

Tree-Mendous Trees Lesson Plans
Grade 3

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Tree-mendous Trees

Grade: 3 Lesson 1 (Prior to field trip)

by Kelly Ruxer and Brandy Welp

Indiana Standards:

3.3.1 – (Science) Identify the common structures of a plant including its roots, stems, leaves, flowers, fruits and seeds. Describe their functions.

3.6 – (English) Students write using Standard English conventions appropriate to this grade level.

Materials:

- Chart paper
- Book, *Tell Me, Tree: All About Trees for Kids*, by Gail Gibbons.
- Science journals/notebooks

Objectives:

- To understand what parts make up a tree
- To understand what function each part serves

Activity/Procedures:

1. Begin the lesson by having students write in their science journals. Each child will start with a clean sheet of paper and write the date in the top right corner, then on the first line, the question, “What do I know about trees?” Then, skip a line and begin writing everything they know, or think they know, about trees. (At this point I would not be worried about complete sentences. My goal is for them to simply get their ideas on paper.)
2. When they finish, bring the class together to create a KWL chart, based on what they wrote in their journals. Then list on chart paper all of the things kids know about trees, and discuss any misconceptions. Some examples of things they may know are listed below:
 - They provide shade and cool places.
 - They release oxygen into the air.
 - They clean the air by taking in carbon dioxide from the air.
 - Their roots keep dirt from washing away.
 - Fallen leaves and branches and dead trees decompose and enrich the soil.
 - Trees provide homes and food for wildlife and humans.
 - They provide thousands of useful products which we use every day to make our lives better and more enjoyable.
3. Next read, *Tell Me, Tree: All about Trees for Kids*, by Gail Gibbons. This book is an excellent resource to begin a discussion on the parts of a tree.
4. Briefly, give the students time to look back through their journals, update their lists, and add any new questions they may have.

- Now go back to the KWL Chart and add any information necessary to the list of things they know, or start the list of things they want to learn.

Possible questions:

- How do trees make their own food?
 - How do leaves breathe?
 - Do animals and insects help trees, or hurt them?
 - What do humans use trees for?
 - How can you identify trees?
 - How do leaves use water?
 - What happens when air cannot get to a tree?
 - What helps leaves break down and return to the soil?
- After the class adds to the KWL chart, explain that they will be learning the answers to these questions, and many more over the course of the unit.

Closure:

The students will use this information to begin their exploration into the world of trees. Explain that in the next lesson we will jump in “hands-on” to collect tree specimens and learn about their characteristics.

Assessment:

The students will need to turn in their science journals/notebooks. From the notebooks, I will be checking to see that they participated in listing things they knew about trees prior to our discussion and included questions about things they want to learn. They will also be informally assessed on their participation during the KWL chart discussion.

Extension Activity:

If a student finishes early, they can explore the given web sites listed in the children’s resource section. They can also go through the books selected for this unit and begin looking for some of the answers to the questions we formulated on the KWL chart. Then they can record any findings in their Science journal/notebooks.

Teacher Information:

The main goal of this lesson is to use it as a springboard for the entire trees unit. Throughout the investigation they will be collecting tree specimens to put in a class book for further study. They will also participate in the activities planned at Wesselman Woods Nature Preserve where they will learn about:

- Tree Life Cycle & Species
- Tree Structure & Function
- Tree Growth & play a Tree Factory Game

- Tree-mendous Trek & play a Survival Game

Throughout the unit the students will refer back to their science notebook and KWL chart, adding to and making changes as necessary.

Accommodations:

Due to the information being presented in this lesson, most children should be able to participate. If there are students that cannot fully participate in the activity, the teacher can assign a partner for the student in need to help with reading or writing of materials.

****Note**** Teaching and Student Resources can be found at the end of the three lessons provided.

Tree-mendous Trees

Grade: 3

Lesson 2 (Prior to field trip)

by Kelly Ruxer and Brandy Welp

Indiana Standards:

3.3.1-(Science) Identify the common structure of a plant including the roots, stems, leaves, flowers, fruits and seeds. Describe their functions.

3.6 – (English) Students write using Standard English conventions appropriate to this grade level.

3.7.8 – (English) Clarify and enhance oral presentations through the use of appropriate props, including objects, pictures and charts.

Materials:

- Gallon-sized Ziploc bags
- Checklist of tree items (bark rubbing, seeds, twigs, cones, leaves/needles)
- 8 ½ x 11 in. sheets of paper- tag or construction
- Plastic sleeve protector sheets
- Transparent contact paper
- Computer paper
- Brown crayon
- Digital camera, printer and photo paper
- Book, *Trees, Leaves and Bark*, by Diane L. Burns
- Book, *My Favorite Tree*, by Diane Iverson

Objectives:

- To collect and identify different parts of a tree.
- To distinguish the different characteristics of their findings
- To identify the differences between other trees' parts

Activities/Procedures:

****Before this lesson, we would have discussed the different types of leaves (needle, simple and compound) so they would be able to identify them when outside.**

1. You can begin the lesson by reviewing the parts of the tree from the previous lesson. Refer to the KWL chart that was also created add to or make changes as necessary.
2. Have the students create a list of things they think they can collect from a tree in their science journals. As a teacher, you will already have the 4-5 things you are expecting them to collect as listed above in the Materials.

*Depending on your school's campus, you can take the class outside to collect from trees in the schoolyard or a neighboring park. If there are insufficient trees, this might have to be a take-home project for the collection.

3. Tell the students that they are going to explore some trees that are around them every day. The teacher will put the students in groups of 4 or 5 for the hike. Each group will be given a gallon-sized Ziploc bag with a checklist of the items they need to collect. Instruct the students that each member of their group is responsible for collecting one thing from the tree. Make sure to tell each group that they are only collecting from one tree. The teacher will come to the tree that each group chooses and take a picture of the tree with a digital camera. (The photo will be printed out and given to each group to use for the project).

4. The teacher will find the best time to take the students outside for their collecting. Before they embark on this wonderful adventure each student needs to keep in mind the following questions.

****Note**** I would type this list of questions, adding to or taking away as needed. Then I would have the students glue the questions into their science notebooks/journals and refer to them when they are actually collecting the items from the tree. After collecting the items, they need to sit down as a group and answer the questions in their journals.

- Does the tree have flowers or cones?
- If it has flowers, what color, shape, and size are the flowers?
- What shape, size and color are the seeds?
- What is the general shape of the tree?
- Is it wider at the top or bottom?
- Does it have branches all the way down its trunk or only partway down?
- Are the leaves broad and flat?
- Are they simple or compound leaves?
- What shape are the leaves?
- Is the bark rough or smooth?
- What color is the bark?

5. Share the books, *Trees, Leaves, and Bark*, by Diane L. Burns and, *My Favorite Tree*, by Diane Iverson. By using these books, the groups should be able to recognize the parts of their tree and be able to identify their tree's name.

6. Each group will be given an 8 ½ x 11 in. piece of tag paper to display the parts of the tree. Instruct the students to label the tree at the top of their paper. Then they attach all five parts (bark rubbing, seeds, twigs, cones, and leaves/needles) using contact paper with adult assistance and label each part. The teacher will provide a printed off photo of your tree to add to the display. Once each group is finished with their page, they can be slid into a sleeve protector page for extra protection. The group can present their display/findings to the rest of the class.

*As a teacher, you can decide how to display the pages. They can be hung up in the classroom, hallway, or be combined to make a class book that can be added to later.

7. Now that the students have completed their display, they need to use their science journals to reflect on what they have learned through this hands-on activity. Specifically they need to include which tree they studied, details about each tree's characteristics, and predict whether or not they will be able to spot the same tree on the field trip.

Closure: Review the parts that the students discovered on their hike. Remind the students that they will be taking a field trip to Wesselman Woods Nature Preserve and they should be on the look-out for their tree. The groups need to find out if Wesselman's have the same trees as the school does.

Assessment: The students will need to turn in their science journals/notebooks. From the notebooks, they will be assessed on the list of the things they can collect from a tree, the list of questions discussing the characteristics of the tree, and the reflection of what they learned. They will also be assessed on their presentations and group participation.

Extension: The students can research more about their tree or pick another tree that they might be interested in. Have them record their findings in their Science journals. They can also create another page to add to the class display or book.

Accommodations: Each student should be able to succeed with this activity. If there would be specific issues, the students will be in groups selected by the teacher.

Tree-mendous Trees

Grade: 3 Lesson 3 (After field trip)

by Kelly Ruxer and Brandy Welp

Indiana Standards:

3.3.2 – (Science) Investigate plant growth over time, take measurements in SI units, record the data and display the data in graphs. Examine factors that might influence plant growth.

3.6 – (English) Students write using Standard English conventions appropriate to this grade level.

Materials:

Investigation 1: Enlightening Leaves

- Science Inquiry notebooks/journals
- Leafy green plant
- Opaque paper
- 2 large paper clips
- Scissors
- Copy of My Scientist Checklist
(Included Below)

Investigation 2: Thirsty Leaves

- Science Inquiry
notebooks/journals
- 2 quart-size glass Mason jars
- 2 leafy twigs
- Water
- Permanent marker
- Vegetable oil
- Copy of My Scientist Checklist
(Included Below)

Objectives:

To examine factors that might influence plant growth.

To successfully complete an investigation using the Scientific Checklist in their journals.

Activity/Procedures:

This lesson was designed for children to take all of the information they have been learning about trees a step further. Now that they have learned what parts make up a tree, what function each part serves, and how to collect and identify different parts of a tree, the focus is going to shift to factors that might influence plant growth.

For this lesson, the children will be given a choice of two experiments to choose from. Investigation 1 is titled, *Enlightening Leaves*. Investigation 2 is titled, *Thirsty Leaves*.

Each child will choose one of the two topics to perform an investigation, using the *My Scientist Checklist*, listed below as a guide in their Science Notebooks/journals. Regardless of which investigation they choose, the same basic guidelines apply for each. (As a teacher, you can decide how to split the groups if you do not want them to choose themselves).

Before beginning to work on their investigations, each child should get out their Science Notebooks and follow the scientist checklist numbers 1 – 3 below on page 11 of this document. The teacher should help each group come up with the Focus Question for their topic. I am including a sample notebook page of Investigation 1: Enlightening Leaves.

****Side note**** I print a copy of the Scientific Checklist at half scale. Then I laminate them. Each child keeps a copy in the front of their science notebook/journal to use as a guide each time they complete a scientific inquiry. I also staple a Ziplock bag in the front of their journals to use as a sleeve to store the checklist in.

Needs of Plants

Big idea: Plants need certain things to live and grow.

1. **Focus Question:** Does sunlight affect the color of a leaf and how plants make food?
2. **Prediction:** I predict that if plants do not receive the right amount of sunlight then it affects the color of the leaves and the amount of food it produces because sunlight is important to help plants grow.
3. **Planning:** Materials Needed:
 - Leafy green plant
 - Opaque paper
 - 2 large paper clips
 - Scissors

3A. Activity Procedure: (Listed Below)

3B. Observations, Data, Graph:

Plant Leaves	Day 1	Day 2	Day 3	Day 4	Day 5
No Light					
Sun light					

The procedure for each investigation is as follows:

Investigation 1: Enlightening Leaves (This will take five days to complete).

****Note**** This idea came from the Mailbox series book on Plants.

1. Get a leafy green plant, such as an African Violet.
2. Trim the opaque paper to fit over one leaf. Then cut a small, quarter-sized circle in the center of the paper.
3. Now use the 2 large paper clips to attach the paper to the top of the leaf.
4. Set the plant in direct sunlight.
5. Leave the plant with the paper-covered leaf undisturbed for five days.
6. Each student will record daily observations of what happens to the leaf in their science notebooks.
7. At the end of the five days, remove the paper from the leaf and examine the changes.
8. Record these changes in your science notebooks following number 4 on the Scientist Checklist. A sample Science notebook page is listed on the next sheet.

Needs of Plants	
4. Claims and Evidence:	
Claims	Evidence
1. I claim that sunlight affects the color of leaves	1. because the part of the leaf not covered with paper was a darker green color than the covered sections.
2. I also claim that plants won't produce as much food without enough sunlight	2. because the dark green color is the part that absorbs energy from the sun to make food.
5. Conclusion:	
The evidence supported my prediction because the section on the leaf not covered by paper is a darker green color than the covered sections. It is darker green because it received more sunlight. I learned that the dark green color (chlorophyll) absorbs energy from the sun to make food.	

9. Number 5 on the Science Checklist is for the Conclusion. This is where you are supposed to say if your hypothesis was correct or not. Make sure they write about what they learned, NOT what they did.
10. The last section of the Scientist Checklist is to write a reflection.

<p>6. Reflection: (Next Steps/New Questions)</p> <p>I would like to learn more about how other things like water and air affect leaves on plants. I also wonder why certain plants don't grow well in our area. I know our area has plenty of good soil, water and light, so why don't some plants grow well in the area where I live?</p> <p>Based on our experiment, now I wonder what could happen if the entire leaf or an entire branch were covered.</p>

Investigation 2: Thirsty Leaves (This will take five days to complete).

****Note**** This idea came from the book called, *Trees, Investigate the Fascinating World of Trees, Twigs, and Leaves*.

Before beginning to work on their investigations, each child should get out their Science Notebooks and follow the scientist checklist numbers 1 – 3.

****A sample layout was provided for Investigation 1. You can use that as a guide for Investigation 2 when journaling.**

1. Find two twigs with leaves on them. Put each one in a separate quart-sized Mason jar.
2. Remove the leaves from one of them.
3. Add exactly the same amount of water to both jars and mark the level with a permanent marker.
4. Very carefully, pour a layer of oil onto the water to keep it from evaporating.
5. Leave the plants in the jars undisturbed for five days.
6. Each student will record daily observations in their science notebooks of what happens to the water level in the jars each day.
7. At the end of the five days, compare the water levels in each jar. Record your findings in your Science notebooks, and be sure to finish the Scientist Checklist.

Closure:

As a closing activity, each group will present their investigations to the rest of the class. They will share each part of the process orally and include a reflection on new steps and new questions they may have based on the investigation.

Assessment:

The students will be assessed on their completed investigation in their Science journals. From their journals, I will be checking to see if they correctly filled out each part involved on the Scientific Checklist. They will also be assessed on their participation with the group throughout the investigation and their oral presentation.

Extension:

If a student finishes early, they can explore the given web sites listed in the children's resource section. They can also go through the books selected for this unit and begin looking for some of the answers to the questions we formulated on the KWL chart. Then they can record any findings in their Science journal/notebooks.

Accommodations:

The students will be placed in groups for this lesson. If a particular student needs extra assistance, the teacher can use their own judgment on the accommodations.

My Scientist Checklist

1. Write a **Focus Question**.
2. Write a **Hypothesis/Prediction**.

"I think _____ will happen because _____."

Or, "If _____ then _____ will happen because _____."

3. **Planning** and Organizing data to record **Observations**.
(descriptive narrative, labeled drawing, chart, graph, graphic organizer)

4. Make a claim based on **Evidence**.
(Write 3 statements in your own words.)

Be thinking: What was my evidence?

Why does the evidence support my claim?

"I claim that when _____, then _____."

"I know this because I observed _____."

5. Write a **Conclusion**.

"The evidence supported/did not support my hypothesis because _____."

How was your hypothesis supported by the evidence, or how would you revise/change your thinking based upon your findings?

"I learned _____."

Or "In conclusion _____."

6. Write a **Reflection**.

"I would like to learn more about _____."

"I was surprised when _____."

"This reminds me of _____."

"Now I wonder _____."

Tree-mendous Trees Vocabulary List

bark- the protective outside covering of a woody stem or root

blossom- the flower of the tree, especially of one that produces edible fruit.

branch- a secondary woody stem coming from the trunk of the tree.

broadleaved- bearing broad, flat leaves

bud- the part of a plant that will grow into a new stem, leaf or flower.

cambium- is made from clusters of cells that produce new layers of bark each year. These layers are called rings. Starting with the heartwood, we count the dark rings to tell the age of the tree.

canopy- high-level foliage in a forest, formed by the crowns of the trees

chlorophyll- the green substance found in leaves and needles that capture the sun's energy

compound leaf- a leaf composed of two or more separate leaflets

cone- the part of a conifer that bears pollen or seeds

crown- the rounded, top part of broadleaved tree

fruit- the part of a plant that contains and disperses seeds

girth- the circumference or distance around a tree's trunk

heartwood- acts as our spine does. It gives strength to a tree and helps it to stand straight.

inner bark- (phloem) brings the food that is produced in the leaves to the rest of the tree, where it is used for growth or is stored

leaf- a green, usually flat, blade attached to a tree. Leaves make food for the tree by photosynthesis.

needles- the long, narrow, stiff leaves of coniferous trees

nut- a dry fruit containing one seed encased in a woody wall.

outer bark- is like your skin. It protects the tree from outside damage.

photosynthesis- is the process of channeling energy from the sun by means of chlorophyll and converting the carbon dioxide in the air to produce nutrients for the tree and oxygen that is released in the atmosphere.

roots- the network below the ground that anchors the tree in the soil. Root hairs push their way through the soil and absorb moisture and minerals in the soil.

seedling- the young plant that develops from a seed

sap- a liquid that flows through trees, carrying nutrients

sapling- a young tree that is about 6 feet tall with a trunk that is 1-2 inches thick

sapwood- (Xylem) is the highway that carries minerals and water to all parts of the tree. The chemicals in the sap are what determine the color that leaves turn in the fall.

seed- a part of a plant in which there is an undeveloped plant along with the food that it will use when it begins to grow

simple leaf- a leaf that is not divided into leaflets

toothed leaf- a leaf with sharp indentations along its edges

trunk- the woody stem of a tree.

Teaching Resources:

<http://www.talkabouttrees.org/plans.html> This is where we got some of the ideas for questions about what the kids should know.

Brennan, Jan and Mary Sanford. *Plants: Curriculum-Based Hands-On Activities*. The Education Center, Inc. (2000). Pages 12 – 19, 32 – 39.

This is an excellent resource from, *The Mailbox*, about investigating science. They list practical and fun units, experiments, demonstrations, games, art and writing activities and include reproducibles. Using ideas from these books will easily get student's attention. As listed on the back cover each unit prepares you with:

- Step-by-step instructions
- Easy-to-implement experiments and demonstrations
- Clearly defined objectives and skills
- Background information for the teachers
- Engaging reproducibles
- Valuable resource booklist

Gibbons, Gail. , *Tell Me, Tree: All About Trees for Kids*. Little, Brown and Company (2002).

This is a nonfiction book explaining the live cycle of a tree. The pictures are drawings rather than real pictures, but it is still a wonderful book to use to introduce a unit on trees. The information is worded on children's level, to let them easily understand the material being presented.

Pascoe, Elaine. *Nature Close-Up: Leaves and Trees*. Blackbirch Press, Inc. (2001).

This is an excellent book for investigating trees and leaves. This book explains the parts of a tree, how to collect leaves and describes growing trees. The third part of this book lists investigations that children can do to deepen their understanding of trees and leaves.

Stout, Charlene. *Hands-on Science: Plants: Experiments, Games, and Writing Activities*. Gr. 2 – 6. Edupress, Inc. (2003).

This resource is full of activities that can be used for studying plants.

Tekiela, Stan. *Trees of Indiana: Field Guide*. Adventure Publications, Inc. (2006).

The field guide is a great resource to use. It has wonderful close-up pictures of the leaves, bark, fruit, and flowers. This book would be a great resource tool for the kids, but they would probably need help to look up the tree they were looking for.

Watts, May. *Tree Finder: A Manual for the Identification of Trees by Their Leaves*. Nature Study Guild. (1963, 1991).

This is another great resource for identifying trees. I would say that it is definitely a resource that an adult would have to help the students with.

Student Resources:

<http://www.realtrees4kids.org/threefive.htm>

<http://www.arboday.org/trees/whatTree/>

Books to use with Children: (Many of these books are available at the Central Library in Evansville).

Arlon, Penelope. *Discovery Kids – Eye know: Tree*. DK Publishing Inc. (2006).

Eye Know books are unique in that each page has a place to flip out or unfold to discover interesting facts. This book also has detailed photographs to aid in understanding how trees look in different stages of its life. Children could easily read this book, and enjoy discovering many new facts at the same time.

Burns, Diane. *Young Naturalist Field Guides: Trees, Leaves, and Bark*. Garth Stevens Pub.(1998).

Trees, Leaves, and Bark is an excellent book to use with children when trying to identify trees. It explains that to identify a tree you can focus on the shape of the tree, height, leaves, bark and seeds. Each page focuses on one tree, and gives tips to find the tree, talks of the lifespan and uses for that type of tree, describes the leaves, bark and seeds for each one. The last couple of pages of the book explain how to grow your own tree, beginning with a closed pine cone.

Dorros, Arthur. *A Tree is Growing*. Scholastic Press. (1997).

A Tree is Growing, has simple text that follows an oak tree through the seasons. It introduces the roles of each part of the tree, how they provide food and shelter for other plants and animals, and how it needs sun, air, soil, and water to survive.

Gamlin, Linda. *Eyewitness Explorers: Trees: Investigate the fascinating world of trees, twigs, and leaves*. Dorling Kindersley, Inc. (1993).

This book is full of factual information and ideas of things for the kids to try, which will help them understand more about trees' life cycles. Some of the observations include showing how leafy twigs suck up water, exploring a way to watch leaves breathe, how to open a pinecone to get seeds out, and many more.

Gibbons, Gail. , *Tell Me, Tree: All About Trees for Kids*. Little, Brown and Company (2002).

This is a nonfiction book explaining the live cycle of a tree. The pictures are drawings rather than real pictures, but it is still a wonderful book to use to introduce a unit on trees. The information is worded on children's level, to let them easily understand the material being presented.

Hickman, Pamela. *Starting with Nature: Tree Book*. Kids Can Press. (1995).

This would be a good book to use as a reference. It has a table of contents that clearly states what topics it covers. Children could easily turn to the page they needed to reference.

Ingoglia, Gina. *The Tree Book: For Kids and Their Grown-ups*. Brooklyn Botanic Garden. (2008).

This is a wonderful resource book. It has a table of contents to reference general information about trees. Then it lists specific trees with drawings and information. It also has a kid-friendly glossary in the back of the book.

Iverson, Diane. *My Favorite Tree: Terrific Trees of North America*. Dawn Publications. (1999).

My Favorite Tree, is a book that is meant to be both educational and inspirational. On one page it gives a short sentence about a favorite tree from a child's perspective. Then on the opposite page it lists tree traits, wild animals that live in them, other facts and even shows a map of where that particular type of tree can grow in North America. This is not a book I would read cover to cover, rather I would use it as a reference if a student wanted to learn more about a certain tree.

Kalman, Bobbie. *The Life Cycle of a Tree*. Crabtree Publishing Company. (2002).

The Life Cycle of a Tree, is a nonfiction resource to use. It has a table of contents that can easily guide you to the specific section you want to learn about. It explains what trees are where they grow. Then it goes through and describes the life cycle of a tree.

Lauber, Patricia. *Be a Friend to Trees*. Harper Collins Publishers. (1994).

This is a Read-and-find-out science book for children. It is a stage 2 book, which means it explores more challenging concepts at the primary level. It also includes hands-on activities that children can do themselves. Specifically, this book explains the different ways we depend on trees and what we can do to protect them.

Markle, Sandra. *Outside and Inside Trees*. Bradbury Press. (1993).

Outside and Inside Trees, examines trees from the inside out. There are wonderful close-up pictures of each part of the tree. Readers are encouraged to see trees in many new ways. This book is a great way to begin an exploration of nature.

Pascoe, Elaine. *Nature Close-Up: Leaves and Trees*. Blackbirch Press, Inc. (2001).

This is an excellent book for investigating trees and leaves. This book explains the parts of a tree, how to collect leaves and describes growing trees. The third part of this book lists investigations that children can do to deepen their understanding of trees and leaves.

Pfeffer, Wendy. *A Log's Life*. Aladdin Paperbacks. (1997).

This story introduces readers to the life cycle of a tree. It has entertaining text and three-dimensional paper sculptures that explain the forest ecosystem. Hopefully it inspires readers to take a closer look at trees and logs in their own back yards. At the end of this book there is also a page full of discussion questions and activities for Language Arts, Art, Music, Science, and Social Studies.