Weather

What's the Weather?

Weather is very important in our lives.

A lot of what we do depends on the weather. We have to know how to get dressed for school, work, or even a picnic! If bad weather is coming, we want to know about it. We need to get ready!

How can we tell what the weather will be? One tool is a **thermometer**. It shows how hot or cold the air is. Another tool is a **wind sock**. It shows which way the wind blows.

The sky can also tell us the weather! Different **clouds** bring different kinds of weather.

Common Clouds

Cumulus (KYOOM-yoo-lus)
If you see clouds like this, the weather will be nice.

Cirrus (SIR-us)
If you see clouds like this, the weather is nice but may be changing.

Stratus (STRAY-tus)
If you see clouds like this, it might rain a little.

Cumulonimbus (KYOOM-yoo-loh-NIM-bus)
If you see clouds like this, it might rain a lot!

Cloud Tracker

Scientists look for patterns in the weather. These patterns help them predict future weather.

Materials

- ★ pencil
- ★ "Cloud Tracker" data sheet

1. Write today's date on your Cloud Tracker chart.

2. Look at the sky in the morning.
   Can you see any clouds?
   - **No:** Write "no clouds" on your chart.
   - **Yes:** Compare the clouds to the pictures on your Cloud Tracker. If they match one of the clouds, write down what kind. If not, describe the clouds or write "unknown."

3. Notice what the weather is like when school lets out.
   Is there rain or snow falling? If so, is there a lot or just a little?
   Is it windy? Record the weather on your chart.

4. Check the weather again at bedtime. Record it on your chart.

5. Do Steps 1–4 on five different days.
   (Try to check the clouds at the same time each day.)

6. Look at your Cloud Tracker chart. Do you see any patterns?

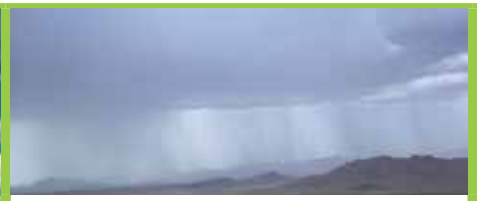
Name: _____

Cloud Tracker

Date					
Kinds of clouds in the morning					
Weather at end of school					
Weather at bedtime					

Common Clouds

Cumulus clouds
usually mean the weather will be nice.



Stratus clouds
often bring drizzles of rain.

Cirrus clouds
can mean the weather may be changing.

Cumulonimbus clouds
usually bring heavy rain and lightning.

Look at your chart. Do you see any patterns in the weather? Write your answer on the back of this sheet.

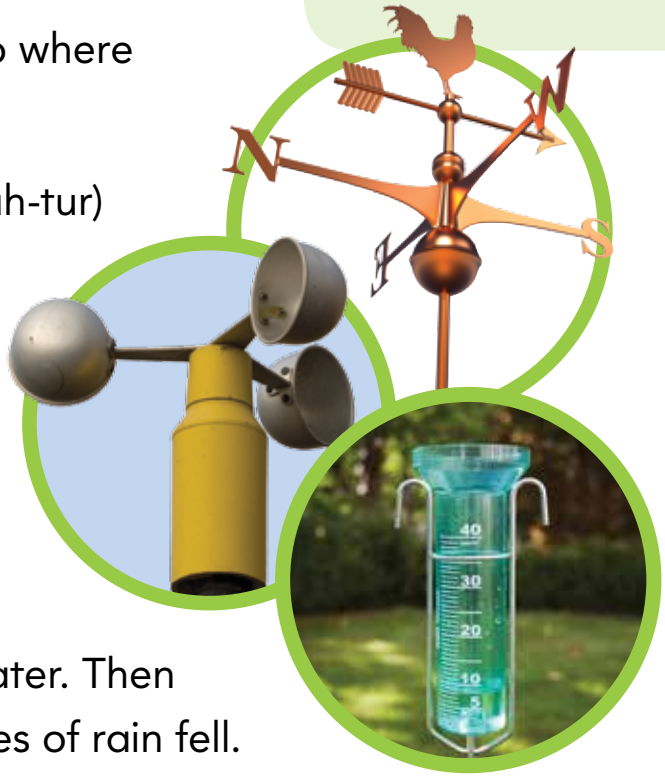
Measure the Weather

Weather experts use tools to learn about the weather. Make your own weather tool!

Materials

- ★ inventor's materials: cardboard, paper or plastic cups, metal can, plastic bottle, ruler, marker, what else?
- ★ "Measure the Weather" data sheet

1. Read about these three weather tools. Pick one you would like to make.
   - A **wind vane** shows which way the wind is blowing. The arrow points to where the wind is coming from.
   - An **anemometer** (an-i-MOM-uh-tur) measures wind speed. It uses three or four small cups. When the wind blows, it makes the cups spin.
   - A **rain gauge** (GAYJ) measures how much rain falls. A container collects the rainwater. Then a ruler can tell how many inches of rain fell.



2. **Think:** What weather tool would you like to make? Do you want to see which way the wind is blowing? Measure the wind speed? Measure the amount of rainfall? What would you need to make your weather tool? How would it work?

3. Draw your weather tool on your data sheet. Label your drawing. Write what you would use to make it and how it works. Then use the inventor's materials from your teacher to make the tool.

Name: _____

Measure the Weather

1. What weather tool would you like to make? (Check one.)

☐ Wind vane ☐ Anemometer ☐ Rain gauge

2. Draw your weather tool below. Label your drawing. Write what you would use to make it and how it works. Then use the inventor's materials from your teacher to make the tool.

Next Generation Science Standards
ESS2.D Weather and Climate
ETS1 Engineering Design

Background

Demonstrate cloud formation for the class using a clear glass container with a wide opening, a frozen cold pack (or a bag of ice), very warm water (at least as warm as steamy bath water—you may want to test this activity ahead of time to make sure your water is warm enough), and a can of spray deodorant.

Explain to the class that to make a cloud, you need water vapor, cold temperature, and tiny particles for water droplets to form around. Explain that some of your very warm water will quickly evaporate to become water vapor. The cold pack will provide cold temperature. The can of spray deodorant will provide the tiny particles for droplets to form around. Pour about an inch of very warm water into the glass container. Place a hand over the opening for about 10 seconds to allow the water vapor to gather. Give a quick spray of the deodorant into the container and place the frozen cold pack on top. Fairly quickly, you should see a thick cloud forming in the container. If you lift the ice pack, some of your "mini cloud" will start to escape.

Hands-On Hints

Task Card 1: Cloud Tracker

Choose a regular time at the beginning of the day to record cloud data. Have the class record the end-of-the-school-day weather just before dismissal. Remind children to notice the weather at bedtime as well. (If you wish, have the class agree on a time they will check the weather.)

Results for this activity will depend on your location, the time of year, and what kind of weather front is moving through your area. You can choose to do this activity on five consecutive weekdays, or you can wait for days that have one of the four common types of clouds listed on the Cloud Tracker chart. You might also watch weather forecasts to scope out days that might have "interesting" weather.

Children's data may show that certain clouds precede certain kinds of weather. Or they may find that there was no rain all week, even though they saw many kinds of clouds. If the weather data children collect is contradictory, remind them that weather scientists have had to collect years of data from all over the world to find reliable patterns. This activity has allowed them to observe and consider weather like scientists.

Task Card 2: Measure the Weather

After children draw their weather tools, invite them to make models. As a group, brainstorm the kinds of materials your inventors will need. You may have some materials on hand; children may be able to bring in others.

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For optimal results, we suggest following these steps:

1. Introduce the topic by reading aloud the nonfiction acticle. The article helps build background knowledge and provides context for the hands-on activities. You can project it onto your interactive white-board as you read it aloud. There is also a printable version that you can distribute to students so they can read along.

2. Divide the class into small groups. Hand each group a Task Card, and give each student a Data Sheet. (We recommend starting with Task Card 1.) Together with the class, read aloud the steps of the activity to ensure everyone understands what to do. You may also want to have each group conduct an inventory of their materials to make sure they have everything they need.

3. Have students do the activity and record on their Data Sheets.

4. Make sure to leave enough time before the end of the period so you can have a class discussion about the activity. Invite groups to share their findings and results, including any challenges they may have faced.

5. Gather students' data sheets to assess for understanding.

If you plan to continue the unit in your next lesson with the second Task Card, you might want to review the article with the class. In some cases, Task Card 2 builds upon Task Card 1, so you may want to quickly go over the first activity as well.

At the end of a unit, consider asking students to evaluate the topic and activities. This can be as simple as a thumbs-up or thumbs-down. Engage them in a discussion about what they liked or did not like and why. You might find this feedback useful for future lessons.

The two Task Cards feature hands-on activities that incorporate the following eight science and engineering practices—identified by the NGSS as essential for all students to learn:

1. Asking questions and defining problems
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations and designing solutions
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

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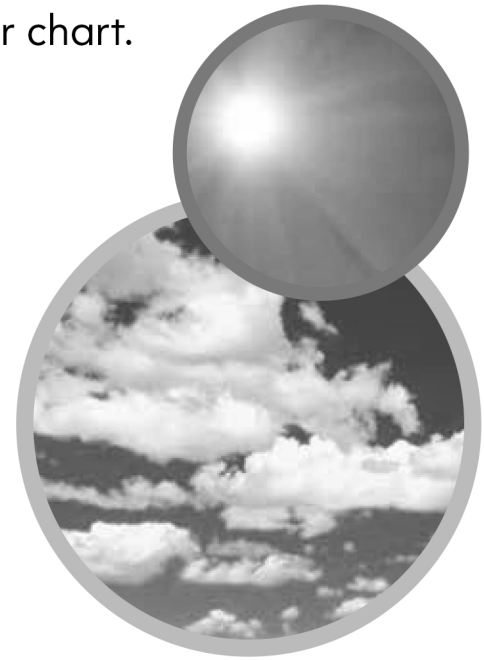

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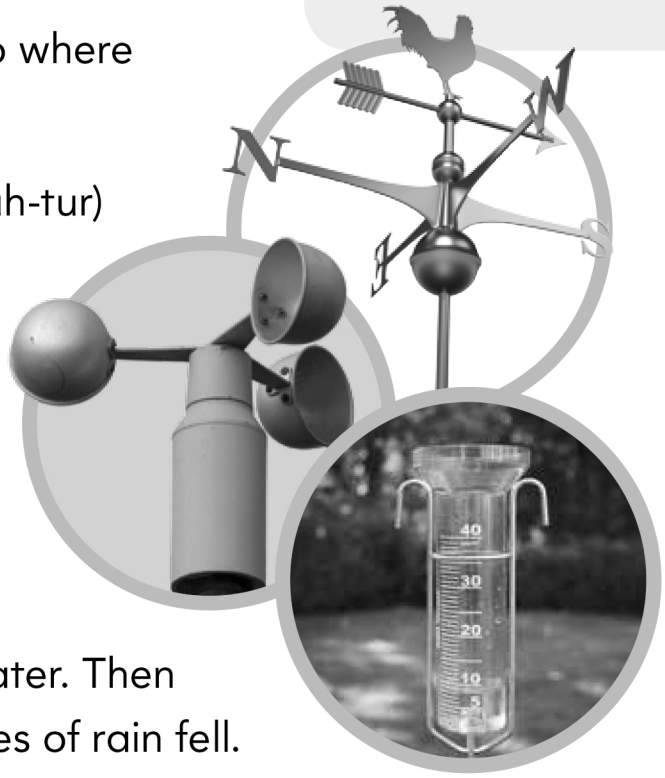

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