

Introduction to the Plant Arc



Indigenous Storywork – Opening Stories

We ground our learning by opening with story. As Indigenous peoples, our stories tell of our observations and hold vast amounts of scientific knowledge as well as traditional teachings and values. Here we offer two plant stories -- one Anishinaabe story from the Great Lakes and one Samish story from the Pacific Northwest. As you engage in these activities, you might refer back to these stories to inform your understanding. We also encourage you to draw on other stories that you know.

- ◇ [Anishinaabe maple sugar story](#) (first 7 minutes)
- ◇ [Samish Story: Grandmother Cedar](#)

Indigenous Science - Overview

Since time immemorial, Indigenous peoples have learned about the world through our relationships. Plant knowledge in particular has always been central to Indigenous lifeways. We learn from plants through our experiences with them whether it be harvesting medicines, growing food in a garden, or simply paying attention to what grows around us. The plant activities are meant to support this kind of experiential and relational learning. You will be prompted to look closely, reflect using all of your senses, and wonder about big ideas as a family.

Arc Gifts and Teachings

ISTEAM is firmly grounded in the teaching that plants are our first teachers. Paying close attention to plant life helps us build stronger relationships with lands and waters, and deepens our place-based knowledge. Plants play important roles within ecosystems so learning from plants teaches us about the many beings that plants are in relation to and about the ecosystems as a whole. Plants can also teach us how to live a good life in harmony with our environment, such as how to care for and respect those around us or how to thrive in difficult conditions.

Our Gift – Our Indigenous Pedagogy

- ◇ We hope these plant activities help you and your family:
 - ◇ Strengthen your **relations** with plant relatives and gain a deeper understanding of the web of relations around you. Consider how you are connected to that web. What are different relations that you have? What does it mean to be in relation with someone or something?
 - ◇ Think deeply about the **roles** you have in this place and how they are interdependent with the roles of other living beings. What would happen if someone forgot their role? How might these roles shift over time?
 - ◇ Reflect on what **responsibilities** you and others have to plant relatives and the place you're in. What are everyday decisions that you and others can

make to support health and wellbeing for others? Why are these responsibilities important?

- ◇ Learn more about **gifts** you have to offer others and also what gifts plant relatives bring to this place. Cycles of gift giving and receiving are present throughout the natural world. What gifts do you have to offer plants? What gifts do they have to offer you and other animals?

Indigenous Observing and Activities by Season

Indigenous peoples have always adapted their living to the changing of the seasons. While ISTEAM typically takes place in the summer, the majority of these activities can be done in any season. We hope that you engage with these activities over the course of the year. Observing changes throughout the seasons can deepen your relationships with and understanding of the place around you. This is especially true for plant life. You might start paying attention to a plant in the Summer and learn how it adapts going into the Fall, Winter and Spring. In addition to seasonal changes we also encourage you to think about and observe changes from year to year. Ask children to consider what this place was like 100 years ago, and what it will be like 100 years in the future.

Relationships with Other Arcs

An important component of Indigenous science is the understanding that all things are related. Nothing exists in isolation and so we hope that you engage with these different activities holistically rather than viewing them as separate from each other. As you engage in the plant activities, think of them in relation to water, birds, and food activities. You might combine multiple activities.

- ◇ Water: Plant relatives have special relationships with water as the health of one is tied to the health of the other. Plants depend on the right water conditions and are made up of water. Conversely, many bodies of water depend on plants as food for inhabitants, filtration and plant roots to keep embankments in place.
- ◇ Plant and bird relatives are dependent on one another. Birds rely on plants for things such as food, nesting and cover from predators while plants rely on birds for spreading seeds, eating insects and limiting the spread of other plants.
- ◇ Food Sovereignty: Plant relatives are vital to food sovereignty across communities. Not only are plants important staples to any Indigenous diet (corn, wild rice, berries, camas etc.) they also support healthy ecosystems for fish and game. As plants nourish humans and other beings what are things that we can do to nourish them?

Visioning our futures

How might climate change bring about new sets of relations for our food, plant, bird and water relatives? Because plants have always been our first teachers, it makes sense to look to them when thinking about our futures. Consider how plant relatives support other plant and animal communities. For example, strawberries offer fruit to birds, deer, bears, humans and other animals. The recipients of these gifts help spread seeds so that strawberries continue to grow. What do plants teach us about how to be in relation with other communities? Black and Indigenous communities both have gifts to offer and

contribute to each other's thriving. Our relationships with invasive species, introduced species and migrating native species can tell us a lot about how we can adapt to our rapidly changing world. According to people of the Salish Sea, Nettle taught us how to be strong and resilient in times of fear and change. Practicing deep and meaningful observations of our plant relatives and their relationships with other species and kinds will give us guidance. It is also our responsibility to develop an understanding of our changing ecosystems and listen closely to what our relatives need. It may be that sometimes they need us to help them thrive and adapt.

Activities

Plant activities can be completed in any order and in many different places. If your family is particularly interested in an activity, do it again in another place or at another time! We encourage you to involve the whole family in the activities and share what you've done with family and friends nearby or in other communities.

Walking Land: Each One, Teach One



Activity Purpose

Since time immemorial, Native and Indigenous people have learned about the world through relationships. Each one of us has special knowledge and gifts that we use to teach others. This activity involves collaborative teaching and learning with plant relatives.



Activity Overview

- ◇ Get to know a plant relative by going on walks and making visits to where it grows. You might use the plant cards or the other activities to guide learning.
- ◇ Now that you are a knowledge carrier for that plant, pass that knowledge on to someone else! You might teach someone you live with, a group of friends, or call someone that lives far away. Tell about how you came to know the plant relative, the plant's life cycle and how it changes through the seasons. Where do you find it? What kind of habitat does it like and why? How do you identify it? What gifts does it have to offer different plants, humans and other animals?
- ◇ Now it's time to learn from others! Ask the other person(s) if they have anything to teach. If you're in a group, go around and have everyone else teach about their plant relative.

Roles, Relations, Responsibilities & Gifts

- ◇ Think about what you know in relation to what others know. We don't need to know everything on our own because we all carry different kinds of knowledge and can learn from each other.
- ◇ What is your role as a knowledge carrier? Discuss your responsibilities to plant relatives and other humans.
- ◇ Think of your knowledge as a gift that you give and receive from others. You receive gifts from plant relatives and can pass them on.
- ◇ Teaching facilitates relationships. You are introducing others to your plant relative so they can have their own relationship with it.

Learning Across Generations & with Other Families

- ◇ Take time to hear the ideas from everyone in your family. What do you learn from each other? What are the different perspectives the youngest children bring? And the oldest?
- ◇ While learning in person is ideal, doing the activity virtually is a good opportunity to learn about plants from other climates.

Making Connections with Stories

- ◇ Do you have any tribal or family stories to share about a plant? Ask an Elder if they have stories to share.
- ◇ Story is a great way to teach about our plant relatives! Consider telling a story about the plant or your relationship to it. Ask children to consider their roles as storytellers about that plant.

Supporting Learning & Wellbeing

- ◇ This activity works best outside where plants are alive and present. If you're in a group, walk to the different plants where everyone takes turns teaching. If you can't physically be with others, you might use video chat.
- ◇ The best kind of learning happens when we teach from our own experiences. Use phrases like, "I noticed that..", "this is how I know..." and "my auntie told me that.."
- ◇ It can be helpful to start the activity by talking about big ideas. When everyone is finished, discuss what you all learned and revisit the big ideas. Bookending in this way can make the big ideas come through more clearly.
- ◇ Give the learners time to ask questions that they might have. Some questions might not have easy answers. These are the best questions because they lead to more learning for everyone!
- ◇ Remember that everyone is still learning. The plant teacher doesn't need to know everything about the plant.

Making Relations with Lands & Waters

- ◇ This activity strengthens relationships among family, friends and community. It also strengthens your collective relationship with land. What are things that you can do collectively to continue building your relationships with land and with one another?

Decolonization, Resurgence & Good Relations

One of the big goals of this activity is to help us think about how we learn and where our knowledge comes from. Colonization started the idea that learning primarily happens in school. This activity disrupts that idea by holding that we learn collaboratively with our plant and human relatives.

Thinking Seasonally & Relationally Using Plant Cards



Activity Purpose

Since time immemorial, Native and Indigenous people have learned about the world through our relationships with plants. This activity involves learning about the seasonal cycles and relationships of plants. Attending to the seasonal and relational aspects of plant life is central to Indigenous ways of being.



Activity Overview

- ◇ Go outside and find a plant, or several plants, to learn about. You might pre-select a plant for your family to find, or learn about whatever plant(s) reveal themselves on your walk.
- ◇ Use the cards as a resource for discussing the seasonal cycles of the plant (front side) and what the plant is in relation to (back side). Your family can read the cards before you go outside, as you walk, or as you make observations.

Roles, Relations, Responsibilities & Gifts

- ◇ Consider how paying attention to seasonal changes and the web of relationships around you strengthens your relationship to place.
- ◇ How does this plant's roles and relations change throughout the year? How do our roles and relations change throughout the year? Consider the differences between seasons.
- ◇ How do the plants' relations change, and what new relations is the plant making as lands and waters change?
- ◇ What gifts does this plant offer? And what gifts can we offer in return? Does this change with the seasons?
- ◇ How do humans adapt with the seasons? Are there similarities in the way that humans and plants respond to seasonal cycles?

Learning Across Generations & with Other Families

- ◇ Take time to hear the ideas from everyone in your family. What do you learn from each other? What are the different perspectives the youngest children bring? And the oldest?
- ◇ Check in with community members and physically distant relatives. What changes have they been noticing?

Making Connections with Stories

- ◇ Are there seasonally specific stories that your tribe has? Is there a special memory that you or your family have of a certain season? Talk to your elders and see what stories they have about plants and seasons.
- ◇ How can we think of the seasons as different stages in a story? Craft a narrative that explains or describes seasonal changes within this place and with particular plants. Get creative!

Supporting Learning & Wellbeing

- ◇ Use the plant cards as a tool rather than the focus of the learning. It's better to get close and perceive the plant with all of your senses than read about it from a distance. Ask yourself, "is this activity place-specific or is it something that can be done from my kitchen table?"
- ◇ Pay attention to patterns. We learn from land by paying close attention to the patterns that exist. What do you notice over time?
- ◇ Big wondering questions make for better learning opportunities than known-answer questions.
- ◇ Use "how" and "why" questions to talk about plants. Consider how plants were a long time ago and how they will be far into the future.
- ◇ Questions you don't know the answer to are great learning opportunities! Discuss different possibilities, talk with friends and family or look to other resources to learn more.

Making Relations with Lands & Waters

- ◇ Remember wherever you are, you are in an ecosystem and on Native land. If you are in a new place, learn which tribal nation communities are nearby or have homelands in that place.
- ◇ Take the perspective of plants. What might plants be feeling in different seasons and how might that explain the way they act across time?

Decolonization, Resurgence & Good Relations

Plant knowledge has always been central to Indigenous ways of living, and our land-based practices shift with the seasons. Resurgence involves going back to these seasonally specific practices. For example, as part of the food sovereignty movement, many tribes are resurging their seasonal harvesting practices. For example, Ojibwe and other woodland tribal communities are continuing maple-tapping. Consider how you can be a part of these resurgent efforts. It could be as simple as paying attention to seasonal changes, or starting a small garden.

Are there factors that make it more difficult to engage in seasonal traditions? What might these challenges be and what are ways for us to overcome them?



Plants

Learning About “Weeds,” “Invasive Species” or Plants That Have Lost Their Original Relationships



Activity Purpose

Some plants have lost their connection to the place they’re from leading them to be categorized as “weeds” or “invasive species.” This activity involves learning about those plants, their impact on their environment, and how we might think about them.



Activity Overview

- ◇ Go on a walk. As you walk, you may come across some plants that are considered “weeds” or “invasive.” These are plants that may not originally be from the area and tend to grow excessively, crowding out other plants.
 - ◇ Dandelions, buckthorn, garlic mustard, poison hemlock are common examples
- ◇ Pay attention to those plants and how they grow in that place. Are there a lot of them or a little? Do other plants grow with and around these plants? How do you think these plants interact with their surroundings (other plants, animals, the soil etc.)? How do these plants affect the health or balance of this place?
- ◇ Consider how these plants got here and why they are the way they are in this place. Many “invasive” plants migrated or were brought from another ecosystem where they were part of a balanced ecosystem. Is it the plants’ fault that they’re here or that the conditions in this place allow them to grow excessively?

Roles, Relations, Responsibilities & Gifts

- ◇ As you discuss these plants, try to frame them in terms of their relationships. Instead of using terms like “weed” or “invasive” you might call them plants that have lost their original relationships.
- ◇ Consider that many of these plants have gifts that humans forgot about, and some gifts that might not be useful for other plants and animals in this area. For example, garlic mustard was widely used as food by people in Europe, but when it was brought to Turtle Island humans forgot about it. Insects and other animals here don’t like to eat garlic mustard so it grows unchecked, disrupting the growth of Indigenous plants.
- ◇ What role does this plant play in this place? How might that differ from the role it plays in its homeland?
- ◇ Consider how these plants might disrupt the roles, relations, responsibilities and gifts of other plants. What are the rippling effects of this interference?

Learning Across Generations & with Other Families

- ◇ Take time to hear the ideas from everyone in your family. What do you learn from each other? What are the different perspectives the youngest children bring? And the oldest?
- ◇ Check in with friends and family who live far away. Do they have the same plants near them?

Supporting Learning & Wellbeing

- ◇ What can we learn about this plant on how (or how not) to adapt to new places and be a good neighbor?
- ◇ Are there specific places where you find this plant? Near water? Near other plants? Why is that?
- ◇ You might learn more about the plant relative by asking someone about it or researching it online.
- ◇ Use “how” and “why” questions to talk about plants. Consider what these plants were like a long time ago and what they will be like in the future.

Making Connections with Stories

- ◇ What stories will be told about this time and place 100 years from now? Ask children to consider what stories they will tell when they are elders.
- ◇ Get creative and make a story that describes the journey of this plant. What does this story teach us about healthy relationships with place and with others?

Making Relations with Lands & Waters

- ◇ Take the perspective of plants. What might they be thinking or feeling about being in this place? What might other plants think about their new neighbors?
- ◇ What are things that you can do to contribute to more healthy plant relationships in this place? You might get involved in restoration efforts near you.

Decolonization, Resurgence & Good Relations

Discuss changes in the land that have come about due to colonization and what we can do to address them.

Consider the terms “weed” and “invasive.” Where do these terms come from and what do they suggest about plants? Ask your elders for teachings about these plants.

Walking Land: Nurturing Relationships with Plant Relatives



Activity Purpose

Since time immemorial, Native and Indigenous people have learned about the world through our relationships. This activity involves revisiting a plant relative and strengthening your relationship with it.



Activity Overview

- ◇ Go on a walk to visit a particular plant that you have visited before. This might be a plant you learned about from the Making Plant Relatives activity or any other plant that you know about. It doesn't matter if it's your second time visiting or the hundredth time. The more time you spend with a plant relative the better!
- ◇ Visit with the plant relative, you may share tobacco, water or a story. Is anything different since the last time you were here? Do you notice anything that you didn't notice last time?
- ◇ You might add to the blank relatives template as you learn more and more about the plant relative over time.

Roles, Relations, Responsibilities & Gifts

- ◇ Think of your visit with this plant the same way you would visit an old friend or a family member. Visiting supports healthy relationships with plant and human relatives alike. You can talk with the plant about what you notice, or listen and consider what the plant is noticing.
- ◇ As you pay attention to plants over time, you get to know them better. You might feel a new sense of care, responsibility, or gratitude as you learn more about a particular plant relative.
- ◇ What is this plant's role in the surrounding ecosystem? Does that role change over time?
 - ◇ An oak tree might provide shade for undergrowth in the summer, but have a different role in the fall.
 - ◇ How might the plant change or have different roles as it grows older?
- ◇ Does the plant have certain gifts to offer that it might not have had, or we didn't notice last time? What gifts can we offer in return?

Learning Across Generations & with Other Families

- ◇ Take time to hear the ideas from everyone in your family. What do you learn from each other? What are the different perspectives the youngest children bring? And the oldest?
- ◇ Check in with community members and physically distant relatives. Tell them about your plant relative and ask if they have any plant relatives they'd like to tell you about.

Supporting Learning & Wellbeing

- ◇ It can be helpful to start the walk by talking about big ideas. Talk about what your last visit was like and discuss what you expect during this visit. Once the walk is finished discuss what you learned and revisit the big ideas. Bookending the walk in this way can make the big ideas come through more clearly.
- ◇ Pay attention to patterns. We learn from land by paying close attention to the patterns that exist. You might notice more of these patterns as you visit the same plant over time.
- ◇ As you revisit a plant over time, you might notice different details. Zoom in and pay attention to smaller details. Zoom out and pay attention to what's around, below, or above the plant.

Making Connections with Stories

- ◇ Make connections to tribal, family and personal stories. Ask your elders if they have a special relationship with a particular plant.
- ◇ Tell the story of your relationship with this plant. Think of your role as a storyteller and what teachings and knowledge you can pass on to others.

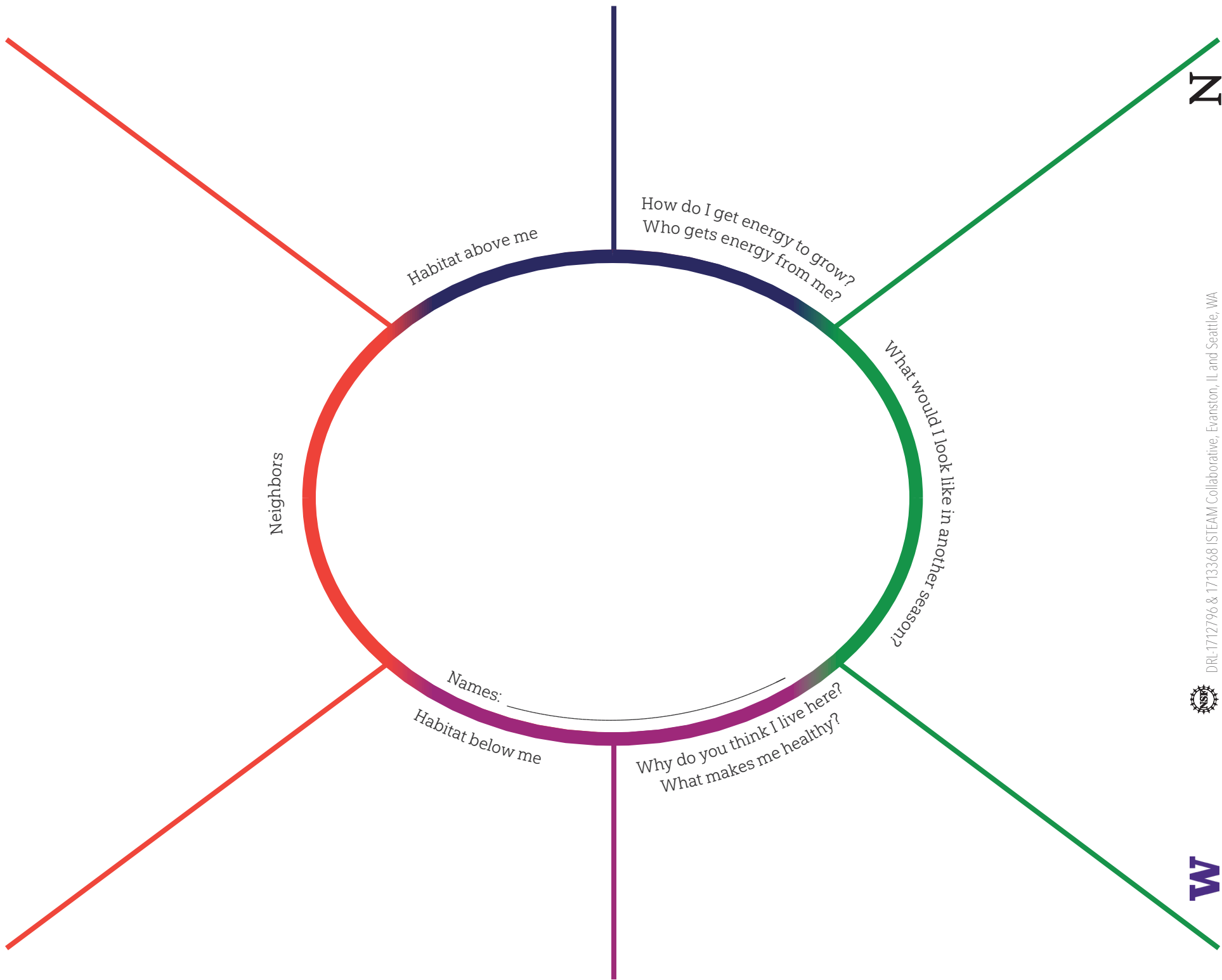
Making Relations with Lands & Waters

- ◇ Consider what this place was like a long time ago. What may it be like one hundred years from now?
- ◇ Consider ways that you can strengthen relations with your plant relative. What can you do each day to help the plant grow and thrive?
- ◇ Take the perspective of your plant relative. What are the experiences of this plant over time? Is the plant happy to have you visit?

Decolonization, Resurgence & Good Relations

We have always learned through walking land with family and community. Getting to know plant relatives continues these traditions and leads us towards a better future.

Some humans have made decisions that have made it harder to be in good relations with plants. What decisions can we make to nurture healthy relationships with plants?



A Closer Look

<u>Leaf</u>	<u>Bark/Stalk</u>	<u>Seed/Cone/Flower</u>
<u>New Growth</u>	<u>Adult Plant</u>	<u>Life Cycle</u>

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Walking Land: Making Plant Relatives



Activity Purpose

Since time immemorial, Native and Indigenous peoples have learned about the world through our relationships. One way to make relationships is by paying close attention. This activity involves building relationships with plant relatives by going on a walk.



Activity Overview

- ◇ Go on a walk (it can be in your neighborhood, at a park, your yard, or any place with plant life). As you walk, talk about the place you're in. What do you notice?
- ◇ Stop to perceive plant life that you notice. What are some interesting details that you notice about the plant? Consider how the plant smells and what colors you see. Do you know things about this plant and how it relates to other plants, humans and other animals? What else is near the plant?
- ◇ You can use the blank relatives template to draw connections and track what you learn about.

Roles, Relations, Responsibilities & Gifts

- ◇ Why might we use the term "plant relative"? What does it say about plants? About us?
- ◇ What role does this plant play in this place? What is our role in this place? How are these roles related? How do we know?
- ◇ Consider your responsibilities to this place. How can humans help or harm plant relatives? What decisions can you make each day to be a good relative to plants?
- ◇ Consider the web of relationships that this plant is part of. How are we, our ancestors and future generations connected to that web?
- ◇ What gifts does this plant offer? And what gifts can we offer in return?

Learning Across Generations & with Other Families

- ◇ Take time to hear the ideas from everyone in your family. What do you learn from each other? What are the different perspectives the youngest children bring? And the oldest?
- ◇ Check in with community members and physically distant relatives. Share what you've learned and ask what they know, or what they've been learning about.

Supporting Learning & Wellbeing

- ◇ Start the walk by talking about big ideas. Ask family members to share what they know about plants or what memories they have with plants. Once the walk is finished, discuss what you learned and revisit the big ideas. Bookending the walk in this way can make the big ideas come through more clearly.
- ◇ Pay attention to patterns. We learn from land by paying close attention to the patterns that exist.
- ◇ Do you see particular plants growing in certain areas? Near other plants? Near water? In lots of sun or in the shade? Why is this?
- ◇ Big wondering questions make for better learning opportunities than known-answer questions.
- ◇ Questions you don't know the answer to are great learning opportunities! Discuss different possibilities, talk with friends and family or look to other resources to learn more.

Making Connections with Stories

- ◇ Are there stories that your tribe has about certain plants? Is there a special memory that you or your family have with a certain plant? Ask your Elders what stories they may have about different plants.
- ◇ Get creative and make your own story about this place or about a certain plant.
- ◇ Ask children to consider what stories they will tell of this time and place when they are Elders.

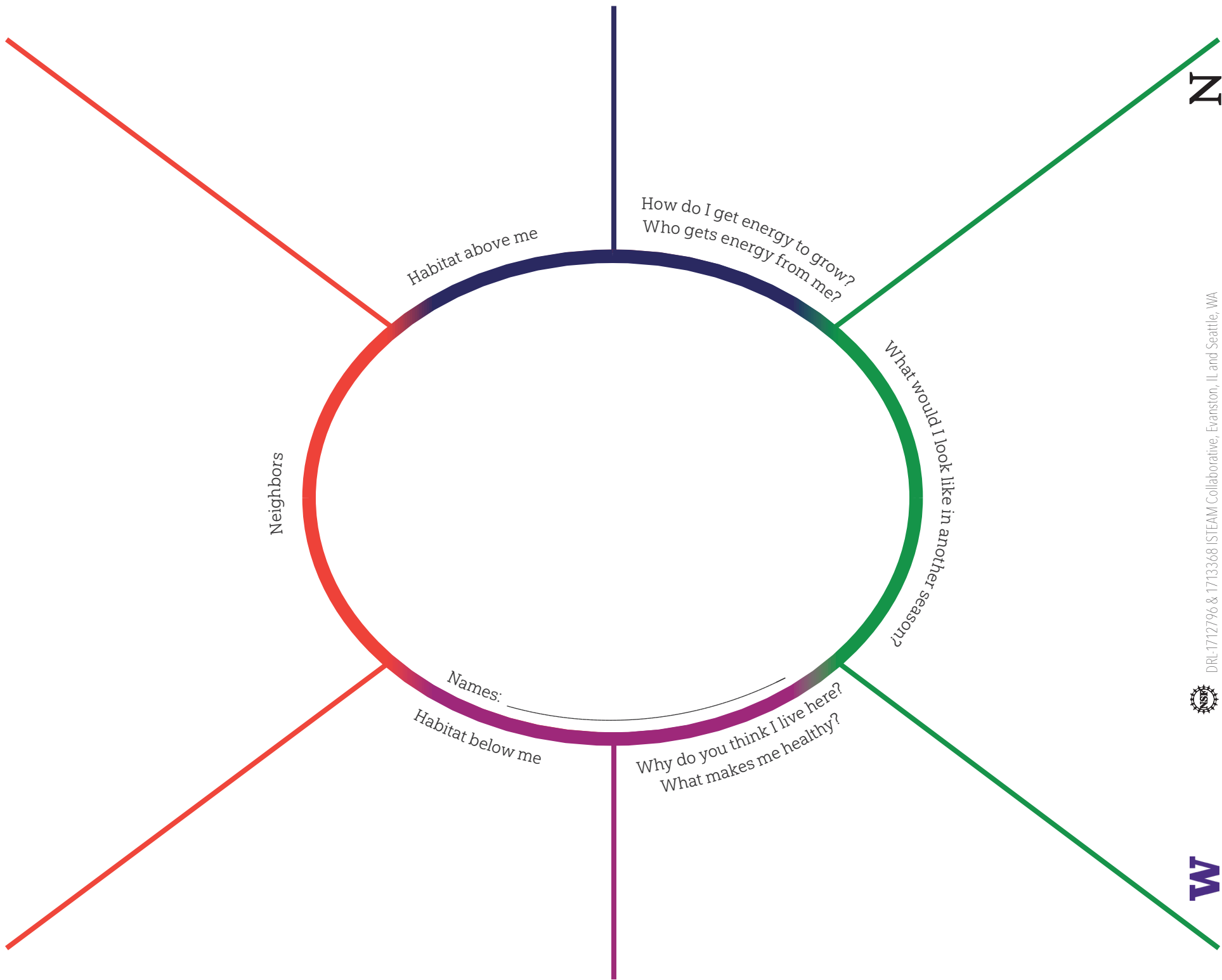
Making Relations with Lands & Waters

- ◇ If you are in a new place, learn which tribal nation communities are nearby or have homelands in this place.
- ◇ Consider what this place was like a long time ago. What may it be like one hundred years from now?
- ◇ You might revisit the same plant(s) or tree(s) multiple times. See the Nurturing Relations With Plant Relatives activity for more information on revisiting a plant relative.

Decolonization, Resurgence & Good Relations

We have always learned through walking land with family and community. Getting to know plant relatives continues these traditions and leads us towards a better future.

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A Closer Look

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