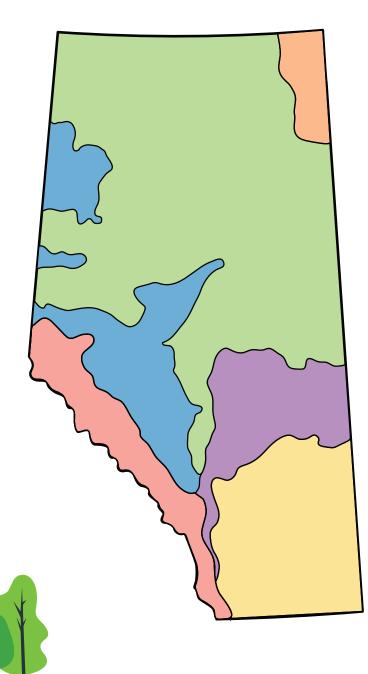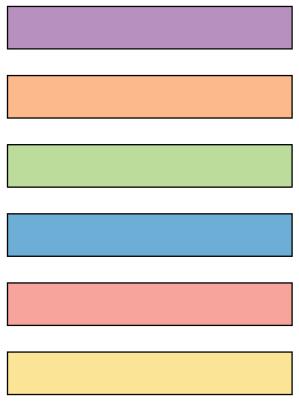Inside education

MY COMMUNITY FOREST

NAME: _____

FIELD JOURNAL

KNOW BEFORE YOU GO!

Alberta has SIX different ecoregions,
do you know what they are?
Label the ecoregions using the legend below.

Which ecoregion are you in today?

_____

Draw a star where you are!

GET TO KNOW YOUR COMMUNITY FOREST

SITE ASSESSMENT

Knowing the weather conditions when you are about to head outside is important for safety! You need to dress appropriately and weather events like wind and heavy rain may be dangerous. **Record the outdoor weather conditions as a class using the *anemometer* in your kit.**

Weather Conditions (*circle one*):

Sunny / Partly Cloudy / Cloudy / Rainy / Snowy / Windy

Temperature: _____ C   **Wind Speed**: _____m/s

Find a space where you can sit by yourself and quietly look, listen and feel what your community forest has to offer today. Record your observations below:

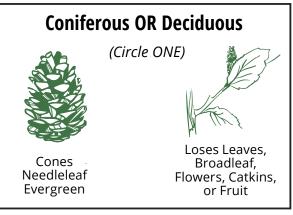| What do you hear?	What do you smell?	What do you see?

PLANT DIVERSITY

Choose a tree and draw it here

AM I A TREE AT ALL

Does your plant have these three characteristics?

☐ **Trunk**: A large single stem

☐ **Bark**: A hard outer layer

☐ **Wood**: A solid inside

If yes, congratulations, it's a tree!

Coniferous OR Deciduous

(Circle ONE)

Cones
Needleleaf
Evergreen

Loses Leaves,
Broadleaf,
Flowers, Catkins,
or Fruit

LEAF SHAPES AND PATTERNS

Different types of leaves and how they grow are often the best way to tell trees apart.

Check all of the characteristics that apply to your tree.

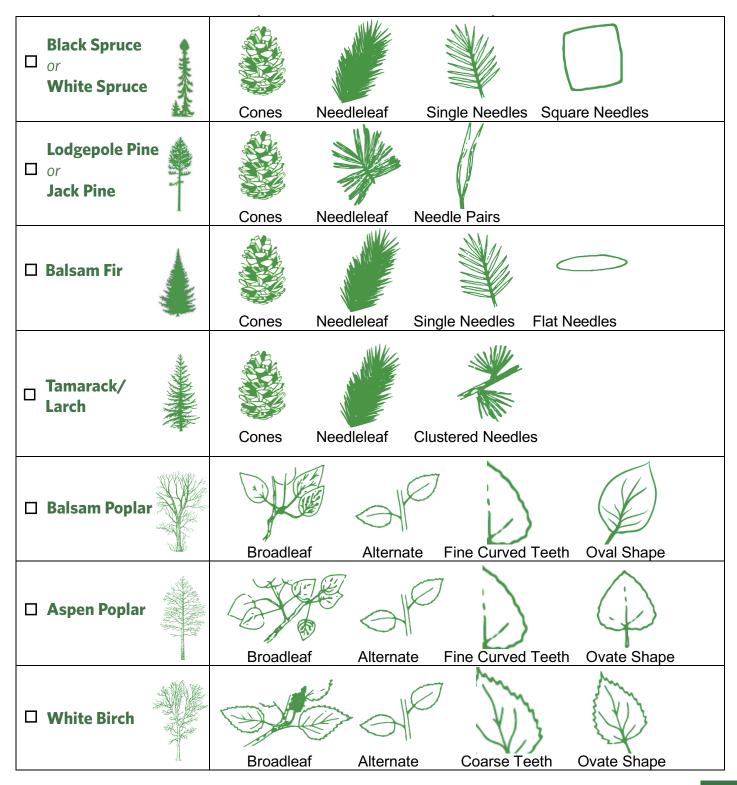|			
☐ Needleleaf	☐ Single Needles	☐ Clustered Needles	☐ Needle Pairs (Sheathed)
☐ Square Needles	☐ Flat Needles	☐ Broadleaf	☐ Alternate
☐ Opposite	☐ Compound	☐ Toothed Edge (coarse or fine)	☐ Lobed
☐ Oblong	☐ Oval/Ovate	☐ Triangular/Heart	☐ Round

Common Alberta Tree Species

Which common Alberta species is most like yours ?

Look at the tree you chose to draw and check next to the species with the most similar characteristics. If you think it's an exact match circle your checkmark.

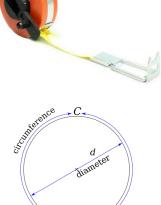|				
☐ **Black Spruce** *or* **White Spruce**	Cones	Needleleaf	Single Needles	Square Needles
☐ **Lodgepole Pine** *or* **Jack Pine**	Cones	Needleleaf	Needle Pairs	
☐ **Balsam Fir**	Cones	Needleleaf	Single Needles	Flat Needles
☐ **Tamarack/ Larch**	Cones	Needleleaf	Clustered Needles	
☐ **Balsam Poplar**	Broadleaf	Alternate	Fine Curved Teeth	Oval Shape
☐ **Aspen Poplar**	Broadleaf	Alternate	Fine Curved Teeth	Ovate Shape
☐ **White Birch**	Broadleaf	Alternate	Coarse Teeth	Ovate Shape

TREE MEASUREMENTS

Measuring Diameter

Imagine the trunk of a tree cut horizontally through the middle as a flat circle. The diameter of a tree trunk is the distance across that circle. This is hard to measure on a living tree, so instead we can measure the circumference of the tree, and use a mathematical formula to calculate the diameter.

Foresters use a tool called a diameter tape that eliminates the need to do this math in the field because the calculations are built in!
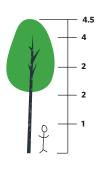
1. **Wrap the *string* all the way around the tree at 1.3m above the ground. Mark where the string meets itself.**

2. **Measure the marked length using a metre stick or measuring tape. This is your *circumference*.**

3. **Follow the formula to calculate *diameter* .**

4. **Record your answers in the table below.**
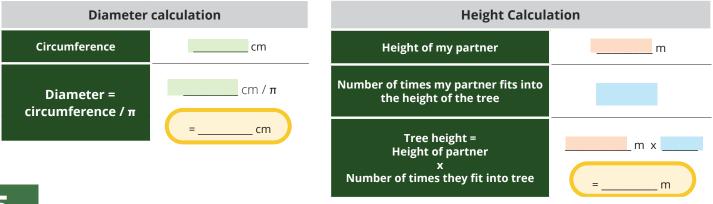
$$C = \pi d$$
$$d = \frac{C}{\pi}$$

Measuring Height

Measuring the height of a tree is no easy task. Unless you have a special tool, it is easier to estimate the height of a tree using your partner as a reference.

1. **Find a partner and measure their height in meters.**

2. **Have your partner stand next to the tree, and move back far enough so you can see the top and bottom of your tree easily.**

3. **Estimate how many times your partner could fit into the height of the tree.**

4. **Complete the calculation and record the estimate the height of your tree.**

5. **Record your answers in the table below.**

Diameter calculation	
Circumference	_____ cm
Diameter = circumference / π	_____ cm / π
	= _____ cm

Height Calculation	
Height of my partner	_____ m
Number of times my partner fits into the height of the tree	
Tree height = Height of partner x Number of times they fit into tree	_____ m x _____
	= _____ m

VOLUME OF WOOD

Using the height and diameter we calculated, we can now estimate the volume of a tree. Foresters use species specific *Tree Volume Tables* to figure out tree volumes. To simplify, we have provided you with only Deciduous and Coniferous tables.

To estimate the volume of your tree, select the appropriate table *(Deciduous or Coniferous)*.
Find your Tree Height row and Diameter column and see where they meet up. This is your volume.

> Volume of wood: _____m^3

Deciduous
Individual Tree Volume in m^3

Total Tree Height (m)	Diameter (cm)							
	1.1 - 11.0	11.1 - 21.0	21.1 - 31.0	31.1 - 41.0	41.1 - 51.0	51.1 - 61.0	61.1 - 71.0	71.1 - 81.0
3.1 - 5.0	0.0047	0.0315	0.0785	0.1435	0.2254	0.3247	0.4422	0.5794
5.1 - 7.0	0.0071	0.0491	0.1230	0.2240	0.3490	0.496	0.6639	0.8525
7.1 - 9.0	0.0096	0.0667	0.1679	0.3060	0.4755	0.6723	0.8935	0.1368
9.1 - 11.0	0.0121	0.0844	0.2131	0.3889	0.6042	0.8527	1.1297	1.4312
11.1 - 13.0	0.0146	0.1021	0.2584	0.4724	0.7342	1.0358	1.3704	1.7326
13.1 - 15.0	0.0171	0.1198	0.3039	0.5563	0.8652	1.2206	1.6142	2.0389
15.1 - 17.0	0.0196	0.1375	0.3495	0.6405	0.9968	1.4068	1.8603	2.3487
17.1 - 19.0	0.0221	0.1553	0.3952	0.7249	1.1290	1.5938	2.108	2.6612
19.1 - 21.0	0.0246	0.1730	0.4408	0.8094	1.2615	1.7818	2.3570	2.9756
21.1 - 23.0	0.0270	0.1908	0.4866	0.8940	1.3942	1.9702	2.6069	3.2915
23.1 - 25.0	0.0295	0.2085	0.5323	0.9788	1.5272	2.1590	2.8576	3.6087
25.1 - 27.0	0.0320	0.2263	0.5781	1.0636	1.6604	2.3482	3.1090	3.9269
27.1 - 29.0	0.0345	0.2441	0.6239	1.1485	1.7937	2.5377	3.3608	4.2459
29.1 - 31.0	0.0370	0.2619	0.6697	1.2334	1.9272	2.7274	3.6131	4.5656
31.1 - 33.0	0.0395	0.2796	0.7156	1.3184	2.0607	2.9173	3.8657	4.8858
33.1 - 35.0	0.0420	0.2974	0.7614	1.4034	2.1944	3.1074	4.1187	5.2066
35.1 - 37.0	0.0445	0.3152	0.8073	1.4885	2.3281	3.2977	4.3718	5.5277
37.1 - 39.0	0.0470	0.3330	0.8531	1.5736	2.4619	3.4881	4.6253	5.8492

Coniferous
Individual Tree Volume in m^3

Total Tree Height (m)	Diameter (cm)							
	1.1 - 11.0	11.1 - 21.0	21.1 - 31.0	31.1 - 41.0	41.1 - 51.0	51.1 - 61.0	61.1 - 71.0	71.1 - 81.0
3.1 - 5.0	0.0048	0.0306	0.0772	0.1470	0.2453	0.3799	0.5609	0.8009
5.1 - 7.0	0.0074	0.0479	0.1193	0.2212	0.3563	0.5295	0.7476	1.0189
7.1 - 9.0	0.1000	0.0654	0.1625	0.2982	0.4725	0.6879	0.9482	1.2588
9.1 - 11.0	0.0126	0.0831	0.2066	0.3774	0.5935	0.8548	1.1631	1.5214
11.1 - 13.0	0.0152	0.1009	0.2512	0.4583	0.7178	1.0279	1.3883	1.8000
13.1 - 15.0	0.0178	0.1188	0.2962	0.5402	0.8446	1.2055	1.6209	2.0902
15.1 - 17.0	0.0205	0.1368	0.3415	0.623	0.9731	1.3863	1.8589	2.3887
17.1 - 19.0	0.0231	0.1548	0.3870	0.7063	1.1030	1.5696	2.1011	2.6937
19.1 - 21.0	0.0257	0.1728	0.4326	0.7901	1.2338	1.7549	2.3465	3.0037
21.1 - 23.0	0.0284	0.1908	0.4784	0.8743	1.3655	1.9416	2.5944	3.3177
23.1 - 25.0	0.0310	0.2089	0.5243	0.9588	1.4978	2.1296	2.8445	3.6348
25.1 - 27.0	0.0337	0.2270	0.5702	1.0435	1.6307	2.3186	3.0962	3.9547
27.1 - 29.0	0.0363	0.2451	0.6163	1.1284	1.7640	2.5084	3.3494	4.2768
29.1 - 31.0	0.0389	0.2633	0.6624	1.2135	1.8977	2.6990	3.6038	4.6007
31.1 - 33.0	0.0416	0.2814	0.7086	1.2988	2.0318	2.8901	3.8592	4.9263
33.1 - 35.0	0.0442	0.2996	0.7548	1.3842	2.1661	3.0818	4.1155	5.2532
35.1 - 37.0	0.0469	0.3178	0.8010	1.4697	2.3007	3.2740	4.3726	5.5814
37.1 - 39.0	0.0495	0.3359	0.8473	1.5553	2.4355	3.4666	4.6303	5.9107

WHAT WOOD I MAKE ?

Different tree species make different types of products. The Alberta forest industry produces 4 main types of products, and Table 1 shows the tree species used to produce each forest product.

Using Table 1, determine what type of forest product can be made with the tree you measured.
Choose one and write it here

Type of forest product I can make with my tree _____

Using Table 2, **calculate the amount of that product you can make.**

Number of items I can make _____

*Hint: Number of items **=** Volume of tree ÷ Amount of wood per item*

Table 1. Forest products produced from various tree species

Native Boreal Forest Trees	Forest Products			
	Lumber	OSB	Plywood	Pulp
White Spruce	×		×	×
Black Spruce	×			×
Jack Pine	×			×
Lodgepole Pine	×			×
Balsam Fir	×			
Tamarack				×
Aspen Poplar		×		×
Balsam Poplar		×		
White Birch	×		×	×

Table 2. Examples of items made from different forest products

Forest Product	What can I make?	Amount of wood per item
Lumber	Picnic Table	0.51m³
OSB	Dog House	0.12 m³
Plywood	Dresser	0.25 m³
Pulp	One roll of Toilet Paper	0.0007 m³

FOREST HEALTH

Trees, just like people, can also get sick.
Fungus, insects, bacteria, viruses, and even other plants all affect trees.
Match the descriptions below to the images on the right.

Dutch elm disease
A fungal infection spread by beetles that burrow in the bark of elm trees turning the leaves turn yellow and brown.

Forest tent caterpillar
This hairy moth larvae is blue with white spots.
It eats the leaves of deciduous trees making them unable to grow.

Mountain pine beetle
This beetle burrows into the bark of pine trees like lodgepole pine. They lay their eggs inside, and the larvae consume the phloem. They also carry a fungus, called blue stain fungus, which clogs up the tree's xylem.

Dwarf mistletoe
Dwarf mistletoe is a parasitic plant. It steals water and food from coniferous trees by growing under the tree's bark. Sometimes the plant itself is visible but the most obvious sign is a clump of dense twigs and branches called a witches broom.

Conk fungi
Conks are the fruiting bodies of fungus that grow within dead and dying trees. They are a sign of decay. Conks come in many colours including white, brown, grey and even green or yellow.

Burl
Burls are large growths on the trunk of a tree. They can be caused by bacteria, viruses, or even insects. Generally they do not cause much damage, but can impact forestry operations.

Now that you know a little more about common diseases and pests in Alberta's forests, get out your magnifying glasses and see if you can find any evidence in your community forest.

Use this checklist to keep track of what you see.

Type of Evidence	Check if present	Draw the most interesting thing you've found!
Larvae on the undersides of leaves or stems	☐	
Damaged buds	☐	
Discolored leaves/needles	☐	
Discolored Stems	☐	
Drooping/wilting	☐	
Holes in leaves	☐	
Cavities in stems/trunk	☐	
Tunnels chewed into wood/bark	☐	
Dead leaves/branches	☐	
Globs of pitch on the outer bark of trees *(pitch is similar to sap, but much thicker)*	☐	
Deformed Growth	☐	
Visible Fungus *(Conk or other)*	☐	

Is there evidence of forest pests/diseases in your community forest?
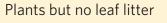
Yes / No *(Circle one)*

Not all insects, bacteria and fungi are harmful to the forest! Sometimes these organisms help turn dead material back into nutrients through decomposition.

Decomposers *(and other helpful insects!)* **live in leaf litter on the forest floor - take a look at your forest floor and choose the image below that best matches the ground in your community forest.**

Bare Soil	Plants but no leaf litter	25% leaf litter	50% leaf litter	100% leaf litter

EVIDENCE OF ANIMALS

ANIMAL EVIDENCE SCAVENGER HUNT

Alberta's forests are full of all kinds of different animals and each one plays their own unique role.

Look for evidence of animals that share your community forest. Check off the different types of evidence you find. Use the *animal tracks* guide to guess which animal left that evidence

Type of Evidence	Animal
☐ Footprints or Tracks	
☐ Scat *(poop)*	
☐ A nest	
☐ A lodge or dam	
☐ Holes dug in the ground	
☐ Holes in a tree	
☐ Scratched or stripped bark	
☐ Chewed Plants	
☐ Hair or Feathers	
☐ Bones	
☐ Hidden stash of cones or seeds	
☐ Bird calls	
☐ Insect sounds	
☐ Frog calls	
☐ Other	

Use the *Alberta Nature Guide* to select an animal.

In the area below draw a forest scene with evidence that your animal was there.

If you need inspiration look at the *Animal Tracks* Guide.

Think about the following things:

   -*How does your animal move?*

   -*Where does your animal hide?*

   -*What does your animal eat?*

   -*What clues does it leave behind?*

Show your forest scene to your friends.

Are they able to correctly guess which animal you have selected?

HUMAN USE OF THE LAND

Think about your community forest as a whole and all the different ways that plants, animals and people are interacting with each other.
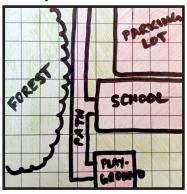
STEP 1

Draw a sketch of your community forest

STEP 2

Using 2 different coloured pencils to create an image of your forest that represents all of its parts.
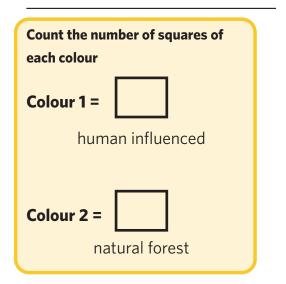
Example:

Colour 1 = the areas that are influenced by humans *(eg path, playgrounds, picnic area, soccer fields, buildings)*

Colour 2 = the natural areas *(grasses, trees, shrubs, water)*

Count the number of squares of each colour

Colour 1 = ☐

human influenced

Colour 2 = ☐

natural forest

Why would it be important to limit the amount of space influenced by humans in your community forest?

STEWARDSHIP REFLECTION

Why are forests important to you?

Think about the relationship between humans and the forest.
List 5 ways that humans rely on the forest:

_____

_____

_____

_____

_____

What can you do to care for your community forest?

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