Warm-up

Page: 544, 1. Ice commonly changes into a __________ before changing into a gas.

liquid

Page: 544, 2. Can water vapor turn directly into ice a solid?

Yes

Page: 544. The amount water vapor in the air is known as __________

Humidity
Page: 545, 1. Humidity is controlled by rates of _______________ and _______________.

condensation and evaporation

Page: 545, 2. When the air is said to be saturated what does it mean?

It is 100% humidity - air can not hold any more moisture

Page: 545. When air temperature drops below dew point what occurs? __________

condensation
Objectives: S.W.B.A.T.

- Define: frost, dew, sublimation, humidity, relative humidity, saturation, transpiration
- Calculate humidity with sling psychrometer
- Use a humidity chart
- Explain the connection between temperature and humidity
- Name two instruments that measure humidity
- Explain why humidity is important aspect sports activities – and explain what high humidity means
Activeities

- Warm-ups
- Humidity lab
- Complete 20-1 worksheet
- Humidity 1-4 worksheet h.w. if time allows
Humidity

Amount Water vapor in the atmosphere is known as **humidity**.

Humidity is controlled by rates of condensation and evaporation.

\[ \text{temperature} = \text{rate of evaporation} \]
Humidity

**dew point** - the temperature at which the rate of condensation equals the rate of evaporation

At temperatures below the dew point, condensation occurs, and liquid water droplets form.
Relative Humidity - the ratio of the amount of water vapor in the air to the amount of water vapor needed to reach saturation (dew point) at a given temperature.
Air may cool to its **dew point** by conduction when the air comes in contact with a cold surface. During the night, grass, leaves, and other objects near the ground lose heat. When the temperature of air cools below the dew point, condensation called **dew** is formed.
Humidity

If dew point falls below the freezing temperature of water, water vapor may change directly into solid ice crystals, or frost.
Frozen dew is not frost

- Frost is ice crystals
- Frozen dew is very uncommon unlike frost frozen dew makes clear beads of ice.
Measuring Humidity

- The *hair hygrometer* determines relative humidity based on the principle that hair becomes longer as relative humidity increases.
Is it humid out?

IT'S THE HUMIDITY!!!
Measuring Humidity

A **psychrometer** is an instrument used to measure relative humidity.

It consists of two identical thermometers. The bulb of one thermometer is covered with a damp wick (**wet bulb**). The bulb of the other thermometer remains dry (**dry bulb**).
Measuring Humidity

The psychrometer is held by a handle and whirled through the air.

The **difference** between the **dry-bulb temperature** and the **wet-bulb temperature** is used to calculate relative humidity.
• https://www.youtube.com/watch?v=m1JV3oeEnWg

• https://www.youtube.com/watch?v=yC7EMtRCqBM
Measuring Humidity

Other humidity instruments:
- **Electric hygrometers** – uses Conductivity of a polymer film

Weather balloon - **radiosonde** for high altitude humidity

**LiCl dew cell** – uses conductivity also
REAL SWIFT MOVE, BUYING THAT DEHUMIDIFIER...
Forms of Water:

- Gas
- Liquid
- Solid

Substances:

- Water vapor
- Steam
- Cloud
- Rain
- Mist
- Fog
- Dew
- Frost
- Snow
- Ice
- Stream
Cool down

1. A psychrometer is an instrument used to measure ___ ___.
   Relative humidity

2. The temperature that air becomes saturated is called the _________ _________ temperature.
   Dew point
Cool down

1. What was the relative humidity today?

2. A sling psychrometer uses _____ thermometers
   two