

Weather

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Our entire planet is cocooned by a thin blanket of gases, which we call the atmosphere. Without this thin layer, which is no thicker on the earth than the skin is on an apple, our world would be as lifeless as the moon. Look up in the sky on a clear day and you can see the earth's atmosphere stretching some 430 miles above you.

Without this blanket of gases to protect us, we could not live. We would be scorched by the sun during the day and frozen solid at night. Most of the atmosphere is a thin mix of gases that are as calm and unchanging as outer space. But the lowest seven miles, the layer where we live and breathe, contains all the weather we experience, and is thick with gases, water, and dust. As the sun warms the land and sea, the heat keeps this thick broth forever churning. It is the constant swirling of this lower layer, called the troposphere, that gives us everything we call weather, from the gentlest summer showers to raging hurricanes and tornadoes.

When air begins to move, it becomes wind. A light breeze occurs when air moves slowly; gales and hurricanes tear through the skies when air moves very quickly. Slow or quick, wind always begins in the same way, with a difference in air pressure. Air pressure usually is measured on a device called a barometer. One of the important things to remember about air pressure is that it is closely related to weather, and changes in air pressure can give a useful indication of weather to come. A sharp drop in pressure indicates the onset of a front and the coming of clouds and rain. High pressure is a sign of clear skies and dry weather.

Clouds are formed by rising air. Because air gets cooler as it rises, it becomes less and less able to hold invisible water vapor. There comes a point when air becomes so cold that the water vapor condenses, forming rain. The amount of water in the air at any one time is known as humidity. Sometimes hot moist air rises rapidly over just a small area to form puffy cumulus clouds, which rarely last for more than a few hours. At other times, air can warm slowly and rise over a wide area to form vast, shapeless stratus (layered) clouds, which cover the entire sky and last for days. The darkest



PLAN YOUR PROJECT

Use this idea starter AND publication 4-H 365 *Self-Determined Project Guide* as the starting place for your 4-H self-determined project. The *Self-Determined Project Guide* is available from your county OSU Extension office or on the Web at ohio4h.org/selfdetermined. You may choose to do a little or a lot depending on your level of interest. Be sure to register your project with your county OSU Extension office.



clouds contain the most water because they are either very thick or very dense. The water simply blocks the sun from view. To make an accurate forecast of the weather, meteorologists need data, and lots of it. Every minute of the day, weather stations, satellites and radar are making detailed recordings of barometric pressure, wind speed and direction, cloud formations, humidity, and temperature. Typically data is fed to a computer and weather charts are drawn up. This compilation of data helps meteorologists forecast changes in the weather.

AREAS OF INTEREST AND THINGS TO DO

Every self-determined 4-H project can be broken down into areas of interest. These are the specific things members want to address during their project adventures. Using *4-H 365 Self-Determined Project Guide*, identify at least three areas of interest with at least three activities per area to explore. Take your ideas from the list below or make up your own.

The Atmosphere

- Visit a website to explain the make-up of the atmosphere.
- Draw and label a cut-away view of the earth's atmosphere.
- Demonstrate how the atmosphere is like a cup of oil and water.
- Compare the atmosphere of the planet Jupiter to ours. Write a brief summary of what you learned.
- Explore how our atmosphere causes the sky to look blue.

Wind and Pressure

- Using a barometer, record the daily change in pressure for two weeks.
- Determine if the sky turns cloudy when the barometer drops.
- Demonstrate where wind comes from.
- Visit a website to explore the jet stream.
- Clouds and Precipitation
- Visit a website to learn about the different types of clouds.
- Demonstrate how clouds are formed.
- Explore how rain is made.
- Record the daily change in cloud cover for two weeks.
- Record the daily change in humidity for two weeks.

Weather Forecasting

- Collect weather data for two weeks then predict the weather for the next three days.
 - Visit a website that tells more about what meteorologists do.
 - Learn how to read a weather map.
 - Determine the accuracy of a local meteorologist for a two-week period.
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RELATED RESOURCES

World Weather, [accuweather.com](https://www.accuweather.com)

Weather Reports, [wunderground.com](https://www.wunderground.com)

National Weather Service, [weather.gov](https://www.weather.gov)

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