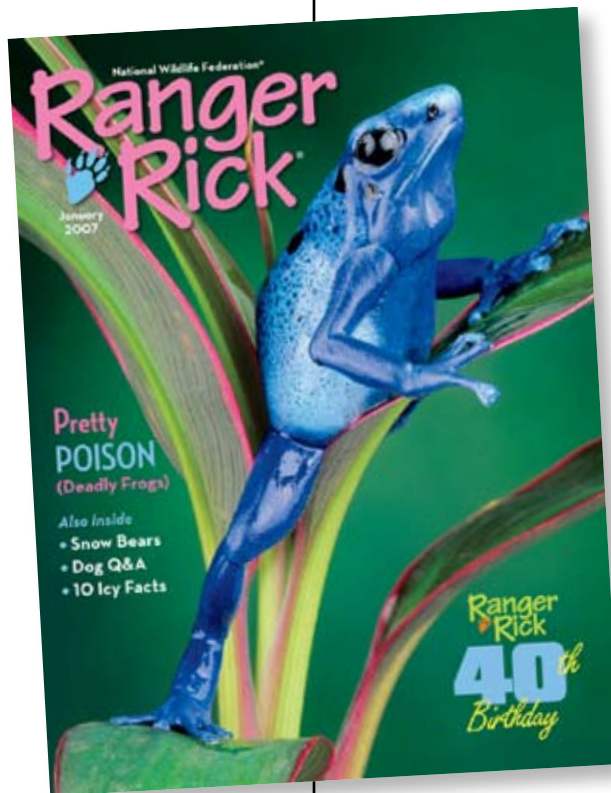


JANUARY 2007

National Wildlife Federation®
Ranger Rick®



EDUCATOR'S GUIDE



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





Contents & Contacts

[2 Contents & Contacts](#)

[3 Introduction](#)

ACTIVITIES

[4 Survival of the Snow Bears](#)

[7 Pretty Poison](#)

[10 10 Cool Things About Ice](#)

[13 Family Fun](#)

[14 National Standards for
Science & Language Arts](#)

Writer: Kate Hofmann

Editors: Ellen Lambeth and Mary Dalheim

Designer: Jeffrey Hutman

NWF Executive Staff

Larry J. Schweiger, *President and Chief Executive Officer*
Jaime Berman Matyas, *Executive Vice President and
Chief Operating Officer*

Education Leadership Staff

Mary Dalheim, *Editorial Director, Children's Publications*
Kevin Coyle, *Vice President, Education*

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

**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 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.

Subscribe to *Ranger Rick!*
Special rate classroom subscriptions available.
Details at www.nwf.org/rangerrick

Survival of the Snow Bears

pages 4-9

1



Learning Links:

Polar bears are well adapted to their Arctic habitat, and mothers teach their cubs important lessons for surviving there. Those same specialized characteristics and behaviors make them vulnerable to changes in their habitat—which is why global warming poses such a grave threat.

DISCUSSION QUESTIONS & WRITING PROMPTS

Pre-Reading Questions:

- How is a polar bear like other kinds of bears?
- How is it different?

Comprehension Check:

- Where do polar bears live?
- How is a polar bear adapted to life in the cold?
- What are three things young polar bears need to learn before they're ready to be on their own?
- What do polar bears eat?
- Where and how do polar bears hunt?
- What might be causing polar ice to form later and melt earlier each year?
- Does the melting ice affect polar bears? In what ways?
- How does Nick Lunn, the scientist in this story, find polar bears to study?
- What does he check out each time he finds one?

Critical and Creative Thinking Connections:

- Many scientists mark the animals they study. Just as Nick Lunn puts I.D. tags and tattoos on polar bears, other scientists put leg bands on birds, radio transmitter collars on wolves, and satellite tracking tags on whales. What information can they get by doing this?
- What do you think are some advantages and disadvantages of each kind of marking device?
- Why is it important for scientists to get more information about how healthy polar bears are?
- How is a polar bear's habitat and diet similar to and different from those of other kinds of bears?
- Do you think polar bears are more or less vulnerable than other bears to changes caused by global warming? Why?

RESOURCES

The World of the Polar Bear by Norbert Rosing (Firefly Books, 2006). This new book follows polar bears through four seasons in a remarkable collection of photographs.

Ice Bear by Nicola Davies (Candlewick, 2005). Here's a beautifully-illustrated tale of polar bears and their relationship with the people of the Far North.

Polar Bear Math by Ann Whitehead Nagda and Cindy Bickel (Henry Holt and Company, 2004). Two polar bear cubs born at the Denver Zoo provide the storyline while details about their care provide practical math lessons on fractions.

➤ www.seaworld.org/animal-info/info-books/polar-bear/index.htm Find lots more interesting polar bear facts in this "infobook" from Sea World.

➤ www.polarbearsinternational.org Explore the Web site of Polar Bears International for more information, and be sure to check out the "Tools for Teachers" section.

ACTIVITY IDEAS

Arctic Survivors

Have students make a concept map showing what they learned about polar bears on the [Polar Bear Facts student page](#). As an extension, explain that polar bears aren't the only animals adapted to live in the habitats of the Far North. Ask students to name some other Arctic animals (seals, whales, walrus, caribou, wolves, Arctic foxes, musk oxen, snowy owls, etc.). Discuss what these animals eat, how they stay warm, and how they move around. Which ones depend on ice as polar bears do? Which ones live on land? Have students research some of these animals and make another concept map showing the animals' relationships to ice, land, and each other. Two good Web sites for more information: www.mnh.si.edu/arctic/html/birds.html and www.saskschools.ca/~gregory/arctic/index.html.

TIME:**45 Minutes****MATERIALS:**[Polar Bear Facts](#)[student page](#)[Internet/library access to research Arctic animals](#)[Paper and pencils](#)

Winter Watchers

While you probably don't have polar bears nearby, there are lots of other animals with interesting strategies for surviving cold weather. Ask students to name some animals that are active in your area during the winter. Discuss what clues students might look for to find out which ones are or have been nearby (tracks, trails, nibbled bark or twigs, scattered seeds, holes and nests, and first-hand sounds or sightings). Then head outside on a winter walk to look for signs in the schoolyard, neighborhood, or nearby park. After you've collected a variety of observations, discuss with students how animals in your area are adapted for winter survival and how their behavior changes during cold weather. Also discuss which animals you *don't* see in winter and why.

TIME:**60 Minutes****MATERIALS:**[Access to an outdoor area](#)

Tracking Polar Bears

In the story, students read about scientist Nick Lunn marking the polar bears he studies with I.D. tags. Some scientists also put radio collars on the bears so they can track their movements. Have students visit www.panda.org/about_wwf/where_we_work/arctic/polar_bear/index.cfm (on the World Wildlife Fund's Web site) to read more about this and track the movements of real polar bears on a map.

TIME:**15 Minutes****MATERIALS:**[Internet access](#)

Global Warming Guide

Discuss the concept of global warming with students. What is it? What causes it? How do people contribute to it? How could it affect polar bears, other animals, plants, and people? For more information, visit www.nwf.org/rangerrick, epa.gov/climatechange/kids/index.html, and www.globalwarming101.com. Then go through a typical day and make a list of activities that contribute to CO₂ emissions. For each one, list some ways to avoid or reduce the emissions. As a class, pledge that each day for a week, each student will do at least one thing from the list to reduce his or her impact. At the end of the week, discuss the process. Which things were easy to do? Which were hard? What would make the hard things less difficult? How could they help other people take those steps, too?

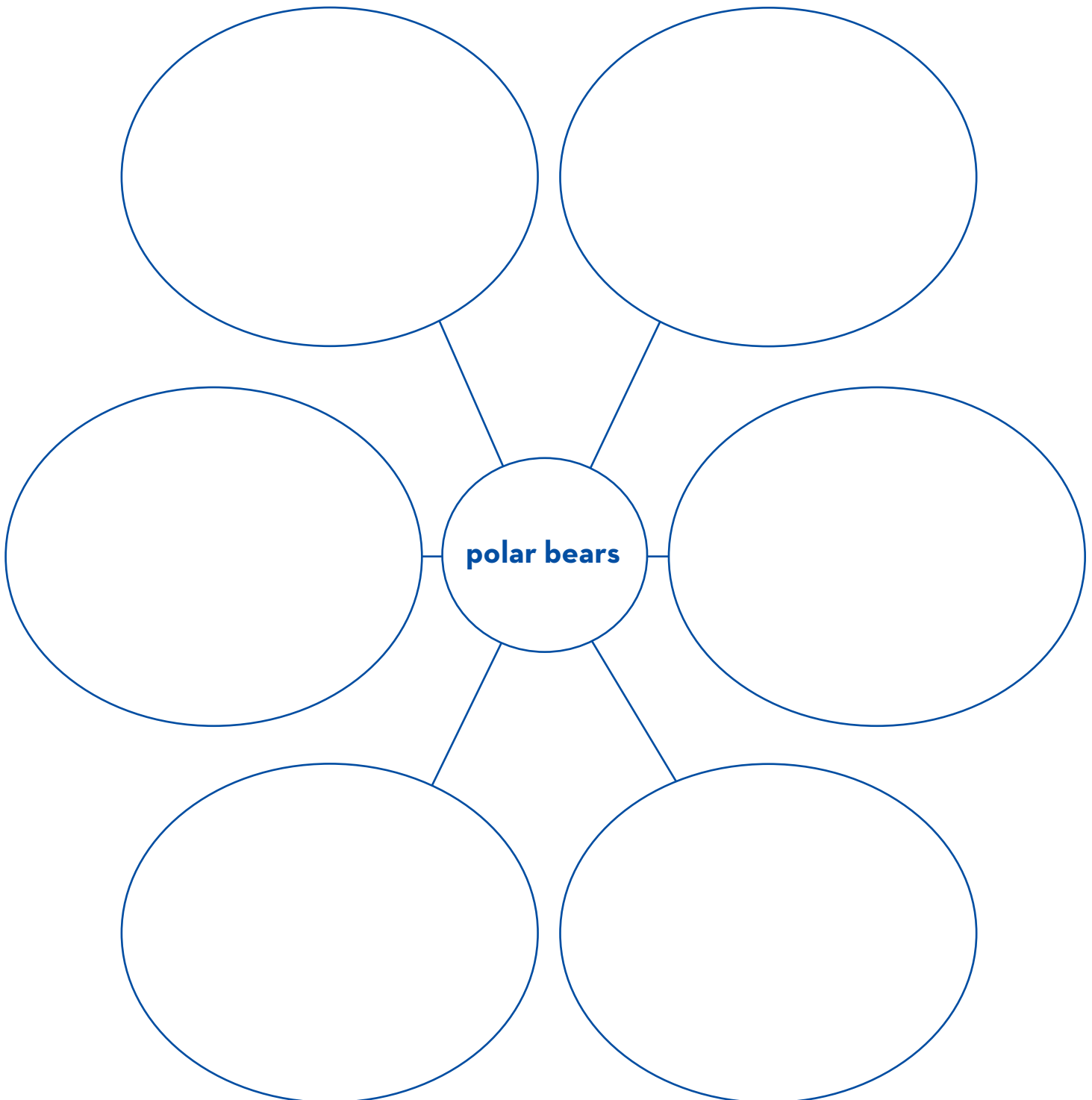
TIME:**60 Minutes +
(over a one-week period)****MATERIALS:**[Internet access](#)[Paper and pencils](#)



Student Page

POLAR BEAR FACTS

In each empty circle below, write something you learned about polar bears from reading "Survival of the Snow Bears." Be sure to include details about where they live, how they stay warm, what they eat, how they hunt, and what scientists are learning about them.



Pretty Poison

pages 22-27

2



Learning Links:

Poison frogs are a perfect example of warning coloration—a startlingly flashy look that tells predators, “Stop! Don’t eat me or you’ll be sorry!” The frogs’ colorful patterns will catch students’ attention, too—and then they’ll learn how the poison works for the frogs, how certain predators get around it, and how human hunters use it.

DISCUSSION QUESTIONS & WRITING PROMPTS

Pre-Reading Questions:

- Animals have lots of ways to protect themselves from their predators. How many tricks can you name?
- If you had predators, what trick would you want to have to avoid being eaten?

Comprehension Check:

- Where do poison frogs live in the wild?
- What characteristic keeps them from being eaten by predators? Does this always work?
- Why don’t they blend in with their surroundings as most frogs do?
- Just how poisonous is the deadliest poison frog?
- How do people use the poison?
- Describe how strawberry poison frogs take care of their eggs and tadpoles.

Critical and Creative Thinking Connections:

- Why do you think the title of this story is “Pretty Poison”?
- The last lines of the poem by Douglas Florian are: *And though their poison can tip a dart,/ These frogs are Masters of Fine Art.* What does this mean to you?
- What are some other examples of animals that are brightly or boldly colored for a warning?
- What are some other animals that use mimicry to fool predators into thinking they are something they aren’t?
- Where do you think poison frogs get the poison for their toxic defenses? Hint: Read the last paragraph again for a helpful clue. (*It comes from chemicals in the ants that they eat.*)

RESOURCES

The Search for Poison-Dart Frogs by Ron Fridell (Franklin Watts, 2002). Join a group of wildlife biologists as they search for and study a special poison frog.

Amphibian (DK Eyewitness Books) by Barry Clarke and Laura Buller (DK Publishing, 2005). Zoom in for a close-up look at poison frogs and all their amphibian relatives.

➤ www.amnh.org/exhibitions/frogs Visit this virtual exhibit at the American Museum of Natural History and explore the amazingly diverse and colorful world of frogs.

➤ nationalzoo.si.edu/Animals/ReptilesAmphibians/Facts/FactSheets/Poisondartfrog.cfm Find interesting details about poison frogs on this fact sheet from the Smithsonian’s National Zoological Park.

➤ news.mongabay.com/2006/1002-frogs.html Here’s a fascinating news item about the relationship between the quality of a frog’s habitat and its toxicity.

ACTIVITY IDEAS

Frog Poems

Read aloud the poem that begins this story. As you read, ask students to imagine a frog with the pattern described in each line of the poem. Then have them look through the photos in the story to see if any of the frogs pictured match these descriptions. Read the last line of the poem again and discuss their ideas about what it means. Then have students use the story and photos as inspiration to write their own poems on the [Poison Frog Poems student page](#).

TIME:

30 Minutes

MATERIALS:

[Poison Frog Poems student page](#)

Frog Art

Now that you've seen these "masters of fine art," have students make some frog art of their own. Set out some bright tempera paints and have each student choose one of the frogs in this story to paint. Add some color to your winter classroom by having students cut out the finished frog shapes and hang them up or paint a rainforest background on which to display them. Or, have students put their frogs on sticks to make puppets and then act out scenes from the frogs' lives.

TIME:

60 Minutes

MATERIALS:

Tempera paints
and brushes
Art paper
Scissors

Watch for the Warning

As a strategy to avoid predation, warning coloration is fairly common in the animal kingdom among animals with poison or venom, foul odors, or other disagreeable characteristics. Humans use warning signs, too, to alert each other of danger. Collect photos of different kinds of warning signs—some from nature and some made by humans. For instance, from the animal kingdom: monarch butterfly, coral snake, bee or wasp, skunk, and poison frogs, of course. From humans: stop signs, caution tape, orange construction cones, and so on. Have students compare these examples and sort them into categories based on classification schemes they devise. What do all these different signs have in common? What seem to be the important characteristics of an effective warning? Why?

TIME:

30 Minutes

MATERIALS:

Photos of a variety
of warning signs

Colorful or Camouflaged?

Just how well do poison frogs stand out in their habitat? In contrast, how well do camouflaged frogs blend in? Engage students in an investigation of these questions by organizing a "frog hunt." Cut out pictures of colorful poison frogs and hide them in an outdoor area or around a room. Do the same with some camouflaged non-poison frogs. Then let students search for the frogs, keeping a tally of how many colorful and camouflaged frogs they find. As a group, draw some conclusions about whether the colorful frogs were easier to spot and the camouflaged frogs better able to "hide." Add an extra dimension to the game by having students seek out answers to questions about frogs. Give them a list of questions and write the answers on the backs of some of the frogs. When they find a frog with an answer on it, they can match it with the appropriate question. For a variety of interesting frog facts, see www.amnh.org/exhibitions/frogs/vivarium and www.amnh.org/exhibitions/frogs/frogfacts.

TIME:

30 Minutes

MATERIALS:

Photos of colorful and
camouflaged frogs

10 Cool Things About Ice

pages 34-39

3



Learning Links:

Ice is all around us and lends itself to consideration from many angles. You can look at it through physical, biological, and Earth science lenses as well as aesthetic and recreational ones. Jack Frost's enthusiasm for this important substance will draw students into a closer examination of each dimension.

DISCUSSION QUESTIONS & WRITING PROMPTS

Pre-Reading Questions:

- What is ice?
- Where can you find it?

Comprehension Check:

- Who is telling this story? How does the narrator feel about ice?
- Name three animals mentioned in this story that depend on ice. How does it help each of them?
- Describe how a glacier forms.
- Where do icebergs come from?
- How much of the Earth is covered with ice?
- Where is most of that ice found?
- Why do scientists study ice?
- When can ice cause problems for people?

- What are some ways that people enjoy ice?

Critical and Creative Thinking Connections:

- What sports and other fun things have you done on or with ice? Which ice activities are your favorites?
- Animals that live on ice have special adaptations to survive in that cold environment. What are some of those adaptations?
- What would you have to change about your body for you to be able to survive on ice?
- How is a glacier like a river? How is it different?
- On page 10, you read about global warming. Make some predictions about how rising temperatures might affect glaciers, icebergs, animals that live on ice, and the oceans and continents of the world.

RESOURCES

Icebergs and Glaciers by Seymour Simon (HarperTrophy, 1999). Find out how these massive ice formations grow, move, and change.

Antarctic Ice by Jim Mastro (Henry Holt and Company, 2003). Meet some of the animals that live on and around the Antarctic ice as it changes through the year.

Ken Libbrecht's Field Guide to Snowflakes by Ken Libbrecht (Voyageur Press, 2006). Take this guide to snowflake-watching outside and see what's falling from the sky.

Snow Crystals by W.A. Bentley (Dover, 1962). You'll be amazed by this classic collection of snowflake photographs.

➤ www.nwf.org/rangerrick Check out the *Ranger Rick* Web site this month for lots of fun experiments to explore the properties of ice.

➤ nsidc.org/glaciers The National Snow and Ice Data Center has an interesting Web site all about glaciers.

ACTIVITY IDEAS

Science on the Ice

This past October, a team of scientists and science educators from around the world went to Antarctica to drill through the ice of McMurdo Sound and learn some of the secrets below. You can join the adventure by visiting www.andrill.org/iceberg. See photos of the drill site and life on the ice, watch video journals on many aspects of the project, and read the educators' blogs about all the things they learned and experienced. Be sure to check out Betty's blog—Betty is a fourth grade teacher and a good friend of *Ranger Rick*. We've loved reading about her amazing time in Antarctica and all the interesting stories she's collected!

TIME:

Any amount

MATERIALS:

Internet access

Weird Water, Incredible Ice

This month at www.nwf.org/rangerrick, you'll find a variety of hands-on activities to investigate the properties of ice. Set up stations where students can experiment with how water expands as it freezes, how ice floats, how water level changes when it melts, and so on. If you live in a cold climate, you can do some of these things outdoors—and if not, a little help from a freezer is all you need. Have students record their observations. Afterward, discuss the implications of these experiments. That is, why are icebergs dangerous for ships? What would happen to sea level if icebergs and glaciers melted? How might melting of polar ice affect the Earth's climate?

TIME:

45 Minutes +

MATERIALS:

Water, salt, and a variety of containers

Access to the outdoors or a freezer

Paper and pencils

Who Likes Ice?

After reading this story, initiate a discussion about the perspective from which it is told. What is Jack Frost's view of ice? Is it different from how others might describe it? Have students brainstorm a list of other characters that interact with ice (people and animals from different parts of the world, as well as non-living things). Ask students to choose several of these characters and write a paragraph or two about ice in each one's voice. Invite them to share their work with the group, and then discuss how the perspectives vary. Ask students to choose which of the perspectives most closely matches their own view of ice and explain why.

TIME:

30 Minutes

MATERIALS:

Paper and pencils

Ice Art

Jack Frost etches his frosty designs all around us: on window panes, spider webs, and frozen puddles, among other places. Snowflakes, too, are intricate, icy works of art. Wind sculpts snow into drifts and ripples and ridges. Icicles drip artfully from eaves. If you live in a place where the temperature dips below freezing, a close look will surely reveal plenty of ice art. Take students on an ice hike and search the neighborhood for frozen wonders. As you make discoveries, have students complete the [Ice Art student page](#) and sketch or photograph what they see. After you return, ask them to create finished works of art (fill in or add paint to sketches, make prints of the photos), then frame them, title them, and write descriptions of where and when they saw the objects and why they found them interesting. Hang the creations in a classroom gallery and invite parents or other students to enjoy them.

TIME:

60 Minutes +

MATERIALS:

[Ice Art student page](#)

Drawing paper, pencils, paints, OR cameras

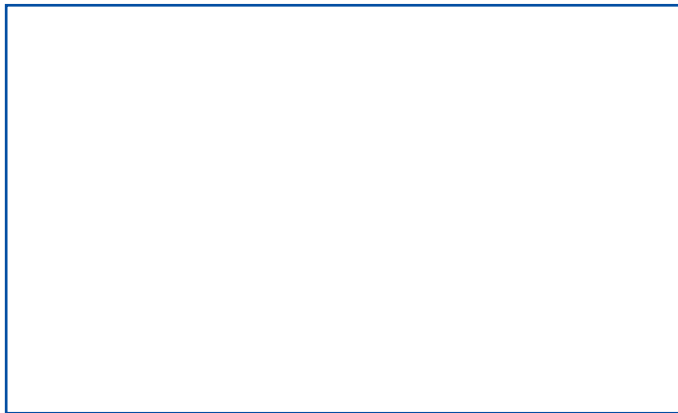
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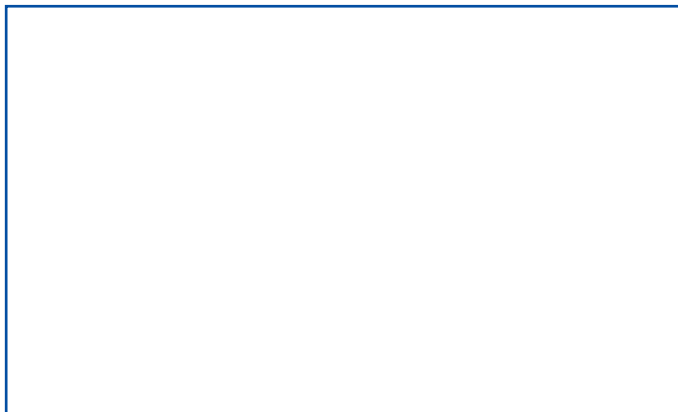


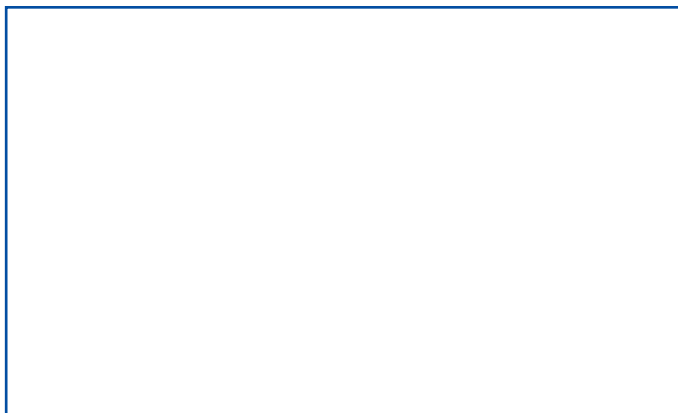
Student Page

ICE ART

On a snowy or icy day, take a walk around your school or neighborhood. What artistic designs did Jack Frost leave for you? Icicles? Snowflakes? Frosty windowpanes? Sculpted snowdrifts? Sketch your favorite finds in the boxes below. Describe where you saw each one and why you liked it.









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.*

COOLING THE CLIMATE

You read about polar bears' lives on the ice in "Survival of the Snow Bears" (pages 4-9) and about how global warming is bad news for Arctic animals and the planet on page 10. Be part of the solution! Check out www.nwf.org/rangerrick to learn more and see what you can do to help. Make a family plan to reduce your contribution to climate change.

STORIES FROM THE OLD DAYS

Can you believe *Ranger Rick* magazine is 40 years old? Lots has happened since the magazine started in 1967. Ask older friends and relatives to tell stories from "back then" and look up what was happening in the world. If your school or public library has old issues of *Ranger Rick*, take a look at them and see how the magazine has changed through the years.

MAKE A MAGAZINE

In "Ranger Rick's Adventures" on pages 17-20, the gang's attempts to make a magazine end in disaster. But it can be a lot of fun, too! Why not put together a family magazine? Pick a theme and make a list of tasks: researching, interviewing, taking pictures, writing stories, creating art, laying it all out on the computer or on paper, and proofreading. Then share the results of your hard work with friends and relatives!

SNOW SCIENCE

In "The Buzz" on pages 28-29, you read about Erica's snow fence experiments. Can you think of an experiment you could do with snow, ice, or other winter weather? Check out www.nwf.org/rangerrick for some ideas on ice projects, or make up your own and see what you can discover.

DOG DILEMMAS

Got a dog? Read through "Dog Q & A" on pages 30-32. Then discuss how the questions relate to your own dog or dogs you know. Have you seen dogs do any of these things? Do the answers seem to explain the behaviors you saw? Think of some other questions you have about dogs and then discuss your ideas about the most logical answers to them.

BOTTOM OF THE WORLD

Jack Frost isn't the only one who loves ice! After you read his story on pages 34-39, visit www.andrill.org/iceberg to check out the amazing adventures of a group of scientists and teachers who have been living on and learning about the ice in Antarctica.

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

