

"FOR THE INCREASE  
AND DIFFUSION OF  
GEOGRAPHIC KNOWLEDGE."

# NATIONAL GEOGRAPHIC for Kids!



Dear Teacher:

Welcome to the premier issue of NATIONAL GEOGRAPHIC FOR KIDS! There's no better way to kick off a new school year than with a new magazine designed to develop literacy skills through high-interest science and social studies content. This month's article lineup includes:

- **Big Talkers** (pages 4-7): A fascinating report from Africa on how Earth's largest land animals use a range of sound below human hearing to communicate long-distance
- **Chew on This!** (pages 12-17): The sticky history and science of gum, including some intriguing information about its production and consumption
- **Deep-Sea Diver** (pages 18-21): An interview with oceanographer Sylvia Earle, who says that when it comes to exploring the ocean depths, the discoveries have just begun.

You'll find that these and all articles in NATIONAL GEOGRAPHIC FOR KIDS cover important science and social studies concepts outlined in state and national standards. Every issue of the magazine also provides the world-class reporting; eye-popping photography; and illustrative charts, graphs, and maps you've come to expect from the National Geographic Society.

Speaking of high-quality visuals, inside this teacher's guide you'll find a stunning two-sided poster. One side highlights an inspiring poem about reading. The other side provides a giant map of Africa. The map is an ideal supplement to the NATIONAL GEOGRAPHIC FOR KIDS cover story on African elephants as well as to a new eight-hour television series called AFRICA.

Coproduced by National Geographic Television, Thirteen/WNET, Tigress Productions, and Magic Box Mediaworks, AFRICA airs in September. Through captivating personal stories, the series offers an intimate look into life on the African continent as it is today—in its cities, towns, and rural villages. Check your local PBS listings for exact times and dates. You and your students won't want to miss this landmark event!

We hope you enjoy this first issue of NATIONAL GEOGRAPHIC FOR KIDS and that you will let us know how we can help you pass on the joy and power of reading to your students.

Sincerely,

A handwritten signature in black ink that reads 'Mary Dalheim'. The signature is written in a cursive, flowing style.

Mary Dalheim  
Editor, NATIONAL GEOGRAPHIC FOR KIDS

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NATIONAL GEOGRAPHIC  
SOCIETY  
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INTERNATIONAL PAPER

# Big Talkers

## Background

**E**arth's largest land animals, elephants are smart and social. And they're lively talkers. Growls, snorts, roars, trumpet sounds, and other vocalizations strengthen the bonds within and between tight-knit herds. The animals' repertoire also includes sounds we cannot hear. In one experiment, biologist Katy Payne recorded zoo elephants in Portland, Oregon. Her high-tech equipment even captured sounds below the range of human hearing. In fact, after studying printouts of the recordings, Payne and her team realized that humans hear only a third of elephants' calls.

For much of their communication, elephants rely on infrasound—noises whose low pitch makes them inaudible to humans. Infrasound can travel for miles, passing unimpeded through forests or grasslands. Thus it makes a perfect communication tool for animals too far apart to see or smell one another.

Infrasound may also prove to be a handy tool for conservationists trying to reduce conflicts between elephants and farmers. (Enraged by crop loss, farmers sometimes shoot the giant animals.) From their library of recordings, scientists would select samples that seem to tell other elephants, "Go away! This place is dangerous." Infrasonic speakers would broadcast these messages from farms, possibly deterring the animals from seeking food there.

Elephants are not the only animals that use infrasound. Payne has also studied infrasonic calls made by fin and blue whales, and researcher Liz von Muggenthaler has recorded infrasound produced by rhinos, giraffes, tigers, and okapis.

## Discussion Questions

- **Selling ivory is profitable for poachers. So how do elephant supporters encourage people not to poach?** (*Possible answer: Help them find other ways to earn money. By visiting elephant reserves, for example, people create jobs for guides, drivers, and hotel staff. By buying crafts, they give the animals' neighbors a chance to sell something other than ivory.*)
- **What is the basic structure of elephant society?** (*Females and their young live in herds with 10 to 20 members. Matriarchs lead the herds. Adult males live alone or with other males.*)
- **How does elephant society compare to ours?** (*Similarities: Both have strong family ties and communication skills. Differences: Male and*



*female  
adult  
elephants  
live apart;  
human leaders are  
male and female.)*

- **Elephants use communication to strengthen bonds within a herd. Is that true for humans too?** (*Yes.*) **How does your "herd" of friends communicate?** (*Answers will vary.*)



## Web Links

To access the following Web resources, go to [www.nationalgeographic.com/ngforkids/links](http://www.nationalgeographic.com/ngforkids/links).

**Creature Feature:** Check out elephant audio and video, a map of elephant ranges, and more.

**The Lost Elephant:** Have students use their knowledge about elephants to reunite a baby elephant with its mother.

**Congo Trek:** Read more dispatches from Mike Fay's journey through the heart of Africa.

**Sound Bytes:** Use this lively little movie to reinforce basic sound concepts.

## Answers

"Elephants in Africa," pages 8-9

1. eastern and southern Africa
2. central Africa (Grassland elephants are easier to see, and thus count, than forest elephants.)

"Going the Distance," page 10

3. The grains of rice should move a little.
5. The grains of rice should move farther than they did earlier.
6. the low-pitch sound
7. Low-pitch sounds travel farther.
8. The vibration from the low-pitch string moved the rice farther.
9. Infrasound allows elephants to communicate over long distances.

# Chew on This!



## Background

**G**um has been around for thousands of years. Its rich history provides excellent opportunities for class discussions about:

**Natural Resources:** Depending upon available resources, gum has been made with everything from honey-sweetened birch resin to mint-flavored chicle (a latex collected from the sapodilla tree) to grape-flavored synthetic rubber.

Today's gum manufacturers keep the exact recipes of their product a secret, but common ingredients include sweeteners (like sugar and corn syrup), softeners (like vegetable oil), flavoring, coloring, and gum base. Current gum bases are mostly synthetic (plastics and rubbers), but they may also contain natural latex.

**Product Marketing:** William Wrigley, Jr., was one of the first manufacturers to use advertisements to increase sales of a brand-name product. He also used ingenious marketing stunts, such as sending a free stick of gum to every person listed in a U.S. phone book.

To further increase gum sales, many manufacturers produced—and continue to produce—product variants, such as bubble gum, gumballs, and gum tape. They also offer unusual gum flavors, such as hamburger and pizza.

**Waste Cleanup:** Men, women, and children in the United States chew an average of 300 pieces of gum a year. That can leave more than 83 billion pieces of ABC (already been chewed) gum around to gum things up! Many U.S. cities are now hiring a company called GumBusters to remove gum from their sidewalks and subways. The company's 70-pound GumBuster machines use 300°F steam to soften the gum. Next, it splashes top-secret "gumfighter" chemicals on it. Using a wire brush, the GumBuster rubs the gum until it dissolves.

## Discussion Questions

- What is gum? (*A sticky substance that people chew, but don't usually swallow.*)
- How did available resources affect gum's ingredients throughout history? (*In early times, gum's main ingredients came from local trees, including birch, sapodilla, and spruce. Sometimes people sweetened this gum with honey or corn syrup. Later, manufacturers also sweetened gum with sugar and sugar substitutes. To make the gum stickier—and because synthetic products are easier to obtain—manufacturers now use plastic or synthetic rubber as the main*

*ingredient in gum bases.*)

- Why do you think kids in North America spend half a billion dollars a year on gum? (*Possible answers: To taste something sweet; to freshen their breath; to clean their teeth; because it's fun to chew.*)
- Butyl rubber is used in most gum bases today. It is also used to line car tires. How do you feel about chewing this? (*Answers will vary.*)
- What three improvements to gum do you think did the most to increase sales? (*Possible answers: Using chicle, adding sugar and flavoring, inventing a gum that chewers could blow into bubbles.*)
- Detectives have used gum to identify criminals. Can you figure out how? (*The detectives compared tooth marks in gum left at the scene of the crime with dental records of suspected criminals.*)
- Can you guess how Chiclets gum got its name? (*Chiclets gum used to be made with chicle.*)

## Small Group Activity

The following questions appear under "To Chew or Not to Chew" on page 16 of the Student Magazine. Have students discuss the questions in small groups and present conclusions to the class.

- Should chewing gum be banned in the United States? What about in your classroom? (*Answers will vary. Positive attributes: It can clean teeth, freshen breath, calm nerves, quench thirst, and aid digestion. Negative attributes: Chewing and popping gum can be rude and distracting; gum clings to many surfaces and can be hard to remove; the sugar in gum can cause cavities.*)



## Web Link

### More Gummy Details:











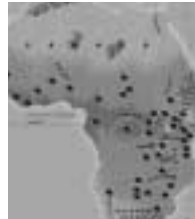



















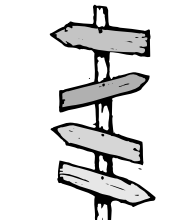






Unwrap more information about gum at [www.nationalgeographic.com/ngforkids/links](http://www.nationalgeographic.com/ngforkids/links).

## Answer Key

"A-mazing History of Gum" maze, page 17 (at right)



# NATIONAL GEOGRAPHIC *for* Kids!

ARTICLE/ DEPARTMENT TITLE	Reading	Writing	Science	Social Studies	Math	CONTENT OVERVIEW <ul style="list-style-type: none"> <li> Literacy Skills</li> <li> Topics</li> </ul>
 <p><b>Teaching Unit</b>            "Big Talkers"            pp. 4-11            ■ Feature Article            ■ Hands-on Science            ■ Online Adventure</p>	■		■	■		<ul style="list-style-type: none"> <li> Reading for information</li> <li> Developing vocabulary</li> <li> Sound</li> <li> Animal communication</li> <li> Animal adaptations</li> <li> Animal habitat</li> <li> Conservation</li> </ul>
 <p><b>Map of the Month</b>            "Elephants in Africa"            pp. 8-9</p>	■		■	■	■	<ul style="list-style-type: none"> <li> Reading a population map</li> <li> Reading a landform map</li> <li> World geography</li> <li> Conservation</li> </ul>
 <p><b>Teaching Unit</b>            "Chew on This!"            pp. 12-17            ■ Feature Article            ■ History Highlights</p>	■		■	■		<ul style="list-style-type: none"> <li> Reading for information</li> <li> Reading a time line</li> <li> Developing vocabulary</li> <li> Natural resources</li> <li> Economics</li> <li> Technology</li> </ul>
 <p><b>Feature Article</b>            "Deep-Sea Diver"            pp. 18-21</p>	■		■	■		<ul style="list-style-type: none"> <li> Reading for information</li> <li> Reading an interview</li> <li> Developing vocabulary</li> <li> Ocean ecology</li> <li> Water cycle</li> <li> Marine technology</li> <li> Career development</li> </ul>
 <p><b>Our Town U.S.A.</b>            "A Slice of New England"            pp. 22-23            ■ Writing Workshop</p>	■	■		■		<ul style="list-style-type: none"> <li> Reading for information</li> <li> Writing to persuade</li> <li> U.S. history and geography</li> </ul>
 <p><b>Photo Finish</b>            "Mud Bath"            p. 24</p>	■		■			<ul style="list-style-type: none"> <li> Developing visual literacy</li> <li> Animal adaptations</li> </ul>

# Issue at a Glance

## DIRECTED ACTIVITY

## SMALL GROUP ACTIVITY

## INDEPENDENT ACTIVITY

- Read the article.
- Discuss the questions on p. TG 2.

**60 minutes**



- Have small groups conduct the science experiment, "Going the Distance," p. 10.

**20 minutes**



- Read this issue's Online Adventure, titled "Congo Trek," p. 11.
- Play the "Lost Elephant" game at [www.nationalgeographic.com/ngforkids/links](http://www.nationalgeographic.com/ngforkids/links).

- Discuss the questions on the map.

**15 minutes**



- Read the article.
- Discuss the questions on p. TG 3.

**60 minutes**



- Have small groups discuss the "To Chew or Not To Chew" questions on p. 16 and report their conclusions to the class.

**30 minutes**



- Complete the "A-mazing History of Gum" activity, p. 17.
- Unwrap more information about gum at [www.nationalgeographic.com/ngforkids/links](http://www.nationalgeographic.com/ngforkids/links).

- Read the interview.
- Discuss the questions on p. TG 6.

**60 minutes**



- Join Sylvia Earle's deep-sea expeditions and pilot a virtual submersible at [www.nationalgeographic.com/ngforkids/links](http://www.nationalgeographic.com/ngforkids/links).

- Read the article, "A Slice of New England," p. 22.
- Complete the "Take My Word for It" writing activity, p. 23.
- Enter the student essay contest at [www.nationalgeographic.com/ngforkids/links](http://www.nationalgeographic.com/ngforkids/links).

- Read the article and complete the activity on p. 24.

# Deep-Sea Diver

## Background

“**W**hat’s left to explore?” some people ask. The answer is, “Plenty!” That’s why the National Geographic Society assembled a team of explorers-in-residence to probe frontiers in science, anthropology, archaeology, conservation, and other areas. “Deep-Sea Diver” interviews one of these explorers, oceanographer Sylvia Earle. We will talk with the other explorers in future issues.

As Earle tirelessly points out, Earth is primarily a marine planet—a fact that humans often overlook. Oceans cover 70 percent of the globe, and they are essential for life. Algae and other aquatic plants provide the bulk of our oxygen, and the water cycle creates rain and snow. The ocean also moderates temperatures, sparing Earth from the extremes that prevail on frigid Mars and fiery Venus.

Despite the ocean’s importance, says Earle in her book *Sea Change*, “more than 95 percent of the sea is still unexplored.” Scuba divers have a limited range, and technology for deep-sea journeys is relatively new and expensive.

Our ignorance of the sea makes it nearly impossible to predict how human actions (e.g., pollution, overfishing) will affect the long-term health of the ocean, and thus of the planet. The situation is similar to damaging parts of a crowded airplane before knowing how those parts affect flight.

Earle is heading the five-year Sustainable Seas Expeditions project to deepen our understanding of the ocean and its inhabitants. The project involves piloting one-person submersibles called *DeepWorkers* through marine sanctuaries in North and Central America. While underwater, Earle and other scientists are observing, documenting, and cataloging plants and animals. They are also recording and analyzing environmental issues at each sanctuary.

## Discussion Questions

- Look at a globe or world map. What does it tell you about the planet’s surface? (*There’s much more water than land.*)
- How does the ocean affect us? (*Main answer: It makes life possible on Earth. Additional answers: Sea plants provide oxygen. The water cycle gives us rain and snow.*)
- How do we affect the ocean? (*Possible answers: We pollute it by dumping trash, sewage, and*



*chemicals into it. We capture its fish for food. Fishing nets sometimes kill dolphins and other creatures.)*

- Sylvia Earle’s passion for the sea started early. So what are you interested in exploring? (*Answers will vary.*)
- Earle says to start exploring today. How might you do that? (*Possible answers: reading, searching the Web, joining or starting an exploration club, visiting museums*)



## Web Links

Plunge into these great Web resources at [www.nationalgeographic.com/ngforkids/links](http://www.nationalgeographic.com/ngforkids/links).

**Blue Frontier:** Pilot a virtual *DeepWorker* and get an overview of the Sustainable Seas Expeditions.  
**Sustainable Seas Expeditions:** Read scientists’ dive logs.

**Explorers-in-Residence:** Meet National Geographic’s “dream team” of explorers.

# Also in This Issue

PAGES 22–23

## Our Town: A Slice of New England

**Answers: “Take My Word for It,”** page 23  
*A Slice of New England:* 1. Lunenburg, Massachusetts, is a nice place to live. Or, even though Lunenburg is a small town, it is exciting in its own way. 2. The town has centuries of history, a town green, small-town friendliness, and big amusements.

*Your Turn:* Answers will vary.

## Essay Contest Directions

### How to Enter

No purchase required. A purchase will not increase your chances of winning.

- In 250 words or fewer, students should tell why they love their hometown (or rural area). The Writing Workshop on page 23 of the Student Magazine can help students structure their essays.
- Students can submit their original essays to their teachers, who will send them by mail to National Geographic. National Geographic is not responsible for lost, misdirected, or delayed mail. The mailing address is: NATIONAL GEOGRAPHIC FOR KIDS, Our Town Mailbag, P.O. Box 98031, Washington, D.C. 20090-8002.
- Submissions must be the original work of students in grades three through six. Eligible students may co-author a submission with another student in grades three through six.
- Entries must be postmarked no later than 11:59 p.m. eastern standard time (EST) on November 15, 2001 to be eligible for publication or prizes.
- The teacher must include with each entry the first name and grade level of each student writer, the teacher's name, school address, and school phone number.
- A prize acceptance/affidavit of eligibility and release of liability form must be signed by the parents of each entrant and must be submitted with each mail-in entry by the teachers in order for a student to be eligible to enter and win. The form (and a copy of these rules) may be obtained by students or teachers online at [www.nationalgeographic.com/ngforkids/contest](http://www.nationalgeographic.com/ngforkids/contest).

### Prizes

- The entries will be judged by National Geographic Society School Publishing Staff. The criteria for selecting the 25 finalists and 5 winners will be originality, writing style, and factual accuracy.
- The top five essays will be published in the online edition of NATIONAL GEOGRAPHIC FOR KIDS.
- The 25 finalists and the 5 winners will receive National Geographic T-shirts valued at \$19.
- National Geographic will notify the 25 finalists and 5 winners by mail. National Geographic will send prizes directly to the finalists and winners. Employees of the National Geographic Society, its subsidiaries, affiliates, advertising or promotional agencies, prize suppliers, and the families of each are not eligible. The contest is open only to residents of the United States (excluding Puerto Rico). Void in Puerto Rico and where prohibited by law. All federal, state, and local regulations apply. Taxes are the responsibility of the winner. Winners' names will be available upon request. For a list of winners, send a self-

# NATIONAL GEOGRAPHIC Kids!



## COMING UP IN THE October Issue

International Space Station  
Crazy for Chocolate  
Face-to-Face With Masks

addressed, stamped envelope to NATIONAL GEOGRAPHIC FOR Kids Essay Contest Winners, Our Town Mailbag, P.O. Box 98031, Washington, D.C. 20090-8002. National Geographic reserves the right to substitute a prize of greater or equal value.

- Submissions become the property of the National Geographic Society, and all rights, including copyright, thereto are transferred to the National Geographic Society by creator as condition of entry. Submissions cannot be acknowledged or returned.
- Winners will be required to get permission from a parent or guardian to allow the use of their essays and first name for publication online.
- We will not use or disclose any information about entrants without parental consent.

PAGE 24

## Photo Finish: Mud Bath

### Answers

1. Mud helps protect a frog from the sun.
2. Mud helps a frog hide from enemies.

### Review Answers: What's the Word? (TG 8)

1. Maya, 2. gills, 3. pitch, 4. desert, 5. submersible, 6. oceans, 7. matriarch, 8. habitat, 9. neurons, 10. resin.

*Riddle Answer: A little otter!*

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National Geographic for Kids Online  
September 2001  
Scavenger Hunt Answer Key

Depending on your pupils' scavenging skills, they may find additional answers.

1. Name two countries that Fay visited.

- Republic of the Congo
- Gabon

2. Name four rivers in Central Africa.

- Goualougo
- Mongomba
- Sangha
- Motsibon
- Kandeko
- Bokiba
- Mambili
- Lengoue

3. List three African animals that are endangered (or almost).

- African elephants
- gorillas
- buffalo
- chimpanzees

4. Name four types of rain forest vegetation.

- rubber trees
- mahogany trees
- ferns
- vines

5. Name three deadly diseases the team faced.

- malaria
- hepatitis
- Ebola

6. List three things the team ate.

- rice
- smoked fish
- peanut butter

7. List four things that Fay wore.

- shorts
- sandals
- eyeglasses
- raincoat

8. Name a life-threatening challenge for Fay and his team.

- crossing rivers and swamps

9. Identify three ways that humans threaten African animals and trees.

- logging companies
- poaching
- drilling for oil

10. How many fences did Fay and his team cross?

None