

Cloud Watching

What do the clouds say about incoming weather?

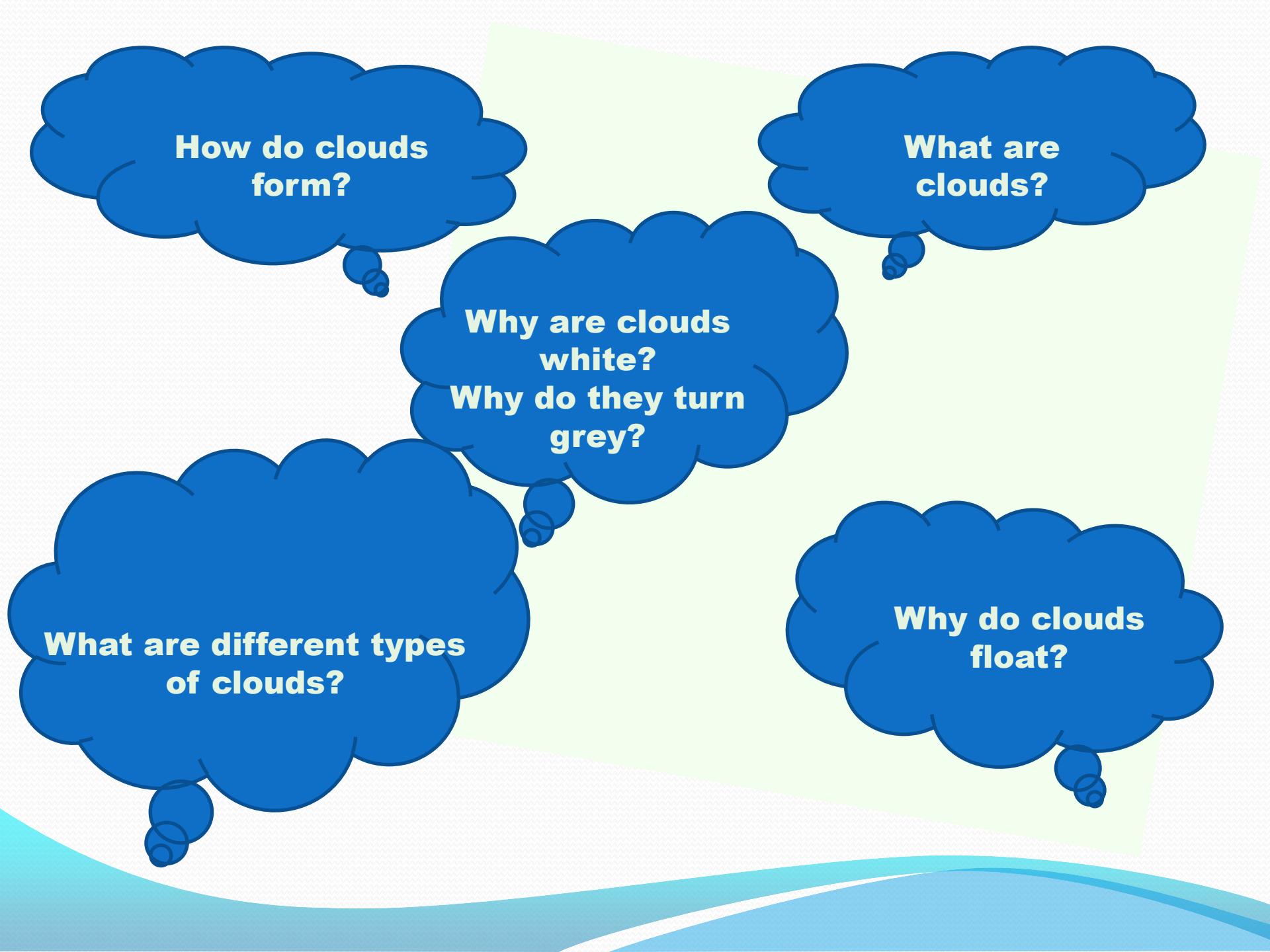
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Fifth Grade Lesson
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Introduction

We often notice when a cloud looks like a dog or when they are dark and menacing.

Many of you may only recognize them by characteristics, such as; fluffy white clouds, wispy clouds, thick ,flat clouds, and rain clouds.

We are going to take time to learn more about how these ornaments in the sky come to be there and how the presence of different types of clouds can help you predict the weather .



**How do clouds
form?**

**What are
clouds?**

**Why are clouds
white?
Why do they turn
grey?**

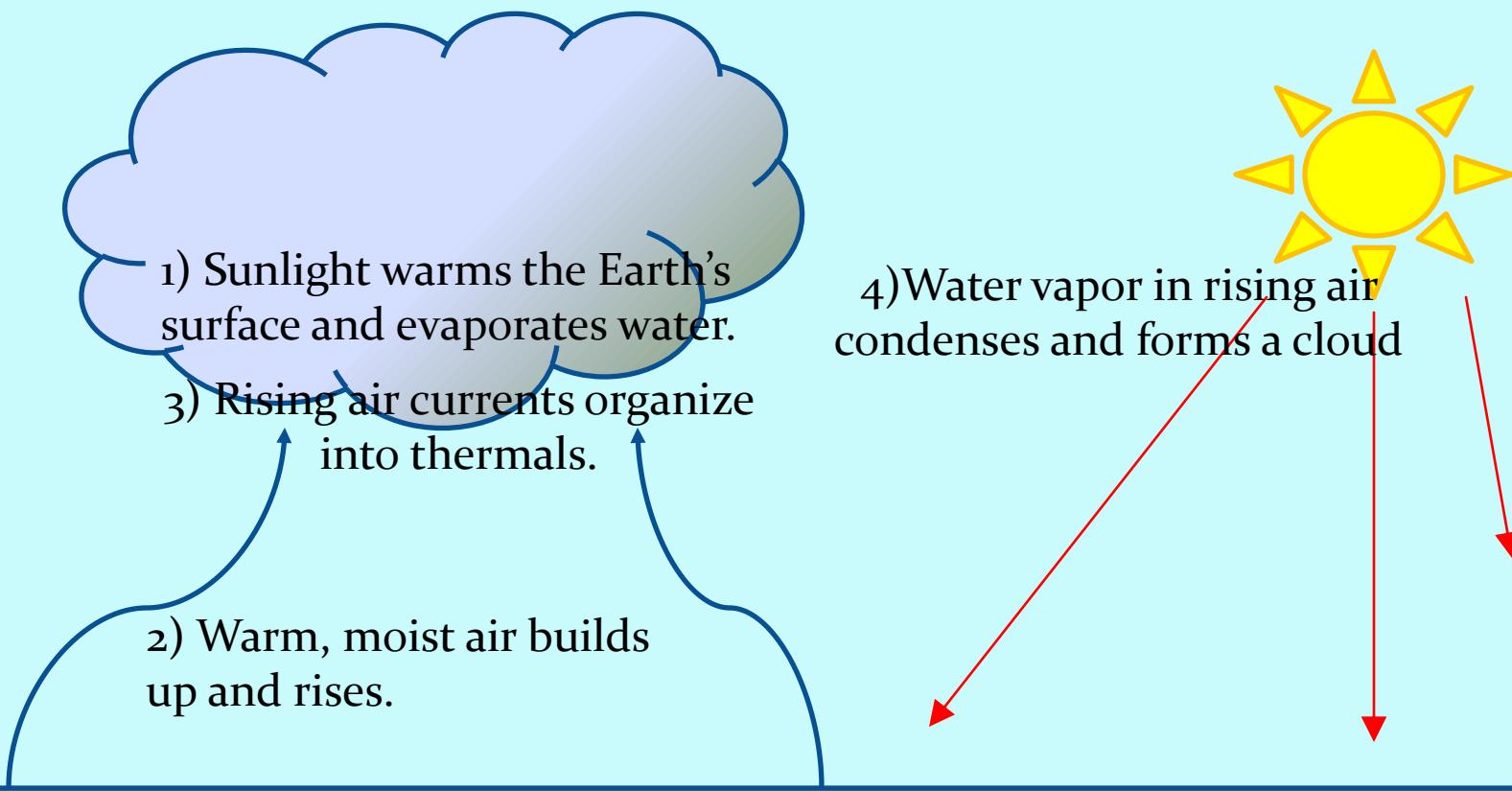
**What are different types
of clouds?**

**Why do clouds
float?**

What are clouds?

- A cloud is a large collection of very tiny droplets of water or ice crystals. The droplets are so small and light that they can float in the air.

How are Clouds Formed?





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Why do clouds float?

A cloud is made up of liquid water droplets.
A cloud forms when air is heated by the sun.

As it rises, it slowly cools it reaches the saturation point and water condenses, forming a cloud. As long as the cloud and the air that its made of is warmer than the outside air around it, it floats!

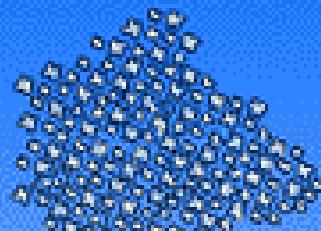
How do clouds move?

Clouds move with the wind. High cirrus clouds are pushed along by the jet stream, sometimes traveling at more than 100 miles-per-hour. When clouds are part of a thunderstorm they usually travel at 30 to 40 mph.

Why do clouds form at different heights in the atmosphere?

The characteristics of clouds are dictated by the elements available, including the amount of water vapor, the temperatures at that height, the wind, and the interplay of other air masses.

Common types of clouds in the troposphere



Cirrocumulus
(mackerel sky)
above 18,000 feet



Cirrus
above 18,000 feet



Altocumulus
6,000 to 20,000 feet



Altostratus
6,000-20,000 feet



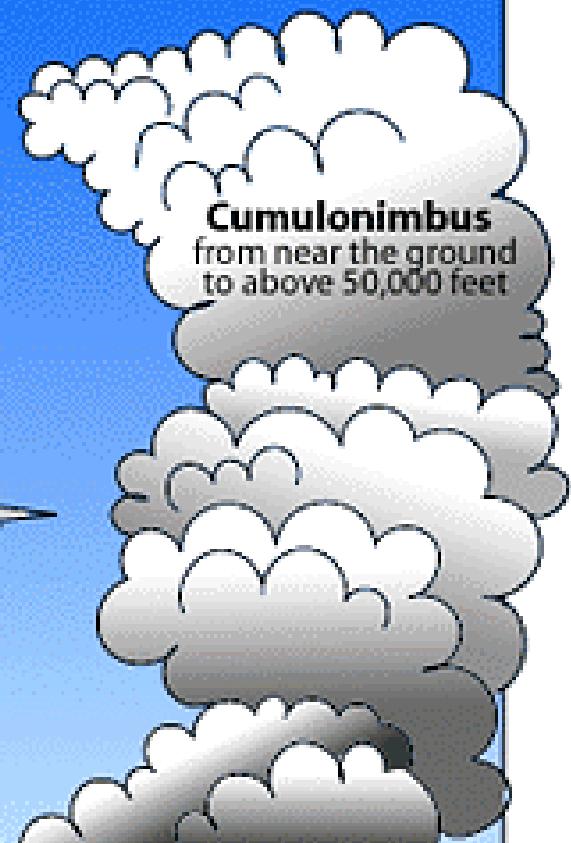
Stratocumulus
below 6,000 feet



Stratus
below 6,000 feet



Cumulus
below 6,000 feet



Cumulonimbus
from near the ground
to above 50,000 feet

Cloud Groups

Cirrus

Above 18,000

Feet



Alto

6,500 Feet to
18,000 Feet



Stratus

Up to 6,500 Feet



Cumulus or

Cumulonimbus

(Clouds with vertical
growth)



Classification

<u>Word</u>	<u>Meaning</u>	<u>Example</u>
Cirrus (Looks wispy, stringy)	“Curl of Hair”	Cirrus Clouds
Alto (Flat or Straight, difficult to determine height from the ground)	“Middle”	Altocstratus Clouds
Stratus (Flat and Straight)	“Layer”	Fog
Nimbus (Can be poofy or flat, grey clouds)	“Rain”	Cumulonimbus
Cumulous (Looks like Cool Whip!)	“Heap”	Cumulus “Fair Weather”Clouds

Cirrus Clouds

Cirrus clouds are the most common of the high clouds. They are composed of ice and are thin, wispy clouds blown in high winds into long streamers. Cirrus clouds are usually white and predict fair to pleasant weather. By watching the movement of cirrus clouds you can tell from which direction weather is approaching. When you see cirrus clouds, it usually indicates that a change in the weather will occur within 24 hours.



Cirrostratus clouds are thin, sheet-like high clouds that often cover the entire sky. They are so thin that the sun and moon can be seen through them. Cirrostratus clouds usually come 12-24 hours before a rain or snow storm.



Cirrocumulus clouds appear as small, rounded white puffs that appear in long rows. The small ripples in the cirrocumulus clouds sometime resemble the scales of a fish. Cirrocumulus clouds are usually seen in the winter and indicate fair, but cold weather. In tropical regions, they may indicate an approaching hurricane.



Alto Clouds

Altocumulus clouds are middle level clouds that are made of water droplets and appear as gray, puffy masses, sometimes rolled out in parallel waves or bands. The appearance of these clouds on a warm, humid summer morning often means thunderstorms may occur by late afternoon.



Altostatus clouds are gray or blue-gray middle level clouds composed of ice crystals and water droplets. These clouds usually cover the entire sky. In the thinner areas of the cloud, the sun may be dimly visible as a round disk. Altostratus clouds often form ahead of storms that will produce continuous precipitation



Source: <http://eo.ucar.edu/webweather/alto.html>

Stratus Clouds

Stratus clouds are uniform gray in color and almost cover the entire sky. Light mist or drizzle is sometimes associated with Stratus clouds. **A Stratus cloud touching the ground is fog.**



Stratocumulus clouds are low, puffy and gray. Most form in rows with blue sky visible in between. Rain rarely occurs with Stratocumulus clouds, however, they can turn into Nimbostratus.



Nimbostratus clouds are dark gray with a ragged base. Rain or snow is associated with Nimbostratus clouds.



Clouds with Vertical Growth

Vertically developing clouds are the **Cumulus** (puffy) type. These small, lumpy clouds are low "fair weather" clouds. However, as they develop vertically (up) they may go from small, fair weather clouds to large, boiling, vertically-growing monsters called cumulonimbus.

Cumulonimbus are generally known as thunderstorm clouds. High winds will flatten the top of the cloud into an anvil-like shape. Cumulonimbus are associated with heavy rain, snow, hail, lightning, and tornadoes. The anvil usually points in the direction the storm is moving.

Source: <http://eo.ucar.edu/webweather/alto.html>



Why are clouds white?

Clouds are white because they reflect the light of the sun. Light is made up of colors of the rainbow and when you add them all together you get white. The sun appears a yellow color because it sends out more yellow light than any other color. Clouds reflect all the colors the exact same amount so they look white.

Why are clouds grey?



Clouds are made up of tiny water droplets or ice crystals, usually a mixture of both. The water and ice scatter all light, making clouds appear white. If the clouds get thick enough or high enough all the light above does not make it through, hence the gray or dark look. Also, if there are lots of other clouds around, their shadow can add to the gray or multicolored gray appearance.



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Review

Clouds are a large collection of very tiny droplets of water or ice crystals. The droplets are so small and light that they can float in the air.

Clouds reflect all the colors of the rainbow at exact same amount so they look white.

A cloud floats when the cloud and the air that its made of is warmer than the outside air around it.

Clouds form when heat from the sun evaporates water vapor from the Earth, the vapor rises, condenses and forms a cloud.

A cloud is grey when it is thick enough or high enough that all of the light above does not make it through, hence the gray or dark look.

Review

Different
types of
Clouds:

Cirrus

Cirrostratus

Cirrocumulus

Altocumulus

Altostratus

Stratus

Stratocumulus

Nimbostratus

Cumulus

Cumulonimbus

Know your clouds

- **This Weekend's Observation Assignment**
- 1) Go outside at 3 times during the day (Breakfast, Lunch, and Dinner) *6 times total over the weekend
 - 2) Identify all the types of clouds that are present each time you go outside.
 - 3) Report the clouds that you identified and the weather for that day. (Windy, Rainy, Sunny, Cloudy)
 - 4) Your assignment should include your six observation times, the types of clouds you identified each time, and the overall weather for each day.

Complete the Sentences

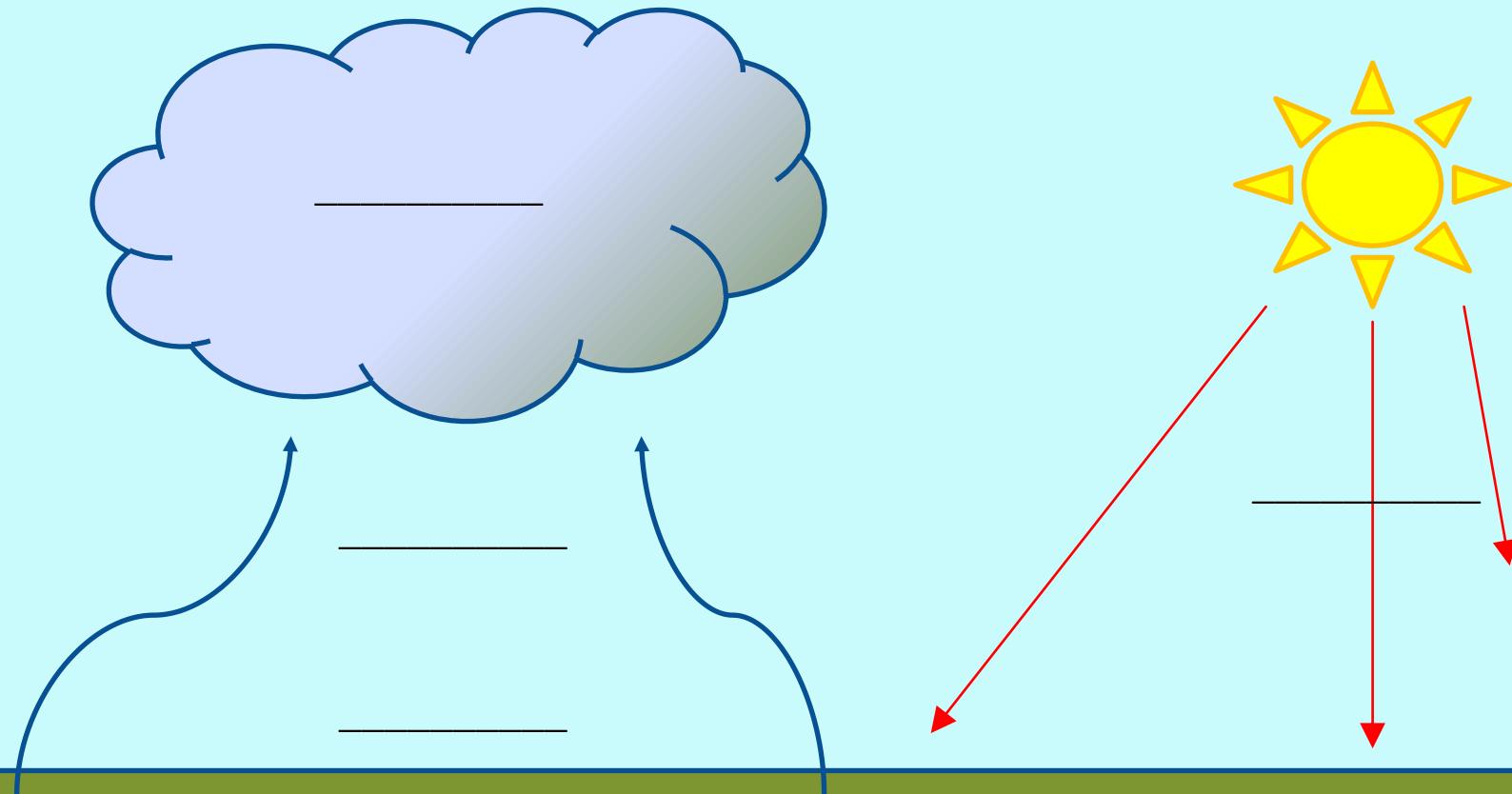
- 1) Clouds are made up of _____.
- 2) The _____ makes clouds move through the sky.
- 3) If the clouds get thick enough or high enough all the light above does not make it through, hence the _____ look.
- 4) Types of clouds that bring rain are referred to as _____.
- 5) A cloud _____ when the air that its made of is warmer than the outside air around it.
- 6) Clouds reflect all the colors of the _____ at the exact same amount so they look white.

Word Box

grey or dark
water vapor
floats

nimbus
rainbow
wind

Identify each process.



- A.) Rising air currents organize into thermals
- C.) Water vapor in rising air condenses and forms a cloud

- B.) Warm, moist air builds up and rises.
- D.) The sun heats the Earth, water evaporates.

Name that cloud!

A.) Cumulus

B.) Cirrus

C.) Stratus

D.) Nimbostratus

“Wispy”



“Fluffy”

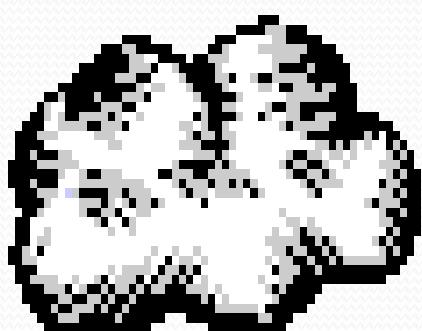


“Rainy”



“Layers”





References

- <http://www.weatherwizkids.com/weather-clouds.htm>
- <http://www.boatsafe.com/kids/weather1.htm>
- <http://eo.ucar.edu/webweather/cloud3.html>