NATIONAL WILDLIFE FEDERATION

PARROTS AND TROPICAL FORESTS GUIDE FOR EDUCATORS

INTRODUCTION

www.climateclassroom.org

News about climate change is everywhere—in the newspaper, on TV and the radio, even at the movies. It's hard enough for grown-ups to sort out what's true and to determine what we should do about it. For kids, it can seem even more complicated and scary. That's why age appropriateness is a vitally important ingredient of climate change education.

The most age-appropriate measure you can take as a teacher is to help your students explore nature in their own neighborhoods and communities. This fosters a strong, positive connection with the natural world and builds a foundation for caring about global environmental problems later in life.

But how do you answer the questions your students inevitably raise about climate change? And how do you begin to examine the topic in a manner that doesn't frighten or overwhelm them? The best strategy is to provide children with brief, accurate information at a level you know they can understand and relate to—and in hopeful ways. This guide is one tool you can use to do just that.

About Howard Ruby, the photographer:

Wildlife images featured on Climateclassroomkids.org and throughout this guide were taken by Howard Ruby. Mr. Ruby is a nature photographer, Chairman of Oakwood Worldwide, and a supporter of the National Wildlife Federation. He has spent years traveling around the world to photograph the many amazing wild animals and wild places seen on this site. He is passionate about using his photos in creative ways to teach children and adults about the effects of climate change and he has been the driving force behind the creative development of this website and education program.

You can also visit his website, **www.howardruby.com** to see a preview of other photos that will soon be featured on our site.

ABOUT NATIONAL WILDLIFE FEDERATION

National Wildlife Federation inspires Americans to protect wildlife for our children's future. For more than 70 years, NWF has been connecting people of all ages with nature through award-winning education programs and resources, including the children's magazines *Wild Animal Baby*®, *Your Big Backyard*®, and *Ranger Rick*®.

ABOUT THIS GUIDE:

This guide's activities are designed for grades 3-5, with extensions for younger and older children. These activities meet national standards for English/Language Arts, Science, Social Studies, and Visual Arts.

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INTRODUCTION

News about climate change is everywhere—in the newspaper, on TV and the radio, even at the movies. It's hard enough for grown-ups to sort out what's true and to determine what we should do about it. For kids, it can seem even more complicated and scary. That's why age appropriateness is a vitally important ingredient of climate change education.

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Tropical rainforests make up about 7% of the earth's land but are home to 50-90% of its living species. Rainforests provide a habitat for biodiversity, an abundance of plants that provide food, medicine and other resources for the world, and natural global cooling effects. Removal of tropical rainforests not only can impact local climate, but can affect the global climate as well.

Why Focus on the Tropical Forests in Climate Change Instruction?

The diversity of plant and animal species in the tropical forests is much greater than anywhere else on earth. Rapid deforestation by humans not only destroys habitat but is also an important factor in climate change.

What Do Parrots Have to Do with Global Warming?

Of the more than 300 species of parrots in the world, nearly 100 are threatened in the wild, in part due to the impacts of climate change on the tropics. Parrots and other birds may be forced to higher elevations to escape warming temperatures, only to compete with other species for habitat. Timing of breeding can also be disrupted, resulting in reduced populations.

TALKING TO KIDS ABOUT CLIMATE CHANGE

1. **Be age appropriate.** Climate change is the largest environmental problem humans have ever faced. Solving it is a vast responsibility to place on the next generation. Our responsibility is to prepare our children for it—and to hand it over only when they're ready. **Preschool/Early Elementary:** This is a time for children to explore the immediate environment (backyard, neighborhood, nearby parks) in a way that is hands-on and full of joy. It's not a time for them to worry about environmental tragedies. There's no need to bring up climate change at this age if children don't ask about it. If they have questions, by all means address them—but keep your answers brief and basic. Assure children that grown-ups are working hard on solutions. The very best thing you can do for the youngest children is to foster a strong, positive connection with the natural world. This builds a foundation for caring about global environmental problems later in life. (For ideas and resources to connect young children with nature, visit www.beoutthere.org) Upper **Elementary:** As their ability to think abstractly increases, older children will be able to discuss climate change in more depth. This is the time to talk about your students' questions and ideas, model your own interest in learning more about the issue, and seek out concrete actions you can take to be part of the solution. At the same time, continue exploring and enjoying the local environment. Outdoor exploration and learning are vitally important ways to foster care for the planet.
2. **Let students guide the conversation.** Listen carefully to their questions and concerns. It may be hard to hold back, especially if you know a lot or are passionate about this subject, but it's important not to overload students with information they aren't ready for.
3. **Answer questions.** To effectively answer students' questions, it's important to be informed yourself. Visit www.climateclassroomkids.org for additional child-friendly information about climate change.
4. **Diffuse fear.** There's no doubt that climate change and many of its projected impacts are scary. If students are anxious or upset by what they have heard, acknowledge these fears. Then try to diffuse them by steering the conversation toward solutions.
5. **Don't burden them.** Children didn't create this problem, and it's not fair to tell them that they'll be solely responsible for solving it. Let them know that many, many grown-ups are working hard to resolve it.
6. **Think positively.** Children are naturally optimistic. We'll need every drop of that optimism to tackle climate change successfully—so be sure they keep it! Emphasize that it's not too late. People have caused this problem, and people, working together around the world, should be able to solve it.
7. **Invite participation.** Explain that solving the problem will require some big changes—in society and also in our own daily lives. We'll need to rethink many things, from the way we get energy to the way we build our houses and get around. Simply turning off the lights won't solve the problem. But everyone can play a part in turning the tide.
8. **Empower action.** Provide opportunities for students to take action at home and in the classroom. Seek out positive steps you can take together. Whenever possible, keep it local and tangible, with visible results. For instance, you may not be able to directly help the parrots in tropical forests, but you could participate in a habitat restoration project that will benefit wildlife in your own neighborhood.

ACTIVITY ONE

WHERE IN THE WORLD?

Subjects: Geography: Landforms, maps, globes

LEARNING OBJECTIVES:

- Identify the Tropical and Sub-Tropical regions and some of their key geographic features on a globe and a world map.
- Compare ways information is presented on globes and maps.
- Record and discuss prior knowledge and perceptions of the Tropics.

MATERIALS:

- Photos of the Tropics
- Globe
- Pencils
- Red Pencils
- Student Page "What I Know About the Tropics"

BACKGROUND:

Tropical rainforests are characterized by high average temperatures and levels of precipitation. This ecosystem is known for its biodiversity, containing 50-90% of earth's living species. Rainforests consist of vertical layers of microclimates and microhabitats, which drives the abundant biodiversity.

Longitude and latitude are imaginary lines on a map or globe that help us describe the location of any place on Earth. Latitude lines measure the distance north or south of the Equator. Longitude lines measure the distance east or west of the prime meridian. Both are measured in terms of the 360 degrees of a circle. The equator Tropics background - equatorial regions, tropic fall within 23.5 degrees latitude of the equator, between the Tropic of Capricorn and the Tropic of Cancer.

WHAT YOU DO:

1. Divide students into small groups and give each group a set of photos of the tropics. Tell students that today they are going to learn about a special place. Have each group look through its photos and jot down answers to these questions:
   - What does this place look like?
   - How would you describe its climate?
   - What is this place called?

Invite groups to share their answers with the class. Then tell students that they are going on a mapping adventure to find the place pictured—the Tropics.

2. Using a globe, show students the tropical region. Ask the class:
   - What are the differences between globes and maps?
   - Which tool would you use to see the best model of the entire Earth?
3. Distribute copies of the student page called "What I Know about the Tropics." Give students ample time to record what they know about the Tropics in the chart on this page.
4. Collect the completed pages. At the end of this teaching unit, return the pages to your students and have them compare their initial Tropical knowledge with their current knowledge.

USEFUL LINKS:

Photos of the tropical rainforests can be found at
www.climateclassroomkids.org/photo-galleries/

STUDENT PAGE

WHAT I KNOW ABOUT THE TROPICS

Directions: Record things you know about the Tropical regions in the spaces below.

Climate

Animals

Plants

People

Other

ACTIVITY TWO

FILL THE BILL

Subjects: Biology, Natural Science, Art

LEARNING OBJECTIVES:

- Describe five different types of beaks and explain how each is adapted to feed on different foods.

MATERIALS:

You'll need to set up eight different stations, each with a special type of "food" that fits one of the eight different types of beaks we've described. And at each station you will need three different tools – one that fits the food and two that don't fit so well. Also have a sign at each station that tells what type of food is represented. For example, have a sign that says "nectar" at Station #1, one that says "worms in the mud" at Station #2, and so on.

The * indicates the tool that best fits the food:

- Station #1 Water in a tall, thin vase to represent nectar in a flower. For tools use eyedropper or straw*, envelope or small fishnet, large scoop or slotted spoon.
- Station #2 Large saucepan filled with dry oatmeal or cracked wheat, with grapes on the bottom to represent worms buried in the mud. You can use fake rubber worms instead of grapes. For tools use chopsticks*, nutcracker, strainer.
- Station #3 Whole walnuts or other nuts to represent seeds with hard coverings. For tools, use nutcracker or pliers*, tongs, chopsticks.

- Station #4 Styrofoam chunks floating in an aquarium or bucket filled with water to represent fish and other aquatic animals. For tools, use large scoop or slotted spoon*, eyedropper or straw, chopsticks.
- Station #5 Popcorn or tiny marshmallows tossed in air (which must be caught in the air) to represent flying insects. For tools, use envelope or small fishnet*, forceps or tweezers, chopsticks.
- Station #6 Rice spread on a log to represent caterpillars and other insects. For tools, use forceps or tweezers*, envelope or small fishnet, nutcracker or pliers.
- Station #7 Swedish or "gummy" fish to represent small fish. For tools, use tongs*, eyedropper or straw, strainer.
- Station #8 Puffed rice in an aquarium or bucket of water to represent tiny aquatic plants and animals. For tools, use strainer*, forceps or tweezers, tongs.
- Student Page

BACKGROUND:

It would be impossible for a hummingbird to gobble up a mouse. And it would be just as impossible for a hawk to slurp up some nectar from a flower. Each type of bird has a special beak and tongue adapted to eating a certain type of food. In this demonstration your group can find out which beaks are best for tearing scooping, cracking and picking by going to different stations you've set up and trying to find out which tools go with which types of "food."

First talk about some different bird beaks to get the kids thinking about how beaks help birds survive.

Here are some examples of birds and beaks you can talk about:

Hummingbirds have long hollow beaks that they use to probe flowers for nectar. The beak protects the tongue which slurps up the nectar.

Curlews, godwits, kiwis, and snipes have very long beaks that they use to probe for worms, crustaceans, and other small creatures in mud and water.

Cardinals, sparrows, grosbeaks, and other finchlike birds have very short, conical beaks. These beaks are very strong and can break open tough seeds.

Spoonbills and pelicans have long, flattened or pouchlike beaks that they use to scoop up fish and other aquatic creatures.

Nighthawks, whip-poor-wills, swifts, and swallows have large, gaping mouths that act like nets to trap insects. These birds catch insects on the wing.

Warblers have small, sharp, pointed beaks for picking insects from leaves, logs, and twigs.

Toucans have very long, thick beaks for reaching out and plucking fruit from trees.

Puffins have thick, curved bills in which they hold small fish crosswise with their tongue while diving for more.

Flamingos and some ducks have bills that act like strainers to filter tiny plants and animals from the water.

Parrots have powerful bills built for crushing even very hard nuts, and they use the raspy edges to saw and chisel away at the shell till they can pry it open and pull the nut out.

WHAT TO DO:

1. Pass out a copy of the student page to each person. Divide the group into eight teams and start each team at a different station. Explain that there will be three different tools at each station, each of which represents a different type of bird beak function. Each group must decide which tool would most efficiently get the food at each station, by trying out the different tools.
2. Once they pick the best tool, they should write the name of the tool in the appropriate square. You might want to set a time limit to keep things moving. Underneath the squares are pictures of different birds and their beaks. On the line under each picture, they should write the number of the square that represents the correct beak. For example, they should write "8" on the line under the flamingo.

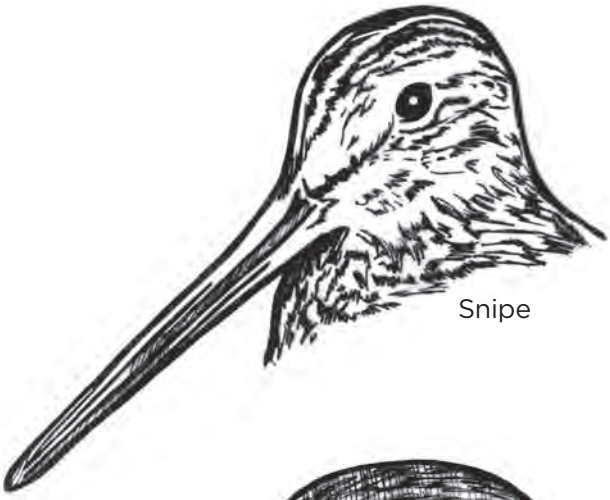
ADAPTATIONS:

For older students: After the activity, discuss beak adaptations in general. Explain that many birds, after millions and millions of generations, have evolved very specialized beaks, beaks that can only be used on one certain type of food. Ask the group how specialized beaks can help some birds stay alive. (A bird with a specialized beak can often eat a type of food that no other bird can eat.) Then ask how a specialized beak might hurt a bird. (If the bird's habitat changes and its food is no longer available, the bird might die because it can't eat anything else.) Explain that some birds, such as crows, have very versatile beaks. Crows can eat fruits, nuts, berries, dead animals, and even fish and small rodents. If one type of food is not available, they can always eat something else.

USEFUL LINKS:

Variation on this activity is available at
www.nwf.org/pdf/Schoolyard%20Habitats/fillthebill.pdf

STUDENT PAGE

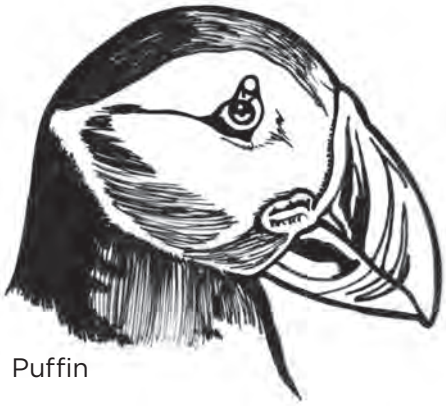


Snipe

Flamingo

Warbler

Grosbeak



Puffin

Whip-poor-will

Pelican

List food:

1 Nectar

2 Worms in the mud

3 Seeds

4 Fish and other water animals

5 Flying insects

6 Caterpillars and other insects

7 Small fish

8 Tiny water plants and animals

Hummingbird

ACTIVITY THREE

BIRDS IN THE NEWS

Subjects: Natural Science, Language Arts

LEARNING OBJECTIVES:

- Describe a bird-related issue currently in the news.

MATERIALS:

- Paper and pencils
- Glue or tape
- Newspapers
- Magazines (optional – for cutting out pictures)

BACKGROUND:

There are many problems facing parrots and other birds today, from loss of habitat to pesticide poisoning. Deforestation is a major concern in tropical forests and is due to human activities including mining, drilling, logging and clearing for agriculture. In addition to providing wildlife habitat, tropical forests provide cooling effects and their destruction increases greenhouse gas emissions. The illegal capture and sale of parrots and other animals in tropical rainforests is another major cause of species loss. But there are also many people working hard to help birds survive. In this activity, your group can learn more about bird issues by keeping an eye on the news and making team newspapers.

WHAT YOU DO:

1. Divide the group into teams of four or five students. Explain that each team will be making a newspaper about bird issues and bird conservation. The newspaper can be filled with items such as:

- Bird-related articles cut from newspapers
- Reports on birds in trouble
- Interviews with people in the neighborhood who are helping to protect birds
- Community bird issues
- Reports on environmental problems affecting birds
- Poems or stories about the problems facing birds
- Pictures and stories of birds that are "bouncing back"
- Habitat issues

The newspapers can have a cartoon section, an editorial page, an international, national, and local section, a good news page, and anything else as long as it has to do with bird issues and conservation.

2. After all the team papers are completed, discuss some of the major issues that are in the news today. Have the children try to look at both sides of a problem and decide what they would do if they were in charge. Then ask the group to come up with ways they could help birds, such as making nesting boxes, holding a "birdathon" to raise money for organizations that are helping birds, writing letters to elected officials about bird-related issues, become involved in community projects that can help birds, and so on.

USEFUL LINKS:

Science Daily has top science news on a variety of subjects, including birds:
www.sciencedaily.com/news/plants_animals/birds/

Bird Conservation Alliance has news articles about wild bird conservation:

http://www.birdconservationalliance.org/news.htm

Visit the Ranger Rick® website for information about all kinds of birds, mammals, insects, and reptiles & amphibians:
http://www.nwf.org/Kids/Ranger-Rick/Animals.aspx

ACTIVITY FOUR

FANTASY ISLAND

Subjects: Reading, Creative Writing, Science

LEARNING OBJECTIVES:

- Define “adaptation” and “niche”.
- Describe the relationship between habitat and adaptation.

MATERIALS:

- Copies of Student Page
- Drawing paper
- Crayons or colored pencils

BACKGROUND:

Animal species differ in the way they adapt to climate change. As a result, range shifts by animal populations can create problems for animals that remain in their historical ranges. Similarly, changes in seasonal timing can knock animals out of sync with the seasonal appearance of the plants and prey they need to survive. As a result, parrots and other wildlife are forced to adapt to changing circumstances, often unsuccessfully.

One way for children to understand how niches, adaptations, and habitats all fit together is to have them create fantasy birds and describe the adaptations, niches, and habitats of their made-up birds. In this activity we've provided habitat background, but the kids have to think up the birds, adaptations, and special niches.

WHAT YOU DO:

1. Pass out copies of the Student Page and have each person read about the imaginary island of Aviana. Explain that this is just a brief description of the habitats on the island, as well as some of the plants and animals that live there. There are many other creatures that live on the island, including many types of birds.
2. Tell the children they should each pick one of the habitats (sandy beach, sandy forest, swampy forest, or field) and describe it in more detail. Then have them describe two birds that live in the habitat they have chosen. Each of the birds should have a different niche. They might eat at different times, nest in different places, eat different foods, hunt in different ways, or migrate at different times of the year.
3. Tell the kids to explain how their birds are especially adapted to the habitat they've described. You can have them write about what, when, and how the birds eat; where they nest; what they use to build their nests; whether or not they migrate and, if they do, where they go and why; and so on.
4. When they finish writing about their birds, have them draw a picture showing the habitat and the two birds they've described. Make sure they draw details of special adaptations the birds have for staying alive.
5. Afterward, have each person hold up his or her picture and talk about how each of the two birds is adapted to its habitat. Compare the different niches and adaptations that everyone came up with and then talk about some of the special adaptations of birds living in your area.

USEFUL LINKS:

Learn more about how animals adapt to global warming: **www.nwf.org/news-and-magazines/national-wildlife/animals/archives/2010/how-animals-fight-global-warming.aspx**

STUDENT PAGE

Many years ago an explorer discovered the tiny island of Aviana. Aviana was a beautiful island, with dense forests, open fields, sandy beaches, rugged cliffs, and rocky sores. Wild and colorful creatures lived on all parts of the island, and exotic wildflowers and trees, with strange fruits, seeds, and nuts, grew In each type of habitat. here's how the explorer described the island in a book she wrote about her trip:

Large catlike predators, which the natives called dorcas, prowled the fields looking for birds and small mammals. With three twisted horns on their heads and two sharp claws on each foot, dorcas were a fierce match for their prey. Dorcas slept in the trees during the day and hunted for prey at night in the open fields of snuffgrass. They could leap three times the length of their bodies and were skilled tree climbers.

Snuffgrass was very common. It was a birght yellow weed with huge, round seed capsules that held hundreds of tiny seeds. When the capsules ripened they burst open, shooting the seeds in all directions.

Lots of weird insects lived in the fields of snuffgrass. Tiny blue caterpillars fed on the leaves and hard-backed beetles with bright red stripes lived in the seed pods. All kinds of pucos - fat grubs that tunneled in the stems of the snuffgrass - also lived in the fields.

One of the strangest plants was the bucavine. It grew in the fields of snuffgrass. Bucavines bore brightly colored fruits that were shaped like bananas but had a very hard shell. And each was filled with a sweet, honeylike juice. The flowers of the bucavine were very large and flat and each held a few drops of sweet, green nectar.

Two different kinds of forests grew on the island - one that grew In dry, sandy soil and one that grew in moist, swampy soil. The drier forest was filled with teeple trees and lufawood trees. The teeple trees had thick, syrupy sap, and super smooth bark that made them almost impossible to climb. The fruit of the teeple trees was crunch and sweet, but the seed in the center was poisonous to many of the island creatures. The lufawood trees were very spongy. All kinds of creatures lived in the soft wood of the branches and twigs. Slippery eelwells crawled up and down the trunk. The eelwells had sharp teeth and a slimy body, but were very tasty treats for the birds - if they could grab one and hold onto it.

In the swampy wet forest, pools of standing water surrounded clumps of huge garbon trees. The roots of the garbon trees came up through the ground and formed a maze of jungle-gym-like branches. Moosha monkeys lived among the roots and fed on the root knobs. The monkeys also fished in the water for sticky eels and turtle swanees - reptiles with long necks and sharp claws. Hard-backed worms lived in the wet, spongy soil in deep, narrow burrows. Zeepas flew over the marsh looking for prey. Zeepas were striped insects that looked like a mix of mosquito, butterfly and wasp all wrapped up in one. Zeepas were quick fliers with delicate wings. They made their nests in the trunks of the garbon trees. Slimy mossworts grew on everything - rocks, tree trunks, and even animals' backs.

On the other side of the island, a sandy beach lined the shore. The sand was black and so were many of the creatures that lived there. Crablike animals with sharp spines lived in the sand, along with two-headed sponges, whirlyfish (fish that could sail llike a Frisbee), pocket rebas (tiny mammals that tunneled in the sand), and many other creatures.

ACTIVITY FIVE

WRITER'S CORNER

Subjects: Language Arts, Visual Arts, Social Studies

LEARNING OBJECTIVES:

- Communicate scientific facts effectively using a variety of media.
- Formulate and express opinions in writing.

MATERIALS:

- Writing supplies or computer access
- Optional: audio or video recording equipment, art supplies
- Student Page: "Here's my Opinion"
- Parrot Fun Facts

WHAT YOU DO:

1. Encourage students to choose one of the topics below or an idea of their own to reflect upon.
- Parrots are quite different but the birds do have some similarities, too. Compare and contrast parrots and other birds
- A food web has species at the bottom, in the middle, and at the top. Which species do you think are most important? Defend your answer..climateclassroomkids.org

- Use the Student Page: “Here’s My Opinion” to answer the questions: Are parrots more or less vulnerable to the effects of climate change? Why? Share the “Parrot Fun Facts” with students. Ask them to write a story about their favorite trait(s) or behaviors of parrots.

2. Ask students to share their thoughts in writing, or give them a choice from among a variety of media. For instance, they may write a song or rap, or perhaps they’d like to make an audio or video recording, a blog post, or a collage or drawing with captions.

3. Provide an opportunity for students to share and discuss their work with each other.

USEFUL LINKS:

www.epa.gov/climatechange/kids on science and impacts of global warming and climate change, and on actions that help address global warming.

Find out more about protecting wildlife from global warming at **www.nwf.org/rrgreenzone/**

STUDENT PAGE

HERE'S MY OPINION

Question: Are parrots more or less vulnerable to the effects of climate change? Why?

Directions: Use this page to create an outline that will help you write an opinion piece about the question above. Refer to the www.climateclassroomkids.org and "Fun Facts" to help you make your outline.

Opening paragraph

What is your main opinion on the question above?

Arguments

1. What is the most important point you want to make?

1b. What evidence or facts support this?

2. What is your next point?

2b. What evidence or facts support this?

3. What other points do you want to make?

Closing paragraph

Restate your main opinion about the question above in another way.

ACTIVITY SIX

WHAT YOU CAN DO

Subjects: Science

LEARNING OBJECTIVES:

- List actions students can take to reduce their own contribution to global warming pollution.

MATERIALS:

- Writing supplies and/or computer access

BACKGROUND:

The average temperature around the world is rising. This is due to increasing levels of carbon dioxide and other greenhouse gases in the atmosphere. These gases, which trap the sun's heat, are released whenever we burn fossil fuels (oil, gas, and coal) for energy. Climate change is a vast problem that can seem insurmountable and scary. Particularly with children, it is important to approach this topic in a way that is empowering rather than disheartening. As students will have learned from studying the sea and coastal ecosystems, climate change is already affecting animals such as puffins. You can focus their concern by steering them toward positive actions they can take to reduce their own carbon dioxide "footprints." While a true solution to climate change must come from major changes to society on an international scale, personal actions are a good place to start.

WHAT YOU DO:

1. Use the concepts and resources presented throughout this guide or the suggestions below to lead a brainstorming session with your students on actions they can take to benefit wildlife and the environment as individuals, as a class or a school.
2. Ask your students to develop a plan for taking action as individuals or as a class.
3. Share your plan and measure progress. Make a chart to document progress on class activities or post everyone's pledges for individual actions in the classroom or in a common area of the school.

Make a list of Simple Steps you can take to fight climate change and parrots and other wildlife of tropical forests!

- Unplug three electronic devices (TV, computer, stereo) when not in use.
- Take reusable bags when you go shopping.
- Walk, bike, carpool and use mass transit whenever you can.
- Replace old light bulbs with energy-saving compact fluorescents.
- Learn more and add to your list at www.nwf.org/energy.

Get involved! Join an organization that works to protect parrots and other wildlife, such as the National Wildlife Federation or a local group that works in your area. You can even join as a class at **www.nwf.org/everystepcounts**.

Write letters! Students can let decision makers, their peers and adults know when they think a subject is important or if an action needs to be taken.

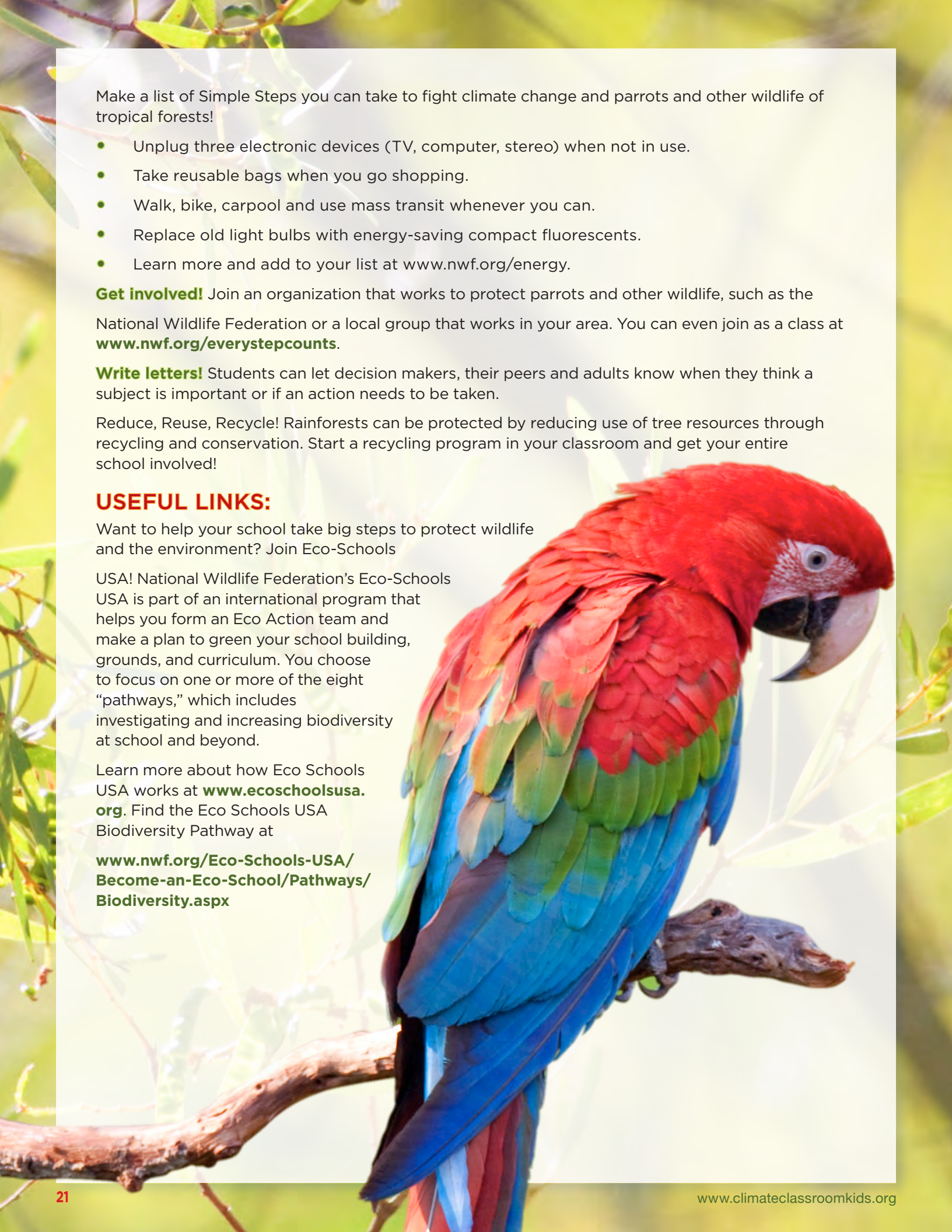
Reduce, Reuse, Recycle! Rainforests can be protected by reducing use of tree resources through recycling and conservation. Start a recycling program in your classroom and get your entire school involved!

USEFUL LINKS:

Want to help your school take big steps to protect wildlife and the environment? Join Eco-Schools USA! National Wildlife Federation's Eco-Schools USA is part of an international program that helps you form an Eco Action team and make a plan to green your school building, grounds, and curriculum. You choose to focus on one or more of the eight "pathways," which includes investigating and increasing biodiversity at school and beyond.

Learn more about how Eco Schools USA works at **www.ecoschoolsusa.org**. Find the Eco Schools USA Biodiversity Pathway at

www.nwf.org/Eco-Schools-USA/Become-an-Eco-School/Pathways/Biodiversity.aspx



STUDENT PAGE

CLIMATE CHANGE ACTION

Directions: Use www.climateclassroomkids.org to help you answer the following questions.

PART ONE:

What is climate change?

What is causing it?

How do scientists measure it?

Why is it a problem?

What are some things people are doing to solve it?

PART TWO:

List five things you could do in your own life that would help save energy and reduce climate change pollution.

1.

2.

3.

4.

5.

PARROT FUN FACTS

(These facts are adapted from National Wildlife Federation's Ranger Rick® magazine)

KNOW YOUR PARROTS

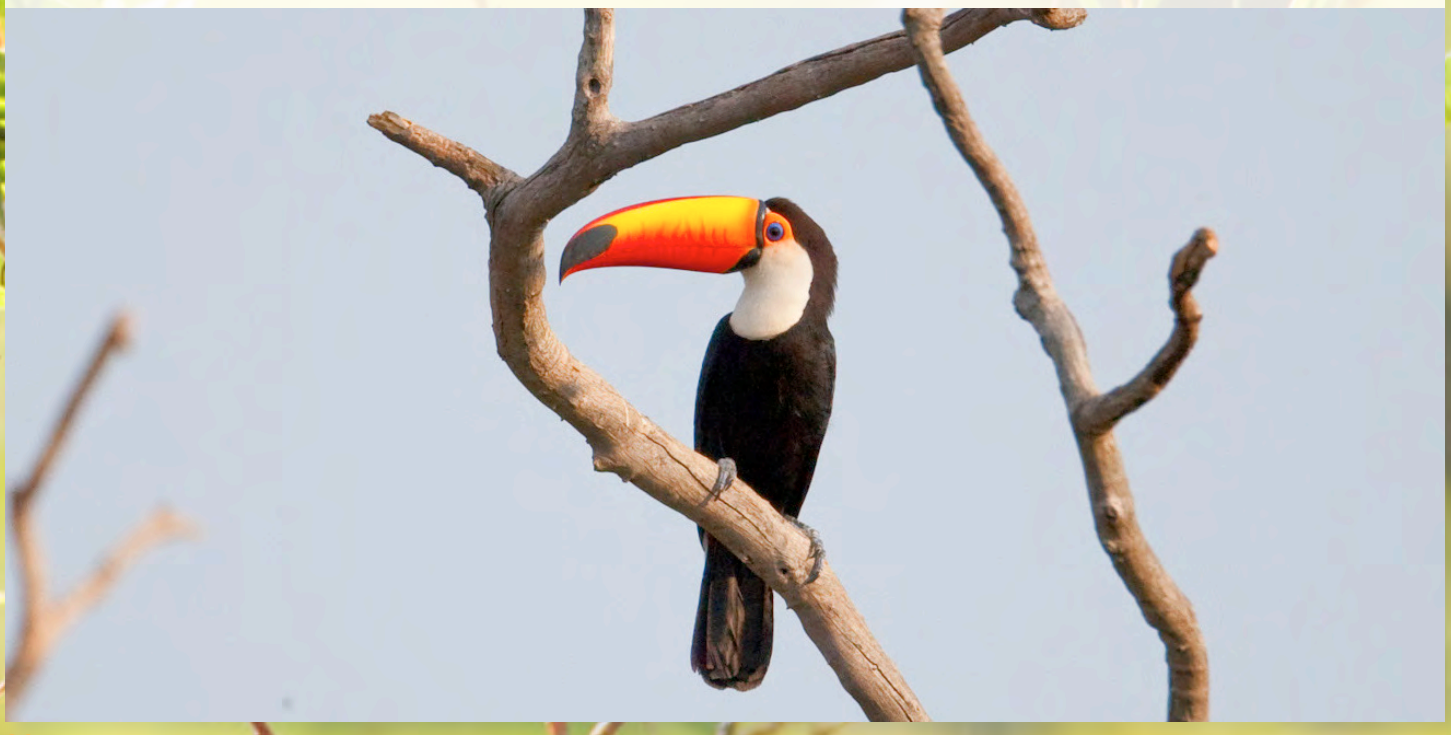
- Most of the 330 species of parrots live in tropical rainforest, but there are species that live in the desert, on the seacoast, and even in cold climates!
- Of the more than 300 species of parrots in the world, nearly 100 are threatened in the wild, due to the illegal pet parrot trade and loss of habitat.
- Cockatoos, macaws, parakeets and lorikeets are all part of the Parrot family.
- Due to their size and the length of their tail feathers, palm cockatoos need extra-large nesting holes. They can't dig the holes out themselves but must find an existing tree-hole.
- Cockatoos have tall crests that are held flat against their back. If a bird is scared or excited, then the crest shoots up into the air!
- Larger parrot species can be very long-lived, up to about 50 years, with most cockatoos living 40 to 60 years. Some can live over 100 years!
- Red-winged parrots eat seeds from trees, usually by hanging upside down from a branch.
- Western corellas eat roots, seeds, and grains from the ground.
- Major Mitchell's cockatoo pairs won't nest close to other pairs, and need more trees and space than other kinds of parrot.
- Macaws are the largest parrots in the world. The hyacinth macaw is the largest macaw and is about 3 feet long from tip to tail.
- The smallest parrot is the buff-faced pygmy-parrot, at a little over 3 inches in length.

PARROT FAMILIES

- A mated pair will choose a nest – most parrots nest in holes in trees. Desert parrots nest in holes in cactuses instead! Monk parakeets weave sticks into nests that can weigh hundreds of pounds, and often several families each have a hole in the nest – a parakeet apartment house!
- Mom lays the egg – up to three – and stays inside with them till they hatch. Dad feeds her during the wait. Even after they're out of the nest and fully feathered, the young parrots are not able to take care of themselves, and stay with their parents till they can – sometimes months later.
- Parrots often gather at water holes to drink and bathe together.
- A mated pair will choose a nest – most parrots nest in holes in trees.
- Even within the flock mates stay near each other. A parrot pair will sit side by side, eat together, and groom, or preen, each other.
- Parrots live in large flocks. A flock of parrots can make a lot of noise squawking and chattering together!

PARROT ADAPTATIONS

- Most parrots have powerful bills built for crushing nuts. They hold the nut up to their beaks and use the edges to saw and chisel away at the shell till they can pry it open and eat the nutmeat.
- Parrots' first and fourth toes are turned backwards, so they walk funny, but they are great climbers.
- Parrots pull themselves from branch to branch using their strong, curved beaks as well as their feet to hold on.
- Bright colors may actually help camouflage parrots – by making them look like colorful flowers to predators!
- Rainbow lorikeets eat the flowers, nectar, pollen and fruit of flowering trees, as well as seeds and insects. It laps up the flower pollen and nectar with its bristly tongue.



NATIONAL EDUCATION STANDARDS

WHERE IN THE WORLD ARE THE TROPICS?

Science: NSES

Grades K-4 Standard C: Life Science

Organisms and environments

Grades 5-8 Standard C: Life Science

Regulation and behavior, Diversity and adaptations

Grades K-4 Standard D: Earth & Space Science

Changes in earth and sky

Grades 5-8 Standard D: Earth & Space Science

Structure of the Earth system, Earth in the solar system

WRITER'S CORNER

Science : NSES

Grades K-4 Standard C: Life Science

Characteristics of organisms, Organisms and environments

Grades K-4 Standard F: Science in Personal and

Social Perspectives Changes in environments

Grades 5-8 Standard C: Life Science

Diversity and adaptations, Populations and ecosystems

Grades 5-8 Standard F: Science in Personal and

Social Perspectives Populations, resources, and environments

English/Language Arts: NCTE/IRA

Standard 1: Reading for perspective

Standard 4: Communication skills

Standard 5: Communication strategies

Standard 6: Applying knowledge

Social Studies: NCSS

Theme 4: Individual development and Identity, Theme 9: Global Connections, Theme 10: Civic Ideals and Practices

WHAT YOU CAN DO

Social Studies: NCSS

Theme 9: Global Connections, Theme 10: Civic Ideals and Practices

FUN FACTS

SCIENCE: NSES

Grades K-4 Standard C: Life Science

Characteristics of organisms, Organisms and environments

Grades 5-8 Standard C: Life Science

Regulation and behavior, Diversity and adaptations, Populations and ecosystems

English/Language Arts: NCTE/IRA

Standard 1: Reading for perspective