

The **continuous cycle of water** of Earth involving **evaporation, condensation and precipitation** is called the **water cycle**.

The sun warms up water on earth causing it to change from a liquid form to a **gas form** called **water vapor**.

Humidity is the term used for water vapor.

A **hygrometer** is used to measure water vapor in the air.

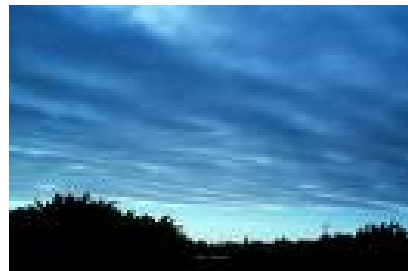


This change of matter from a **liquid to a gas** (water vapor) state is called **evaporation**.

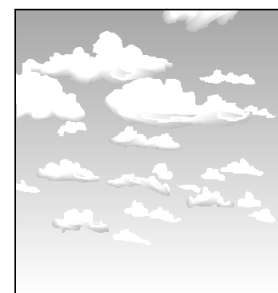
Condensation refers to the process in which water changes from a **gas to a liquid, forming clouds**. Billions of water droplets form a **cloud**!

Cloud Types – Stratus, Cumulus, Cirrus, Cumulonimbus

Stratus clouds – These are smooth, gray clouds that cover the whole sky (block out direct sunlight). Light rain and drizzle are usually associated with stratus clouds. They are fairly close to the ground, can create fog, and are like a blanket in the sky.



Cumulus clouds - These are fluffy and white with flat bottoms. They usually indicate **fair/nice weather**. However, when they get larger and darker on the bottom, they produce thunderstorms.

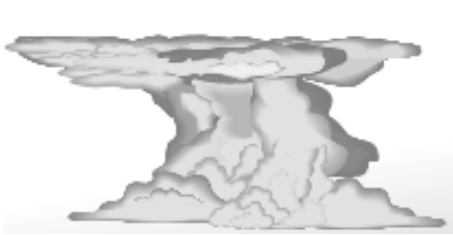


Cirrus clouds -

These are feathery clouds. They are associated with fair weather. Cirrus clouds often indicate that rain or snow will fall within several hours, but at the time they appear there will be **clear, cool weather**.

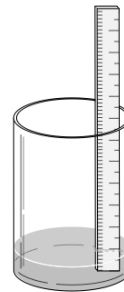
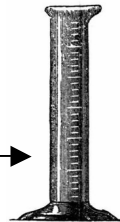


Cumulonimbus clouds - These are **thunderstorm** clouds. They are associated with heavy rain, snow, hail, lightning and even **tornadoes!** They tell us the weather will be **stormy**.

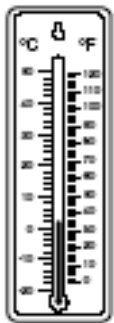


Rain, Snow, Sleet, Hail, and anything else that falls from the clouds is called **precipitation**.

A **rain gauge** measures precipitation.



This simple instrument could be used to measure precipitation.



Meteorologist - This term refers to a person who studies the weather.

Meteorologists use data to **predict weather patterns**. This prediction is known as a **forecast**.



One factor *usually* recorded when gathering weather data is **the temperature of the air**. A **thermometer** is used to measure the amount of heat energy in the atmosphere (temperature). Changes in air temperature can be measured using a **thermometer**.



Weather in the U.S. is *most* likely to move from **west to east, from California (west) to Virginia (east)**.

An **air mass** is a large body of air which has about the same temperature and humidity throughout.

A **front** is the boundary between air masses of different temperature and humidity.

There are two types of fronts: warm and cold.

1. **Cold front** – the leading edge of a cold air mass that pushes up lighter warm air. (Clouds *may* develop, and the sudden rising of warm air *may* lead to showers or thunderstorms.)
2. **Warm front** - the leading edge of a lighter, warm air mass that is lifted over cold air. (As it rises, steady precipitation develops.)



This map reveals a cold front over the eastern U.S. Which type of weather will this *most* likely produce?

- a. Rain and thunderstorms
- b. Sunny, dry weather
- c. A few cirrus clouds
- d. White feathery clouds

Another term to be familiar with is air pressure. **Air pressure is the weight of air pushing on everything around it; determined by several factors including the temperature of the air.**

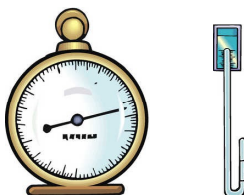
Meteorologists pay attention to two types of pressure systems: Low and High.

1. **Low-pressure System** – Warm air is lighter than an equal volume of cold air. The particles of matter are farther apart. Because warm air is lighter, it tends to rise from the Earth's surface. Because it is rising, warm air presses down on the Earth's surface with less force. This is called a low-pressure system, and is symbolized with a "L" inside a circle.
2. **High-pressure System** - Unlike warm air, cold air is heavier air. Its matter is more closely packed together. It pushes down harder on the Earth's surface, so a cold air mass is called a high-pressure area. Since cold air holds less water vapor, it also tends to be drier air. If you are outside, feeling pleasantly dry and cool, chances are you are in a high-pressure system. This type of system is symbolized with a "H" in a circle.

Wind is the movement of air from high to low-pressure areas.



Air pressure - is due to the weight of the air and is determined by several factors including the temperature of the air. **It is the force of the air pushing down on Earth!**



A **barometer** is used to measure **air pressure**, and changes in air pressure.

Wind speed and changes in wind speed are measured using an **anemometer**.



However, **wind direction and changes in wind direction** are noticed by using a **weather vane**.



Which instrument could tell you that conditions were right for flying a kite?
(Circle one)

- a. anemometer b. barometer c. hygrometer d. thermometer