



Grade 5 Science

Unit 1 - Weather

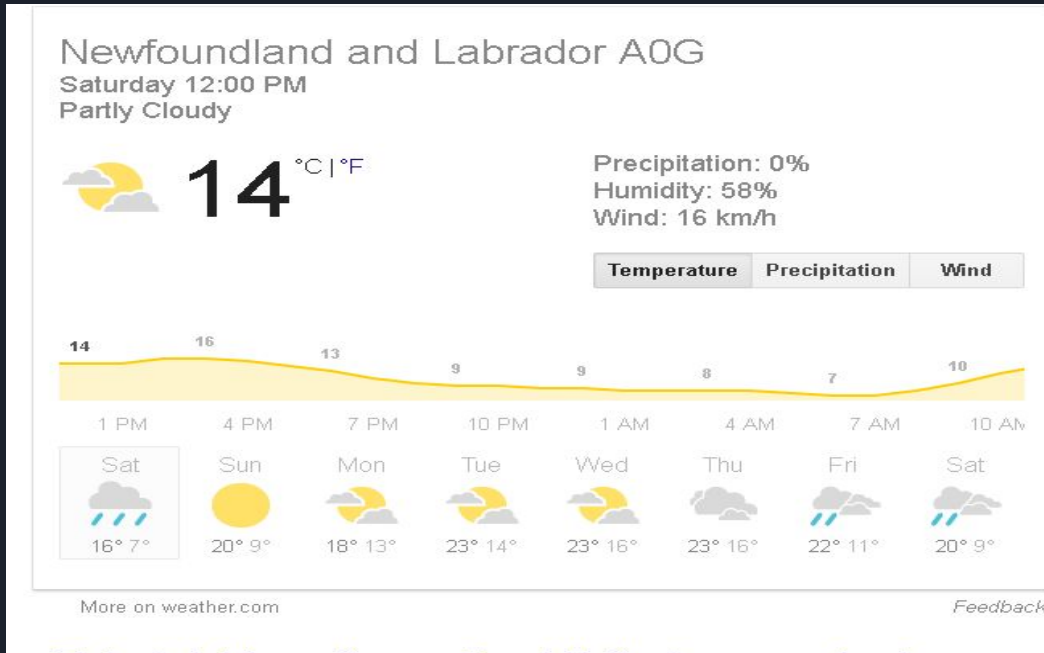
Grade 5 Science - Unit 1 - Weather

When we think of the world weather, what do we think of?



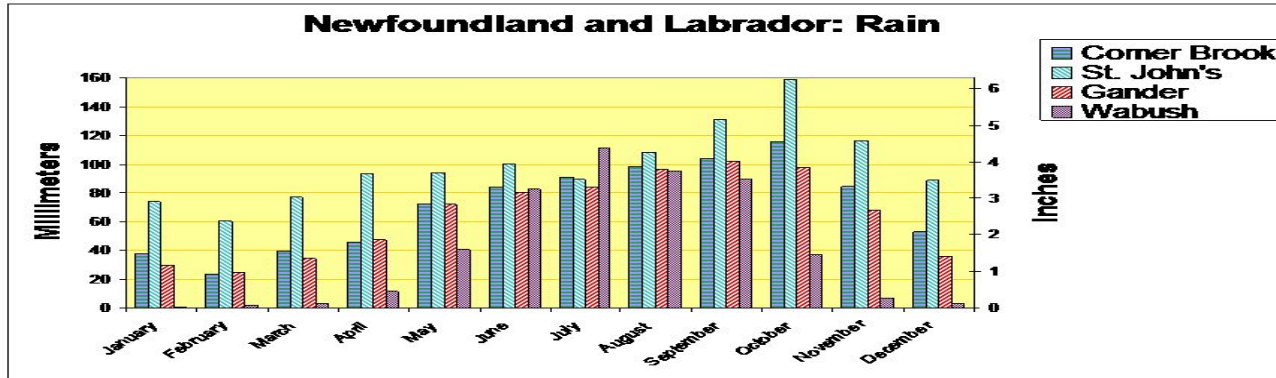
How Can We Describe Weather?

Weather: the daily conditions of our atmosphere



How Can We Describe Weather?

Climate: the typical weather over a long period of time





How Can We Describe Weather?

We often describe the weather and climate by using words such as:

- temperature
- precipitation
- wind
- cloud cover

Temperature

- The amount of heat present measured in degrees celsius
- Located:
 - outside in the park
 - inside your bedroom
 - inside your body

Journal Entry:

How can you describe temperature?





Temperature

Journal Entry:

How can you describe temperature?

- Boiling hot
- Warm
- Cold
- Freezing cold

***Sometimes my parents describe the weather by the clothes we wear

What would you wear if it was -35 degrees outside? How about +10 degrees?



Temperature

Precipitation

The amount of water vapor that falls from the sky

3 major kinds:

1. Rain
2. Snow
3. Hail

Journal Entry: Take a few minutes and describe each





Precipitation

Rain

- Light (drizzle)
- Warm or cold (summer shower or cold in night)
- Mostly comes in a slant (wind)





Precipitation

Snow

- Ice powder type
- Wet slushy snow
- Hard crusty snow
- Packing snow





Precipitation

Hail

- Usually small, like a marble
- Can be very large; as a softball





Wind Speed

Wind comes from the pressure in our atmosphere and the earth rotating around the sun

Questions:

- Is it windier when there is a storm or no storm?
- Why does it get windier when you are closer to the ocean?
- On sunny days, is there more wind or less wind?



Wind Speed

Questions:

- Is it windier when there is a storm or no storm?
 - When there is a storm
- Why does it get windier when you are closer to the ocean?
 - The wind blows from the water to the land
- On sunny days, is there more wind or less wind?
 - On sunny days there is often a light breeze



Cloud Cover

Clouds keep the sun from reaching earth (making it colder)

Clouds trap warm air from escaping to our atmosphere (making it warm and muggy)

Journal Entry:

When we look at the pictures on page 6 and 7, what type of cloud cover do we see?



Cloud Cover

- In the iceberg photo, it looks like there is no cloud cover cloudy
- In the photo with the flag, it is only a little bit cloudy
- The photo of the beach, it is very cloudy

What about today?

Journal Entry:

Why do you think the temperature is lower on days when there is a lot cloud cover?



Cloud Cover

Journal Entry:

Why do you think the temperature is lower on days when there is a lot cloud cover?

- Clouds block the sunlight, so there is less sunlight reaching the ground making it cooler



How Can We Describe Weather?

What is the Atmosphere?

- A layer of gas surrounding the earth that allows us to breath and is held together by gravity

Journal Entry:

Which has the largest atmosphere, Earth or the Moon? How do we know?



How Can We Describe Weather?

Since we can breathe on the Earth and not on the Moon, the Moon's atmosphere is smaller. This is due to the size and lack of gravity on the Moon when compared to the Earth.

How Can We Describe Weather?

So who measures the temperature outside?

- A meteorologists is a scientist who studies the weather





WEATHER-RELATED INNOVATIONS

CLOTHING

- Weather proof jacket
- Gloves
- Rubber boots
- Heat packs
- Synthetic materials



TOOLS/LEISURE

- Shovels
- Snow blowers
- Umbrella
- Air conditioning/Fan
- Ice pack
- Pool



TRANSPORTATION

- Snow tires
- Snow fence
- Snowshoes
- Dog sled
- Snow mobile
- Snow plow
- Glass heating
- Windshield wipers



SHAPE/STRUCTURE OF BUILDINGS

- Igloos
- Sloped roofs
- Flat roofs
- Storm door
- Windows
- Screens





How Can We Describe Weather?

Seatwork:

Answer the Science in Action questions on Page 7

1. Describe the weather today using the 4 types of ways to describe weather
2. What type of clothing should you wear today? why?



How Can We Describe Weather?

Homework:

Answer the 3 “What Do You Think” questions on page 7

1. Describe a time when you were unprepared for the weather. How did you cope?
2. “If you don’t like the weather, wait a minute” is a saying about the weather in Newfoundland and Labrador. What does it mean?
3. Create a guide for describing the amount of cloud cover.



How Do We Measure Weather?

We have many different types of special instruments that measure the weather:

1. Rain Gauge
2. Thermometer
3. Barometer
4. Hygrometer
5. Anemometer
6. Weather Vane

How Do We Measure Weather?

Rain Gauge: measures the amount of rainfall in mm or cm



Where would be the best place to put a Rain Gauge and how do you think it works?

How Do We Measure Weather?

Thermometer: measures temperature in degrees celsius

What type of liquid is in a thermometer and how does a thermometer work?



How Do We Measure Weather?

Barometer: measures air pressure (weight of the air pressing down on the earth)

If it is very windy outside, is that because there is high air pressure or low air pressure?



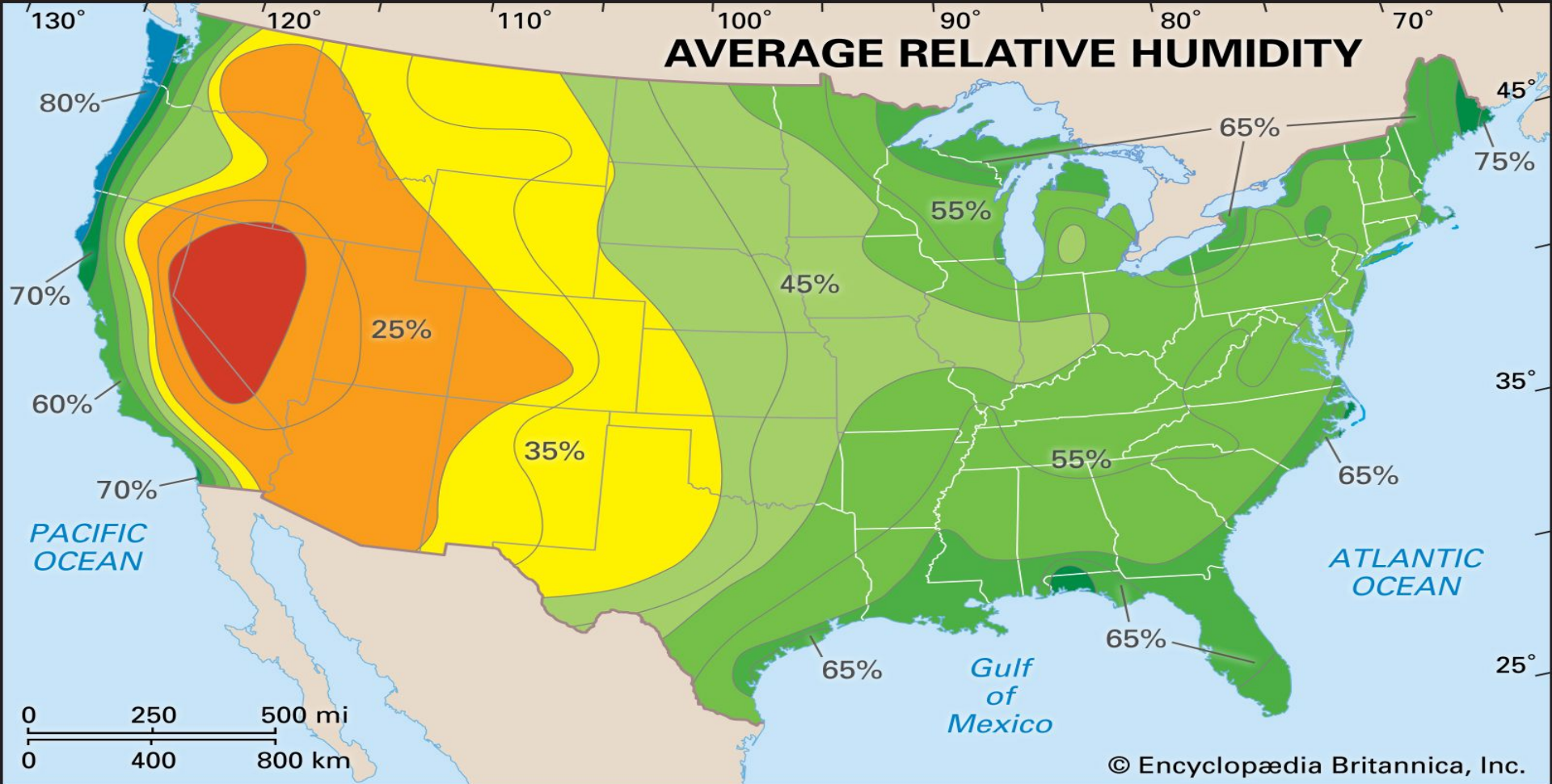
How Do We Measure Weather?

Hygrometer: measures humidity (the amount of water in the air)

What happens when the humidity is very high?



AVERAGE RELATIVE HUMIDITY



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Average percentage taken at local noon in July



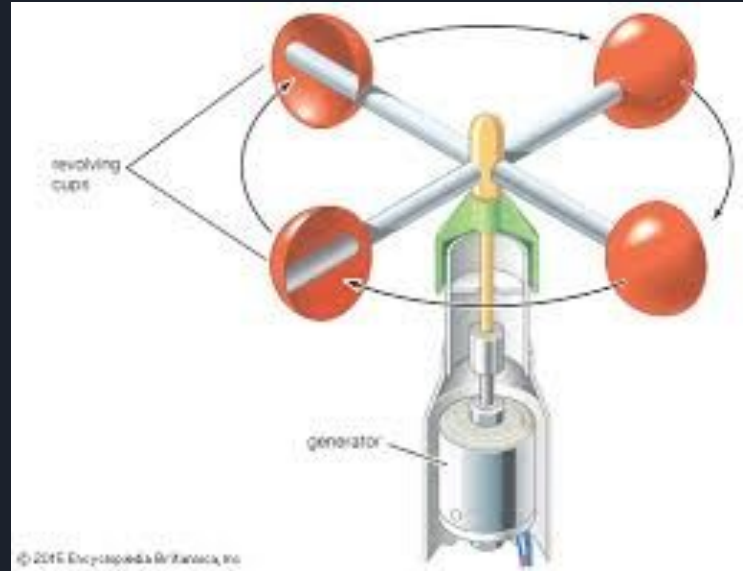
WORLD MAP



How Do We Measure Weather?

Anemometer: measures wind speed

How do you think the Anemometer works?



How Do We Measure Weather?

Weather Vane: shows the direction the wind is coming from.

How do you think the weather vane works?





How Do We Measure Weather?

Journal Entry:

Why might temperature, wind speed, and humidity differ around the schoolyard?



How Do We Measure Weather?

Temperature

- Temperature may be higher over a concrete area than a shady area like under a slide or next to a building.

Humidity

- Shady areas have less humidity than an open area like a field of grass

Wind speed

- An area that blocks the wind (like the side of a building) has less wind speed



How Do We Measure Weather?

Journal Entry:

Which weather measurement do you think is the most important? Why?



How Do We Measure Weather?

A thermometer and Rain Meter are the most important:

- Thermometer: Affects what I want to wear and what I want to do outside
- Rain guage: measuring the amount of rain is important because if there is a lot of rain, I may not want to go outside, or be able to complete activities where it needs to be dry (like mow the lawn)

How Do We Measure Weather?

Complete the “What Do You Think” Questions

1. Using an iPad, look up today’s weather report for the following places in Newfoundland to make a weather map:
 - a. St. John’s
 - b. Marystown
 - c. Gander
 - d. Grand Falls - Windsor
 - e. Corner Brook
 - f. St. Anthony
 - g. Port Aux Basques





How Do We Measure Weather?

2. What do you think the term “wind chill” is describing?
3. Meteorologists also use weather buoys, balloons, and satellites to gather weather data. Using your iPad choose one and find out what it measures.



How Do We Measure Weather?

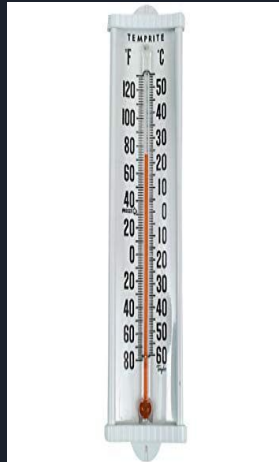
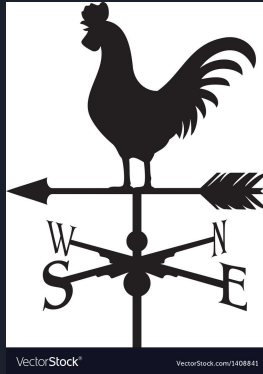
Big Idea 1 Review (Page 13)

Answer all 5 of the following questions

How Do We Measure Weather?

Foldable Cube Activity

- Students will create a Weather Instrument foldable
- Students will include:
 - The name of each instrument
 - A basic two or three word definition
 - A small picture (found in the textbook)



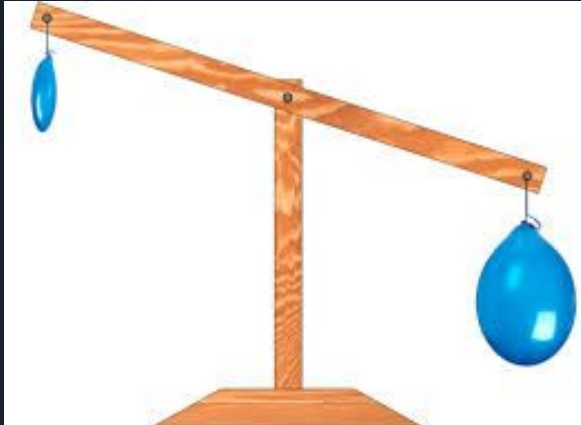
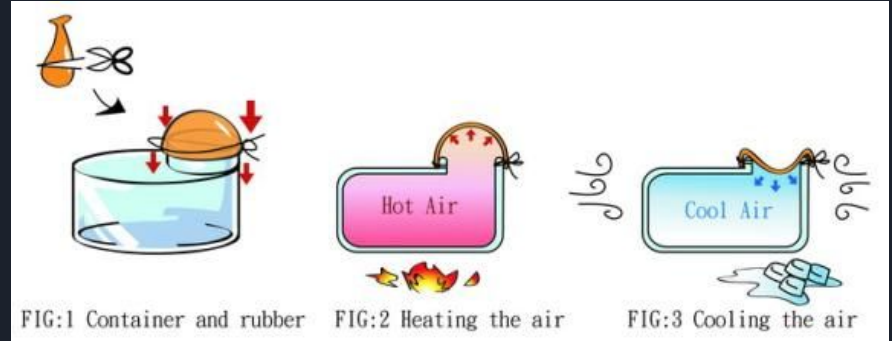
Measuring Instruments (pg 8-9)

1. Rain Gauge: Rain
2. Barometer: Air Pressure
3. Weather Vane: Wind Direction
4. Hygrometer: Humidity
5. Thermometer: Temperature
6. Anemometer: Wind Speed



What are the Properties of Air?

- Air is a form of Matter:
 - Air has mass
 - Air has volume (it takes up space)
 - Air expands when heated and contracts when cooled





How Does the Earth's Water Affect Weather?

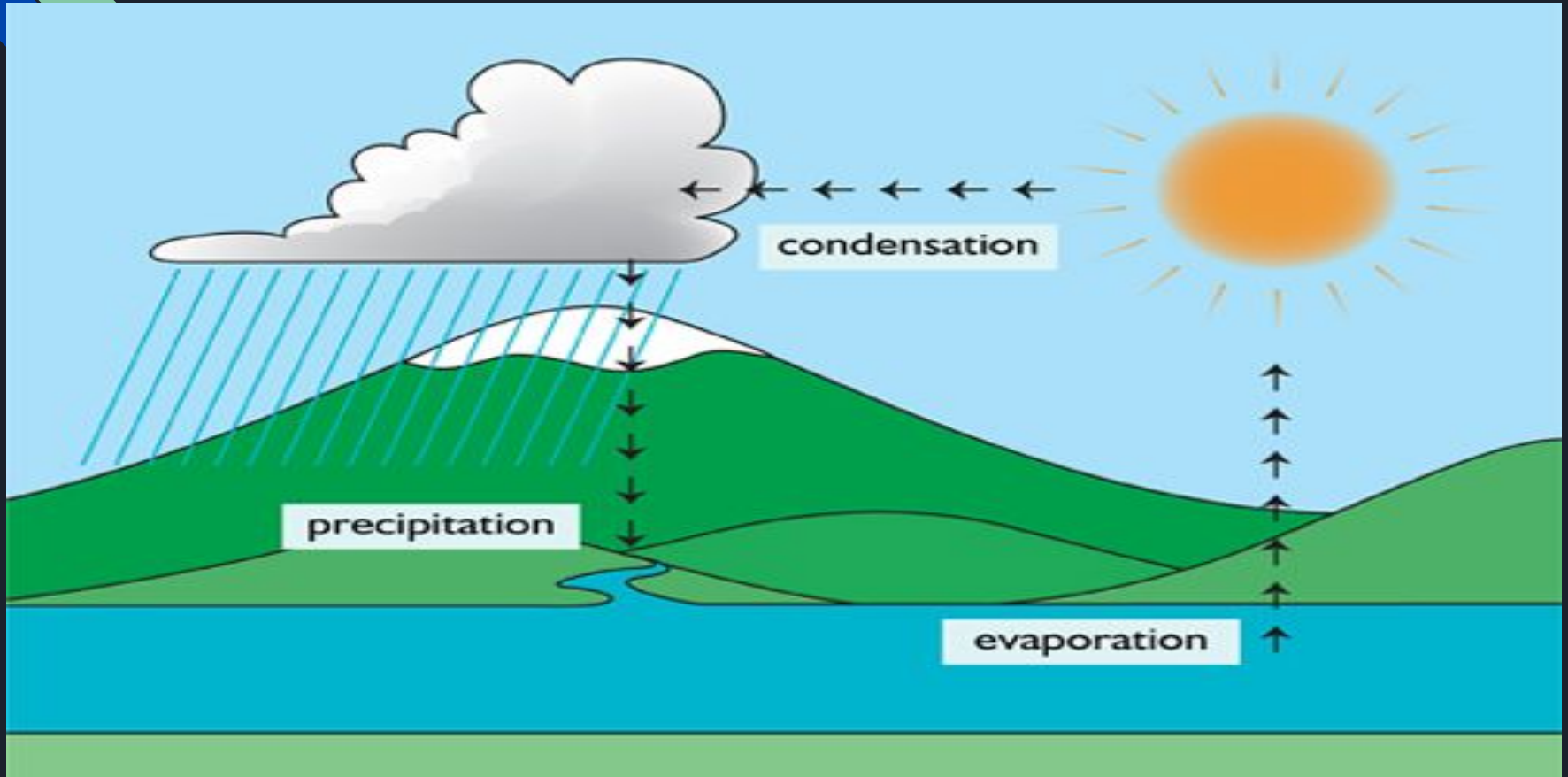
- Clouds, humidity, and precipitation are weather components that relate to the water cycle
- Water Cycle - the constant movement of water from Earth's surface to the atmosphere and back to Earth's surface.



THE WATER CYCLE

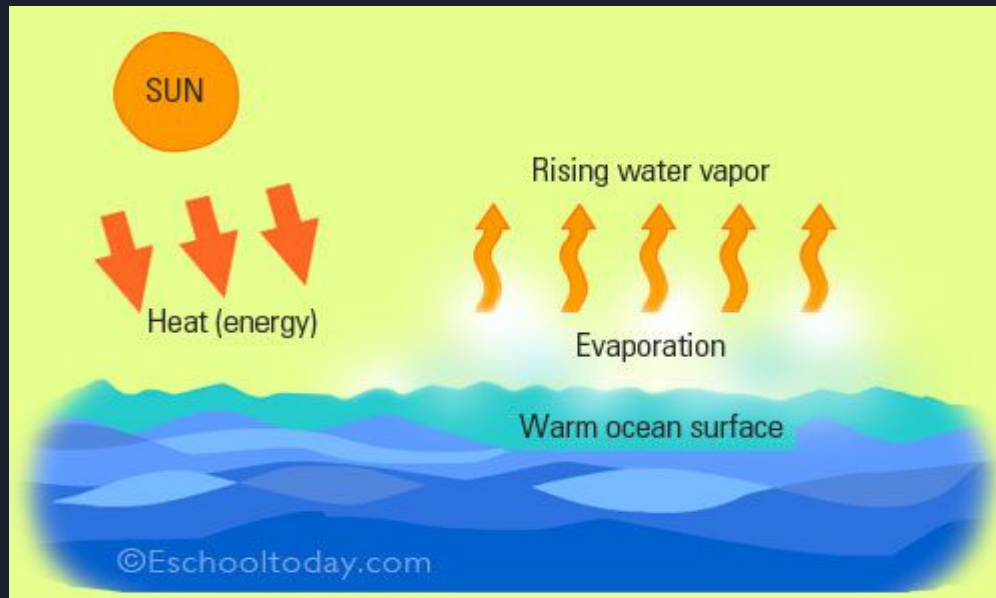


How Does the Earth's Water Affect Weather?



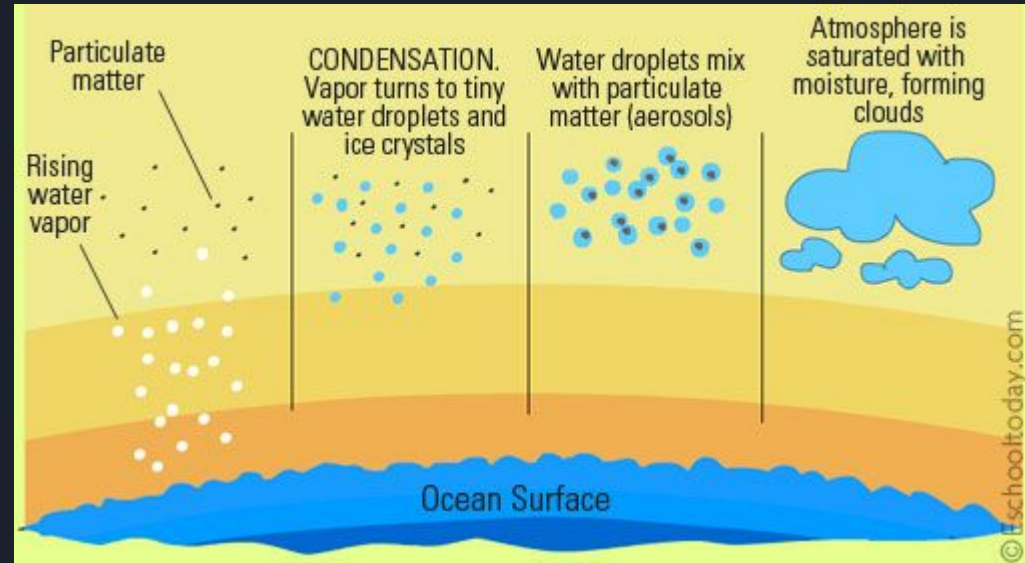
How Does the Earth's Water Affect Weather?

Evaporation - energy from the Sun heats water on Earth's surface, water evaporates forming water vapour.



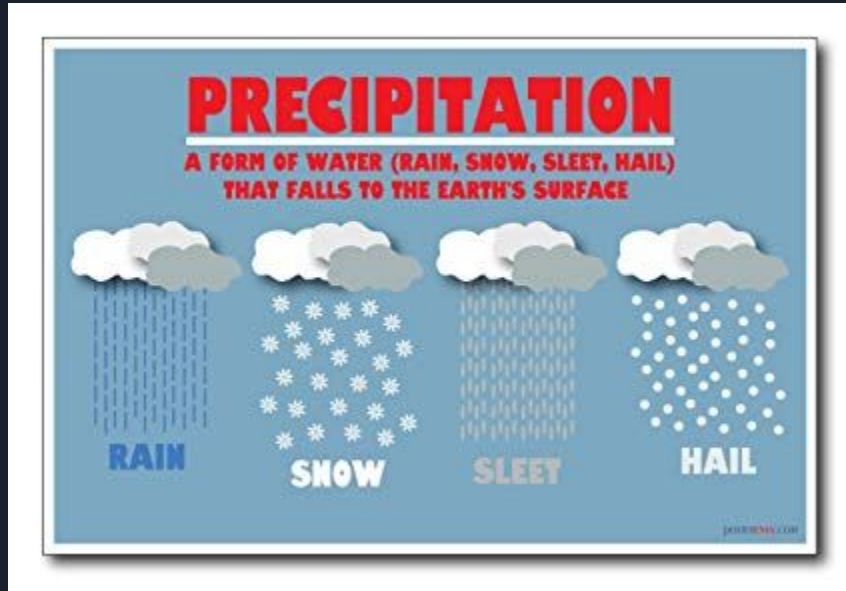
How Does the Earth's Water Affect Weather?

Condensation - water vapour rises in the atmosphere, cools, and condenses forming water droplets (i.e., clouds).



How Does the Earth's Water Affect Weather?

Precipitation - when the air cannot hold the water droplets anymore they fall to Earth's surface as precipitation.





How Does the Earth's Water Affect Weather?

Important Facts about the Water Cycle:

- Evaporation of surface water increases humidity.
- Warmer air holds more water vapour than cooler air.
- Warm humid air, cools and condenses as it rises in the atmosphere forming water droplets (i.e., clouds).
- Wind moves water vapour from where it evaporates to where it returns as precipitation.
- Precipitation type (e.g., rain, snow) depends on air temperature.



How Does the Earth's Water Affect Weather?

- Which parts of the water cycle are shown in the pictures on page 22 and 23?



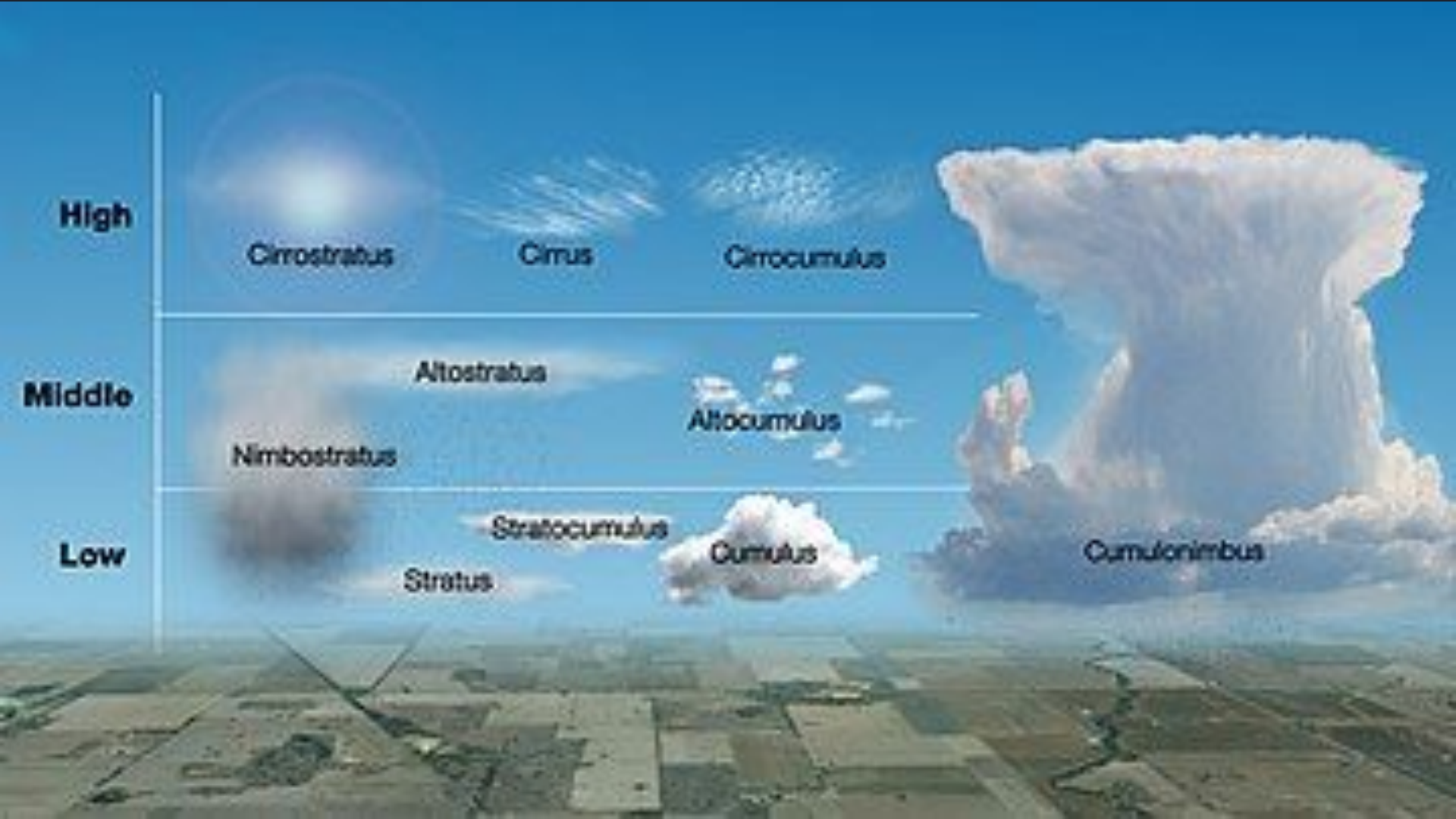
How Does the Earth's Water Affect Weather?

- Which parts of the water cycle are shown in the pictures on page 22 and 23?

Winter scene: Precipitation

Foggy Lake: Evaporation

Lake Picture: Condensation



High

Cirrostratus

Cirrus

Cirrocumulus

Middle

Altostratus

Alto cumulus

Nimbostratus

Low

Stratocumulus

Cumulus

Stratus

Cumulonimbus

How Can We Classify Clouds?

- Cumulus Clouds
 - White and fluffy



How Can We Classify Clouds?

- Cirrus Clouds
 - White, thin, and wispy



How Can We Classify Clouds?

- Stratus Clouds
 - Grey and flat



How Can We Classify Clouds?

- Nimbus Clouds
 - Any that can produce precipitation



Cloud Types

- **Cirrus**



- **Stratus**



- **Nimbus**



- **Cumulus**





How Can We Classify Clouds?

- Cirrus clouds appear as white, thin, wispy streaks, high in the sky. They form from ice crystals but do not produce precipitation.
- Cumulus clouds are fluffy, piled up clouds. They are associated with fair weather when relatively small and widely spaced. Cumulonimbus clouds are darker, present in larger numbers, and are associated with powerful thunderstorms and heavy precipitation.
- Stratus clouds appear as a low layer of cloud covering the sky. Nimbostratus clouds are associated with precipitation.
- Note the term nimbus refers to any cloud that produces precipitation

How Can We Predict the Weather?

- Meteorologists use data from many different sources to predict the weather (called a forecast)





How Can We Predict the Weather?

- Over time people have used methods of predicting the weather
 - the use of weather folklore (e.g., Red sky at night, sailors delight; red sky in the morning, sailors take warning);
 - predicting changes in weather based on a headache or joint pain; and
 - tapping a barometer to determine if pressure was rising or falling (i.e., rising pressure means weather improving, falling pressure means weather worsening).



Folklore Weather Sayings Which Ones Are Reliable



How Can We Describe Weather Systems?

- Low Pressure System
 - Moist and unstable



- High Pressure System
 - Dry, blue sky, light wind





How Can We Describe Weather Systems?

What is the result of low and high weather systems?

1. Thunderstorm
2. Drought
3. Tornadoes
4. Flood
5. Blizzard
6. Hurricanes

How Can We Describe Weather Systems?

Thunderstorm

- Thunder and lightning



Drought

- Long period of dry weather



How Can We Describe Weather Systems?

Tornadoes

- Powerful thunderstorm, look like funnel shaped clouds



Flood

- Water flows over land that used to be dry



How Can We Describe Weather Systems?

Blizzard

- Severe snowstorm



Hurricanes

- Tropical rain storms





How Does Weather Affect Us?

- Climate Change: changes in the climate, including global warming caused by human activity and greenhouse gases



How Does Weather Affect Us?

- Greenhouse gases: process where the atmosphere traps the Sun's energy and keeps the Earth warm

