Michigan’s Terrific Trees (4th, 5th & 6th) Program Information Sheet

Theme: Terrific Trees
Recommended Grade Levels: 4th, 5th, & 6th grade
Seasons Offered: Fall
Program Length: 1.5 hours (can be adapted upon request)
Maximum # of Students: 60

Program Synopsis: This hands-on program allows students to explore and observe Michigan trees up close as they hike through a Beech Maple Forest. Students will learn how to identify common types of Michigan trees by looking at unique characteristics, such as branching patterns, bark, leaf shape, and seeds. They will also explore trees using their senses, participate in an activity that demonstrates the needs of a tree, investigate a rotting log, and build a “human tree” by acting out the different functions of each part of the tree. If time allows, students may also have the opportunity to examine various tree cookies.

Key Concepts: basic tree identification, photosynthesis, basic needs of a tree (sunlight, water, air/CO2, nutrients, space), environmental effects on trees (drought, overcrowding, nutrient deficient soil…), life cycle of a tree (seed, sprout, sapling, mature tree producing seeds, dead tree, rotting log), decomposers, layers of a forest (forest floor, shrub layer, understory, and canopy), parts of a tree (heartwood, sapwood, cambium, phloem, bark, roots, branches, leaves), field guides, Beech Maple forest

Teaching Objectives: Students will ....
- Use their senses to explore a variety of Michigan trees
- Learn basic tree identification skills and some common trees of West Michigan
- Learn about what causes tree leaves to change color
- Identify the survival needs of a tree
- Discover how trees are affected by natural changes in the environment (drought, overcrowding, storms, nutrient deficient soil)
- Find trees in various stages of the life cycle
- Learn about decomposition and the importance of decomposers while investigating a rotting log
- Discuss the importance of the relationship between trees and decomposers
- Discuss and look for the layers of the forest

Tips for a successful field trip

Preparing for an Outdoor Program: Students, teachers and chaperones need to dress for the weather. During inclement weather, outdoor activities may be shortened and conducted inside the nature center; but, unless the weather is severe, we will still go outside. Please have students wear lots of layers, hats, gloves, boots and coats in cold weather and rain gear when needed. Clothes and apparel may get dirty or wet during outdoor programs—please advise your students’ parents of this. During certain times of the year, insect repellent may be needed.

Before arriving, please remind your students and chaperones of the following:
- Walk quietly. Quiet hikers see more wildlife.
- Staying on the trails protects you, as well as the plants and animals that live in the preserve.
- Stay behind the leader and listen carefully to instructions.
- To care for our plants and animals, we need to be kind and not hurt them.
Learn the parts of a tree and their functions

**MI GLCE Standards:**

**4th Grade**
- S.IP.04.11: Make purposeful observation of the natural world using the appropriate senses.
- S.IP.04.12: Generate questions based on observations.
- S.IP.04.13: Plan and conduct simple and fair investigations.
- S.IP.04.14: Manipulate simple tools (hand lens) that aid observation and data collection.
- S.IA.04.12: Share ideas about science through purposeful conversation in collaborative groups.
- S.IA.04.13: Communicate and present findings of observations and investigations.
- S.RS.04.15: Use evidence when communicating scientific ideas.
- S.RS.04.19: Describe the effect humans and other organisms have on the balance of the natural world.
- L.OL.04.15: Determine that plants require air, water, light and a source of energy and building material for growth and repair.
- L.EV.04.21: Identify individual differences (color, size, leaf shape) in organisms of the same kind.

**5th Grade**
- S.IP.05.11: Generate scientific questions based on observations, investigations, and research.
- S.IP.05.13: Use tools and equipment (hand lens) appropriate to scientific investigations.
- S.IA.05.13: Communicate and defend findings of observations and investigations using evidence.
- S.RS.05.13: Identify the need for evidence in making scientific decisions.
- S.RS.05.17: Describe the effect humans and other organisms have on the balance in the natural world.
- L.EV.05.12: Describe the physical characteristics (traits) of organisms that help them survive in their environment.

**6th Grade**
- S.IP.06.11: Generate scientific questions based on observations, investigations, and research.
- S.IP.06.13: Use tools and equipment (hand lens) appropriate to scientific investigations.
- S.IA.06.13: Communicate and defend findings of observations and investigations using evidence.
- S.RS.06.13: Identify the need for evidence in making scientific decisions.
- S.RS.06.17: Describe the effect humans and other organisms have on the balance of the natural world.
- L.OL.06.51: Classify producers, consumers, and decomposers based on their source of food (the source of energy and building materials).
- L.EC.06.21: Describe common patterns of relationships between and among populations.
- L.EC.06.22: Explain how two populations of organisms can be mutually beneficial and how that can lead to interdependency.
- L.EC.06.42: Predict possible consequences of overpopulation of organisms, including humans (for example: resource depletion).
Program Activities:

Meet a Tree: (S.IP.04.11)
In this hands-on activity, students will engage their senses – other than sight – to explore a tree while being blindfolded. After using their senses to explore the tree, students will return to the trail and with blindfolds removed, the students must try to locate the tree they explored. This a great introduction activity to teach students about the different characteristics of trees by using their senses (other than sight). It is also a wonderful activity to teach the importance of teamwork and trust.

Basic Tree ID: (S.IP.04.11, S.IP.04.12, S.IA.04.12, S.IA.04.13, S.RS.04.15, L.EV.04.21, S.IP.05/6.11, S.IA.05/6.13, S.RS.05/6.13, L.EV.05.12)
Students will become botanists (scientists who study plants) and will identify common types of Michigan trees by looking at unique characteristics such as branching patterns, bark, leaf shape, and seeds of each species while exploring the preserve.

Every Tree for Itself (Needs of a tree): (S.IA.04.12, S.IA.04.13, S.RS.04.19, L.OL.04.15, S.IA.05/6.13, S.RS.05/6.17, L.OL.06.51, L.EC.06.42)
During this activity, students will pretend to be trees and try to get the requirements they need in order to produce their own food and to grow tall and strong. Photosynthesis will be discussed, as well as how trees are affected by various environmental situations such as drought, overcrowding, and nutrient deficient soil.

Life of a Tree & Rotting Log Investigation: (S.IP.04.11, S.IP.04.12, S.IP.04.13, S.IP.04.14, S.IA.04.12, S.IA.04.13, S.RS.04.15, S.IP.05/6.11, S.IP.05/6.13, S.IA.05/6.13, L.OL.06.51, L.EC.06.21, L.EC.06.22)
While exploring the preserve, students will identify trees in various stages of a tree’s life cycle. They will also investigate a rotting log and learn about the importance of the relationship between decomposers and trees/rotting logs.

Build a Tree (Parts of a Tree): (S.IP.04.11, S.IP.04.12, S.IA.04.12, S.IA.04.13, S.RS.04.15, S.RS.04.19, S.IP.05/6.11, S.IA.05/6.13, S.RS.05/6.17, L.EV.05.12, L.OL.06.51)
As a group, students will build a tree from the inside out by acting out the different functions of each part of the tree. The parts discussed include: heartwood, sapwood, cambium, phloem, bark, branches, leaves, and roots.

Optional - Reading the Rings: (S.IP.04.11, S.IP.04.12, S.IP.04.14, S.IA.04.12, S.IA.04.13, S.RS.04.15, S.IP.05/6.11, S.IP.05/6.13, S.IA.05/6.13)
As time allows, students will have the opportunity to use hand lenses to examine a variety of tree cookies from various Michigan trees. They will try to identify the different parts of a tree and figure out the age of the tree.

Ideas for Pre & Post Classroom Activities:

Activities:

Design a Tree Leaf Key: Have students collect 5-7 different kinds of leaves and bring them to school. Explain that the students will be working in groups of 2-3 in order to design a dichotomous key for leaf identification using the leaves that they brought in. (Visit www.exploringnature.org/graphics/tree_key.pdf for a good example of a leaf key.) Brainstorm characteristics that the students could use to classify their leaves (simple vs. compound, lobes
or no lobes, venation – parallel, pinnate, palmate, size in cm, shape, color etc.) and show them an example of a leaf key. Give them time to design their own leaf keys. If time, after designing their keys have students exchange their leaves and leaf key with another group and try to “key out” or classify their classmates’ leaves.

Art:

**Leaf Identification & Leaf Rubbings:** Collect leaves of various shapes and sizes from the ground. Teach the students how to use a field guide to identify their leaves. After they identify their leaves, have the students place a leaf underneath a piece of paper and use the flat side of a crayon to color over the leaf. The leaf’s shape and venation should appear on the paper as the student continues to color over the leaf. Explain that when scientists collect data, they always label and date it. Have the students label and date their own leaf rubbings.

**Tree Portraits:** Collect leaves, twigs, and seeds from the ground. Have students create tree portraits by gluing these items onto a paper as the main parts of a tree such as roots, trunk, branches, leaves, and seeds.

**Tree Drawings:** Encourage students to make drawings of common Michigan trees. Take students outside and allow them to choose a tree or part of a tree (specific branch or section) and to sketch the tree as realistically as possible. Encourage them to remember the tree’s unique characteristics (bark, branching patterns, leaves, seeds…etc.) and to include those characteristics in their drawings.

**Exploration & Experiments:**

**Adopt a Tree:** Take your students to an area with trees nearby the school. Allow the students to walk through the trees and choose one tree to “adopt” for the next few weeks. Provide the students with various colored ribbons to tie around a branch on their tree in order to identify their tree on future visits. Encourage the students to use their senses to explore and observe their tree. Have them take a notebook with them to record their observations during each visit. Have the students return to visit their tree weekly or bi-weekly in order to observe and note the changes that they observe. Some of the following questions/activities may be useful in guiding their observation and exploration:

<table>
<thead>
<tr>
<th><strong>Introduction Questions</strong></th>
<th>What can you tell me about this tree?</th>
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<tbody>
<tr>
<td></td>
<td>Is this tree alive or dead? How do you know?</td>
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<td></td>
<td>How old do you think it is?</td>
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<td><strong>Size</strong></td>
<td>How large is the tree? Give the tree a hug.</td>
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<td>Can your arms fit around the whole tree?</td>
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<td></td>
<td>Use yarn to measure the circumference of your tree.</td>
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<td><strong>Bark</strong></td>
<td>How does the bark feel?</td>
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<td></td>
<td>Have the students make bark rubbings by placing paper against the bark and rubbing with a crayon. (<em>This works best if you peel the wrapper off the crayon and rub it horizontally instead of rubbing with the point.</em>)</td>
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Leaves, Fruit, Seeds

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<tr>
<th>Question</th>
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<tbody>
<tr>
<td>What do the leaves look like?</td>
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<td>What shape are the leaves?</td>
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<td>Are there any leaves on the ground?</td>
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<tr>
<td>Make a leaf rubbing of your tree’s leaves.</td>
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<td>Does the tree have fruit or flowers?</td>
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Other

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<th>Question</th>
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<tr>
<td>Lay on the ground and look up at the tree to view from a different perspective.</td>
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<tr>
<td>Look at the tree from different locations: far away, up close with a magnifying glass.</td>
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<td>Are there any animal signs on or around your tree?</td>
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Application

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<th>Activity</th>
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<tr>
<td>Draw a picture of the tree</td>
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<tr>
<td>Write a journal entry involving your senses – What do you see, feel, hear?</td>
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<tr>
<td>Use a tree field guide to identify your tree</td>
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*Adaptation in the fall: Encourage the students to only choose one branch to observe. By just studying one branch in the fall, students should notice smaller details such as buds developing and leaves changing color.

Plant Life Cycle Experiment: In a one gallon Ziploc bag, place several sheets of wet paper towel. Place 2-4 bean seeds in the middle of the paper towel and staple underneath each seed in order to prevent it from falling to the bottom. Nearly seal up the bag, but leave a small corner open for some air flow. Through this process, students can watch the process of germination. This experiment can also be done in a different form by having the students collect seeds from trees (acorns, walnuts, beech nuts, maple samaras, etc.) or bring in seeds such as sunflower seeds or beans and have students plant them in potting soil. This would also work with placing bean or avocado seeds in water.

Tree Detectives: Using the attached “Tree Detective Notes” worksheet, have your students use their senses to explore the unique characteristics of a Michigan tree. Through the process of exploring the tree, students should be able to use the information they gathered to identify their tree. This would be an appropriate follow-up activity to the preserve program since the students would be able to apply what they learned about identifying trees.

Sharing/Discussion:

Nature Station: Set aside an area in your classroom for students to bring in nature items to display. Have the students share where they found the item, why they think it is special, how it feels, smells, looks, etc. A nature station also creates a unique resource for other sensory activities where students can blindfold each other and try to identify the object by using their other senses such as touch, smell, and hearing.

The Lorax: Read the story of The Lorax by Dr. Seuss in class and have a class discussion with the students about the message of the book. Some questions to guide the discussion include:
- How does the story relate to us and what we are studying in class?
- Does it remind you of anything happening around us?
- What can we do to help save our forests, the animals, and the natural community?
- What are some things that we can do every day to help protect the earth?

Extension activity: Reading The Lorax should bring up some questions about issues like deforestation. With your students, examine the implications of forest depletion. Use
this new knowledge to work with your students on a service project to help the problem by planting trees and flowers around your school or in a local park.

Writing:

Tree Reports: Have each student choose a Michigan tree that they are going to research. They can practice using resources such as field guides, libraries, the internet and experts to write a presentation for the class. You could have the class take notes on each presentation, or have each student make a fact sheet for their tree so that you can create a class field guide from each student’s research information.

Nature Journaling: Have students create a nature journal. They can put their nature based artwork and projects in their journal, as well as journal about experiences in nature.

Great Resources for the Classroom

Our Favorite Tree & Forest Storybooks Include:

- A Log’s Life by Wendy Pfeffer
- Around the Forest: Who’s Been Here? by Lindsay Barrett George
- Forest Explorer: A Life-Size Field Guide by Nic Bishop
- In a Nutshell by Joseph Anthony
- Leaf Man by Lois Ehlert
- Red Leaf, Yellow Leaf by Lois Ehlert
- Sky Tree by Thomas Locker
- The Apple Pie Tree by Zoe Hall
- The Busy Tree by Jennifer Ward
- The Gift of the Tree by Alvin Tresselt
- The Giving Tree by Shel Silverstein
- The Lorax by Dr. Seuss
- The Tin Forest by Helen Ward
- The Tree in the Ancient Forest by Carol Reed-Jones
- Where Would I Be in an Evergreen Tree? by Jennifer Blomgren
- Who Will Plant a Tree? By Jerry Pollatta

Internet Resources:

Beach Maple Forest Unit Plan- This unit plan was created for teachers in the Great Lakes region to use in their classrooms to learn more about Beach Maple Forests. Includes five lesson plans correlated to Michigan’s GLCE standards for 1st to 3rd grades and accompanying background information and handouts. Lesson plans include: Forest Overview, Michigan Trees, Decomposers, Terrarium Observations, and Forest Web. Created by April VanderMolen, Senior Elementary Education student at Calvin College and CCEP student staff member under the direction of Jeanette Henderson, CCEP Program Manager, January 2012. www.calvin.edu/academic/eco-preserve/programs/school.html

Focus on Michigan Forest: Michigan PLT Lesson Plans- This free guide is intended to be used as a supplement to the Project Learning Tree (PLT) Pre K-8 Environmental Education Activity Guide. It has been structured for educators who wish to teach about Michigan’s amazing forests. Each section provides correlations to the Michigan frameworks, additional resources
and contact information for public and private organizations that manage and/or protect natural resources in the state. [www.michiganplt.org/pdf/PLTcurriculum1101.pdf](http://www.michiganplt.org/pdf/PLTcurriculum1101.pdf)

**Mesic Southern Forest (Beech Maple Forest) Community Abstract** - This is a great scientific description of a Beech Maple Forest community on the Michigan Natural Features Inventory’s website. [http://mnfi.anr.msu.edu/abstracts/ecology/Mesic_southern_forest.pdf](http://mnfi.anr.msu.edu/abstracts/ecology/Mesic_southern_forest.pdf)

**Michigan Forest Forever Teacher’s Guide** – This is a resource on the web about Michigan’s forests. It is comprehensive source of information about Michigan's forests and Michigan forestry. Designed especially for the needs of Michigan educators and students and benchmarked to the Michigan Education Middle School Standards. It contains a lot of wonderful resources and a tree identification primer. [http://mff.dsisd.net/TreeBasics/TreeBasics.htm](http://mff.dsisd.net/TreeBasics/TreeBasics.htm)

**Lesson Plans:**

- **Hands-On Nature: Information and Activities for Exploring the Environment with Children**
  Edited by Jenepher Lingelbach & Lisa Purcell. Published by: Vermont Institute of Natural Science. Here are some specific lesson plans connected to this program:
  - Rotting Logs: Temporary Homes on the Forest Floor (p. 80)
  - Meet a Tree: The Sum of Many Parts (p. 129)
  - Winter Twigs: Signs of Four Seasons (p. 157)
  - Variations on a Leaf: The Great Producers (p. 191)
  - Cones: Cradles for the Conifers (p. 198)

- **Project Learning Tree: Environmental Education Activity Guide for Pre-K-8th**
  Published by American Forest Foundation. Here are some specific lesson plans connected to this program:
  - Get in Touch with Trees (p. 20)
  - We All Need Trees (p. 65)
  - Adopt a Tree (p. 97)
  - Trees as Habitats (p. 102)
  - The Fallen Log (p. 105)
  - Every Tree for Itself (p. 117)
  - Three Cheers for Trees (p. 130)
  - Plant a Tree (p. 132)
  - And many more tree lessons!

For questions and/or additional information about this program please contact:

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Complied by AW, 7/27/12 Updated by JMH 9/27/12
Tree Detectives Notes

Use this worksheet to gather clues and notes to help you identify your mystery tree.

Name: ___________________________ Date: ____________________

Group Members: ________________________________________________
____________________________________________________________________________

Creative Tree Name: ___________________________
(Make up a unique name for your tree until you identify it)

Location

Habitat
Where is your tree located? In a forest, wetland, grassland, school yard, neighborhood…etc.

Tree Neighbors
Trees, much like people, prefer to hang out with other trees and plants that need the same
surrounding environment. Knowing who your tree’s neighbors are can help you identify it. Look
around your tree and describe/draw some of the trees surrounding your tree. Are they taller,
shorter, larger…etc. than your tree?

Now look for plants and fungus growing under or on your tree. Record what you see (mosses,
lichens, mushrooms, grasses):
Identifying Characteristics

Circle one. Is your tree... deciduous coniferous

Tree Size
Hug your tree. Do your arms stretch all the way around the tree? Yes No

Scientists always measure the diameter or circumference of a tree at 4.5 feet (1.4 meters) from the forest floor. This measurement is called Diameter at Breast Height (DBH). Using the meter stick measure where the DBH location is on your tree and then take the tape measure and measure the diameter of the tree.
Record the DBH here: ____________ inches or cm (circle the appropriate unit of measurement)

Branching Patterns
What is your tree’s branching pattern? Opposite Alternate

Fruit, Flowers, & Seeds
Do you see any fruit, flowers, or seeds on your tree or on the ground around it? If yes, describe and/or draw them.

Bark of the Tree
Feel the bark of the tree and describe it. What color is it? How does it feel? Any unusual markings or patterns?

Now use a pencil or crayon to make a rubbing of the tree’s bark.
Leaves
Are most of the leaves…still on the tree…fallen on the ground

Choose one of the leaves to study up close. Are the leaves…simple…compound

Does your leaf have lobes? Yes No

Look at the leaf margins (edge of the leaf). Are they…smooth…toothed

Are the veins of the leaf…parallel…palmate…pinnate

Describe the shape of your leaf. Oval, heart shaped, shaped like your hand, round, long and skinny, needle like…etc.

How does your leaf feel? Fuzzy, hairy, thick, thin, oily, wax-papery, crunchy…etc. Describe how it feels.

Use a crayon to make a leaf rubbing below.
Shape of the Tree
Stand back from the tree. Draw the shape of the tree including its trunk, branches, and canopy (treetop). Is it round, pointy, tall, short…etc?

Tree Identity
After observing, exploring, and gathering data on your tree, use a field guide to help you identify your Michigan tree.

Tree Name: _____________________________

Congratulations on identifying a Michigan tree!