



## Seasonal Change: *Discussion Guide*

### Overview

Seasonal change varies in different parts of the world. Near the equator, temperatures and weather conditions remain relatively consistent year round. As we travel away from the equator in either direction, conditions become more temperate and seasons become more marked. Temperatures are extreme at the extremes of the Earth, the poles, where it is bitter cold year round. But even the poles experience seasonal warming. In addition to anticipated natural changes in temperature and weather, we now know that humans have had a great impact on Earth's climate—an impact that could eventually become catastrophic.

Help your students understand the natural events of weather and seasonal change, as well as the powerful impact of humankind on the natural order.

### Classroom Activities

1. Show the “Seasonal Change in Temperate Deciduous Forests” segment from the *Temperate Deciduous Forests* video.
  - **Graphic Organizer:** Create a graphic organizer that illustrates the seasonal changes that occur in a temperate deciduous forest. Use the following Web sites for additional information:
    - [http://www.blueplanetbiomes.org/deciduous\\_forest.htm](http://www.blueplanetbiomes.org/deciduous_forest.htm)
    - <http://www.ucfv.bc.ca/biology/Biol210/1999/SeasonalChange/Seasons.html>
  - **Responding Through the Fine Arts:** Forests have been an inspiration for musicians, artists, and writers throughout recorded history. Play George Winston's “Woods” from his *Autumn* album. Ask students to close their eyes as they listen and let the music create an image in their mind's eye. Ask students to work alone or in small groups to complete one of the following activities: write lyrics to accompany “Woods”; write a poem or draw a picture that captures the feeling of the forest.



3. Show the “Our Changing Climate: Researching and Forecasting Weather” segment from the *Biomes: Extreme Climate* video. (Access to unitedstreaming is required.)
  - **Pre-Viewing Discussion:** Before watching the video, ask students what they know about global warming and the greenhouse effect. Questions to consider include the following: How serious is global warming? How does it affect our lives today? How will it affect our lives in the future? Next, have students test their knowledge by completing an online quiz prepared by the U.S. Environmental Protection Agency. Visit <http://yosemite.epa.gov/oar/globalwarming.nsf/content/impacts.html> and click on “Test Your Knowledge.”
  - **Public Service Announcement:** The video discusses some of the potential dangers of global warming. Have small groups of students prepare public service advertisements that inform the public of these dangers. Share the ads with the student body to educate everyone about the issues. Ads can be in video, print, or audio format. Students can visit the following sites for more information:
    - <http://www.time.com/time/2001/globalwarming/splash.html>
    - <http://www.nrdc.org/globalWarming/default.asp>
    - <http://pubs.acs.org/hotartcl/cenear/951127/pg1.html>
  - **Find a Solution:** Have students research possible solutions to the problem of global warming, focusing especially on what they can do at home and in their own lives to combat the problem.
  - **Map It:** The segment mentions three hot spots of dramatic climate change: the Western Arctic (north of Alaska and Canada), the Antarctic (the tip of land that sticks out toward South America), and the Siberian Arctic. Have students look at a map or a globe to find these locations.
4. Show the “Melting Polar Ice Caps and Glaciers: Drastic Change Ahead” segment from the *Biomes: Extreme Climate* video. (Access to unitedstreaming is required.)
  - **Climate Glossary:** Have students make a list of unfamiliar words as they watch the video. After watching the video, have students look up the terms in a dictionary or encyclopedia. The following words might be unfamiliar: *ecosystem, habitat, species, organisms, environment, coastal erosion, thermal expansion, barometer*.
  - **Politics and Global Warming:** The video shows a clip of a press conference with President Bush in which he states that he will not put a cap on carbon dioxide (CO<sub>2</sub>) emissions if it will hurt the economy. Have students visit [http://www.globalwarming.org/politics\\_archive.htm](http://www.globalwarming.org/politics_archive.htm) to research other political decisions that might have an effect on climate.

- **Post-Viewing Discussion:** After viewing the video, have students discuss the impact of humans on world climate. Ask them if they are surprised by the drastic changes that scientists are predicting. Have students consider the impact of the following facts mentioned in the video: the sea level is expected to increase by three meters; half of the Alpine glaciers are expected to disappear; 70 to 80 percent of the ice-based ecosystems in the Arctic are expected to disappear; the ice caps may disappear by the year 2050.

## Academic Standards

### Mid-continent Research for Education and Learning (McREL)

McREL's Content Knowledge: A Compendium of Standards and Benchmarks for K-12 Education addresses 14 content areas. To view the standards and benchmarks, visit <http://www.mcrel.org/compendium/browse.asp>.

This lesson plan addresses the following national standards:

- Working With Others
  - Contributes to the overall effort of a group
- Science
  - Places and Regions
    - Understands the concept of regions
  - Uses of Geography
    - Understands global development and environmental issues
- Language Arts
  - Writing: Uses the general skills and strategies of the writing process; Gathers and uses information for research purposes
  - Reading: Uses reading skills and strategies to understand and interpret a variety of informational texts
  - Viewing: Uses viewing skills and strategies to understand and interpret visual media
  - Listening and Speaking: Uses listening and speaking strategies for different purposes

### The National Council of Teachers of English (NCTE)

The National Council of Teachers of English and the International Reading Association have developed national standards to provide guidelines for teaching the English language arts. To view the standards online, visit [www.ncte.org/about/over/standards/110846.htm](http://www.ncte.org/about/over/standards/110846.htm)

This lesson plan addresses the following English standards:

- Students conduct research on issues and interests by generating ideas and questions, and by posing problems. They gather, evaluate, and synthesize data from a variety of sources (e.g., print and non-print texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience.
- Students adjust their use of spoken, written, and visual language (e.g., conventions, style, vocabulary) to communicate effectively with a variety of audiences and for different purposes.

- Students use a variety of technological and information resources (e.g., libraries, databases, computer networks, video) to gather and synthesize information and to create and communicate knowledge.

### **National Council for the Social Studies**

The National Council for the Social Studies (NCSS) has developed national standards to provide guidelines for teaching social studies. To view the standards online, go to <http://www.socialstudies.org/standards/strands/>.

This lesson plan addresses the following thematic standards:

- Time, Continuity, and Change
- People, Places, and Environments
- Individuals, Groups, and Institutions
- Power, Authority, and Governance