



FORESTS
ONTARIO

Forest
Recovery
Canada

2023

National Forest Week

Forest Fun Booklet

Table of Contents

3	Parts of a Tree
4-5	Discover Your Forest: True Colours
6	LEAFO Bingo
7	Maze: Plant Your Tree!
8-9	Discover Your Forest: Build a Bark Quilt
10	Forest Fun Word Search
11	Scavenger Hunt

PARTS OF A TREE



CROWN

The crown of a tree is composed of branches, twigs, and leaves. The branches and twigs hold the leaves up allowing them to receive sunlight which is vital to food production. In addition, branches and twigs also support the flowers and fruit of a tree.



FLOWERS

Tree flowers produce fruit, which encase seeds. Within each seed lies the beginning of a new tree. Tree seeds are dispersed by wind, wildlife, and water.



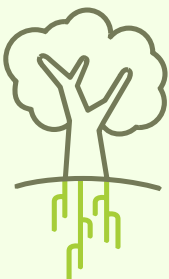
TRUNK

The trunk is the main stem of a tree and has two primary functions: to support the crown of branches, twigs, and leaves and to transport food and water throughout the tree. Cutting through the outer bark would expose many different layers. The outer bark of a trunk protects the inside of a tree from injury as well as acts as an insulator against cold and heat. The phloem is soft and serves to distribute the food produced in leaves to every living cell in a tree. The xylem or sapwood distributes water up the trunk to the leaves, where food is manufactured. The cambium is the thin growing layer found between the xylem and the phloem. The heartwood is the accumulation of older wood which no longer carries sap.



LEAVES

Leaves manufacture the food for trees. Food is produced through the process of photosynthesis, which means “putting together with light”. Powered by sunlight, the green substance in leaves called chlorophyll uses carbon dioxide and water to produce carbohydrates. Also through the process oxygen is released through tiny pores called stomata and water is released through the process of transpiration. In a way trees act like giant air conditioners, cooling the air with water vapour and expelling oxygen, which we need to breathe. Leaves come in many different shapes and sizes and are attached to the twig in different patterns. For example, some leaves like the maples, are attached opposite one another. Others, like the oak, are arranged alternately on the twig. Observing shapes and arrangement of leaves is helpful in identifying trees.



ROOTS

Roots are the network found underground that helps to anchor the tree. In addition, roots help in absorbing water and nutrients from the soil which the trees use to manufacture food and grow. Usually roots extend as far underground as the crown of the tree spreads overhead.

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DISCOVER YOUR FOREST TRUE COLOURS

GOAL: Learn about plant pigments and discover what causes fall colours.

BACKGROUND:

Chlorophyll is a green pigment in most plants, primarily responsible for photosynthesis, the process that plants use to create their own food using sunlight, carbon dioxide, and water. This pigment is responsible for the lush green colour of our forests.

Chlorophyll isn't the only pigment in leaves, however! All plants have invisible secondary pigments that serve vital functions in the leaf and shine through in the autumn. Chlorophyll disappears when deciduous trees such as oaks, maples, and even tamaracks, experience shorter days and cooler temperatures as seasons change. As the leaves receive less sunlight, chlorophyll levels drop, but the other pigments remain. The leaves appear to be a different colour, even though the pigments were there the whole time!

There are two categories of secondary pigments. Carotenoids appear as yellow to orange. They are the same pigments responsible for the colour of carrots. Anthocyanins appear as red to blue and play a silent role throughout the year as protectors from UV light.

The following experiment works because the pigments in the leaves can dissolve in alcohol. The molecules of different pigments are different sizes, which allow the smaller ones (including most carotenoids and some anthocyanins) to travel through the filter paper faster than the larger ones, such as chlorophyll. As molecules of the same size move at the same speed, coloured bands will form on the filter paper as the liquid is dispersed and then dries. This separation of pigments through the filter paper is called chromatography.

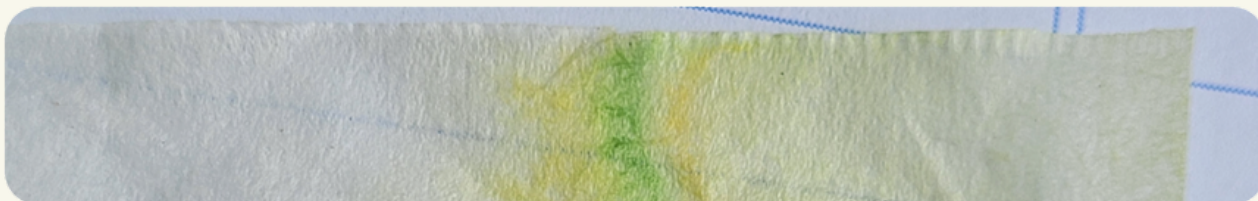
MATERIALS:

- A glass jar
- Rubbing alcohol
- Coffee filter
- Green leaves
- Pencil
- Tape
- Scissors
- Mortar & pestle (or a spoon and a bowl)
- Clean paper



ACTIVITY:

1. Collect a single green leaf each from outside.
2. Tear the leave into small pieces and mash into a pulp using the mortar and pestle.
3. Put the leaf mash into a jar and add just enough rubbing alcohol to cover. Let stand for 5 minutes.
4. While the leaf mash stands, cut a piece of coffee filter paper that will touch the bottom, without bunching, while taped to a pencil, about 2.5 cm x 10 cm.
5. After 5 minutes, balance the pencil atop the jar and lower the filter paper into the jar. It should only just touch the bottom – if too long, remove and cut.
6. When liquid has moved halfway up the filter paper, remove it from the jar and lay it on a fresh sheet of paper to dry.
7. Observe the bands of colour that appear after the filter paper has dried.



EXTENSION:

Collect and test the leaves of different tree species. What are the differences between species?

Save your filter paper and wait until the leaves of your chosen tree change. Compare the colour of the changed leaves to the bands on the filter paper. Did the experiment predict what colour the leaves would turn?

Preform the True Colours experiment with leaves that have already changed colour. Are there any differences in the resulting filter paper? Why or why not?

LEAFO Bingo

With more than 80 native tree species growing in Ontario it is no surprise that tree leaves come in a wide variety of shapes, sizes, and arrangements. Each species of tree has its own unique set of leaves with characteristics that distinguishes it from the rest. By learning common leaf characteristics, you can improve your tree identification skills!

Next time you are heading out for a walk, print out a copy and see how many you can find. Can you complete a single line, just the borders, fill the whole card or even make an X? Many leaves will display more than one of the listed characteristics, challenge yourself to find a unique leaf for each box. Remember to leave living leaves on their trees. Good luck!

 Alternate leaves	 Asymmetrical Base	 Coniferous	 Cordate (Heart Shaped)	 Curved/Twisted Needles
 Deciduous	 Deltoid (Triangle Shaped)	 Double Compound	 Lobed	 Narrow
 Needles	 Palmately Compound	Free Space!	 Opposite Leaves	 Oval
 Not Lobed	 Pinnately Compound	 Oak	 Rough Edges	 Scales
 Smooth Edges	 Maple	 Symmetrical Base	 Wedge	 White Pine

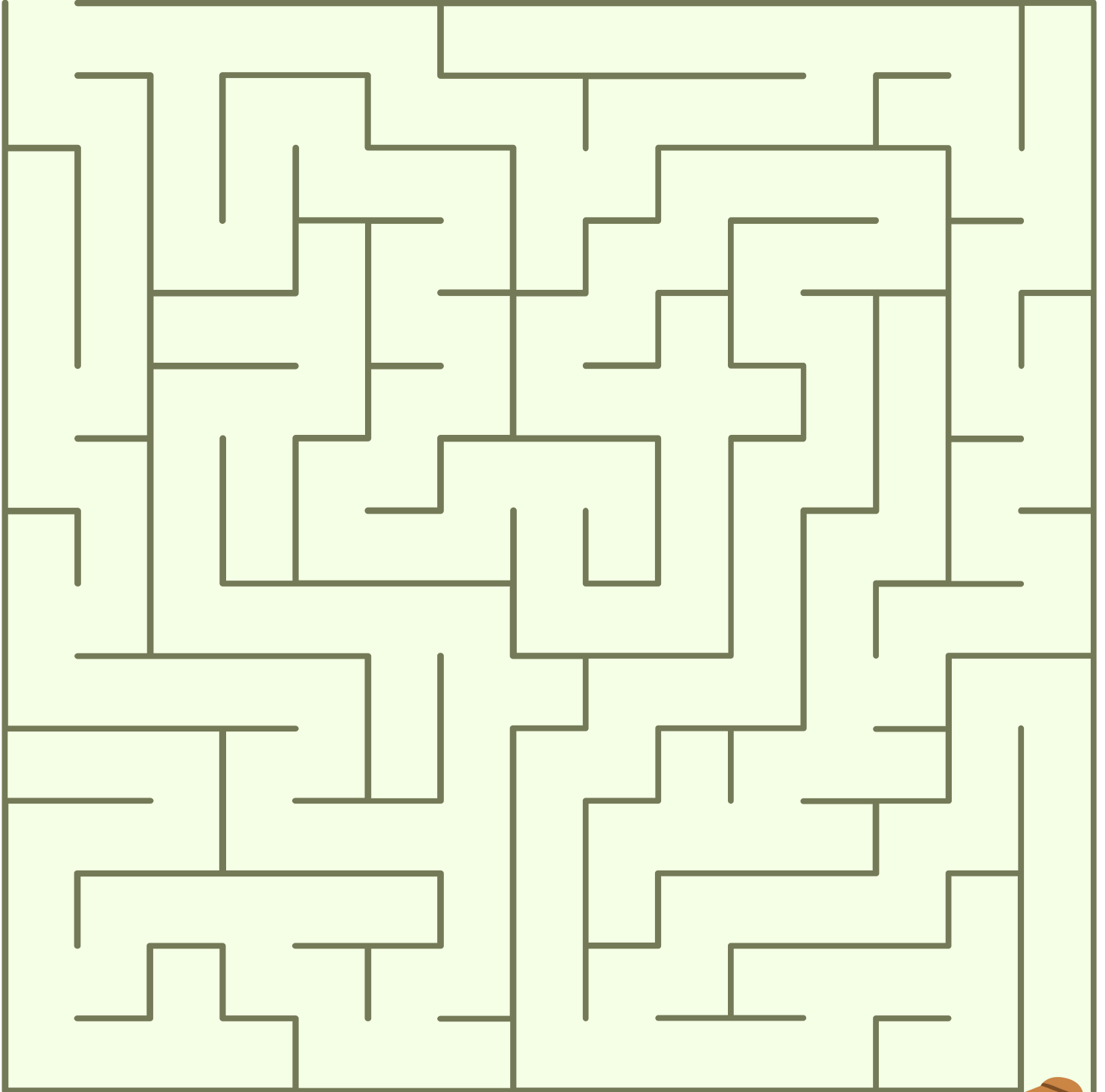
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Plant Your Tree!



From forests to trees it all starts with seeds!
Can you take your seedling through the maze and plant your tree?



DISCOVER YOUR FOREST

BUILD A BARK QUILT

GOAL: Learn about the function of bark and discover its unique and varied textures through the creation of a colourful bark rubbing quilt.

BACKGROUND:

Using leaves to identify a tree is a time-tested skill, but did you know a tree's bark can also be used as an identification tool? Unlike leaves, fruits and flowers, bark remains on trees throughout the year, making it useful in tree identification. Bark is also a living shield against the elements, with a species-specific pattern of cracks and crevasses developing over years of growth.

The most important role of bark is to protect a tree from injury and disease. This is achieved through a number of adaptations, such as prickly thorns to keep mammals away, bad tasting chemicals to deter insects, or an unusually dense layer of bark to protect the tree from forest fires. While the external surface of bark is often hard and can be almost woody itself, it protects two soft inner layers. The inner bark, also known as phloem, carries the sugars created by leaves to the tree's branches, trunk, and roots, providing food for the tree. Next to the phloem is the cambium, which is the growth layer of a tree that is responsible for the outward growth (also known as secondary growth) of tree trunks. The cambium creates a new ring of woody tissue each year that is visible in cross-sections and tree cookies. Both the phloem and cambium are essential to the health and well-being of a tree and are protected by the living shield that bark provides.

As a tree matures, its bark will change and develop a unique texture as it cracks or stretches to accommodate annual outward growth. As a result, a younger tree's bark will generally have less texture when compared to a mature tree of the same species, and very old tree bark will have a different texture than mature bark due to age and weathering.



Please remember that trees need bark to protect themselves from the outside world. Never peel or remove bark from a living tree, as it can cause harm and stress to it. If enough bark is removed, the tree may even die.

*Young Black Cherry (*Prunus serotina*) bark (left) compared to mature Black Cherry bark (right). When identifying the mature tree, it is easy to spot the 'burnt cornflakes' of the bark; a reference to its dark colour and raised, flaky texture.*

MATERIALS:

- White printer paper
- Wax crayons, multiple dark colours
- Tape or glue
- Construction paper (optional)



ACTIVITY:

1. With paper and crayons in hand head out to a nearby Forest.
2. Select a tree you can reach without leaving the trail. Place a piece of paper on the bark and gently rub the crayon back and forth. Repeat with different trees and crayons until you have collected at least 4 rubbings.
3. Tape the rubbings together to form a paper quilt, use construction paper to form border.



EXTENSION:

Using Tree Bee (www.treebee.ca), try to identify the tree species included in your bark quilt. How many species were you able to identify?

Share your complete bark rubbing quilt with a friend or family member and challenge them to find the trees included in your quilt. Were they successful?

FOREST FUN

WORD SEARCH

Can you find all the words related to our forests?

g	x	j	p	x	d	s	o	x	c	m	a	m	t	x
y	b	x	n	c	k	d	p	y	z	m	t	s	h	o
c	u	b	c	e	n	e	e	e	c	e	w	h	a	f
a	d	c	r	a	e	a	c	c	c	d	i	r	r	o
r	t	n	o	a	m	d	t	b	i	i	g	u	v	r
b	c	r	d	l	n	i	l	i	r	d	e	b	e	e
o	o	a	u	g	o	c	h	e	v	w	u	s	s	s
n	n	x	w	n	y	u	h	d	g	e	r	o	t	t
c	e	s	o	k	k	n	r	e	t	y	g	a	u	i
o	b	i	o	d	i	v	e	r	s	i	t	y	c	s
n	o	h	d	r	d	b	a	r	k	t	r	e	e	l
i	s	u	s	t	a	i	n	a	b	l	e	r	o	e
f	p	s	h	j	f	s	d	x	q	j	v	j	v	a
e	l	p	q	w	o	t	i	a	c	x	d	n	t	f
r	l	m	c	r	o	w	n	c	n	r	o	o	t	s

bark	colour	forest	roots	trunk
biodiversity	cone	harvest	shrubs	twig
branches	conifer	leaf	species	wood
bud	crown	native	sustainable	
carbon	deciduous	needle	tree	



SCAVENGER HUNT



Our forests are beautiful—so be gentle as you walk through them. If you are collecting any of the items below, make sure that they have already fallen on the ground. For those items that are not on the ground, just observe and check off that you’ve found them. Let the searching begin!

ACORN	LEAF	FLOWERS	TWIG
BARK	SEED	NEEDLE	CONE
MUSHROOM	SOIL	MOSS	BRANCH
TRUNK	FEATHER	ROCK	BUD

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