**Weather- Snow Day Science**

*Lesson 9-Air Masses, Wind, and Fronts*

A screenshot of a computer

Description automatically generated**LESSON 8 RECAP:**

**Background:** Hail forms when water droplets in a cloud get very, very cold (supercooled) and collide with other supercooled water droplets. This happens in **thunderstorms** when the clouds grow so tall they lift the water droplets into very cold parts of the atmosphere. Hail can grow very large if it is forming inside a storm that has strong updrafts pushing those droplets into this part of the atmosphere.

Watch the demo using the ‘Make Thunderstorm’ simulation to test out your ideas about what causes a storm to form.

1. On the diagram above,
   1. Put a star on each condition slider where you would form the biggest thunderstorm.
   2. Model the force of gravity and lift (updraft) that would have to occur for hail to form.
2. Why do thunderstorms/hailstorms happen most often in spring according to this model?

**INVESTIGATION QUESTION:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**AIR MASSES**

*Directions: On the map below, name the air mass, briefly describe the air, and show the direction it moves.*

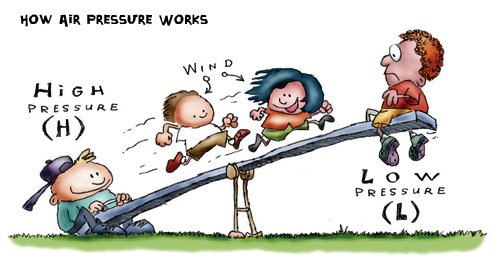
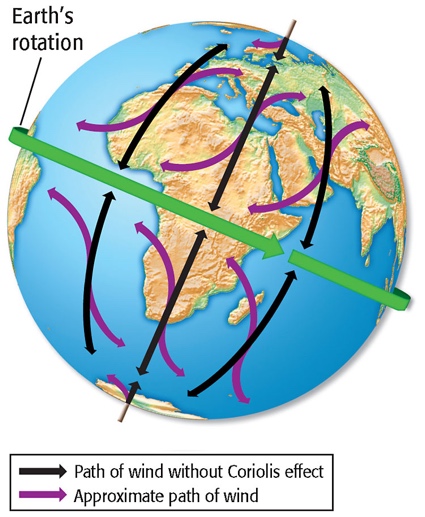
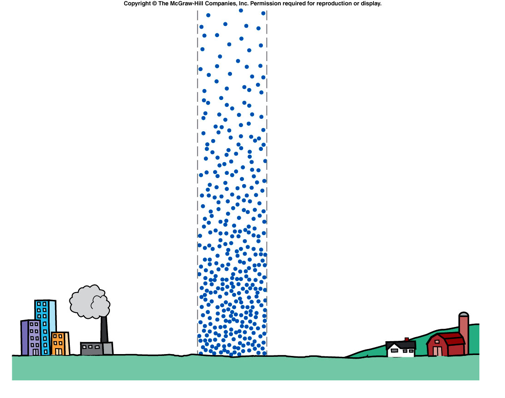
**Connections:**

1. Which air mass(es) may influence the production of hail? Why?
2. Which air mass(es) may influence the call of a snow day? Why?
3. What about the geography in this area may also help contribute to hail?

**WIND, AIR PRESSURE AND CORIOLIS EFFECT**

**Wind:** the movement of air caused by differences in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + Wind moves from areas of \_\_\_\_\_\_\_\_\_\_\_ pressure to areas of \_\_\_\_\_\_\_ pressure
  + **Coriolis Effect**: causes global wind to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + **Air Pressure:** the result of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ pushing down on an area.
    - Measured with a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (psi, atm, mmHg, millibars)



**AIR PRESSURE DEMOS**

|  |  |  |  |
| --- | --- | --- | --- |
| **Demo** | **Predict** | **Observe** | **Explain** |
| **1** |  |  |  |
| **2** |  |  |  |
| **3** |  |  |  |
| **4** |  |  |  |

**FACTORS THAT EFFECT AIR PRESSURE**

|  |  |  |
| --- | --- | --- |
| **FACTOR** | **EFFECT** | **PICTURE** |
| **Altitude** |  | **3_elevation_6.png** |
| **Temperature** |  | H  L |
| **Humidity** |  | **A close up of a piece of paper  Description automatically generated**  L  H |

**A picture containing text, map

Description automatically generatedAIR PRESSURE AND WEATHER**

1. What type of pressure systems brings

stormy weather according to the weather

maps above? Why?

**FRONTS-WHEN AIR MASSES MEET**

*DEMO: Watch the simulation of a hot and cold “air mass” meeting.*

1. Make a prediction of what you think will happen when the hot and cold ”air masses” meet.
2. Draw what happens over time.

*A screenshot of a social media post

Description automatically generated*

*Directions: Record any observations you believe are necessary to help you understand the differences between fronts, and draw a model showing* ***how air masses interact with one another*** *to form the front.*

|  |  |
| --- | --- |
| **FRONT & DESCRIPTION** | **MODEL** |
| **Cold Front** |  |
| **Warm Front** |  |
| **Stationary Front** |  |
| **Occluded Front** |  |

**ANALYSIS:**

What type of front (cold, warm, stationary, or occluded) do you think is more likely responsible for:

* 1. Fog? Why?
  2. the rain out (2 days of rain) earlier this year? Why?
  3. 1967 blizzard in Lansing? Why?
  4. A hail storm? Why?