

SUGGESTED REFERENCES

- *El Nino Research Forecasts and Observations*
<http://www.elnino.noaa.gov/>
- *PBS Kids: Tracking El Nino*
http://www.pbs.org/wgbh/nova/el_nino
- FEMA for Kids: *Hurricanes*
<http://www.fema.gov/kids/hurr.htm>
- The Weather Channel
<http://www.weather.com>
- *National Weather Service Tropical Prediction Center*
<http://www.nhc.noaa.gov/>
- *National Weather Service National Oceanic and Atmospheric Administration*
<http://www.noaa.gov/>
- *Lesson Plans Internet Workshop:*
<http://www.teachervision.com>
Keyword: weather

SCIENCE SCREEN REPORT FOR KIDS

NATIONAL SCIENCE EDUCATION STANDARDS

K - 4

Earth and Space Science

Changes in the earth and sky

5 - 8

Earth and Space Science

Structures in the earth system

Science in Personal & Social Perspectives

Natural hazards

Science and Technology

Understandings about science and technology

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SCIENCE SCREEN REPORT FOR KIDS'

Science Brought To Life In The Classroom

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HOW WEATHER HAPPENS



Accreditation Board
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SYNOPSIS

One of Earth's remarkable features is its weather. Our planet's diverse yet consistent climate creates the conditions for life to flourish. Our food supply, some of our resources, and how we live our lives are all weather related. And, the more we study our weather, the more we realize what an extraordinary phenomenon it is.

This edition of SCIENCE SCREEN REPORT FOR KIDS explores the different elements of nature that interact to form our weather. It demonstrates why the oceans are responsible for normal weather patterns, huge storms and abnormal events such as El Niño. It also explains how technology is increasing forecast accuracy, and some of the ways scientists may be able to modify our weather in the future.

CURRICULUM UNITS

- EARTH SCIENCE
- GENERAL SCIENCE
- METEOROLOGY
- OCEANOGRAPHY

RUNNING TIME

16:20

BACKGROUND

One of Earth's remarkable features is its weather, and our diverse but consistent climate creates the conditions for life to flourish. Many different facets of nature combine to form weather, including the wind and the ocean that establish global weather patterns.

The weather we experience begins with the sun. During the day, heat from the sun warms various regions of the earth and the oceans. At night these regions cool down. However, some regions cool down more rapidly than others. This variance creates changes in atmospheric pressure that result in high and low pressure systems. As air pressure changes, wind is created.

The oceans influence the weather because they are so massive - covering roughly three quarters of our planet. All of this water holds the heat it receives from the sun and releases it in the form of energy. As the energy interacts between the ocean and atmosphere, it produces prevailing winds that are a constant in our atmosphere, and also form our oceans' currents.

Every five to seven years a warm water current called El Niño forms and replaces the normally cool water current. This water temperature change creates strange and sometimes violent weather all over the planet.

In addition to El Niño, ocean currents are also responsible for producing massive storms such as hurricanes that cause tremendous damage. Hurricanes are storms that have winds greater than 119 kilometers per hour. They are also called typhoons or cyclones. While hurricanes originate in the ocean, tornadoes are created on land. These deadly storms sometimes have winds that reach more than 400 kilometers per hour.

Luckily, technological advances in meteorology have helped to improve weather forecasts, allowing us to prepare for such natural disasters. The video demonstrates how satellites and high-speed computers are helping to predict weather with increased accuracy, and how, from the vantage point of space, scientists can monitor subtle changes in the earth's oceans that can cause unusual weather events.

ADVANCED ORGANIZERS

Prior to showing the program:

1. Discuss the different types of weather you experience in your climate. What types of weather do other regions experience?
2. Create a KWL chart. Complete the K and the W prior to the video and the L after the video. (K-what you Know; W-what you Want to know; L-what you Learned)
3. Read a book such as *Weather* by Seymour Simon. Chart the different types of weather discussed in the book.
4. Select one type of weather from the chart, research it, and write an expository essay describing its aspects and characteristics. (Some weather related books by Seymour Simon are *Storms*, *Super Storms*, *Tornadoes*, *Hurricanes and Lightning*.)

CRITICAL THINKING EXERCISES

1. After viewing the program:
 - a| Describe the chain of events that causes weather.
 - b| What makes prevailing winds unique?
 - c| Give examples of how ocean currents cause weather.
 - d| Why are satellites useful for forecasting the weather?
 - e| What is the main cause of El Niño?
2. With the use of a world map, ask students which coasts are likely to have warm or cold water currents.
3. Separate students up into groups. Have each group create a weather forecast production complete with visual aides. Students can reference books such as *Weather Forecasting* and *Weather Words and What they Mean*, by Gail Gibbons.
4. Have students research the type of equipment they would need to forecast the weather from earth and the type of equipment they would need to forecast the weather from space.
5. Ask students to think of different ways technology might be able to modify the weather.

VOCABULARY

- Atmospheric Pressure.** . . . The pressure of the atmosphere surrounding the earth
- Easterlies.** Prevailing winds originating from the east
- El Niño.** An unusually warm, water current found in the Pacific that causes abnormal weather
- Gulf Stream.** A warm water current that flows off the eastern coast of the United States
- High Pressure.** A high measure of pressure as recorded on a barometer, usually associated with stable weather conditions
- Hurricane.** A storm with winds greater than 119 kilometers per hour
- Low Pressure.** A low measure of pressure as recorded on a barometer, usually associated with unstable weather conditions
- Meteorologist.** A person who studies the atmosphere and weather
- Prevailing Winds.** Winds that blow consistently from the same direction
- Topography.** A region's physical features and their structural relationships
- Tornado.** A funnel shaped cloud that moves over a narrow path of land
- Weather.** The condition of the atmosphere with respect to cold, heat, wetness, dryness, clear and cloudiness
- Westerlies.** A prevailing wind originating from the west
- Wind.** The movement of air from high pressure to low pressure

CAREER POSSIBILITIES

- | | | |
|---------------------|-----------------|--------------|
| ■ ASTRONAUT | ■ METEOROLOGIST | ■ RESEARCHER |
| ■ BIOLOGIST | ■ OCEANOGRAPHER | ■ SCIENTIST |
| ■ COMPUTER ENGINEER | | |