**Weather- Snow Day Science**

*Lesson 8-Why Hail*

**LESSON 7 RECAP:**

Last time, we reviewed the water cycle and investigated what conditions are needed for different types of precipitation and why it doesn’t precipitate all the time.

1. Fill-in the diagram with the parts of the water cycle.

**A picture containing drawing

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**Word Bank:**

Evaporation

Transpiration

Condensation

Precipitation

Storage

Groundwater

Infiltration

Run-off

1. What two “forces” drive the water cycle? (Without them the water cycle would not exist).
2. Based on the diagram below and our last lesson, why do we get different types of precipitation? Label what type of precipitation each of these results in.

**A close up of a sign

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1. Draw the movement of and the lift force acting on the precipitation based on the key and scenario given.

A close up of text on a black background

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1. Use the model to explain why it doesn’t precipitate as soon as water condenses.

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

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**BACKGROUND: HOW DOES HAIL FORM?**

*Watch the ‘Formation of Hail’ video and answer the following questions:*

1. What, in some thunderstorms, pushes rain and ice pellets high into a thunderstorm keeping them suspended within a storm to form hail?
2. What are temperatures like in this area?
3. What happens when ice pellets comes into contact with a water droplets? If this happens slowly what does the ice look like? What happens if it happens quickly?

1. The longer a strong updraft is present the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the hail stone can become.
2. Pea size hail can be formed with updrafts of \_\_\_\_\_\_\_\_\_\_\_. Softball size hail needs updrafts of \_\_\_\_\_\_\_\_\_\_\_\_.

**PLANNING OUR INVESTIGATION-**

**Question- *What causes more lift in one cloud versus another?***

A picture containing wall, indoor, table

Description automatically generatedClouds in a blue cloudy sky

Description automatically generated*Observe set-up of demonstration and fill in the following:*

**B**

**B**

**A**

**A**

*A picture containing wall, indoor, table

Description automatically generated*A screenshot of a cell phone

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1. Describe the movement of the dye after it was added to the water and draw what you observed.
2. How does the movement of the dye over the warm cup relate to what is happening with the air in the atmosphere over warm ground?
3. *Identify the following for this investigation:*

**Hypothesis:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
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**Independent variable:** *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_* **Dependent variable:**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Constants:**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**OBSERVATIONS:**

|  |  |
| --- | --- |
| **Relative Temperature at “B”** | **Observations** |
| Hot |  |
| Cold |  |

|  |
| --- |
| **Question** |
| *A group of scientists measures the temperature of the ground and the air above that surface at three locations. Which location would you expect to have the strongest updrafts?* |
| **CLAIM:**  *Circle one*   * 1. an area where the surface temperature is much greater than the air above it   2. an area where the surface temperature is colder than the air above it   3. an area where the surface temperature is the same as the air above it |
| **EVIDENCE:** |
| **REASONING:** |

**ANALYSIS:**

**CONCLUSION- PUTTING IT ALL TOGETHER**

1. What claims can we make about what causes different strength or size of updrafts?
2. Where is the thermal energy coming from that causes the updrafts? Where did this energy originally come from?
3. What is happening to the air molecules in an updraft? (Speed, arrangement, density???)
4. What did we call that movement for air? For water?
5. Why would higher temperature differences between the surface and the air above make for stronger convection and evaporation?
6. What types of surfaces can absorb more radiant energy and cause a higher temperature difference?

**NEXT STEPS:**

What about other movement? What did we notice happening in the water and dye investigation at the surface and at the bottom of the tub? What do you think this might be simulating?