

NEW YORK STATE

CONSERVATIONIST



**TREES ARE
TERRIFIC!**

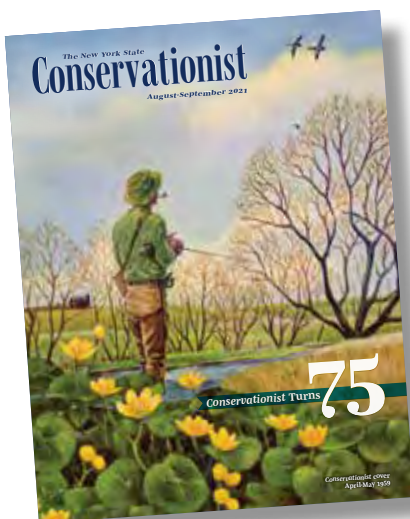


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In this issue, students will learn about what trees are, some of the different types of trees found in New York State, and how DEC helps manage forests for trees, wildlife, and people. They will also learn about maple sugaring and the importance of trees in the fight against climate change.



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WHAT IS A TREE?

A tree is a woody plant with three main sections – the roots, which absorb water and nutrients from the soil and hold a tree in the ground, the trunk (stem), which gives the tree its support structure, and the leaves, where photosynthesis mainly occurs.

Photosynthesis is the process that plants use to convert sunlight, water, and carbon dioxide into food.



Tree trunk

Tree trunks have several layers:

the outer bark – a tough outer skin that helps protect the tree;
the inner bark – a thin layer of living tissue that transports the food created during photosynthesis throughout the tree;
the cambium – the growing part of the trunk that produces new wood and bark;
the sapwood – a thin layer of cells that moves water from the roots up to the leaves;
the heartwood – dead sapwood which provides a strong central pillar that supports the tree as it grows. In some trees, the heartwood can be as strong as steel!

What Kinds of Trees Are There?

With approximately 100,000 types found around the world, trees make up roughly one quarter of the plant species found on Earth. There are two main types of trees – deciduous trees and conifers. **Deciduous** trees, also known as hardwoods, lose their leaves in the fall and are dormant (not actively growing) during the winter. These are the trees that we see changing colors in the fall, like maples and oaks. As days become shorter and temperatures get cooler, leaves begin to die and lose their chlorophyll – a green pigment used in photosynthesis – which gives leaves their green color. This allows the other pigments that are always present, but masked by the green chlorophyll, to be seen before the leaves fall from the trees.

Conifers are trees that have needles or scale-like leaves and produce seed cones. Most conifers keep their needles year-round, earning them another name, evergreens. This group includes pines, cedars, and the classic Christmas trees – fir and spruce. Evergreen needles have a thick, waxy coating that helps protect them against drying out in harsh winter winds, and their narrow shape allows snow to shed off easily. Evergreens do lose their needles, but not all at once like deciduous trees, so they continue to produce food and grow during the winter months, just at a slower rate.

Conifer

Deciduous



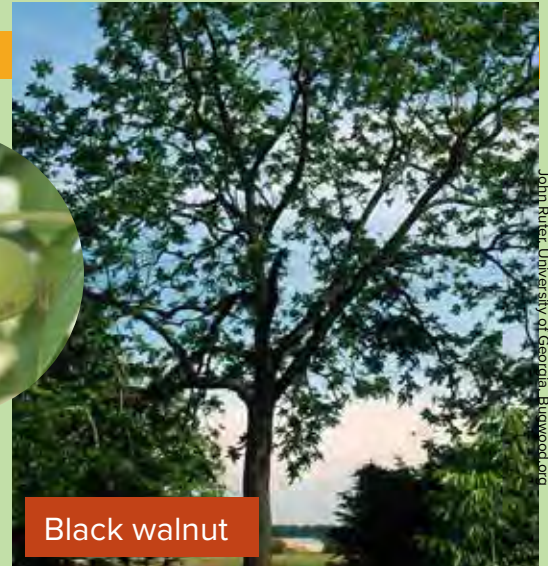
The oldest known living tree is a bristlecone pine in California that is more than 4,800 years old!

Trees of New York State

New York State has approximately 100 native tree species (here before the first European settlers arrived), plus many non-natives that have been introduced for a variety of reasons, including use in gardens and landscaping, and for fruit or nut crops. Here are some of the native trees that you can see around the state:

Deciduous Trees

Black walnuts are known for their tasty and nutritious nuts, but they also have a deep brown heartwood that is highly prized for making furniture. They have large compound leaves with 15 or more leaflets, and their bark has thin ridges that are in a diamond-shaped pattern.



Eastern cottonwoods are large, fast-growing trees that usually grow along streams and rivers. They have triangle-shaped leaves and produce catkins – long, drooping clusters of flowers – in the spring. Their seeds look like white fluff and are spread by the wind.

There are several species of **oak** trees native to New York State, including **white oak, red oak, pin oak, bur oak, and black oak**. Their strong wood is often used as lumber, and their acorns, which ripen in the fall, are an important food for many kinds of wildlife, including turkeys and bears. Oak leaves will remain on the tree long after they die, sometimes not falling until the next spring when they get pushed off by the new leaves.



The sugar maple is the state tree of New York and the main kind of tree that maple syrup is made from. In the spring, they produce winged seeds called samaras, which are often called “whirligigs” because of the way that they spin as they fall to the ground. Their fall coloring is considered one of the most spectacular, ranging from bright yellow to fluorescent reddish-orange.



Conifers

Balsam firs have soft, flat needles with rounded tips that are not very sharp. Unlike other conifers, their cones stand upright on their branches. They are small to medium-sized evergreens, only growing to about 50-65 feet, and are one of the more popular species used for Christmas trees. Native Americans have used their needles as medicine for thousands of years.



Balsam fir



Eastern hemlock

The **eastern hemlock** is an evergreen tree that is able to grow in shady areas, and can live more than 500 years.

They have flat needles that are shiny green on top and have two white stripes on the underside. Hemlocks grow well on steep slopes and along stream banks, where they are vital in preventing erosion and providing shade, which helps maintain the cool water temperatures necessary for fish species such as trout.



Pine trees have needles that are grouped together in bunches of two or more along their branches and are usually longer than those of other conifers. The **eastern white pine** has needles that are flexible, bluish-green, and come in bunches of five. **Red pines** have long, yellow-green needles that come in bunches of two and snap easily when bent in half. Both have pendulant (hanging) cones.



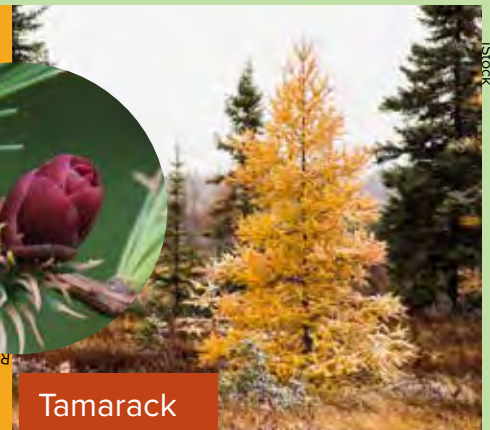
Eastern white pine

Spruce trees have short, sharp needles that are individually attached to their branches. New York State has three native spruce – **white spruce**, **red spruce**, and **black spruce**. Spruce are considered some of the most important trees for making paper, but are also commonly used as Christmas trees.



White spruce

Did you know that all evergreens are conifers, but not all conifers are evergreen? Meet the **tamarack**! Also known as **American larch**, these trees are unusual in that they produce cones and have needle-like leaves like conifers, but like deciduous trees, they lose their needles in the fall. They are New York's only native deciduous-conifer and their golden-brown color in the fall is considered quite striking.



Tamarack

istock

Steven Katovich, Bugwood.org

istock

Trees are Tree-men

Trees Keep Us Healthy

One of the most important things we get from trees is oxygen. We breathe in **oxygen** and breathe out **carbon dioxide**, while trees do the opposite – taking in carbon dioxide and releasing oxygen – a perfect partnership! There are other health benefits that trees provide too. Studies have shown that people who work in offices with views of trees are happier, more productive, and have a lot less stress. Even pictures of trees in hospitals and doctor offices can boost recovery rates and help people feel better faster.

carbon dioxide IN



oxygen OUT

oxygen IN



carbon dioxide OUT

Trees Give Us Food, Shelter, and More

Trees are used to make paper and all things made of wood, including toothpicks, furniture, corks, doors, floors, clothespins, pencils, ladders, and musical instruments, but there are so many more products you might not know of! Cellulose fibers from trees are used to make things like hard hats, sandwich bags, and rayon for clothes. Chemicals can be extracted to make dye, deodorants, and scented oils. Trees are also used to make shampoo, toothpaste, and some medicines, and don't forget about the food we get from them, like walnuts, apples, cherries, and yummy maple syrup (see the Outside Page to learn about maple sugaring).



Trees Provide Shade

Areas with trees tend to be cooler than open areas, especially places with a lot of development (cities and areas used for homes and commercial purposes). If you have trees around your home or other buildings, you often don't need to use as much energy to cool the building in the summer. Shade is also important to maintain certain habitats, like rain forests, and to keep soils from drying out in the hot sun. During extreme droughts, a lack of protection from the sun can result in plants dying from a lack of moisture. As plants die, the soil is even more exposed, causing more moisture to be lost, and so on, until you are left with desert conditions.

Trees and Climate Change

Carbon dioxide is one of the gases produced by the burning of fossil fuels and is a leading cause of climate change. Since trees take in carbon dioxide, they are a very important tool in the fight against climate change, but they are also expected to be negatively impacted by it in the long term. Higher temperatures will allow more tree pests and diseases to survive through the winter. Changes in the timing of spring and fall frost will increase damage to trees' buds, flowers, and roots. More winter rainfall, summer droughts, storms, and flooding will put stress on trees. All these changes will damage trees, slow tree growth, raise the susceptibility of trees to forest pests and diseases, lower the amount of seeds produced, and change where some tree species can grow. Planting trees is a great way to be a part of the solution. Choose native species whenever possible, and look up the soil and sunlight conditions the tree will need so you can plant it properly to ensure it will survive! If you are not able to plant trees where you live, or if you want to do more, you can also support any number of the different organizations that plant trees. Some of these include the Arbor Day Foundation, One Tree Planted, the National Forest Foundation, American Forests, and many others*. DEC also has its own tree nursery, the Colonel William F. Fox Memorial Saratoga Tree Nursery, which has a spring seedling sale, and a school seedling program. You can learn more on DEC's website at <https://www.dec.ny.gov/animals/7127.html>.



*Please note – the mentioning of these organizations should not be considered an endorsement, and any donations to these or other organizations should always be carefully researched.

Indoously Important

Trees Support Wildlife



Trees are very important to wildlife for many different reasons. Birds and other wildlife nest in trees or use them for shelter, and many kinds of trees provide food for wildlife. Some animals eat the leaves and branches of young trees, or the new growth on trees in the spring and summer. Many different species of animals eat the seeds, fruits, and nuts produced by trees. Even dead trees are important for wildlife and should be left standing when they are not a safety threat. Cavity-nesting birds, such as woodpeckers, wood ducks, bluebirds, kestrels, and a variety of other birds, use hollowed-out portions of dead trees to nest in.



Eastern bluebird



Eastern cottontail

What is Forest Management?

New York State has almost 19 million acres of forested land and DEC is responsible for a large chunk of those forests. DEC's Division of Lands and Forests (DLF) manages nearly 5 million acres of state-owned forested land to produce timber, create recreation opportunities, provide wildlife habitat, and address climate change. DLF also has a variety of programs, including Urban and Community Forestry, Conservation Easements, Trees for Tribes, Forest Health, and Cooperating Foresters programs, among others, that provide guidance and support to private landowners and municipalities on how to manage their own forests and community trees.

You can learn more about all these programs on DEC's website at <https://www.dec.ny.gov/lands/309.html>.

DEC's Division of Fish and Wildlife (DFW) is responsible for more than 120 Wildlife Management Areas (WMAs) around the state, which include 120,000 acres of forests. To further their goal of providing wildlife habitat, and protecting threatened and endangered species, DFW began the Young Forest Initiative, which involves removing

some of the older trees from WMAs to allow new trees and other vegetation to grow. Many species of wildlife depend on younger trees and new vegetation, which often cannot grow in areas full of older, mature trees. The Young Forest Initiative will be implemented across roughly 10 percent of the forested land on the WMAs. You can learn all about the Young Forest Initiative in the Fall 2016 issue of *Conservationist for Kids*, available on DEC's website at <https://www.dec.ny.gov/education/100637.html>.



Get outside!

Learn About Maple Sugaring

All trees produce sap that can be turned into syrup, but most syrup is made from sugar maples because of their sap's high sugar content. Sap is gathered by drilling small holes into the sapwood of a tree, gently tapping a spile (small wooden or metal "faucet") into the hole, and then hanging a bucket to catch the drips. The sap is then boiled to remove most of the water, leaving the sugary syrup behind. People have been making maple syrup for hundreds of years, starting with Native Americans, before Europeans even arrived. Maple sugaring takes place in the late winter and early spring, when the trees are waking up after going dormant during the winter. If you have a nature center or environmental education center near you, many of them offer programs on maple sugaring to schools and the public. To learn more about DEC's environmental education centers, visit <https://www.dec.ny.gov/education/74.html>.



Identify Trees Where You Live

See how many trees you can identify in the place where you live. Depending on the time of the year, different clues that can be used include the tree's leaves, bark, nuts/seeds/fruit, and twigs. Make a list of the trees you find, what you think they are, and take some photos of them to share with your class!



New York State CONSERVATIONIST FOR KIDS
Volume 15, Number 1, Fall 2021
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Environmental
Conservation

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This issue was paid for through the Environmental Protection Fund. Special thanks to staff from DEC's Divisions of Fish and Wildlife and Lands and Forests for their help with content development.

EDITORIAL OFFICES - *Conservationist for Kids* ISSN 1940-8099. © 2021 by NYSDEC, is an official publication of the New York State Department of Environmental Conservation published 3 times per year at 625 Broadway, Albany, NY 12233-4502. Telephone (518) 402-8047. TO SUBSCRIBE TO CONSERVATIONIST FOR KIDS, visit the department's website at www.dec.ny.gov or call 1-800-678-6399. CONSERVATIONIST FOR KIDS and the Teacher Supplement are available online at www.dec.ny.gov. The New York State Department of Environmental Conservation does not discriminate on the basis of race, national origin, disability, age or gender.

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Conservationist for Kids

Supplement for Classroom Teachers – Trees Are Terrific!

Fall 2021

Why Study Trees?

There are approximately 100,000 types of trees found around the world, with many of them located in tropical rainforests. Trees comprise approximately one quarter of the plant species found on Earth. Trees are important for many reasons, from providing food and shelter for wildlife to helping combat climate change. This issue of *Conservationist for Kids* introduces students to what trees are, examines some of the different reasons why trees are important, and describes some of the common native tree species found in New York State.

Project Learning Tree

Project Learning Tree (PLT) is an interdisciplinary, hands-on curriculum that uses the forest as a window to the world. There are curricula for early childhood (Environmental Experiences for Early Childhood, min 3-hour workshop), Pre-K to 8th grade (Project Learning Tree Activity Guide, min 6-hour workshop), and a variety of secondary modules for high school students (Secondary Modules, such as Focus on Forests and Places We Live, min 2-hour workshop). The Pre-K to 8th grade guide is correlated to Common Core State Standards in both Math and English Language Arts, STEM concepts, and FOSS Kits. To learn more about Project Learning Tree, visit DEC's website at <https://www.dec.ny.gov/education/1908.html>.

Arbor Day Artwork Contest

DEC's Urban Forestry Program is excited to announce the Student Arbor Day Artwork Contest! The new 4th and 5th grade poster contest is open now and posters must be received by December 10. The theme this year is "Healthy Trees, Healthy People!"; both lesson plans and resources are available on the Artwork Contest webpage. Schools may submit up to 5 posters per grade level from among their students. Homeschoolers may also submit posters for their students. One state winner and 11 runners-up will be selected to be featured in a calendar. Winning schools will receive calendars for their participating students. The state winner will also have a tree planted at his/her/their school and receive a framed copy of the poster. For the complete list of rules and how to apply, visit the contest webpage: <https://www.dec.ny.gov/education/25420.html>.

Maple Sugaring

If you have a nature center or environmental education center near you, many of them offer programs on maple sugaring to schools and the public. To learn more about DEC's environmental education centers, visit <https://www.dec.ny.gov/education/74.html>. You can also find a list of New York State Parks nature centers at <https://parks.ny.gov/environment/nature-centers/>. There are lots of other nature centers around the state, often run by local/county governments or non-profit organizations. Check with one near you to see if they offer maple sugaring programs.

School Seedling Program

Planting and caring for tree seedlings can help young people learn about ecosystems and the valuable roles that trees play. Schools and youth organizations are eligible to receive free trees or shrubs by participating in DEC's School Seedling Program. Participants receive seedlings from the Colonel William F. Fox Memorial Saratoga Tree Nursery along with guidance on how to plant and care for them. To learn more, visit DEC's website at <https://www.dec.ny.gov/animals/9393.html>.

Online Resources

DEC Resources

Arbor Day <https://www.dec.ny.gov/lands/5274.html>
Big Tree Register <https://www.dec.ny.gov/animals/5248.html>
Forests <https://www.dec.ny.gov/lands/309.html>
Forest Health <https://www.dec.ny.gov/lands/4969.html>
How To Plant A Tree <https://www.dec.ny.gov/lands/5303.html>
Saratoga Tree Nursery <https://www.dec.ny.gov/animals/7127.html>
Teacher Information <https://www.dec.ny.gov/education/66.html>

Other Resources*

Acorn Naturalists: Resources for the Trail and Classroom <https://www.acornnaturalists.com/>
American Forests <https://www.americanforests.org/>
Arbor Day Foundation <https://www.arborday.org/>
Life as a Tree <https://oregonforests.org/tree-biology>
Maple Syrup Resources https://ny.agclassroom.org/resources/lesson_maple/
National Forest Foundation <https://www.nationalforests.org/>
One Tree Planted <https://onetreeplanted.org/>
Plant a Billion Trees <https://www.nature.org/en-us/get-involved/how-to-help/plant-a-billion/>
Project Learning Tree <https://www.plt.org/>
Tree & Plant Identification Apps <https://northernwoodlands.org/about/post/tree-and-plant-identification-apps>
Tree Biology <https://climate-woodlands.extension.org/tree-biology/>
Tree Cookies Lesson Plans <https://www.plt.org/blog/activity/activity-76-tree-cookies/>
Tree Identification Tools <https://www.uwsp.edu/cnr-ap/leaf/Pages/LEAF-Tree-Identification-Cards.aspx>
Trees for the Future <https://trees.org/>
U.S. Forest Service: Educators <https://www.fs.usda.gov/learn/educators>

Books*

Brockman, C. Frank. *Trees of North America: A Guide to Field Identification*. St. Martin's Press, 2001.
Burns, Diane. *Trees, Leaves, and Bark* (Take Along Guides). Cooper Square Publishing LLC, 1995.
Daniels, Patricia. *Ultimate Explorer Field Guide: Trees*. National Geographic Kids, 2017.
Green, Jen. *The Magic and Mystery of Trees*. DK Children, 2019.
Kershner, Bruce. *National Wildlife Federation Field Guide to Trees of North America*. Sterling, 2008.
Maloof, Joan. *Treepedia: A Brief Compendium of Arboreal Lore*. Princeton University Press, 2021.
National Audubon Society. *National Audubon Society Trees of North America*. Knopf, 2021.
Sibley, David Allen. *The Sibley Guide to Trees*. Knopf, 2009.
Seuss, Dr. *The Lorax*. Random House Books for Young Readers, 1971.

*Please note, the listing of websites and books is not to be considered an endorsement, as not all have been reviewed by the editor.

Conservationist for Kids and an accompanying teacher supplement are distributed free of charge to 4th grade classes throughout New York State three times per school year (fall, winter, and spring). If you would like to be added to or removed from the distribution list, need to update information, or if you have questions or comments, please e-mail the editor at KidsConservationist@dec.ny.gov. Limited quantities of some back issues are also available on request. The full archives can be found online at <https://www.dec.ny.gov/education/100637.html>