

Pacing Chart and Vocabulary

One class period is approximately 40 minutes.

Lesson Plan Title	Pacing	Vocabulary	Assessment
Where Do I Live?	2–3 class periods	ecosystem environment habitat (arctic, cave, coral reef, desert, forest, grassland, lake, mountain, ocean, pond, rain forest, river, shore, swamp) organism	Check matching cards in game activity. Check reproducible for accurate responses.
Living or Non-Living?	2 class periods	animal living non-living plant	Check for correctly labeled drawing. Check for accurate definitions on reproducible.
Yum, Sun Food!	2 or more class periods (over 2 weeks)	leaf photosynthesis root stem	Check reproducible for correct observations. Check diagram for accurate labeling.
Are You Hungry?	3 class periods	carnivore herbivore omnivore	Check students' food pictures for appropriateness. Check reproducible for correct identification of carnivores, herbivores, and omnivores in each habitat.
Power ON!	2 class periods	carnivore energy food chain herbivore	Check reproducibles for correct responses.
Hide and Seek	1–2 class periods	blending camouflage	Check reproducible for accurate conclusion. Check for correctly labeled pictures of habitats.
My Perfect Animal	2–3 class periods	adaptation	Evaluate students understanding of adaptations using the reproducibles.
The Knowledge Ball	2 class periods	habitats (Antarctic, arctic, backyard, desert, forest, grassland, rain forest, savanna, underground, wetland)	Check reproducible for accuracy. Assess students' answers to oral questions.

Where Do I Live?

A Lesson on Habitats and Their Animal Inhabitants

Content

Students will strengthen their analytical abilities while learning about land and aquatic habitats, including how organisms function within those environments.

National Standards

The following standards will be addressed in this lesson:

Geography

The geographically informed person knows and understands characteristics and spatial distribution of ecosystems on Earth's surfaces.

Mathematics

Students should be able to apply and adapt a variety of appropriate strategies to solve problems.

Science

Students should develop understanding of the characteristics of organisms.

Students should develop understanding of organisms and environments.

Multiple Intelligences

The following intelligences will be activated throughout the lesson:



Interpersonal



Logical-Mathematical



Naturalist



Spatial



Verbal-Linguistic

Prerequisites

Read the books *Land Habitats* and *Water Habitats* to familiarize students with different habitats and the animals that function in those habitats. Students should also review their prior knowledge of habitats.

Materials

- *Land Habitats* and *Water Habitats* books
- pictures or slides of habitats and animals in *Land Habitats* and *Water Habitats*
- paper
- scissors
- pencils or markers
- student copies of the *Where Do I Live?* reproducible
- optional: world map
- optional Internet or other resources

Instructional Procedure

Anticipatory Set

To begin the lesson, show pictures or slides of different types of animals mentioned in *Water Habitats* and *Land Habitats*. Invite students to name the animals and guess their land or water habitats.

Class Discussion

Write *habitat*, *environment*, *ecosystem*, and *organism* on the board, and define these terms with students. Show photos or slides of the different land and water habitats described in the *Water Habitats* and *Land Habitats* books (e.g., arctic, cave, coral reef, desert, forest, grassland, lake, mountain, ocean, pond, rain forest, river, shore, swamp). You may choose to display maps to help students recognize typical locations of each habitat. Discuss the characteristics of each habitat.

Then show slides of animals again, and have students find each animal in the *Water Habitats* or *Land Habitats* books. Ask questions such as the following about each animal:

- What is this animal's habitat?
- How would this animal get food?
- What characteristics of this animal help it to survive?
- What would happen if this animal were put into a different environment?

Distribute the *Where Do I Live?* reproducible to students. As they complete the chart, remind them to draw on information from the discussion. You can also record key responses on the board for students to transfer onto their charts.

Objectives

The student will be able to...

- recognize the diversity of habitats and their organisms
- define *habitat*, *environment*, *ecosystem*, and *organism*
- identify characteristics and needs of land and water animals
- understand how animals depend on their habitats to meet their needs
- analyze how different habitats cause different behaviors

Activity

Place students in pairs and provide each pair with two sheets of paper. Have students cut out 50 rectangles. For a matching game, have students prepare two sets of cards: Animal Cards and Habitat Cards. Direct students to write these names on the Animal Cards:

alligator	arctic hare	bass	bat
clam	coral	crab	crayfish
crocodile	egret	giant panda	giraffe
green tree frog	hippopotamus	iguana	jackrabbit
kangaroo	kit fox	lemming	mountain goat
mountain lion	mussel	polar bear	prairie dog
ring-tailed lemur	river otter	salmon	scorpion
sea slug	sea snail	sea star	snapping turtle
snow leopard	stonefish	tadpole	trout
zebra			

Direct students to write these names on the Habitat Cards:

arctic habitat	cave habitat	desert	grasslands
lake habitat	mountain forest	mountain habitat	pond habitat
rain forest	river habitat	salt water habitat	shore habitat
swamp habitat			

Ask students to lay out the Habitat Cards face up on a table or desk and shuffle the Animal Cards, placing them face down in a pile. Have students take turns drawing an Animal Card and matching it to a Habitat Card, placing it underneath. Remind students that they can use their books or their *Habitat Charts* to verify their matches. For each match, a student scores one point. After students match all the cards, they may reshuffle the Animal Cards and repeat the activity to reinforce their learning.

Answers:

Arctic – arctic hare, lemming, polar bear

cave – bat

coral reef – coral, sea slug, stonefish

desert – iguana, jackrabbit, kit fox, scorpion

grassland – giraffe, kangaroo, prairie dog, zebra

lake – bass, crayfish, trout; pond – tadpole

mountain forest – giant panda

mountain habitat – mountain goat, snow leopard

rain forest – green tree frog, mountain lion,

ring-tailed lemur

river – crocodile, hippopotamus, river otter, salmon

shore – clam, crab, egret, mussel, sea snail, sea star

swamp – alligator, snapping turtle

Accommodations and Extensions

Prepare cards for small groups ahead of time or encourage students to match fewer cards.

As an extension, have students research additional animals and plants that live in each habitat. Have students write the definition of each habitat on the back of each Habitat Card to use as study aids.

Closure

Make sure that students understand the reasons why each animal belongs with its matching habitat. Review how each animal functions in its habitat — how the habitat meets the animal's needs and affects its behavior.

Assessment

This activity tends to be self-evaluating. Matching all of the cards demonstrates students' ability to identify animals with their habitats. Check the number of points a student receives as an indication of mastery. Check reproducible for accurate responses.

Living or Non-Living?

A Lesson on Traits of Living Organisms

Content

Students will practice their reading skills as they develop understanding of the differences between living and non-living things in habitats.

National Standards

The following standards will be addressed in the lesson:

Language Arts

Students should develop reading comprehension skills.

Students should develop their ability to express themselves orally.

Science

Students should develop understanding of the characteristics of organisms.

Students should develop understanding of organisms and environments.

Multiple Intelligences

The following intelligences will be activated throughout the lesson:



Interpersonal



Linguistic



Logical-Mathematical



Naturalist



Spatial

Prerequisites

Read books in the *Introducing Habitats* series with students. Students should review their prior knowledge of different types of habitats.

Materials

- *Introducing Habitats* books
- vinegar
- baking soda
- container for experiment
- paper
- colored pencils or markers
- pictures of living and non-living things
- student copies of the *Living or Non-Living?* reproducible

Instructional Procedure

Anticipatory Set

The concepts of living and non-living can be confusing to young students since they may associate movement and change, and softness with life. Perform a simple experiment that may indicate something living to some students. Put baking soda in a container and add vinegar, allowing the students to see the mixture bubble and foam. Ask students what might lead them to believe that this was a living thing (possible answers: movement or bubbles). Emphasize that these substances are not living, but rather are involved in a chemical reaction. The movement students see is not evidence of life.

Class Discussion

Distribute and have students complete the *Living or Non-Living?* reproducible. Then ask students to raise their hands if they agree with the following statements:

- Living things move
- Living things breathe.
- Living things are soft.
- Living things change.
- Living things grow.
- Living things need food, water, and air.

Show students pictures of the following objects. Discuss whether these items have the traits mentioned above — and whether they are living or non-living:

- a branch (*It's hard, but it's alive.*)
- a cloud (*It grows but is not alive.*)

Objectives

The student will be able to...

- define *living* and *non-living*
- identify elements of specific habitats
- categorize elements of habitats as living or non-living

- an ice cube (*It changes form, but it's not alive.*)
- the moon (*It moves and appears to change, but it's not alive.*)
- a pillow (*It's soft, but it's not alive.*)
- a rock (*It changes by getting mossy, but isn't alive.*)
- running water (*It moves, but it's not alive.*)
- a tree (*It doesn't move, but it's alive.*)
- wind (*It moves, but it's not alive.*)

Ask students to identify the traits on the *Living or Non-Living?* reproducible that apply to all living things (*Living things need food, water, and air*), and have students test this statement against all the items you presented. Help students summarize the definitions of living and non-living based on this exercise.

Activity

Individually or in groups, have students select one of the habitats featured in an *Introducing Habitats* series book and draw a scene from the selected habitat, including as many features as they can fit. Then have students label each item in their drawing as **L** for living or **N** for non-living. As students share their drawings and describe their specific habitats to the class, write the name of each item on the board in one of two columns: *Living* or *Non-Living*.

Accommodations and Extensions

Supply photos or detailed illustrations for students to use instead of asking them to draw their habitats.

Students can also create a diorama scene instead of a drawing.

Give students extra time to prepare their presentations.

As an extension activity, take students outside and ask them to name everything they see as living or non-living. Alternatively, have them examine a small section of ground in detail and list living and non-living things they see.

Closure

Make sure that students understand the characteristics shared by all living things. Based on what they have learned, have them write notes in their science notebook:

- In habitats you find living things—plants and animals. They need air, food, and water to live.
- In habitats you find non-living things—rocks, water, and dirt. They do not need air, food, and water to live.

Assessment

Check to see if the students marked their pictures correctly with **L** or **N** and that the definitions on their reproducible have been revised correctly.

Yum, Sun Food!

A Lesson on Photosynthesis in Plants

Content

Students will use the inquiry method and strengthen their analytical skills as they learn about photosynthesis.

National Standards

The following standards will be addressed in the lesson:

Mathematics

Students should apply appropriate techniques, tools, and formulas to determine measurements.

Science

Students should develop understanding of the characteristics of organisms.

Students should develop understanding of organisms and environments.

Students should develop abilities necessary to do scientific inquiry.

Multiple Intelligences

The following intelligences will be activated throughout the lesson:



Interpersonal



Linguistic



Logical-Mathematical



Naturalist



Spatial

Prerequisites

Read books in the *Introducing Habitats* series with students to familiarize them with how plants function in different habitats.

Materials

- *Introducing Habitats* books
- four plants of the same variety and size
- ruler
- paper, pencils
- water
- petroleum jelly
- dark construction paper
- carrots and other plant foods
- *Yum, Sun Food!* reproducible
- camera for documenting change
- optional: overhead projector and “Parts for Making Food” transparency

Instructional Procedure

Anticipatory Set

Since students often do not associate the food they eat with growing plants, show them a carrot that still has its leaves attached. Explain that the leaves, through the process of photosynthesis, help to create and store food for the plant. Tell students that a carrot’s food is the orange taproot, which we eat. If permitted, hand out carrot slices to eat, and remind students they are eating the food the plant made for itself.

Class Discussion

Review with the students the “Plants Make Food” section with the diagram “Parts for Making Food” in one of the *Introducing Habitats* books. You may wish to display it with an overhead projector. Draw a plant on the board, and ask students to identify and label the parts that are needed for photosynthesis. Discuss how each plant part functions in the process of photosynthesis.

Bring in other food products such as apples, potatoes, celery, and corn. Discuss how these foods grow as parts of plants, and explain that these are foods produced by plants. Plants and animals use this stored food.

Objectives

The student will be able to...

- understand the purpose of photosynthesis
- identify the basic components of photosynthesis as air, sunlight, and water
- investigate what a plant needs from its habitat to survive
- use the inquiry method in a scientific investigation

Activity

Select four of the same type of plant, and label them as follows:

- Plant A: Control plant – will receive air, water, sunlight
- Plant B: Sunlight plant – will receive air, water
- Plant C: Water plant – will receive air, sunlight
- Plant D: Air plant – will receive water, sunlight

For each plant except the control plant, eliminate one of the three components necessary for photosynthesis to occur.

- Plant A: Give it air, water, and sunlight.
- Plant B: Wrap black paper around the plant to eliminate sunlight.
- Plant C: Do not water the plant.
- Plant D: Coat the undersides of one or more of the leaves with petroleum jelly to prevent entry of air.

Have students measure and visually check the plants every three days, using the *Yum, Sun Food!* reproducible to record their observations. When the soil of the control plant is dry, water all of the other plants. Discuss the appearance of the plants with the students. Take photographs every few days so that students have a basis for comparison.

At the end of two weeks, discuss why each plant looks the way it does. Make sure students understand that photosynthesis requires that all the necessary elements be present. If one element is removed, the process cannot occur and the plant will die. Expected results are as follows:

- Plant A will continue to grow as photosynthesis occurs.
- Plant B will die as sunlight cannot reach the leaves.
- Plant C will die as lack of water dries out the roots, stem, and leaves.
- Plant D's leaves will die as air cannot be taken in for photosynthesis to begin.

Accommodations and Extensions

Have students complete the activity in small groups and compare results. They can also record their observations in an illustrated project notebook with diagrams and drawings of the plants at different stages.

An extension activity is to demonstrate a plant's need for light and the process of phototropism: wrap a plant with black paper that has a large hole cut on one side and observe how over time the plant leans toward that side to get sunlight.

You can also have students water an additional test plant with different liquids such as tea, carbonated beverages, and milk.

Closure

Invite students to summarize for the class what they have learned about how photosynthesis helps meet plants' needs. Emphasize that unless plants get what they need for photosynthesis in their habitat, they will not survive.

Assessment

Evaluate reproducible for accurate observations. You can make sure that students understand the concept of photosynthesis by having them draw a plant (with roots, leaves, and stem) and indicate each part's role in photosynthesis. At the bottom of the drawing have them write the word that tells what photosynthesis gives a plant—Answer: food

Are You Hungry?

A Lesson on Carnivores, Herbivores, and Omnivores

Content

Students will sharpen their analytical and research skills as they learn about the types of food that animals eat.

National Standards

The following standards will be addressed in the lesson:

Language Arts

Students use a variety of technological and information resources to gather and synthesize information and to create and communicate knowledge.

Students should develop their ability to express themselves orally.

Science

Students should develop understanding of the characteristics of organisms.

Students should develop understanding of organisms and environments.

Multiple Intelligences

The following intelligences will be activated throughout the lesson:

-  Bodily-Kinesthetic
-  Interpersonal
-  Linguistic
-  Logical-Mathematical
-  Naturalist

Prerequisites

Read books in the *Introducing Habitats* series to familiarize students with animals' food needs. Review with students the use of the index in each book to find out about "food," and suggest that students review these pages.

Materials

- *Introducing Habitats* books
- paper plates, one per pair of students
- food for carnivores, herbivores, and omnivores
- index cards with names of animals from different habitats
- yarn
- paper, pencils
- magazines with pictures of animals from different habitats (or access to web sites and a printer)
- glue
- scissors
- student copies of the *Are You Hungry?* reproducible

Instructional Procedure

Anticipatory Set

Ahead of time, set up three plates containing foods that could be eaten by carnivores, herbivores, and omnivores. Discuss the food, focusing on which items come from plant sources (e.g., fruits, vegetables, leaves, hay) and which come from animal sources (e.g., dried jerky, insects, worms, ham). Discuss the differences, and have the students guess the animals that might eat each plate of food.

Class Discussion

Ask students for definitions of these terms used in the *Introducing Habitats* books:

- *Carnivore* – an animal that eats other animals
- *Herbivore* – an animal that eats plants
- *Omnivore* – an animal that eats plants and other animals

Referring to a specific habitat, ask the students "Which animals in this habitat are carnivores, which are herbivores, and which are omnivores?" Discuss the foods various animals eat.

Objectives

The student will be able to...

- understand that animals have different dietary needs
- define *carnivore*, *herbivore*, and *omnivore*
- recognize that an animal's classification affects its habitat
- understand that humans are omnivores, although people can make dietary choices

Make two large separate yarn loops. Place them on the floor so that they overlap, creating a Venn diagram with a third area in the center. Label the three areas: (left circle) plants, (right circle) animals, (center area) plants and animals. Distribute index cards containing animal names, and have students place each card in the correct area according to the foods eaten. When students are finished, help them label the three areas of the Venn diagram: *herbivores*, *carnivores*, and *omnivores*.

Be sure to give students a card for humans and discuss where it belongs in the Venn diagram. Guide them to understand that humans can eat animals and plants. Some people make the choice to eat only plants, making them *vegetarians*.

As a follow-up, have students complete the *Are You Hungry?* reproducible. Answers are as follows:

Habitat	Carnivores	Herbivores	Omnivores
Antarctic	orca	krill	Antarctic isopod
Arctic	Arctic fox	lemming	ptarmigan
Backyard	hawk, pygmy owl	squirrel, woodchuck	possum
Desert	hawk, kit fox	iguana, jackrabbit	roadrunner
Forest	spotted owl, wolverine	snail, woodrat	wild turkey
Grassland	badger, hawk	prairie dog, rabbit	red fox
Savanna	cheetah, crocodile	eland, rhinoceros	ostrich
Rain Forest	jaguar, puma	capybara, macaw	monkey
Underground	badger, burrowing owl	desert tortoise, prairie dog	nine-banded armadillo
Wetland	alligator, northern water snake	beaver, tadpole	skunk

Activity

Assign pairs of students an animal, and tell the students they must prepare a plate of food for their hungry animals. Require them to do research to find out the types of food that their animal can eat. Have them seek information from the *Introducing Habitats* books, library books, the Internet, and reference books. Suggest that students list the food items as they find them, noting special needs. For example, a student may discover bears eat a variety of berries or fish, depending on the type of bear and its habitat.

Then have students cut out, draw, or print pictures of their animal's foods. Ask them to glue these pictures onto the paper plates, labeling each food item. Invite each pair of students to show the class their animal and explain their plate of food. Have students identify their animal's type of "ivore," or ask the class to guess the animal based on the plate of food.

Accommodations and Extensions

As an alternative, supply a choice of food pictures for students to put on the animals' plates.

For enrichment, take students to a zoo to watch the feeding of different animals. If possible, arrange for a behind-the-scenes tour of the animals' food preparation.

Invite a dietitian, veterinarian, or chef to class to share knowledge of human food needs.

Closure

Hold an "ivore" bee where you provide the names of animals and ask students to identify them as carnivore, herbivore, or omnivore. Ask students "what if" questions, such as the following: *What if plants in a habitat are killed during a fire? What if carnivores in a habitat are infected with illness?* Encourage students to predict how carnivores, herbivores, omnivores, and plants affect each other in a habitat.

Assessment

Check students' food pictures for appropriateness and their reproducibles for correct identification of carnivores, herbivores, and omnivores in each habitat.

Power ON!

A Lesson on How Energy Is Transferred in Living Things

Content

Students will strengthen their analytical ability while learning about how organisms transfer energy through food chains within habitats.

National Standards

The following standards will be addressed in the lesson:

Language Arts

Students should develop reading comprehension skills.

Science

Students should develop understanding of the characteristics of organisms.

Students should develop understanding of organisms and environments.

Multiple Intelligences

The following intelligences will be activated throughout the lesson:



Bodily-Kinesthetic



Interpersonal



Linguistic



Logical-Mathematical



Naturalist



Spatial

Prerequisites

Read books in the *Introducing Habitats* series and familiarize students with the “Getting Energy” pages. Students should also review their prior knowledge of photosynthesis, herbivores, carnivores, and omnivores.

Materials

- *Introducing Habitats* books
- balls, two or three
- yellow, red, and green construction paper (or yarn)
- scissors and glue or tape
- large yellow hoop or ball
- pencils or markers
- student copies of the *Power ON!* reproducible

Instructional Procedure

Anticipatory Set

To begin the lesson, juggle a set of balls or toss a yarn ball with a student in class. Then show a photograph of the sun. See what students think the connection is. Tell students that this lesson will demonstrate how the sun gave you the energy to toss the balls.

Class Discussion

Ask the following questions as you review the “Getting Energy” pages in the *Introducing Habitats* books:

- *Why do animals eat? (to get energy)*
- *Where do animals get their energy? (directly from plant or animal food, indirectly from the sun)*
- *How do plants make energy from the sun? (through photosynthesis)*
- *How do animals get energy from plants and other animals? (by eating plants and/or animals as food)*

Make sure students understand that the transfer of energy from the sun to living things happens in many different ways, but begins with plants using the photosynthesis process to produce food that contains energy. Provide examples of the multiple paths a food chain can take (e.g., sun to plant to mouse to snake to owl). Refer to the food chains on the “Getting Energy” pages of the various *Introducing Habitats* books.

Objectives

The student will be able to...

- identify the sun as the source of energy for plants and animals
- define *food chain*
- understand how energy is produced and transferred in plants and animals
- recognize the interdependence of plants and animals within a habitat

Activity

Place a large yellow hoop or ball in the middle of the room and assign students roles in food chains (e.g., plant, grasshopper, toad, snake, and hawk). Chains will emanate out from the sun, like spokes on a wheel. Have students make paper chains to show their parts in the food chain.

Plants make green paper chains and attach one end to the sun and hold the other end. Animals that eat plants make yellow paper chains, giving one end to the “plant” and holding the other. Animals that eat animals make red paper chains, giving one end to the “animal” and holding the other. Animals that eat both animals and plants make a green paper chain and a red paper chain, giving the green chain to the “plant” and the red chain to the “animal,” then holding both other ends.

Have each student explain his or her role in a particular food chain. Make sure that the students point out the source of their energy. *Example* —Mouse: “I am a mouse, I eat the plant to get energy, and I am food for other animals.”

These are food chains depicted in the *Introducing Habitats* books:

Sun > cactus > jackrabbit > hawk
Sun > clover > woodchuck > hawk
Sun > grass > capybara > puma
Sun > grass > eland > cheetah
Sun > grass > lemming > arctic fox
Sun > grass > prairie dog > badger
Sun > grass > rabbit > hawk
Sun > leaves > woodrat > owl
Sun > plankton > krill > leopard seal
Sun > plant > tadpole > northern water snake

To reinforce the concept of food chains, distribute and have students complete the *Power ON!* reproducible. Answers are as follows:

1. Sun > Plant > Grasshopper > **Toad** > Snake > **Hawk**
2. Sun > **Plankton** > Small Fish > Seal > **Killer Whale**
3. Sun > Nuts > **Squirrel** > Fox > Lynx
4. Sun > Plant > **Mouse** > Snake > Owl
5. Sun > Algae > Shrimp > Codfish > **Seal** > Polar Bear
6. Sun > **Plant** > Insect > Lizard > Hawk
↳ Fox
7. Sun > Plankton > Jellyfish > Tuna > **Shark**
8. **Sun** > Grass > Zebra > Lion
9. Sun > Plants > **Lizard** > Monkey
↳ Monkey
10. Sun > Plants > **Worms** > Turtles
↳ Turtles

Accommodations and Extensions

Extend the activity by having students identify the habitat for each of the food chains. Depending on the sophistication of the class, point out that when an animal dies, its body decomposes and enriches the soil for plants completing the cycle. Dead plants and animals are “eaten” by decomposers, which return minerals and nutrients to the soil.

Closure

Invite students to summarize what they learned about the source of energy and the transfer of energy in plants and animals.

Assessment

Check students’ reproducibles and observe participation in the food chain activity.

Hide and Seek

A Lesson on Camouflage as Protection for Animals in Habitats

Content

Students will strengthen their analytical ability/study skills while learning about how animals can protect themselves within their habitats.

National Standards

The following standards will be addressed in this lesson:

Language Arts

Students should develop reading comprehension skills.

Science

Students should develop understanding of the characteristics of organisms.

Students should develop understanding of organisms and environments.

Multiple Intelligences

The following intelligences will be activated throughout the lesson:



Interpersonal



Linguistic



Logical-Mathematical



Naturalist



Spatial

Prerequisites

Read the books in the *Introducing Habitats* series with students. Students should also review their prior knowledge of camouflage.

Materials

- *Introducing Habitats* books
- large sheet of white paper
- dark marker
- green, brown, and black dried beans and matching colors of construction paper
- paper and pencils
- student copies of the *Hide and Seek* reproducible

Instructional Procedure

Anticipatory Set

Ahead of time, lightly pencil in outlines of arctic animals such as polar bears, arctic hares, and arctic foxes on a large sheet of white paper. To begin the lesson, hold up the paper and tell students that this is a picture of a huge snow pile. Ask them to identify the animals that they can see. As the students point out the animals, outline the animals in dark markers. Ask the students why it would be hard to see these animals in a pile of snow.

Class Discussion

In the *Introducing Habitats* books point out the following examples of animals blending into their habitats:

- Snowshoe hare and white seal in snow – pages 24–25 in *The Arctic Habitat*
- Fox in a log – page 7 of *Backyard Habitats*
- Squirrels on sand – page 31 in *A Desert Habitat*
- Ground squirrel and bobcat in grasses – pages 30–31 in *A Grassland Habitat*
- Moths on fallen leaves – page 29 in *A Rainforest Habitat*
- Rabbit in dried grass, frog on a lily pad – page 24–25 in *A Wetland Habitat*

With each photograph, discuss how the animal is protected by its colors, asking questions such as these:

- *Why is the animal hard to see?*
- *How is the animal protected by its coloring?*
- *Why does this animal want to hide?*
- *What are the ways animals can hide in this habitat?*

Objectives

The student will be able to...

- understand how an animal's appearance helps it survive
- recognize how animals use their surrounding habitats for protection
- give examples of camouflage as a way animals hide in a habitat
- become more familiar with the interrelationships of animals in a habitat

Review the sections of the books on “Blending In,” “Hiding,” “Staying Safe,” and “Hard to See,” and define *camouflage* as anything used to hide. Explain that camouflage helps animals to hide for two reasons: a) so that the animal will not be attacked and used for food and b) so that the animal can successfully hunt for food. Ask students to give examples of each type of camouflage. Make sure they understand that camouflage can help animals at all levels of the food chain survive in their specific habitats.

Activity

Give pairs of students a black piece of construction paper and a certain number of dried black beans. Have partner #1 turn away from the paper and shut his or her eyes while partner #2 spreads the black beans on the construction paper. On a signal, give partner #1 three seconds to count as many beans as possible. Ask each pair to record the data on the *Hide and Seek* reproducible, then switch roles and repeat the activity. Have students repeat with the black beans on green paper and brown paper. Then ask students to repeat the entire process with green and brown beans.

Afterward, discuss when each type of bean was hardest to count and why. Guide students to understand the meaning of the numbers they recorded on their *Hide and Seek*. They should discover that the numbers in the columns where the beans and paper are the same color are lower because those beans were “hiding.”

Accommodations and Extensions

Complete the activity together as a class, using a large cloth in the center of the room.

Introduce the element of texture by staging the bean activity outdoors on grass, dirt, and asphalt.

To apply the concept of camouflage to different habitats, show photos of different animals and discuss the habitat that would best camouflage each animal.

Also, ask students to choose an animal that hasn't been discussed and draw a picture of the animal blending into its habitat.

Closure

Ask students to draw conclusions about what camouflage means and why it helps animals in habitats. Make sure that students can define *camouflage*, recognize the reason for camouflage, and understand how camouflage differs in different habitats.

Assessment

Have students draw and label a picture that shows an animal camouflaged in a habitat. Review students' reproducible for accurate conclusions.

My Perfect Animal

A Lesson on Animal Adaptations to an Environment

Content

Students will strengthen their analytical ability while learning how animals adapt to their environments.

National Standards

The following standards will be addressed in this lesson:

Geography

The geographically informed person knows and understands the changes that occur in the meaning, use, distribution, and importance of resources.

Language Arts

Students should apply strategies to comprehend and interpret texts.

Students use the writing process to communicate for a specific purpose.

Science

Students should develop understanding of the characteristics of organisms.

Students should develop understanding of organisms and environments.

Multiple Intelligences

The following intelligences will be activated throughout the lesson:



Interpersonal



Linguistic



Logical-Mathematical



Naturalist



Spatial

Prerequisites

Read the books in the *Introducing Habitats* series with students and also review their prior knowledge of traits that help plants and animals meet their needs in their habitats.

Materials

- *Introducing Habitats* books
- hiking boots, helmet, down vest, rope, compass, walking stick, handheld GPS or map (or other clothes and objects that would indicate adaptations to a specific habitat)
- whiteboard and markers
- poster board, drawing paper, or clay
- crayons or markers
- feathers, fabrics, and glue
- pencil and paper
- student copies of the *My Perfect Animal* reproducible
- student copies of the *My Perfect Animal: Grading Rubric* reproducible

Instructional Procedure

Anticipatory Set

Appear in class dressed in and holding a variety of items such as hiking boots, a helmet, down vest, rope, compass, walking stick, handheld GPS, or map.

Tell the students that you are ready to live in a certain habitat. Ask them to guess what that habitat would be (e.g., mountain habitat), and explain how the items you are wearing or holding will help you to survive.

Class Discussion

Talk with students about different climate types. Ask them to think about how climate affects plants and animals (including humans).

Place students in small groups, and assign each group one of the *Introducing Habitats* books. Tell students to determine which characteristics help the animals of that habitat to survive in the environment. As an example, show the photo on page 23 of *A Wetland Habitat* and explain that the spoonbill's long beak helps it to survive in a marshy wetland habitat by allowing it to catch small fish. Likewise, ask students how these adaptations help:

- Baobab tree's trunk (*stores water in dry savanna habitat*)
- Kangaroo rat's big eyes (*help it see in underground habitat*)
- Snowshoe hare's big feet (*help it run on snow in Arctic habitat*)

Objectives

The student will be able to...

- understand how animals meet their needs in an environment
- define *adaptation*
- recognize how adaptations allow animals to survive in their habitats
- become familiar with the interrelationships between animals and habitats

Have each group make a chart with two columns: Habitat and Animal Traits. In the Habitats column have students describe the habitat. In the Animals column have students list traits that help animals survive in that habitat.

Invite each group to explain its list to the class. As the students report, make a list on the board. Make sure that students understand how animals' traits help them to survive, e.g., that fur keeps animals in cold climates warm and gills allow animals to breathe underwater.

Ask students how plants and animals respond when habitats change. Explain that over generations many plants and animals adapt to their changing habitats, while others that cannot adapt die out. Successful adaptations allow plants and animals to function better in a different environment. Discuss how plants and animals might adapt to these environmental changes:

- Buildings and streets take over open lands
- Climate becomes warmer
- Forest fires destroy trees
- Streams dry up

Activity

Tell the students that they have learned to determine what makes animals successful at adapting to different environments. Have students use poster board or drawing paper to draw their animals or clay to construct 3-D figures. Encourage them to use the extra materials to make their animal adaptable to every habitat.

Hand out the *My Perfect Animal* reproducible, directing students to answer the questions about their animals. At the same time, share the *Grading Rubric* reproducible that you will use and remind students of the rubric requirements. When everyone is finished, have each student share his or her perfect animal with the rest of the class.

Accommodations and Extensions

Depending on the availability of computers and software, allow students to use computer software to create their perfect animal on the computer screen.

Extend the lesson by considering unusual plant adaptations such as insect-eating plants.

Closure

Guide students to summarize the main ideas about adaptations:

- animals and plants have traits to help them survive in their habitat
- over time they can change and adapt to changing surroundings
- animals and habitats are interconnected

Assessment

Evaluate students' understanding of adaptations using the *My Perfect Animal* and *My Perfect Animal: Grading Rubric* reproducibles.

The Knowledge Ball

A Lesson on Reviewing Habitats

Content

Students will strengthen their analytical ability while reviewing important ideas about different habitats.

National Standards

The following standards will be addressed in this lesson:

Geography

The geographically informed person knows and understands characteristics and spatial distribution of ecosystems on Earth's surfaces.

Language Arts

Students should develop their communications skills in reading, writing, and speaking.

Science

Students should develop understanding of the characteristics of organisms.

Students should develop understanding of organisms and environments.

Multiple Intelligences

The following intelligences will be activated throughout the lesson:



Bodily-Kinesthetic



Interpersonal



Linguistic



Logical-Mathematical



Naturalist



Spatial

Prerequisites

Read the books in the *Introducing Habitats* series with students and review their prior knowledge of habitats.

Materials

- *Introducing Habitats* books
- beach balls or playground balls, one per group
- permanent markers or labels
- student copies of *The Knowledge Ball* reproducible

Instructional Procedure

Anticipatory Set

In advance, print one word on a ball: *habitat*. Toss the ball to one person. Ask that person to find the word on the ball and tell you a fact about the term *habitat*. Explain that this is a knowledge ball, but at the moment it only has one word on it. The knowledge is missing! Tell the students they will help put information on the ball so the game can continue.

Classroom Discussion

Assign the students to groups, and assign one of the *Introducing Habitats* books to each group. Each group will be responsible for finding and writing the most important words and concepts about that habitat on a ball.

As students review the books, ask them to choose key words and information about their habitat that should be included on the knowledge ball. For example, the following terms could be on the savanna habitat ball:

acacia tree	Africa	baboon	baobab tree
cheetah	few shrubs	fire	flat land
gazelle	giraffe	grasses	hippopotamus
hot	hyena	meerkat	monitor lizard
nyala	ostrich	queles	rhinoceros
secretary bird	spring hare	storms	wildebeest

Hand out *The Knowledge Ball* reproducible to help students identify key points about their habitat. Check the lists as the students compile the information to make sure that they are on target. If students need help identifying the location of habitats, assist them with maps. After key terms have been chosen, have the group scribes carefully print the words, spreading them all over the ball.

Objectives

The student will be able to...

- identify the key features of an environment
- understand the characteristics of different habitats

Activity

Have students use the knowledge balls to review the basic concepts and information about the different habitats. Arrange the students in a circle, and announce the rules of the game:

- Students will gently toss or roll one of the knowledge balls to each other.
- As Student A tosses the ball to Student B, Student A tells Student B to say the word under a specific finger on a specific hand (e.g., *giraffe*).
- Student A asks a question about that word, and Student B gives the answer. (*What food do giraffes find in the savanna habitat? Leaves at the top of a tree.*)
- Student A declares the answer correct or offers the correct answer.
- The process is repeated with Student B tossing the ball to Student C, etc., until everyone gets an opportunity to toss and receive the knowledge ball.

Follow this process with the knowledge ball for each habitat.

Accommodations and Extensions

If writing on a ball is problematic, use labels instead. Based on your knowledge of students' strengths or needs, assign different roles, such as word researchers, picture researchers, fact checkers, scribes, and materials managers.

Have students make flashcards with the basic terms for each habitat and use the cards to review characteristics of the various habitats.

Closure

As you show photos of each of the habitats, have students summarize basic characteristics. Make sure students realize what makes the various habitats distinctive.

Assessment

Review students' reproducible and evaluate their questions and responses during the activity.

Where Do I Live?

Directions: List features of each habitat and two animals or plants that live there.

Habitat	Features	Animals/Plants
Arctic		
Cave		
Coral reef		
Desert		
Forest		
Grassland		
Lake		
Mountain		
Ocean		
Pond		
Rain forest		
River		
Shore		
Swamp		

Living or Non-Living?

Directions: Circle A for each statement you agree with. Circle D for each statement you disagree with.

A D 1. Living things can move.

A D 2. Living things are soft.

A D 3. Living things can breathe.

A D 4. Living things change.

A D 5. Living things grow.

A D 6. Living things need food, water, and air.

7. What is the definition of a "living thing"?

8. What is the definition of a "non-living thing"?

Yum, Sun Food!

Directions: Complete the following chart. Describe the plant's size, color, and what it looks like.

	Plant A <i>(receives air, water, and sunlight)</i>	Plant B <i>(receives air and water)</i>	Plant C <i>(receives air and sunlight)</i>	Plant D <i>(receives water and sunlight)</i>
Day 1	Size: Color: Appearance:	Size: Color: Appearance:	Size: Color: Appearance:	Size: Color: Appearance:
Day 4	Size: Color: Appearance:	Size: Color: Appearance:	Size: Color: Appearance:	Size: Color: Appearance:
Day 7	Size: Color: Appearance:	Size: Color: Appearance:	Size: Color: Appearance:	Size: Color: Appearance:
Day 10	Size: Color: Appearance:	Size: Color: Appearance:	Size: Color: Appearance:	Size: Color: Appearance:
Day 13	Size: Color: Appearance:	Size: Color: Appearance:	Size: Color: Appearance:	Size: Color: Appearance:

Are You Hungry?

Directions: Write the names of the following animals in the correct box: alligator, Antarctic isopod, Arctic fox, badger, beaver, burrowing owl, capybara, cheetah, crocodile, desert tortoise, eland, hawk, iguana, jackrabbit, jaguar, kit fox, krill, lemming, macaw, monkey, nine-banded armadillo, northern water snake, orca, ostrich, possum, prairie dog, ptarmigan, puma, pygmy owl, rabbit, red fox, rhinoceros, roadrunner, snail, spotted owl, squirrel, tadpole, turkey, wild skunk, wolverine, woodchuck, and woodrat.

Hint: Use your *Introducing Habitats* books for clues. Some names may be used twice. (One row has been completed for you.)

Habitat	Carnivores	Herbivores	Omnivores
Desert	kit fox, hawk	iguana, jackrabbit	roadrunner
Antarctic			
Arctic			
Backyard			
Forest			
Grassland			
Rain forest			
Savanna			
Underground			
Wetland			

Power ON!

Directions: Fill in the blanks to complete these food chains. Use the *Introducing Habitats* books to help you.

1. Sun > Plant > Grasshopper > _____ Snake > _____

2. Sun > _____ > Small Fish > Seal > _____

3. Sun > Nuts > _____ > Fox > Lynx

4. Sun > Plant > _____ > Snake > Owl

5. Sun > Algae > Shrimp > Codfish > _____ > Polar Bear

6. Sun > _____ > Insect > Lizard > Hawk
↳ Fox

7. Sun > Plankton > Jellyfish > Tuna > _____

8. _____ > Grass > Zebra > Lion

9. Sun > Plants > _____ > Monkey
↳ Monkey

10. Sun > Plants > _____ > Turtles
↳ Turtles

Hide and Seek

Directions: In this activity, you will count beans on different colors of paper. After each three-second count, record your total on the chart.

	Black Paper	Green Paper	Brown Paper
Black Beans			
Green Beans			
Brown Beans			

When the colors of the paper and beans match, do you have larger or smaller numbers? Why?

My Perfect Animal

Directions: Imagine a "perfect animal" for a specific habitat. Answer these questions to help make your animal "perfect."

What is the name of your animal? _____

What is its habitat? _____

What adaptations does your animal have that help it live successfully in its habitat?

Adaptation #1: _____

How is this adaptation helpful?

Adaptation #2: _____

How is this adaptation helpful?

Adaptation #3: _____

How is this adaptation helpful?

Adaptation #4: _____

How is this adaptation helpful?

My Perfect Animal Grading Rubric

3	2	1
Student's Perfect Animal could exist in many habitats.	Student's Perfect Animal could exist in just a few habitats.	Student's Perfect Animal could exist in only 1 habitat.
Student's Perfect Animal is complete and has many qualities of real animals.	Student's Perfect Animal is almost complete and has qualities of real animals.	Student's Perfect Animal is not finished.
Student is able to clearly explain the different attributes of the Perfect Animal.	Student is able to explain some of the different attributes of the Perfect Animal.	Student does not display or explain the Perfect Animal.

Rubric Score: _____ out of 9 possible points

Written Comments:

The Knowledge Ball

Directions: Fill in the name of the habitat your group is assigned. Then write key words about important aspects of your habitat.

My Habitat: _____

Land Features: _____

Location: _____

Climate: _____

Weather: _____

Plants: _____

Animals: _____
