

Animals: *Discussion Guide*

Overview

Furry monkeys, gelatinous jellyfish, iridescent trout, downy ducks, and hard-shelled turtles—we share the planet with an amazing array of animals. Help your students explore these diverse and amazing creatures with this discussion guide and its related videos and activities.

They'll begin by examining the many ways animals use color for survival. Then, they'll see how pigeons and lobsters use the Earth's magnetic field to navigate perilous conditions. A look at hibernation and homing introduces students to the world's eight species of bear. And an exploration of backbones sets the stage for investigating animal classification.

Classroom Activities

1. Show the “Colors” segment from the *Animal Colors and Shapes* program.
 - **Discussion:** Ask students: What purposes do animal colors serve? (*The colors help animals stay out of danger, locate food, and find mates.*) What do bold colors and patterns typically signify in the animal kingdom? (*danger*) Which colors are the best for camouflage? (*green, brown, gray—colors that are common in nature*) Why is the saying “You are what you eat” particularly true for flamingos? (*They would be gray if it weren't for their food, which has a chemical that turns their feathers a bright pink.*) Why are most male birds colorful while female birds are brown or gray? (*A male's bright colors, which signify that he is healthy, help him attract a female's attention; a female's dull colors serve as protection by helping her blend in with her surroundings.*)
 - **Vocabulary:** Write the following four terms on the chalkboard: warning colors, camouflage colors, changing colors, and show-off colors. As a class, develop a definition for each term.
 - **Colorful Tales:** Working individually or in small groups, have students select an animal to represent each of the four types of colors discussed in the segment and defined in the vocabulary activity—warning, camouflage, changing, and show-off. Then challenge them to write a short story in which these four animals are characters. Encourage students to be imaginative, but remind them that the animals' colors should be central to their tales.

2. Show the “Animals and Magnetism: Pigeons and Lobsters” segment from the *Understanding Magnetism* program. (Access to *unitedstreaming* is required.)
 - **Discussion:** Ask students: What happened to the pigeons when the Cornell University researchers attached magnets to their heads? (*These birds, which normally flew directly home, became hopelessly disoriented.*) What did this tell scientists about pigeons? (*They use magnetism to navigate.*) How does using the Earth’s magnetic field to navigate help spiny lobsters? (*They are able to hold their course at night, when sediment in the water makes visibility poor, or when waves and water currents are impinging on them from different directions.*)
 - **History Investigation:** During WWII, Britain used carrier pigeons to aid its war effort. These birds were the subject of the Disney movie, *Valiant*, released in the summer of 2005. If any students saw the film, ask them to explain how the birds helped the British. Then, working in small groups, have students research the carrier pigeons and the people who worked with them. Have the groups script and act their own movie scenes about the carrier pigeons. The following BBC sites provide a good starting point for students’ research:
 - **Brave birds animated adventure**
<http://news.bbc.co.uk/2/hi/entertainment/4080009.stm>
 - **Pigeon’s war medal up for auction**
http://news.bbc.co.uk/2/hi/uk_news/england/southern_counties/3956171.stm
 - **Hero pigeon’s WWII medal on show**
http://news.bbc.co.uk/2/hi/uk_news/england/hampshire/4600865.stm
 - **Wartime pigeon parachute on show**
http://news.bbc.co.uk/2/hi/uk_news/wales/4462359.stm
3. Show the “Hibernation and Homing” segment from the *Animal Instincts* program. (Access to *unitedstreaming* is required.)
 - **Discussion:** Ask students: What is hibernation? (*This deep sleep allows bears to survive the severe conditions of winter.*) What happens to a bear’s body when it hibernates? (*The bear’s heart slows and its body temperature drops more than 10 degrees.*) Why is it said that a bear is never lost? (*All of the world’s bears are born with a homing instinct, which allows them to wander hundreds of miles through all types of terrain and always find the most direct way home.*) Why is a homing instinct especially necessary for polar bears? (*It allows them to navigate more than 100,000 square miles of moving ice floes and still find their way back to familiar ground—even when the ice floes are turning different directions.*)
 - **A Year in the Life of . . . :** Divide the class into eight groups, one for each of the world’s bear species—polar bears, brown bears, black bears, spectacled bears, sloth bears, giant pandas, Asiatic bears, and sun bears. Assign the writing activity suggested at the end of the video segment (repeated below), having each student write a story about the bear species his or her group researched.

Write a story about a year in the life of a bear. Then illustrate your story to show the different locations that the bear visits during the year.

- **Science Investigation:** In the video, students hear that because bears' bodies are able to recycle water, they don't need to drink or urinate during hibernation. This ability is unique among animals that hibernate. Have students visit the following Web sites to learn more about how studying bear hibernation may lead to breakthroughs in medical science.

- <http://www.pulseplanet.com/archive/Dec98/1771.html>
- http://www.sciencentral.com/articles/view.php3?article_id=218392188&language=english

4. Show the "Classification of Animals" segment from the *TLC Elementary School: What Is a Living Thing?* program. (Access to *unitedstreaming* is required.)

- **Discussion:** In the video, students learn that more than 95 percent of all animals are invertebrates, meaning they don't have backbones. Does this surprise them? Would they have guessed that one group of invertebrates (arthropods) makes up 75 percent of the world's animal species? Or that the insect class of arthropods has nearly one million species—roughly two-thirds of all known species?
- **Graphic Organizer:** Challenge students to create a Venn diagram that correctly uses overlapping circles to show the relationships of the following vocabulary from the video segment:

animals	elephants	mollusks
amphibians	fish	placental mammals
arachnids	humans	platypi
arthropods	insects	reptiles
birds	invertebrates	sand dollars
centipedes	kangaroos	snakes
crocodiles	lizards	squids
crustaceans	mammals	turtles
echinoderms	marsupials	vertebrates

- **Science Investigation:** Working individually or in small groups, have students create a chart like the following one and then use textbooks or research materials to locate and list the distinguishing characteristics for each class of vertebrates.

Vertebrate Class	Distinguishing Characteristics
fish	
amphibians	
reptiles	
birds	
mammals	

Academic Standards

National Academy of Sciences

The National Academy of Sciences provides guidelines for teaching science in grades K–12 to promote scientific literacy. To view the standards, visit this Web site:

<http://books.nap.edu/html/nses/html/overview.html#content>.

This discussion guide addresses the following national standards:

- Life Science: The characteristics of organisms; Organisms and environments; Structure and function in living systems; Diversity and adaptations of organisms; Behavior of organisms
- Science and Technology: Understandings about science and technology

Mid-continent Research for Education and Learning (McREL)

McREL’s Content Knowledge: A Compendium of Standards and Benchmarks for K-12 Education addresses 14 content areas. To view the standards and benchmarks, visit

<http://www.mcrel.org/compendium/browse.asp>.

This lesson plan addresses the following national standards:

- Science
 - Life Science: Understands relationships among organisms and their physical environment; Understands biological evolution and the diversity of life
 - Nature of Science: Understands the nature of scientific knowledge; Understands the scientific enterprise

- Language Arts
 - Writing: Uses grammatical and mechanical conventions in written compositions; Gathers and uses information for research purposes
 - Viewing: Uses viewing skills and strategies to understand and interpret visual media

The National Council for the Social Studies (NCSS)

NCSS has developed national standards to provide guidelines for teaching social studies. To view the standards online, go to <http://www.socialstudies.org/standards/strands/>.

This lesson plan addresses the following thematic standards:

- Science, Technology, and Society