

TREES AND RECIPROCITY



LESSON TITLE: Trees and Reciprocity

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LESSON BIG IDEA:

(student-friendly language, can be posted or reiterated throughout)

- Trees provide animals and humans, even other plants with gifts such as shade, oxygen, fruit, etc.
- For the Earth to stay in balance, humans must give back in equal measure what they take.

FUNDAMENTAL CONCEPTS:

- Reciprocity & Climate Change

CURRICULUM EXPECTATIONS

(Big Ideas/Overall):

SCIENCE

Growth & Changes in Plants

- assess ways in which plants have an impact on society and the environment, and ways in which human activity has an impact on plants and plant habitats;
- investigate similarities and differences in the characteristics of various plants, and ways in which the characteristics of plants relate to the environment in which they grow;
- demonstrate an understanding that plants grow and change and have distinct characteristics.

SOILS IN THE ENVIRONMENT

- assess the impact of soils on society and the environment, and of society and the environment on soils;
- investigate the composition and characteristics of different soils – demonstrate an understanding of the composition of soils, the types of soils, and the relationship between soils and other living things.

SOCIAL STUDIES (B)

- The natural features of the environment influence land use and the type of employment that is available in a region.



GATHERING THE GROUP:

When taking students outside to learn in and about nature, it is important to differentiate between recess play and outdoor learning activities. The yard where the students play tag or soccer is now their outdoor classroom and requires them to see the yard through a new lens.

Here are some considerations:

- Establish a ritual which lets students know it is outdoor learning time and not recess (e.g., “Activate your owl eyes”).
- Find a home base, a gathering spot for initial provocations, read alouds, mid-activity check-ins, knowledge building circles, etc.
- Establish boundaries, the furthest places students may venture. Walking the perimeter of the boundary on an earlier visit to the yard can ensure students understand and stay within their limits.
- Decide on a signal to let students know when to come back to home base (e.g., a wolf call, a train whistle, etc.). It is worth practicing leaving and coming back to home base as a separate activity so that students are ready.
- Just like in an indoor classroom, students will need to listen to the person who is speaking, waiting their turn to share.

Climate change is a consequence of a colonial and capitalist system which has exploited people and the environment. The two struggles are inseparable. Many in the Global North may not be fully internalizing the impacts of the climate breakdown in this moment, however droughts, desertification and food insecurity as a result of climate change are happening now and disproportionately so to Black, Indigenous and people of colour. This resource invites students and educators to explore climate justice in intersectional ways. See the full resource at etfo.ca.





“AN ACT OF RECIPROCITY MEANS RETURNING THE GIFT. TREES PROVIDE US MANY GIFTS INCLUDING SHADE, OXYGEN, FRUIT, ETC. AND AID IN THE FIGHT AGAINST CLIMATE CHANGE BY REMOVING CO2 FROM THE ATMOSPHERE. HOW MIGHT WE CARE FOR TREES? HOW MIGHT WE SHOW GRATITUDE FOR THESE GIFTS AND RETURN THE FAVOUR? AS RESPONSIBLE ENVIRONMENTALLY CONSCIOUS CITIZENS, CARING FOR TREES AND PROMOTING TREE HEALTH AND GROWTH IS A WAY TO EXPRESS OUR GRATITUDE FOR THE MANY GIFTS THEY PROVIDE US.”

- Human activities and decisions about land use may alter the environment.
- Human activities affect the environment, but the environment also affects human activities.

OVERVIEW: (Brief)

As students observe and investigate trees on the yard (e.g., comparing similar and different characteristics such as bark, leaves, etc.), they will learn about growth and changes in trees and the composition of their soil. In addition, they will also develop an appreciation for the gifts the trees provide and learn to return the favour in an act of reciprocity.

BACKGROUND INFORMATION:

(Adult learning, references, data, etc.)

RECIPROCITY

Watching the way light flickers through the treetops, it is impossible not to appreciate the beauty and wonder of trees. Robin Wall Kimmerer, Professor of Environmental and Forest Biology at the State University of New York College of Environmental Science and Forestry (SUNY-ESF) says about reciprocity:

“We are showered every day with the gifts of the Earth, gifts we have neither earned nor paid for: air to breathe, nurturing rain, black soil, berries and honeybees, the tree

that became this page, a bag of rice and the exuberance of a field of goldenrod and asters at full bloom.”
(humansandnature.org)

An act of reciprocity means returning the gift. Trees provide us many gifts including shade, oxygen, fruit, etc. and aid in the fight against climate change by removing CO2 from the atmosphere. How might we care for trees? How might we show gratitude for these gifts and return the favour? As responsible environmentally conscious citizens, caring for trees and promoting tree health and growth is a way to express our gratitude for the many gifts they provide us.

ESSENTIAL QUESTIONS:

- What are the characteristics of trees found on the schoolyard?
- What gifts do trees provide animals? Humans? Other plants?
- What impact do humans have on the trees growing on the schoolyard?
- Which soil conditions favour tree growth and general health?
- What other conditions favour tree growth and general health?
- How might we reciprocate the gifts given to humans by trees?
- How do we express our gratitude for these gifts?



LESSON PLAN FRAMEWORK

Access to Clean Water Template Sample

CONNECT:

- Connect with students and their interests and experiences
- Connect students with each other
- Connect students with community (experts, resources)

STEPS:

1. Community Circle: “What do you know about trees?” Determine the group’s previous knowledge about the characteristics of trees. Hand out sticky notes knowing some students may wish to share their knowledge in writing. As students share, cluster the sticky notes into categories (e.g., characteristics, species, food from trees, tree growth, etc.).

2. Observing Trees: Which are the characteristics of the trees found on the schoolyard? How are they similar and/or different? Invite the students to find a tree that will be theirs to observe throughout the school year. Prompt students to look for similarities and differences in the characteristics among trees (e.g., size and outline, bark texture, leaf shape, deciduous vs coniferous, root length, etc.).

3. Deeper Exploration: How can you identify tree species? Use field guides to identify trees based on their bark texture, leaf shape, etc. (e.g., The University of Guelph Arboretum Biodiversity Identification Sheets or the Ontario Tree Atlas which allows students to search for trees by region.)

4. Sharing: What did you notice about the trees on the yard? Students may record their observations in a nature journal and later share with the group.

*If your schoolyard has limited trees, students may share a tree or check for neighbouring outdoor treed spaces.

EXPLORE + EMPOWER:

- Explore a variety of resources available to you
- Empower students to make meaning of the big idea

STEPS:

5. Explore the Schoolyard: What impact do humans have on the trees growing on the schoolyard? As students regularly go outside to observe trees on the schoolyard or in a neighbouring wildspace, they will notice (or be prompted to notice) ways in which humans have an impact on the trees in the environment. For example, in many well-travelled areas of the yard, some trees may have less leaves, more dead branches or exposed roots. In other areas, away from high traffic spaces, trees may appear more full with roots hidden under the soil. Close to the street, students may notice the effects of road salt on tree health or soil composition.

6. Investigating Soils: Which soil conditions favour tree growth and general health? Invite students to investigate the characteristics of soil around the bases of trees in high and low use areas on the schoolyard. Students may notice the soil is dry and cracked in high traffic areas and the tree roots are showing.

7. Extending Knowledge About Soil: What impact might soil compacting have on the bacteria, soil animals and the tree itself? Introduce the concept of compacted soil. Typically, 50% of soil is made up of air. When soil in high-traffic areas is stressed (e.g., by hundreds of students running over it during recess), the soil particles are pressed together and the air in the soil is displaced. The bacteria, soil animals and tree roots have less oxygen to breathe.

Soil Experiments for Children: fao.org/3/i7957e/i7957e.pdf

Extension: Comparing Soils

Investigating the composition of different soils on the schoolyard: What do you notice about soils from the schoolyard? Invite students to gather soil samples around a variety of trees on the yard, digging small holes a metre away from each tree. Place soil samples in clear recycled containers (e.g., baby food jars) or on double-sided tape.

Many towns and cities have forestry departments. Their experts make school visits (e.g., City of Ottawa Forestry Department) offering suggestions and advice on how to amend the soil to promote bacteria, soil animal and tree health and growth. Students, following the advice of community experts, are then able to devise a plan to support the existing trees on the schoolyard (e.g., add nutrients to the soil, protect the root system with extra mulch, water new trees, etc.).

ACT + ADVOCATE:

- Create experiences where students have engagement and agency
- Take action in your local community

STEPS:

8. Climate Action Activity: Why might we introduce more trees to the schoolyard? How might this action help fight climate change? Planting more trees on the schoolyard has multiple benefits in the fight against climate change (e.g., adding carbon stores, aiding in the sequestering of gaseous air pollutants and particulates, etc.). Invite students to make a case for the planting of new trees on the yard.

9. Map it Out: What other conditions favour tree growth and general health? After researching tree placement (e.g., Tree Canada Locating New Trees or Evergreen Where to Plant a Tree), invite students to map out possible locations for new trees. Be sure to avoid high traffic areas. Baby trees may not be able to withstand continuous stress.

**Of all the gifts trees provide, students seem to appreciate shade the most, especially during recess.*



10. School Ground Greening Grants:

Which trees might be planted on the schoolyard? Facilitate students' consultation with community experts regarding tree placement. Working with community members (e.g., parents, community associations, etc.) apply for school ground greening grants (e.g., Tree Canada Greening Canada School Grounds, TD Friends of the Environment, or local tree grants like the City of Ottawa Schoolyard Tree Planting Grant Program).

11. Develop a Summer Watering Plan:

How might we care for new trees on the schoolyard? New trees are often planted in the late spring or summer and will need to be maintained (e.g., Evergreen Tree Maintenance Suggestions) and watered throughout the summer months. Collaborate with students and the School Council to recruit volunteers and create a watering schedule.

**Any tree expert will recommend taking care of existing trees first, regularly adding nutrients and mulch to protect root systems before planting additional trees to the yard.*

REFLECT + SHARE:

- Reflect on the big idea
- Reflect on learning that has occurred
- Share learning with others

STEPS:

12. Journaling: How might you express your gratitude for the gifts trees give? Invite students to take note of the gifts provided by trees throughout the year (e.g., food, animal habitats, windbreak, shade, etc.) in their nature journals. Encourage them to express gratitude for these gifts from trees (e.g., "I am grateful for the shade on a hot summer day.").

13. Community Circle: Trees provide us with many gifts, how might you return the favour? Ask students to consider an act of reciprocity and share their thoughts with the group.

EXTENSIONS & MODIFICATIONS:

Extension: What gifts do trees provide animals? Humans? Other plants? Throughout the year, continue to visit the trees offering different prompts to provoke an appreciation of these gifts:

- In the Fall, invite students to observe the beauty of leaves changing colours. Introduce concepts such as photosynthesis, chlorophyll, carotenoids and xanthophylls to support their learning around the science of fall colours.
- In Winter, invite students to appreciate the windbreak offered by evergreen trees. Compare how plants grow and change (e.g. deciduous trees drop their leaves in the Fall, but coniferous or cone bearing trees do not. Sidebar: The tamarack tree is both a coniferous and deciduous tree. *The Story of the Tamarack Tree* is a Métis story about the Muskeg People written and illustrated by Leah Marie Dorion.
- In Springtime, if you have maple or birch trees on the schoolyard, tap the trees so that students might appreciate the sweet gift of maple water. When tapping trees on the schoolyard, with permission from the Principal, it is best to gather maple water for the period of time you are outside with the students. Very little maple water is needed for students to appreciate this sweet gift. If the trees are not on school property, check with the municipality for guidelines.
- In the Summer, invite students to read a book under large trees on the schoolyard to appreciate the gift of shade. ■

ADDITIONAL RESOURCES:

(Publications, websites, videos, downloads, etc.)

Robin Wall Kimmerer interview:

Gratitude and Earth: Reciprocity in Nature

Books for Educators:

The Hidden Life of Trees: What They Feel, How They Communicate, Peter Wohlleben

Forest Bathing: How Trees Can Help You Find Health and Happiness, Dr. Qing Li

Gathering Moss, Robin Wall Kimmerer

Books for Students:

Tree: A Little Story About Big Things, Danny Parker

The Magic and Mystery of Trees, Jen Green

The Maple Leaves of Kichi Makwa, Albert Dumont

The Story of the Tamarack Tree, Leah Marie Dorion

Maple Moon, Connie Brummel Crook and Scott Cameron

A Tree Can Be, Judy Nayer

A Tree is Nice, Mark Simont

Online Resources to Support Student Learning:

Nature Conservancy: The Science Behind Fall Colours

Ontario Tree Atlas

Soil Experiments for Children

Curriculum Documents:

Environmental Education, 2017 Scope and Sequence