

Field Enhancement 3: Caring for the Future of Forests

NUTSHELL

In this lesson, students dig in and participate in each step of planting a tree.

They learn about the things a tree needs to grow, research and choose the right tree for the right site, and plant a tree. They are also encouraged to think about the purpose of the tree and the values it will grow to provide.

ENDURING UNDERSTANDINGS

- All citizens have a responsibility to be stewards of the environment that sustains human life. This includes making informed decisions about forest resources.

ESSENTIAL QUESTION

- What does it mean to be a steward of the environment?
- What can I do to help sustain Wisconsin's forests?

OBJECTIVES

Upon completion of this lesson, students will be able to:

- Identify that planting a tree is one way to be a forest steward.
- Explain how to match the right tree species to the right planting site.
- Explain how to plant a tree.
- List what a tree needs to grow.

SUBJECT AREA

Science

LESSON/ACTIVITY TIME

Total Lesson Time: 60 minutes (each option)

OPTIONS 1 & 2:

- Introduction.....5 minutes
- Activity 110 minutes
- Activity 215 minutes
- Activity 315 minutes
- Conclusion.....20 minutes

TEACHING SITE

Anywhere you have permission to plant a tree.

CLASSROOM LESSON CONNECTIONS

This lesson ties closely with **Lesson 7: Sustaining Our Forests**.

STANDARDS CONNECTIONS

Standards for this lesson can be viewed online at the LEAF website (leafprogram.org).


BACKGROUND INFORMATION

J. Sterling Morton, the founder of Arbor Day, was a journalist and the editor of Nebraska's first newspaper. He frequently used the newspaper to spread his enthusiasm for trees. Eventually, Morton became the secretary of the Nebraska Territory. In this position, Morton proposed the idea of Arbor Day at a meeting of the Nebraska State Board of Agriculture in 1872. The date for the first Arbor Day was set for April 10, 1872.

Before the end of the 1870s, other states began observing Arbor Day. Today Arbor Day is celebrated throughout the United States and beyond. National Arbor Day is the last Friday in April (when Wisconsin also celebrates), but each state sets its own date for celebrating based on the best tree planting times in their area. The highlight of every Arbor Day celebration is planting a tree.

MATERIALS LIST


For Each Pair of Students - Option 1

- Copy of Student Page  **1, Choose-a-Tree**

For the Class - Option 1

- Access to the internet
- *Tree Field Guides* (the LEAF 4th Grade Lesson Guide Kit has 25 copies of *Forest Trees of Wisconsin* www.uwsp.edu/wcee/wcee/kits/leaf-4th-grade-lesson-guide-kit)
- Containerized or balled and burlapped tree
- Two shovels
- Rake
- Scissors
- Wood chips (2.5 cubic feet)
- Water

For Each Pair of Students - Option 2

- Copy of Student Page  **2, Choose-a-Site**

For the Class - Option 2

- Access to the internet
- *Tree Field Guides* (the LEAF 4th Grade Lesson Guide Kit has 25 copies of *Forest Trees of Wisconsin* www.uwsp.edu/wcee/wcee/kits/leaf-4th-grade-lesson-guide-kit)
- Seedling
- Shovel
- Trowel
- Water

SAFETY PRECAUTIONS

Extra supervision is needed as students use tools to plant a tree.

TEACHER PREPARATION

- Google Resource: *Educator Slideshow_ FE3_How to Plant Your Tree* found at uwsp.edu/wcee/wcee/leaf/leaf-curriculum/k-12-forestry-lesson-guides.
- Decide in advance if your class will participate in the Wisconsin DNR Fourth Grade Arbor Day Free Tree Program. The application needs to be completed by March. An alternative is to purchase a tree from the National Arbor Day Foundation, the Historic Tree Nursery, or a local nursery.
- Get permission to plant a tree on the school grounds or another site.

By planting a tree, students can be forest **stewards**. They are taking responsibility to make decisions and take actions today that will allow resources to be maintained in a healthy manner. It is important for students to realize that we all make a difference, no matter how small some efforts might seem. By making informed decisions and being aware of their impact on forest resources, students are practicing stewardship. Staying on trails when walking in the woods, picking up litter, not damaging trees and other plants, putting up birdfeeders or birdhouses, and recycling are all actions students can take.

This lesson provides two options for planting a tree. The first option involves purchasing a balled and burlapped or containerized tree. The second option involves getting free seedlings from the Wisconsin DNR. In either case, planting your tree may or may not be done in correlation with an Arbor Day Celebration.

“There is always an adventure waiting in the woods.”

★ Katelyn S. Boldt ★

It will be important for you to match the right tree to the right site. Choose a tree that can survive in the hardiness zone in which you live. Most of Wisconsin is in Zone 4. However, a small portion of the state in the far northwest is in Zone 3. The southeastern corner of the state is in Zone 5. Also consider how much space is available for the tree to grow. Check for both height and width. Trees planted near powerlines must have a mature height of 25 feet or less. Leave enough room for the crown of the tree to reach its full diameter at maturity. Avoid planting it too close to buildings. At some planting sites, it will be important to choose a tree that does not drop messy fruit or nuts. You will want to consider how important it is to have a tree that displays vibrant fall colors or attractive flowers in the spring, or how important it is to plant a species that provides habitat for wildlife. You may also want to consider if there is a long-term purpose for the tree. Can it provide shade and reduce summer cooling costs? Can it provide wind protection or more privacy? Would the tree ever be harvested and used to make something?

The best time of year to plant trees, especially seedlings and bare root trees, is early spring. Containerized and balled and burlapped trees will probably do well when planted anytime during the growing season.

Your city may have ordinances that apply to your planting project. Cities often restrict which species get planted along roadways or on public property. They also dictate guidelines for the location of new trees. Check your city's website, or call the city forester to learn more about the ordinances in your area. If planting a tree on the school grounds, check with your school grounds crew about the chosen site. Your school may have a long-term landscaping plan in place. Be sure to plant your tree in a place where it can grow for a long time.

OPTION 1: PURCHASE A TREE

If you plan to purchase a tree, there are several options for locating one. The National Arbor Day Foundation (www.arborday.org) has a website where they offer a variety of trees for sale. In addition, your local nursery or garden center can be an excellent resource for you.

Follow these steps when you plant a balled and burlapped or containerized tree:

1. Talk to your school's maintenance or grounds crew to determine areas where a tree can be planted at your school. Ensure that Diggers Hotline has been contacted (1-800-242-8511 or www.diggershotline.com) to check for buried utility lines on your site.
2. Keep soil around the roots and the root ball moist at all times.
3. Dig a wide, shallow hole, three times the diameter of the root ball. The hole should be deep enough so that the **root collar** will be even with the top of the ground but no deeper. Do not loosen the soil beneath the root ball; otherwise the tree may settle.
4. Place the tree in the hole.
5. Cut off the burlap and twine or remove the container. This is done while the tree is in the hole to protect the roots while the tree is being handled.
6. Replace the soil that you removed from the hole. Gently firm the soil with your foot.
7. Lay wood chips three inches deep in a three-foot circle around your tree to keep the soil cool and moist. You will need about 2.5 cubic feet of wood chips. Don't let the wood chips touch the trunk. They trap moisture and attract insects and bacteria.
8. Water your tree once or twice weekly throughout the first growing season.

NOTE: Another option is to purchase a bareroot tree. Planting a bareroot tree is more like planting a seedling, so for the planting steps, follow Option 2, Activity 3 (see page 255). The only additional step is to unpack the tree and soak it in water for three to six hours before planting it.

OPTION 2: WISCONSIN DNR FOURTH GRADE ARBOR DAY PROGRAM

Even if you plan on purchasing a tree for your class to plant, you may still participate in the Wisconsin DNR's Arbor Day Program. Through this program, the Wisconsin DNR provides free seedlings to 4th grade students. Each of your students will get a seedling to take home and plant with their family. This will serve as a wonderful extension of their classroom experience. Applications can be found on the Wisconsin DNR website each November by searching "Arbor Day Seedlings for Fourth Graders." The application deadline is in March and trees are distributed in time for Arbor Day in April. Order an extra seedling so you have one to plant with your class. The species is chosen by the state nursery based on your location in the state but is usually red pine, eastern white pine, or white spruce.

Once you receive your tree or seedlings, remember that they are perishable. Keep seedlings refrigerated until planting time, even while transporting them. Leave trees and seedlings in their packaging and keep them moist until planting time. Plant them as soon as possible.

When it is time to plant the seedling, follow these steps:

1. Talk to your school's maintenance or grounds crew to determine areas where a tree can be planted at your school. Ensure that Diggers Hotline has been contacted (1-800-242-8511 or www.diggershotline.com) to check for buried utility lines on your site.
2. Remove all grass and groundcover within a couple feet of the planting site. This will reduce competition and increase the seedling's chances of survival.
3. Use a shovel to loosen the soil within a couple feet of the planting site. This will help the roots establish themselves.

VOCABULARY TERMS

Root Collar: Where the trunk and roots meet.

Steward: A person who takes responsibility to make decisions and take actions today that will allow resources to be maintained in a healthy manner.

4. Dig a small hole in the center of the loosened soil. The hole should be deep enough so that the roots can hang freely in the hole without being crooked or twisted. The roots should just touch the bottom of the hole.
5. Fill in the soil around the roots. The seedling should be at the same depth as it grew in the nursery or slightly deeper. (Look for a moist soil line around the trunk.)
6. Pack the soil gently after planting. Water your seedling once or twice each week for the first growing season.
7. Place a flag, wire fence, or other marker near the seedling to indicate its location and protect it from damage.

**"A nation that destroys its
soils destroys itself.
Forests are the lungs of our land,
purifying the air and
giving fresh strength
to our people."**

★ Franklin D. Roosevelt ★

PROCEDURE

Introduction

1. Ask your students if they have ever planted a tree. Tell students that they are going to plant a tree together. Planting a tree is a very important responsibility. We need to make sure that our tree has everything it needs to survive. Ask what a tree needs. *(Trees need nutrients, sunlight, space, air, and water.)* When we choose a place to plant our tree, we will need to remember that our tree needs nutrients, sunlight, space, and water. Air is everywhere, so that does not need to be taken into consideration. Ask if anyone knows what the word “stewardship” means. *(Taking responsibility to make decisions and take actions today that will allow resources to be maintained in a healthy manner.)* Tell students that by planting a tree they are helping to be forest stewards. Ask for ideas on other ways they can be forest stewards. *(Stay on trails when walking in the woods, pick up litter, don’t damage trees and other plants, put up a birdfeeder or birdhouse, etc.)*
2. Explain to students that there are a lot of things to consider when planting a tree – in any school, home, or urban setting. Tell them it is important for people to match the right tree to the right site and purpose and that the tree must be able to survive in the hardiness zone where it is being planted. Most of Wisconsin is in Zone 4. However, a small portion of the state in the far northwest is in Zone 3 and the southeastern corner of the state is in Zone 5. Display a map of hardiness zones for students to see found at hort.extension.wisc.edu/articles/maps.
3. Explain to students that people need to consider how much space is available for the tree to grow and check both height and width. Trees planted near powerlines must

have a mature height of 25 feet or less and all trees need enough room for their crown to reach its full diameter at maturity. This means it is important not to plant trees too close to buildings.


4. Explain that there are other factors to consider too. Will the tree drop messy fruits or nuts? Will it flower in the spring or have vibrant fall colors and leaves to rake? Do you want the tree to provide habitat for wildlife, and if so, what birds or animals? People should also think about if there is a long-term purpose for the tree. Can it provide shade and reduce summer cooling costs? Can it provide wind protection or more privacy? Would the tree ever be harvested and used to make something?

Option 1: Purchase a Tree

ACTIVITY 1: FIND A SITE

1. Take your students on a walk to choose a planting site. Tell your students that trees planted near the street provide shade and help cool the entire neighborhood. Ask your students if they see a spot near a street where they might plant a tree. Explain to your students that shade trees planted near homes or buildings can lower energy costs. Do your students see a place near a home or building where they might plant a tree? Do they see a spot that needs more color or more shade? *(Answers will vary depending on your location.)*
2. As a group, decide which spot needs a tree the most. Before leaving, ask your students to take note of the following things. This information will help them choose the right tree for the site:
 - Soil type: Is the soil wet, moist, well drained, or sandy?
 - Does the site get full sun, partial shade, or full shade?
 - Is there a utility line overhead?
 - How much space is available for the crown?

ACTIVITY 2: CHOOSE A TREE

1. Divide your students into pairs and give each pair a copy of Student Page  **1, Choose-a-Tree**. Begin by leading a discussion about and answering the questions at the top portion of the student page.
2. Ask your students to fill in the middle portion of the student page. The University of Wisconsin-Wisconsin Horticulture Division of Extension has maps of hardiness zones on their website (hort.extension.wisc.edu/articles/maps) that students can use. To determine soil types, students can use the Soil Regions of Wisconsin map found at wgnhs.wisc.edu/pubshare/M123.pdf. Assist students as needed.
3. Next ask each pair of students to research which tree species would grow best at the chosen site. Provide your students with tree field guides and access to the internet. Allow your students to look up some of the websites listed in the Recommended Resources section of this lesson (see page 256). Each pair of students should choose one tree to recommend to the rest of the class. Then they should list three reasons why they chose that tree and draw a picture of the tree to show the class. Their reasons may include but are not limited to the following: because the tree grows well in the type of soil we have at our site; because it will not grow tall enough to interfere with the utility line; because it has pretty flowers; because it provides habitat for birds, etc. It is okay if more than one pair chooses the same tree species. Give the groups time to work.
4. Ask each pair of students to come forward and present their recommendation. Students should show the class the drawing of the tree they chose and read the three reasons they chose that tree. After everyone has presented, ask the class to vote for the tree they want to plant.
5. Purchase the tree.


ACTIVITY 3: PLANT THE TREE

1. Ask your students to help carry the tree and the tools out to the planting site. Inform your class that you have already talked to the grounds crew and contacted Diggers Hotline to check for buried utility lines at your planting site. Explain that there are several steps involved in planting a tree and that everyone will get a chance to be involved with something.
2. Explain that when you purchase trees, they come several different ways. These include balled and burlapped, in a container, bare root, and as seedlings. Each requires a slightly different method of planting.
3. Tell your students that first they will use shovels to dig a hole for the tree. Ask students to help you dig a shallow hole three times the diameter of the root ball. The hole should be deep enough so that the root collar will be even with the ground but no deeper. Point out where the root collar is located to the students and explain that it should not be buried. The root collar is the point where the trunk and roots meet. The trunk tissue above the collar cannot withstand the microorganisms in soil, so should not be underground. Also, if the root collar is buried, the roots will be too deep and not get enough air.
4. Next ask two students to work together to lift the tree into the hole. Once the tree is in the hole, ask them to cut off the burlap and twine or remove the container.
5. Ask two more students to help replace the soil around the roots. Two additional students can gently firm the soil around the roots with their feet.

6. Two students can help lay wood chips around the tree and spread them with a rake. The chips should cover a three-foot circle but should not touch the trunk of the tree. Explain that the wood chips prevent grass and weeds from growing close to the tree and competing with it for water and nutrients. They also keep the ground moist above the roots. The wood chips should not touch the trunk of the tree because they can trap moisture next to the trunk, which may attract insects and bacteria.
7. One more student can help by watering the tree.

Option 2: Wisconsin DNR Fourth Grade Arbor Day Program

ACTIVITY 1: RESEARCH THE TREE

1. Once you have your seedlings, divide your students into pairs, and give each pair a copy of the Student Page  **2, Choose-a-Site**. Tell students the species of the seedling they will be planting. Have them write it at the top of their student page.
2. Ask each pair of students to research the tree species you will be planting. They should find out what type of seeds it drops and whether or not it turns color in the fall. They should look into wildlife considerations. They should research what type of soil the tree grows best in and how much sunlight it needs. In addition, they should find out how tall and wide the tree grows. Finally, the students should draw a picture of what the tree will look like when it matures.
3. After the pairs have had time to work, call the group together to discuss what they found.

ACTIVITY 2: CHOOSE A SITE

1. Take your students on a walk to choose a planting site. Tell your students that trees planted near the street provide shade and help cool the entire neighborhood. Ask your students if they see a spot near a street where they might plant a tree. Explain to your students that shade trees planted near homes or buildings can lower energy costs. Do you see a place near a home or building where we might plant our tree? Do you see a spot that needs more color or more shade?
(Answers will vary depending on your location.)
2. As a group, make a decision as to which spot needs a tree the most. Be sure to remember the specific needs of the species you will be planting:
 - Soil type: Does your tree need the soil to be wet, moist, well-drained, sandy, or rich?
 - Does your tree grow best with full sun, partial shade, or full shade?
 - How tall and wide will your tree grow? Choose a site with enough room for the tree to reach its full height and width.
 - Will it drop messy fruit or nuts? If so, choose a place where this will not cause a problem.

NOTE: If you have a suitable site on your school grounds or at your school forest, consider planting a group of seedlings. A group of seedlings will mimic a rural forest and will bring about different discussion about choosing a site.

**"Come to the woods, for
here is rest. There is no repose
like that of the
green deep woods.
Sleep in forgetfulness of all ill."**

★ John Muir ★

ACTIVITY 3: PLANT A SEEDLING

1. Demonstrate how to use the shovel to turn the soil over. Ask one student to use the shovel to loosen the soil within a couple feet of the planting site. Meanwhile, two other students can help remove the grass and ground cover from the loosened soil.
2. Ask another student to dig a small hole in the center of the loosened soil. The hole should be deep enough so that the roots can hang freely in the hole without being crooked or twisted.
3. Ask for two more volunteers. Have one student hold the seedling in the hole, while the other student fills in the soil around the roots. The seedling should be at the same depth as it grew in the nursery.
4. Another student can pack the soil gently after planting is complete. Ask someone else to water your seedling.
5. Finally, place a stake, flag, or small fence around your tree to mark its location and protect it.

Conclusion

Review with your students what things need to be considered in order to match the right tree with the right planting site. (*Soil type, sunlight, size of the mature tree, amount of water available, what the leaves and flowers look like, whether or not it drops messy fruit or nuts, whether or not it attracts wildlife.*) Have your students list the steps in planting a tree. (*Loosening the soil, digging a hole, placing the tree in the hole, backfilling the soil, and watering the tree.*) Review again with your students what a steward is. (*Someone who takes care of or maintains something.*) Explain that by planting a tree or seedling at home they are all forest stewards.

Extension

- Plan an Arbor Day event for your school and plant your tree on that day. For more resources, visit dnr.wisconsin.gov/education/arborday or www.arborday.org/celebrate/celebration-ideas.cfm.
- Have a city forester or arborist come to discuss with your class where they might plant a tree and what species they might plant.
- Plan a field trip to one of the Wisconsin DNR state nurseries. They are located in Wisconsin Rapids, Hayward, and Boscobel. Contact the local nursery manager to make arrangements. Information can be found on the Wisconsin DNR website at dnr.wisconsin.gov/topic/treeplanting/contact. Show the Wisconsin DNR video *Growing Trees for the Future at Boscobel Nursery* found in the Recommended Resources section (see page 256).

SUMMATIVE ASSESSMENT

Have each of your students make a poster about how to plant a tree or have groups of students make short videos showing how to plant a tree. The poster or video should include a list of materials and step-by-step instructions. The poster or video should also contain at least three points about how to choose the right tree for the right site.

RECOMMENDED RESOURCES

Books and Publications

Wisconsin Department of Natural Resources - Division of Forestry. *Forest Trees of Wisconsin How to Know Them*. Madison, WI: Wisconsin Department of Natural Resources, 2015.

Wisconsin Department of Natural Resources, 2016. *New Tree Planting* [Brochure]. PUB-FR-184 2016. widnr.widen.net/view/pdf/kp0fqvh1yq/New-Tree-Planting-brochure---FR-184.pdf.

Google Resources

Additional resources to support this lesson have been created in Google format. They may be accessed on the LEAF website at: uwsp.edu/wcee/wcee/leaf/leaf-curriculum/k-12-forestry-lesson-guides.

Other

Wisconsin Diggers Hotline
1-800-242-8511
www.diggershotline.com

Videos

Arbor Day Foundation. *Ask an Arborist: How Do I Plant Bare-root Trees?* 23 Nov 2016. www.youtube.com/watch?v=d5FiqoypXfo.

Minnesota Department of Natural Resources. *How to Mulch a Tree*. 11 Apr 2018. www.youtube.com/watch?v=Le05ExdzSIA.

Minnesota Department of Natural Resources. *How to Plant Tree Seedlings*. 23 Apr 2015. www.youtube.com/watch?v=giXfCHT05wk.

Utah State University Extension. *How to Plant Bare Root Trees*. 25 Feb 2015. www.youtube.com/watch?v=U4j0LewYwuQ.

Wisconsin Department of Natural Resources. *Growing Trees for the Future at Boscobel Nursery*. 18 Oct 2022. www.youtube.com/watch?v=Ow6_bylegYk.

Wisconsin Department of Natural Resources. *Planting a Balled and Burlapped Tree*. 27 Apr 2021. www.youtube.com/watch?v=ZijTjoDQid8.

Wisconsin Department of Natural Resources. *Planting a Tree from a Container*. 27 Apr 2021. www.youtube.com/watch?v=FC3uEZALMwY.

Websites

National Arbor Day Foundation, n.d. *Celebrate Arbor Day Celebration Ideas*. www.arborday.org/celebrate/celebration-ideas.cfm.

National Arbor Day Foundation, n.d. *A Tree Can Be*. www.arborday.org/celebrate/sample-program.cfm.

National Arbor Day Foundation, 2024. *Choosing the Right Tree*. www.arborday.org/trees/index-choosing.cfm.

Universities of Wisconsin-Wisconsin Horticulture Division of Extension, 2024. *Selection*. hort.extension.wisc.edu/article-topic/deciduous-selection.

Wisconsin Department of Natural Resources, n.d. *Urban Tree Planting Resources*. dnr.wisconsin.gov/topic/urbanforests/treeplantingresources.

**"Going for a leisurely
walk in the forest
feels like getting a big ol' hug
from Mother Nature."**

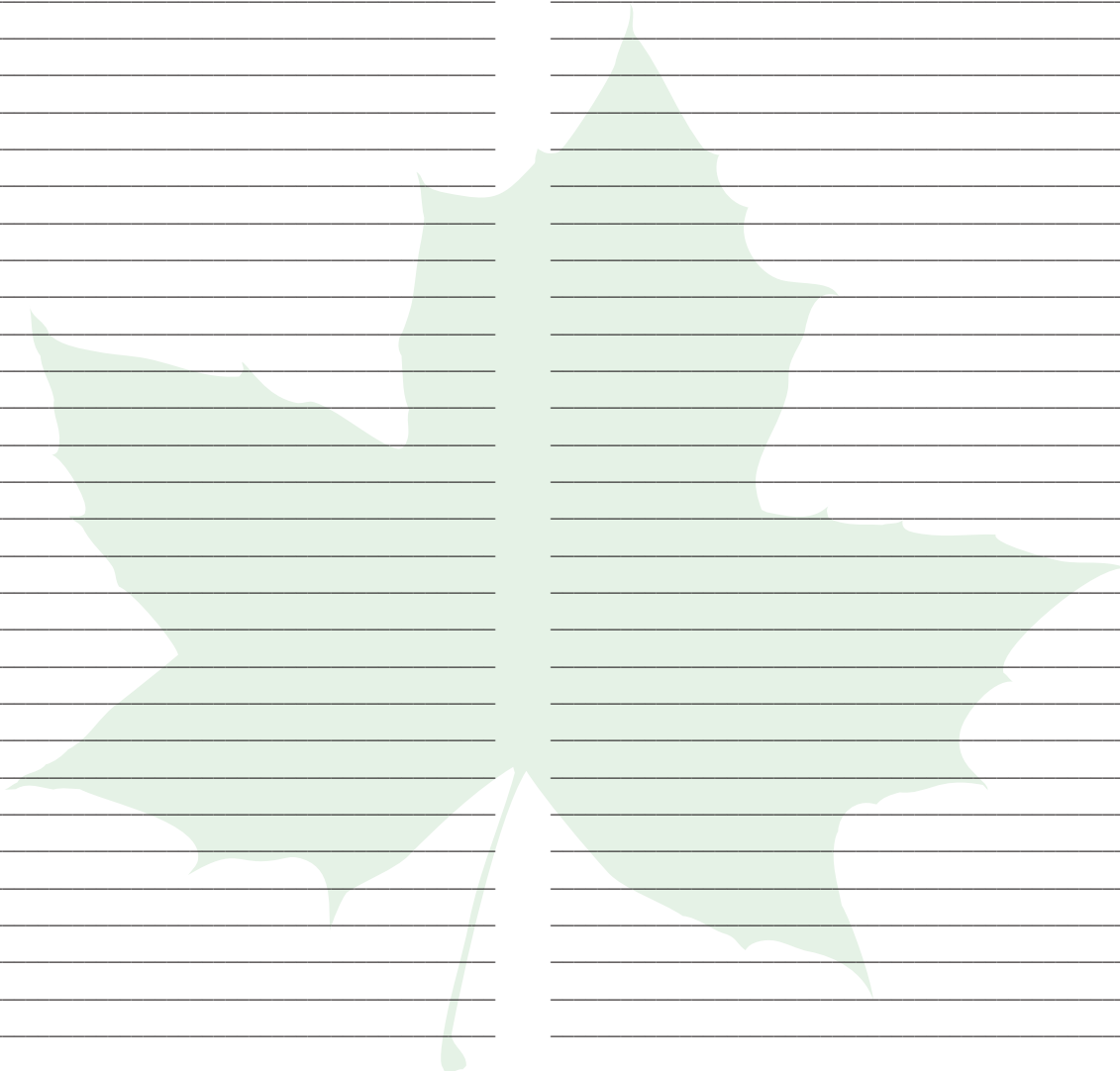
✿ Jamie Erwine ✿

NOTES

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NOTES

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CHOOSE-A-TREE (Option 1)

Think about your site and answer the following questions.

1. How important is it that the tree does not drop messy fruits or nuts?

☐ very important

☐ somewhat important

☐ not important

2. How important is it that the tree displays vibrant color in the fall?

☐ very important

☐ somewhat important

☐ not important

3. How important is it that the tree displays attractive flowers in the spring?

☐ very important

☐ somewhat important

☐ not important

4. How important is it that the tree provides habitat for wildlife?

☐ very important

☐ somewhat important

☐ not important

Keep these things in mind as you choose a tree for your site.

Find a Tree That Can Live In:

Hardiness Zone: _____ Soil Type: _____

Sun Exposure: ☐ Full Sun ☐ Partial Shade ☐ Full Shade

Is there a utility line over the planting site? ☐ Yes ☐ No

If yes, then choose a tree that only grows to be 25 feet or less.

How much space is available for the crown to grow in width? _____

Choose a tree that will have enough room for the crown to reach its full width.

I think the best choice is: _____

I think it is the best choice because:

1. _____

2. _____

3. _____

Draw a picture of the tree you have chosen on the back of this page.

Student Page  1

CHOOSE-A-SITE (Option 2)

We will be planting a _____ seedling.
(List Species)

**Research the species you will be planting. Fill in the following information.
Use this information to find the best site for your seedling.**

This Species Drops: ☐ Fruits
☐ Nuts
☐ Pine Cones
☐ Seeds
☐ Other: _____

The Leaves: ☐ Stay Green All Year
☐ Turn Colors and Drop In the Fall

They Provide Habitat for the Following Wildlife: _____

They Grow Best In:

Soil Type: _____

Sun Exposure: ☐ Full Sun ☐ Partial Shade ☐ Full Shade

They grow to be _____ feet tall and _____ feet wide.

Draw a picture of the tree you have chosen on the back of this page.

Student Page 2