



Backyard Phenology

Content Connections:

Life Science - Plant and animal behaviors and interactions

Skills - Observation, data collection and reporting

Grades: K-12th

Time: 1-2 hours

Objective: In this lesson students will observe and record seasonal weather, plants and wildlife in the familiar surroundings of their schoolyard. Through observation and data collection students will increase their awareness of nature.

Materials:

- plant field guides and/or specimens
- drawing paper
- note taking paper
- pencils
- graph paper

Background:

A naturalist is a scientist who specializes in studying nature. Naturalists make notes and drawings to help them record and track their observations of the natural world. Phenology is an account of seasonal changes and the effects on plants and animals in a given location and the biological effects of those changes. Naturalists often make phenological studies to look at changes in the natural world over time.

This lesson includes an optional extension to participate in a Community Science project. Community Science, or Citizen Science, is the collection and analysis of data relating to the natural world by members of the general public, typically as part of a collaborative project with professional scientists.

Procedure:

1. Introduce the activity by asking students what they already know about pollination and why it is important. Share with students that there are over 200,000 types of pollinators in the world and in this activity we are going to go outside to make seasonal observations, or a phenology study, of some of our local pollinators.
2. Prepare students to go outside.
 - a. Learn plant identification specific to your area. Use a field guide and, if possible, examples of picked plant specimens to help students learn about what they are likely to see outside. Provide students with a list and pictures of different types of pollinators they may see. A list for younger students may be shorter and less specific (i.e., bee, butterfly, moth, etc.) while a list for older students may be longer and more specific (i.e. Honey Bee, Monarch, Cabbage White Moth, etc.).
 - b. Conduct a short naturalist drawing activity. Students should independently choose one field guide illustration or a plant specimen and draw it to the best of their ability. They should make notes about the drawing for later reference including size, color, shape, smell, etc. Give students 10-15 minutes to draw and make notes. Then ask them to trade with a partner. Partners should compare the drawing with the specimens and try to identify what's in the drawing.
 - c. If using a data collection sheet during the outdoor observation portion of this activity, have students practice with it.
3. Go outside and make some observations! Find a place on the school playground, in a neighborhood park, outside your building, or on a field trip to a natural area.
4. Instruct students to spend 10-20 minutes observing a flower or group of flowers. Have them note types, numbers, and characteristics of pollinators that visit their flowers. The details of observations will vary with grade level (see below for examples of data to be collected by each level)
 - a. K-5 - Students should be expected to draw and/or describe pollinators using a provided list of adjectives (colors, textures, sizes), count the number of flowers in a given area, and count the different types of pollinators.
 - b. 6th-12th - Students should be expected to document common names and/or scientific names of the pollinators and carefully describe plant interactions encountered. Students can also note the kinds of flowers pollinated, whether or not more than one type of pollinator visited a specific flower, and conclude if those flowers had special characteristics (scent, certain color, size, etc.).
5. Return inside and process the data. Create a class chart of what was observed. Elementary students can record this information on a bar graph to help visualize types of pollinators observed and numbers of flowers. Discuss the data and identify the most common type of pollinator and flower. Discuss whether or not they think they would

observe more or less pollinators if there were more or less flowers. Older students may create graphs using data collected. Use this opportunity to discuss the difference between quantitative and qualitative data and how the observations (qualitative data) can be used to support the quantitative observations.

6. Debrief the experience by having students infer as to why a certain pollinator prefers a particular plant. Students may need to make observations and do further research when getting back to the classroom.

Extension:

- People all over the world are collecting data on pollinators in their yards, gardens, schools and parks. If you'd like to get involved in a bigger phenology tracking opportunity, provide your data to a Community Science project. You can find many Community Science projects online and log your data from anywhere. The Great Sunflower Project is a general pollinator data reporting website. States and counties may also have their own community science project website.
<https://www.greatsunflower.org/quickguide>
- Other Community Science projects can be found through the Xerces Society for Invertebrate Conservation: <https://xerces.org/citizen-science/>

References:

- Tallgrass Prairie Observation lesson from the National Park Service:
<https://www.nps.gov/common/uploads/teachers/lessonplans/Pollinators%20lesson%20plan4.pdf>