Finding my Forest

around the corner and across the nation

Teacher's Guide to Discovering the Forest

For Grades 3 through 8

Forest Hall of Fame

Become a Forest Hall of Fame Honoree

See inside!

Finding my Forest

around the corner and across the nation

Dear Educator,

Remember what it was like playing outside as a child? Maybe you were a tree climber, a ball player, a forest explorer … or a playground queen or king. Or did you prefer to find your special place and just sit quietly until your family called you in? However you spent your days outside, you almost certainly enjoyed more unstructured "outdoor time" than your current students do.

Today's children have full agendas. Between school, scheduled activities, television, computers, and cell phones, they have little free time. It's no wonder that children are losing touch with natural spaces like our forests —and yet, time spent in natural spaces has been proven to help children *and* adults succeed. It reduces stress and improves both concentration and productivity. As such, helping children find "*their* forest"—their place in nature, imprinted in their hearts no matter where they are—offers benefits that cannot be underestimated.

Public forests are ours to use and enjoy. The Forest Service manages 193 million acres of public land owned by all of us—and there are millions more when you include local and state natural spaces in this tally.

Research has shown that outdoor experience with a mentor is a strong predictor of how environmentally aware and involved a child will become as an adult. *Finding My Forest* provides the tools you need to integrate the wonder of our forests right into your curriculum.

> *"If a child is to keep alive his inborn sense of wonder, he needs the companionship of at least one adult who can share it, rediscovering with him the joy, excitement and mystery of the world we live in."*
>
> – Rachel Carson, Author, *Silent Spring*

Please participate in the movement to engage our nation's students in forests and natural spaces. Help create the next generation of environmental stewards, so that current and future generations can benefit from a lifetime connection to nature.

Many thanks,
Thomas L. Tidwell
Chief, Forest Service

See what's inside, so you can get outside!

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For more information about the Discover the Forest program from the Ad Council and the USDA Forest Service, including research about the benefits of natural spaces for children and adults, go to **www.FindingMyForest.org**.

Throughout this guide, we have provided website links to pertinent reference material. These were current at time of publication. If you discover a link that is no longer active, go to Discovertheforest.org for other helpful links.

How to Use This Guide

Suggestions for Getting Started

Familiarize yourself with www.discovertheforest.org—the program website. You will find a searchable map of natural spaces across the United States, information about forests and their benefits, and supplemental resources such as the *Book of Stuff to Do Outside*. Encourage your students to visit the site during computer lab or at home with their families to get them excited about learning about forests.

Take Students Outside

The four integrated lessons make taking your class outdoors as easy as walking outside … literally. Almost all lessons and activities can be completed in your schoolyard! Each has Wonder, Discover, Act, and Connect components to engage your students.

Easily Enrich Your Curriculum

Whether you are a classroom teacher or outdoor educator, these lessons can fit into your curriculum. The lessons are interdisciplinary and connect with diverse learning styles.

While you can mix and match the lessons, we do encourage you to teach Lesson 1 as the introduction to the unit. All lessons have a Science and Environmental Education focus, and also integrate with other subject matter.

English Language Arts:	Lessons 1, 2, 3, 4
Math:	Lessons 2, 3
Music/Art:	Lessons 1, 4
Social Studies:	Lessons 3, 4

Join the iForest Community

By adding your class to the iForest network map at (**www.FindingMyForest.org/connect.html**), you can connect and engage with those classrooms around the country who are also using this curriculum.

- Step-by-step information on how to access the iForest network is available online at (**www.FindingMyForest.org/connect.html**)
- How to create a classroom blog is clearly outlined and can be found at (**www.FindingMyForest.org/connect.html**)

Become a Forest Hall of Fame Honoree

Your class could become famous throughout your state and across the country! One participating classroom from each state will be chosen for the nation's *Forest Hall of Fame*. If selected, your class will be featured on the Discovertheforest.org website, and people from around the country will be able to see how you've been exploring and caring for forests.

Complete the curriculum, actively update your iForest blog, and connect with other classrooms in the network. Then, submit your class's work for *Forest Hall of Fame* consideration at **www.FindingMyForest.org/hall-of-fame.html**. Only one class from each state will be chosen. It could be yours!

Objectives and Standards

Objective

Your students will spend time in the forest in order to understand how and why this time and these forests are so important. The Learning Objectives in this guide are building blocks for a lifetime of active and thoughtful engagement with forests and other natural spaces.

Outcomes

As a result of the *Finding My Forest* curriculum, students will be able to:

- Discover myriad opportunities in nature, and actively choose to return to the forest during their out-of-school time
- Experience time in nature (specifically, forests) that is beneficial to their mental and physical well-being
- Explain how "healthy forests" are an interconnected web of resources that can be threatened by fire, invasive species, loss of open space, and unmanaged recreation, and understand how to protect them
- Explain the benefits of forests to our communities
- Engage with their local forests through exploration and conservation activities
- Explore forest-related careers
- Use digital media, including the Discovertheforest.org website and the iForest Network, to enhance and reflect on their forest experiences
- Connect with like-minded students across the country and join the effort to conserve forests for future generations

National Standards

Each lesson is aligned with Grade 4 and Grade 8 benchmarks of the North American Association for Environmental Education's (NAAEE) Excellence in Environmental Education—Guidelines for Learning (Pre K-12). They are indexed with national standards for Arts, Civics and Government, Economics, English Language Arts, Geography, History, Mathematics, Science, and Social Studies.

21st-Century Outcomes

Each lesson meets the themes and skills identified as 21st-Century Student Outcomes by The Partnership for 21st-Century Skills.

Full-text versions of these standards, indexed by lesson, are available on our website: **www.FindingMyForest.org/download**.

Lesson 1 Discover the Forest

It's closer than you think!

Lesson Objective

How much do your students know about forests? Your students will become **environmental journalists**: developing a definition of a forest, researching "urban forests," and creating the first posting for their iForest blog.

At the end of this lesson, your environmental journalists will be able to:

- Define "forest" and "urban forest"
- Locate their local forests, including an urban forest, on a map *and* outdoors
- Identify the similarities and differences in two or more forests

Standards Alignment: North American Association for Environmental Education (NAAEE):

Strand 1: A, B, C, E, G
Strand 2.2: A, C
Strand 2.4: A, B, C, E
Strand 3.1: D

21st-Century Skills:

- Creativity & Innovation
- Critical Thinking & Problem Solving
- Communication & Collaboration; Information
- Communications & Technology Literacy

21st-Century Themes:

- Environmental Literacy

Time Estimate: One class period

Advance Prep

- Find, print out or make a map of your local area that includes your school.
- Designate notebooks to be used as students' *Forest Journals*, or collect supplies for students to create their own journals (see *Tip* on next page).
- Copy the *Finding My Forest* grid, one for each student (page 18).
- Copy the *Be a Forest Family* Take-home Activity, one for each student (page 19).
- Use the step-by-step directions to access the iForest Google Map and create an iForest blog at **www.FindingMyForest.org/connect.html**.
- OPTIONAL: Gather one or more compass for each group.

Helpful Resources

- For more information on U.S. forests and urban forestry, check out the **www.FindingMyForest.org/wonder1.html**.

Tip Check out the Year-Round Calendar on page 20 for scheduling/school year integration ideas. It also offers suggestions for revisiting certain lessons at appropriate times during the year.

Wonder:

What Is a Forest?

Share that the class will be exploring forests today. You may choose to get your students thinking about forests by engaging them with familiar media, such as fairy tales or other literature set in forests. You could also show the USDA Forest Service's Public Service Announcements.

Ask

- What is a forest?
- Who has visited a forest?
- What did you see there? What did you do?

By definition, a forest is a dense growth of trees, together with other plants, covering a large area of land. It is also an ecosystem, consisting of a community of plants and animals interacting with one another and with the physical environment.

Tip

Students could create their own *Forest Journals* by using recycled cardboard, paper, and fasteners like yarn or binder rings.

Simply hole-punch the cardboard for the covers, the recycled paper for the pages, and fasten.

If no one has visited a forest, ask students to describe a forest they have heard or read about. If students *have* visited forests, ask them to share specific information about those they have visited. Encourage them to talk about all facets of a forest, not just the trees. Students may mention other plants, animals, or nonliving forest elements, as well as spontaneous or planned activities they witnessed or participated in. (For example: A forest is … a place with lots of trees; a habitat for many animals; somewhere you can go to get away from the city.)

As a class, discuss these typical qualities of forests. Together, create a class definition of a forest. This discussion will be a great springboard for exploring the concept of urban forests later in the lesson, as well.

Let students know that they will each be keeping a *Forest Journal* for the duration of their work in forests. Distribute the notebooks to be used as journals (or have students construct their own—see *Tip* at left). Ask each student to write the definition of a forest in his/her new journal.

Extended Discussion:

Expanding the definition of "forest"

Encourage your students to think more broadly about forests, either as part of a class discussion or individually through journaling.

Tip

Encourage self-directed exploration by having students search the websites we highlight throughout this curriculum.

Suggest that they work on their own during computer lab time, or at home with their families.

Ask

- What does a forest look like?
- What different forms can a forest take?
  — Examples: rainforest, mountain top, national forest, local forest, your own backyard
- What or who lives in forests?
- How do different parts of the forest work together?
- How do forests help our planet *and* us?
- What may harm forests?
- Who takes care of forests, and why is it important to do so?

To extend the conversation, you may choose to share multimedia examples of forests from across the U.S., found on the USDA Forest Service's *Forests By State* list (www.fs.fed.us/recreation/map/state_list.shtml). Select and share a few forests from this list that may not look as students expect. For example:

- The saguaros of the Coronado National Forest
- The temperate rainforest of Olympic National Forest
- The sand pine scrub forest of Ocala National Forest
- Petrified Forest National Park

Discover:

Where are forests?

Show students the map of your local area, or have them create their own using your map and Discovertheforest.org's *Where To Go* tool (www.discovertheforest.org/where-to-go) as resources. Ask them to locate your school and as many nearby forests as possible.

Have students bring their *Forest Journals* outside to the schoolyard (or the nearest area with one or more trees). Ask students to point in the direction of the nearest forest, using what they have learned from the map(s).

Tip

Take this lesson in a new direction. Have students locate a forest on the map and then, using a compass, determine the direction of the forest in relation to the classroom.

For a quick compass lesson, check out: www.discovertheforest.org/what-to-do.

Explain to students that they are actually standing *in* a forest—an urban forest. An urban forest may not seem like a *traditional* forest because most parts of an urban forest do not have dense tree growth.

- An urban forest is the ecosystem in any settled area—urban, suburban, or rural. It encompasses all of the green space, including street trees, parks, landscaped boulevards, public gardens, greenways, and more! Eighty percent of the nation's population resides in urban areas, so urban forests may sometimes be the only forests that people experience.
- Urban forests enrich our lives by providing us with clean air and water, storm-water control, energy conservation, reduction of pollution and noise, and an increase in outdoor opportunities and economic development, not to mention tranquility and beauty. (For more on how urban forests affect our lives, see *Lesson 3: A Forest of Benefits*.)

Explain to students that they will be environmental journalists, using their Journal to record their research and writing a nonfiction story about their urban forest.

"Forest Freeze" Game

Encourage your students to explore their urban forest from different perspectives by playing a game of "Forest Freeze."

1. Have students walk around the schoolyard/urban forest and write or draw what they experience in their *Forest Journals.* Remind them to use their senses of sight, touch, hearing, and smell. Then, call "Freeze."
2. Students should stop, look, and closely observe the small area immediately around them, recording (through words or pictures) what they discover. Call "Unfreeze," and they will return to a larger area exploration until you call "Freeze" again.
3. Return to the classroom and have students discuss their urban forest and share their journals with each other.

Tip

Modify the game by calling directions, as well. Example: *"Freeze Up!"* would have your students freezing and looking up for a period of time, paying specific attention to what can be seen above—such as birds and tree canopies.

Next, revisit and revise the classroom definition of a forest based on these experiences. Have students write the new definition in their journals. Students could also create a Venn Diagram comparing a "traditional" forest and an urban forest (Grades 3-5); or, choose forests in three different forms (examples: urban forest, rainforest, scrub forest) and research/write a paper exploring these forests' similarities and differences (Grades 6-8).

Act:

Meet My Forest

- Give students their *Find My Forest* grids. Explain that they will use the grid both in and outside of school to keep track of what they do and see in natural spaces; encourage them to continue exploring. Students can challenge each other to see who can complete the grid the fastest; or, your classroom could challenge other classrooms as part of a school-wide competition. Have students check off which grid squares they completed as part of the day's lesson.
- Hand out the *Be a Forest Family* Take-home Activity, and encourage students to get their families excited about forests too!
- Invite a local environmental journalist or an urban forester to come and speak to your students. S/he could discuss urban forestry and give your students tips to include in their iForest blog, and possibly jump-start careers in journalism, natural resources, or environmental science.
- Make your schoolyard/urban forest an even more natural space than it already is. Some trees—like fruit trees—need "pollinators" such as bees and butterflies to help them reproduce. Grasslands often serve as hosts for forest pollinators. Create a **pollinator garden** in your community, and host the insects that help forests continue to thrive (visit pollinatorlive.pwnet.org/). Or, develop an outdoor *Nature Explore* classroom with the help of the Arbor Day Foundation and Dimensions Educational Research Foundation (www.arborday.org/explore/). To see a garden in action, follow USDA's People's Garden on Twitter (twitter.com/peoplesgarden).

Connect:

Meet My iForest

- Introduce the iForest network and the class iForest blog to students. Explain that they will be part of a network of classrooms from across the country that are learning about, exploring, and conserving forests too.
- Get your class excited about the chance to be chosen as your state's representative in the *Forest Hall of Fame*. It's their work throughout this curriculum and on their iForest blog that could win them the slot.
- Break students into groups to complete their first blog posting—and remind them that it's time to publish their urban forest story and share it with the world. Group blogging assignments could include: composing a paragraph that introduces the class, writing a description of their urban forest, or comparing their urban forest to a well-known forest either in their area or elsewhere in the U.S. Lead off the post with your class' forest definition.
- Depending on age and capabilities, students may also decide to include artwork from their journals, photos, or videos in their blog post. Once their nonfiction story is complete, students could also create their own forest poetry or fairy tales to share on the blog.

Top: Photo by Darla Lenz
Bottom: Photo by Lois Ziemann

Lesson 2 Know My Forest

Lesson Objective

How much do your students know about your local forest ecosystem? Your students will be **ecologists**, exploring a local forest and discovering how the different elements of the forest are interrelated.

At the end of this lesson, your student ecologists will be able to:

- Identify local plants and animals through touch, sight and sound, and collect specimens with minimal impact
- Explain how local plants and animals are interconnected within your ecosystem
- Identify threats to your local forest ecosystem and how they impact the ecosystem web

Standards Alignment: North American Association for Environmental Education (NAAEE):

Strand 1: A, B, C, E, F, G
Strand 2.1: A
Strand 2.2: A, B, C, D
Strand 2.4: B

21st-Century Skills:

- Creativity & Innovation
- Critical Thinking & Problem Solving
- Communication & Collaboration; Information
- Communications & Technology Literacy

21st-Century Themes:

- Environmental Literacy

Time Estimate: Two class periods

Advance Prep

- Use Helpful Resources (below) to plan *Sensory Stations* specific to your area.
- Locate a local forest using the *Where To Go* tool (www.discovertheforest.org/where.html) and plan a class trip to visit it, if possible. If not, plan to take your students to a local park or your schoolyard.
- Obtain field identification guides for your students' use – field guides are helpful tools to enhance students' experiences in the field (your school or local library may have some to borrow), and/or review the online guides listed in Helpful Resources.
- Gather cameras, cell phones with cameras, and/or pencil and paper to "collect" live specimens in non-disturbing ways (and easily post pictures to your iForest blog). It's usually OK (check site regulations) to collect leaves, cones, and generally, other non-living specimens.
- Cut 8-foot (2.44-meter) pieces of string, in two colors (several for each student). One color will represent "food sources," the other "protection" (warmth, shelter, etc.).

Helpful Resources

- **Field Guides:**
  - —Peterson Field Guide Series – by Roger Tory Peterson
  - —Enature.com's *Zip Guides* (field identification guides specific to your zip code, including bird songs: www.enature.com/zipguides/)
  - — The Arbor Day Foundation's *What Tree Is That?* Guide: www.arborday.org/trees/whattree/
- **Animal Sounds:**
  - — Discovertheforest.org's *Animal Sounds*: www.discovertheforest.org/what-to-do
  - — The Cornell Lab of Ornithology's *Macaulay Library Online Archive: The World's Largest Archive of Animal Sounds and Video*: macaulaylibraryorg/ index.do
- **Nature-Watch webcams:** www.fs.fed.us/outdoors/naturewatch/index.htm
- For more information on healthy forest ecosystems, check out **www.FindingMyForest.org/wonder3.html**.

Wonder:

What Is in My forest?

Your students may travel to—and through—forested spaces in your community. But how much do they *really* know about their local forest? To get students thinking about what they know and don't know about the forest(s) in their local community, have them complete a *"Wonder" Challenge* (see box, below).

Next, set up a series of *Sensory Stations* in your schoolyard or local park. If outdoor work is not possible, set up the stations in your classroom. Every student should visit each station. You might want to include:

- A **listening station** where students can listen to local forest sounds and count the different sounds they hear. This can be as simple as having a small group sit quietly outside or near an open window or they could listen to sounds of local birds, animals, and streams on a portable music player or computer.
- An **exploration station** where students can try to identify local flora. Bring your field guides outside for tree, bird, and plant identification. You could collect local flora respectfully by having your students bring in flora that they wish to identify and/or find images of local flora online.
- A **viewing station** where students can get up-close and identify local animals. This could be a school bird feeder, observing a butterfly/pollinator garden, or a field trip to a Forest Service Nature Watch site: http://www.fs.fed.us/outdoors/naturewatch/. This website also has nature cams, where you can observe wildlife online. Students could observe insects in their natural habitat by turning over a log or shaking a tree branch over a white sheet and seeing what they find. They could look at drawings or pictures you (or they) have brought in. Contact your local nature center and see if they have any additional animal resources you may borrow (skulls, skins, etc.). For a list of nature centers in the U.S., check out: www.eeweek.org/nature_centers.htm.

Have students record their observations and guesses for each sound, plant, and animal in their *Forest Journals*. As students switch stations, share the correct answers for the station they are leaving.

At the end of the experience, have students discuss what they now know about their local forest—and what they are excited to learn about next. Students may wish to record some research questions for further study in their *Forest Journals*. These could be answered in the next part of this lesson or throughout the year as your class continues to explore their forest.

Tip

Before taking your students outdoors, you may want to review how to experience the forest with minimal impact and share some tips about safety. Discuss plants to stay away from, like poison ivy, oak, and sumac; and animals/insects like ticks.

For more information on safe and low-impact exploration, check out **www.FindingMyForest.org/experience.html**

"Wonder" Challenge

Offer each "Wonder" Challenge as an outdoor *Forest Journaling* activity, or as part of a class discussion. Include challenges such as:

- Name or draw three different local plants (including trees)
- Name or draw three different local animals (including insects)
- Name or draw three things besides plants and animals that you might find in a forest

Photo by Steve Kozlowski

Discover:

Where Is My Forest?

Explain to students that they will be ecologists studying how living things in forests interact with each other and their environment. Have them bring their *Forest Journals* and field guides to a local forest, a local park with dense tree cover or the schoolyard if travel is not possible. Break students into groups corresponding to the layers of a healthy forest—canopy, understory, and forest floor.

- **Canopy:** Old-growth trees that receive the most sunlight, and shade/protect the other forest layers
- **Understory:** New-growth trees, bushes, and other larger plants that are able to live under the Canopy's shade
- **Forest Floor:** Decomposing plant and animal matter (natural composting!) that creates nutrient-rich soil in which small plants, fungi, and seedlings can thrive

Tip

Expand this into a conservation lesson by having students safely remove any trash they might find.

Have students search for specimens from their assigned forest layer. Students may "collect" these specimens, in non-disturbing ways by drawing or photographing them, or by collecting non-living samples for later identification.

Once they find a specimen have them also "collect its connections" by writing down at least one thing that the specimen is connected to in the forest (Example: The fallen leaf is connected to the tree it came from … and to the bug it is sheltering and the nutrient-rich soil it will become).

Upon returning to class, have students use their drawings, photos, and other information they've collected to create graphic organizers of the specimens. This will serve as a record of what the class has found. Categorize them in different ways such as living versus nonliving; canopy, understory, or forest floor; deciduous versus evergreen; etc.

Tip

Some urban parks have areas with dense tree cover similar to traditional forests. Examples:

- Central Park, New York, NY
- Fairmont Park, Philadelphia, PA
- Forest Park, St. Louis, MO
- Griffith Park, Los Angeles, CA

Use Discovertheforest.org's *Where To Go* tool (www.discovertheforest.org/where-to-go) to find one in your area.

"Be the Web"

A healthy forest ecosystem is one that interacts in such a way that resources are shared and a diversity of plant and animal life is supported. Using the connections they wrote down during their search have students "Be the Web" and create a "human" forest ecosystem web.

1. Print or copy the students' drawings and photographs of the specimens.
2. Bring the class outside and have each student hold one or two images.
3. Have some students be the resources that the plants and animals rely on: sun, clean water, nutrient-rich soil.
4. Give each student several 8-foot (2.44-meter) lengths of string in each color.
5. Starting with the sun, have each student connect his/her pieces of string to another student holding:
   a) Color 1: Food sources for his/her plant or animal
   b) Color 2: Shelter, warmth, protection sources for his/her plant or animal

Once the web is complete, have students drop various strings to test how the web is affected if certain parts "drop out" due to impact of fire, invasive species, loss of open space, and/or unmanaged recreation. For example: What if canopy trees are logged (cut down) to make way for development? To demonstrate, the students holding canopy trees will drop their strings ... and in turn, students connected to canopy trees then drop their strings. How much of the web loses its sources of food and shelter as a result?

Extended Discussion:

Threats to your local forest ecosystem

- Challenge students in grades 6 through 8 to research threats to their local forest. Have them identify native and non-native species in their area, using www.invasivespeciesinfo.gov/ or Enature.com's Native/Invasive Plant Finder: www.enature.com/native_invasive
- Research how these species positively or negatively affect the ecosystem web. Information and activities on threats to our ecosystems can be found in The World's Forests issue of the Natural Inquirer (www.naturalinquirer.org/The-World%27s-Forests-i-13.html) and at www.invasivespeciesinfo.gov/resources/educk12.shtml.

Act:

Know My Forest

- Adopt the forest! Make the forest you visit in this lesson "your" forest. Return to this forest with the class throughout the year; each time have students complete their research questions and search for additional specimens to add to their forest ecosystem web. Students could even "map" a certain area of the forest to understand fully the breadth of living and nonliving elements and how they are interconnected.
- Add a **community service component** and have students monitor and care for the forest by removing litter, identifying and removing nonnative species (with approval of the forest's owners/caretakers), performing trail maintenance, planting native trees, and more.
- Using their *Find My Forest* grids and *Forest Journals* as catalysts, have students search for, identify and share additional specimens from the urban forest around their homes. Remind them to do the same in other forests—both nearby and far away—that they may visit on weekends or vacation. Finding additional specimens will involve the whole family *and* will encourage more time outdoors. Also, the more specimens they bring in from farther away the more they can map all of the different types of forests in the United States!
- Take a nature hike with your class! By keeping your class active, you will be addressing issues of childhood obesity, continuing your discovery of the forest, and instilling a life-long interest in the outdoors in your students. To learn more about helping kids maintain a healthy and active lifestyle, check out the *Let's Move Outside!* initiative at http://www.letsmove.gov/letsmoveoutside.php.
- Invite an ecologist, local park or nature center educator, or city, state or national forest ranger to come and speak to your students about your local forest ecosystem. Or better yet, meet this specialist at your local forest, and ask abut getting a guided tour. In this way, your students will experience a career they may want to explore further! To locate your closest Forest Service education coordinator, visit http://fs.usda.gov/conservationeducation.

Photo by Donna Edwards

Tip

Have each student adopt his or her own tree and chart its progress over time. Have your class pass along their records to next year's incoming students to keep the connections going. For more on this idea, see the Year-Round Calendar (page 20).

Connect:

Share My Forest

- Break students into groups, and have each group compose a blog entry that introduces "their forest" using their *Forest Journals* as inspiration. Blog entries should include the location of "their" forest (add the GPS coordinates, if known). Describe what the forest is like. For example: What you can see? What you can do? What did you find? Have students come up with forest-focused questions to pose to the readers of their blog.
- Start a *Forest Finds* feature on your iForest blog. This will be a recurring entry that highlights information, photos or videos of particularly interesting specimens, connections, and/or stories that have come from your students' forest fieldwork in their *Forest Journals*. Have students decide what the first post should be by choosing the most interesting thing they learned in "their" forest.
- Encourage students to be creative on their blogs. Remind them that, based on their work, your class could be selected to represent your entire state in the nation's *Forest Hall of Fame*!

Lesson 3 A Forest of Benefits

Lesson Objective

How much does your community benefit from forests? Your students will be **environmental scientists** and **foresters**, conducting experiments, mapping their urban forest understanding its benefits, and developing ideas about conservation.

At the end of this lesson your environmental scientists and foresters will be able to:

- Identify products they use that come from trees
- Explain how trees and forests give us clean air and water and reduce energy costs
- Calculate the many benefits trees provide their community, and explain their importance
- Design and complete large and small projects to help protect these benefits

Standards Alignment:
North American Association for Environmental Education (NAAEE):

Strand 1: A, B, C, D, E, F, G
Strand 2.1: A, B, C
Strand 2.2: A, B, C
Strand 2.3: A, B, C, D, E
Strand 2.4: A, B, C, E
Strand 3.1: A, B, C, D
Strand 3.2: A, B, C, D
Strand 4: D

21st-Century Skills:

- Creativity & Innovation
- Critical Thinking & Problem Solving
- Communication & Collaboration; Information
- Communications & Technology Literacy

21st-Century Themes:

- Environmental Literacy
- Civic Literacy
- Health Literacy

Time Estimate: Two class periods

Advance Prep

- Collect materials for the *"Ecosystem Experiment":*

  For each group: two one-gallon milk jugs (pre-cut: see diagram on page 13); tuna-sized can (pre-punched: see diagram); soil (or trowels for collecting soil); leaf litter; and a bucket of water (please recycle everything afterward!)
- Familiarize yourself with the *National Tree Benefits Calculator* (www.treebenefits.com/calculator/).
- Collect materials for *National Tree Benefits Calculator* activity:

  For each group: One tape measure and one 8-foot (2.44-meter) length of string. *Note:* you can reuse the string from Lesson 2!

Helpful Resources

- For more information on how forests affect our planet, check out the **www.FindingMyForest.org/wonder3.html**

Tip Before class, have students go to Oregon Wood Innovation Center's *Common Products We Get from Trees* (owic.oregonstate.edu/teachers.php#common). Each student should find at least one product on the list that they currently have in their homes. Have them bring in their product and share with the class how it's made from trees.

Wonder:

What Do Forests Do?

Have students walk quickly to something in the classroom that came from a tree, and report what they found. Each student should choose something different.

Ask What else do we get from trees?

Ask students to share the product they identified from home. Depending on student responses, discuss additional things they may not expect—like medicine and toothpaste.

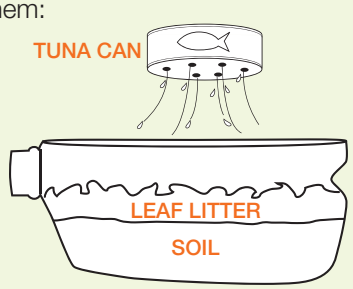
Tip

Remind students that they may wish to write and/or illustrate the steps of each experiment in their *Forest Journals*. That way, they can repeat them with their families at home.

Ecosystem Experiment

Take the class into the schoolyard or another urban forest. Split students into teams, and give each team two pre-cut one-gallon milk jugs, a pre-punched tuna-sized can, some soil, and forest leaf litter. Have them:

1. Fill both jugs with soil to just below the spout.
2. Put forest floor leaf litter on top of the soil in *only* one jug.
3. Write a hypothesis about what will happen when water is sprinkled into each jug.
4. Sprinkle 1-2 cups of water from the pre-punched can into each jug. Pour water from each jug into a clear container. Compare what they observed with their hypothesis. For discussion purposes **only**, which water would you rather drink?



Conclusions:

- The jug with the forest litter holds more water (like a sponge). Also, the water that comes out of the spout is cleaner (as if going through a filter). In the jug with no leaf litter, the soil eroded quickly, and runoff and dirty water poured out of the spout.
- Just as a sponge sucks up water, trees and forests do the same for our communities—absorbing polluted air and water, preventing water runoff and erosion, and acting as a filter by returning fresh air and water to the environment.

Ask How much are these benefits—*clean water, clean air, shade*—worth to you?

Discuss how trees—and the clear air, clean water, shade and wind protection they provide—affect our lives. For more information, check out the USDA Forest Service's *Trees for People: Urban Forestry 101* at www.fs.fed.us/ucf/treesforpeople.html.

Discover:

How Do Forests Benefit My Community?

Explain to students that they will be calculating how much the benefits of each tree are worth to their school and community.

Break students into groups, and assign each group a separate area of the schoolyard or other urban forest. Have them collect data on the area's trees to use with the *National Tree Benefits Calculator* and record findings in their journals.

Back in the classroom, have students input the collected data into the *National Tree Benefits Calculator* (URL on page 12). Have them calculate and record: therms of energy saved, gallons of storm runoff prevented, amount of carbon collected.

Have groups share findings and calculate the **total dollar amount of benefits** provided by the trees measured. Discuss how their urban forest benefits their community and school.

Collecting and entering data for the *National Tree Benefits Calculator* is easy.

1. Go to www.treebenefits.com
2. Enter your zip code.
3. Record the tree species. Use a field guide from Lesson 2 for identification.
4. To find the diameter of the tree, first find the circumference by wrapping a length of string around the trunk, approximately 4.5 feet up from the ground. Mark the string where both pieces meet, and measure the length (the length is the circumference). Calculate the diameter of the tree (diameter= circumference/π).
5. Land-use type – choose "small commercial business" from the drop-down window.

Tip

Students in grades 6 through 8 may also wish to experiment with iTree (www.itreetools.org). Additional information and activities can be found in the Natural Inquirer's Urban Forest Edition (www.naturalinquirer.org/Urban-Forest-Edition-i-9.html).

Extended Discussion:

How do the world's forests affect me? How do I affect them?

Share the Amazonian Deforestation images from NASA's *Earth Observatory* (earthobservatory.nasa.gov/Features/WorldOfChange/deforestation.php). Discuss how forests that are far away, like the Amazonian rainforest, are still very important to your community. They serve as large "carbon sinks," accumulating carbon and giving back more than 20% of the oxygen for the whole planet.

Ask

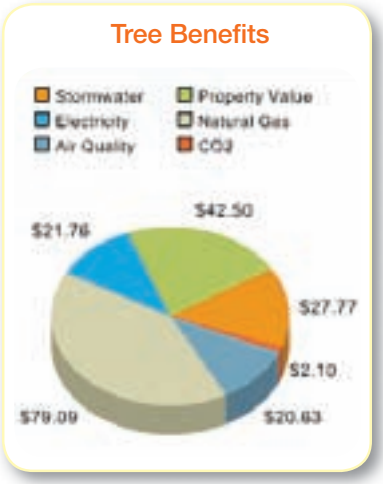
- What would it be like if there were no trees or forests?
- How would our lives be different?

In groups, or as a class, have students discuss how they knowingly—and unknowingly—may contribute to deforestation in the world's forests. How can they help prevent or solve such issues in their own community and the world?

Act:

Help My Forest

- Have students complete squares on their *Find My Forest* grids that have to do with forest conservation/community improvement. Also have them fill in at least one of their empty *Finding My Forest* squares with a way they can help forests.
- Encourage students to use the *National Tree Benefits Calculator* to complete a survey of the trees around their own home and neighborhood. Remind them to share the results with their families as part of a discussion about why trees are important and ways to protect and increase the benefits trees provide their families.
- As a class, you could also visit your adopted forest from *Lesson 2: Know My Forest* and calculate the benefits it provides.
- Have students research the feasibility of planting more trees on school property. Ask them to prepare a presentation for the principal or school board using information from the *National Tree Benefits Calculator*. They should show how even *one more tree* could reduce school energy bills, increase property value, and provide a healthier environment. Take the presentations even further and show village, town, or city officials the benefits of more trees in the community.



- Engage your students in a career in conservation. Invite a local forester, landscaper, or city, state, or national forest ranger to speak with your students about the threats to local and global forests— and what students can do to help. Encourage them to come on the day your class is measuring your trees, and have them show students how it's done.

Connect:

The Benefits of Friends

- Ask students to write an "open letter" on their blog in which they post the total benefits their urban forest provides. Have them list ways they have pledged to help protect these benefits and how others can do the same.
- It's time to join the conservation conversation! Search for other classrooms participating in this curriculum on the iForest Google Map.
  - — Have students choose one classroom to be their "iForest Friends" and read that class's blog.
  - — Next, have them choose one blog post on which they'd like to comment positively and one on which they would like to make a thoughtful suggestion, and one on which they'd like to ask an insightful question. Students will craft their comments, get your approval, and then post them to the chosen blog to begin the conversation.

Lesson 4 A Forest of Possibilities

Lesson Objective

How much do your students benefit from time in forests? Your students will be **outdoor educators**, developing a new understanding of the benefits of time spent outdoors.

At the end of this lesson, your outdoor educators will be able to:

- Creatively express their feelings about forests
- Explain how forests benefit their health and well-being
- Create their own activities to undertake in forests
- Develop plans for the future that include time spent exploring and conserving forests

Standards Alignment:
North American Association for Environmental Education (NAAEE):
Strand 1: A, B, E, G
Strand 2.4: A, B, E
Strand 3.2: A, B, C, D
Strand 4: C, D

21st-Century Skills:
- Creativity & Innovation
- Critical Thinking & Problem Solving
- Communication & Collaboration; Information
- Communications & Technology Literacy

21st-Century Themes:
- Environmental Literacy
- Civic Literacy
- Health Literacy

Time Estimate: Two class periods

Advance Prep

- Review The Children and Nature Network's summary of the research on children and natural spaces: www.childrenandnature.org/downloads/Educationsynthesis.pdf.
- Prepare a trip to "your" forest. If possible, visit a forest or a local park with dense tree cover for this lesson.

Helpful Resources

- Discovertheforest.org's *What To Do* has interactive and downloadable forest activities: www.discovertheforest.org/what-to-do.
- For more activities and forest conservation opportunities, check out the **www.FindingMyForest.org/wonder4.html**.

Bring Fame to Your Class
Remind your class that they can represent their state in the *Forest Hall of Fame* by becoming top-notch bloggers and connecting with other classrooms around the United States.

Wonder:

How Do I Feel in Forests?

Have students bring their *Forest Journals* outdoors. Share the John Muir quote: "*I only went out for a walk, and finally concluded to stay out till sundown, for going out, I found, was really going in*." and the poem "City Trees" by Edna St. Vincent Millay with your students. (Find the poem at www.poemhunter.com/poem/city-trees/ or in your school or local library.) Discuss each author's view of her/his outdoor space, and how each was inspired by a traditional or urban forest.

- Identify and share your own examples of celebrations of the forest in art, poetry, literature, and music. You could even share something that represents your own forest experiences.
- Discuss benefits of viewing and being in nature. These include stress reduction and improved concentration/productivity.

Tip

Share some of the research from The Children and Nature Network about how time in forests benefits children's health and well-being. **www.FindingMyForest.org/wonder4.html**

Have students spend time outside observing, free-drawing or free-writing in their *Forest Journals.* Give them the goal of creating individual representations of what they like to do in the forest, and how they feel when they are there.

To get them started, you could have students complete the following: "When I am in the forest, I like to _____ (active activity). When I am in the forest, I feel _____ (feeling)."

When I am in the forest,
I like to _____ .
(active activity)
When I am in the forest,
I feel _____ .
(feeling)

Once indoors, encourage students to develop further their drawing or writing about the forest. Invite them to publish/display it on paper or film, or through sculpture, audio, video, or mixed media. Challenge them to be creative by using evergreen tree branches, pussy willows, or grasses as paintbrushes, painting with colorful flower petals by pressing them against the paper, pressing leaves and laminating them in wax paper; or using all manner of natural objects in an art project. Invite each student to share what s/he has created and discuss how the forest personally affects him or her.

Photo by Fletcher Koncewicz

To extend the creativity, develop an outdoor Forest Gallery to showcase your students' projects. Invite parents and community members to attend the "gallery opening" and discuss their *own* forest experiences with students. Students could also create a virtual gallery on your iForest blog. Have them invite iForest Friends to post comments on the work and share their own relevant experiences.

Discover:

What Can I Do in My Forest?

Travel with the class to "your forest." Give students a time limit, and encourage them to choose one of the activities they have yet to complete on their *Find My Forest* grid. Groups should be adult-chaperoned but student-led. Early finishers can create their *own* activity and write it in one of the empty squares on their grid. Guide your students on nature hikes, so that they continue their on-going forest discovery.

Have students come back together as a class and share what they did, and how they felt about the experience. Next, have each student fill in another of the blank squares on his or her grid with something s/he would like to do in the forest in the future.

Act:

Keep the Forest in My Future

- Have students write individual plans in their *Forest Journals* for how they will complete the rest of the squares on their grid. They can also identify where they will complete each square by searching for natural spaces on www.discovertheforest.org.
- As a class, create a *Keep the Forest in Our Future* plan that focuses on exploring and conserving natural spaces. Ideas could include anything from planning a *Forest Classroom* day, where the class goes to the forest and completes lessons in all subject areas ... to "reforesting" your area by planting and tending to native trees and plants in the schoolyard. Students may also create individual *Keep the Forest in My Future* plans and add them to their *Forest Journals* showing how they will continue to experience and conserve forests long after the school year is over.

- Invite a local outdoor and/or conservation educator to give your students additional ideas for how to experience and conserve the forest. Encourage him or her to share activities with your students that they, as young outdoor/conservation educators, can teach to their family and friends.
- Using what they have learned in this curriculum, encourage students to be forest leaders. Have students challenge the school and their families to engage in and conserve the forest throughout the year. See the *Year-Round Calendar* for awareness days and months in which your community can participate.

Connect:

Share My Forest

- Have students share some of their creative forest celebrations on the blog.
- Start another recurring blog feature: *Keep the Forest in Our Future*. Have students post some of the long-term ways they will explore and conserve natural spaces. As you revisit your forest and other natural spaces in your area, have students continue to post new activities under the *Keep the Forest in Our Future* heading.
- Submit your class's work to the nation's *Forest Hall of Fame* (**www.FindingMyForest.org/hall-of-fame.html**), and look for your class's name on the *Forest Hall of Fame* page. Have them congratulate iForest Friends in other states who are selected for the *Forest Hall of Fame*, too.

Forest HALL OF FAME

For More Information:

- For research on **children and natural spaces**, go to: www.childrenandnaturenetwork.org/downloads/Educationsynthesis.pdf.
- You can find additional information about the **Discover the Forest program** at www.discovertheforest.org.
- To learn more about the **USDA Forest Service**, go to www.fs.fed.us.
- To learn more about Forest Service Conservation Education, go to http://fs.usda.gov/conservationeducation, and Project Learning Tree website, www.plt.org.

Finding my Forest

Use this grid as a checklist for what you've accomplished and as a catalyst to go outdoors and discover more! Put a check next to each activity you've completed.

My Name _____

Where does your water come from? Find out how forests help keep it clean. Learn more at www.fs.fed.us/water/	Plant a native tree in your schoolyard or backyard.	Play hide-and -seek among the trees (check with an adult before playing).		Go geocaching or letterboxing. Learn more at www.geocaching.com and ww.letterboxing.org.
Go for a hike (don't forget to bring water and wear sunscreen).	Download the *Book of Stuff To Do Outside* from www.discovertheforest.org and complete the activities. Have an adult check to see that you've completed all 10!	Tell someone about how forests help our planet.	Name five trees that are native to your area. Have your teacher or a family member check your answers.	
Visit a traditional forest.	Pick up litter in a natural space, and recycle what you can.	Go to an urban forest.	Complete the *Be a Forest Family* grid with your family.	Adopt a tree. Check on it and chart its progress throughout the year.
Follow an insect and see where it goes.		Travel to a National Forest.	Take a photo of your favorite bird, and identify it using a field guide.	Search for animal tracks in mud or snow.
Take care of your ecosystem! Identify and report any invasive species. Learn more at www.fs.fed.us/invasivespecies/definition.shtml	Make a fort or tree house (without harming the environment).	Sit quietly in the forest for several minutes. Write down what you see, hear, smell, and touch.	Become a Junior Forest Ranger! Learn how at na.fs.fed.us/ceredirect/jfr.	

A blank grid is available online at **www.FindingMyForest.org/download** if you would like to further customize and continue the learning!

Finding my Forest

BE A Forest Family!

Dear Family Member,

Your child is learning about forests and how they impact your community, your planet, and YOU! Spending time in natural spaces like forests benefits children and adults alike by reducing stress, improving productivity and fostering family camaraderie.

Talk to your child about what he or she has learned about forests in class. In addition, encourage him/her to share the forest with *you*! To learn more about how forests can have a positive effect on you and your family—and for easy ideas for spending more time in natural spaces near you—go to www.discovertheforest.org.

See you outside!

The USDA Forest Service

Family Forest Fun

Ask your child to show you the *Find My Forest* grid he or she has been developing in class. Your child wants to complete his or her grid by going to natural spaces. We're also giving you a *Be a Forest Family* grid (right), so that your trips to these places can be fun for everyone!

Use your family grid as a scavenger-hunt list, or play a family game of Bingo and see who can complete a row first. Make new grids for different seasons to keep your family forest-focused. It's a great way to enjoy and share the great outdoors—together!

We've started the grid, and now it's your family's turn to finish it. What would *you* like to do in the forest?

	Join a local park or forest clean-up		Hang a bird feeder in your yard
		Go to a place where there are more trees than people	
Plan a forest visit with your family			Take a family forest discovery hike
	Go camping as a family		Make up a game in a natural space

Where To Go

To find forests and natural spaces near you, check out the *Where To Go* tool from Discovertheforest.org (www.discovertheforest.org/where-to-go). Be sure to talk to your child about the places s/he has been visiting with the class.

Finding my Forest Year-Round Calendar

SEPTEMBER

- Back to School! Start the curriculum, teach **Lesson 1**, "adopt" a local forest or natural space, and kick off a year of forest fun!
- On **National Public Lands Day** (last Saturday of the month), spend some time helping out and enjoying a natural public space. Find an event near you at www.publiclandsday.org/.
- In **Lesson 3: A Forest of Benefits**, students learn about how forests can clean water. Be a citizen-scientist and monitor your closest stream, river, pond. Find out about **World Water Monitoring Day** (September 18) by visiting www.worldwatermonitoringday.org.

OCTOBER

- Teach or revisit **Lesson 2: Know My Forest**.
- Have students "adopt" a tree, take measurements, and chart changes in the tree.
- Set up a bird feeder outside your classroom, and keep an identification guide nearby. How many local and/or migratory birds can students spot?

NOVEMBER

- As temperatures get cooler, bring students back to the forest and have them chart the changes to "their" tree.
- In some regions, the loss of foliage may make it a good time to revisit **Lesson 3: A Forest of Benefits**.

DECEMBER

- How many of your students are visiting forested places for the holidays? Have them take pictures so the class can identify the trees and other flora and fauna.
- Post the pictures on your iForest blog.

JANUARY

- When temperatures are lower, the forest changes. Head to the forest and revisit **Lesson 4: A Forest of Possibilities** and chart the changes to "their" tree.
- In this wet or snowy season, look for animal tracks in mud or snow and identify them using the *Animal Tracks* activity at www.discovertheforest.org/what-to-do. Other animal signs may be easier to spot too. Look for nests, droppings, and feathers.

FEBRUARY

- Buds are appearing! Report what you see at *Project BudBurst* (www.budburst.ucar.edu/). Dissect buds and/or put budding twigs in water and watch the leaves open.
- It's maple syrup season! If you live in an area where sugaring occurs, take your class to a local sugar syruper.

MARCH

- How does "your" forest look now? Is spring in full swing? The first day of spring occurs on March 20th or 21st, the day of the vernal equinox (when the sun sits directly over the equator).
- Revisit **Lesson 2: Know My Forest** and have students hunt for new specimens and connections as the forest teems with new life.

APRIL

- It's **Earth Day** (April 22), **Arbor Day** (last Friday of the month), and **Keep America Beautiful Month**! Check www.discovertheforest.org for celebration ideas. It's also the deadline to submit your class's work for possible inclusion in the *Forest Hall of Fame* (**www.FindingMyForest.org/hall-of-fame.html**).
- Revisit **Lesson 3: A Forest of Benefits** and get your students thinking about why we celebrate and conserve our forests.
- If you haven't already, plant your pollinator garden (see Lesson 1: Discover My Forest as well as Pollinator LIVE at pollinatorlive.pwnet.org/)

MAY

- Return to the forest and continue to chart the changes to the tree your students have adopted, and to the forest as a whole. Post a school year's worth of changes on your iForest blog.
- Revisit **Lesson 4: A Forest of Possibilities** to get students excited about all of the things they can do in forests during their summer vacation.

JUNE

- Celebrate **Great Outdoors Month**, **World Environment Day** (June 5), **National Trails Day** (first Saturday of the month), and **National Get Outdoors Day** (second Saturday of the month)! Spend time outside and participate in events that are nearby.

JULY

- Summer camp and outdoor educators: Celebrate **National Recreation and Parks Month** by visiting a park or recreation area with the young people you work with. Teach **Lesson 2: Know My Forest**.

AUGUST

- Summer camp and outdoor educators: Keep the forest fun going, by teaching **Lesson 4: A Forest of Possibilities.**