

Lesson Plan Title

Operation Weather Station

Grade Level

4th Grade

Subject Area

Science

MSCCRS

- E.4.9B.1 - Analyze and interpret data (e.g., temperature, precipitation, wind speed/direction, relative humidity, or cloud types) to predict changes in weather over time.
- E.4.9B.3 - Design weather instruments utilized to measure weather (e.g., barometer, hygrometer, rain gauge, anemometer, or wind vane). Use an engineering process to define the problem, design, construct, evaluate, and improve the other weather instruments.

Art Form

Media Arts

MSCCR Creative Arts Standards

MA: Cr1.1.4 Generate and conceptualize artistic ideas and work.

a. Conceive of original artistic goals for media artworks using a variety of creative methods, such as brainstorming and modeling.

MA: Cr2.1.4 Organize and develop artistic ideas and work.

a. Discuss, test, and assemble ideas, plans, and models for media arts productions, considering the artistic goals and the presentation.

MA: Cn10.1.4 Synthesize and relate knowledge and personal experiences to make art.

a. Examine and use personal and external resources, such as interests, research, and cultural understanding, to create media artworks.

Duration

5 days

Materials

Gather Data: A Weather Watch Activity

Weather Data Sheet printable, two copies per student (in resources below)

Daily weather reports (e.g., from daily newspaper or at websites such as The Weather Channel, National Oceanic and Atmospheric Administration, or a local news site)

Pencils

Materials needed to build each weather tool: anemometer, wind vane, barometer, thermometer, rain and snow gauge

Objectives

Students will:

Understand when exact measurements are preferred over estimates.

Learn to use different instruments to report wind speed, wind direction, air pressure, snow/rainfall, and temperature

Work cooperatively with classmates to create an operational weather station

Vocabulary

Humidity

Temperature

Precipitation

Gauge

Analyze

Interpret

Art Vocabulary

Media

Generate

Conceptualize

Model

Assemble

Lesson Description

DAY 1

Step 1: Assess students' prior knowledge through discussion and by asking questions such as:

What is weather?

Why is the sky blue?

How can meteorologists predict tomorrow's weather or that a snowstorm is possible in three days?

Step 2: Discuss the difference between guessing or predicting and taking an exact measurement. Ask students to think about instances when you want an exact measurement instead of a prediction. For example: If you were sick, would you want the doctor to guess what your temperature was? Or if your parents are driving a car, should they guess how fast they are going or use a tool to measure their exact miles per hour?

Step 3: Ask students if they know of any tools that can be used for measuring weather. These include an anemometer, barometer, thermometer, rain gauge, and wind vane. Write the names of each of these on the board or in a word bank as you discuss it so students may refer to them later.

Step 4: Have students go to the Gather Data: A Weather Watch Activity to investigate the six different weather forecasting tools.

Step 5: Explain to students they will be creating a weather station with the forecasting tool, which they will use to learn about the weather for the next several days. (Depending on current weather conditions, the weather stations can include either a rain gauge or a snow gauge.)

DAY 2

Step 1: Divide students into either five or ten groups. Each group will be responsible for one of the tools needed for the weather station (so you will be able to set up one or two complete stations).

Step 2: Give each group a copy of the directions (which can be found in the Gather Data: A Weather Watch Activity) to build an anemometer, wind vane, barometer, thermometer, or rain or snow gauge.

Step 3: Allow approximately 30 minutes for students to build their tool. After all of the tools are completed, have each group explain what their tool does and how it works.

Step 4: Have students set up their weather stations in an area that is far from walls, shrubs, and trees.

DAY 3

Step 1: Distribute two copies of the Weather Data Sheet printable to each student. On the top of one have them write, "Weather Station Data" and atop the other, "Actual Weather Data."

Step 2: Next, have students visit the weather station and follow the directions for experimenting with an anemometer, wind vane, barometer, thermometer, or rain or snow gauge. Have them record the data they collect on the "Weather Station Data" sheet.

Step 3: Once students have come back inside, go over their findings together. Ask students if they believe their results are accurate. Discuss ways you might get a weather forecast that is accurate (e.g., on television, on the radio, by calling a weather station, going online).

Step 4: Using a reliable print or online weather source, find a current weather report. Have students record this data on the "Actual Weather Data" sheet. Compare and contrast any differences between the real and actual data.

Step 5: Repeat steps 2–4 for the next four days.

Step 6: After five days of data collecting, have students look over their results. Discuss how the weather pattern changed over the week. Ask students questions like:

What were the highest and lowest temperatures?

Did the temperature remain consistent?

How did temperature and wind speeds compare? Does one affect the other?

Who observed the most rain/snow?

How can location determine if an area gets rain or snow?

What did you observe about air pressure?

When the air pressure went up, what happened to your other observations?

Recommended Resources

<https://www.scholastic.com/content/dam/teachers/lesson-plans/migrated-featured-files/gather.pdf>

http://teacher.scholastic.com/activities/wwatch/gather_data/

Lesson Extension:

Have students record their daily readings in a line graph for one or more areas of the forecast.

Advise students to color-code their graph for easy reading. The student readings could be in red while the professional readings could be in blue.

Author

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