

8 inch

7 inch

6 inch

5 inch

4 inch

3 inch

2 inch

1 inch

0 inch

COOL FALL FACT

Monarchs travel up to 100 miles a day taking up to two months to complete their migration to winter habitats.



MINNESOTA MASTER NATURALIST

UNIVERSITY OF MINNESOTA
EXTENSION



MASTER NATURALIST EXPLORERS

Fall Nature Journal



Name _____

Date _____

The Minnesota Master Naturalist Explorers Program connects adult volunteers with youth in an after-school setting. The goal of the Explorers Program is to offer fun, outdoor, science-based educational opportunities for elementary students to learn about the ecology and natural history of their schoolyard, neighborhood, nearby natural areas, and the entire state.

Explorers is a component of the Minnesota Master Naturalist Program whose mission is to promote awareness, understanding, and stewardship of Minnesota's natural environment by developing a corps of well-informed citizens dedicated to conservation education and service within their communities.

Acknowledgments

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A Quick Guide to Leaf Types (page 19) is adapted from the poster *Minnesota's Forest Treasures*, MN DNR, Forestry.

Funding for this project was provided by a grant from the Minnesota Environment and Natural Resources Trust Fund.



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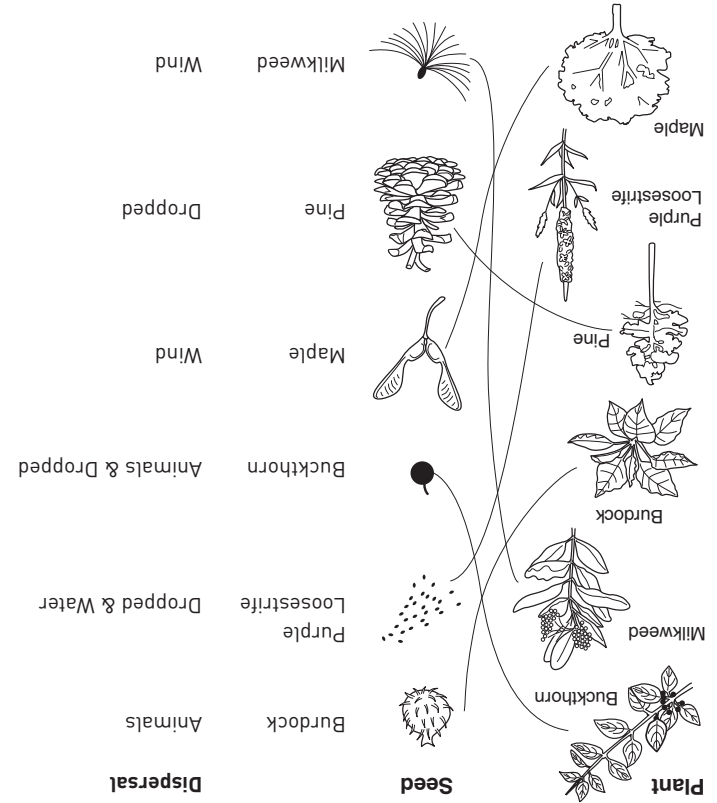
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Answers

Nature Word Search page 13

D	L	X	N	R	E	G	N	E	V	A	C	S		
M	E	R	O	V	I	B	R	E	H	P	L	E	X	
N	A	C	I	L	L	S	R	E	R	O	L	P	X	
O	F	A	I	O	P	P	H	E	N	O	L	G	Y	
I	L	R	S	D	O	L	N	W	S	L	Y	L	N	
T	I	N	T	D	U	O	A	X	U	O	H	L	A	
A	T	I	V	E	O	T	N	O	M	P	A	T	F	
R	T	I	V	A	L	M	E	U	E	R	E	O	M	U
G	E	O	P	S	N	S	S	E	U	R	W	R	P	
I	R	A	D	E	G	A	L	F	U	O	M	A	C	
M	O	E	X	E	I	P	L	W	I	W	L	J	L	
A	D	A	P	T	A	T	I	O	N	M	H	O	I	R
M	O	U	R	E	M	U	S	N	O	C	R	S	N	
L	A	R	E	S	O	P	M	O	C	E	D	S	T	M

Water Cycle page 8



Vocabulary Words

phenology – the science of seasonal changes and their effect on the natural world

journal – notebook or binder used to make recordings, drawings, and write thoughts and reflections

producer – organism that produces its own food mainly through the process of photosynthesis

consumer – organism that consumes other organisms to get its nutrients

decomposer – organism whose role is to break down the remains of other living things

scavenger – organism that eats dead matter

herbivore – animal that eats plants

carnivore – animal that eats meat

omnivore – animal that eats both plants and meat

leaf litter – organic matter found on forest floor

soil – substance containing both small rock particles and decaying matter

seed – reproductive part of a flowering plants life cycle

seed dispersal – mechanism for spreading seeds to another location

COOL FALL FACT

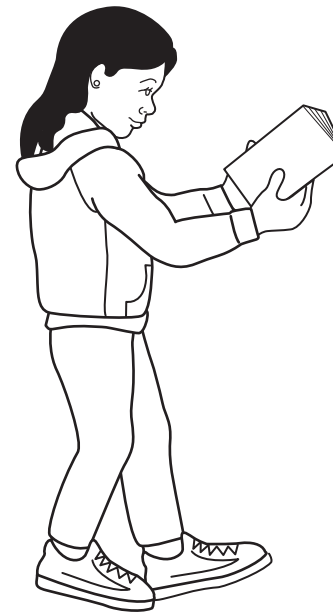
People from all over the world have visited Hawk Ridge in Duluth, Minnesota to watch the fall migration of thousands of raptors.



Introduction

Who is a Master Naturalist Explorer?

It is someone like YOU! A kid who is interested in nature, wants to learn more about it, and have fun exploring the outdoors.



Please do the following:

Be safe.

Be respectful of each other and nature.

Have fun!



What is a nature journal?

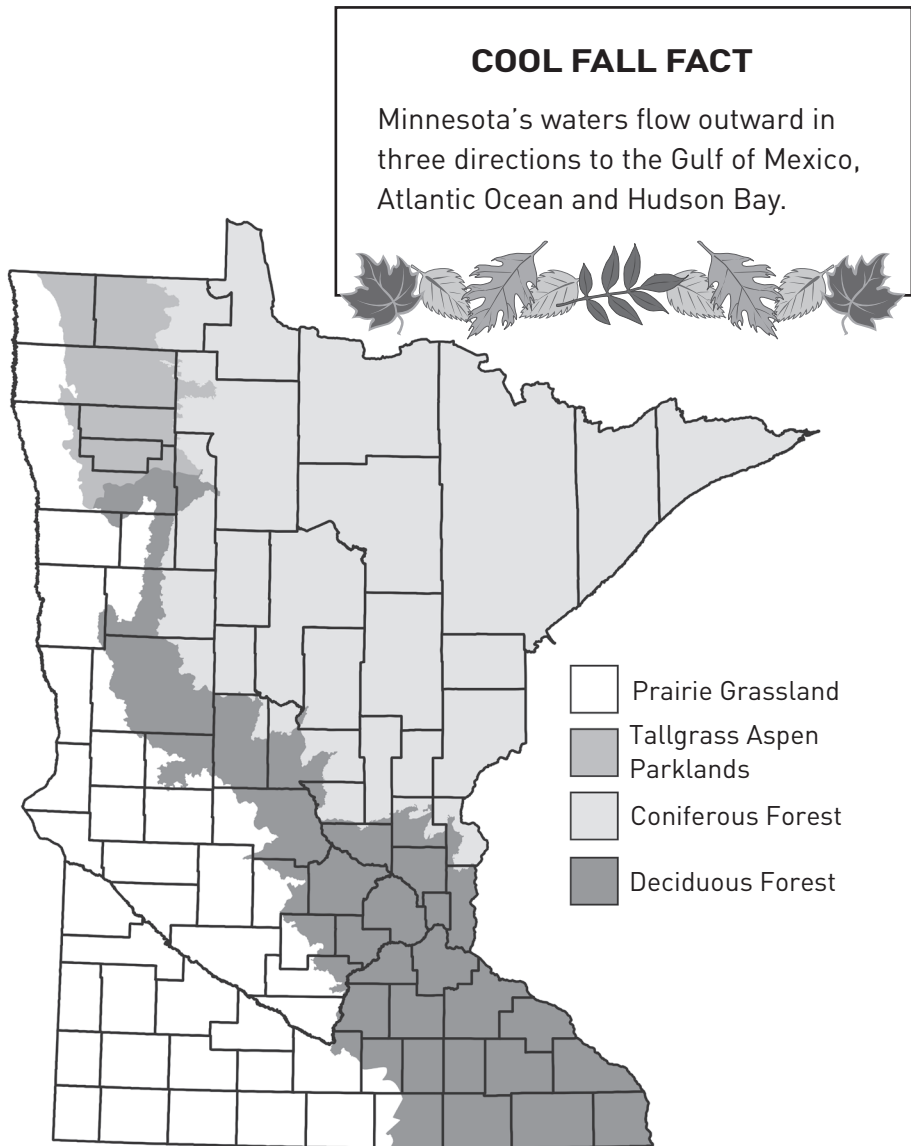
A nature journal is a booklet that helps you capture your experiences in nature. It is a place to write, sketch and record your personal observations and thoughts about nature. It is a great way to keep track of your discoveries over time.

Minnesota Biomes

In general, a biome is a large area of land with the same type of plant communities.

Put a star on the map to mark the location of your Explorers program.

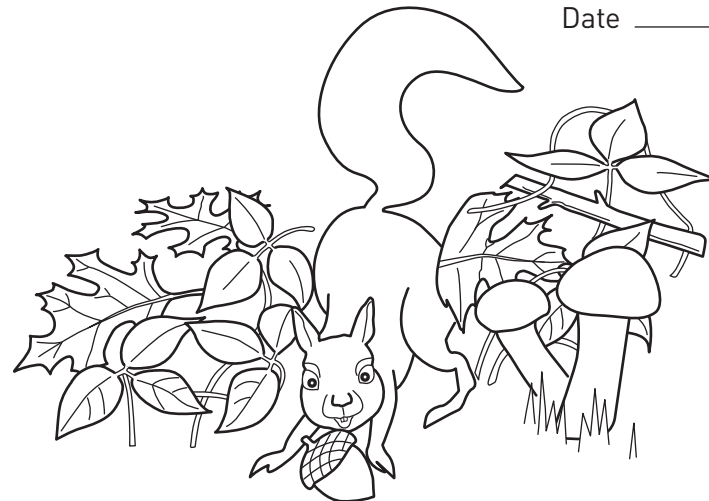
What biome are you in? _____



I Promise I Will Help Nature by:

Signature _____





Date _____



Nature Observations/Field Sketches

Nature Observation

Explore your site. Write or draw your nature observations in the boxes below.

	I see		I feel	
	I smell		I hear	

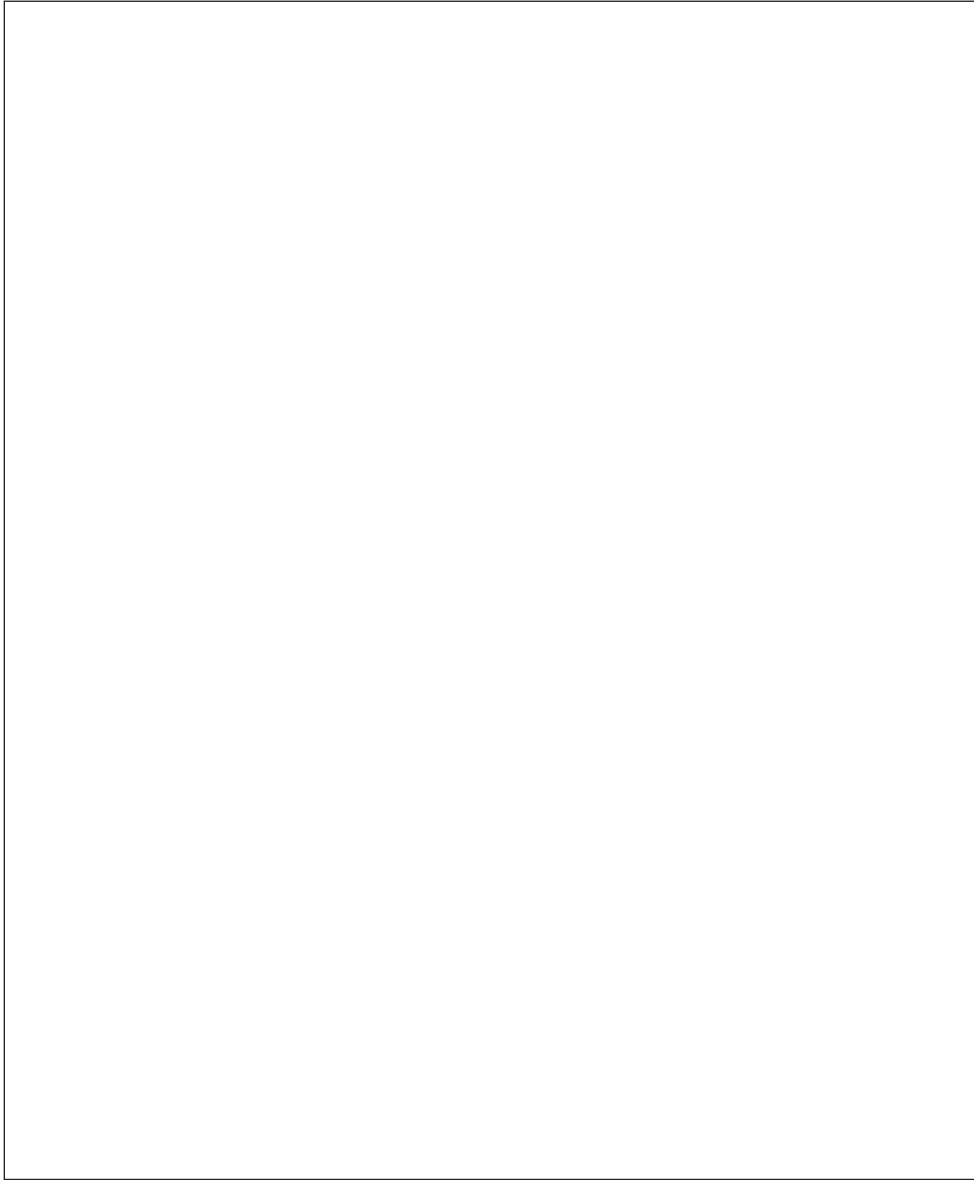
COOL FALL FACT

Thousands of acorns are produced by the time an oak tree is 80 years old.



Draw a Map of Your Site

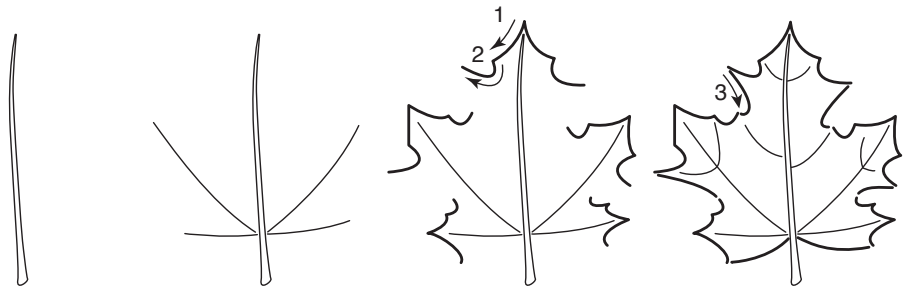
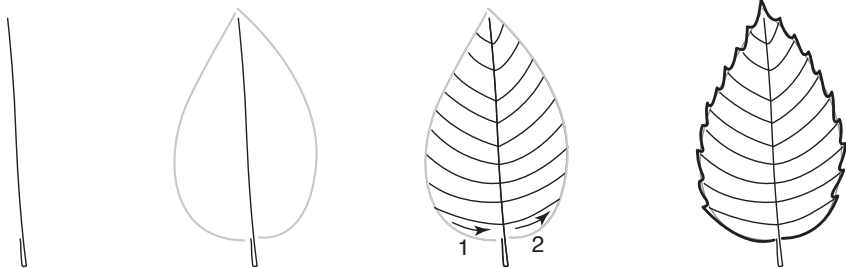
Create a birds-eye view map of your Explorers program site. Draw in large items such as buildings, playgrounds, streets, grassy areas, trails, forests or gardens. Create a key to identify major features.



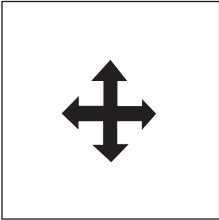
Nature Observations/Field Sketches

How to Draw

Take one step at a time to draw an item such as a leaf.



Key



Phenology

Phenology is the science of seasonal changes and their effect on the natural world. In the squares draw and/or write natural things that may be happening in the different seasons.

Spring	Summer
Fall	Winter

COOL FALL FACT

Yellow and orange leaf colors are hidden under the green chlorophyll until autumn.

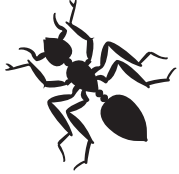


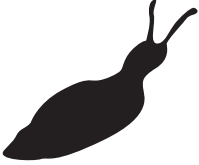






Leaf Observation

Collect and attach one or more leaves below, or do a leaf rubbing.

Leaf Litter Critters

Gently explore the leaf litter and check off critters you find. Draw others that aren't on the list.

Ant <input type="checkbox"/> 	Beetle <input type="checkbox"/> 	Spider <input type="checkbox"/> 
Slug <input type="checkbox"/> 	Woodlouse <input type="checkbox"/> 	Centipede <input type="checkbox"/> 
Cricket <input type="checkbox"/> 	Caterpillar <input type="checkbox"/> 	Other <input type="checkbox"/>
Other <input type="checkbox"/>	Other <input type="checkbox"/>	Other <input type="checkbox"/>

Fall Phenology

The first time you discover each item below check it off and write down the date. Add your own things to watch for.



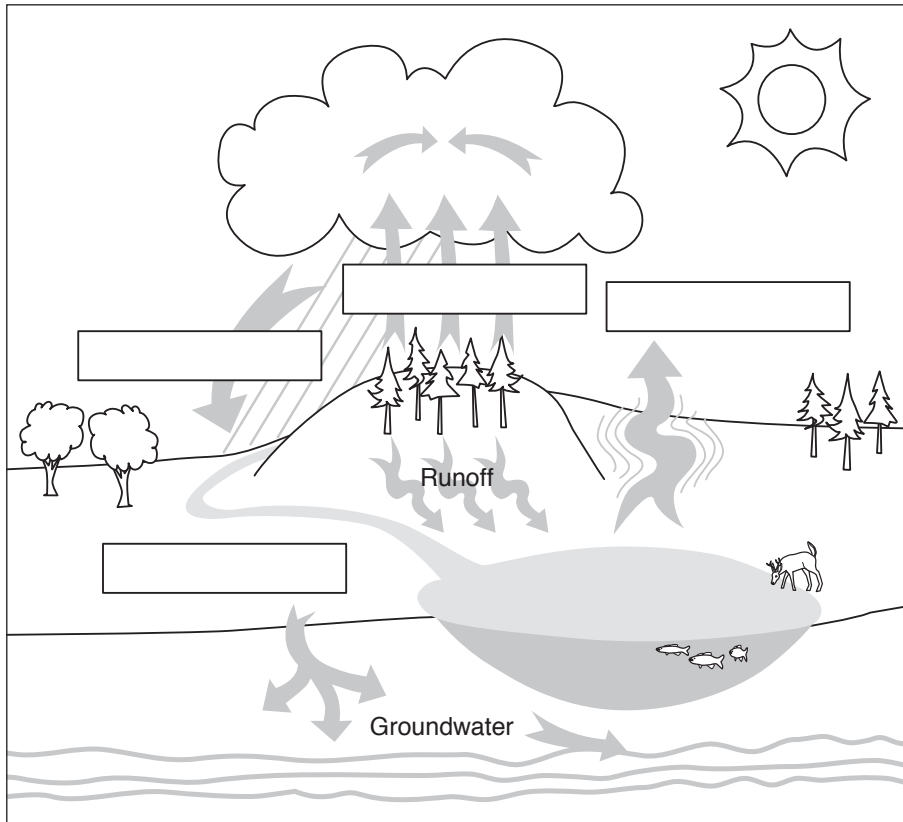
Date: _____

Leaves change color	<input type="checkbox"/>	_____
Squirrels burying food	<input type="checkbox"/>	_____
Asian lady beetles or box elder bugs gathering	<input type="checkbox"/>	_____
Someone raking leaves	<input type="checkbox"/>	_____
Juncos return	<input type="checkbox"/>	_____
Ducks or geese flying overhead	<input type="checkbox"/>	_____
First snowflakes	<input type="checkbox"/>	_____
Robins gathering in groups	<input type="checkbox"/>	_____
Daylight savings time ends	<input type="checkbox"/>	_____
Acorns falling to ground	<input type="checkbox"/>	_____
Hear someone scraping frost off their car windshield	<input type="checkbox"/>	_____
Ice begins to form on local lake/wetland	<input type="checkbox"/>	_____
Wear winter or warmer jacket	<input type="checkbox"/>	_____
Leaves begin falling from trees	<input type="checkbox"/>	_____
Caterpillars crawling on ground	<input type="checkbox"/>	_____
First frost	<input type="checkbox"/>	_____
Trees mostly leafless	<input type="checkbox"/>	_____
First morning you can see your breath	<input type="checkbox"/>	_____
Other _____	<input type="checkbox"/>	_____
Other _____	<input type="checkbox"/>	_____

Water Cycle

Fill in the blanks with the word that best describes what is happening in the water cycle.

Transpiration Evaporation Precipitation Infiltration



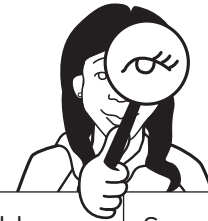
COOL FALL FACT

The idea for VELCRO® came from a burdock seed.



Scavenger Hunt



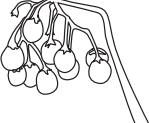


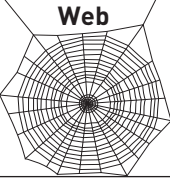
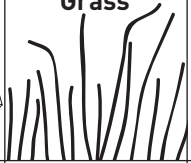









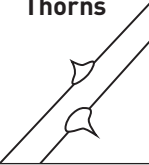





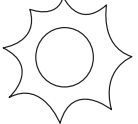
Check-off each item you find and then sketch or write what it is.



<p>Something that needs air/oxygen to survive <input type="checkbox"/></p>	<p>Something older than yourself <input type="checkbox"/></p>	<p>Something smaller than your thumb <input type="checkbox"/></p>
<p>Something that flies <input type="checkbox"/></p>	<p>Something taller than you <input type="checkbox"/></p>	<p>Something younger than yourself <input type="checkbox"/></p>
<p>Something that you have not seen before <input type="checkbox"/></p>	<p>Something with a scent <input type="checkbox"/></p>	<p>Something with a bud <input type="checkbox"/></p>

Fall Nature Bingo

Take a walk outside and try to find each one of the objects on the bingo board. Cross off the ones that you find. Yell "nature!" if you find five objects in a row or diagonally.

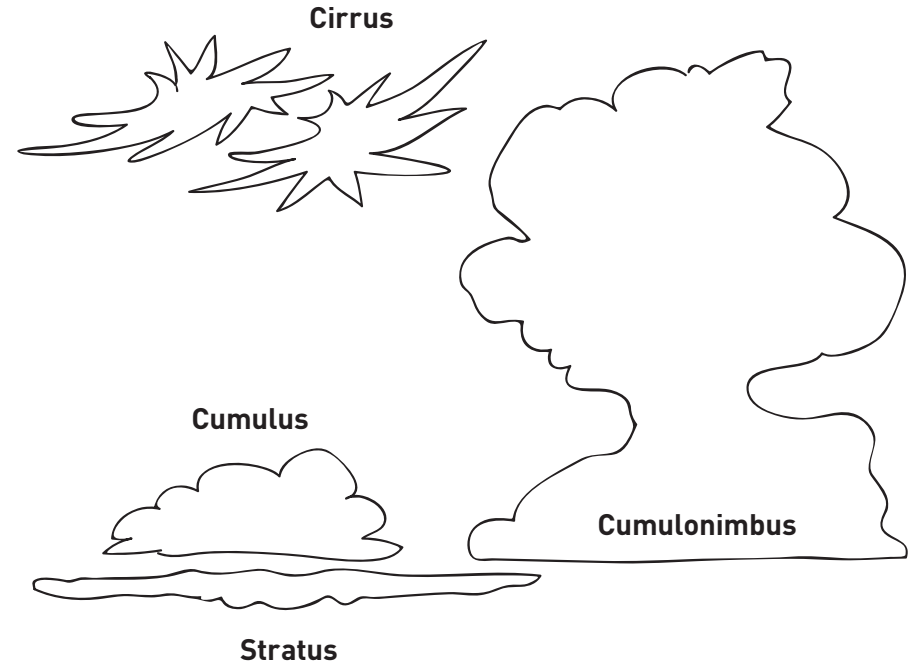
Ant 	Clouds 	Berries 	Soil 	Other
Seeds 	Web 	Grass 	Insect 	Wind 
Flying bird 	Mushroom 	Free Space	Squirrel 	Decaying leaf 
Rocks 	Animal sound 	Coniferous tree 	Thorns 	Fly 
Squirrel nest 	Butterfly 	Flower 	Bark 	Sun 

COOL FALL FACT

You are most likely to see Northern Lights (*aurora borealis*) in the fall.



Common Cloud Types



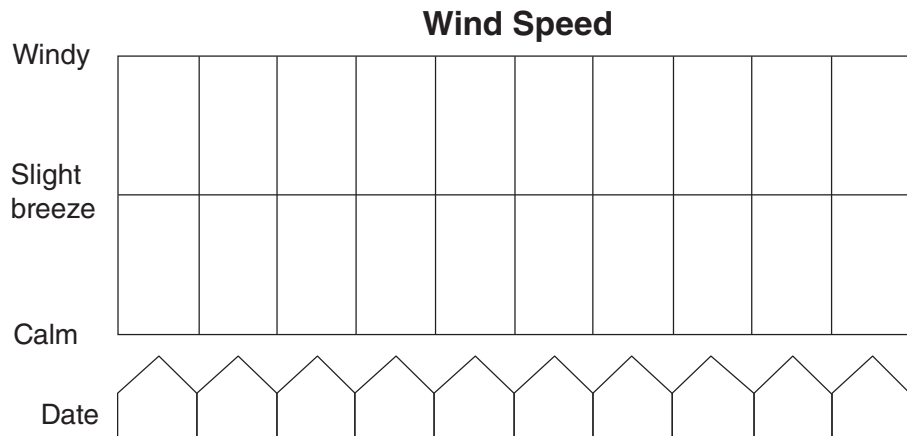
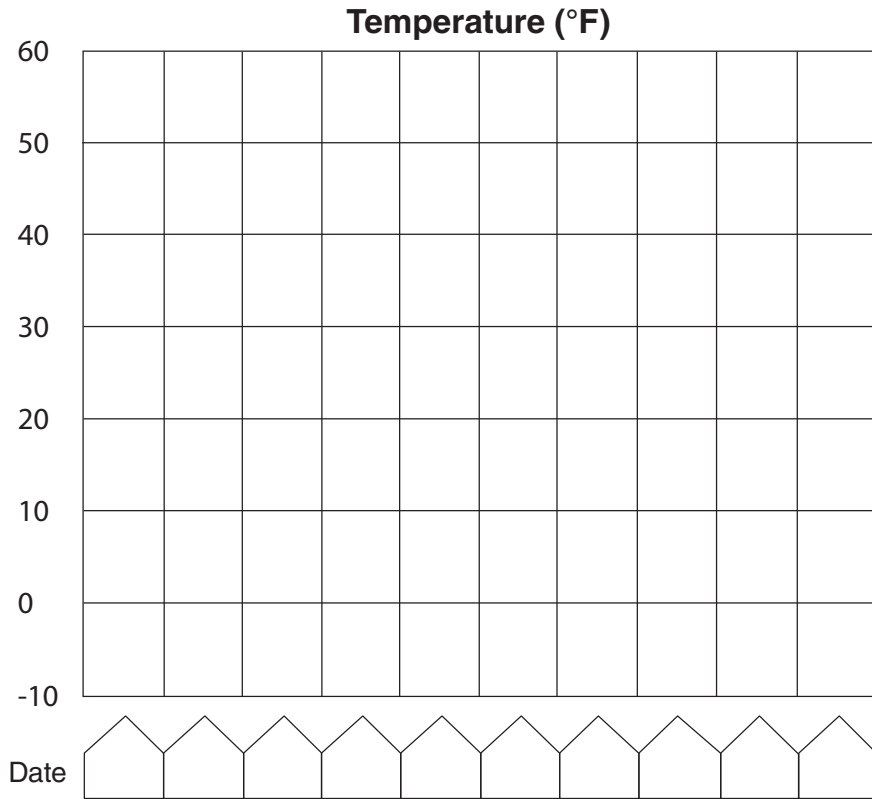
COOL FALL FACT

Migrating hawks and other soaring birds travel during the day using thermal updrafts while most songbirds travel at night.

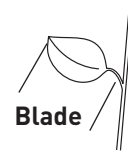


Weather Tracker

Create a bar graph for temperature and wind speed. Enter a symbol for cloud conditions and precipitation.



A Quick Guide to Leaf Types



Blade

Simple leaves have only one leaf blade.

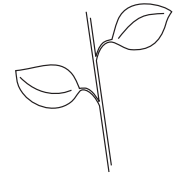


Leaflets

Compound leaves have many leaflets.



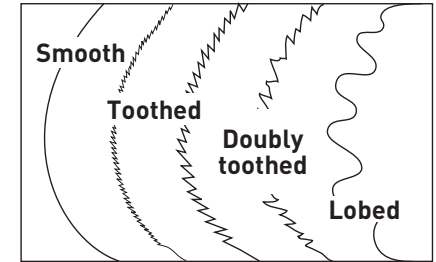
Opposite leaves grow directly across from one another, in pairs.



Alternate leaves grow singly along a branch, with space between each leaf.

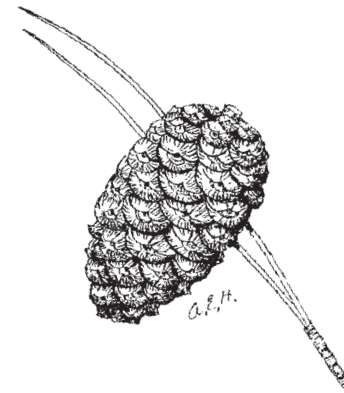
Leaf edges

Smooth leaves have smooth edges. Toothed leaves have jagged edges. Lobed leaves have rounded sections.



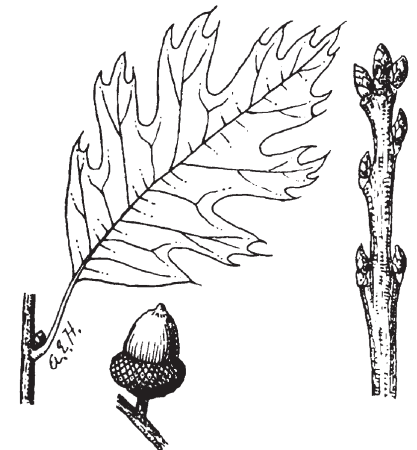
Coniferous

Red pine or Norway pine (Minnesota's state tree)



Deciduous

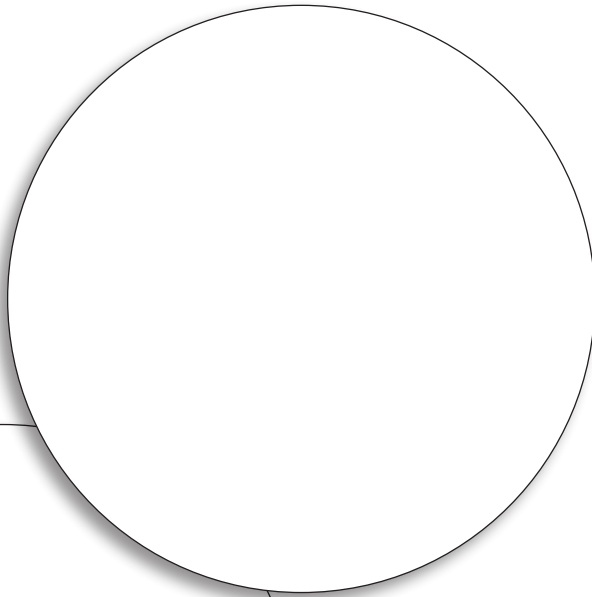
Red oak



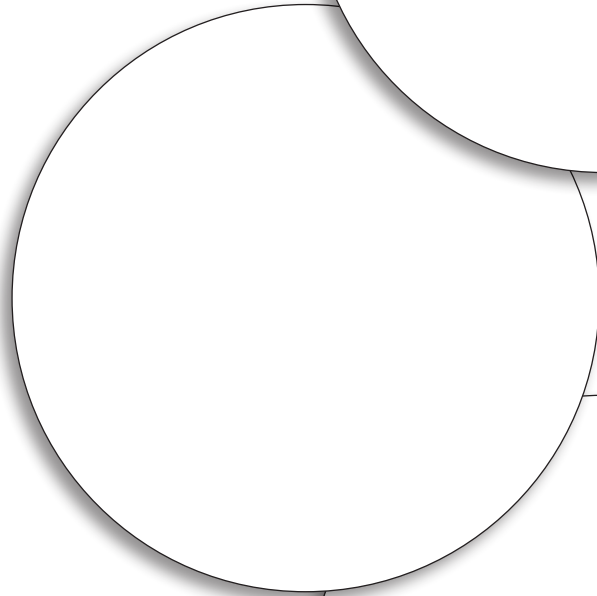
Leaves and Branches

Draw the items below.

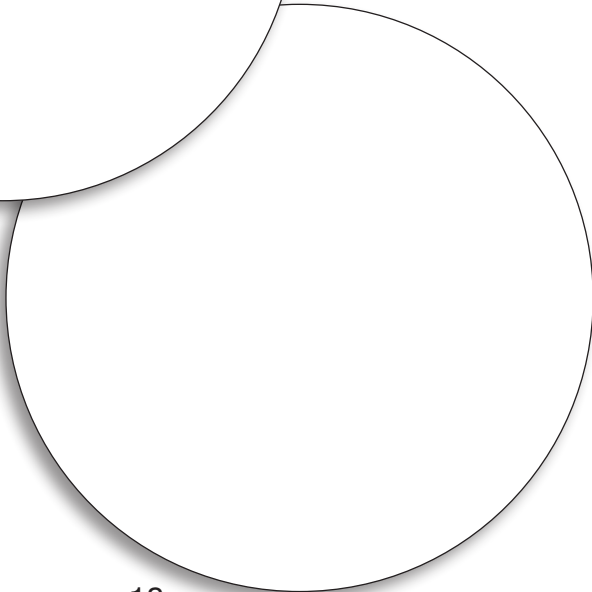
**Opposite
branching**



**Alternate
branching**



Leaves



Cloud Conditions



Cirrus



Cumulus



Stratus



Cumulonimbus



None

--	--	--	--	--

Date



--	--	--	--	--

Date



Precipitation



Rain



Sleet



Snow



None

--	--	--	--	--

Date



--	--	--	--	--

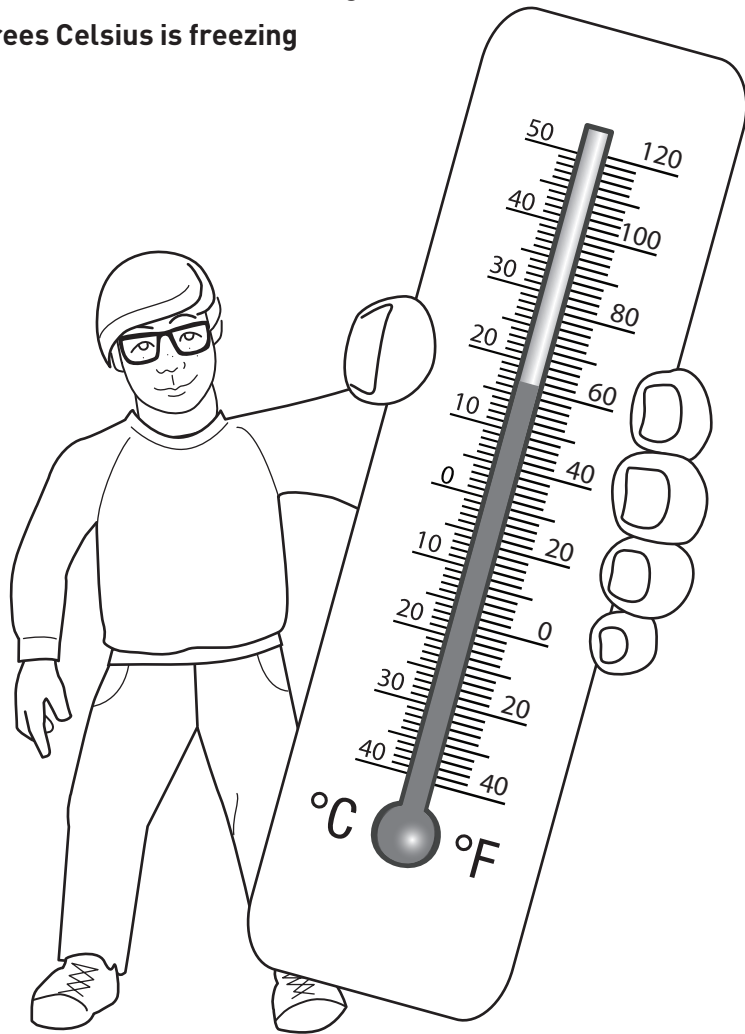
Date



Temperature

32 degrees Fahrenheit is freezing

0 degrees Celsius is freezing



Conversion formulas

Fahrenheit to Celsius

$$^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times \frac{5}{9}$$

or

$$^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times .56$$

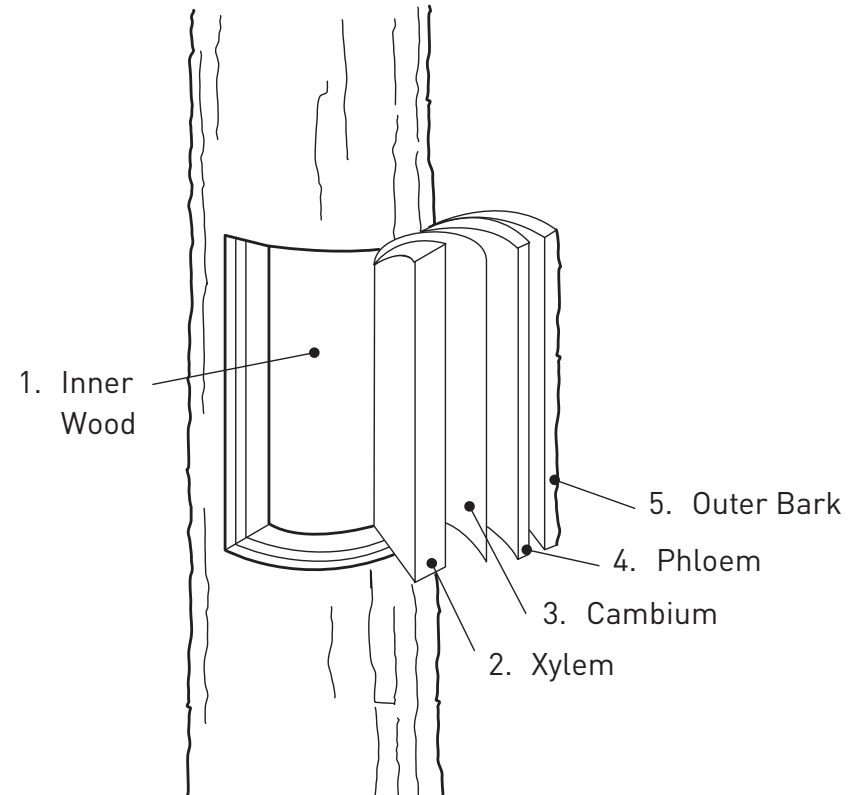
Celsius to Fahrenheit

$$^{\circ}\text{F} = ^{\circ}\text{C} \times \frac{9}{5} + 32$$

or

$$^{\circ}\text{F} = ^{\circ}\text{C} \times 1.8 + 32$$

Inside a Tree

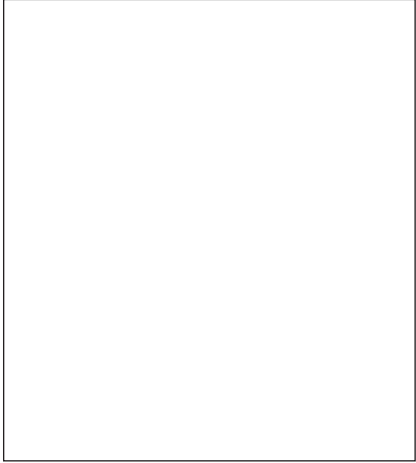



1. Inner Wood—supports tree, stores growing compounds and sugars
2. Xylem (zahy-luh m)—carries water and minerals from roots to leaves
3. Cambium (kam-bee-uh m)—makes trunk, branches and roots thicker
4. Phloem (floh-em)—carries food (sap) from leaves to rest of tree
5. Outer Bark—dead tissue that protects the tree from injury

Field Guide

Field guides help you to identify plants and animals found in nature. There are many kinds, big and small, but all contain some basic information such as: common name, scientific name, a picture and description.

Create your own imaginary plant or animal field guide entry below.

Common Name	

Scientific Name	

Description	

Nature Word Search

Find and circle the words below. Words can be found up, down, across, diagonally, forward and backward.

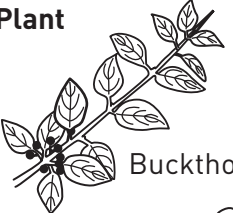






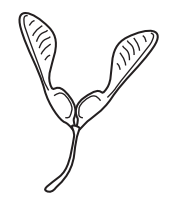
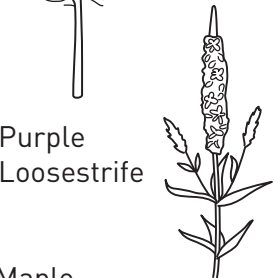

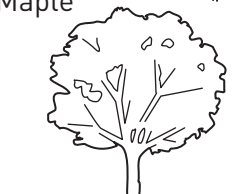
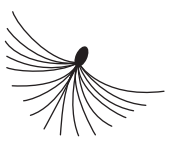
```

D L X N R E G N E V A C S P S
M E R O V I B R E H P L E X Q
N A C I L L S R E R O L P X E
O F A I O P P H E N O L O G Y
I L R S D Q L N W S L Y L N I
T I N T D U O A X U O H L A P
A T I P E E O T N O M P A T F
R T V A L M E U E R E O M U C
G E O P S N S S S E U R W R P
I R R A D E G A L F U O M A C
M O E X E I P L W I W L J L G
A D A P T A T I O N M H O I R
M O U R E M U S N O C C R S N
L A R E S O P M O C E D S T M
    
```

- | | | |
|-------------|------------|------------|
| ADAPTATION | DECIDUOUS | LEAFLITTER |
| CAMOUFLAGE | DECOMPOSER | MIGRATION |
| CARNIVORE | EXPLORERS | NATURALIST |
| CHLOROPHYLL | FALL | PHENOLOGY |
| CONIFEROUS | HERBIVORE | SCAVENGER |
| CONSUMER | JOURNAL | SEEDS |

Seed Dispersal

Match the plant to the seed and the seed to its dispersal method.
 Note: some seeds may have more than one way of dispersing.

Plant	Seed	Dispersal
 <p>Buckthorn</p>		
 <p>Milkweed</p>		<div style="border: 1px solid black; padding: 5px; text-align: center;">Wind</div>
 <p>Burdock</p>		<div style="border: 1px solid black; padding: 5px; text-align: center;">Animals</div>
 <p>Pine</p>		<div style="border: 1px solid black; padding: 5px; text-align: center;">Dropped</div>
 <p>Purple Loosestrife</p>		
 <p>Maple</p>		<div style="border: 1px solid black; padding: 5px; text-align: center;">Water</div>

Seed Collection

Look for the seed types below and attach some examples.

Sticks to clothes	Travels over one meter when blown on
Seed head containing 20+ seeds	Hard seed with thick coat
Fruit with seed inside	Super tiny seed