

Here at Discovery, we've had a lot of snow lately! It feels like we spend most days watching the weather and trying to predict what will come next. People who study the weather and make predictions are called meteorologists. Let's learn about how meteorologists study the weather!

Weather refers to the general conditions of temperature, pressure, humidity, and precipitation in an area. Weather changes over time, and even over the course of a single day. If there's a general pattern to the weather that is consistent over a very, very long period of time, that pattern would be referred to as the area's climate.



TEMPERATURE

Temperature refers to how hot or cold something is. In the United States, we generally use a system of measurement for temperature called Fahrenheit, where water freezes at 32 degrees and boils at 212 degrees under normal pressures. In other places, temperature might be measured in Celsius, where water freezes at 0 degrees and boils at 100 degrees under normal pressures. Average temperatures in Connecticut change from season to season, with warm to hot summers and cool to cold winters.

PRESSURE

Pressure tells us how we measure the weight of the column of air that's above a point of measurement. Air is made of matter, which has mass and takes up space, so on Earth where it feels the pull of gravity, it has weight. The **atmosphere**, the blanket of air that surrounds our planet, is made up of tons of air that is pulled in towards the surface by gravity, all pushing in on everything on Earth at all times. Typical air pressure is described as 14 pounds per square inch (psi), which means that every square inch of any surface at standard heights above sea level feels about 14 pounds of air pushing on it. Areas of high pressure want to spread out or travel and fill areas of low pressure. In weather, we describe pressure as measured by "atmospheres" or "millibars."

HUMIDITY

Humidity refers to the amount of water that is in the air. Water can exist in different states of matter, or different physical forms. Water is able to exist as a liquid between 32 and 212 degrees Fahrenheit. It can also exist as a solid (ice) or as a gas (water vapor). Due to the water cycle, water evaporates and some of it exists as water vapor gas in the air around us. The amount of water vapor in the air can change with the temperature and pressure. Warmer air holds more water vapor than cold air, so usually summer is fairly humid, and winter air is dry.

PRECIPITATION

Precipitation is what happens when there is more humidity in the air than the air can hold at that temperature and pressure. Water vapor collects in groups that form clouds, and when the clouds are not able to hold any more water, we experience precipitation. The kind of precipitation we have depends on the temperature and the pressure. If it's cold, the water might stay frozen and come down as snow, which is tiny ice crystals forming a crystal structure we call a snowflake. If it's warm, the water will hit the Earth as liquid rain. If conditions are changing through the journey to the surface, we can end up with other things like hail, sleet, and freezing rain.



MAKE A FORECAST

By studying the weather patterns in an area and knowing the climate of an area, we can make predictions about the weather called **forecasts.** In a forecast, we predict what the weather coming up might be like based on the weather we have had, and the factors that we can measure. For example, if we know that there has been high humidity lately, and the pressure is getting lower, that suggests that a storm might be moving into an area. If it rained a few days ago and there has been low humidity since, we know it's not likely to rain again until there's more water ready to precipitate again.

Keep a weather journal for one to two weeks. Use the template to help you track important details! Every day, mark down the temperature outside. Make notes of whether it rains, snows, or has other precipitation. Is it windy or cloudy? After you've collected data for a week, make a forecast for the weather over the next three to five days. Watch a weather report and see how a meteorologist predicts the weather for the coming week. Does it match your forecast?



Was there Lightning Today?

Yes

No

Storm Watch

Tornado Hurricane

I predict the weather tomorrow will be:

Tropical Storm

Humidity Levels

Very High Very Dry High Medium Dry

