Community Science

Pollinators

Lesson 10: Quadrant Study

Duration: 1.5 – 2 hours **Location:** Outdoor

Overview

In this lesson students will become familiar the quadrant method of surveying to better understand the abundance and diversity of pollinators in their local community. Students should be familiar with what a pollinator is and know 5 examples of pollinator species. Students should also be comfortable using SEEK by iNaturalist.

Learning objectives

By the end of the session, students will be able to:

- identify 5 different pollinator species living in and under trees within their local community;
- identify reasons why trees are valued by insects and by humans.

Curriculum links

Grade: 6

Subject and Unit: Science, Trees and Forests

- Identify reasons why trees and forests are valued. Students meeting this expectation should be aware that forests serve as habitat for a variety of living things and are important to human needs for recreation, for raw materials and for a life-supporting environment;
- Describe kinds of plants and animals found living on, under and among trees; and identify how trees affect and are affected by those living things.

Equipment required

- ☐ Flagging tape
- ☐ Tent pegs
- ☐ Magnifying glasses
- ☐ Magnifying cubes
- ☐ Bug nets
- ☐ Nature journals or observation sheet
- ☐ Tablets/iPads
- ☐ Guidebooks
- ☐ Clipboards (optional)
- ☐ Writing utensils
- ☐ Beating sheet
- ☐ Stick

Additional information

A quadrant is a sampling plot used to survey a selected area. Each quadrant can vary in size and may be any shape. However, all quadrants should be the same size and shape within each study.

Lesson plan

Time	Activity	Equipment needed
10 minutes	Create transects using your own materials or the flagging tape and tent pegs provided.	• Flagging tape • Tent pegs

	Each transect should be the same size. Attempt to have the transects large enough to accommodate the group sizes. For example, smaller groups can use a 1 meter by 1 meter quadrant, while a larger group can have a quadrant up to 3 meters by 3 meters. Select transect locations which are biodiverse. For instances, areas with many bushes, trees, wildflowers, etc. Label, or make each quadrant identifiable from the others (number them, colour coded, etc.) Ensure that you have one transect per group.	
5 minutes	Divide class into groups. It is recommended to have at least 2 and maximum of 5. Have each group divide into different roles, - Observers & note takers. During the quadrant study, the observers will be going through the study area to look for and identify any pollinators while the note takers will be either drawing and/or writing down the pollinators found and identified. Each group should have the following materials to help them locate, capture and identify pollinators: magnifying glasses, magnifying cubes, bug nets, and a tablet/iPad. You can hand these out to each group or place materials at the quadrant for pick up.	• Magnifying glasses • Magnifying cubes • Bug nets • Nature journals or observation sheet • Tablets • Guidebooks • Clipboards (optional) • Writing utensils

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30 - 60 minutes	Give each group a clip board (optional) and ensure the note takers have their nature journal or the Quadrant Study observation sheet. Have note takers fill out the metadata (dates, time starting the observations, location) at the top of their sheets. Designate each group to a quadrant. Allow them to start their observations. After 10 minutes have all groups rotate to the next quadrant. During observation times, visit each quadrant and assistance for how to use SEEK, identify pollinators found, and where to look. When the group moves to another quadrant, students will switch roles. Note takers will be observers and observers will be starting a new Quadrant Study observation sheet or page in their nature journal and inputting the metadata again (dates, time starting the observation, location). Repeat as time and attention allows. Attempt to use the teachers' beating sheet with each group. It is ideal to use this tool in a quadrant that has a tree or bush. To use the beating sheet, place it under a branch or leafy section of a plant. Gently, hit the branch or section with the stick, having all falling debris land on the sheet. This will help students find species they may have missed. As well, the sheet acts as a good background to observe and identify smaller animals.	• Magnifying glasses • Magnifying cubes • Bug nets • Nature journals or observation sheet • Tablets • Guidebooks • Clipboards (optional) • Writing utensils • Beating sheet • Stick
10 minutes	At the end of your observation time, bring the groups together and share findings. As students are sharing their animal sightings, start to create a class list, being careful to not count species/individuals twice.	• Nature journals or Quadrant Study

	Submit pollinator findings through a tablet on the iNaturalist app.	observation sheet • Tablet
10 minutes	Use some of the recommended debrief questions below to review learning. 1. Did we notice a difference in the types or number of insects we saw from the beating sheet (within tree layers) compared to what we found on the ground (under the tree)? 2. Did we notice a difference in the types or number of insects we saw in the quadrants based on their location (close to a tree vs middle of a field)? 3. (If) We didn't find many pollinators; why would that be? Is this area a good home/habitat for pollinators? Why and why not? 4. Through our explorations today, we noticed many insects use trees for different purposes. What are some of these purposes? (discuss habitat connection) 5. Besides providing biodiversity, what are some other reasons why trees are valued?	

Extension

1. Based on the species and number of each species observed during the Quadrant Study activity, have students create a graph showing this data.