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Ranger Rick®

EDUCATOR'S GUIDE

This guide is designed to complement the June 2007 issue of National Wildlife Federation's *Ranger Rick*® magazine.

NATIONAL WILDLIFE FEDERATION

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Introduction

Welcome to the *Ranger Rick Educator's Guide!*

This guide provides you with educational activities to bring **National Wildlife Federation's** *Ranger Rick*® magazine alive in the classroom and beyond. Using *Ranger Rick* feature articles as an entry point, this guide engages students ages 7-12 in exploring the natural world to build literacy, critical and creative thinking skills, and understanding across the disciplines. Activities are correlated with the National Education Standards for science and language arts, and are designed to assist you in meeting required curriculum objectives.

Can we have class outside today?

Find out how you can say "Yes!" at **www.nwf.org/backyard**. The outdoor environment offers excellent opportunities for active, hands-on, interdisciplinary learning. You can enhance the learning experience by creating your own habitat site. Revitalize an entire schoolyard, a garden, or even a rooftop, windowsill, or balcony by creating an outdoor classroom and sanctuary for birds, butterflies, and other wildlife.

How To Use This Guide

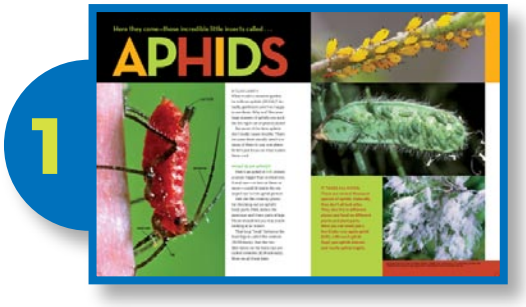
Each section of the guide is matched with a specific *Ranger Rick* feature. After you read through the magazine, choose the stories and activities that complement your curriculum and that will interest your students. Sections include:

- ***Learning Links.*** A summary of concepts presented in the article.
- ***Discussion Questions and Writing Prompts.*** Entry points to engage students in discussion or writing to develop literacy and thinking skills.
- ***Resources.*** Web sites and books where you can find further information.
- ***Activity Ideas.*** Quick investigations and extended projects to complement article topics.
- ***Student Pages.*** Ready-to-copy activity sheets for students.

We have also provided a ***Family Fun*** activities page for you to copy and send home with students.

Aphids

pages 6-11



Learning Links:

Aphids are often considered to be nothing more than a nuisance in the garden—and sometimes a big one, considering their small size. This story shows why they are so successful at forming large colonies by illuminating some of these insects' fascinating features and behaviors. It also makes clear their importance in the food web.

DISCUSSION QUESTIONS & WRITING PROMPTS

Pre-Reading Questions:

- Are there "good bugs" and "bad bugs"? What do you think?
- In your opinion, what would be the characteristics of each?

Comprehension Check:

- Why might gardeners not like aphids?
- How can you tell that an aphid is an insect?
- Describe some of the different aphid species.
- Where would you look for aphids?
- What do you call a group of aphids living together?
- What does an aphid eat?
- How does it get its food?
- Do aphids lay eggs or give birth to live young? (Careful—this one's tricky!)
- Are more aphids male or female?
- Why do some aphids have wings?
- Why do ants sometimes hang around with aphids?
- How does an aphid use its rostrum? Its cornicles?
- What are three predators that eat aphids?

Critical and Creative Thinking Connections:

- Gardeners may not like aphids, but they often love ladybugs and lacewings. Why? What would make an insect a "good bug" or a "bad bug" in a gardener's mind?
- What are some characteristics of aphids that make them so successful at forming large colonies on plants?
- Why are aphids important? What would happen if they disappeared?
- The story ends by saying, "In the world of the wild, it's a natural balance." What does this mean?

RESOURCES

Spittlebugs and Other Saptappers by Elaine Pascoe (Blackbirch Press, 2003). Aphids aren't the only insects that feed on the sap of plants. Find out about more of these "sap-tapping" insects in this fascinating book.

Insect-Lo-Pedia by Matthew Reinhart (Hyperion, 2003). Get your fill of all things insect in this fun volume of facts and colorful illustrations of various insect families.

www.hiltonpond.org/ThisWeek010422.html The Hilton Pond Center publishes interesting weekly photo essays about seasonal natural phenomena. Check out these firsthand observations of aphids and the ants that tend them.

ACTIVITY IDEAS

Aphids Ahoy!

TIME:
Variable
MATERIALS:
Hand lenses
Journals

Summer is prime aphid season, and a close look just might reveal some of these interesting insects right outside your door. Pass out hand lenses and take students on an aphid hunt. Discuss where to look and what to look for. Have students take notebooks or journals outdoors and, when you find some aphids, encourage students to try to answer the following questions.

- Are all the aphids the same or different kinds? Same or different sizes?
- Approximately how many aphids are in the colony?
- Do they have wings or no wings?
- Are any of them eating? Being eaten? Doing other interesting things?
- Do you see any ants near the aphids? If so, what are they doing?

If possible, revisit your aphids at different times to look for changes. Are there more or fewer now? Do they seem to be affecting the plant over time?

Habitat Hunt

TIME:
45 Minutes
MATERIALS:
Habitat Hunt student page

Aphids, like all animals, need certain things from their habitat in order to survive and reproduce. In this same issue of *Ranger Rick*, the sapsucker's "café" and the hyenas' "haven" are examples of other habitats that meet animals' needs. Ask students to name some things a habitat provides. There are four basic habitat elements: food, water, cover, and places to raise young. To help students further explore the concept of habitat, ask each one to take on the identity of an animal native to your region. Then hand out copies of the **Habitat Hunt student page** to complete on a group walk in a nearby wild area. Instruct students to look around as they walk. Do they see all the elements they need to survive as this animal? Encourage students to explore the area carefully and then complete the chart and questions to determine if the area would make a good habitat for them.

Aphid Farmers

TIME:
15 Minutes
MATERIALS:
Paper and pencils

Ants are aphid farmers—tending them, protecting them, and "milking" them for honeydew almost like dairy farmers tend cows. In fact, aphids are sometimes called "ant cows." Have students write a song about this relationship. They could compose an original tune or start with the familiar "Old MacDonald Had a Farm" and write new words for it.

Drama in the Garden

TIME:
60 Minutes
MATERIALS:
Paper and pencils
Props for skits or puppet shows

Nature shows on television often feature big predators chasing down prey in dramatic battles for survival: lions bringing down a zebra, a pack of wolves in pursuit of a deer, a lynx bounding through the snow after a snowshoe hare. But every day, all around us, smaller predators are engaged in their own dramatic battles for survival. Have students write a story or screenplay that zooms in on a garden-scale stage and features hunting scenes such as the ones described in this story. If possible, show students excerpts from a few nature shows and encourage them to note some of the elements they might want to include. Then have them perform their dramas as skits or puppet shows for the group.

Habitat Hunt

Choose an animal that lives in your area. Pretend you are this animal. In order to survive, you need food, water, cover, and places to raise your young. Take a look around you. To help you decide if this is a good habitat for you, write down what you find in the chart below.

I am a(n) _____ *(kind of animal).*

Food Sources	
Water Sources	
Cover	
Places to Raise Young	

1. *Will you stay and set up home here?* _____

2. *Why or why not?* _____

_____

_____

_____

3. *What other things would make it a better habitat for you?* _____

_____

_____

Sapsucker Café

pages 16-17

2

Learning Links:

A sapsucker is a bird that makes holes in trees to drink the sap. Many other animals also benefit from this sweet treat—making this phenomenon a good example of the ecological concepts of niches, food webs, and interdependence.

DISCUSSION QUESTIONS & WRITING PROMPTS

Pre-Reading Questions:

- Have you ever seen a tree with rows of small holes?
- What do you think might have made them, and why?

Comprehension Check:

- What is a sapsucker?
- How many kinds of sapsuckers live in North America?
- How does a sapsucker get sap from a tree?
- What is the "Sapsucker Café"?
- Name at least five other animals that benefit from the sapsucker's work.

Critical and Creative Thinking Connections:

- People tap trees, too. Why? What kind of trees? How is what we do similar to and different from what a sapsucker does?
- Why does the author say that the café is open "at all hours of the day and night"?
- What does it mean that "some of the diners become dinner"?
- What are some of the sapsucker's physical adaptations (parts of its body) that help the bird get its food?
- What do you predict would happen if all the sapsuckers disappeared from a forest?

RESOURCES

www.hiltonpond.org/ThisWeek070215.html The Hilton Pond Center publishes photo essays about seasonal natural phenomena, including this firsthand look at the yellow-bellied sapsucker. Don't miss the amazing photo of the bird's tongue!

www.birds.cornell.edu/AllAboutBirds/BirdGuide/Yellow-bellied_Sapsucker.html Get more fun facts about sapsuckers from the Cornell Lab of Ornithology.

nationalzoo.si.edu/ConservationAndScience/MigratoryBirds/Featured_Birds/default.cfm?bird=Yellow-bellied%20Sapsucker Here you'll find a more detailed description of the yellow-bellied sapsucker's life history from the Smithsonian National Zoological Park.

ACTIVITY IDEAS

Can You Find a Café?

Now that you've read about sapsuckers and the other animals that visit the trees they tap, go look for a Sapsucker Café in your own neighborhood. Can you find that distinctive grid of holes that indicate a sapsucker at work? Does the café seem to be open for business or is it an old one that's no longer producing sap? Might you be lucky enough to spot the sapsucker itself? Do you notice any other animals taking advantage of the sap (or signs that they've been there)? Use field guides to identify what you see, and have students make notes and sketches of their observations. If you've found an active café, try to return from time to time to look for changes.

TIME:
Variable
MATERIALS:
Field guides
Journals
Access to wild area

Reading the Signs

If you can't find a Sapsucker Café, don't despair! Just expand your search to include other signs of animals finding food in the forest. There's lots to look for! For instance, you might see holes made by woodpeckers as they look for insects inside trees, the remains of acorns or pine cones eaten by squirrels, bark nibbled by porcupines, twigs munched by deer or rabbits, and even whole trees felled by beavers. ***Tracks, Scats, and Signs*** by Leslie Dendy (NorthWord Press, 1995) is a good resource for your search.

TIME:
Variable
MATERIALS:
Field guides
Journals

Nifty Niches

Discuss the ecological concept of *niche*. The space an organism occupies in an ecosystem—including how it gets its food and how it interacts with other species—constitutes its niche. The sapsucker's adaptations allow it to take advantage of a resource that would otherwise be unavailable, and by doing so it provides food for a number of other animals. What's the advantage of this to the sapsucker? To the other animals? How does niche contribute to the biodiversity of an area? Ask students to relate this idea to our own society as well. Do people occupy different niches in the jobs they do or roles they play? Why is this important?

TIME:
15 Minutes
MATERIALS:
None

Create a Café Menu

Have students write a menu for a Sapsucker Café in your neighborhood. They can give it a clever name, an address, hours, and a list of specials to tempt the likely diners. Provide students with some examples of menus from local restaurants and suggest that they incorporate any elements they like. For instance, they may wish to include a note from the proprietor about the reason for opening the restaurant, icons that indicate meals suitable for special diets (such as carnivores), or drawings to enhance the design.

TIME:
60 Minutes
MATERIALS:
Sample restaurant menus
Drawing paper
Art supplies

Professor Pinecone's Mys-trees

pages 18-24

3

Learning Links:

Trees are affected by many factors as they grow. Unusual shapes, patterns, or forms can be clues that indicate events in a tree's past. Professor Pinecone and Twiggy guide students to look closely at some of these clues and hypothesize explanations.

DISCUSSION QUESTIONS & WRITING PROMPTS

Pre-Reading Questions:

- What is the title of this story? Based on this title, what do you think it will be about?
- Flip through the story and look at the pictures. Make some predictions: Who is Professor Pinecone? Who is Twiggy? What are the mys-trees?

Comprehension Check:

- Who are the two cartoon characters in this story? Which one is more experienced at solving tree mysteries?
- Why is the tree in the first photo growing in a boat?
- How can wind affect the way a tree grows?
- What are two other things that caused trees in this story to grow in unusual ways?
- What are cypress knees?

Critical and Creative Thinking Connections:

- Before reading this story, what did you predict it would be about? Which parts of your prediction were correct? Which parts weren't?
- What did Professor Pinecone and Twiggy add to this story? Could the story have been told without them? Why do you think they were included?
- What was your favorite mystery tree case in this story? Why?
- Have you ever seen a tree similar to one in this story or with some other mysterious feature? If so, describe it.

RESOURCES

Take a Tree Walk by Jane Kirkland (Stillwater Publishing, 2002). Use this book as a guide for learning, writing, and drawing about trees in your neighborhood.

Trees, Leaves, and Bark by Diane L. Burns (NorthWord Press, 1995). Take a close look at some common trees in this appealing guide and activity book.

www.arborday.org/trees/wtit/ Practice tree ID skills with the National Arbor Day Foundation's "What Tree Is That?" guide.

ACTIVITY IDEAS

Tree Comics

Divide students into small groups and have them choose one of the mystery trees featured in the story. In comic-strip style, have them describe the tree's growth from its "childhood" up to the time of its discovery by Professor Pinecone and Twiggy. Then have students share their finished comic strips with each other. Discuss the difference between facts and speculation based on the evidence available. Ask students to discuss whether there is any way to know for certain what happened to each of these trees.

TIME:
45 Minutes
MATERIALS:
Drawing paper
Pencils
Colored pencils or crayons

Be a Tree Detective

Try the activities listed on page 24 in a yard, schoolyard, or nearby park or woods. Have students create a "tree log" to take outdoors and use for recording their observations. After students find one or more mystery trees and jot down some notes, have them write a more formal log entry that follows the model established in the story. It should include the following elements: 1) a name for the "case," 2) a list of clues, and 3) a logical explanation for the mystery phenomenon, based on an educated guess.

TIME:
60 Minutes
MATERIALS:
Journals to use as "tree logs"
Pencils

Trees on Tour

Once students have identified some interesting trees in the local area, have them design a guided tour of the highlights. They can choose which trees to feature, give them names, use the library or Internet to research interesting facts to share, create a map or tour brochure, and lead their families or students from another class along the route they have chosen.

TIME:
Variable
MATERIALS:
Library/Internet access
Paper and pencils
Art supplies

Tree ID Guide

Compile a class field guide to local trees. Have each student create one page in the guide featuring a species native to your area or even an individual tree present in the schoolyard or neighborhood. Share examples of published field guides and work with students to decide which elements their guide will include, such as photos or drawings, range maps, local maps, identification information (leaf or needle shape; flowers, fruits, or nuts; bark characteristics; overall size and shape; habitat type; etc.), cultural history, and any other details that the students find interesting. Students could also design a dichotomous key to help others identify the trees they include in their guide.

TIME:
Variable
MATERIALS:
Sample field guides
Digital cameras
Computer access
Paper
Art supplies

Hyena Haven

pages 26-30

Learning Links:

Spotted hyenas' habitat is the dry plains and brushy areas of Africa. They have a complex social system in which they hunt large prey and raise their offspring in communal dens.

DISCUSSION QUESTIONS & WRITING PROMPTS

Pre-Reading Questions:

- What do you know about hyenas?
- What does the word "haven" make you think of?
- Look at the photographs on pages 26-30. What do you think makes a place a haven for hyenas?

Comprehension Check:

- Where do spotted hyenas live?
- How large are they?
- How does a spotted hyena snag a creature nearly twice its size?
- How would you describe a spotted hyena's den?
- List some characteristics of baby and teenage spotted hyenas.
- Why do littermates fight?
- What does a spotted hyena mom do during most of the day?
- What does she usually do at night?

Critical and Creative Thinking Connections:

- What three words would you use to describe a spotted hyena? Why did you choose those words?
- What do you think would make the perfect "haven" for a spotted hyena?
- How would a day in the life of a high-ranking female hyena differ from a day in the life of a low-ranking one?
- Why is social rank so important to spotted hyenas?

RESOURCES

Hyena Family by Jane Goodall (Wildlife Animal Books, 1991). World-renowned anthropologist Jane Goodall provides an intimate portrait of hyena family life.

www.lioncrusher.com/family.asp?family=Hyaenidae Look here for lots more facts about each hyena species, including range, habitat, diet, and social behaviors.

www.wildcam.com/guides/critter.jsp?animalid=67 Listen to the eerie calls of spotted hyenas on this Web site.

ACTIVITY IDEAS

What Do You Know?

Before students read "Hyena Haven," ask them to complete the true-false chart on the **What Do You Know About Spotted Hyenas? student page**. After they have read the story, have students do the second portion of the student page, which asks them to select one of the statements on the chart and support their response to it. As a class, discuss students' responses to all the statements.

TIME:
30 minutes
MATERIALS:
What Do You Know About Spotted Hyenas? student page

A New-and-Improved Haven

Ask students to define the word "haven." Guide them to the conclusion that a haven is a place where animals find what they need to survive: food, water, cover, and places to raise their young. Have students describe each of these components for a hyena. Then tell students to imagine that they are spotted hyenas. Page through the photos in "Hyena Haven" and ask your young hyenas if they want to stay and set up a home in the location pictured. Is it truly a haven? Why or why not? Next have students use what they have learned about hyenas to design their own hyena haven—one that is better than the one pictured in at least three ways. Students should draw their new haven and list its features. Display the drawings on a bulletin board and invite students to discuss their improvements with the group.

TIME:
30 Minutes
MATERIALS:
Drawing paper
Art supplies

Give Me a Call!

Spotted hyenas are also called laughing hyenas. But their eerie giggles aren't laughs. They are expressions of fear or anxiety. Spotted hyenas use many different calls to communicate. You can hear some of their calls at www.sounddogs.com/results.asp?Type=&CategoryID=1003&SubcategoryID=30
Have students listen to the following three calls:

- Hyena babies crying for their mother
- An angry call
- A hyena's anxious laugh

After listening to and identifying all three calls, replay them in a different order and ask students to identify them. Then challenge students to imitate the calls.

TIME:
15 Minutes
MATERIALS:
Internet access

Beyond Spots

Spotted hyenas are just one of four species of hyenas. Investigate all four species with students and list how they are alike and different. Students could fold a sheet of paper into a four-page booklet and record information about a different species on each page. They could also find out where each species lives and mark the range on a map to find out if any of their homes overlap. For lots of information about each of the four species, visit www.lioncrusher.com/family.asp?family=Hyaenidae.

TIME:
60 Minutes
MATERIALS:
Paper
Pencils
Map of Africa
Internet access

What Do You Know About Spotted Hyenas?

1. *Before you read "Hyena Haven" in* Ranger Rick, *complete the chart below with your best guesses. For each statement, check True or False.*

True	False	
☐	☐	*All spotted hyenas have spots.*
☐	☐	*Spotted hyenas are ferocious.*
☐	☐	*Spotted hyenas are friendly.*
☐	☐	*They laugh a lot.*
☐	☐	*Social rank is very important to them.*
☐	☐	*The life of a mother spotted hyena can be really tough.*

2. *After you read "Hyena Haven," look at your answers in the chart above. Are there any you'd like to change? If so, go ahead and change them.*

3. *Then select one of the statements on the chart and explain why the answer you chose is correct. Back up your answer with facts from the story.*

Ranger Rick

Family Fun!

Dear Parent or Guardian,
Your child is reading* Ranger Rick *magazine in class. Each month, amazing photos, feature articles, and activities bring nature, wildlife, and conservation to life. You can extend the learning and fun at home with these engaging family activities.

CAMPOUT!

In "Dear Ranger Rick" on page 4, you can read some letters from readers about their camping adventures. On June 23, you can have an adventure of your own! It's the Great American Backyard Campout, and families across the country will be part of it. Visit **www.nwf.org/campout** to join the fun.

BUG SAFARI

After taking a look at all those aphids and aphid predators on pages 6-11, are you wondering what's going on in *your* garden? Head outside on a wild bug safari! Visit the plants in your yard or a nearby park or garden and see how many different kinds of insects you can spot. Are any of them eating? Being eaten? Doing other interesting things?

WEIRD TREE TOUR

Professor Pinecone and Twiggy introduced you to some truly strange tree mysteries on pages 18-24. Do you have any mysterious trees in your own neighborhood? Take a walk and see for yourselves! When you find a tree with an unusual feature, look for clues that could reveal what caused it. Remember your favorite weird trees and come back to visit them on future walks.

HERE'S A HAVEN

What does a hyena haven look like? Check it out on pages 26-30. Then have a family chat around the dinner table about what *your* havens would look like. The same as a hyena's? Probably not! Take turns describing your ideal places to play and relax outdoors.

PHOTO CRITIQUE

One of Ranger Rick's star photographers is featured in "Getting the Picture" on pages 34-39. After you read about some of his special techniques, take a closer look at the photos in this or previous issues of *Ranger Rick*. Which ones do you like best? Why? Poll the members of your family on their favorite photos. Take a look at everyone's choices and see if there are certain things they have in common. What things would you say make a photo especially effective?

***For more interactive family fun, be sure to visit* www.nwf.org/kids.**

NATIONAL EDUCATION STANDARDS

NATIONAL SCIENCE EDUCATION STANDARDS

		Aphids 1	Sapsuckers 2	Mys-trees 3	Hyenas 4
Science as Inquiry					
K-8	Abilities necessary to do scientific inquiry	■	■	■	
K-8	Understandings about scientific inquiry	■	■	■	
Life Science					
K-4	Characteristics of organisms	■	■	■	■
K-4	Life cycles of organisms	■		■	■
K-4	Organisms and environments	■	■	■	■
5-8	Structure and function in living systems	■			
5-8	Reproduction and heredity	■			■
5-8	Regulation and behavior	■			
5-8	Populations and ecosystems	■	■		■
5-8	Diversity and adaptations of organisms	■	■	■	■
Earth & Space Science					
K-4	Properties of Earth materials			■	
K-4	Objects in the sky				
K-4	Changes in earth and sky			■	
5-8	Structure of the Earth system				
5-8	Earth's history				
5-8	Earth in the solar system				
Science & Technology					
K-4	Abilities to distinguish between natural and human objects			■	
K-8	Abilities of technological design				
K-8	Understanding about science and technology				■
Science in Personal and Social Perspectives					
K-8	Personal health				
K-4	Characteristics and changes in populations				
K-4	Types of resources		■	■	
K-4	Changes in environments		■		
K-4	Science and technology in local challenges				
5-8	Populations, resources, and environments				
5-8	Natural Hazards				
5-8	Risks and benefits				
5-8	Science and technology in society				
History and Nature of Science					
K-8	Science as a human endeavor	■	■	■	■
5-8	Nature of science			■	■
5-8	History of science				

ENGLISH LANGUAGE ARTS

1	Reading for perspective	■	■	■	■
2	Understanding the human experience				
3	Evaluation strategies	■	■	■	■
4	Communications skills	■	■	■	■
5	Communications strategies	■	■	■	■
6	Applying knowledge	■	■	■	■
7	Evaluating data			■	■
8	Developing research skills			■	■
9	Understanding and respecting diversity			■	
10	Developing English competency	■	■	■	■
11	Participating in literary communities	■	■	■	■
12	Using language for oneself				