

Weather Data and Forecasting Study Guide

What is weather? Weather describes the condition of the air outdoors, such as temperature, cloud cover, wind speed, and rainfall.

What is climate? Climate describes the average weather conditions of a region year after year.

What are some ways a meteorologist describes the weather conditions? Possible answers include sunny, clear, cloudy, partly cloudy, mostly cloudy, chance of rain, and the temperature in Fahrenheit.

How does the weather compare from year to year? The weather should be similar during the same times of the year.

How would you use the different weather tools to predict the weather?

- The wind vane would be used to determine the direction of the wind.
- The anemometer would be used to measure the speed of the wind.
- The rain gauge would be used to measure the amount of rainfall.
- The barometer would be used to measure the atmospheric pressure.
- The thermometer would be used to measure the temperature.

You notice that the wind speed is increasing, the temperature is dropping, and the rain gauge is showing an increasing amount of rain. As a meteorologist, what would you need to do next? You would want to let the public know that there is bad weather approaching and beginning so they can take the appropriate precautions. Flooding may occur as well as wind damage.

What is the relationship between the seasons and weather? Each season has its typical weather due to the amount of direct or indirect sunlight each part of the Earth receives. Indirect sunlight means we have colder temperatures during winter. More direct sunlight means we have hot summers.

What is the relationship between an area's location on Earth and its weather? The closer to the poles, the colder the weather all year. The closer to the equator, the warmer the weather all year. This is caused by the indirect or direct sunlight received due to Earth's tilt. The areas in between experience the actual four seasons and the weather associated with those seasons.

Why do we concern ourselves with the weather? Possible answers: The weather affects how we dress for the day and how we get to places. We might walk or ride our bike to school if it's sunny. The weather also determines what activities we can or can't do outside.

Why do meteorologists track weather over long periods of time? They track and collect weather data so they can make predictions about the weather before it happens.

Why are a meteorologist's predictions sometimes incorrect? They are predictions based on patterns observed over long periods of time. Sometimes things change due to unforeseen events. Weather is affected by so many factors that it's impossible to predict accurately every time.

Meteorologists are able to predict when and where natural disasters will occur. How is this helpful? Knowing that a natural disaster is coming allows people to prepare their homes and leave if necessary.

Using today's weather data, make a prediction about tomorrow's weather. Answers will vary but should demonstrate understanding. If you could create your own weather symbols, what would they look like? Why would you choose those symbols? Answers will vary.

What is a front? A front is a moving mass of cold or warm air.

What is the symbol for a cold front on a weather map? A cold front is represented by a blue line with blue triangles.

What is the symbol for a warm front on a weather map? A warm front is represented by a red line with red semicircles.

In which direction do most fronts move? Most fronts move from left to right or west to east.

What information does a weather map contain? A weather map shows where the fronts are located and what type of front is near your location. A weather map also shows a compass so you can tell the direction the fronts are moving. Sometimes it tells you how fast the front is moving.

What are some ways a meteorologist describes the weather conditions? Possible answers include sunny, clear, cloudy, partly cloudy, mostly cloudy, chance of rain, and the temperature in Fahrenheit.

What type of pressure is associated with severe or rainy weather? Low pressure usually means severe or rainy weather.

What type of pressure is associated with clear, sunny weather? High pressure usually means clear, sunny weather.

The meteorologist is predicting cooler weather tomorrow. What must be happening to support that prediction? A cold front must be near the area and likely to move in our direction.

You hear your meteorologist say a warm front is moving in and will reach your town by the weekend. Should you make weekend plans to be outside? No, you should probably stay inside because when the warm front displaces the cold front, precipitation occurs.

What is the relationship between the seasons and weather patterns? Each season has its typical weather due to the amount of direct or indirect sunlight each part of Earth receives. Indirect sunlight means we have colder temperatures during winter. More direct sunlight means we have hot summers.

Can you formulate a theory for the types of clouds and weather conditions? Answers may vary but should include reference to warm fronts, to cirrus and cumulus clouds, and to cold fronts and stratus clouds.

If you could create your own weather symbols, what would they look like? Why would you choose those symbols? Answers will vary.

What information does a weather map contain?

A weather map shows where fronts are located and what type of front is near your location. A weather map also shows a compass so you can tell the directions the fronts are moving. Sometimes it tells you how fast the fronts are moving.

Describe the connection between clouds and various types of weather.

- Stratus clouds are low, flat, gray clouds that look like sheets covering the sky. They are the closest clouds to the ground. They can produce rain, drizzle, snow, or mist.
- Cumulus clouds are puffy and white, like cotton balls. They usually indicate fair weather. Sometimes they grow very large and become thunderheads. As these clouds gather, they create thunder and lightning, and they can produce precipitation in the form of rain and hail.
- Cirrus clouds are thin, curly, wispy clouds. They are sometimes referred to as mares' tails. They often indicate an incoming storm or weather change.