See what your students know:

Use this fun Kahoot to help the DNR understand what your students know on this topic before the program.

Learning outcomes:

Join DNR educator Craig Kasmer from one of Michigan's most amazing forest resources, Hartwick Pines State Park. An area that escaped the axes of Michigan's White Pine Logging Era, Hartwick Pines boasts stands of enormous white pines and is a tremendous setting to learn about how trees grow, what benefits they provide us and wildlife, and how forests are managed in Michigan. This 30-minute presentation will meet the following learning outcomes:

- Learn the parts of a tree and how it grows and how individual tree species may have different needs for growing.
- Discover how trees provide us with wood products that we use every day of our lives.
- Understand that forests provide habitat for wildlife and help improve water quality.
- Recognize the need for harvesting trees to promote a healthy forest and improve wildlife habitat and safety.

Background information:

Just about everyone can remember an experience with a tree or a forest: the tree you climbed as a kid, where you sat in the shade to read a book, the discovered nest of a pair of robins, or turning over rotting logs in a forest close to where you live. There is simply nothing else in nature quite as helpful to humans as a tree.

In Michigan, we are fortunate to have millions of acres of forest land as well as urban and community forests. 20 million acres to be exact! To fully understand the value of our forests, it is important to know how trees grow, what problems they are facing, how they benefit society and our wildlife populations, and how they are managed so that we have forests for future generations to use and enjoy

Resources:

- BeLEAF It or Not video series
- Michigan Forests Forever Teacher's Guide
- Michigan Upper Peninsula tree ID key

Suggested pre-activity:

- Have students review the Tree and Forest Definitions page.
- Draw a tree (deciduous or coniferous) using these parts: roots (below ground), trunk and crown. Feel free to add some branches or other details.

Directions for your *DNR Nature at School* virtual program:

1. You will receive a reminder email from SignUp Genius three days prior to your scheduled *DNR Nature at School* program. Please read and follow the directions, so we all can have a successful program.
2. At least one day prior to your lesson, send your instructor the link to your Zoom/Google Meet/Skype/Teams for your lesson time. Starting 10 minutes early with just your instructor is encouraged.

   Day of
3. Make sure students have their sound muted and their cameras on to participate (with thumbs up, number on fingers).
4. If you use the chat feature, we encourage the students to ask their questions there, and the teacher can ask them at the end of the program.
5. See further directions in your SignUp Genius confirmation.

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Guiding question/phenomenon:

How do forests provide for humans?
How do humans inmpact forests?

Science and Engineering Practice	Disciplinary Core Idea	Cross Cutting Concepts
Developing and Using Models Use a model to test interactions concerning the functioning of a natural system. • Students will model the life cycle of trees and their needs/limiting factors in the pre-activities. **Planning and Carrying Out Investigations** Conduct an investigation to produce data to serve as the basis for evidence that meets the goals of an investigation. • Students will design and conduct a field investigation, starting with an essential question at home or in the schoolyard as a post-activity.	**LS1.B: Growth and Development of Organisms** Plants reproduce in a variety of ways, sometimes depending on animal behavior and specialized features for reproduction. Genetic factors as well as local conditions affect the growth of the adult plant. • Students will learn how cones produce and protect seeds and their different seed dispersal adaptations, and how sunlight and soils affect growth. **LS1.C: Organization for Matter and Energy Flow in Organisms** Plants, algae (including phytoplankton), and many microorganisms use the energy from light to make sugars (food) from carbon dioxide from the atmosphere and water through the process of photosynthesis, which also releases oxygen. These sugars can be used immediately or stored for growth or later use. • Students will learn how Michigan trees produce their food to grow and reproduce.	**Systems and System Models** A system can be described in terms of its components and their interactions. • Students will learn parts of the Michigan forest system from reproduction, to harvest, to human use, and discuss how to ensure the sustainability of that system. **Cause and Effect** Cause and effect relationships are routinely identified and used to explain change. • Students will learn tolerance parameters for water, soils, nutrients and sunlight for the trees at Hartwick Pines State Park, and their relationship to species growth.

Recommended grade band(s): upper elementary and middle school

All Nature At School virtual programs have been created to introduce students at any grade level to life and/or earth science core ideas, when used with pre- and post-lesson suggestions.

See what your students learned:

Use this fun Kahoot to help the DNR understand what your students know on this topic, after the program. This data helps the DNR create and update free programming for teachers across the state.

Activity wrap-up:

We have learned how a tree grows and how each tree species has different needs for sunlight, water and nutrients. We also talked about the wood products that we use every day in our lives. To get these forest products, trees need to be harvested. Although the forest products industry is a driving force for tree harvesting, there are many other reasons why trees are cut down. Removing some trees helps to maintain forest health and encourages regeneration. Invasive species have created many dead trees, and while these can make great homes for tree-dwelling animals and birds, they can also be hazardous to our health and homes.

Resources:

- BeLEAF It or Not video series
- Michigan Forests Forever teacher's guide
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Connect to home:

Students may live in a house or apartment, in a suburb or in a farm field. But somewhere nearby is a tree, if not several. Getting to observe a tree up close can be a calming experience. Is there evidence of insect activity like feeding on the leaves, cocoons, or caterpillars? Are there birds or squirrels? What colors are present? Look for light or dark hues of green or a broad spectrum of colors in the fall. Have the students investigate a tree growing nearby and look for these characteristics. You may even instruct them to make a few sketches of the tree or make a bark rubbing using a crayon.

Post-activities:

- Tree Bingo

We covered how trees grow, how different species have different requirements, some of the health problems trees can have and how they are beneficial to wildlife. This Bingo page lures the students to get outside and take a closer look at the trees around their neighborhood. Comparing shapes and forms of leaves and branches encourages them to get to know a tree up close.

Connect with DNR content:

For a daily dose of nature, like MiNatureDNR on Facebook.

Visit the DNR Nature at Home page for educational video series, resources, lessons, virtual tours and more.