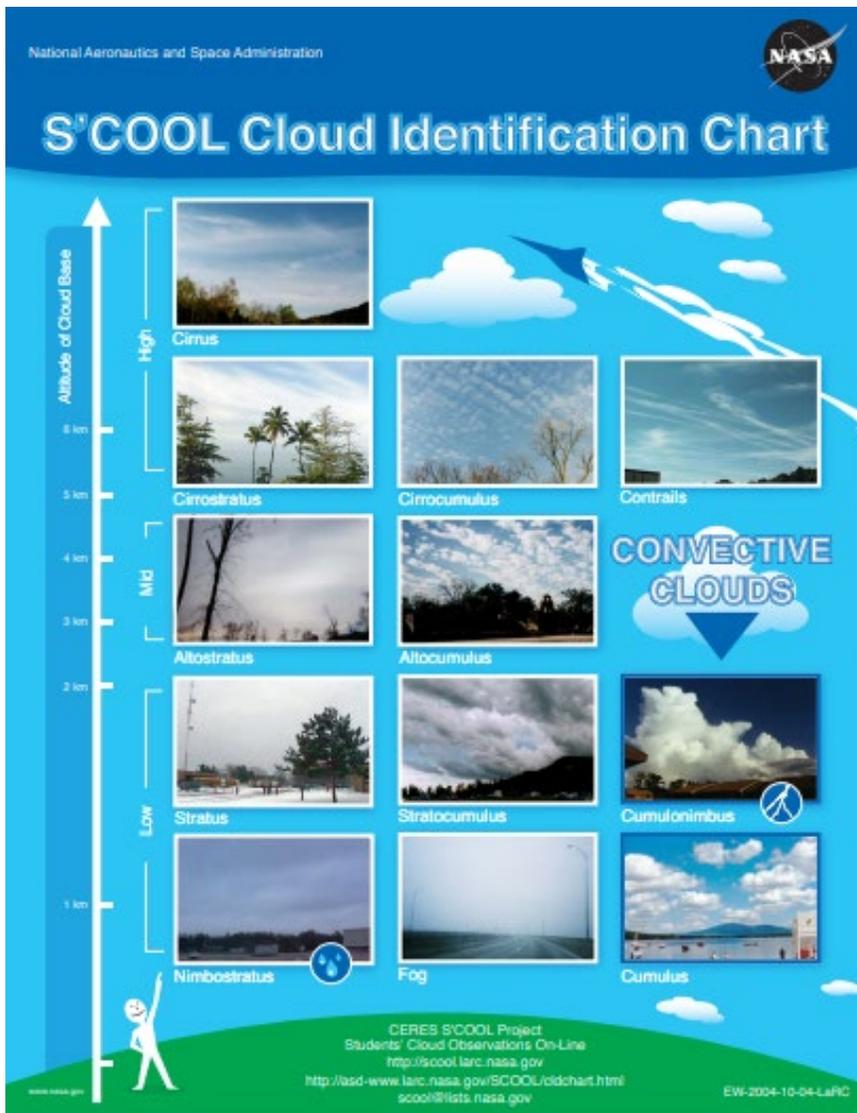


CLOUD FACTORY FAST FACTS

- Farmers and sailors often used clues from the clouds to forecast the arrival of storms.
- Clouds form due to condensation, which is when water vapor changes into a liquid form.
- Clouds are classified by their shape and by their elevation.
- Clouds form where warm and cold air meets along the edge or frontal boundary.



- Clouds form on condensation nuclei, which are particles of dust in the atmosphere. Without that dust, clouds could not form.
- Sometimes airplanes intentionally drop dust clouds into the atmosphere, which is called “cloud seeding.” The purpose of this practice is to create clouds to get rain/snow in an area.
- Clouds that come out of jet engines are called contrails.
- Fronts are the edges where air masses collide. They are named by the types of air they bring behind that leading edge. Warm fronts are warmer air on the way. Cold fronts are colder temperatures on the way.
- There are four main types of fronts, typically associated with the following weather.
 - Cold fronts: fast moving weather, often with high winds and violent thunderstorms followed by cooler temperatures.
 - Warm fronts: slower moving changes, with clouds or gentle rain followed by warmer temperatures.
 - Stationary fronts: several days of steady all day long rain.
 - Occluded fronts: highly changeable weather, often with intermittent, sun, and changing temperatures.

https://d32ogoqmya1dw8.cloudfront.net/files/eslabs/weather/cloud_chart_small.pdf

Science Vocabulary

Front: The boundary where air masses meet. Typically, fronts have the most changing weather. Fronts are named for the temperature of the air that is “invading.”

Air Mass: Air masses are fairly homogenous, and are named by where they form. Continental air masses form in the interior of continents and tend to have dry air with low humidity. Maritime air masses form over the ocean and tend to be humid, moist air. Air masses are also described by the latitude over which they form, with polar air masses being cold and tropical air masses having warm air.

Weather: The atmospheric conditions at the moment

Climate: Long-term trends in temperature and precipitation

Clouds: Water droplets in the atmosphere

Condensation Nuclei: particles of dust in the atmosphere against which water vapor condenses to turn into clouds.

Cirrus: High, wispy clouds made of ice crystals.

Cumulus: Fair weather, fluffy clouds.

Stratus: Low level flat clouds that are associated with rain.

Cumulonimbus: Towering storm clouds typical of convective thunderstorms in the summer.

Alto: High level clouds.

Contrail: A cloud formed by jet engine exhaust.

Stationary Fronts: Slow moving fronts that typically have long-lasting heavy rain.

Cold Fronts: Cold fronts: fast moving weather, often with high winds and violent thunderstorms followed by cooler temperatures.

Warm Fronts: Warm fronts: slower moving changes, with clouds or gentle rain followed by warmer temperatures.

Occluded Fronts: Occluded fronts: highly changeable weather, often with intermittent, sun, and changing temperatures.

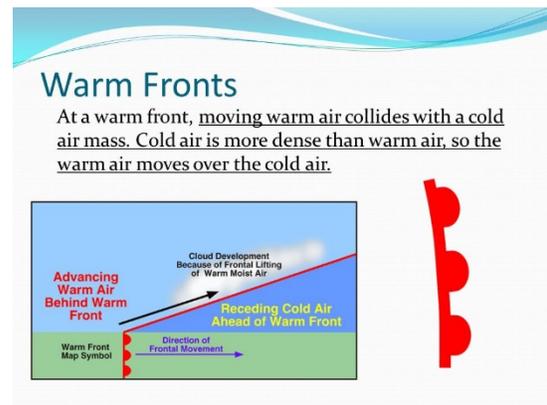
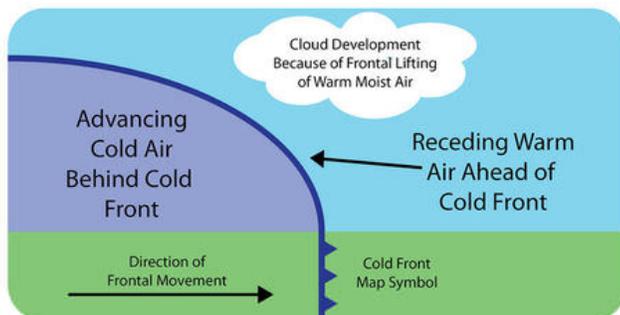
Convection: Transfers energy through in currents, like spaghetti boiling in water, where heat rises and falls in cycles.

Radiation: Transfers energy through the vacuum in space; the sun’s energy travels across space through the electromagnetic spectrum.

Conduction: Transfers energy through direct contact, like a metal to metal.



The map symbol for a cold front is blue triangles that point in the direction the front is moving.



Warm Fronts

At a warm front, moving warm air collides with a cold air mass. Cold air is more dense than warm air, so the warm air moves over the cold air.

Printable Handouts

1. Student Handouts parts 1- 3
2. STEM To-Go
3. Great handouts, including a weather related fortune teller/cootie catcher

<http://sc6thgradescience.weebly.com/6e2b2-air-masses-pressures--fronts.html>

Kid-Tech Spot: Supplemental interactive websites and games

1. A great 5th – 9th grade website for interactive cloud labs.
<https://www.pbs.org/wgbh/nova/labs/lab/cloud/research/intro/>

More Resources, Just in Case

1. This is a great overall weather website with many handouts. <http://sc6thgradescience.weebly.com/6e2b2-air-masses-pressures--fronts.html>

Resources for Teachers:

1. A good site for maps and forecasts. <https://www.wunderground.com/>

In the News

1. Many articles on clouds in the news from Discovery Magazine. <https://discovermagazine.com/tags/?tag=clouds>

On the Road

1. Piedmont:
 - a. Museum of Life and Science, Durham, NC
 - b. NC Museum of Natural Sciences, Raleigh, NC
2. Coastal Plain:
 - a. Ingram Planetarium, Sunset Beach, NC. <http://museumplanetarium.org/sky-theater-shows/>
3. Mountains:
 - a. Catawba Science Center, Hickory, NC, Tornado Simulator <https://catawbascience.org/attractions/permanent-exhibits>

Other Lessons and Reference Materials Used to Develop this Unit

1. <http://sc6thgradescience.weebly.com/6e2b2-air-masses-pressures--fronts.html>
2. <https://www.pbs.org/wgbh/nova/labs/lab/cloud/research/intro/>
3. <https://www.noaa.gov/education/resource-collections/weather-atmosphere-education-resources/weather-systems-patterns>