

**RESOURCE LIBRARY**

ACTIVITY : 30 MINS

## Extreme Weather on Earth

Students use prior knowledge, a photo gallery, and a video to discuss what they already know about extreme weather on Earth and brainstorm and categorize a list of weather-related words and phrases. Then they identify the necessary conditions for weather events to occur, and the factors that affect extreme weather. Students organize information about weather events and conditions, identify patterns, and make connections between weather and climate.

**GRADES**

6 - 8

**SUBJECTS***Earth Science, Meteorology***CONTENTS**

8 Images, 1 Video, 1 PDF

## OVERVIEW

Students use prior knowledge, a photo gallery, and a video to discuss what they already know about extreme weather on Earth and brainstorm and categorize a list of weather-related words and phrases. Then they identify the necessary conditions for weather events to occur, and the factors that affect extreme weather. Students organize information about weather events and conditions, identify patterns, and make connections between weather and climate.

For the complete activity with media resources, visit:

<http://www.nationalgeographic.org/activity/extreme-weather-on-earth/>

## Program

# DIRECTIONS

## 1. Activate students' prior knowledge about extreme weather on Earth.

Ask: *What do you know about extreme weather on Earth?* Have students brainstorm a list of weather-related words and phrases. Write their responses on the board. Then ask students to sort the list into logical categories, such as types of weather, tools to measure weather, and effects of weather.

## 2. Discuss a photo gallery of extreme weather.

Tell students they will look at a photo gallery of extreme weather and then watch a video about weather. Display the photo gallery Extreme Weather. Invite volunteers to read aloud each caption. Then, show the National Geographic video "Weather 101." Ask students to describe the extreme weather events. Then ask: *What are the necessary conditions for each weather event to occur?* Elicit responses from students such as: differences in circulating air masses, clashing warm and cool air masses (fronts), and jet streams. Ask: *What are the factors that affect extreme weather?* Elicit responses from students such as: the sun (temperature), water (precipitation), and other atmospheric conditions like jet stream, pressure, wind, humidity, and clouds.

## 3. Have students complete the worksheet Weather Investigation.

Distribute a copy of the worksheet Weather Investigation to each student. Read aloud the directions and go over the provided answer. Allow students to gather and organize the information they have learned about weather and atmospheric conditions present for each type of weather. Their answers should include the following:

- Tornado: clouds, strong wind, rain, hail
- Hurricane or cyclone: strong wind, heavy rain
- Blizzard: heavy snow, ice, cold temperatures
- Dust storm: strong winds, arid conditions
- Flood: heavy rainfall
- Hail storm: cold or warm temperatures, rain, ice
- Ice storm: freezing rain

After students have completed the worksheet, ask: *What patterns do you see?*

#### 4. Have students make connections between weather and climate.

Ask: *What is climate? How does climate relate to weather?* Some students may understand that the climate in areas closer to the Equator has fewer extremes than in the areas farther away from the Equator. Make sure students understand that the term *weather* describes conditions in the atmosphere over a short period of time. The term *climate* describes weather patterns of a particular region over a longer period, usually 30 years or more. Climate is an average pattern of weather for a particular region. Build background by providing the following example: The weather in Wisconsin can vary from day to day. Some days can be very warm, with record temperatures over 100° Fahrenheit (F), with other summer days not even reaching 70° F. Winter temperatures can vary just as much. The climate however, is a trend over an extended period of time. Temperature trends in the Midwest show an overall warming of between 0.3° F to 1.8° F from data collected during the period of 1895-2006.

## Informal Assessment

Ask students to orally describe:

- examples of weather on Earth and the atmospheric conditions present
- the difference between weather and climate

## OBJECTIVES

## Subjects & Disciplines

### Earth Science

- Meteorology

## Learning Objectives

Students will:

- list and find patterns in the conditions required for weather events to occur
- describe the similarities and differences between weather and climate

## Teaching Approach

- Learning-for-use

# Teaching Methods

- Brainstorming
- Discussions
- Multimedia instruction
- Visual instruction

# Skills Summary

This activity targets the following skills:

- Critical Thinking Skills
  - Analyzing
  - Understanding

# National Standards, Principles, and Practices

## NATIONAL SCIENCE EDUCATION STANDARDS

- (5-8) Standard D-1:

Structure of the earth system

## Preparation

## What You'll Need

## MATERIALS YOU PROVIDE

- Pencils
- Pens

## REQUIRED TECHNOLOGY

- Internet Access: Required

- Tech Setup: 1 computer per classroom, Projector, Speakers
- Plug-Ins: Flash

## PHYSICAL SPACE

- Classroom

## GROUPING

- Large-group instruction

## BACKGROUND & VOCABULARY

### Background Information

The term *weather* describes conditions in the atmosphere over a short period of time. *Climate* describes weather patterns of a particular region over a longer period, usually 30 years or more. Climate is an average pattern of weather for a particular region. Identifying patterns in the atmospheric conditions of extreme weather events can help you understand Earth's weather system.

### Prior Knowledge

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### Recommended Prior Activities

- [Design a Space Probe](#)
- [Extreme Weather in Our Solar System](#)
- [Jupiter's Great Red Spot](#)
- [Measuring Weather](#)
- [Space Probes](#)

### Vocabulary

Term	Part of Speech	Definition
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Term	Part of Speech	Definition
air mass	<i>noun</i>	a large volume of air that is mostly consistent, horizontally, in temperature and humidity.
air pressure	<i>noun</i>	force pressed on an object by air or atmosphere.
atmosphere	<i>noun</i>	layers of gases surrounding a planet or other celestial body.
blizzard	<i>noun</i>	storm with high winds, intense cold, heavy snow, and little rain.
climate	<i>noun</i>	all weather conditions for a given location over a period of time.
dust storm	<i>noun</i>	weather pattern of wind blowing dust over large regions of land.
Equator	<i>noun</i>	imaginary line around the Earth, another planet, or star running east-west, 0 degrees latitude.
extreme weather	<i>noun</i>	rare and severe events in the Earth's atmosphere, such as heat waves or powerful cyclones.
flood	<i>noun</i>	overflow of a body of water onto land.
front	<i>noun</i>	boundary between air masses of different temperatures and humidities.
hail	<i>noun</i>	precipitation that falls as ice.
hurricane	<i>noun</i>	tropical storm with wind speeds of at least 119 kilometers (74 miles) per hour. Hurricanes are the same thing as typhoons, but usually located in the Atlantic Ocean region.
jet stream	<i>noun</i>	winds speeding through the upper atmosphere.
precipitation	<i>noun</i>	all forms in which water falls to Earth from the atmosphere.
temperature	<i>noun</i>	degree of hotness or coldness measured by a thermometer with a numerical scale.
weather	<i>noun</i>	state of the atmosphere, including temperature, atmospheric pressure, wind, humidity, precipitation, and cloudiness.

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## For Further Exploration

### Articles & Profiles

- [National Geographic Education: Article—Meteorological Sleuth](#)
- [National Geographic Education: Profile—Real-World Geography: Dr. Randall Cerveny](#)

### Websites

- [NOAA: Satellite and Information Service—Extreme Weather and Climate Events](#)
- [Nat Geo Movies: Wildest Weather in the Solar System](#)

## FUNDER



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