

RESOURCE LIBRARY
ACTIVITY : 30 MINS

Measuring Weather with Tools

Students use prior knowledge to brainstorm instruments scientists use to measure weather. They use a photo gallery to identify what weather conditions each instrument measures. Then students play a game to match illustrations of instruments that measure weather with descriptions of each instrument.

GRADES

2 - 5

SUBJECTS

Earth Science, Meteorology

CONTENTS

9 Images, 1 PDF

OVERVIEW

Students use prior knowledge to brainstorm instruments scientists use to measure weather. They use a photo gallery to identify what weather conditions each instrument measures. Then students play a game to match illustrations of instruments that measure weather with descriptions of each instrument.

For the complete activity with media resources, visit:

<http://www.nationalgeographic.org/activity/measuring-weather-with-tools/>

Program



DIRECTIONS

1. Activate prior knowledge about instruments used to measure weather.

Ask: *What instruments do you or your family members use to measure weather? What instruments do scientists use to measure weather?* Students will likely be able to name a thermometer, but they may not be able to name any other instruments that measure weather. Explain to students that there are many more tools scientists use to measure weather. They even use their eyes as important instruments for measuring visibility and making observations.

2. Discuss the photo gallery of instruments that measure weather.

Display the photo gallery Instruments That Measure Weather. Cover the names of the instruments and the captions with a piece of blank paper. Describe what each instrument is and how it works, without stating what it measures. Have students raise their hands to tell what “weather ingredient” the instrument measures. For example:

- Display the photo of an anemometer. Point out that it is a stick with a rotating x on the top. At the tips of the x are little cups that catch moving air. When the air moves a lot, the cups spin the x around quickly. Elicit from students that the instrument measures wind.
- Display the photo of a snow/rain gauge. Point out that the tall cylinder is left out in the weather and fills with snow or water. Elicit from students that the instrument measures rain or snow.
- Display the photo of a thermometer. Point out that the long, thin tube is filled with mercury. Heat makes the mercury expand and it rises up the tube. Elicit from students that the instrument measures hot and cold temperatures.
- Display the photo of a barometer. Point out that it looks like a thermometer, but it moves up when the air is lighter and down when it is heavier. Elicit from students that the instrument measures air pressure.
- Continue with the remaining photos.

3. Have small groups create decks of cards.

Divide students into small groups. Distribute one copy of the worksheet Instruments That Measure Weather to each group. Have the group cut apart the cards to create a deck for their group.

4. Have small groups match illustrations and descriptions.

Make sure each group has a full set of 9 description cards and a full set of 9 illustration cards. Have each group mix or shuffle each set of cards and then arrange the cards so they can see all of both sets. Ask students to look at all of the illustrations of instruments that measure weather. Have each group choose one student to start the activity. The starting student will

read the clues on the back of a card. The student who thinks they see the matching illustration will give it to the starting student and explain why they think it is a match. The matched pair is set aside. Then the student to the left reads the clues on the back of another card, and play continues around the circle until all illustrated cards have a matching description. After all groups are done, have a whole-class discussion to check groups' answers. (Instrument 1: thermometer; Instrument 2: barometer; Instrument 3: anemometer; Instrument 4: rain/snow gauge; Instrument 5: sling psychrometer; Instrument 6: wind vane; Instrument 7: weather satellite; Instrument 8: observations; Instrument 9: visibility)

5. Have students make connections to weather on other planets.

After a couple of rounds of play, refocus students. Have a whole-class discussion about the questions below. In between each, allow students time to discuss the question in their small groups and then report back to the whole class. Ask:

- *What weather ingredient(s) do you think would be important to measure on another planet?*
- *Which instrument would give you the best measurement of your chosen weather ingredient?*

Modification

To make this activity more hands-on, and to help your kinesthetic learners, obtain examples of the actual instruments from the school science lab or other teachers. Allow students to touch and examine them.

Informal Assessment

Have students play the card game a second time as an assessment activity after teaching about weather instruments.

OBJECTIVES

Subjects & Disciplines

Earth Science

- Meteorology

Learning Objectives

Students will:

- determine which instruments would be helpful on other planets

Teaching Approach

- Learning-for-use

Teaching Methods

- Discussions
- Simulations and games

Skills Summary

This activity targets the following skills:

- 21st Century Student Outcomes
 - Learning and Innovation Skills
 - Communication and Collaboration
- Critical Thinking Skills
 - Analyzing
 - Understanding

National Standards, Principles, and Practices

NATIONAL SCIENCE EDUCATION STANDARDS

- (K-4) Standard A-1:

Abilities necessary to do scientific inquiry

- (K-4) Standard E-2:

Understanding about science and technology

Preparation

What You'll Need

MATERIALS YOU PROVIDE

- Glue sticks
- Pencils
- Safety scissors

REQUIRED TECHNOLOGY

- Internet Access: Optional
- Tech Setup: 1 computer per classroom, Projector

PHYSICAL SPACE

- Classroom

GROUPING

- Small-group instruction

BACKGROUND & VOCABULARY

Background Information

Weather is measured using a variety of instruments. Before we can collect data on other planets, we must understand what data is collected on our own planet and how.

Prior Knowledge

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Recommended Prior Activities

- [Design Your Own Space Probe](#)
- [Discover Space Probes](#)
- [Extreme Weather on Other Planets](#)

- Extreme Weather on Our Planet

Vocabulary

Term	Part of Speech	Definition
air pressure	<i>noun</i>	force pressed on an object by air or atmosphere.
anemometer	<i>noun</i>	a device that measures wind speed.
barometer	<i>noun</i>	an instrument that measures atmospheric pressure.
observation	<i>noun</i>	something that is learned from watching and measuring an object or pattern.
rain gauge	<i>noun</i>	device for measuring rain or other forms of liquid precipitation, usually in millimeters. Also called a precipitation gauge, udometer, pluviometer, or ombrometer.
sling psychrometer	<i>noun</i>	device for measuring humidity that uses two thermometers: one measures the air temperature while the bulb of the other is kept cool and moist. The sling psychrometer is whirled around until moisture from the wet bulb evaporates.
thermometer	<i>noun</i>	device that measures temperature.
visibility	<i>noun</i>	the ability to see or be seen with the unaided eye. Also called visual range.
weather satellite	<i>noun</i>	instrument that orbits the Earth to track weather and patterns in the atmosphere.
wind vane	<i>noun</i>	device that rotates to show the direction the wind is blowing. Also called a weather vane.

FUNDER



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