

Program Name: Be-leave the Leaves!

Grade Level(s): 4-9

Curriculum Connection(s): Plant Growth and Change (Gr. 4); Wetland Ecosystems (Gr. 5); Trees and Forests (Gr. 6); Plants for Food and Fibre (Gr. 7); Freshwater and Saltwater Systems (Gr. 8); Biological Diversity (Gr. 9)

Approximate time required: 3 hours (not including travel or eating time)

Key Concepts and Terms:

Deciduous	Petiole	Photosynthesis
Coniferous	Midrib	Chlorophyll
Dichotomous Key	Margin	Native species

Student Learning Objectives:

Demonstrate ability to listen to, read, and comprehend verbal and written instructions.

Demonstrate knowledge in identifying local vegetation ecosystem components.

Develop skill in group work and division of responsibilities.

Develop ability to use and create dichotomous and multi-choice keys.

Brief Description of Program:

A one day program where students work together to identify local vegetation based on leaves, using dichotomous keys, in order to develop an understanding of how ecological relations can be mapped and to increase their knowledge of which species are locally present.

Activities:

Discussion

Lead a class discussion on leaves in the interview room or outside, weather permitting. Discuss types of leaves (including needles, spines, etc.), leaf functions, leaf parts, how leaf type is related to plant type, etc. Have students name plant types with different leaf categories (ex: white spruce, jack pine, and tamarack all have needle-like leaves). Explain dichotomous keys (a 'map' where each intersection has only two options) and use a leaf as an example to walk students through how to use the keys.

Download and use the free app LeafSnap (or a similar app) while you are connected to the Station's WiFi onto supervisors' phones to double check and identify unknown leaves after being in the field, once you return to the Station after the activity.

Activity

Break students into groups with one supervisor in each group. Sign out a magnifying glass and plant identification book to each group supervisor, and make sure each group has a tree species dichotomous key. Depending on student age level, choose or adapt one or multiple of the following activities, as time allows.

Set a time limit (~60 min) and send groups on a scavenger hunt to find and identify as many plant species as possible using their leaves to help identify them. Have students examine fallen leaves or leaves on plants (please remind students and supervisors to not pick leaves) and use the dichotomous key to make educated guesses as to what kind of plant the leaf belongs to. Use the plant identification book to check the guess. Take a picture of the leaf (with the phone that has LeafSnap, if possible) to refer back to later.

Once the time limit is up and students have returned, have each student individually fill out a Leaf Bingo card, in pen, based on the list of vegetation their group identified, putting different plants in whatever spaces they want; if they didn't identify enough plants, they will have blanks on their card, making it harder to win (blanks are NOT free spaces and should be crossed out before beginning the game). Randomly call plant names from the dichotomous key until someone gets a straight line, then a 2x2 square, an 'X', etc.

If time permits, assign a plant species to each group (preferably one that was identified on their scavenger hunt) and have them research that species on the Station laptops to determine its Latin name, leaf pattern, fun facts, unique characteristics, etc. Have groups present their plant to the rest of the class, making sure that each group member contributes equally in the presentation.

Have students create their own dichotomous (or multi-choice) keys to classify other groupings: classmates' footwear, ecosystem components, Station equipment, etc. and have other students test the keys to see if they can identify down to the level of the individual.

Closing:

Clean and return all equipment to its proper storage location.

Tidy the Station to its previous condition, collecting all belongings. Remember to turn off all water and lights, and deposit your key **before** exiting the Station **after** ensuring both exterior doors are locked and windows are closed.

Continued Connections:

Back in your classroom, create a leaf dichotomous key display board and use the pictures of the leaves students took to name which plants ended up where on the key. Place a student's name next to each plant and assign them that species- have them research the species in detail to determine its history in Alberta, current interactions with humans, plants, and other animals, current and past distribution, branching pattern, leaf patterns, unique characteristics, etc. Anything you and they feel is applicable in distinguishing their species as being different and deserving its own spot on the dichotomous key. Have groups present their plant to the rest of the class or to other students.

Equipment and Resources Provided:

Magnifying glasses

Tree species dichotomous keys

Plant identification books

Laptops (5) and WiFi

*Remember to bring blank copies of Leaf Bingo.

*Please have supervisors / students bring and use cameras or phones to take pictures of different leaves they identify if you plan on using LeafSnap.

Contact the Station Manager at gth@ualberta.ca for pricing and more details.

LEAF BINGO

Draw a leaf, in pen, in any square below - this is your only 'free' square, use it wisely! Fill the rest of the squares, in pen, with one tree species you identified by its leaves. Do not duplicate squares. If you cannot fill the entire card, cross out the empty squares - they do not count as 'free' spaces, you cannot call LEAF BINGO with one of these empty squares in your winning row!
