**Science 8**

**Snow Lab**

**Questions**: Can we describe and model the kinetic relationship between solids, liquids, and gases using snow? How can we create a system to collect as much steam as possible and return it to its liquid state?

**Hypotheses**:

1. If we add energy (heat) to snow, then \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. If we \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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then we can turn the steam back into water and collect it.

**Experiment**:

* Materials per pair:

1 pair of glasses per person

1 beaker (250 mL)

1 hot plate 1 piece of cling wrap

1 pencil per person

1 elastic

1 pair of beaker tongs

1 thermometer

1 pair of scissors

Additional materials as provided by your teacher:

1 scale

* Procedure:

1. Put on safety glasses, tie back long hair, and collect materials.
2. Collect some snow from outside in the beaker.
3. Record 3 qualitative (words to describe – think of the 5 senses) and 3 quantitative (numbers that describe) observations about the snow.
4. Melt the snow in the beaker on a hotplate (make sure the outside of the beaker is dry first).
5. Once the substance completely changes state, record 3 qualitative and 3 quantitative observations about the substance.
6. Cover the beaker with cling wrap and secure it with an elastic. Bring the substance to a boil.
7. After boiling for 2 minutes, remove the beaker from the hotplate using the tongs. Record 3 qualitative and 2 quantitative observations about the substance.
8. Carefully remove the elastic and cling wrap using scissors, and then return the beaker to the hotplate.
9. **Design and test a method of returning the escaping steam to its liquid state and collecting the liquid.**
10. **Bring collected liquid to the teacher for measuring.**
11. Clean up all supplies and work area. Leave hotplate out to cool.
12. Wash your hands.

**Observations & Data**:

|  |  |  |  |
| --- | --- | --- | --- |
| **Qualitative** measurements  (use your 5 senses and words) | Solid (Snow) | Liquid (Water) | Gas (Steam) |
|  |  |  |
|  |  |  |
|  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Quantitative** measurements | Solid (Snow) | Liquid (Water) | Gas (Steam) |
| Mass |  |  |  |
| Volume |  |  |  |
| Temperature |  |  | 100°C |

**Analysis**: Answer the following questions with complete sentences and scientific language.

1. Describe the movement and spacing of the molecules in each of the phases.
   1. Solid (snow): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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* 1. Liquid (water): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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* 1. Gas (steam): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Refer to the masses you recorded in the data table. The **Law of Conservation of Mass** is a theory that states that matter in a closed system cannot be created or destroyed, though it can be rearranged. Did your results support this theory? Please explain.

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1. Refer to step 9 of the procedure.
   1. Describe your method of returning the escaping steam to its liquid state.

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* 1. Did your method work? Explain why or why not. If you collected any liquid, how much did you collect?

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* 1. What would you do differently next time?

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1. Think of at least one situation in the real world where you would have to change a substance's phase of matter.

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**Conclusion**: Please write complete sentences to answer the original questions, refer to your hypotheses, explain what you learned, and ask another question.

Answer the original questions: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Refer to your hypotheses: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Explain what you learned: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Ask another question: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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