

Materials (for Part 1)

- Flip chart paper and markers
- Weather forecast with sunrise/sunset times
- Garden journals
- Binoculars
- Hand trowels and rulers/yardsticks

Preparation

- Print out a weekly weather forecast with sunrise/sunset times.
- Identify a suitable space in the garden for bird watching. Select another space for worm hunting. Place visible markers by each.

PROCEDURE: Part 1 – In the Garden

Step 1: Tour the garden and take weather measurements

- Have the group gather in the outdoor classroom. As a class, tour the garden and visit the following measurement stations: max/min thermometer and sun position.
- At each station, select a student volunteer to record data. Return to the outdoor classroom and post the data from each station on a piece of flip chart paper.
- Select another student to read the weekly weather forecast and sunrise/sunset times. Record on flip chart.
- Have students consult their garden journals and compare the current temp conditions to those at the beginning of the school year.
- Select a garden entry from earlier in the year. Have students share their temp measurements from a previous garden session. Record this data on the flip chart paper.

Step 2: Discuss seasonal changes and animal survival strategies

- “What differences do you notice between today’s weather measurements and weather data from earlier in the year? Do you notice any trends between then and now? How has the temperature changed over time?”
- Review the four seasons. “What are the weather characteristics of each season? How do you prepare for each season? What types of clothes do you wear?”
- “Each season gives us different types of weather. As seasons change, some animals change their feeding and living habits.” Introduce new garden terms: *migration* and *hibernation*.
- “When the weather is cold, it is more difficult for animals to find food and they change the things that they do. Some animals *migrate*, which means they move to a warmer place. Some animals *hibernate*, which means they sleep while it’s cold.”

Step 3: Search for migrating birds and hibernating worms

- “Today we are going to search for migrating birds and hibernating worms in the garden.”
- Split students into two groups, which will move through the two stations in ten-minute rotations.
- At the bird watching station, students will search for migrating birds. They will record their observations in their garden journals.
- At the worm hunting station, students will use hand trowels to hunt for earthworms deep in the soil. Have students count the worms they find and use a ruler to measure the depth at which they find them (if any).
- Switch groups and repeat. Gather in the outdoor classroom and transition to the classroom activity.

ENGAGE

Discuss findings from the outside activity. Did students spot any birds? If so, what did they look like? Did students find any worms? If not, where might the worms be hiding? Discuss other observations from the outside activity. What, in anything, was still growing in the garden? Did students see much insect/animal life?

Post two pieces of paper in the classroom. Label one “migrate” and the other “hibernate”. Encourage students to offer definitions for each word. Introduce the inside activity.

Objectives

- Students will understand how changing seasons affect animal behaviors
- Students will understand ways in which animals prepare for and survive winter
- Students will understand the difference between animals that migrate and animals that hibernate

PROCEDURE: Part 2 – In the Classroom

Step 1: Learn about butterflies’ migration patterns

- Show a picture of the monarch butterfly. “A butterfly survives by feeding on flower nectar. What do you think happens to the butterfly’s main food source as the weather gets colder?”
- “Why does the butterfly have to migrate in the winter? What direction might it travel? Where might it go?”
- Show the globe/map and identify North America. Locate Pennsylvania and then Mexico. Tell students that the monarch must migrate to Mexico to winter. Discuss the following questions:
 - “What are the dangers involved in migrating for the monarch butterfly?”
 - “What is the weather like in Mexico? What is the weather like in Pennsylvania?”
 - “Why do you think the butterflies fly all the way down to Mexico from Pennsylvania?”

Step 2: Learn about groundhogs’ hibernation patterns

- Show students a picture of a groundhog. Explain to students that the groundhog is an animal native to Pennsylvania that hibernates.
- “Animals that hibernate, lower their body temperature and heart rate and take a long winter nap. They can do this without food and water. As the temperature rises and food becomes abundant, they begin to stir and move around searching for food.”

Materials (for Part 2)

- Pictures of PA animals: butterfly and groundhog
- Globe or map of North America
- Materials for picture matching game

Note: Various pictures can be found at Pennsylvania Parks and Wildlife Web site at <http://darylrice.com/paanimal.html>.

EVALUATE

Journal prompt: How do you adapt to changing weather conditions? What do you do to prepare for winter?