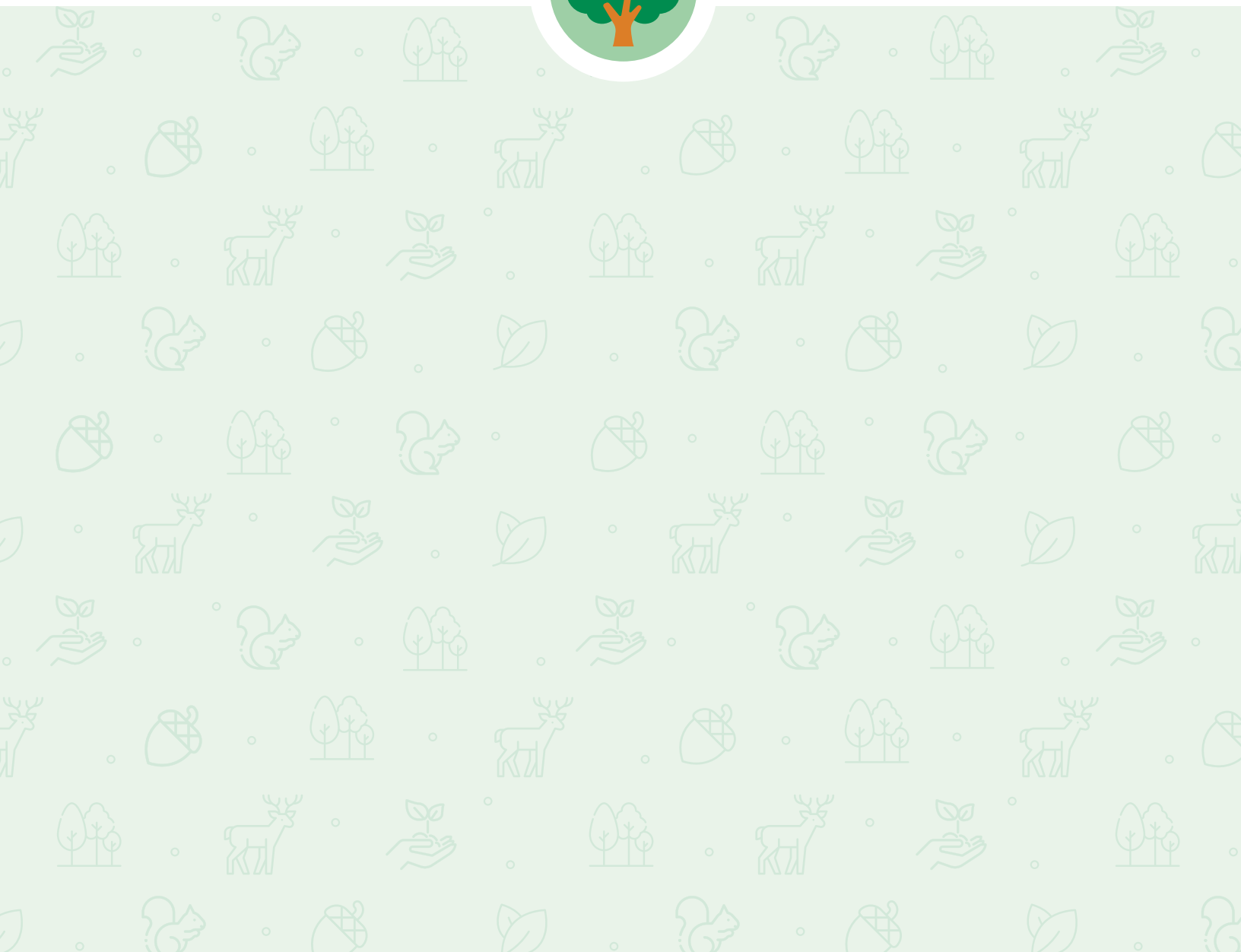


Tree ID and Anatomy





Tree ID and Anatomy

Introduction

Trees are amazing plants. Tall and woody, they can live for hundreds—sometimes thousands—of years. Part of that is due to their unique way of growing and the ability to make new parts if they lose some. Trees also make use of their internal, dead framework which supports their large size, allowing them to grow big without using too much energy. Because each tree species has its own way of growing and thriving, there is great variation in species, and trees look different from each other.

Tree ID focuses on all the things that make a tree a tree, including its parts and their purposes and the characteristics that help trees survive in particular environments. Tree Trekkers can learn how to identify which trees live around them, which will help them to better understand their own environment and how to care for the planet.

Questions to guide explorations and experiments

 What makes trees different from other plants?

 Are all trees the same?

 How do a tree's parts help it live and grow?

 Why are trees important?

 Why is it important to identify trees?

 How can we help others learn more about trees?



Helpful “tree-sources” for this topic



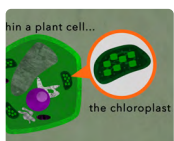
Tree Biology from Oregon Forest Resources Institute

Takes a look inside of a tree and the parts that help it grow
learnforests.org/all-resources/forest-fact-break-tree-biology



Nature Neighborhood: Trees to Meet You from North Carolina Museum of Natural Science

Points out characteristics of a tree that can help in identifying it
youtu.be/ygOEdkXxBsE



Photosynthesis video from PBS Learning Media

pbslearningmedia.org/resource/2bdaf922-572b-4f5c-a801-1eb2fb31b101/photosynthesis-uncvtv-science



Guess that Tree from SciShow for Kids

Emphasizes journaling to help identify evergreen trees
youtu.be/qFVh2fTR2XA

Children's Books

FICTION

- *Be a Tree* by Maria Gianferrari (ages 4-8)
- *Beatrice Was a Tree* by Joyce Hesselberth (ages 4-8)
- *The Cottonwood Sings* by Alfreda Beartrack-Algeo (ages 4-8)
- *If I Were a Tree* by Andrea Zimmerman (ages 4-8)
- *Looking for Peppermint, or, Life in the Forest* by Maxwell Eaton (ages 4-8)
- *The Nature Journal: A Backyard Adventure* by Savannah Allen (ages 4-8)
- *Only a Tree Knows How to Be a Tree* by Mary Murphy (ages 3-7)
- *There Was A Tree* by Rachel Isadora (ages 3-7)
- *The Tree That Bear Climbed / El árbol que trepó el oso* by Marianne Berkes (ages 4-8)
- *Trees* by Tony Johnston (ages 3-6)
- *Under My Tree* by Muriel Tallandier (ages 4-8)
- *What Do You See When You Look at a Tree?* by Emma Carlisle (ages 3-7)
- *Winter Trees* by Carole Gerber (ages 4-8)



Tree ID and Anatomy

POETRY

- *Sometimes I Feel Like an Oak* by Danielle Daniel (ages 3-6)
- *Trees* by Verlie Hutchens (ages 4-8)

NONFICTION

- *The Book of Amazing Trees*
by Nathalie Tordjman (ages 8-12)
- *I Can Name 50 Trees Today!*
by Bonnie Worth (ages 4-8)
- *I See Leaves* by Tim Mayerling (ages 4-6)
- *I See Trees* by Tim Mayerling (ages 4-6)
- *A Kid's Guide to Backyard Trees*
by Felicia Brower (ages 7-10)
- *The Magic and Mystery of Trees*
by Jen Green (ages 5-10)
- *Science Comics: Trees: Kings of the Forest*
by Andy Hirsch (ages 9-12)
- *Tell Me, Tree: All About Trees for Kids*
by Gail Gibbons (ages 4-8)
- *The Tree Book for Kids and Their
Grown-Ups* by Gina Ingoglia (ages 6-10)
- *Trees* by Lisa Jane Gillespie (ages 4-7)
- *Trees* by Robin Twiddy (ages 4-8)
- *Trees, Leaves & Bark*
by Diane Burns (ages 4-8)



Parts of a Tree

Introduction

Each part of a tree has a purpose. The **roots** anchor the tree and gather **nutrients** and water. The **trunk** supports the weight of the **boughs** and brings water to **branches, twigs**, and **leaves**. The **leaves** use sunlight to help make food for the tree.

Keeping a Tree Trekker Journal is a great way to get your Tree Trekkers outdoors to explore and keep track of what they're learning about trees. It's a place where they can note not only their observations, but things that might surprise them—such as most of a tree's trunk is dead tissue, but still supports the weight of the tree **crown**!

Get Tree Trekkers started on their journals with information that will help them identify trees and provide them with some of the words they'll need to record their observations. As they learn more about the parts of a tree, kids can develop an appreciation for the ways trees grow and thrive, make connections to how the existence of trees is vital to other living organisms, and record their responses to and reflections about the natural world.

Supplies

- Blank spiral notebooks or sketchbooks (or fold 10 sheets of paper in half and staple along the fold to create booklets)
- Copies of Tree Trekker Journal cover (optional)—find the printable on page 18
- Writing tools
- Drawing materials
- Copies of the Tree Parts Scavenger Hunt handout—see page 19

Get kids thinking

Trees are such a familiar part of our world that when you pass them by, you probably don't think too much about them or look carefully to notice the differences in trees. As with other living things, there is **biodiversity** among trees. There is wide variety in the size, shape, color, and **habitat** of trees. But trees basically all have parts that function in the same way.



Parts of a Tree

Ask: What makes a tree a tree? What characteristics do trees share? How would you describe a tree? Make a list together so that everyone can see and agree on what all trees have in common (trunk, roots, branches, leaves). While looking over the list, ask kids to think about other plants and consider how trees are different from other plants and what is unique about trees (one erect woody stem or trunk).

Let's get started!

Start with a book! Share features of trees from nonfiction titles such as *The Magic and Mystery of Trees* by Jen Green, *The Book of Amazing Trees* by Nathalie Tordjman, or *Tell Me, Tree: All About Trees for Kids* by Gail Gibbons. Talk about the characteristics all trees share and the similarities and differences among trees.

Give kids time to look at the parts of a tree in detail from one of the books or from the Tree Parts diagram on page 16. As you go over the parts, talk about the purpose and function of each:

Tree Parts



Roots and root hairs: tree root systems absorb water and other nutrients from the soil, store food for the tree, and anchor the tree in the ground. The types of roots a tree has and how they grow depend on the species of tree and what else is in the ground.



Root collar: where the below-ground roots meet the above-ground trunk. This part of the tree is important for the stability of the tree.



Trunk: provides support and carries water and nutrients to the leaves and branches and brings food down from the leaves to the roots.



Bark: covers the trunk (and branches) and protects the tree from weather, disease, and injury. Beneath the outer bark, inner layers include the **vascular cambium** which makes new **phloem** and **xylem** cells every year. Phloem moves food in any direction up or down—from leaves up to a fruit or from a leaf down to the roots. **Sapwood** is functioning xylem that moves water, while **heartwood** is xylem that is no longer moving water.



Branches and twigs: branches, which are connected to the trunk, enable the tree to spread out its leaves to get as much sunlight as possible. Twigs, which grow from branches, provide support for leaves, leaf buds, and flower buds.



Parts of a Tree



Buds: store energy and contain new leaves and flowers for next year's growth.



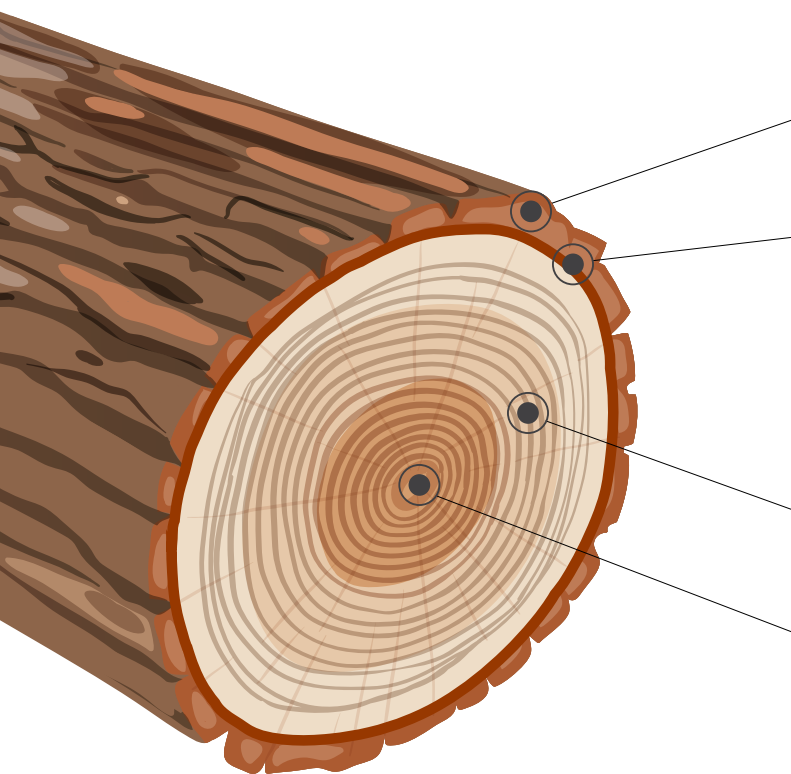
Flowers and fruits: flowers are part of a tree's reproductive system and produce the seeds that can be used to produce new plants. Fruits are the mature and ripened ovaries of flowers and the seed-bearing structures.



Crown: contains the tree's leaves and branches. The crown is where **photosynthesis** takes place. It also filters dust from the air and protects the soil below from erosion from rainfall.



Leaves: make food for the tree and oxygen for the planet using **photosynthesis**. A leaf has two parts: the flat part crossed with **veins** is the **blade** (or **lamina**); the part that holds the blade to the twig is the **leafstalk** (or **petiole**). **Simple leaves** have an undivided blade, while **compound leaves** have blades divided into **leaflets** attached along the **main vein** or **midrib**. Leaves are shaped and arranged differently depending on whether the tree is **deciduous** or **coniferous**.



Inside the Tree

Phloem: the inner bark that transports food from the leaves to the rest of the tree.

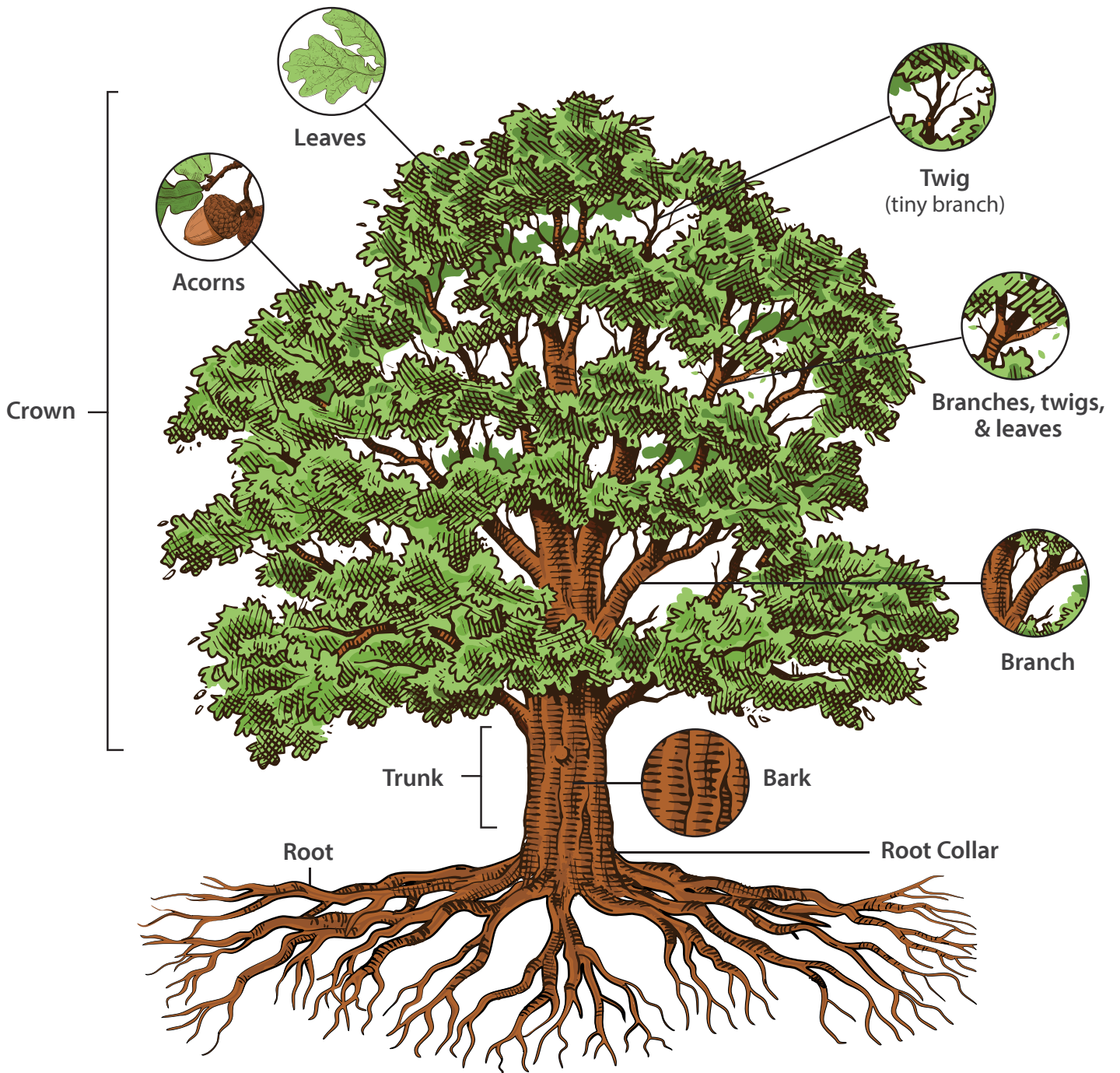
Cambium: where cells grow outward to produce new phloem and inward to produce new wood, or xylem. The ages of some tree species can be determined by counting growth rings the layer of wood formed during one growing season.

Sapwood: dead xylem that transports water upward from the roots.

Heartwood: xylem that no longer transports water. It is resistant to decay, very strong, and helps support the tree's weight.



Diagram: Tree Parts





Parts of a Tree

Next, try another book such as *Looking for Peppermint*, or, *Life in the Forest* by Maxwell Eaton or *The Nature Journal: A Backyard Adventure* by Savannah Allen. Explain how journaling gave characters in these books their own opportunity to use drawing and writing together to show their observations, document their discoveries, pose questions, note their ideas, and learn to see and hear more. Talk about how all the different books you've shared use images and writing together to share observations, facts, ideas, and more about trees, forests, and nature.



Ask: What is a journal? Have you ever kept a journal? Who else might keep a journal? Why?

Talk about how scientists and naturalists keep field notes and journals of their observations and experiments. Writers keep journals of their observations and feelings about people and places. As Tree Trekkers, how do they think they could use a journal?

Pass out blank notebooks or staple folded sheets of paper with the Tree Trekker Journal cover (page 18) to make a booklet and make writing and drawing materials available. Let kids know that their journals can look however they want them to look!

Ask kids to draw a picture of a tree from memory in their journal. As kids sketch, help them understand that they don't ever have to draw beautiful "perfect" pictures—their journal's best use is to document their observations and draw what they think is important to remember.

After they've finished sketching, let kids pair up and compare their tree pictures. Have pairs share what the trees in their drawings have in common and what's different. Then, as a group, have kids explain those similarities and differences to you. Use the details they share to draw your own tree on poster board or a whiteboard. With their input, label your tree's key parts. Then have kids do the same for the tree they drew in their journal or draw another tree and label it.



BRANCH OUT!

With their new understanding of the parts of a tree, provide kids with the Tree Part Scavenger Hunt handout (on page 19) and **Branch Out!** to search outside for tree parts.

Date:

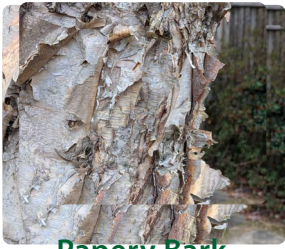
Tree Trekker Journal



FOLD ALONG DOTTED LINE

Tree Parts Scavenger Hunt

Time for an adventure! Look for the following tree parts and draw what you find.



Papery Bark



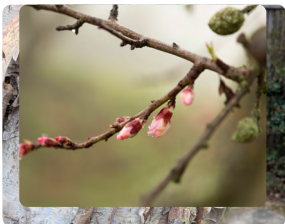
Rounded Crown



Toothed Leaf



Fruit



Buds



Smooth Bark



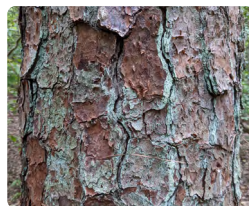
Lobed Leaf



Needle Leaves



Conical Crown



Scaly Bark



Field Guide Fun

Introduction

Knowing the names of the trees around them can be a powerful way for kids to build a connection to a place. Trying to identify trees makes us stop and take a closer look at the parts of a tree and their characteristics. Take Tree Trekkers outside to explore trees closely, then have them use their observations to create a product to share what they've learned—a field guide to the trees of your community.

Supplies

- Tree Trekker Journals (or notebooks)
- Field guides
- Writing tools and drawing materials
- Copies of the Field Guide template (page 23)

Get kids thinking

Ask kids: What different types of trees do they know? How did they learn the names of different trees? When we know the parts of a tree and the different characteristics they can have, what can we do with that information?

Let's get started!

Start with a book! Talk with kids about **field guides**—books that help identify things in nature, such as birds, insects, rocks, and trees! Talk about how field guides help everyone better understand how the world works and why the ability to identify and recognize species is important to the health of our ecosystems. To help them develop an understanding of what field guides are, how they are organized, and what they might find in an entry, have a variety of field guides for kids to look at (find them at the library or try online guides).



FIELD GUIDES TO TREES

- *A Kid's Guide to Backyard Trees* by Felicia Brower
- *National Audubon Society First Field Guide: Trees* by Brian Cassie
- *National Geographic Kids Ultimate Explorer Field Guide: Trees* by Patricia Daniels
- *National Geographic Field Guide to the Trees of North America* by Keith Rushforth
- *National Wildlife Federation Field Guide to Trees of North America* by Bruce Kershner
- *Peterson First Guide to Trees* by George A. Petrides
- *The Sibley Guide to Trees* by David Sibley

DIGITAL GUIDES TO TREES

- Arbor Day Foundation (arborday.org/tree-identification)
- Leaf Snap (leafsnap.app)
- Seek by iNaturalist (inaturalist.org/pages/seek_app)
- vTree (dendro.cnre.vt.edu/dendrology/vtree.htm)



Ask kids: What is the purpose of a field guide? What would you expect to find in a field guide? How could you use the information in a field guide to identify particular trees? Show kids how to find common local trees in a field guide, reading through an entry together, connecting their knowledge of the parts of a tree to the identifying characteristics noted in the entry (crown shape, leaves, bark, twigs, cones, fruit). Then, have everyone head outdoors with Tree Trekker Journals and pencils in hand to look at trees.

When outdoors, have kids explore trees and record their observations, specifically looking for **crown** shape, **leaf** types, **bark** texture, **cones**, and **fruit**. Let kids know that writing and drawing about what they see and hear in their Tree Trekker Journal will help them observe more carefully. Encourage drawings and notes about the trees and tree parts they discover, making leaf and bark rubbings as part of their tree observations.



Field Guide Fun



Next, have kids use a field guide to trees to do some reading and research to clearly identify and learn more about the trees they observed. Talk with them about how to compile their observations and research into their very own field guide to trees. Kids can each make their own guides about the trees in their community or collaborate, with each Tree Trekker working on an entry for a different tree or trees that are added to a group-authored guide. Provide kids with copies of the Tree Field Guide template (on page 23) as needed where they can add descriptions and illustrations of their trees and the identifying characteristics.

Keep in mind that kids could add new entries as they further explore outdoors and revise and edit their field guides as they learn more. Whenever they consider their guides complete, have kids add page numbers and an index to help readers use the guide. Consider having them put their guide or guides into action by sharing them with a local nature center or library.

Name of Tree:

What it looks like

Leaves

.....
Notes:

Bark

.....
Notes:

.....
Notes:

Where it lives (habitat)

Interesting fact