

# Species Life Cycles: Match...or Mismatch?



## Grade Levels

3-5

## Overview

This activity can be used independently or as an extension of the Plant and Animal Life Cycle Drawings activity. Using those same procedures, students will draw life cycle timeline calendars for two species that are interdependent for food, pollination, reproduction, or habitat. (Examples include monarch butterflies and common milkweed or honeybees and wild blueberry.)

## Background

Phenology is the study of the timing of life cycle events, done mostly through personal observations. As the climate changes, phenological changes in plants and animals may shift, and no longer align through the year.

## Real-world Connection

Observation skills are necessary for scientific study and are included throughout the elementary SOL standards. In addition, observation skills are necessary for all aspects of learning academically, socially, and emotionally.

## 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.

## Learning Objectives

Participants will be able to:

- Learn about the life cycles and life history of local plant and animal species.
- Learn about the timing of individual species' life stages.
- Practice critical thinking and hypothesis and prediction.
- Gain experience collaborating and communicating with their peers towards a common goal.

## Next Generation Science Standards

LS: Life Science			
	Grade 3		Grade 5
3-LS1-1	Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death	5-LS2-1	Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment
3-LS3-2	Use evidence to support the explanation that traits can be influenced by the environment		

## Conducting the Activity

### Materials

#### Resources needed

- Field materials such as flagging tape, plant markers, pens for writing, hand lenses
- Identification guides for local plant and animal species
- Science notebooks
- (optional) Computers with Internet connection
- (optional) Bird feeders and seed if you would like to observe bird phenophases
- (optional) Binoculars and digital cameras

### Engage

#### Connect to prior knowledge

- Ask students about ways they have noticed that plants and animals change from season to season.
- Think about what they have previously learned about food webs. How do seasons affect availability of food for plants and animals?
- Discuss observation, and way that scientists observe and record the natural world.

## Estimated Time

Two 20-30 minute class periods for preparation and planning

10-20 minutes on a weekly basis to record data on datasheets

30-40 minutes to plan and begin creating the timeline calendar

Two 30-40-minute class periods to finalize the calendar and write up summary

One 30-40-minute class period for presentation(s) of findings and group discussion

## RESOURCES

Adapted from:

Signs of the Seasons: A New England Phenology Program

Species Life Cycles: Match... or Mismatch? By: Beth Bisson, Medea Steinman, and Esperanza Stancio

## NOTES ON ACTIVITY

## Conducting the Activity

### Explore

#### Hands-on learning

1. Decide which pair of species your group will observe.
2. Find a location that would be easy to access on a weekly basis where you can observe your species.
3. Decide on when and how to collect the data. If you will be observing a number of different species, you may wish to assign small teams to keep track of 2 or 3 species each.
4. Mark individual plants you are observing; establish a schedule and system for making regular observations.
5. Ask students to establish a science notebook or journal to be used in the course of this project. Talk about basic information that should be included in a science-minded journal. This depends on the activities and research but might include things like dates, weather information, careful observations of species, phenophases, behavior, predictions and hypotheses, drawings, samples (pressed leaves or flowers) or notes about the process and any limitations.
6. When phenophase changes are observed, or when anything notable occurs, record these observations through notes and photographs and drawings. These could be used later to embellish your life cycle timeline/calendar.
7. Draw out a timeline on a large sheet of paper. Using your recorded notes, with dates of phenophases, establish the life cycle timeline of the species on your blank timeline. Students can paste photo prints and/or drawings of the phenophases onto the calendar in the appropriate places.
8. Guide the students in a discussion about what their field observations and investigations have turned up. What happened with respect to timing of phenophases? What do the findings tell them with respect to ecology and climate in their locale?
9. Make predictions about what might happen if the one species or the other changes the timing of its phenophases.
10. Make plans to present the life cycle drawings and the findings to other student groups. Help your students think about how to share their findings and discuss their experiences and observations.

### Explain

#### Listening and communicating understanding

- Ask participants to reflect on their field experience, the data collection system, and the preparation of the timeline. Reflect on what worked well and what they could do differently next time. Ask them to talk about any ways their expectations about the life cycle timing were or were not met. Can they speculate about possible reasons or causes?

### Extend

#### Group projects, real world connections

1. The teacher can open a *Nature's Notebook* account and create a site for the students to monitor. They can print out datasheets for the species they are observing.
2. The teacher can enter the data collected by the students online, and use the visualization tool to show how observations become data that scientists use to answer questions about the world around them.
3. The visualization tool can also be used to show students when phenophases are shown at different times of year - they can use this to complete their life cycle drawing for the months that they can't observe phenophases themselves.
4. Students can come up with their own questions that can be answered using their data.

### Evaluate

#### Summarize, check for understanding, assess

- Collect the students' science notebooks or journals to see how well they recorded their observations and understood the process and the data they collected. Do they seem more comfortable with the process of making observations and collecting data in the field? Save examples of student work for reference the next time you try this activity.