Understanding Weather

Part 4: Precipitation

Precipitation

- Any form of water that falls from clouds and reaches Earth's surface
- Not all clouds produce precipitation
- For precipitation to occur, cloud droplets or ice crystals must grow heavy enough to fall through the air
- Cloud droplets grow larger by colliding and combining with other droplets

Review: How did the water get up there?

Looking ahead: how many different forms of water falling from the sky can you think of?

Types of Precipitation

- Rain:
  - Size: at least 0.5 mm diameter
  - If it's smaller, it is called "drizzle"
  - If it's even smaller, it's called "mist"
  - Drizzle and mist usually fall from stratus clouds

Sleet

- If raindrops fall through a layer of air that is below freezing (32 degrees Fahrenheit, 0 degrees Celsius)
- As they fall, they freeze into solid particles of ice
- Ice particles smaller than 5 mm in diameter are called sleet

Freezing Rain

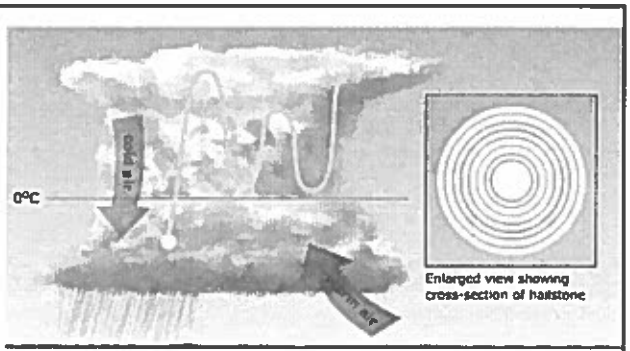
- Instead of freezing in the air, like sleet, Freezing rain is when raindrops freeze as soon as they touch a cold surface
- This creates a smooth, thick layer of ice build-up on every surface
- The weight of the ice building up on tree branches can cause them to fall and damage power lines, leading to power failures
- Can make sidewalks and roads slippery and dangerous

Snow

- Water vapor in a cloud is converted directly into ice crystals
- These ice crystals = snowflakes
- Each has a unique shape (six sides or branches)
- Can join together in large clumps

Hail

- Round pellets of ice larger than 5 mm in diameter = hailstones
- Form only in cumulonimbus clouds
- Strong updraft carries the ice pellet through the cold region many times, building up a new layer of ice each time
- Cut in half, hailstones have layers like onions
- When they are too heavy, they fall to earth
- Cause tremendous damage to crops, buildings, and vehicles



Drought

- A long period of weather that has unusually low precipitation

- Cloud seeding
  - Scientists trying to figure out how to produce rain
  - Adds tiny crystals of silver iodide into clouds for water droplets to freeze to (condensation has to have a surface or it won't happen)
  - Also adds dry ice to cool the droplets even further, so they will freeze without particles being present
  - Works on water droplets below 0 degrees C
  - Result is mostly unsuccessful, but they try :)

Measuring Precipitation

- Rain gauge: an open-ended can or tube that collects rainfall.

- Snowfall measuring: measured using a measuring stick or by melting collected snow and measuring the depth of the water it produces
  - On average, 10 centimeters of snow contains about the same amount of water as 1 cm of rain
  - Light, fluffy snow contains far less water than heavy, wet snow