Trends Forecasting

Overview:

How do meteorologists forecast weather? Students learn one of 5 main methods for forecasting weather, use it to create a forecast, and analyze results.

Objectives:

The student will:

- understand the trends method of forecasting;
- make a weather prediction using the trends method; and
- utilize technology to examine weather data.

GLEs Addressed:

Science

- [5-8] SA1.1 The student demonstrates an understanding of the processes of science by asking questions, predicting, observing, describing, measuring, classifying, making generalizations, inferring, and communicating.
- [7] SD3.1 The student demonstrates an understanding of cycles influenced by energy from the sun and by Earth's position and motion in our solar system by describing the weather using accepted meteorological terms (e.g., pressure systems, fronts, precipitation).

Materials:

- Map of Alaska (to scale)
- Calculator (1 for every 2 students)
- Computer with Internet access
- OVERHEAD: "Radar Map"
- STUDENT WORKSHEET: "Trends"

Activity Procedure:

1. Remind students the persistence method of forecasting is one way meteorologists forecast weather.
2. Another method of weather forecasting is called trends. This method looks at winds and clouds approaching from a distance and estimates when they will arrive at the location in question. For this, one needs to know where the weather is coming from and how fast it is moving.
3. Share the following example with the class:
   a. There is a storm approaching from the east. It is 250 miles away and is moving west at 25 miles per hour. How long will it take the storm to arrive?
   b. 250 miles ÷ 25 miles/hour = 10 hours
4. If there are sufficient computers, ask students to form groups (preferrably pairs) and navigate to the following website: http://www.edheads.org/activities/weather. Ask students to click on the graphic that says "Click here to start," then "Predict Weather," then "Level 2." Instruct each group to follow the instructions to complete the game. Calculators may be used in sections that require math.
5. Distribute the STUDENT WORKSHEET: "Trends." Explain students will determine where the weather in their community is going by examining radar maps.
6. Show OVERHEAD: "Radar Map." Explain the colors on the map represent cloud cover. The key on the right shows which colors indicate heavier cloud cover. Cloud cover is a way of predicting rainfall intensity. The heavier the cloud cover, the more likelihood of rain.

7. Instruct students to complete their worksheets individually or in small groups. As a class, discuss the answer to question 8 (wind speed and direction can change, storms can dissipate) and 9 (it is more accurate due to the changing nature of our weather).

Answers:

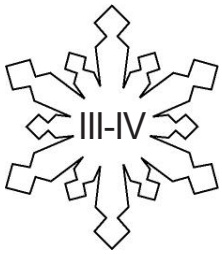
Answers will vary depending upon the weather conditions.

Name:_____

Trends

Student Worksheet (page 1 of 2)

Levels



1. Go to the National Weather Service Web site: http://www.nws.noaa.gov and type in your city and state in the upper left corner where it says "Local Forecast by City, St."

2. Using the forecast retrieved in Step 1, answer the following questions.

   What is the wind speed for today? _____ mph

   What is the wind direction for today? _____

3. To determine where the weather in your community will be tomorrow, first determine how far the weather will travel in 24 hours.

   Multiply the wind speed (Step 2) by 24 hours: _____ mph x 24 hours = _____ miles

4. Use a map of Alaska to find a community located in the direction the wind is traveling (see step 2) **and** approximately the distance from your community the weather will travel in one day (see step 3). Write the name of the community that you forecast will have your weather tomorrow.

   Community name: _____

5. Return to the National Weather Service forecast Web page reached in step 1. Click on the radar picture under the "Radar and Satellite Images" heading. Next, click on the "Go to: Standard Version" link located at the top of the page. Colored sections of the radar image represent cloud cover. The key on the right of the image shows which colors indicate heavier cloud cover.

   Use the key on the right of the radar image to determine whether the cloud cover in your community is heavy, moderate, light or very light. Write "none" if there is no cloud cover.

   Cloud cover: _____

6. Using the trends method of forecasting, predict tomorrow's weather for the community specified in step 4.

   _____

7. Go back to the National Weather Service home page at http://www.nws.noaa.gov. Type in the city and state for the community specified in step 4 where it says "Local Forecast by City, St" in the upper left corner.

   What does the National Weather Service predict for tomorrow's weather in the community you specified?

   _____

   Does your trends forecast match the National Weather Service weather prediction for tomorrow?

   _____

Name:_____

Trends

Student Worksheet (page 2 of 2)

8. If not, why do you think this might be the case?

_____

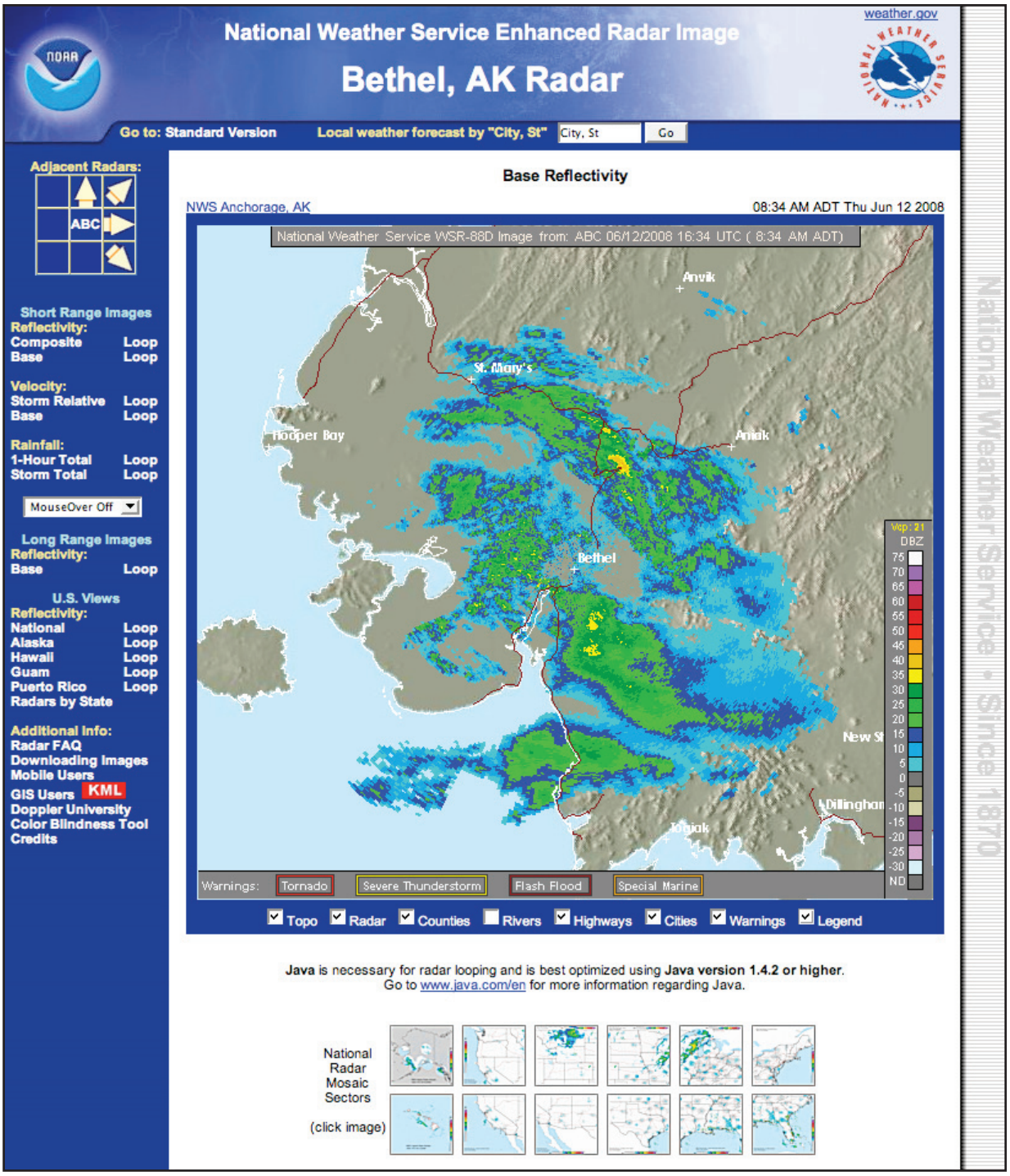
_____

_____

9. Why might a forecaster use a trends forecast instead of a persistence forecast?

_____

_____

Radar Map
Overhead

NOAA Website: http://www.noaa.gov