

Activity 3.2 Reading the Sky: using cloud types to predict the weather

Can any understand the spreading of the clouds?

Job, 37:16

Hamlet: Do you see yonder cloud that's almost in the shape of a camel?

Polonius: By the mass, and 'tis like a camel, indeed.

Hamlet: Methinks it is like a weasel.

Polonius: It is backed like a weasel.

Hamlet: Or like a whale?

Polonius: Very like a whale.

William Shakespeare, *Hamlet*

When clouds appear like rocks and towers
the Earth's refreshed with frequent showers.

Traditional

Teacher Background

As the interplay between Hamlet and Polonius indicates, shapes in the sky can be ambiguous. Yet the wealth of weather sayings and folklore from around the world indicates that humans have long used cloud shapes to predict what's ahead. As we noted in Activity 2.1 (when students create clouds in a glass jar), it was in 300 B.C. that the Greek philosopher Theophrastus published a book of signs containing over 100 cloud types. The system of classification we use today was developed in 1803 by the English chemist, pharmacist and amateur meteorologist, Luke Howard, whom some call "The Man Who Named The Clouds." Howard wrote, "...it is by observing the changes and transitions of cloud form that weather may be predicted." Howard spent 30 years closely observing the relationship between cloud type and weather. We now know (Activity 2.6) that particular conditions such as warm fronts and cold fronts trigger the formation of specific types of clouds. This Activity builds on students' earlier hands-on experiences and now invites them to "read the sky", learning to identify clouds and collecting data to see if cloud types are indeed accurate predictors of future weather.

Objectives

Students will practice identifying clouds using a cloud chart.

Students will observe the sky for several days and record the types of cloud and the percentage of sky covered by clouds.

Students will make weather predictions based on cloud type, and compare their predictions to official forecasts and to the actual weather for the time period.

Vocabulary

prediction

forecast

Materials

Student Worksheets 3.2.1 and 3.2.2

cloud charts (optional: Worksheet 3.2.1 provides diagrammatic sketches of cloud types)

compass

WEATHERlogs

LFSTORM Standards Correlation sheet for teacher reference

Engage

Ask students how they know what the weather will be each day. Discuss the different sources of information available—television, radio, newspapers, the Internet. What are the advantages of each? The disadvantages? Is there a way they can get a weather forecast without relying on the media? Perhaps by reading the sky with their own eyes? (There are, of course, disadvantages to relying on personal, local observations, but we believe that the idea of “doing it for themselves” will provide a novel challenge and motivation.) What sayings or weather lore have they heard that use the appearance of the sky to predict the weather? (“Red sky at night, shepherd’s delight. Red sky in the morning, shepherd’s warning.”)

Take students outside on a cloudy or partly cloudy day and have them make as many observations as possible about the sky. (See Activity 2.1 Engage for additional suggestions.) Discuss their observations. Ask students what type of weather they would expect tomorrow based on that day’s observations.

Explain/Explore

Distribute student worksheets 3.2.1 and 3.2.2 and review them. Show students how to use a compass to determine wind direction. (If you’ve implemented Activity 3.1 they may already know all about wind speed and direction.) Have them record the wind direction on their worksheets. Using the cloud descriptions on Student Worksheet 3.2.1, have them observe the sky and determine cloud types. Record cloud types on their worksheets. Based on the cloud type, encourage students to make a weather prediction for the next 12 and 24 hours, and to record their predictions on the worksheet. During the next class period have students record the actual weather that occurred, and compare prediction and reality. Encourage them to continue to record cloud type and record their predictions for one or two weeks. At this end of this period have them compare their set of predictions with the actual weather that occurred. How accurate were they? Compare their results with the results of other students or teams. Were they in fact able to predict the weather accurately based solely on cloud type?

Expand/Adapt/Connect

Have students work in groups. Each group takes a different medium (TV, newspaper, the Internet) and records forecasts for a week. Each day during that same week have them record the actual weather. Each team should present to the class a review of the accuracy of their medium’s forecasts and whether they would recommend this medium for weather forecasts.

Discuss how similar the forecasts of each medium are or how different. (Many will be taking NOAA’s official outlooks and minimally customizing them, putting their own logos and graphic look on them.) Listen to the weather reports or look for articles in the newspaper that might explain why the actual weather did not match the forecast.

Watch LIVE FROM THE STORM program 1 and note how much fun NOAA hurricane researcher Mark Croxford has in “reading” an approaching thunderstorm—and how promptly he moves to safety as the storm gets closer. (See SAFETY BRIEFING at the LFSTORM Home page.)

Have students research weather lore and folk sayings: each individual can then set up an experiment to see if, for example, flowers close up, and cockroaches grow more active (!), before a storm. If the timing is appropriate, have students prepare reports on their scientific tests of weather lore for upcoming science fairs.

Suggested URLs

[http://ww2010.atmos.uiuc.edu/\(Gh\)/guides/mtr/fcst/home.rxml](http://ww2010.atmos.uiuc.edu/(Gh)/guides/mtr/fcst/home.rxml)

Factors weather forecasters must consider when making accurate forecasts are explained here.

<http://vortex.plymouth.edu/cloud.html>

Excellent images of various cloud types. May take a little longer to load, but will provide detail not seen in smaller photos. (These images are used in the Cloud Concentration puzzle in STUDENTS' CORNER/GAMES.)

<http://inspire.ospi.wednet.edu:8001/curric/weather/pricloud/index.html>

Explains how to observe clouds with excellent graphics of different cloud types.