

Planted in Place

A Big Day Out in the Schoolyard

Designed to be experienced in Autumn.
Incorporates the Grade 4 Alberta Programs of Study.
Easily adaptable to other seasons and grade levels.



Popcorn Thanksgiving

In an opening circle discussion, ask the students what they are grateful for and let them answer popcorn-style.
Introduce the theme of plants, emphasizing how plants are necessary for our survival.
Ask, "Who came first, people or plants?"

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Time Travel

Using the length of the school field, engage students in this large group activity, taking them through Earth's 4.6 billion-year-history. As they travel through time, they'll learn a variety of evolutionary events along the way.



3-7

Circle Discussion

Debrief the Time Travel activity asking, "what surprised you?"
Acknowledge the First Peoples of this land and learn the word for "Autumn" in the Îêthka (Stoney Nakoda) language.

8-9

Sit Spot

Invite students to take their journals to their sit spot.
Optional journal prompt:
"How are plants taking care of me?"



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Planted in Place

A Big Day Out in the Schoolyard, continued

Plant Stories

9-10

In small groups, students look for evidence of plant life in the schoolyard. They then work together to imagine and create a compelling story about the plant's life history.

Ice Sheet Retreat

In this large group activity, students create a map of Alberta using pylons in the school field. They then enter the map, their bodies representing the ice sheet that covered this area during the last ice age. As the ice melts, they retreat, leaving Alberta's vegetative regions behind.

10-15

Walk

15

Take a short walk around the schoolyard or into the community. Look for evidence of Alberta's different natural vegetative regions. What geographical region is best represented in your school community?



Talking Circle

15-16

Express gratitude for the ways plants care for us and for the variety of plants and natural regions here in Calgary. Pass around a talking stick and invite students to reflect on something that has been meaningful for them from the day's activities.

Planted in Place

Planted in Place is a full-day lesson plan that brings to life the natural vegetation regions of Alberta and connects students to the amazing world of plants. Bring your students outside for the day to lead them through a series of engaging large group, small group, and solo activities. Learn where plants fit in to Earth's evolutionary history, engage in imaginative storytelling, and gain appreciation for the diversity of Alberta's natural vegetative regions that are represented right here in Calgary.

Program Details

Grade Level: Created for Grade 4. Easily adapted for Grades 5 and 6.

Season: Autumn

Location: Outside, in the schoolyard

Potential Benefits and Skills:

- Connection to place
- Emotional wellness
- Creativity
- Understanding multiple perspectives
- Collaborative learning and teamwork
- Personal growth and well-being

Curriculum Connections to Alberta Programs of Study – Grade 4

- Social Studies
 - “Alberta: A Sense of the Land”
 - Students will demonstrate an understanding and appreciation of how elements of physical geography, climate, geology and paleontology are integral to the landscapes and environment of Alberta...
 - Students will value Alberta's physical geography and natural environment...
 - Students will examine, critically, the physical geography of Alberta by exploring and reflecting upon...:
 - What are the major geographical and natural vegetation regions, landforms and bodies of water in Alberta?...

- Students will analyze how Albertans interact with their environment by exploring and reflecting on:
 - In what ways do the physical geography and natural resources of a region determine the establishment of communities?...
 - The Stories, Histories and Peoples of Alberta...
 - Students will recognize the presence and influence of diverse Aboriginal peoples as inherent to Alberta's culture and identity....
 - Which First Nations originally inhabited the different areas of the province?" (Alberta Education, 2006, pp. 1-5).
- Science
 - "Plant Growth and Changes...
 - Recognize that a variety of plant communities can be found within the local area and that differences in plant communities are related to variations in the amount of light, water and other conditions...
 - Describe ways that various flowering plants can be propagated, including from seed, from cuttings, from bulbs and by runners...
 - Describe the care and growth of a plant that students have nurtured (Alberta Education, 1996b, pp. B.21-B.22).

Optional Pre-Program Activities

- Watch this [Deglaciation of North America](#) video on YouTube. It shows an animated representation of the ice sheets retreating from Alberta after the last ice age. The segment from 1:18-3:00 is particularly relevant.
- Download the [Stoney Mobile Dictionary](#) to your mobile device. Practice saying the following word in the Îethka (Stoney Nakoda) language:
 - Ptâ yedu (p-ta YAY-due): Autumn

Materials Needed

- Students' reflective/nature journals, writing utensils, and sit pads
- 7 pylons
- Map of Alberta (see PDF at the end of this document). Print 8 copies if doing student setup for *Ice Sheet Retreat*.
- An item that can be used as a talking stick for the final Talking Circle. See *Teacher's Guide*

Lesson Plan

Opening Circle Discussion

Popcorn Thanksgiving and Plants Discussion

- Ask the students what they are feeling grateful for today. Invite them to answer popcorn-style.
- In some Indigenous languages, the word for plant means “those who take care of us” (Kimmerer, 2013, p. 229)
 - Have you ever felt thankful for a plant?
 - What do you already know about plants?
 - They can make their own food from the sun! Can we?
 - They are producers
 - We need them to survive for food and oxygen
 - They quite literally take care of us!
- Who came first? People or plants? Let's do some time travel and see if we can figure this out.

Large Group Activity

Time Travel

A movement activity that helps students begin to grasp the timeline of Earth's evolutionary history. Students start together on one end of the school field: the starting line represents the beginning of time on Earth. Each running stride they take represents one hundred million years. A variety of different events in Earth's evolutionary history are noted.

Setup: Place a pylon, or other marker 46 running strides away from the starting line. This marker represents the present day. Alternately, you could use a soccer goal as a marker and count 46 running strides back from that.

- While you are setting set up, ask the students to run around, getting used to the idea of 1 running stride, 5 running strides, $\frac{1}{2}$ of a running stride, etc. - warming up for the time travel ahead. Once you have your marker set up and the students have warmed up, have students stand shoulder-to-shoulder at the starting line.
- Begin the activity: Time Travelers – are you ready to explore some of the major events that have happened here on planet Earth in the last 4.6 billion years? When did animals show up? Plants? Us? Where you are standing right now is at the beginning of Earth time. That pylon (or soccer post, or other marker you have placed 46 strides ahead) represents the present day. Each running stride you take represents 100 million years. That's a mind-boggling number! Where you are standing represents 4600

million years ago. Let's head in that direction, bit by bit, and find out how the story of planet Earth has unfolded up to now.

- I'm going to shout out a number and then say, "Go!" When I say, "Go!", that's your cue to run that number of strides toward the present moment. Once you've run that many strides you FREEZE. And I'll tell you what is happening in the story of Earth.
 - Ready? **2 running strides**. Go! Freeze
 - We've travelled 200 million years. The **oceans formed** 4400 million years ago. Ask one student to stay in place to represent oceans forming.
 - Ready? **5.5**. Go! Freeze
 - We've travelled another 550 million years. The **first simple forms of life** appeared about 3850 million years ago: microbes and cyanobacteria. Ask one student to stay in place to represent the first simple forms of life. Ask the student who represents oceans forming to call out: "Oceans!", ask the student who represents first life call out: "First life!".
 - Ready? **23.5**. Go! Freeze
 - **Oxygen begins to accumulate in Earth's atmosphere** about 1500 million years ago. About 2 billion years since the first forms of simple life appeared. Take 3 deep breaths and breathe in that oxygen! Ask one student to stay in place to represent the accumulation of oxygen in the atmosphere. Ask the student who represents oceans forming to call out: "Oceans!", ask the student who represents first life call out: "First life!", ask the student who represents oxygen to call out: "Oxygen!". *If the students representing oceans, first life, and oxygen are too far away to hear and be heard, you can invite them to come closer so they can continue to participate.*
 - Ready? **8**. Go! Freeze
 - The **first simple animals** evolved 700 million years ago. These were simple, single-celled animals. Ask one student to stay in place to represent the first animals. Ask the student who represents oceans forming to call out: "Oceans!", ask the student who represents first life call out: "First life!", ask the student who represents oxygen to call out: "Oxygen!". Ask the student who represents the first simple animals to call out: "First simple animals!"
 - Ready? **1.5**. Go! Freeze
 - The **first vertebrates** evolved 530 million years ago. These were fish. What is a vertebrate? Animals with backbones. Can you feel yours? Stretch your back nice and straight, then curve over into a forward bend. Ask one student to stay in place to

represent the first vertebrates. Ask the student who represents oceans forming to call out: "Oceans!", ask the student who represents first life call out: "First life!", ask the student who represents oxygen to call out: "Oxygen!". Ask the student who represents the first simple animals to call out: "First simple animals!". Ask the student who represents the first vertebrates to call out: "Fish!"

○ Ready? **1.5**. Go! Freeze

- The **land plants** evolved 400 million years ago. This was made possible by a barrier being formed in the atmosphere (ozone) to protect plants from harmful rays. Here is when plants appeared! Ask one student to stay in place to represent the first land plants. Ask the student who represents oceans forming to call out: "Oceans!", ask the student who represents first life call out: "First life!", ask the student who represents oxygen to call out: "Oxygen!". Ask the student who represents the first simple animals to call out: "First simple animals!". Ask the student who represents the first vertebrates to call out: "Fish!". Ask the student who represents the first land plants to call out: "Plants!"

○ Ready? **0.5**. Go! Freeze

- Once plants evolved, it only took another 50 million years for **land vertebrates** to evolve. They followed the plants! First were primitive amphibians and then reptiles. Everyone hop like a frog. Ask one student to stay in place to represent the first land vertebrates. Ask the student who represents oceans forming to call out: "Oceans!", ask the student who represents first life call out: "First life!", ask the student who represents oxygen to call out: "Oxygen!". Ask the student who represents the first simple animals to call out: "First simple animals!". Ask the student who represents the first vertebrates to call out: "Fish!". Ask the student who represents the first land plants to call out: "Plants!". Ask the student who represents the first land vertebrates to call out: "Land vertebrates!"

○ Ready? **1.25**. Go! Freeze

- It took another 125 million years for **dinosaurs** to evolve from the first land vertebrates. Ask one student to stay in place to represent the dinosaurs. Ask the student who represents oceans forming to call out: "Oceans!", ask the student who represents first life call out: "First life!", ask the student who represents oxygen to call out: "Oxygen!". Ask the student who represents the first simple animals to call out: "First simple animals!". Ask the student who represents the first vertebrates

to call out: "Fish!". Ask the student who represents the first land plants to call out: "Plants!". Ask the student who represents the first land vertebrates to call out: "Land vertebrates!". Ask the student who represents the first dinosaurs to call out: "Dinosaurs!".

o Ready? **1.5**. Go! Freeze

- **Dinosaurs** roamed the Earth for about 160 million years before they became **extinct**. After one or more meteorites struck planet Earth, earthquakes and volcanoes and tsunamis were set off that sent so much ash into the atmosphere that the sun was obscured. Plants could not produce food and whole food chains collapsed. Ask one student to stay in place to represent the extinction of the dinosaurs. Ask the student who represents oceans forming to call out: "Oceans!", ask the student who represents first life call out: "First life!", ask the student who represents oxygen to call out: "Oxygen!". Ask the student who represents the first simple animals to call out: "First simple animals!". Ask the student who represents the first vertebrates to call out: "Fish!". Ask the student who represents the first land plants to call out: "Plants!". Ask the student who represents the first land vertebrates to call out: "Land vertebrates!". Ask the student who represents the first dinosaurs to call out: "Dinosaurs!". Ask the student who represents the extinction of the dinosaurs to call out: "Extinct".

o Ready? **0.5**. Go! Freeze

- **The first modern humans** evolved about 130,000 years ago, around 65 million years after the dinosaurs became extinct. It took some time for life to rebound after the great extinction event of the dinosaurs. Plants were once again able to make energy from the sun, plants and animals evolved. Ask one student to stay in place to represent humans. Ask the student who represents oceans forming to call out: "Oceans!", ask the student who represents first life call out: "First life!", ask the student who represents oxygen to call out: "Oxygen!". Ask the student who represents the first simple animals to call out: "First simple animals!". Ask the student who represents the first vertebrates to call out: "Fish!". Ask the student who represents the first land plants to call out: "Plants!". Ask the student who represents the first land vertebrates to call out: "Land vertebrates!". Ask the student who represents the first dinosaurs to call out: "Dinosaurs!". Ask the student who represents the extinction of the dinosaurs to call out: "Extinct!". Ask the student who represents the extinction of the dinosaurs to call out: "Humans!".

- Ready? **0.001 (or one one-thousandth of a running stride)**. Go!
Freeze
 - This brings us to the **present day**. Ask all remaining students to represent present day. We live in a time where plants can take energy from the sun and create food. Plants and trees also make Oxygen for us to breathe. Let's go back to our original question. Who came first? Plants or people? Ask the student who represents oceans forming to call out: "Oceans!", ask the student who represents first life call out: "First life!", ask the student who represents oxygen to call out: "Oxygen!". Ask the student who represents the first simple animals to call out: "First simple animals!". Ask the student who represents the first vertebrates to call out: "Fish!". Ask the student who represents the first land plants to call out: "Plants!". Ask the student who represents the first land vertebrates to call out: "Land vertebrates!". Ask the student who represents the first dinosaurs to call out: "Dinosaurs!". Ask the student who represents the extinction of the dinosaurs to call out: "Extinct!". Ask the student who represents the extinction of the dinosaurs to call out: "Humans!". Ask the remaining students to call out: "Present Day!".

Figure 1: Time Travel Distance Table

Distance from start 1 running stride = 100 million years	Distance from previous marker	Geological event	When it happened Mya = Million years ago
0 running strides	0 m	Planet Earth formed	4600 mya
2 running strides	2 running strides	Oceans formed	4400 mya
7.5 running strides	5.5 running strides	First life appeared (microbes, cyanobacteria)	3850 mya
31 running strides	23.5 running strides	Oxygen begins to accumulate in atmosphere	1500 mya
39 running strides	8 running strides	The first animals evolved (simple single-celled)	700 mya
40.7 running strides	1.7* running strides	The first vertebrates evolved (fish)	530 mya
42 running strides	1.3* running strides	The first land plants evolved	400 mya
42.5 running strides	.5 running stride	The first land vertebrates evolved (amphibians)	350 mya
43.75 running strides	1.25 running strides	The first dinosaurs	225 mya
45.33 running strides	1.58* running strides	Extinction of dinosaurs (just after Rockies form)	65 mya
45.999 running strides	.669* running strides	First humans	130,000 ya
46 running strides	.001 running strides	Present day	

*For simplicity, these numbers have been rounded to the nearest 0.5 during the activity

1 running stride = 100 million years

1 running stride = approx. 1 metre

Adapted from Dynamic Earth Education (n.d.)

Circle Discussion

Activity Debrief

- Discussion questions:
 - What surprised you about the Time Travel activity?
- The story of Earth is long and full of dramatic stories. It turns out that no life can survive on its own. Animals could not survive without plants. Plants could not survive without the protective layer of ozone in the atmosphere. Animals could not have evolved on land until there were plants. Dinosaurs could not survive without plants being able to produce the food they needed. Today, we too rely on plants for life – they take care of us.

Land Acknowledgement and Îethka (Stoney Nakoda) Connections

- Let's take a moment to acknowledge that today we are learning on the traditional territory of several different communities.
 - Ask your students if they know whose traditional territory this is
 - If your students are prepared to offer their own land acknowledgement, invite one of them to do so here. If not, you can remind them that the land in Southern Alberta is the traditional territory of several different Indigenous communities, including the Îethka (Stoney Nakoda), the Niitsitapi (Blackfoot) and the Tsuut'ina. Alberta is also the traditional home of many Métis people.
 - Right now, we are experiencing autumn. The time of year when the days are getting cooler, and the plants are preparing for winter. Many trees and shrubs are dropping their leaves. In the Îethka, or Stoney Nakoda language, the term for autumn is "ptâ yedu" which means the 'evening of the seasons'. Let's say that together. "ptâ yedu" (p-ta YAY-due).
 - Why do you think autumn is the 'evening of the seasons'?
 - What do you think would be considered the 'nighttime of the seasons'? Winter? What about 'morning of the seasons'? Spring?
 - The Îethka people have lived in close relationship with this land for many thousands of years. Their language is a reflection of that close relationship.
- We've learned that in many Indigenous languages, the word for plants means, "those who take care of us". Do you think plants can take care of us and also act as our teachers?
- *Read this quote from Robin Wall Kimmerer:* "In Native ways of knowing, human people are often referred to as 'the younger brothers of Creation.' We say that humans have the least experience with how to live and thus the most to learn – we must look to our teachers among the other species for guidance. Their wisdom is apparent in the way they live. They teach us

by example. They've been on the earth far longer than we have been, and have had time to figure things out...Plants know how to make food and medicine from light and water, and then they give it away...The plants can tell us [Mother Earth's] story, we need to learn to listen" (Kimmerer, 2013, pp. 9-10).

Sit Spot

See the [Sit Spot Guide](#) on the Thimbleberry Learning Website

- Ask students to write the following prompt in their journals, "How are plants taking care of me?" Invite students to retreat to their sit spots while they reflect on this question, then write in their journals.

Small Group Activity

Plant stories

In small groups, students find evidence of plant life in the schoolyard, and work together to imagine and create a compelling story about its life history. They then return to the larger group and present their story.

- What makes a good story? What kinds of things make a story interesting to you? Think of some of your favourite books or movies.
 - Is there a hero?
 - Does everything go really smoothly for the hero?
 - Does the hero run into some difficulty or problem?
 - Does the hero have to prove themselves?
 - Does the hero overcome the difficulty or problem by the end?
- We love these kinds of stories. If you think back to your favourite books and movies, you'll probably start to notice this same pattern repeating itself in many of your favourites.
- You will now be divided into small groups. As a group, you will need to find some evidence of plant life here in the schoolyard. It could be a leaf, a blade of grass, a pinecone, a twig, etc. As a group you are going to sit in a circle and pass it around and generate ideas about its life story. What has this leaf, for example, been through? Right now, it's autumn. Think back through winter, spring, and summer and what kind of journey or adventure this leaf has been through. What has it overcome? Can you create a story based on what you notice about the object, as well as what you imagine?
 - Divide students into small groups
 - Give the students 5 minutes to find their evidence of plant life
 - Give the students 20 minutes to come up with a compelling story about it. To facilitate the co-creation of the story, the students can

- each come up with one line of the story and build on it as they pass the object around the circle.
 - Come back together and have each group present their story to the rest of the class
- Debrief:
 - Did the pattern of the hero having to overcome difficulty show up in any of the stories?
 - Can you see this pattern happening in nature?
 - In a tree as it passes through the seasons?
 - In a caterpillar as it transforms into a butterfly?
 - In a forest after it comes through a fire?
 - Can you think of any more?
 - Can you see this pattern happening in your own life?
 - It can be helpful for us to see that challenges and difficulties are a natural part of life for all of us. Watching how our heroes find their way out of difficulties can give us courage to do the same. What's even more encouraging, is to notice that their difficulties and challenges are often the very thing that make them stronger and transform them into the heroes they have become.

Large Group Activity

Ice Sheet Retreat

A large group activity that helps students learn about the different geographical regions of Alberta. An area of the school field is chosen to represent the province of Alberta. Students all start out the activity representing the ice sheet that covered most of the province during the last ice age. The teacher represents the passage of time and at intervals calls out, "Ice Sheet Retreat!" as well as instructions for how far to retreat, and what gets left behind. As the ice sheet retreats to the North, students stay behind in the different regions, becoming plant species from the Boreal Forest, Aspen Parkland, Prairie Grasslands, Foothills, Rocky Mountain, and Canadian Shield regions.

Setup

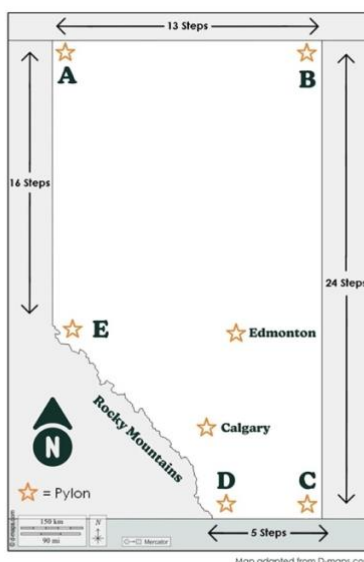
(Quick setup): Using pylons, or other markers, mark the boundaries of the area that will represent the province of Alberta, as well as its two major cities (see diagram below). On the eastern border, from south to north, set the pylons 24 steps apart. On the northern border, from east to west, set the 13 steps apart. The Western border, from the North, to the start of the Rockies is 16 steps apart. The Southern border, from east to west is 5 steps. Also place one pylon at the approximate locations of both Edmonton and Calgary.

(Student setup): Divide the students into 8 groups. Give each group a copy of the map of Alberta (see PDF at the end of this document). Each group, except the group representing the Rocky Mountains, will also need a pylon.

- Group A: NW corner
- Group B: NE corner
- Group C: SE corner
- Group D: SSW corner
- Group E: NSW corner
- Group 6: Edmonton
- Group 7: Calgary
- Group 8: Rocky Mountains (rather than a pylon, this group will use their bodies to represent the SW border of Alberta along the Rocky Mountains)

Orient the students toward North in the schoolyard. Invite Group A to lay down their pylon (ensuring there is enough space to the east and south to lay out the other pylons). At this point, you can invite each of the other groups to figure out where their pylons belong and work as a class to set up the entire map of Alberta. A simpler (although potentially less fun!) alternative is to invite groups one at a time to add their marker to the schoolyard map of Alberta.

Alberta



Play

Once the map is set up, invite students to gather in for instructions.

Point out the pylons that have been set out, and what they represent. Orient them toward the four directions, the Rocky Mountain border, as well as to the two major cities, Calgary and Edmonton.

Explain:

- During the last ice age, this entire region was covered in ice
- About 15,000 years ago, all that ice started to move out – or retreat – toward where the Northwest Territories are now. Different kinds of plants grew in the soil that was left behind.
- At the start of this activity, you are all going to represent this ice sheet. As the ice sheet retreats north, different geographical regions and bodies of water are left behind.
- During the course of this activity, you will become different types of plants and trees across the province. Each tree or other plant has a corresponding action. Let's practice:
 - **Prairie Grasses:** kneel on the ground, arms swaying above
 - **Coniferous Trees:** standing, hands above head, fingers meeting in an upside-down "V" shape
 - **Deciduous Trees:** standing, arms swaying above
 - **Wildflowers:** crouch on the ground
 - **Sphagnum moss, lichen:** Lie on the ground

Invite students to spread out across the entire province. You, representing the passing of time, will stand on the southern border, facing the students.

Now that students know the different plant types of plants they may become during this activity, remind them that they are all starting out as ice. Invite them to act out shivering cold again.

Tell students that you represent the passing of time. During this activity you will call out "Ice Sheet Retreat!" and start walking northward into the province. All of the students will have to retreat as you approach (walking backward) as you walk forward. After each retreat, you will call out instructions, letting them know what is being left behind as the ice sheet retreats.

1. *Call out: "Ice sheet retreat!"* and take 3 steps forward (all students in your path will need to take 3 steps backward).
Instructions: "Boreal forest trees love the cold, wet land left in the wake of the ice sheets. I need 4 Boreal Forest Trees to come and stand between me and the rest of the ice sheet, still facing me."

3 of the Boreal Forest trees are coniferous with hands over head in upside-down “v” shape, and one is deciduous with arms swaying overhead. For extra learning you can identify them as 2 Black Spruce (coniferous), 1 Jack Pine (coniferous), and 1 White Birch (deciduous).

2. **Call out: “Ice sheet retreat!”** and take 2 steps forward (all students in your path, including the 2 Boreal Forest Trees will need to take 2 steps backward).

Instructions: “Did you know trees can walk? Well, not exactly! But over the course of hundreds and thousands of years, as conditions change, trees “move” across the region. The **Foothills** are an in-between area where the Boreal Forest meets the Rocky Mountains. There is a wide variety of plants and animals in the Foothills. I need **3 Foothills Trees** to come and stand here in the west (to your left) and **stay put** as the ice sheet continues to retreat North.

2 of the Foothills Trees are coniferous with hands over head in upside-down “v” shape, and one is deciduous with arms swaying overhead. For extra learning you can identify them as White Spruce (coniferous), Lodgepole Pine (coniferous), and Balsam Poplar (deciduous).

3. **Call out: “Ice sheet retreat!”** and take 3 steps forward (all students in your path, including the 3 Boreal Forest Trees will need to take 3 steps backward). The Foothills Trees stay put.

Instructions: “The **Aspen Parkland** is not as wet and cool as up in the Boreal Forest, next to the ice sheet. The Aspen Parkland is home to, you guessed it, aspen trees, as well as poplar and some open grassy areas too. I need **3 Aspen Parkland Trees** to come and stand here in the east (to your right), just South and East of the Edmonton pylon. They will **stay put** as the ice sheet continues to retreat North.

All 3 of the Aspen Parkland Trees are deciduous with arms swaying overhead. They are all aspen trees (deciduous).

4. **Call out: “Ice sheet retreat!”** and take 2 steps forward (all students in your path, including the 3 Boreal Forest trees will need to take 2 steps backward). The Foothills and Aspen Parkland Trees stay put.

Instructions: “As we climb out of the Foothills, we get into the **Rocky Mountain** Region. Some of the plants in the Rockies would have survived in places that were protected or not covered by the ice sheets. Just like in the Foothills, there are Spruce and Pine trees in the Rockies, but as you go higher, you have special species not found elsewhere in Alberta. Some examples are Limber Pine, an endangered species, which can live for 1000 years, and Engelmann spruce. If you keep climbing higher and higher in the mountains, you go above the treeline and the mountains are carpeted in beautiful alpine meadows in the summer. I need **3 Rocky Mountain Species** to come and stand here in the west (to your left, and to the west and north of the Foothills trees). They will **stay put** as the ice sheet continues to retreat North.

2 of the Rocky Mountain species are coniferous with arms over head in an upside-down “v” shape. 1 of the Rocky Mountain species represents the alpine meadows, and will crouch close to the ground. For extra learning you can identify them as Limber Pine (coniferous), Engelmann Spruce (coniferous), and Rock Jasmine (alpine meadow wildflower).

5. **Call out: “Ice sheet retreat!”** and take 2 steps forward (all students in your path, including the 3 Boreal Forest trees will need to take 2 steps backward). The Foothills, Aspen Parkland, and Rocky Mountain species stay put.

Instructions: “Let’s review what’s happened so far. The Boreal Forest is following along the retreating glacier. It’s loving the cold, wet soils left behind. All of the Boreal Forest trees, remind us who you are by swaying in the wind. Next we had the Foothills trees left behind – sway in the wind you Foothills trees! Then there were the aspens of the Aspen Parkland in the east. Sway in the wind, Aspen Parkland trees! Then the species of the Rocky Mountains. Sway in the wind Rocky Mountain species!

Now we come to the **Prairie Grassland** region. As the ice sheet retreats and thousands of years go by, the region down in the southern part of Alberta begins to dry out. It becomes populated by aspens and prairie grasses and wildflowers. I need **3 Prairie Grassland Species** to go back to the south end of the province. They will **stay put** as the ice sheet continues to retreat North.

2 of the Prairie Grassland species are grasses, kneeling on the ground with arms swaying above. 1 is a wildflower, crouching near the ground. For extra learning you can identify them as Rough Fescue (grass), Sweetgrass (grass), and Wild Rose (wildflower).

6. **Call out: “Ice sheet retreat!”** Take 12 steps forward and invite the Boreal Forest trees to come with you this time. Leave one of them behind for every 3 steps that you take. (All remaining students in your path will need to take 12 steps backward). The Foothills, Aspen Parkland, Rocky Mountain, and Prairie Grassland species stay put.

Instructions: “Way up here in the northeastern corner of Alberta, where the Boreal Forest ends, we have the **Canadian Shield**. Lots of it is covered by water. There are some trees and other vegetation too, including lichen, sphagnum moss, and some trees. I need **2 Canadian Shield Species** stay here in the Northeast corner of the province.

1 of the Canadian Shield species is Sphagnum moss, the other is lichen, both lying down on the ground.

7. **Explain:** “The ice sheet has completely retreated from the region we now call Alberta. The Boreal Forest covers most of Alberta, as well as land across the rest of Canada, Europe, and Russia too – a Boreal forest band across the globe.”

Have all of the students stay put where they are. Walk down to the pylon, or other marker that represents Calgary.

Explain, “Calgary is a very special and unique place in the province. We’re where the Prairies meet the Foothills. We border on some Aspen Parkland, and there’s even a bit of Boreal Forest that sneaks down into our area. We have such a rich variety of vegetation and geography right here in our city and in the surrounding areas. That variety also means we have a lot of interesting animals, including over 300 species of birds that come through here over the course of a year.”

To show the variety of geography we have here in Calgary, invite 1 Boreal tree, 2 Aspen Parkland trees, 2 Foothills trees, and 2 Prairie Grassland species to come mingle with you in the Calgary area.

Circle Discussion

Ice Sheet Retreat Debrief

- What surprised you about the Ice Sheet Retreat activity?
 - Did you know the boreal forest covered such a huge part of Alberta? Just as it does a huge part of the Northern hemisphere.
 - If you could travel to any part of Alberta, where would it be?
 - We are very fortunate to live in Calgary where we have such a large diversity of landscapes, vegetation, and animal life. Aside from the native vegetation that grows here, the City of Calgary has made it a priority to plant many, many trees throughout the city. There are many more trees here today than were here in the past.
 - The traditional territory of the Îlethka people stretched deep into the Rocky Mountains, all along the Foothills and across the Prairie Grasslands. Today most Îlethka people live on three different reserves in the Foothills – the biggest one is in Morley. If you drive from Calgary to the mountains, you will see, and can visit, the Chiniki Cultural Centre which has displays about their history and language. The Rocky Mountains are a sacred place for the Îlethka people.

Walk

Take a short walk around your schoolyard, or into the community if you are able. Look for evidence of the different natural vegetation regions in or near the schoolyard. What geographical region is best represented in your school community? Prairie Grassland? Aspen Parkland? Foothills? Boreal Forest?

Closing Talking Circle

- Express gratitude for the way plants care for us and for the variety of plants and natural regions that are represented in Calgary. Each species is

unique. The diversity of plants we have here contribute to our communities and make Calgary a beautiful place to live.

- Pass around the talking stick and invite students to reflect on something that has been meaningful to them from the day's activities. Some prompts could include:
 - What is one piece of learning you will take with you from today?
 - What surprised you about plants?
 - How can plants be our teachers?

Post-program Activities

Large Group Activity

Bulb Planting

Fall is a great time to plant bulbs that will flower in the spring! There are a variety of bulbs available in the fall, including tulips, daffodils, crocuses, anemones, and alliums. These will bring some welcome colour to the schoolyard after a long Calgary winter. Students will learn about the life cycle of flowering bulbs and will be delighted to see the beautiful results. The best time to plant is 6 weeks before the ground freezes, but anytime in the fall will work. Don't worry if there is snow on the ground, you can simply shovel it aside.

Caring for bulbs/Bulb life cycle.

We plant bulbs in the fall so that they can begin to grow roots deep into the soil. This will allow them to get the nutrients and water that they need to survive the winter and to bloom in the spring. Although dormant, the bulbs are still alive underground, waiting for the conditions to allow them to grow and bloom. When the days start to get longer and the temperatures rise, the bulbs will send their green stems skyward. The long-awaited flower will bloom and brighten your early spring days. After a few weeks the bloom will begin to fade away, but the stem and leaves will remain green. At this point, the plant is continuing to send nutrients down into the bulb, resourcing it for the winter ahead. Be sure to allow the stems and leaves to wilt and turn yellow before cutting them back. The bulb's life cycle continues through summer and fall. Even though there is no longer visible life above ground, the bulb is still alive underground and growing new roots.

Connecting to bulbs as models of resiliency.

For more background on these concepts, see [The Butterfly Cycle](#) on the [Our Framework](#) page on our [website](#).

Planting bulbs offers your students a hands-on, visceral experience that will help them connect to seasons and cycles. Just as the caterpillar spends time in chrysalis, the bulb spends time underground in darkness. These periods of seeming dormancy or difficulty result in a marvellous transformation.

During the winter, when challenges in learning arise, take the opportunity to connect back to the bulb you planted, which is establishing roots underground. Working through challenging concepts in math, for example, or struggling with writing, can feel quite difficult for some students. They may see their mistakes as an indication of their incompetence, rather than an important and crucial part of the learning process. Can you encourage your students to stay with their difficulties and challenges in learning, just as the bulb underground is in darkness? Even though the bulbs you planted are not showing results in this season, they are creating the conditions necessary to bloom again in Spring. So

much of the learning process involves struggle and challenge; recognizing that these are a necessary part of the process can help build resilience.

As a visual in-class reminder of the bulb's life cycle, you can adapt the *Desktop Butterfly Cycle* from the [My Butterfly Teacher](#) resource. Instead of depicting the life cycle of a butterfly, you can substitute these four stages of the life cycle of a bulb: (1) wilting stems (2) bulb underground in winter (3) new stems emerging in spring (4) flowers producing seeds. Students can then, as with the *Desktop Butterfly Cycle*, map their own experiences in life and learning to the life cycle of a flower bulb.

Individual Project

Getting to Know a Tree in your Community

Most of the land that Calgary sits on today is part of the Prairie Grassland ecosystem. Trees were traditionally found only near rivers, ponds, creeks, and streams. Many of the trees in the Calgary area today have been planted by the City in an effort to create a beautiful urban canopy. Some of these trees are native to Alberta, while some are cultivated species that are native to other areas.

Take students into the schoolyard, or into the community. Have each of them choose one tree to connect to. Before going back inside the school to learn more about the tree, spend time sketching the tree, noticing details in the bark, branches, and leaves/needles. How does the tree smell? How does it feel to the touch? Is the bark rough or smooth? What is the shape of the leaves/needles? Using their reflective journals, students can describe their experience of the tree.

Back inside the classroom, students can learn more about their tree by finding it on the City of Calgary Tree Map:

- Enter the address of your school into the [City of Calgary Tree Map website](#)
- Each coloured circle on the map represents a tree that has been planted by the City. Click on a circle to find out the tree's species and size.

It may take multiple explorations back to the community or schoolyard to determine which tree on the map is the tree they are studying. By the end of this project, students should be able to answer:

- What is the tree's species?
- Is this species native to Alberta?
 - If so, in which natural vegetative region can this type of tree be found? What is the best kind of habitat for this tree?
 - If not, why do you think the City chose to plant this species?

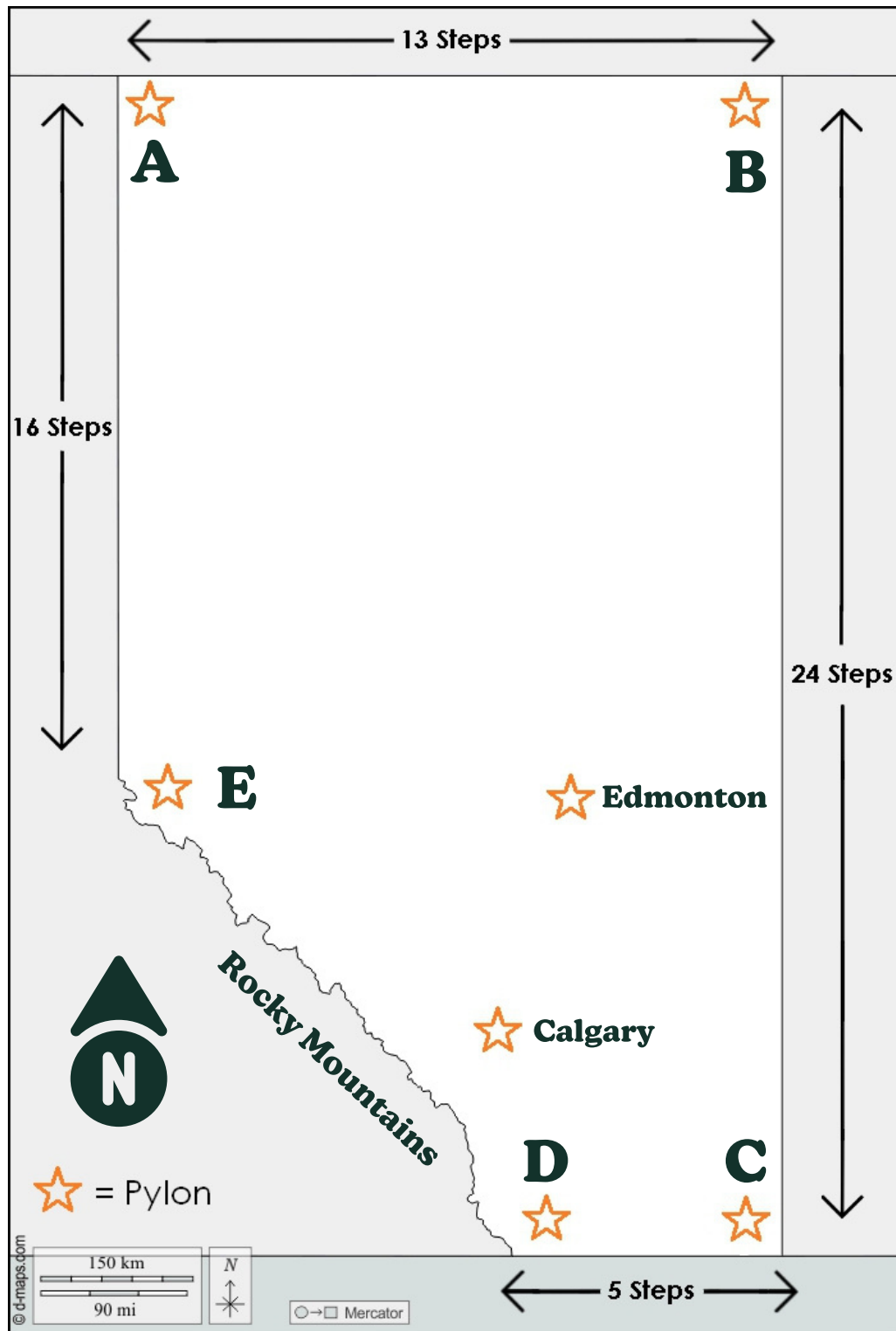
Have each student create a poster about their tree that they can present to the rest of the class. The poster can include insights from their reflective journals, drawings, as well as information learned through internet research.

Inside Education's [Guide to the Common Native Trees & Shrubs of Alberta](#) (Inkpen & Van Eyk, 2018) is an excellent resource for studying native trees.

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Alberta



Map adapted from D-maps.com