Introduction:

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

At point A, where observations begin, the substance exists in a solid state. Material in this phase has a definite volume and a definite shape. With each passing minute, ____________ is added to the substance. This causes the molecules of the substance to ____________ more rapidly, and this change is detected by an increase in the ____________ of 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 a definite volume and does not have a definite shape. The energy put into the substance between minutes 5 and 9 was used to convert the substance from a ___________ to a ___________.

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 does not have a definite volume or a...
definite shape. The energy put into the substance between minutes 13 and 18 converted the substance from a ___________ to a ___________ state. 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>

1a. The unit rate of change (slope) of each of the lines between points B and C and between points D and E is 0 (zero). That tells us that in those two lines, as time passes, the temperature _________________________________.

1b. Since heat is still being added to the substance between points B and C and between points D and E, what is the heat doing?

___________________________________________________________________________

___________________________________________________________________________

2a. Calculate the slope between points C and D.

2b. Put the slope calculated in 2a above into words by filling in the blanks:

From point C to point D on the Phase Change Diagram, as time increases, the temperature
______________ and therefore the slope has a **positive (+) / negative (-)** sign. (circle one)