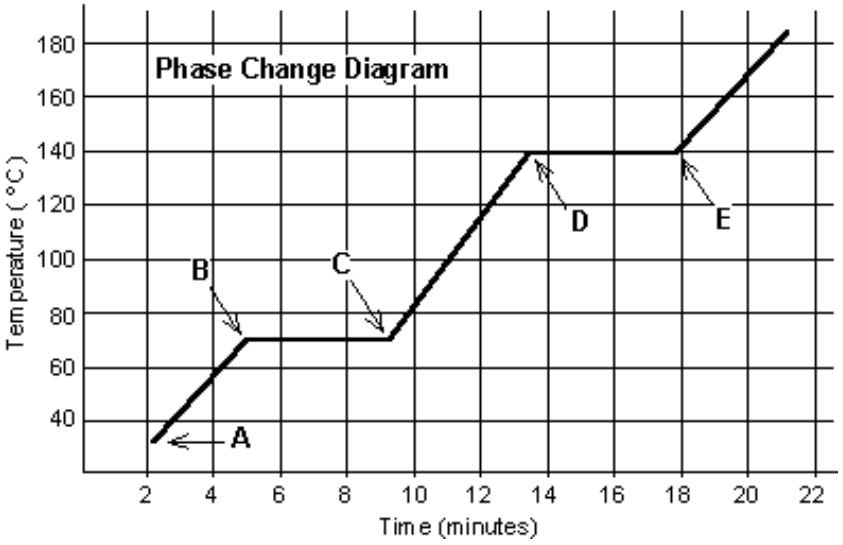
MiSP Phase Changes Worksheet #3 L3
ASSESSMENT

Name _____ Date_____

L 1, 2, 3

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



Word bank:	Some words may be used more than once. Some not at all.				
gas	solid	faster	cool	boiling	slower
heat	temperature		melted	freezing	liquid
move	melt	condensing			

At **point A**, the beginning of observations, the substance exists in a solid state. Material in this phase has a definite volume and definite shape. With each passing minute, _____ is added to the substance. This causes the molecules of the substance to _____ more rapidly which we detect 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?

_____

Substance	Melting point	Boiling point
Bolognium	20 °C	100 °C
Unobtainium	40 °C	140 °C
Foosium	70 °C	140 °C

L2,3

1a. The unit rate of change (slope) of each of the lines between points B + C and D + 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 + C and D + E, what is the heat doing?

_____

_____

2a. Calculate the slope between points C + 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)

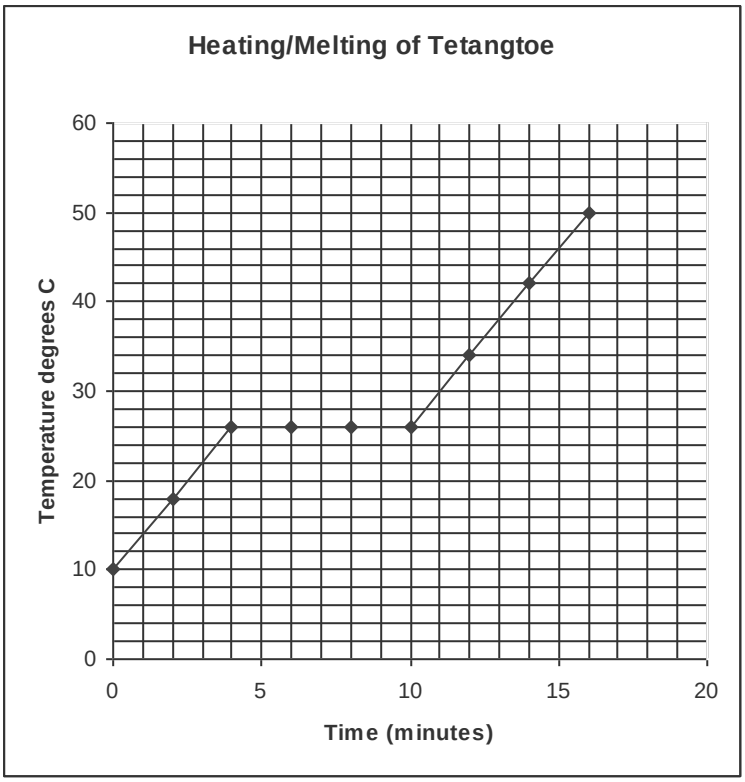
L3

Data for the melting of a different solid substance is recorded on the table:

Heating of the substance tetangtoe – constant flow of heat added:

Time (minutes)	Temperature °C
0	10
2	18
4	26
6	26
8	26
10	26
12	34
14	42
16	50

The data was graphed:



3. Determined the y intercept and unit rate of change (slope) for the line between 0 and 4 minutes.

y intercept

Unit rate of change (slope)

4. Determine the formula for the line between 0 and 4 minutes using the y intercept and slope calculated in 3 above.

5. Using the formula for the line between 0 and 4 minutes from question #4, What will the temperature be after 3.25 minutes? Show work.

6. Why would you not use the formula from #4 above to calculate the temperature at 15 minutes?

_____

_____

_____