



Weather Bugs

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Grade Level: 5

Time Allotment: 2, 75 minute sessions; 4, 10 minute follow-up sessions

Overview: In this lesson students will participate in a discussion on predicting the weather and will help make barometers to predict weather patterns. At the end of the lesson they will understand how to use a barometer and will be able to make educated predictions about the weather. They will also realize how important weather and climate changes are to their daily lives and the lives of people around the world. By watching the DragonFly TV episode on predicting the weather, students will begin to understand that there are clues to weather patterns in nature, and they will see the scientific process in action. They will also test their knowledge about weather and climate by taking the EPA's online student quiz on climate change.

Subject Matter: Science

Learning Objectives:

- Students will demonstrate their knowledge that air pressure relates to weather by recording their observations of the changes in the level of the straw on the classroom barometer
- Students will demonstrate a working knowledge of a barometer by using their barometers to predict weather patterns

Standards: Montana Science Content Standard 1.2: *Students design, conduct, evaluate, and communicate scientific investigations. Select and accurately use appropriate equipment and technology to measure (in SI units), gather, process, and analyze data from a scientific investigation.* (Source: <http://www.opi.state.mt.us>)

Media Components: DragonFly TV #107: Weather

EPA Global Warming Kids Site

(<http://www.epa.gov/globalwarming/kids/games/index.html>) -- this is the official EPA Global Warming Kid's site. There are numerous games and activities on this site, as well as factual information about climate change and weather.

Materials:

- Small coffee can or glass jar, 1 per student plus 1 for whole class
- Plastic wrap (a piece large enough to fit over the top of the can), 1 piece per student plus 1 for whole class
- Scissors, 1 pair per student
- Straw or coffee stirrer, 1 per student, plus 1 for whole class
- Large rubber band, 1 per student plus 1 for whole class
- Index card, 1 per student plus 1 for whole class
- Weather prediction worksheet (1 double-sided copy per student)
- “You’re Going on Vacation!” worksheet, 1 copy per 3 students

Teacher Prep:

Load “DragonFly TV #107: Weather” video and cue to “Weather Wizards” opening, with “Weather Wizards” displayed across screen in white letters with music playing in the background.

Photocopy weather prediction sheets, 1 double-sided copy per student

Photocopy “You’re Going on Vacation!” worksheet, 1 per every 3 students

Collect coffee cans or glass jars, and other barometer materials, 1 per student plus 1 for the class

Bookmark <http://www.epa.gov/globalwarming/kids/games/index.html>

Introductory Activity: “You’re Going On Vacation!”

1. Divide students into groups of three.
2. Hand out the “You’re Going on Vacation!” sheet.
3. Give students 15-20 minutes to decide what to bring.
4. Ask students to tell you what they decided to bring and why.
5. Ask students to share some frustrations they had, why might it be difficult to choose 10 items to bring to a “secret” location? What kinds of information might you need to know before deciding what to bring? (Guide them into a discussion about various locations, seasons, and different weather patterns, ask such questions as “Have you ever been to a tropical island during the winter? What is the weather like?”; “Have you ever been on a ski vacation? What do you need to wear on such a vacation?”; or “Is it usually hot or cold in the mountains during the summer?”)

Learning Activities:

1. Introduce and have your students watch the “Weather Wizards” portion of the show (begin tape from the teacher prep cue). Set the focus for media interaction: tell students they will have to tell you the first four clues the students in the video will use to try to predict the weather. Point out the clues as they appear on the screen. (Answers: Watching the clouds at sunset, checking hair for curls (moisture), watching whether or not the bees are around, and checking the barometer).

2. Pause the video with the visual image of the homemade barometer and the audio cue of “dropping air pressure means...” and point out the barometer. Ask students if they have ever seen a barometer or used one before. Ask students to tell you how the barometer works. If nobody can tell you, rewind and replay the barometer segment.
3. Resume watching the video after setting the focus for media interaction: Tell students they will have to tell you the last two clues the girls will use to predict the weather and how many days each of the six clues were accurate in predicting the weather. (Answer: Last two clues used are the behavior of the cows and whether or not grandma’s toe will ache. The clouds at sunset were accurate for 7 out of 9 days, bees were accurate for 6 days, cows didn’t work, the hair clue worked for four days, the barometer predicted five days, and grandma’s aching toe worked for three days.)
4. Stop the video with Mari saying, “If we could find our own weather clues that work, we can do our own forecasting.” After viewing the episode segment, check for comprehension by discussing the different ways the girls tried to predict, or guess, the weather (grandmother, hair, barometer, clouds at sunset, etc.) and listening to the answers to your media interaction question.
5. Introduce the concept of a “barometer”—a device used to measure atmospheric pressure and help predict weather patterns, again check for comprehension by having a student explain. Show students the coffee can or glass jar and let them know they will be making barometers similar to the one in the show, to help the class predict the weather.
6. Steps for making the barometer
Ask a volunteer to hold the plastic wrap tightly over top of the can or jar. Make sure the wrap is tight or the barometer will not work. Secure the plastic wrap over top of the can/jar with a large rubber band.
7. Ask for a different volunteer to place the straw on top of the can/jar, so that about half of it is on the plastic wrap and the other half sticks off the side of the jar/can. Have the volunteer hold the straw in place while you tape it down.
8. Tell the students you will be using the barometer to determine the air pressure every day for a week. Tape an index card to the back of the can/jar, behind the straw. Ask for a volunteer to draw a line in pencil on the index card indicating the current location of the straw. Pass the barometer around so that all students agree on the placement of the line and then go over the penciled line with a marker to make it more visible.
9. Place the barometer in a visible location in the classroom (preferably near a window to get a more accurate reading). Draw a large barometer on the board or on an overhead projector, being sure to include the straw. Illustrate how if the straw tilts down over time, it indicates high air pressure and usually means clear skies. If the straw moves up, it means there is low air pressure and that usually indicates bad weather, approaching rain or even a possible snowstorm. Check for comprehension.
10. Pass out student barometer materials and take the students through the same steps as they make their own barometers.

11. Wait for 30 minutes. While you are waiting, have students log on to <http://www.epa.gov/globalwarming/kids/games/index.html>. Set focus for media interaction: Ask students to take the test on Climate Change Knowledge and report their scores. When they are finished taking the quiz discuss the information. “Which questions did everyone answer correctly?” “Did you learn something new about climate from taking this quiz? What?” (possible answers might include that they learned that climate is weather over time, a hot summer is climate while a rainy day is weather, or that greenhouse gases trap energy in the atmosphere.)
12. When the discussion has ended, have students work on the crossword puzzle in pairs until the 30-minute wait period is up.
13. Returning to the weather lesson, circle the students around the class barometer. Ask them to tell you if the straw has moved. Remind them that if the straw moves down, that means there is high pressure. Ask them to tell you what it means if the straw moves up. Ask them if they remember what weather usually occurs when there is high atmospheric pressure and also when there is low pressure.
14. Have students read the barometers they have made and discuss the differences they notice (if any) between the class barometer and their individual barometer readings. Talk about possible reasons why there would be different readings (locations-near or far from indoor heating or cooling vents, distance from the outside air, open water bottles on desks, etc.)
15. Have students predict what type of weather will occur the following day, based on the movement of the straw. Have them record their predictions on the weather prediction handout. Make sure they write the day’s date on the prediction sheet so that at the end of the week they can look back and see which days they had predicted correctly.
16. The following day, have the students look at their prediction sheet. Were they correct? Have them record the actual day’s weather in the second column. Have a few students check the level of the straw on the class barometer again and report to the class. Ask several students to read their own barometers and report the changes they find there. Has the straw gone up or down? Have students record new predictions for the following day’s weather.
17. Check the barometers and repeat weather predictions for the rest of the week, or longer. Make sure to rotate the volunteer checkers and student volunteers so that each student gets a chance to check the class barometer or read the findings from their individual barometer aloud.

Culminating Activity:

1. At the end of the week, allow time for students to share how accurately they were able to predict the weather.
2. Make a whole class graph for the week showing how many students correctly predicted the weather each day.

Cross-Curricular Extensions:

Science

- Include a weekly weather forecast in the classroom newsletter or school newspaper, forecasted and written by students.
- Investigate different types of severe weather: thunderstorms, floods, drought, hurricanes, tornadoes, and windstorms. Have your students explore and write reports on which part(s) of the country are most affected by these different disasters and why.

Community Connections:

- Invite a meteorologist to come speak to the class.
- Take a field trip to a local weather forecasting center.
- Write letters or emails to meteorologists or storm chasers asking them about their jobs and unique weather patterns they've seen.
- Investigate local weather patterns and how they may have affected population and economic trends in your city or town throughout history.

Name:

MY WEATHER PREDICTIONS

Today's Date:

Prediction	Actual Weather

Today's Date:

Prediction	Actual Weather

Today's Date:

Prediction	Actual Weather

YOU'RE GOING ON VACATION!

Congratulations! You and two friends have just won a four-day, all expenses paid trip to a secret location! HOWEVER, you can each only bring 10 things and they must be the same. What will you bring?

- bathing suit
- sundress
- shorts
- t-shirt
- tank top
- sandals
- sunglasses
- sunscreen
- beach towel
- warm coat
- long underwear
- mittens
- sun hat
- raincoat
- umbrella
- rain boots
- jeans
- sweatshirt
- sweater
- long pants
- long sleeve t-shirt
- hiking boots
- sneakers
- wool socks
- cotton socks
- scarf