



Grade Levels

9-12

Overview

Conduct this activity before students are introduced to data collection using the Nature's Notebook observation protocols. This activity will familiarize students with some of the main phenophases present on select species during certain times throughout the school year. After students do this activity you may wish to have them make observations using the *Nature's Notebook* observation protocols and then at the end of the year students can view their collected data in conjunction with the data they viewed during this activity.

Background

Phenology is the study of the timing of life cycle events, done mostly through personal observations.

Real-world Connection

It's important to mention to students that variability is normal in the natural world. If they do not see changes when they expect to, or among all individuals of the same species, they should be cautioned against leaping to conclusions. Encourage them to think carefully about what they have observed and consider as many explanations as possible.

Citizen Science Connection

This activity can be completed with or without a *Nature's Notebook* account. Completing it with an account can provide an opportunity to teach students about the importance of citizen science, and how their contributions help us to better understand the world around us.

Estimated Time

This activity can be done throughout the course of the academic year. Depending upon how much time is available, teachers can revisit the activity more than one. Ideally teachers should set aside at least 4 or 5 class sessions of 50-90 minutes. Conduct this activity prior to asking students to collect phenology observations using the *Nature's Notebook* protocols.

Learning Objectives

Participants will be able to:

- Identify five local plant species.
- Understand why plants undergo changes throughout the year
- Name four phenophases.
- Understand why we study phenology.
- Make observations of plant structures and relate them to function and phenology



Next Generation Science Standards

LS: Life Science			
	Grades 9-12		Grades 6-8
HS-LS2-2	Use mathematical representations to support explanations of factors affecting biodiversity and populations in ecosystems at different scales	MS-LS2-2	Construct an explanation that predicts patterns of interactions among organisms along multiple ecosystems

Conducting the Activity

Materials

Resources needed

- A selection of 5 different species of plants
- Clipboards and paper or nature journals
- Something to write with
- Phenophase photo guides or field guides
- Outdoor space to conduct the activity - find an area where you can take your class that has at least 4 stops with 5 tagged plants where they can collect phenology data.
- *Nature's Notebook* data sheets for the 5 species you selected
- Access to at least one computer with Internet access

Engage

Connect to prior knowledge

- Give students some intriguing part of a plant. This could be willow catkins, buckbrush flowers, manzanita berries, a gall. Have them make "I notice" and "I wonder" observations about the object. If they have seen the object before, tell them that the goal of the exercise is to observe something they have never seen before.
- Zoom in/Zoom out - get students to journal using the zoom in/zoom out method. First students draw the plant as the actual size. Then have students draw a close up of one of the structures of the plant. Make sure students focus on the details and tell them not to worry about trying to draw a work of art. Let them know that they will continue to get better the more they do these kinds of drawings. Have students that want to describe their drawing talk about their plant and the special structure they drew.

