**Kinetic Theory of Matter:**
- Molecules are always *moving*. This is known as the *kinetic* theory of matter.
- We measure this kinetic energy with a thermometer as *temperature*.
- The greater the material's internal energy, the higher the temperature of that material.
- *Heat* is the energy flow between objects of different temperature.
- Heat and temperature are NOT the same.
- *Brownian motion* describes how visible particles are seen moving due to invisible molecules bumping into them.

**Phases of Matter:**

**Solid**
- matter that has definite volume and shape.
- The molecules are packed together tightly and move slowly.

**Liquid**
- matter that has definite volume but not shape.
- Since the molecules of a liquid are loosely packed and move with greater speed, a liquid can flow and spread.

**Gas**
- matter that has indefinite volume or shape.
- Molecules of a gas are so loosely arranged and move so rapidly that they will fill their container.

**Phase Change Descriptions:**

**Melting**
the change from ________________ to ________________.

**Freezing**
the change from ________________ to ________________.

**Evaporation**
the change from ________________ to ________________.

**Condensation**
the change from ________________ to ________________.

**Sublimation**
the change from ________________ to ________________.

**Deposition**
the change from ________________ to ________________. 
Fill in the phase changes in the blank provided.
Phase Change Worksheet

The graph was drawn from data collected as a substance was heated at a constant rate. Use the graph to answer the following questions.

At point A, the beginning of observations, the substance exists in a solid state. Material in this phase has ____________ volume and ____________ shape. With each passing minute, ____________ is added to the substance. This causes the molecules of the substance to ____________ more rapidly which we detect by a ____________ rise in the substance. At point B, the temperature of the substance is _______°C. The solid begins to ____________. At point C, the substance is completely ____________ or in a ____________ state. Material in this phase has ____________ volume and ____________ shape. The energy put to the substance between minutes 5 and 9 was used to convert the substance from a ____________ to a ____________.

This heat energy is called the **latent heat of fusion.** (An interesting fact.)

Between 9 and 13 minutes, the added energy increases the ____________ of the substance. During the time from point D to point E, the liquid is ____________. By point E, the substance is completely in the ____________ phase. Material in this phase has ____________ volume and ____________ shape. The energy put to the substance between minutes 13 and 18 converted the substance from a ____________ to a ____________ state. This heat energy is called the **latent heat of vaporization.** (An interesting fact.) Beyond point E, the substance is still in the ____________ phase, but the molecules are moving ____________ as indicated by the increasing temperature.

Which of these three substances was likely used in this phase change experiment?

<table>
<thead>
<tr>
<th>Substance</th>
<th>Melting point</th>
<th>Boiling point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolognium</td>
<td>20 °C</td>
<td>100 °C</td>
</tr>
<tr>
<td>Unobtainium</td>
<td>40 °C</td>
<td>140 °C</td>
</tr>
<tr>
<td>Foosium</td>
<td>70 °C</td>
<td>140 °C</td>
</tr>
</tbody>
</table>