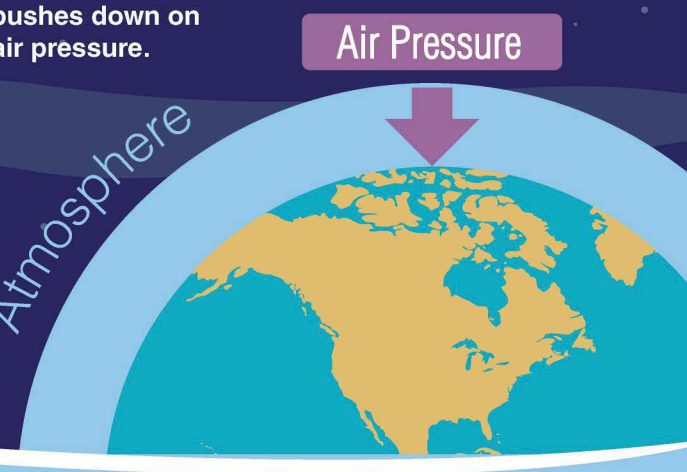
Why does the Wind Blow?

NOAA

Wind is a part of weather that we've all experienced at one time or another. And whether it's a welcome breeze on a hot day, or a destructive gust during a storm, it all starts in the same way: differences in air pressure.

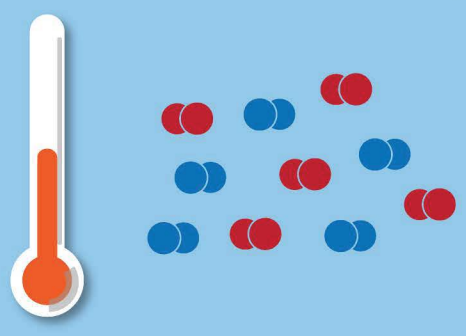
Air is a mixture of gases in Earth's atmosphere. The weight of these gases pushes down on Earth, creating air pressure.



How does air pressure cause wind?

Wind is caused by differences in air pressure, and temperature can affect these diferences.

Gases are made up of tiny particles called molecules.

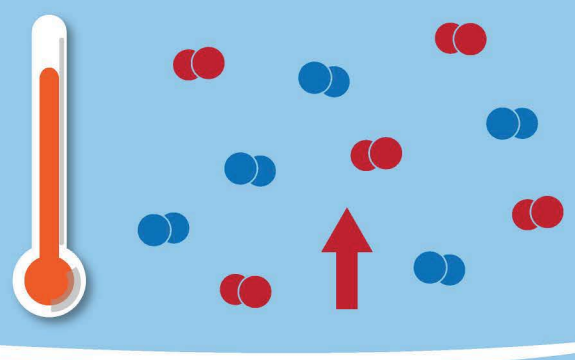


When gas molecules in our atmosphere are warmed by the sun, they do three things:

The molecules move quickly

They spread out

And they rise up.

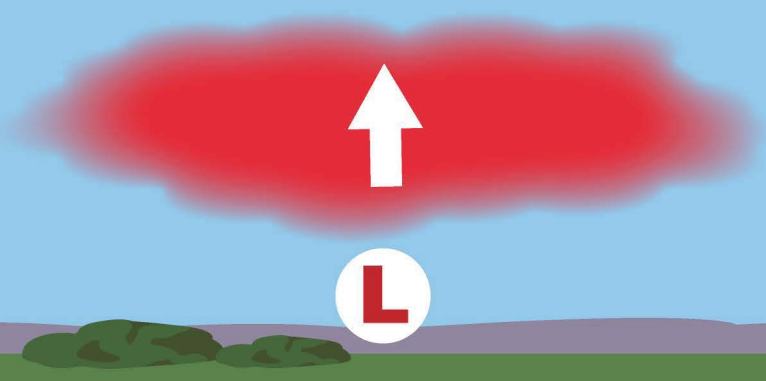


When gas molecules are cold, they do the opposite:

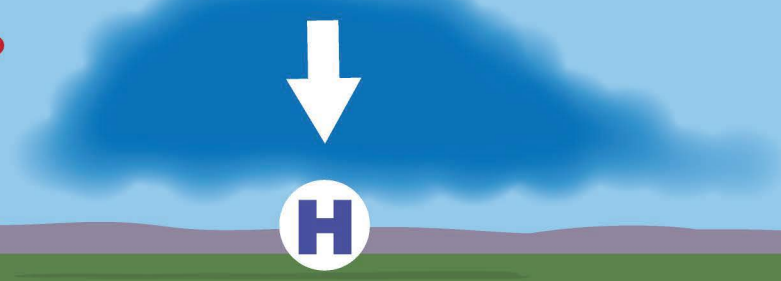
They slow down,

Move closer together,

And sink.



As warm air rises up into the atmosphere, it isn't pushing down on Earth quite as much. This creates an area of low air pressure.



As cold air sinks down in the atmosphere, the weight of the air pushes down on Earth's surface a bit harder. This creates an area of high air pressure.

The sun doesn't heat all of Earth equally, so there are high pressure areas and low pressure areas all over the planet.

In general, air always flows from an area of high pressure to low pressure.

So, cool air in high pressure areas will rush into the low pressure area created by rising warm air.

Warm

Wind

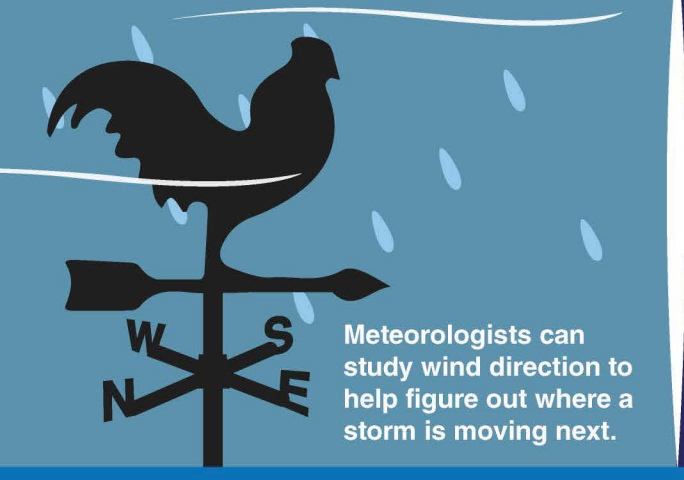
Cool

This rushing air is called wind.

Why is some wind a gentle breeze while other wind is a strong gust?

The strength of the wind depends on the temperature and pressure difference between the warm and cool air.

Wind is important because it moves more than just leaves and trees-it moves storms, too.



Meteorologists can study wind direction to help figure out where a storm is moving next.

They can also use weather satellites, such as NOAA's GOES-R series, to track wind by the movement of clouds. This helps to forecast the path of big storms, such as hurricanes.

Whether it's a major storm like a hurricane or a gentle breeze on a hot day, all winds form in the same way-and now you know why!

Find out more about Earth's weather at NOAA SciJinks! www.scijinks.gov