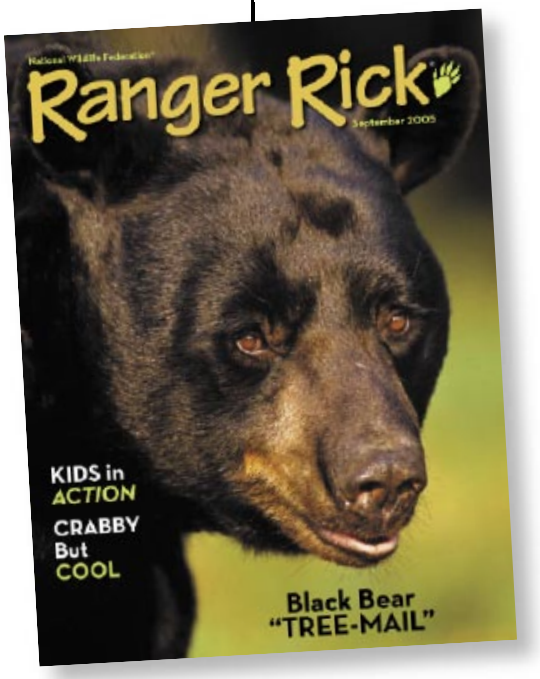
September 2005

National Wildlife Federation®
Ranger Rick®

EDUCATOR'S GUIDE



This guide is designed to complement the September 2005 issue of National Wildlife Federation's *Ranger Rick*® magazine.

NATIONAL WILDLIFE FEDERATION®
www.nwf.org®

Contents & Contacts

Writer: **Kate Hofmann**
Editors: **Ellen Lambeth and Gerry Bishop**
Designer: **Jeffrey Hutman**

For more information on NWF's education programs, visit www.nwf.org/education

For more information about this guide, or to offer comments, email Kate Hofmann at chofmann@nwf.org

National Wildlife Federation
11100 Wildlife Center Drive
Reston, VA 20190

1-800-822-9919
info@nwf.org

www.nwf.org

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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 Science Education Standards 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/schoolyardhabitats**. The outdoor environment offers excellent opportunities for active, hands-on, interdisciplinary learning. You can enhance the learning experience by creating your own ***Schoolyard Habitats*** or ***Backyard Wildlife 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. Each section includes:

- ***Learning Links.*** 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*** page for you to copy and send home with students.

1 The Crabby Crew

pages 4-10

Learning Links:

Crabs exhibit many variations on the theme of skinny legs, pinching claws, and peering eyestalks. Students explore crabby adaptations ranging from different body sizes and shapes to unusual feeding strategies and creative camouflage.

DISCUSSION QUESTIONS & WRITING PROMPTS

Pre-Reading Questions:

- Have you ever seen a crab? What kind of habitat was it living in?
- What do you imagine when you think of a crab? What do you think all crabs have in common?
- How many different kinds of crabs can you name?

Comprehension Check:

- In what ways are all the crabs in the article similar? How are they different?
- Explain the function(s) of each of the following parts of a crab's body: hard shell, legs, eyestalks, claws.
- Crabs eat lots of different things. Name some of the things they eat.
- What are three ways that crabs protect themselves?

Critical and Creative Thinking Connections:

- Why do you think we call someone in a bad mood "crabby"? Do you think it has anything to do with a characteristic of real crabs?
- What good is a claw? Brainstorm a list of all the ways you can think of that crabs might use their claws. *(For grabbing and holding food, tearing it into pieces, and bringing it to their mouths; for protection and fighting; for communication.)*
- The author of this article calls crabs "the ocean's trash collectors" because many eat dead plants and animals. Is this an important job? What do you think would happen if all the trash-collecting animals in the world disappeared?

Resources

www.museum.vic.gov.au/crust/crabbiol.html Details about crab anatomy and biology.

www.blue-crab.org Lots of information about the blue crab.

www.enature.com/fieldguides Search the eNature field guides under "Seashore Creatures" to learn more about many crab species.

Crab by Rebecca Stefoff (Benchmark Books, 1998).

ACTIVITY IDEAS

A Day in the Life

Ask students to imagine life as a crab. Maybe they'd be a hermit crab, living in one borrowed home after another and hauling it around everywhere they go. Maybe they'd be a decorator crab deciding on the perfect objects to complete their disguise. Have them choose one of the crabs in the article and write a story or journal entry from the crab's perspective about its life.

TIME:
30 Minutes
MATERIALS:
Pencils/paper or computer access

Fast Crab Facts

Direct students' attention to the "Fast Facts" boxes in the article. Give them a chance to look up other interesting facts about crabs. (See the **resources** listed on the previous page.) Have students write their own "Fast Facts" on index cards and then display them on a poster or bulletin board.

TIME:
45 Minutes
MATERIALS:
Books/Internet to research crabs
Index cards

Model Crab

Most crabs have eight walking legs, two front legs with claws, a hard shell (carapace), and eyestalks. Discuss the function of these body parts and how they vary among species. Then have students make a model that shows the parts of a crab's body. See **www.museum.vic.gov.au/crust/crabbiol.html** for diagrams. Use modeling clay or supplies rescued from the recycling bin, such as pieces of cardboard, plastic, or foam containers. Students could even add strings to their models to make marionettes. Can they make them scuttle sideways like a crab does?

TIME:
30 Minutes
MATERIALS:
Craft supplies

Postcards from Crabville

The crabs in this article live all around the world. Have students find out where each kind is found and mark it on a map. You can also find out whether crabs live near you at **www.enature.com/fieldguides**; look under "Seashore Creatures" for crabs. Then take students on an imaginary trip around the world to meet some of these crabs in their own habitats. Have them write postcards describing what they saw, did, and learned when visiting each crab.

TIME:
1 Hour
MATERIALS:
World map
Books/Internet to research crabs
Blank postcards

Crab Family Reunion

Crabs live in many different habitats all over the world. What if they held a grand crab family reunion, where all the distant cousins had a chance to meet each other? Have students make up a skit or story describing the scene. What kinds of food would all the different crabs bring to the party? What tales would they exchange about their lives? If they had a talent show, what talents would the various species display? Encourage students to search for more facts about crabs and to make costumes, puppets, or other props to help communicate the similarities and differences among them.

TIME:
1 Hour or more
MATERIALS:
Books/Internet to research crabs
Costume clothes or craft supplies

The Crabby Crew Student Page answers: 1.f; 2.d; 3.g; 4.c; 5.e; 6.a; 7.b

National Wildlife Federation® Ranger Rick® Student Page

CRABBY CREW

Matching Crabs

Different kinds of crabs have very different lives.
Match the name of each crab with the action for which it is known.

_____ 1. Arrow crab
_____ 2. Coconut crab
_____ 3. Decorator crab
_____ 4. Spanner crab
_____ 5. Hermit crab
_____ 6. Shame-faced crab
_____ 7. Urchin crab

a. hides its face behind its claws
b. plays hide-and-seek in sea urchins
c. buries itself in sand
d. climbs trees
e. moves into a mobile home
f. catches food on its long skinny legs
g. dresses up in borrowed clothes

Create-A-Crab

You've just met crabs with all kinds of wild ways of eating and avoiding being eaten.
Use your imagination to make up your own crab.
On the back of this page, draw a picture of your crab.
Use the space below to describe it.

My crab is called a _____

It eats _____

_____

It gets its food by _____

_____

_____

_____

It protects itself by _____

_____

_____

_____

2 Black Bear "Tree-Mail"

pages 22-28

Learning Links:

Black bears don't really log onto the Internet to discuss their lives, but this engaging conversation introduces many details about the habitat and life history of our most widely distributed bear species.

DISCUSSION QUESTIONS & WRITING PROMPTS

Pre-Reading Questions:

- Do you ever use the Internet to talk to people who live in other places?
- What kinds of things do you talk about?
- Imagine that you could talk to animals this way! What kind of animal would you want to have a conversation with? What would you ask or tell it about?

Comprehension Check:

- What do black bears eat? Are they carnivores (meat-eaters), herbivores (plant eaters), or omnivores (both meat and plant eaters)?
- Why do black bears climb trees? Are they better or worse climbers than grizzlies?
- Look at the names of the bears. How does each one relate to something the bear said?
- Why did "Safety First" want "Camp Scamp" to stay away from humans?
- Why wasn't anyone answering "Florida Fella" in January and February?

Critical and Creative Thinking Connections:

- Bears eat many different things. Make a list of all the foods the bears mention in their messages. What are the advantages of this type of diet?
- Bears in different places eat different foods and have different habits. Compare and contrast the lives of "Cool Climber" in the forest, "Tundra Trekker" in northern Canada, "Southwest Dude" in the American southwest, and "Easy Livin'" in Florida.
- This story is written as an e-mail conversation between black bears. Of course, black bears don't really use e-mail. But a lot of what they talked about was true. Why do you think the author used this format? Do you think it was a good way to communicate information about black bears? Why or why not?

Resources

www.bear.org/Black/BB_Home.html The North American Bear Center on black bears.

www.kidsplanet.org/factsheets/black_bear.html Black bear fact sheet from Kids' Planet by Defenders of Wildlife.

www.bearbiology.com/specdesc.html Descriptions of all eight bear species from the International Association for Bear Research and Management.

Black Bears (Nature's Children) by Caroline Greenland (Grolier, 1986).

Bears by Dagmar Fertl, Michelle Reddy, and Erik Stoops (Sterling Publishing Co, 2000).

The Moon of the Bears by Jean Craighead George (Harper Collins, 1993).

ACTIVITY IDEAS

Bear at the Keyboard

Have students continue the conversation with these computer-literate bears. Here are two different approaches:

- Students compose questions addressed to specific bears or to the group. You or another wildlife-enthusiast adult volunteer could write responses, or students could research and write their own responses.
- Students create their own bear character and join the conversation using this identity. Find out what kinds of bears live near you and what they do at different times of the year. Have students give their bear a name and write a few messages from him or her, either responding to something one of the other bears said or introducing a new topic.

TIME:
30 Minutes
MATERIALS:
Books/Internet to research bears
Writing materials

Hibernation Across the Nation

The bears in the article discussed how their lives are shaped by the habitat and climate where they live. The length of time each bear spends hibernating is one of the major differences among them. Have students review the article to complete the questions about hibernation on the student page that follows. After they make a prediction about how long bears in your area hibernate, challenge them to find a local bear expert who can provide the correct answer. They could try contacting a local nature center, a biology or wildlife professor, or an avid outdoorsperson in your community.

TIME:
30 Minutes
MATERIALS:
Hibernation across the Nation student page

Animal Chat

Set up a class e-mail group where students contribute messages from the perspective of animals of their choice. You could expand from black bears to all kinds of bears (polar bear, sloth bear, sun bear, spectacled bear, brown bear [grizzly], Asiatic black bear, and panda) or open it up to other categories of animals entirely. Before they start writing, have students compile information about their animal's habitat, behavior, survival needs, and life cycle. Over the course of the conversation, encourage them to ask each other questions and compare different aspects of the animals' lives.

TIME:
1 Hour
MATERIALS:
Books/Internet to research animals
Computer access

National Wildlife Federation® Ranger Rick® Student Page

HIBERNATION ACROSS THE NATION

In their "Tree-Mail" messages, the black bears had a lot to say about hibernation. Read their conversation carefully and answer the following questions.

1. What is hibernation?

2. Why are "Camp Scamp," "Safety First," and "Sup-r-model" bulking up for the winter?

3. What advice do "Safety First" and "Alaska Guy" share about finding a good den?

4. Why doesn't "Easy Livin'" need to hibernate?

5. How long does "Alaska Guy" say bears in Alaska hibernate?

6. What can you say about how long "Mama Bear" hibernates? Does she sleep for more or less time than "Alaska Guy"?

7. Where do you think "Mama Bear" lives in relation to "Easy Livin'" and "Alaska Guy"?

8. Now think about where you live. Make a prediction about whether black bears hibernate in your area. If so, when do you think their hibernation begins and ends?

✔ **BACK-PAGE BONUS: Ask an expert! Find a local bear expert who can tell you if your prediction is right. On the back, explain what you found out.**

3 Ranger Rick's Adventures: Boomer in Caveland

pages 29-31

Learning Links:

Caves are unique habitats that are home to an unusual array of creatures. This article offers an opportunity to discuss adaptations and how they arise in response to specific habitat features, as well as the geologic processes at work when caves form and change.

DISCUSSION QUESTIONS & WRITING PROMPTS

Pre-Reading Questions:

- Imagine a cave. What words or pictures come to mind?
- If you were going to explore a cave, what would you want to take along?
- What might you expect to find living there?

Comprehension Check:

- What is the exciting discovery Rick reads about at the beginning of the story?
- What is strange about the animals Boomer encounters in the cave?
- Why does the beetle ask Boomer not to shine the light in its eyes?
- How do cave creatures survive without sight?

Critical and Creative Thinking Connections:

- What do all the cave-dwelling creatures seem to have in common?
- Why do you think caves are home to such strange and interesting animals? What is different about caves compared with other habitats?
- Why do you think so many cave species are just being discovered today?
- Does this adventure remind you of another story? Read or review *Alice in Wonderland* by Lewis Carroll and look for parallels between the two stories.
- What do you predict will happen in the next episode?

Resources

http://interactive2.usgs.gov/learningweb/teachers/explorecaves_animals.htm Learn about cave animals and lots more with these teaching materials from the USGS.

www.cavern.org/hrc/hrchome.php Explore the Cave Museum in Horse Cave, KY.

www.goodearthgraphics.com/virtcave.html Visit a virtual cave!

Cave Animals by Francine Galko (Heinemann, 2003).

Cave Life by Christiane Gunzi (DK Publishing, 1993).

Caves by Larry Dane Brimner (Grolier, 2000).

One Small Square: Cave by Donald M. Silver (Learning Triangle Press, 1993).

ACTIVITY IDEAS

Senseless? Nonsense!

Troglobites are animals that spend their entire lives in dark caves. Because sight is not useful to them, many have become blind or even lost their eyes entirely over time. Instead, they rely on their other senses to navigate and find food in complete darkness. Ask students to imagine how it would feel to have this ability. Give them blindfolds and have them try to move around in a place they know well. How well can they find their way without sight? Do they feel their other senses taking over? Afterward, discuss their experiences. Ask them to think of real or imaginary settings in which other senses would not be useful, and discuss how animals might adapt to these places.

TIME:
15 Minutes
MATERIALS:
Blindfold for each student

Cave Cousins

Many cave-dwelling creatures have daylight counterparts. Cave crayfish have cousins that live in sunlit rivers and lakes. Blind cavefish are not so different in most ways from fish with eyes. Crickets, beetles, salamanders, and shrimp all live both inside and outside of caves. Have students create a skit or story about a meeting between a cave-dwelling animal and its non-cave relative. What would each one think of the other? What would they tell each other about their lives? Would they have any trouble communicating? Have students share their creations with each other. As a class, discuss how each featured animal is adapted to survive in its own habitat.

TIME:
30 Minutes
MATERIALS:
Writing materials or an assortment of props for skits

Home Sweet Cave

Some animals that live in or visit caves are familiar, such as bats and spiders. Others are truly bizarre, such as cave shrimp and blind cavefish. Have students investigate these creatures and design their own field guides to cave life. You may want to suggest that they divide the guide into three sections: the *trogloxenes* (animals that visit caves); *troglophiles* (animals that can live in caves but also live in other damp, dark places); and *troglobites* (animals that live only in caves and spend their entire lives there). For an extra challenge, ask students to consider how they would consult their field guide in a dark cave. Have them invent a format for the guide or a tool that would help them identify animals in the dark without disturbing them.

TIME:
1 Hour
MATERIALS:
Books/Internet to research cave life
Computers or writing/drawing supplies

Interior Designs

Find out about different kinds of caves, how they form, and the special structures that develop inside, such as stalactites, stalagmites, columns, and cave pearls. Assign groups of students to investigate each process. Have them create a visual representation of their topic (such as a poster, Powerpoint presentation, or model) and then teach their classmates what they learned. Looking to delve deeper? Find out if there is a cave nearby you can visit, or invite an avid cave explorer to speak to your class.

TIME:
1 Hour
MATERIALS:
Books/Internet to research cave formation
Computers or art supplies

4 White Pelicans: What's the Scoop?

pages 32-37

Learning Links:
Pelicans are birds whose goofy looks really work for them. Students learn how pelicans' long bills, stretchy pouches, heavy bodies, strong wings, and group hunting strategies all work together to create one interesting bird.

DISCUSSION QUESTIONS & WRITING PROMPTS

Pre-Reading Questions:
- Have you ever seen a pelican? Where?
- What did you notice about how it looked or behaved?

Comprehension Check:
- How many kinds of pelicans are there in North America? What kind is this article mainly about?
- What do pelicans eat? How do white pelicans use teamwork to get a meal?
- Where do pelicans build their nests?
- How do pelicans feed their babies?

Critical and Creative Thinking Connections:
- White pelicans hunt as a team. What do you think are the advantages of this strategy?
- How do you think adult pelicans can tell which baby is theirs?
- Why would a pelican want to waterproof its feathers?
- Look at the map on page 37 that shows where white pelicans live. Unlike brown pelicans, which live along the coasts, white pelicans live inland on freshwater lakes. How do you think their lives are different from the lives of brown pelicans as a result of their different habitat?

Resources:

www.montereybay.com/creagrus/pelicans.html Pictures and information about several kinds of pelicans.

www.nhptv.org/natureworks/brownpelican.htm More about the brown pelican.

Pelicans by Dorothy Hinshaw Patent (Clarion Books, 1992).

North American Pelicans by Lynn Stone (Carolrhoda Books, 2002).

ACTIVITY IDEAS

Gone Fishin'

Organize a tag game in which some students are pelicans and others are fish. Establish boundaries (shorelines) and challenge the pelicans to work as a team to herd the fish so they can catch them. The pelicans can hold their arms out like scoops and use them to tag the fish.

TIME:
15 Minutes
MATERIALS:
None

Pelican Poetry

Similes and metaphors can help us describe and understand the behavior of animals. In this article, a white pelican coming in for a landing is described as "water-skiing" and pelicans' fishing strategy is called a "team sport." On the board, write sentences such as "A pelican is like a ___" and "A pelican is as ___ as a ___." Ask students to look at the pictures in the article and complete these sentences. Later, have them use their similes and metaphors to compose a poem about pelicans.

TIME:
30 Minutes
MATERIALS:
Writing supplies

Horn Hypothesis

An adult white pelican grows a mysterious "horn" on its top bill during breeding season. Scientists who study pelicans don't know its function. Have students make up explanations for the horn, and then ask them to design an experiment to test their hypothesis. For example, if I hypothesize that the horn helps a pelican attract a mate, perhaps I could set out pelican decoys with and without horns during breeding season and see if one attracts more attention than the other. After students design their experiments, give them a chance to share, critique, and refine their procedure in small groups.

TIME:
30 minutes
MATERIALS:
Writing supplies

Brown or White?

The brown pelican is our other North American pelican species. Have students make a Venn diagram to compare and contrast white and brown pelicans. On the student page that follows, have them record similarities in the overlapping center section and unique characteristics in the outer sections. Check the resources above for more information about brown pelicans, or see the July 1999 issue of *Ranger Rick*. Direct students' attention to characteristics such as color, size, habitat, range, feeding habits, and nesting.

TIME:
30 Minutes
MATERIALS:
Scoop on Pelicans student page
Books/Internet for research

Big Birds

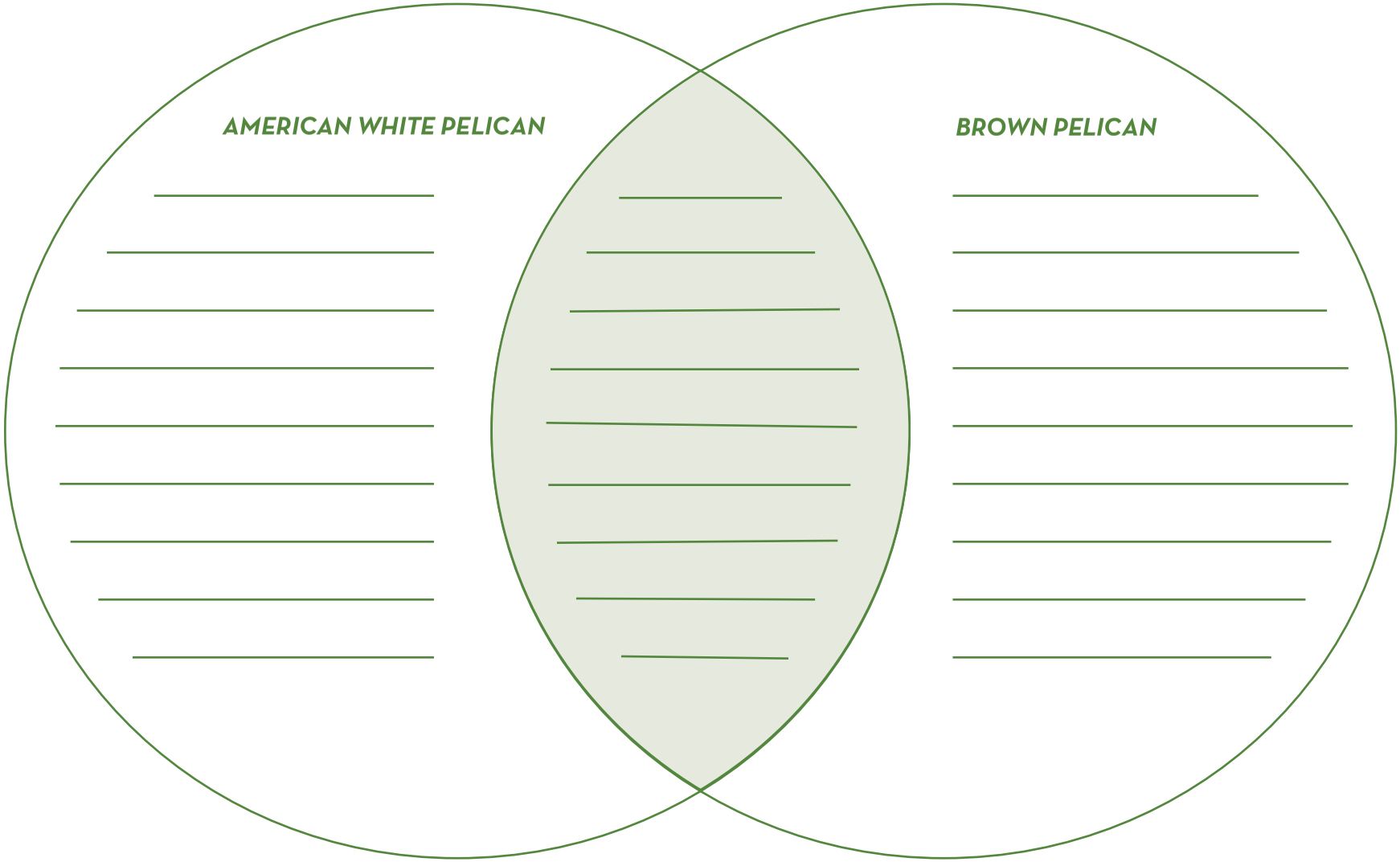
White pelicans are superlative birds. Only slightly smaller than the largest bird in the United States (the California condor), white pelicans have a 9 foot (3 meter) wingspan and a foot-long bill. A white pelican's pouch holds almost 3 gallons of water (three times as much as its stomach)! The birds can weigh up to 22 pounds. To help students get a feel for these numbers, have them draw a pelican outline with sidewalk chalk and measure out the wingspan and bill length. Have them fill a container with three gallons of water and find something that weighs 22 pounds. Incorporate a math lesson by having them calculate their own weight and "wingspan" as a fraction or percentage of a pelican's.

TIME:
15 Minutes
MATERIALS:
Sidewalk chalk
3 gallon container
Tape measure
Scale

National Wildlife Federation® Ranger Rick® Student Page

THE SCOOP ON PELICANS

American white pelicans and brown pelicans are relatives. Like any family, they have some things in common—but not everything! These pelican eggs need your help to figure out how they should turn out. Fill in the diagram with similarities in the center section and differences on the outsides.



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. Extend the learning and fun at home with these engaging family activities. Enjoy!

BABY ZEBRA BLUES

What do you think the baby zebra on page 2 is saying? Give everyone in the family a chance to share an idea. Or make up a whole story to go along with this photo.

CRAB HUNT

After you read "The Crabby Crew" on pages 4-10, you'll probably wonder if any crabs live near you. Find out at **www.enature.com/fieldguides**. Look under "Seashore Creatures" for crabs. If so, go on a crab hunt! (Some crabs can pinch hard, so handle them carefully.) If you catch a crab, put it in a container and observe it. What does it look like? What does it do? Be sure to treat it gently and let it go after a short time. If you don't live in crab habitat, you could stop by a public aquarium to look at crabs up close.

CREATURE TEACHER

Read the poem called "A Silly Sort of Schooling Plan" on page 12. What would school be like if you had a creature for a teacher this year? Pretend you do! As you sit around the dinner table talking about your day, make up a story about what you did in school with your creature teacher. Mom or Dad can make up stories about a day when creatures came to work.

FAMILIES IN ACTION

Were you inspired by "Kids in Action!" on pages 18-19? Now's the time for YOU to help nature! Come up with a family project. What is your goal? How can you accomplish it? What role will each person in the family play? How will you know when you've achieved success? After you finish your project, send a report about what you did to *Ranger Rick*!

YOU CAN IF PELI-CAN!

Why should pelicans have all the fun? After you read "White Pelicans: What's the Scoop?" on pages 32-37, make your own scoops by cutting the bottoms off empty milk jugs. Throw a ball or a toy fish to each other and see if you can catch it. If all that work makes you hungry, maybe it's time to plan a real fishing trip!

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

NATIONAL SCIENCE EDUCATION STANDARDS

Science as Inquiry

K-8	Abilities necessary to do scientific inquiry	
K-8	Understandings about scientific inquiry	

Physical Science

K-4	Properties of objects and materials	
K-4	Position and motion of objects	
K-4	Light, heat, electricity, and magnetism	
5-8	Properties and changes of properties in matter	
5-8	Motions and forces	
5-8	Transfer of energy	

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	