



Life Science

Plant and Animal Adaptation

On Level

How Animals Survive

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How Animals Survive

How are animals well-suited to live in their environments?

CORE CURRICULUM STATEMENTS

Individual organisms and species change over time.

Each animal has different structures that serve different functions in growth, survival, and reproduction.

- wings, legs, or fins enable some animals to seek shelter and escape predators
- the mouth, including teeth, jaws, and tongue, enables some animals to eat and drink
- eyes, nose, ears, tongue, and skin of some animals enable the animals to sense their surroundings
- claws, shells, spines, feathers, fur, scales, and color of body covering enable some animals to protect themselves from predators and other environmental conditions, or enable them to obtain food
- some animals have parts that are used to produce sounds and smells to help the animal meet its needs
- the characteristics of some animals change as seasonal conditions change (e.g., fur grows and is shed to help regulate body heat; body fat is a form of stored energy and it changes as the seasons change)

In order to survive in their environment, plants and animals must be adapted to that environment.

- animal adaptations include coloration for warning or attraction, camouflage, defense mechanisms, movement, hibernation, and migration

Organisms maintain a dynamic equilibrium that sustains life.

Animals respond to change in their environment (e.g., perspiration, heart rate, breathing rate, eye blinking, shivering, and salivating).

Some animals, including humans, move from place to place to meet their needs.

Particular animal characteristics are influenced by changing environmental conditions including: fat storage in winter, coat thickness in winter, camouflage, shedding of fur.

Some animal behaviors are influenced by environmental conditions. These behaviors may include: nest building, hibernating, hunting, migrating, and communicating.

Plants and animals depend on each other and their physical environment.

When the environment changes, some plants and animals survive and reproduce, and others die or move to new locations.

On Level



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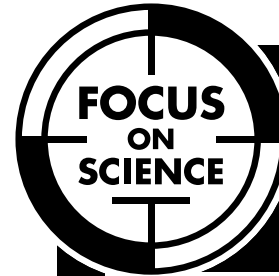
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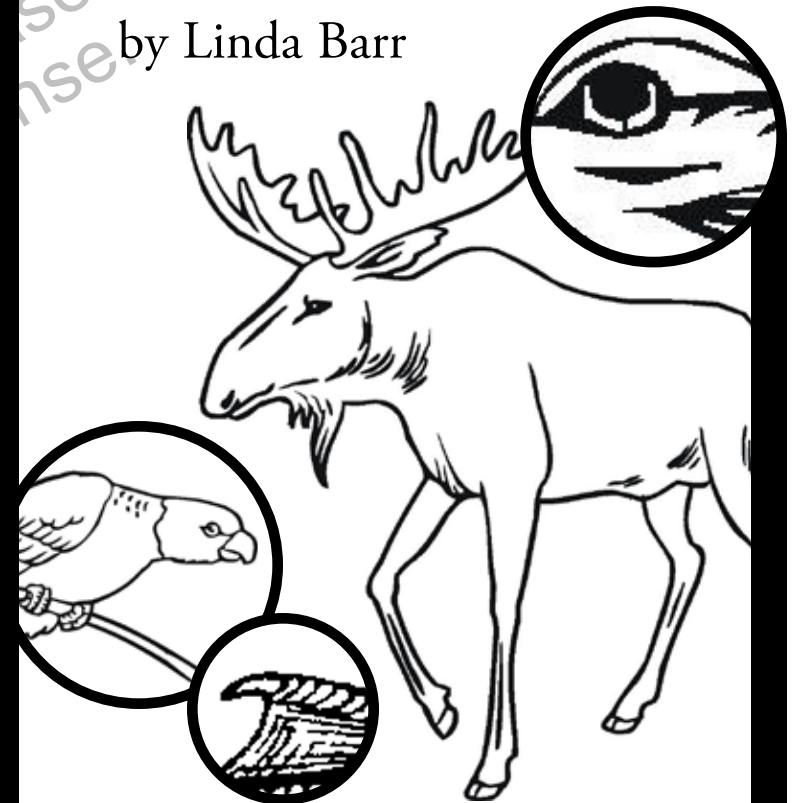


Life Science

Plant and Animal Adaptation

How Animals Survive

by Linda Barr





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Curriculum materials for **your** content standards

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INTRODUCTION

Classifying Animals

Millions of animals are born on Earth every year. Scientists classify all these animals into two groups—vertebrates and invertebrates.

Invertebrates are animals with no bones such as spiders, insects, jellyfish, and earthworms. Vertebrates are animals that have cartilage or bones.

Vertebrates can be further divided into two groups—warm-blooded and cold-blooded. A warm-blooded animal is like you. It keeps its body temperature the same.

A cold-blooded animal doesn't keep its body temperature the same. It changes according to the surroundings. The chart on the next page describes five different types of vertebrates.

Warm-Blooded Vertebrates	
Mammals	Have hair or fur Breathe air Feed their young milk
Birds	Have wings and feathers Breathe air Lay eggs
Cold-Blooded Vertebrates	
Fish	Have scales, fins, and tails Breathe underwater using gills
Reptiles	Have dry skins and scales Breathe air Lay eggs
Amphibians	Have smooth, wet, or slimy skins Spend part of their life in water and part on land

You and every animal have the same basic needs—food, water, oxygen, space, and shelter.

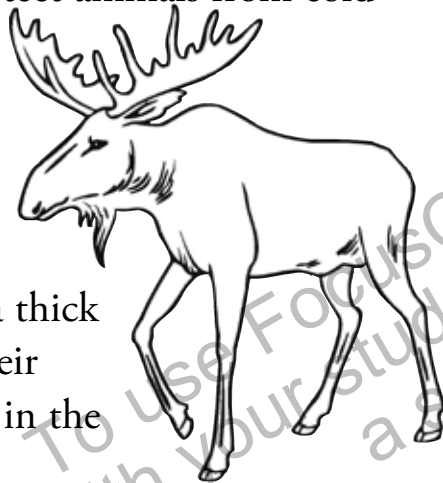
It's not easy for animals to meet these basic needs. However, they have special body parts that help. They also behave in ways that help them get what they need. In this book, you will find out what helps these animals **survive**.

survive: to remain alive

Body Parts for Survival

Fur and Feathers

Body coverings help animals in many ways. Fur and feathers protect animals from cold weather. Many animals, such as moose, have one or two layers of thick fur. Walruses and other animals have a thick layer of fat under their fur. It helps to keep in the warmth.



Birds fluff up their feathers when the cold winds blow. Fluffy feathers trap air, like a sleeping bag. That helps keep the birds warm.

–Transfer–
How does your body covering help you survive?

Scales keep desert animals from drying out. The desert is very dry. Animals living there must survive with very little water. The scales covering snakes and lizards help keep water in their bodies.

Body covering helps animals hide from **predators**. Many birds and insects are green or brown. They blend in with their surroundings. That makes it harder for hawks and other predators to spot them.

Body covering also helps animals sneak up on their **prey**. Wolves and other predators are colored like their surroundings. It's hard for their prey to see them coming.

predator: an animal that eats other animals; examples: lion, wolf, hawk

prey: an animal that is eaten by other animals; examples: mouse, rabbit, bird

Body covering protects animals from predators in other ways. Have you ever seen an armadillo? It is covered with bony plates. Most predators cannot bite through them. Porcupines are covered with sharp quills. Turtles have hard shells.

Insects, snails, clams, lobsters, and many other animals also have shells or hard body coverings. They are invertebrates. They do not have bones. Instead, their shells or body coverings protect and support their bodies.

Body coverings can make some animals look like other animals. The monarch butterfly tastes bad to birds. The viceroy butterfly tastes good. However, the viceroy looks like a monarch. Birds cannot tell them apart. So they do not eat either butterfly.

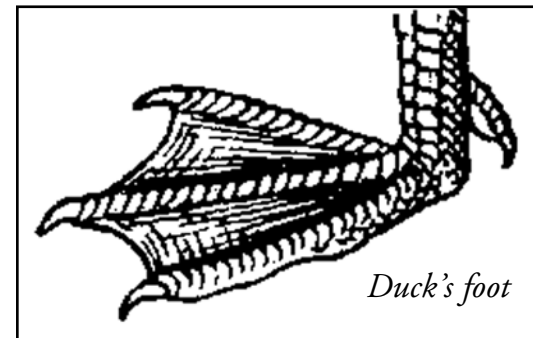
–Summarize–
Describe the ways that body coverings
help animals survive.

Fins and Feet

Animals often try to swim, run, or fly from predators. Fins, feet, and wings also help animals catch their food.

Some animals have special fins or feet. For example, flippers help whales and sea lions dive deep in water. Webbed feet help frogs and ducks swim fast. Long toes help birds hold on to tree branches. Monkeys can use their hands and feet to swing from branch to branch.

Deer and other animals have hooves that protect their feet. Special hooves help bighorn sheep scramble up slippery mountain cliffs. Large back legs help rabbits and kangaroos out-hop their predators.



Duck's foot

Necks and Tongues

Why do giraffes have such long necks? So they can reach the highest leaves on the trees. Antelopes and other plant-eaters cannot reach those leaves.

Giraffes also have long tongues. Their tongues let them reach even farther in trees. An octopus doesn't have a tongue. It can taste things with its **tentacles**. It does not have to get close to see if something is good to eat.

Elephants use their trunks to grab food. Anteaters use their long noses and long, sticky tongues to capture ants. Keep reading to find out about other special parts that help animals meet their needs.

tentacle: a long, thin, flexible arm that can reach out and grab things; found on octopuses and squid

Eyes and Ears

Hawks can spot mice while flying far above them. Sharp eyesight helps many predators find food. It also helps animals see predators in time to get away.

Many animals can hear really high or really low sounds. People cannot hear these sounds. This "super hearing" helps animals know when predators are tiptoeing toward them. Mice can hear the whoosh of hawks' wings!

Some animals can feel other animals getting closer. For example, ants can feel movement through two inches of soil. Crabs have special hairs on their claws. The hairs help them feel movement in the water.

–Connect–

How do your eyes and ears help you survive?

Claws and Teeth

Claws and teeth help animals protect themselves. They also help animals eat their food.

Different animals have different types of teeth. Wolves have sharp teeth for catching and eating their prey. Cows have strong, flat teeth for grinding up tough grasses. Like a wolf, you have sharp teeth for biting. Like a cow, you have flat teeth for chewing.

Sharks have super-sharp teeth to catch and eat prey. Their teeth fall out easily. Then they grow new ones. One shark might have 20,000 teeth during its life!

Different birds have different beaks. Their beaks help them eat different types of food. Look at the different beaks on the next page.

–Apply–

A scientist finds a new type of bird. Why must this scientist describe the bird's beak very carefully?

Beaks and Bills

Eagle

Eagles and hawks have strong, sharp beaks. These beaks help them catch and eat small prey.



Woodpecker

Woodpeckers and many other birds eat insects. They need pointed beaks to reach the bugs crawling under tree bark.



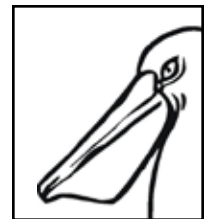
Parrot

The parrot's strong, curved bill helps it open seeds and nuts.



Pelican

Pelicans store fish in their large bills so they can feed their babies.



Behaviors for Survival

Migrating

With a thick coat of fur and fat, some animals can survive the coldest weather. However, when fall turns into winter, some animals must change their behavior. If not, they will not survive the cold days ahead.

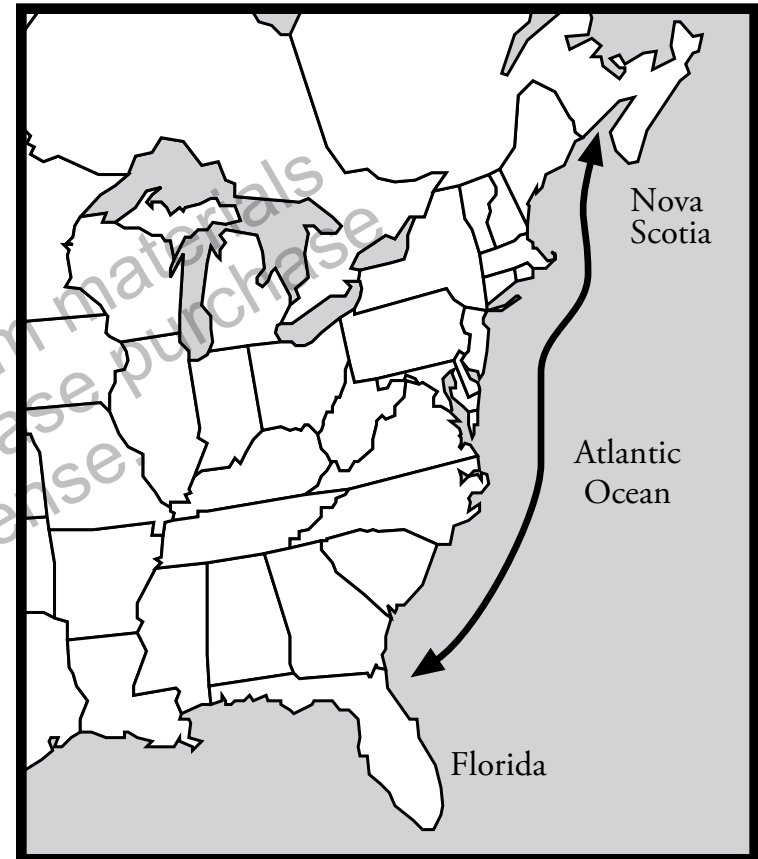
When the weather gets chilly, many animals leave. The plants or animals they eat will soon be hard to find. They cannot keep themselves warm in cold weather. So they migrate to a warmer place. Many kinds of birds head south for the winter. Butterflies, whales, and other animals also migrate. When spring comes, they head back north again.

–Propose–

What types of investigations do you think scientists use to learn about the migration of whales?

migrating: traveling from one place to another and back again

The Migration of the Right Whale



One whale was named because it was the “right whale” to hunt. It is slow and big. Now few right whales survive. Every fall, the ocean near Nova Scotia in Canada gets very cold. The right whales leave and swim all the way to the coast of Florida. In the warm water there, they can find the tiny fish they need to eat. In the spring, these whales migrate back to the waters of Nova Scotia.

Hibernating

Other animals sleep through the winter. First, they eat a lot of food. That stores fat in their bodies. Next, they find a safe place, such as a hole in a tree or in the ground. Then they hibernate, or go into a deep sleep.

As an animal hibernates, its heart slows down. Its body gets cooler. It breathes less often. Instead of eating, its body uses the stored fat to stay alive.

Hibernation helps the animal survive. If it did not hibernate, it would starve or freeze to death. Some types of mice, chipmunks, ground squirrels, and bats hibernate.

–Evaluate–

Why don't all animals hibernate during the winter?

hibernating: going into a very deep, sleep-like state for a long while

Some animals only seem to hibernate, but don't go into a deep sleep. Instead, they go into a **dormant** state. Most bears and frogs go dormant during the winter. Bears crawl into a den. Frogs dig into the mud. Some snakes go dormant, too.

While these animals are dormant, their hearts slow down. They breathe less often. Their bodies cool off, but not as much as hibernating animals. Dormant animals can wake up once in a while during winter. They might even move around and eat on warm days. Some mother bears have babies while they are dormant.

Don't poke a dormant bear! It might wake up quickly—and be very hungry!

–Distinguish–

What is the difference between hibernating and being dormant?

dormant: a state of being alive but not moving or growing

Hiding

You know that some body coverings help animals **camouflage** themselves, or blend in with their surroundings. Behaviors help them blend in, too. For example, chameleons change color. Their skin has a type of paint in it. It has four colors—red, yellow, blue, and white. Their bodies mix these colors to match their surroundings. A chameleon can change color in 20 seconds!

Other animals hide by standing still. Predators do not see them. Opossums and many kinds of snakes pretend to be dead. They lie very still. They let their mouths fall open. They do not move. After the predator leaves, the animal hurries to safety.

–Predict–

What is an animal's risk of pretending to be dead?

camouflage: to disguise in order to hide

Fighting Back

Many animals survive by fighting their predators. Some use their teeth, claws, or feet. Others use horns, antlers, or wings. Some animals, such as wasps, sting. Others, such as skunks, use smell to chase predators away. Porcupines can shoot their quills at predators.

Some animals, such as the puffer fish, make themselves look larger. That often scares off predators. Others make a lot of noise. Have you ever heard two cats fight? Then you know how loud angry animals can get!

Like you, animals must meet their basic needs. Like you, they use their body parts and behaviors to stay alive.

Disappearing Animals

Animals adapt to their environments. But what happens when a big change occurs in the environment?

Sometimes animals cannot adapt and they move to a new location. If they are not able to move, they will die.

In recent years, the number of orca whales living off the coast of Washington has declined. Salmon is their main food source. But people have overfished—or taken too many fish out of the water. The whales do not have enough to eat.

Orcas are facing other threats, too. One of these is noise pollution, or sound that is harmful. Orcas use their sense of hearing to find prey. But boats, ships and other human activities are adding noise to the water. This noise makes it more difficult for orcas to locate food.

It is not always easy to know why an animal population declines.

Scientists' studies suggest that the numbers of frogs, toads, and salamanders have been declining rapidly over the last 20 years in the Sierra Nevada Mountains. They wonder why these animal populations seem to be disappearing when they have survived on Earth since before dinosaurs. These scientists are asking:

- Are the populations of frogs, toads, and salamanders really declining, or is it a natural cycle occurring?
- Are people involved somehow in the decline of these animals?
- Has their habitat changed in recent years?
- If their habitat has changed, how are these animals affected by the change?
- What can be done to stop the trend in declining populations?

Glossary

camouflage—to disguise in order to hide

dormant—a state of being alive but not moving or growing

hibernating—going into a very deep, sleep-like state for a long while

migrating—traveling from one place to another and back again

predator—an animal that eats other animals; examples: lion, wolf, or hawk

prey—an animal that is eaten by other animals; examples: mouse, rabbit, or bird

survive—to remain alive

tentacle—a long, thin, flexible arm that can reach out and grab things; found on octopuses and squid

To Find Out More . . .

Want to learn more about how animals survive?

Try these books

Amazing Arctic Animals by Jackie Glassman. Grosset and Dunlap, 2002.

Armor to Venom: Animal Defenses by Phyllis J. Perry. Franklin Watts, 1998.

Claws, Coats, and Camouflage by Susan E. Goodman. Millbrook Press, 2001.

How Do Animals Adapt? by Bobbie Kalman. Crabtree, 2000.

What Are Camouflage and Mimicry? by Bobbie Kalman. Crabtree, 2001.

What Do Animals Do in Winter? by Melvin and Gilda Berger. Ideals, 1995.

What Is Migration? by John Crossingham and Bobbie Kalman. Crabtree, 1997.

Access this Web site

Amazing Animal Senses
<http://faculty.washington.edu/chudler/amaze.html>

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Published by FOCUScurriculum

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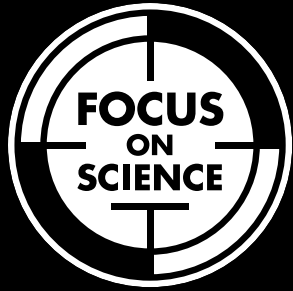
Order Number: LS-2201

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Assessments

How Animals Survive

Print pages 20–22 of this PDF for the assessments.

Check Understanding

Shade the circle next to the correct answer or write your answers on the lines provided.

1. A green chameleon climbs onto a brown tree trunk. Less than one minute later, the chameleon is brown, too. This behavior is an example of
 - Ⓐ migration
 - Ⓑ hibernation
 - Ⓒ camouflage
 - Ⓓ fighting back
2. Hibernation helps animals to
 - Ⓐ find food
 - Ⓑ stay warm
 - Ⓒ feel movement
 - Ⓓ hear predators

Note that question 3 has only three choices.

3. The shape of a bird's beak suggests
 - Ⓐ what kind of food it eats
 - Ⓑ how fast it can swim
 - Ⓒ whether it migrates
4. Describe **two** types of body coverings that help animals.

(1) _____

(2) _____

Check Understanding

Shade the circle next to the correct answer or write your answers on the lines provided.

5. Scientists classify animals into two groups called

- Ⓐ migrators and hibernators
- Ⓑ mammals and birds
- Ⓒ vertebrates and invertebrates
- Ⓓ fish and reptiles

Note that question 6 has only three choices.

6. Animals that cannot adapt to their environment will

- Ⓐ relocate or die
- Ⓑ hibernate or migrate
- Ⓒ learn to swim or to fly

7. The picture below shows a moose.



Identify **one** body part that helps the moose survive.

Explain how this body part helps the moose survive.

Assessment Scoring Guidelines

1. Answer C is correct.

2. Answer B is correct.

3. Answer A is correct.

4. Fur protects animals from the cold

Feathers protect animals from the cold

Coloring helps animals blend in with their surroundings.

Scales keep desert animals from drying out.

5. Answer C is correct.

6. Answer A is correct.

7. **Antlers**

The moose uses the antlers to fight back against predators.

Fur

The thick layer of fur keeps the moose warm during winter.

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English Language Arts Activities

How Animals Survive

Print pages 24–28 of this PDF for the reading activities.

Summarize Main Ideas

TRY THE SKILL

Summarizing means retelling the main ideas of something you have read using as few words as you can. Summarizing helps you understand what you read.

Read this paragraph.

With a thick coat of fur and fat, some animals can survive the coldest weather. Polar bears are one example. Yet few animals can do this. Instead, when fall turns into winter, those animals must change their behavior. If not, they will not survive the cold days ahead.

Is this sentence a good summary of this paragraph?

Polar bears can survive the coldest weather.

No! This is not the main idea of the paragraph. Is the sentence below a good summary?

Some animals must change their behavior to survive cold winters.

Yes! This is the main idea of the paragraph.

Read the paragraphs. Shade the circle next to the best summary.

1. Why do giraffes have such long necks? That way, they can reach the highest leaves on the trees. Antelopes and other plant-eaters cannot reach those leaves.
 - Ⓐ Giraffes can reach the highest leaves on the trees.
 - Ⓑ Giraffes have long necks to help them get enough food.
 - Ⓒ Antelopes need to have longer necks.
 - Ⓓ Giraffes eat only the highest leaves on the trees.
2. Giraffes also have long tongues. Their tongues let them reach even farther. An octopus doesn't have a tongue. It can taste things with its tentacles. It does not have to get close to see if something is good to eat.
 - Ⓐ Different body parts help animals get food.
 - Ⓑ An octopus can taste things with its tentacles.
 - Ⓒ An octopus does not need a tongue.
 - Ⓓ Both giraffes and frogs have long tongues.

Classify Information

TRY THE SKILL

Graphic organizers help you understand information by taking it out of the text and putting it in the form of a picture. Often, when you see a set of facts, the facts make more sense than when you read them in the text.

Use this organizer to classify several animals according to their characteristics.

Animals Classifications			
Animal	Type	Body Parts	Behaviors

Use the information in the chart to write a summary comparing and contrasting the characteristics of two animals.

Use Context Clues

TRY THE SKILL

Some words have several meanings. You can use the rest of the sentence to decide which meaning is being used. For example, here are two meanings of the word *hard*.

“not soft”

A turtle has a hard shell.

“difficult”

It’s hard to figure out whether an animal is hibernating or dormant.

Here are two meanings of the word *second*.

“after the first”

The bear was the second animal to enter the cave.

“part of a minute”

The chameleon changed color in 20 seconds.

Read each word and its meanings. Then read each sentence and write the letter of the correct meaning on the line.

store A. to save B. a place that sells things

1. Before hibernating, squirrels _____ food in their bodies.

match A. a stick used to light a fire B. look like

2. Brown fur helps wolves _____ their surroundings.

back A. not the front B. to go where you have been

3. In the spring, whales migrate _____ north.

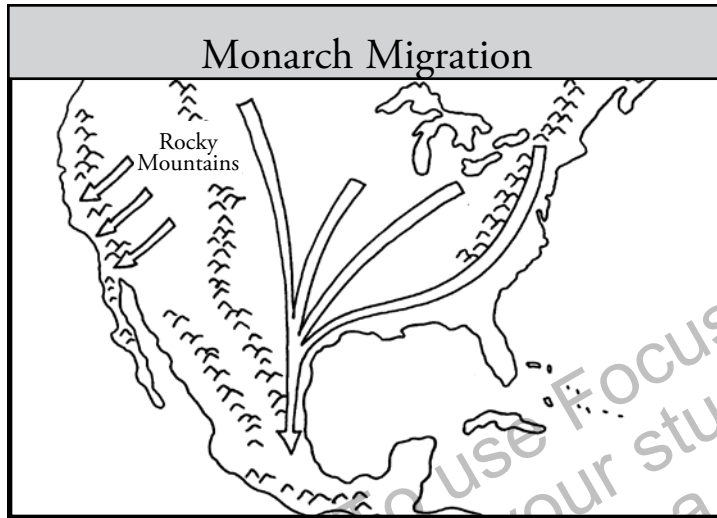
spot A. see B. a mark

4. An eagle can _____ its prey from high overhead.

Draw Conclusions

TRY THE SKILL

After you read the title and labels on a map, study what it shows. Then you will be ready to draw conclusions, or make decisions about what is shown on the map.



What can you tell from this map?

Notice the little pointy shapes that are labeled “Rocky Mountains.” You can see other pointy shapes on the map, too. You know some of these shapes are mountains, so you can conclude that they all are.

The mountains in the eastern United States are the Appalachians. Near the West Coast are the Cascade and the Sierra Nevada Mountains. This map shows that some of the mountains in the United States continue into Mexico.

Shade in the circle next to the correct answer.

1. What do the arrows on this map show?
 - (A) how many monarchs migrate every year
 - (B) when the monarchs migrate
 - (C) where the monarchs migrate
 - (D) the direction that monarchs fly in the spring
2. What does the map show?
 - (A) All of the monarchs in the United States migrate to Mexico.
 - (B) The monarchs never cross mountains.
 - (C) The monarchs in the eastern states migrate to the East Coast.
 - (D) The monarchs in the western states migrate to the West Coast.
3. What else does the map show?
 - (A) Few monarchs fly over the Rocky Mountains.
 - (B) The monarchs migrate back north every spring.
 - (C) Monarchs live all over North America.
 - (D) Many monarchs do not survive the migration.

Answer Key

Summarize Main Ideas

1. B
2. A

Classify Information

1. Classifications will vary based on animals chosen.

Use Context Clues

1. A
2. B
3. B
4. A

Draw Conclusions

1. C
2. D
3. A

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