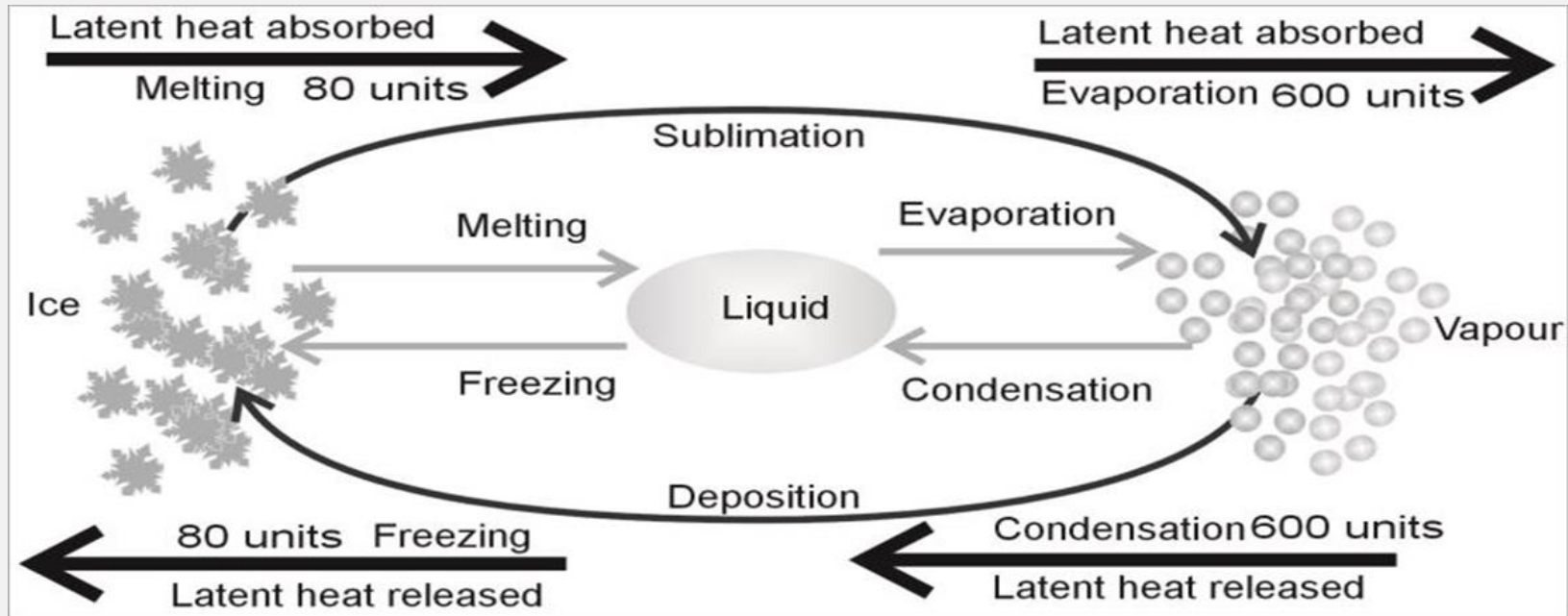


WEATHER VS CLIMATE

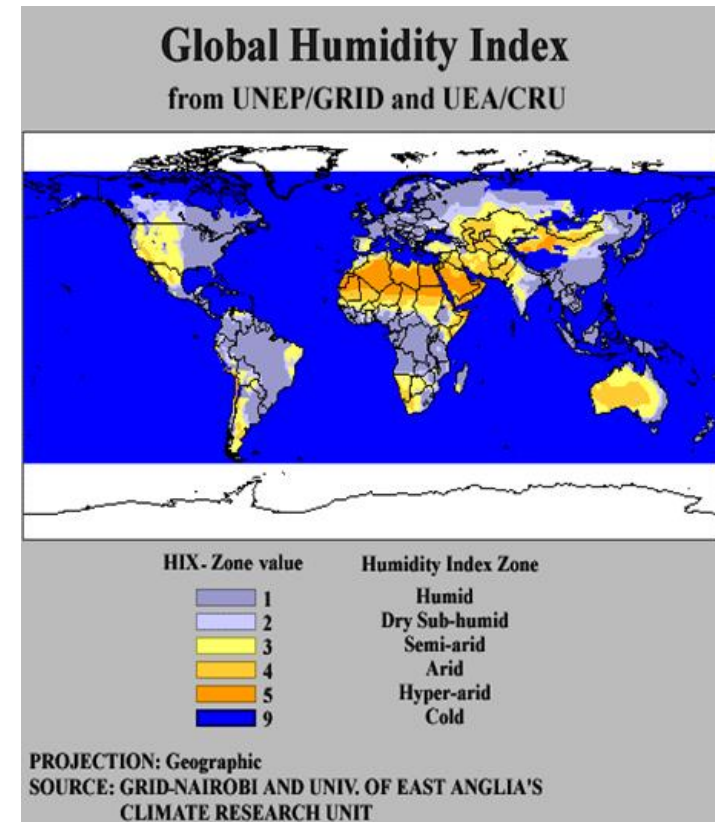
- **Weather**: the current state of the atmosphere with respect to wind, temperature, moisture, pressure, & cloudiness.
- **Climate**: meteorological factors (temp., humidity, precipitation....etc) in a given region over long periods of time. (Average weather)
- [Video Explanation](#)

QUICK REVIEW



WHAT IS HUMIDITY

- Humidity is the measure of how much water vapor is present in the atmosphere.
 - Humidity depends on the TEMPERATURE of the air.
- WARM AIR CAN HOLD MORE WATER VAPOR THAN COLD!

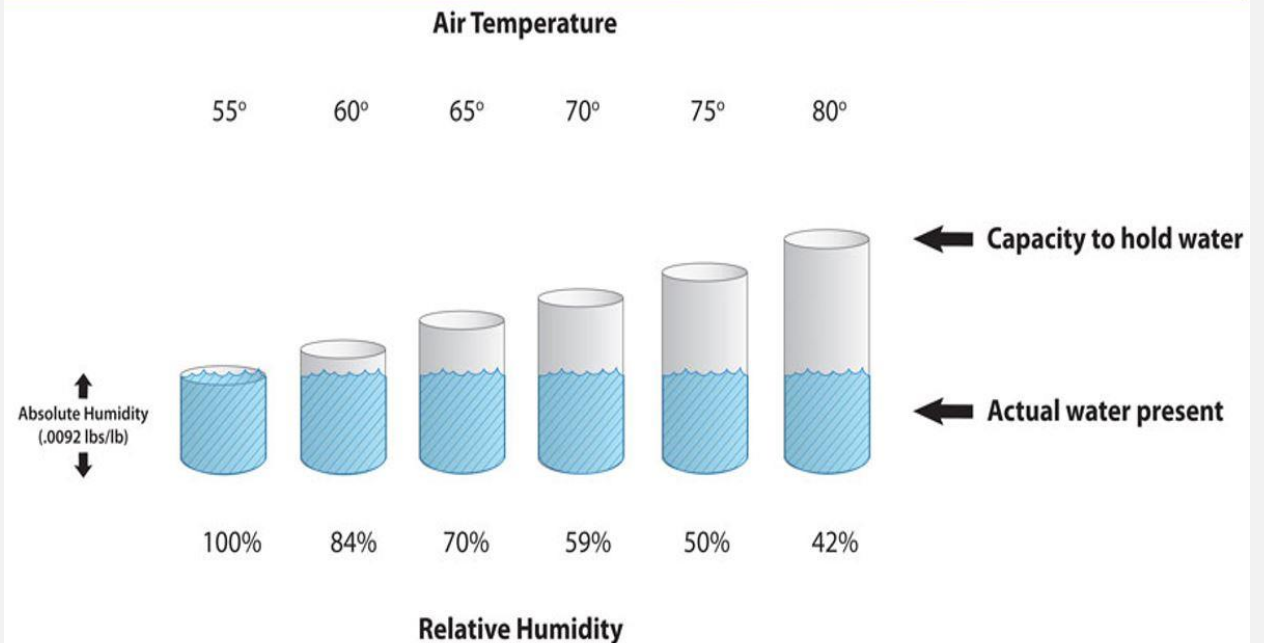


WHAT IS CAPACITY/SATURATION POINT?

- The amount of water a parcel or piece of air can hold. It is saturated

As air is cooled, its molecules condense closer together, making less room for water vapor to exist.

When air temperature lowers, % humidity rises!



WHAT IS RELATIVE HUMIDITY

- **Relative humidity** is the ratio of the amount of water vapor in the air compared with its saturation point at a specific temperature and pressure.
- This ratio is expressed in the form of a percentage it can be calculated:

$$(\text{Specific Humidity/Capacity}) \times 100\% = \text{RH}$$

| Temperature | | Water Vapor Content at Saturation (g/kg) |
|-------------|-------|--|
| °C | (°F) | |
| -40 | (-40) | 0.1 |
| -30 | (-22) | 0.3 |
| -20 | (-4) | 0.75 |
| -10 | (14) | 2 |
| 0 | (32) | 3.5 |
| 5 | (41) | 5 |
| 10 | (50) | 7 |
| 15 | (59) | 10 |
| 20 | (68) | 14 |
| 25 | (77) | 20 |
| 30 | (86) | 26.5 |
| 35 | (95) | 35 |
| 40 | (104) | 47 |

WHAT IS RELATIVE HUMIDITY (CONTINUED)

- A relative humidity of 80% means that the air contains 80% of the total amount of water vapor it can hold **at that specific temperature and pressure**.
- When relative humidity reaches 100%, water must then condense in the air and form precipitation.



CALCULATING RELATIVE HUMIDITY(RH)

- To determine relative humidity we must know the
 - Capacity or Saturation
 - Specific Humidity (Actual amount of water in the air)
- $(\text{Specific Humidity} / \text{Capacity}) \times 100\% = \text{Relative Humidity}$
- Practice:
 - Air at a temperature of 30C has a specific humidity of 15grams. The capacity of air at 30C is 26.5grams. What is the relative humidity?
 - $(\text{Specific} / \text{Capacity}) \times 100\% = \text{RH}$

PRACTICE CALCULATING RH

- Use the table to help answer the following questions in your Humidity Notes.
- Find the RH for the following scenarios:
 - 1. Temperature: -10C Specific Humidity: 2 grams RH=
 - 2. Temperature: 0C Specific Humidity: 2 grams RH=
 - 3. Temperature: 25C Specific Humidity: 15 grams RH=
 - 4. Temperature 35C Specific Humidity: 40 grams RH=
 - 5. What would form in scenario 4?

| Temperature | | Water Vapor Content at Saturation (g/kg) |
|-------------|-------|--|
| °C | (°F) | |
| -40 | (-40) | 0.1 |
| -30 | (-22) | 0.3 |
| -20 | (-4) | 0.75 |
| -10 | (14) | 2 |
| 0 | (32) | 3.5 |
| 5 | (41) | 5 |
| 10 | (50) | 7 |
| 15 | (59) | 10 |
| 20 | (68) | 14 |
| 25 | (77) | 20 |
| 30 | (86) | 26.5 |
| 35 | (95) | 35 |
| 40 | (104) | 47 |

HUMIDITY
CONCEPT
CHECK

Using the Dark Blue books,
answers questions 1, 3, 4, 5,
and 6 on page 509.

Answer using complete
sentences!

HONORS EARTH
SCIENCE HUMIDITY
CONCEPT CHECK

Using the Light Blue books,
answers questions 1, 2, 4, and 6 on
page 498.

Answer using complete
sentences!

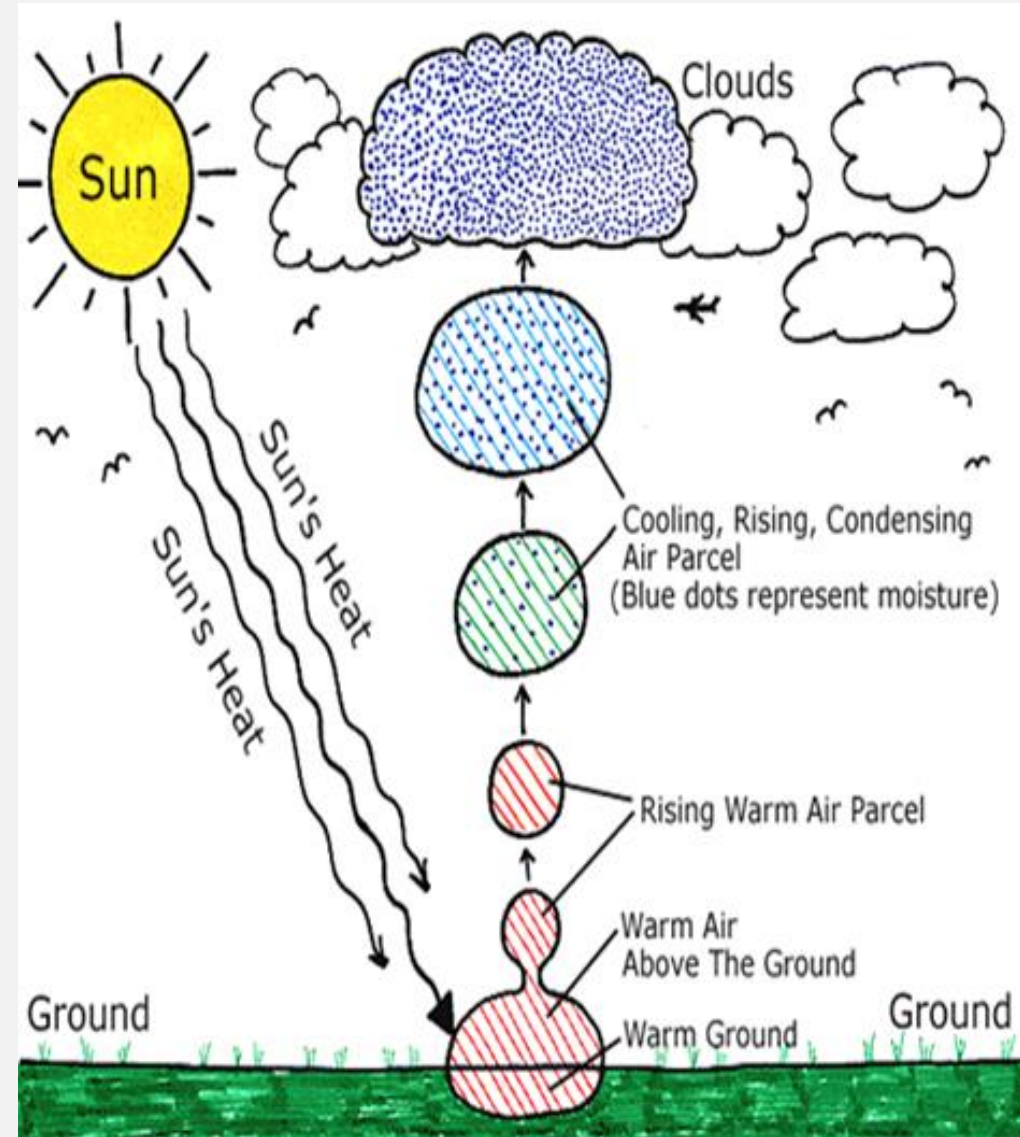
When you're done read pages
498-499 and draw Figure 17.10 on
the back of your notebook paper.

WHAT IS DEW POINT

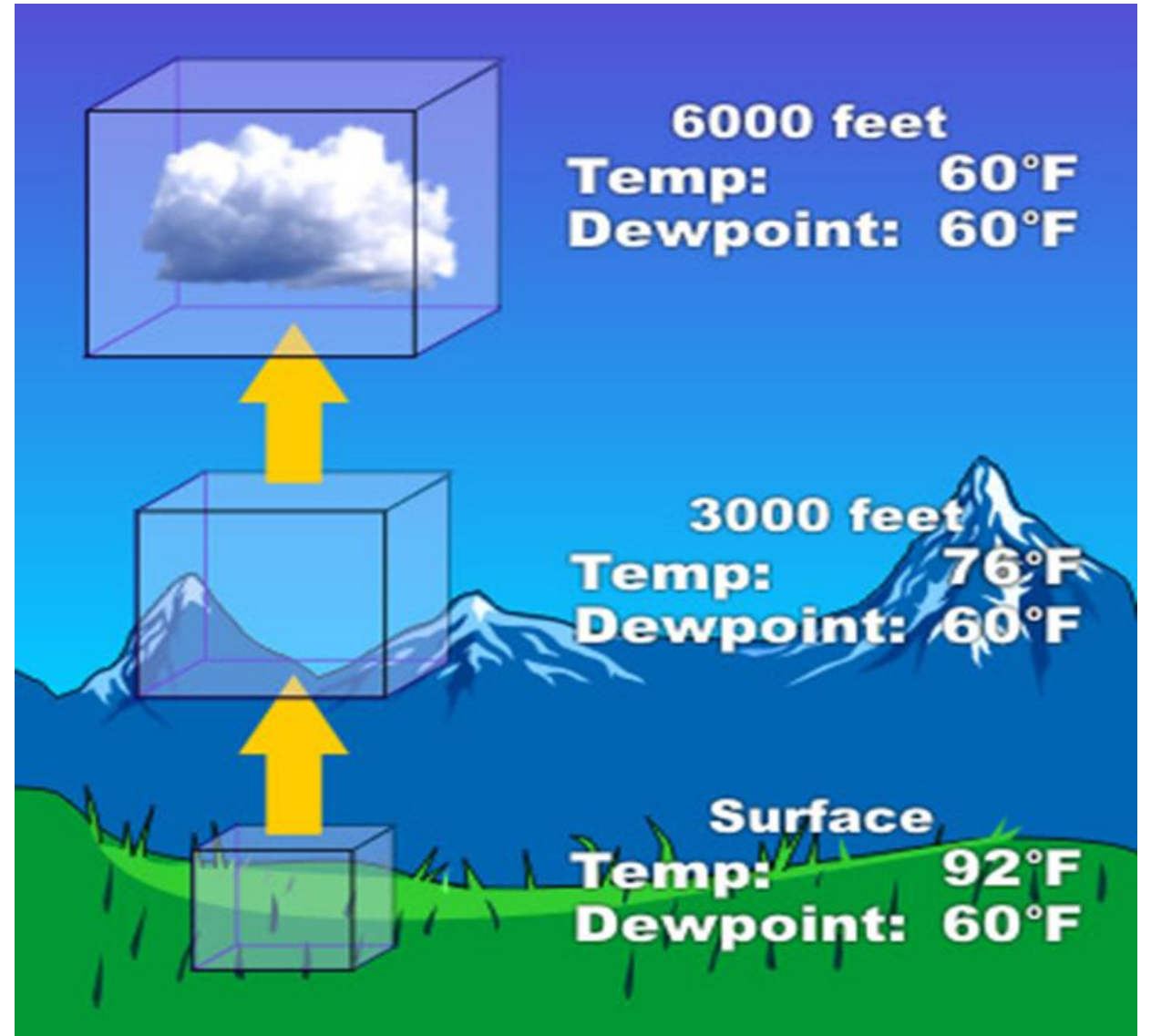
- Dew Point is the temperature air must cool too for it to become saturated with water
- Dew (condensed water) is released when air becomes saturated with water vapor

HOW DOES A CLOUD FORM?

1. Air is warmed at the ground and rises in the troposphere
2. As air rises it spreads out and cools down (**adiabatic cooling**)
3. Air cools, reaches its **dew point** and is saturated with water
4. Water vapor condenses onto small pieces of **condensation nuclei** (dust/sand/smoke/salt)
5. All the tiny droplets of water form a cloud



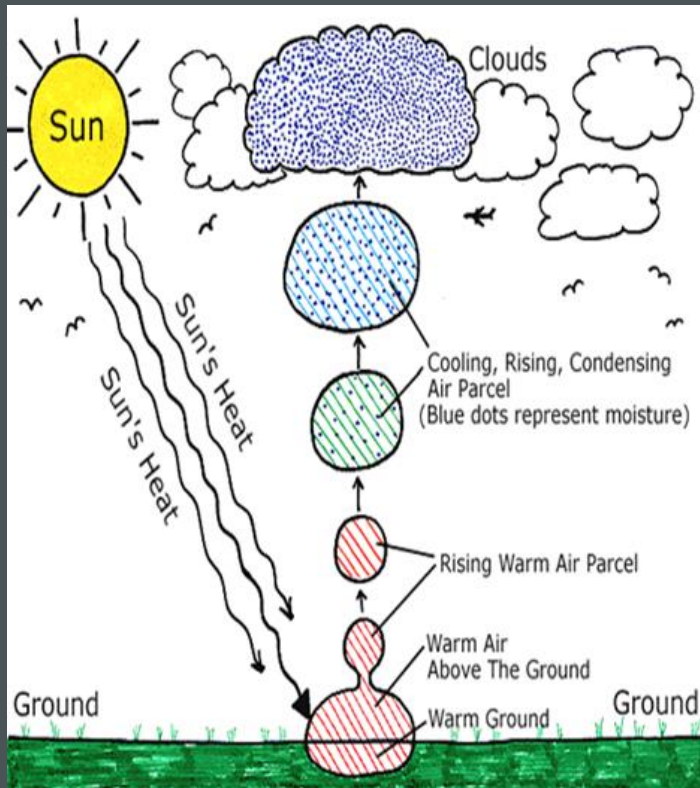
HOW A CLOUD FORMS



CLOUD IN A BOTTLE LAB

Complete the Cloud in a Bottle Make-Up Lab if you were gone when we did this in class.

DIAGRAM HOW A CLOUD FORMS



1. Get a piece of paper

2. Draw and label the steps of cloud formation following

- Air is warmed at the ground
- Warm air rises
- Air cools as it expands at higher elevation and low pressure
- When air cools to its dew point condensation forms on condensation nuclei
- A cloud is made!

3. Color the diagram

4. On the back write the 3 ingredients for a cloud