|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2. Background Research: Describe what I know about the problem that could impact the experiment.**1. Matter comes in \_**THREE**\_\_\_\_\_\_\_\_\_main forms (states). These states of matter are: \_\_\_**SOLID**\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_**LIQUID**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_**GAS**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. **(Bonus states of matter: plasma and Bose-Einstein Condensate)**
2. Two factors affect the state of matter. \_\_\_**TEMPERATURE (ENERGY)**\_\_ and \_\_\_\_\_**PRESSURE**\_\_\_\_\_\_\_\_\_\_\_ determine what state a particular type of matter is in.
3. When matter changes state, this is a \_\_\_\_**PHYSICAL CHANGE**\_\_\_\_\_\_\_\_\_\_\_\_\_change. When matter undergoes this change, it is still the \_\_\_**SAME**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_type of substance. The particles simply get \_**FASTER**\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_**SLOWER**\_\_\_\_\_\_\_\_\_\_\_.
4. **Complete the chart:**

|  |  |  |  |
| --- | --- | --- | --- |
| Change of State | Direction(starting state to ending state) | Endothermic(Energy is absorbed)orExothermic (Energy is released) | Example |
| Melting | Solid -> Liquid | Endothermic | Ice melting in soda |
| Freezing | Liquid -> Solid | Exothermic | Water freezing into ice |
| Boiling(Vaporization) | Liquid -> Gas | Endothermic | Boiling water to make Mac&Cheese |
| Condensation | Gas -> Liquid | Exothermic | Water on the outside of a cold glass |
| Sublimation | Solid -> Gas | Endothermic | Dry ice at a Halloween Party |
| Deposition | Gas -> Solid | Exothermic | Frost forming on a leaf when it is cold |

   |

**![MCj04039250000[1]]()![MCj03979030000[1]]()![MCj03970220000[1]]()![MCj04039970000[1]]()**

1. **Draw particles showing the process of melting - freezing, boiling - condensing, and sublimation -deposition. Label each box and arrow. Show where energy is added and where energy is taken away.**

**S**

**Particle Models must show:**

**Shape/Arrangement**

**Volume**

**Energy/Motion**

**Deposition**

**Sublimation**

**Condensation**

**Freezing**

**Melting**

**Boiling/ evaporation**

**L**

**S**



**G**

**L**

**L**



**S**

**S**

**G**



Solid gas condensation boiling deposition

Liquid plasma evaporation sublimation

Bose-Einstein Condensate freezing melting



**Plasma**

**Bose-Einstein Condensate**

**Gas**

**Condensation**

**Melting**

**Solid**

**Liquid**

**Boiling/Evaporation**

**Freezing**

(Kinetic Energy)