

RESOURCE LIBRARY
ACTIVITY : 45 MINS

Extreme Weather on Other Planets

Students compare ways of investigating weather on Earth and on other planets in our solar system. They use a video to discuss which different types of weather information might help us understand what the environments are like on each planet. Then students compare and contrast weather conditions for planets in our solar system.

GRADES

2 - 5

SUBJECTS

Earth Science, Astronomy, Meteorology

CONTENTS

1 Video, 2 PDFs

OVERVIEW

Students compare ways of investigating weather on Earth and on other planets in our solar system. They use a video to discuss which different types of weather information might help us understand what the environments are like on each planet. Then students compare and contrast weather conditions for planets in our solar system.

For the complete activity with media resources, visit:

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

Program



DIRECTIONS

1. Compare ways of investigating weather on Earth and on other planets in our solar system.

Explain to students that scientists and meteorologists investigate weather on Earth in several ways:

- They measure weather with thermometers and other tools.
- They view the weather from satellites above Earth's atmosphere.
- They use photography and video to capture images of major weather events.

Ask: *What is weather like on other planets? How do you think scientists investigate weather on other planets?* Have students draw their ideas about what weather is like on other planets and how scientists investigate it. Then tell students that they will explore the answers to these questions in this activity.

2. View and discuss the video "Solar System 101."

Show students the National Geographic video "Solar System 101." Ask students what types of information about the planets might help us understand what the environments are like on each planet. Write students' ideas on the board. Elicit responses such as temperature, winds, presence of water or ice, or whether a planet is made of gas or rock/soil. For each characteristic, ask: *What might this tell us about the weather on that planet?*

3. Have students complete a worksheet to analyze weather conditions in our solar system.

Distribute copies of the handout Solar System Environments to each student. Read aloud the directions and answer any questions students may have. Review any vocabulary that is new to students, such as math terms *minimum*, *maximum*, and mean and science terms wind speed, moons, *gaseous*, and *rocky*. Help students practice using the information in the chart by looking for the hottest planet or the planet with the highest wind speed. Then distribute copies of the worksheet Planet Investigation. Have students work in pairs or small groups to complete the worksheet. Emphasize that in worksheet questions six and seven, there are no right answers. Help students use information from the handout to inspire their ideas. Make sure students understand that scientists still ask questions and seek more information about the planets in our solar system—even if that planet has been explored already.

Modification

If students have difficulty understanding temperatures that are below zero, draw a thermometer on the board and mark where the mercury falls with different temperatures in both Celsius and Fahrenheit. Talk about temperatures on Earth. For example, if you are using Fahrenheit (F), mention 100 degrees F being very warm, 32 degrees F being freezing, 212

degrees F being the boiling point for water, and temperatures below zero being very cold for humans. Then talk about temperatures on another planet, drawing and numbering another thermometer. Students will have trouble imagining such temperature extremes, but they will understand that they are extreme.

Informal Assessment

Ask students to explain which planets they think may be good for weather study and why. Then have them imagine they are scientists studying solar system weather, and have students each write a question they would want to answer about wild weather on another planet or dwarf planet.

Extending the Learning

You can use this series of activities to prepare students to design their own space probe. If so, let students know that each of these activities is leading to that goal. Encourage them to think of ideas for their probe as they move through the activities.

OBJECTIVES

Subjects & Disciplines

Earth Science

- Astronomy
- Meteorology

Learning Objectives

Students will:

- describe weather conditions on other planets in our solar system

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

- (K-4) Standard D-3:

Changes in earth and sky

Preparation

What You'll Need

MATERIALS YOU PROVIDE

- Drawing paper
- 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

OTHER NOTES

In 2006, the status of Pluto was changed from a planet to a dwarf planet. A dwarf planet is not gravitationally dominant. It shares orbital space with other bodies of similar sizes.

BACKGROUND & VOCABULARY

Background Information

Scientists and astronomers are interested in learning more about our solar system. Before exploration takes place, even via remote sensing by probes or satellites, scientists and engineers must consider environmental conditions such as weather. They must design equipment that can handle extremes of temperature, wind, and other factors.

Prior Knowledge

["planets in our solar system"]

Recommended Prior Activities

- [Design Your Own Space Probe](#)
- [Discover Space Probes](#)
- [Extreme Weather on Our Planet](#)
- [Measuring Weather with Tools](#)

Vocabulary

Term	Part of Speech	Definition
mean	<i>noun</i>	mathematical value between the two extremes of a set of numbers. Also called the average.
meteorologist	<i>noun</i>	person who studies patterns and changes in Earth's atmosphere.
moon	<i>noun</i>	natural satellite of a planet.

Term	Part of Speech	Definition
planet	<i>noun</i>	large, spherical celestial body that regularly rotates around a star.
satellite	<i>noun</i>	object that orbits around something else. Satellites can be natural, like moons, or artificial.
solar system	<i>noun</i>	the sun and the planets, asteroids, comets, and other bodies that orbit around it.
space probe	<i>noun</i>	set of scientific instruments and tools launched from Earth to study the atmosphere and composition of space and other planets, moons, or celestial bodies.
temperature	<i>noun</i>	degree of hotness or coldness measured by a thermometer with a numerical scale.
thermometer	<i>noun</i>	device that measures temperature.
weather	<i>noun</i>	state of the atmosphere, including temperature, atmospheric pressure, wind, humidity, precipitation, and cloudiness.
wind speed	<i>noun</i>	force and velocity of wind.

For Further Exploration

Websites

- [NASA: Space Place—Planet X-treme Weather](#)

FUNDER

