Weather

Weather has three main parts: **sunlight**, **water**, and **air**. These three things create all the weather for the entire planet. Let's start by looking at the job of sunlight.

Sunlight

We know the light from the sun heats the air that surrounds our planet. It heats different parts of the planet different amounts. For example, the air close to the equator is hotter than the air at the poles.

The amount of heat in the air also depends on the time of day. Have you noticed that usually, it is warmer in the daytime than it is at night? That is because our earth is rotating on its axis. As it turns, the part of the planet receiving the most energy from the sun changes.

As the air in one place heats up and the air in another place cools down, it causes the air to move. We feel this movement as wind.

Air

What about water? As the sun warms the water on the earth, some of it evaporates into a gas called water vapor. The amount of water vapor in the air determines the humidity. Humidity is why some days feel hot and sticky while other days feel dry and scratchy. Water also collects in the air in the form of clouds.

Water

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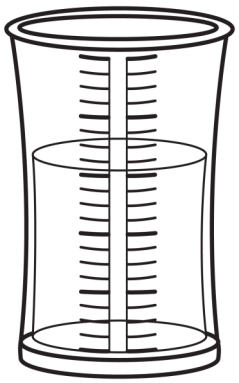
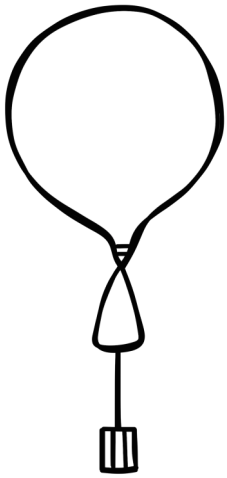
A **rain gauge** is important for measuring how much rain has fallen in a specific place during a certain time. This is important to record so meteorologists have a record of what the weather has done over time, and it's important for predicting if an area is in danger of not receiving enough rain and having a drought.



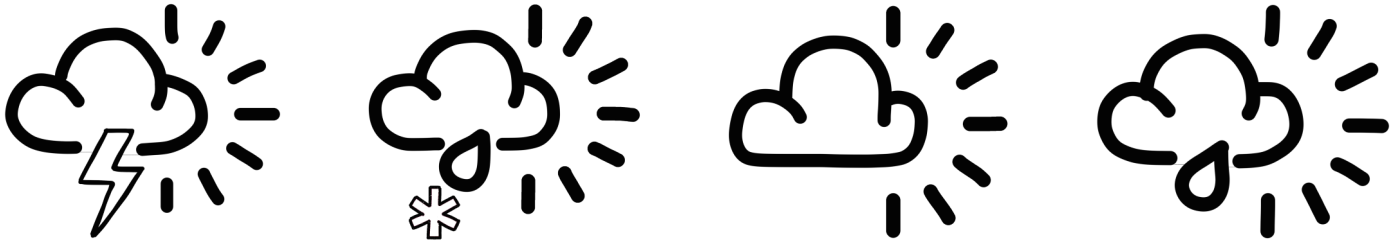
Rain gauge



Weather balloons are scientific devices meteorologists use to take readings high up in our atmosphere. They record the three important factors about air that are necessary to understand and forecast the weather—the air temperature, air pressure, and humidity.

Weather balloon

Why do you think it's important to record so much data about the weather? One way scientists use this data is to forecast what changes in the weather are coming. As they see changes in air pressure, they know a storm could be coming. When precipitation is in the forecast, the temperature can determine whether we see rain or snow. Meteorologists also record this data for use in the future. The information they record today can help meteorologists several years from now know what is normal and what is unusual for an area. All of this data helps meteorologists forecast what weather we should expect, which helps us know how to dress, when we might need to leave early for a trip, and when it might be safer to stay home. When a storm or extreme weather is on its way, meteorologists can help save lives by letting people know what to expect and how to prepare and stay safe.



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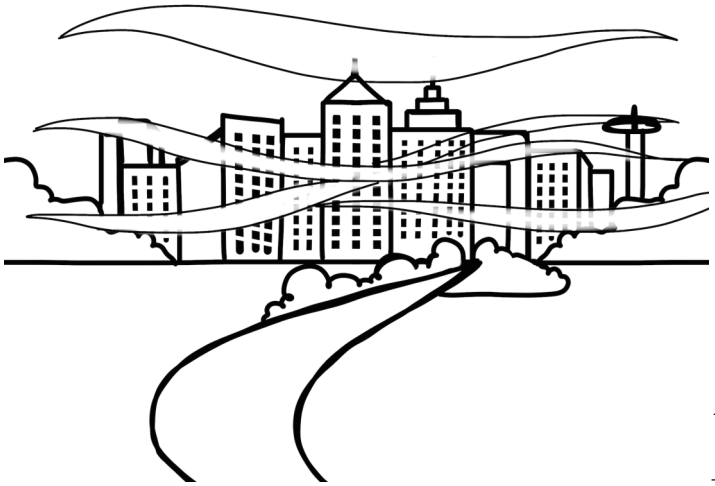
Floods can be caused by many different circumstances, but one of the common ways a flood happens is when rain falls in an area faster than the ground can absorb it or drain it away. Floods can be small and affect only a few blocks or they can be large and affect entire towns. Meteorologists help people stay safe and protect their homes by knowing how much rain has fallen and how much rain is expected.

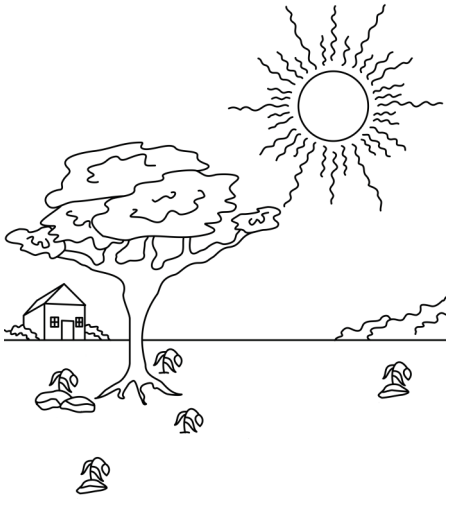
Flood



Fog is a lot like clouds, but fog touches the ground in places. It's made up of water vapor. If the air is cool and has more water in it than it can hold, fog can form. As the air heats up, the fog disappears. Fog can make it hard to see to drive, so it's important for meteorologists to warn people when fog might be in an area.

Fog

A **drought** happens when an area gets far less than average rainfall over a period of time, such as months or even years. Droughts cause crops to die, and they increase the chance of a wildfire happening. In some places, a drought can lead to a dust storm as the soil dries out and is more easily picked up by the wind.



Drought

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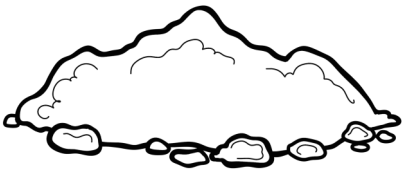
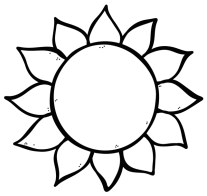
Review

Which of the following is not a main ingredient in weather? Draw an X through it.



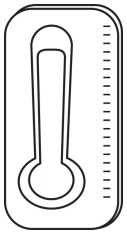
Dirt



Sunshine

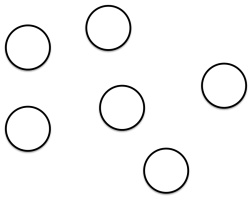
Water

Which of the following is determined by the amount of water vapor in the air? Draw a circle around it.



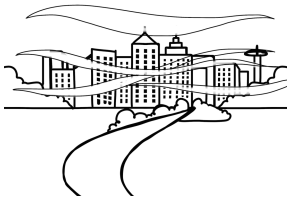
Air temperature

Air pressure



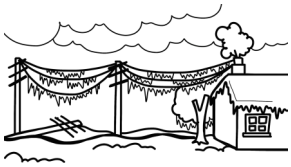
Humidity

Which of the following is caused by freezing rain? Draw a circle around it.



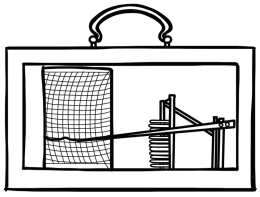
Fog

Mud slide

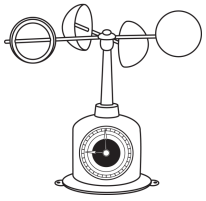


Ice storm

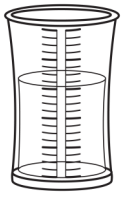
Which of the following measures the speed of the wind? Draw a circle around it.



Barograph



Anemometer



Rain gauge

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