

# OUR CHANGING WORLD

## LESSON PLAN



**WOLF RIDGE**<sup>SM</sup>  
ENVIRONMENTAL LEARNING CENTER



## CLASS DESCRIPTION: An Environmental Issues Class

To understand why energy conservation matters we need to understand the connection between energy consumption, atmosphere, climate and ecology. Using observation, theatrics and representative models the class explores how earth's changing atmosphere affects earth's climate, and the effects of climate change on the ecology of earth. Ecological change is the major focus of this class. Photography, drawing and writing provides a means for students to document the plants and animals that call Wolf Ridge home. Students also look for phenology (calendar of natural events such as flowering). A changing climate affects both the presence or absence of species and their phenology. Students construct an ecological time stamp. This ecological stamp provides a means to examine ecological change over time. Scientists worry that if the climate changes too fast ecological systems could face major extinctions if the ecology can't ADAPT or humans can't STOP climate change. Learn some ways scientists think we can help people and other life adapt to this quickly changing climate.

**Total time:** 3 hours (varied inside and outside)

**Audience:** 6-20 students, 4th grade through adult

**Activity level:** easy

**Travel:** 1/4 mile Remain on level ground

## GUIDING QUESTION

How does a change in temperature affect changes in nature?

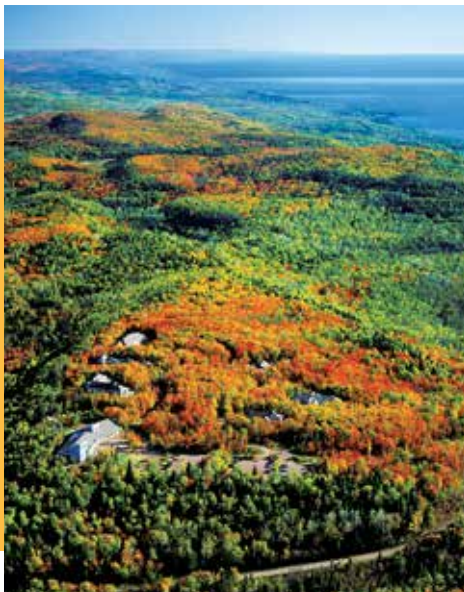
## CONCEPTS

1. Changes in nature are affected by changes in Earth's climate and atmosphere created by CO<sub>2</sub> emissions from human energy behavior.
2. Documenting ecological conditions at a given point in time provides an opportunity to track and verify change over time.
3. Collecting data and making observations are processes of knowing in science.
4. Humans have a great ability to alter natural systems, and a responsibility to consider the effects of their actions.
5. Life on Earth has adapted to change over time; life cannot survive abrupt and fast changes.

## OUTCOMES

Upon completion of Climate Change students will be able to:

- Describe the relationship between humans and climate change.
- Define climate change, ecology, phenology, and adapt.
- Examine phenology events to understand how climate change can affect earth's ecology.
- Construct a digital ecology snapshot to capture presence/absence data and current phenology.
- Understand cause and effect relationships through scientific data.



**Our mission** is to develop a citizenry that has the knowledge, skills, motivation and commitment to act together for a quality environment.

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*Wolf Ridge Environmental Learning Center and the USDA are equal opportunity providers and employers.*



## Equipment

- computer cart
- bug nets
- time stamp notebooks
- cameras
- weather calendars
- time stamp data sheets
- skit props bag
- thermometers
- field guides
- seasonal phenology sheet
- year in pictures slideshow
- CO2 jars
- lamps
- CO2
- binoculars
- backpack

## Appendices

- Glossary
- Optional Activities
- References
- Sources
- Class Sheets
- Spiral Learning Sheet
- Planning Outline

## Set-up (15 min.)

- Classroom/class prep description
- Safety Management

### I. Why is the climate changing? (30 min.)

- A. Calendars and Change
- B. CO2 Model

### II. How does temperature change affect nature? (60 min.)

- A. Ecological Change Board (Phenology Display)
- B. Phenology Hike
  1. Preparation and Route
  2. The Hike
- C. Impacts of Change
  1. Year of Phenology
  2. Ecology Skit
  3. Stop or Adapt to Change

### III. How to study changes? (90 min.)

- A. Ecological Time Stamp
  1. Introductory slide shows
  2. Observation Tools
- B. Observations and Data Collection
  1. Update Ecological Change Board
  2. Importance of Patterns
- C. Process Data
  1. Photos
  2. Compare to Past Observations
  3. Share and Summarize
- D. Contributing to Climate Science
  1. Data Comparisons
  2. Our Contributions

## Clean-up (15 min.)