

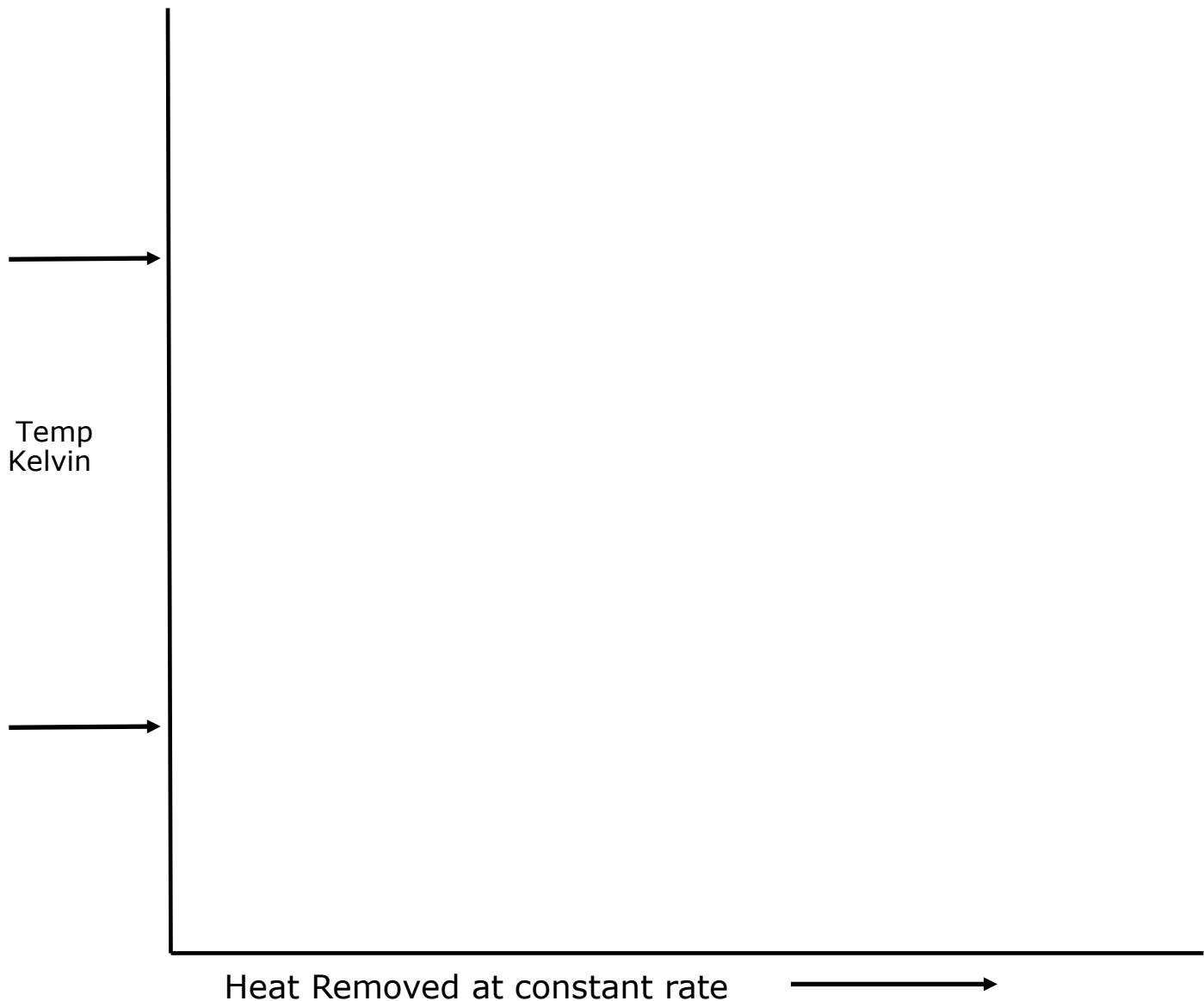
**PHASE
HW 1**
page
1/2

name: _____

Directions: read phases **BASICS**, draw a Cooling curve for bromine. Put in dots at the end of each line segment, label the dots with the letters A to F (left to right). Title the graph, add temperatures to the Y axis. Fill in boxes with: inc dec or steady

segment	phase or phases	KE	TEMP	PE
AB				
BC				
CD				
DE				
EF				

TITLE:

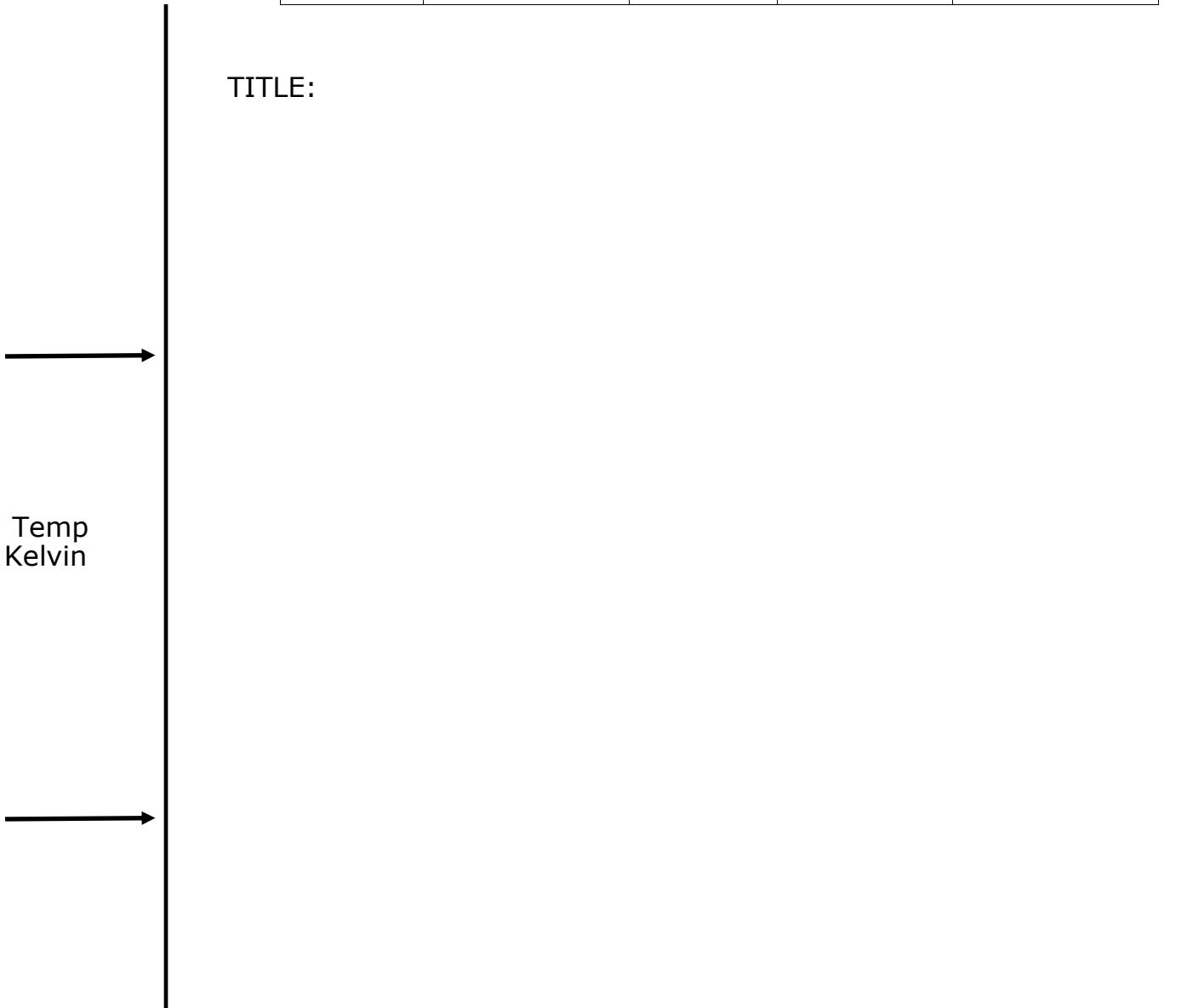


**PHASE
HW 1
page
2/2**

Directions: Draw a Heating curve for phosphorous. Put in dots at the end of each line segment, label the dots with the letters A to F (left to right).
Title the graph, add temperatures to the Y axis. Fill in boxes with: inc dec or steady

segment	phase or phases	TEMP	Kinetic Energy	Potential Energy
AB				
BC				
CD				
DE				
EF				

TITLE:



Heat Removed at constant rate

PHASE HW 2

name: _____
Read the Phases BASICS AGAIN (or for the first time)

- 1 Name of the force that attracts the molecules of a liquid together. _____
- 2 Describe the difference between vaporization and evaporation.
- 3 Describe how can evaporation (or boiling) be described as a "cooling process"?
- 4 Explain "The temperature of a liquid can never go above its boiling point".
- 5 Why can't liquids be compressed very much?
- 6 At the normal pressure of 101.3 kPa, water boils at 100°C, or 373 K.
High up a mountain or deep in a cave the air pressure is NOT NORMAL.
Fill in this chart with estimates of pressure in kPa and estimates of the BP for water.

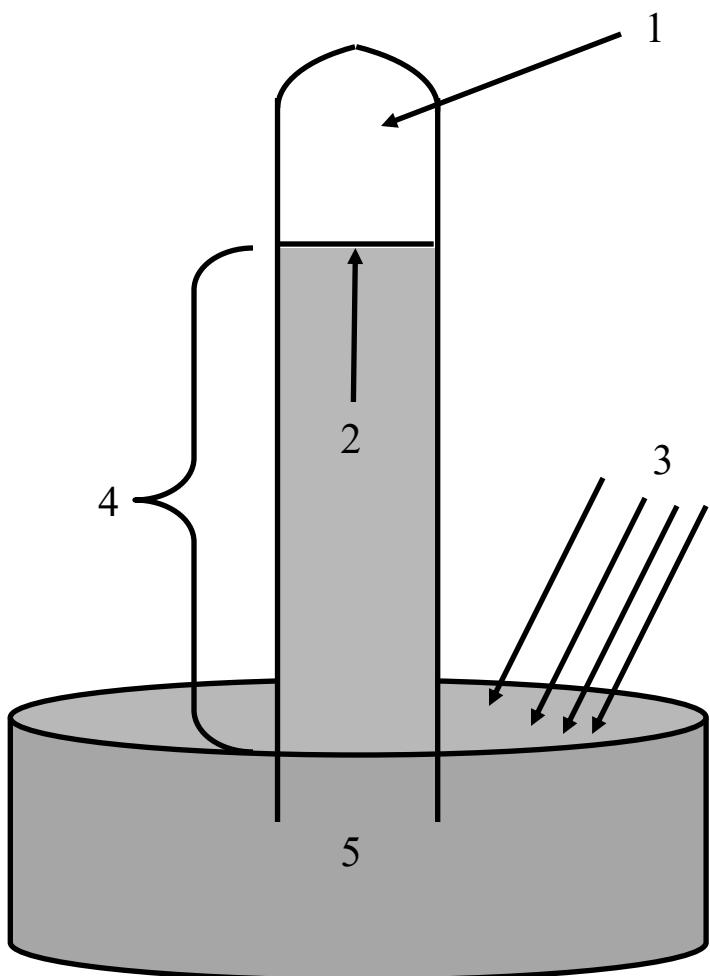
	approx. air pressure (in kPa)	boiling point of water °C
below sea level in a deep cave		
at sea level	(Normal) 101.3 kPa	100°C
high atop a mountain		

- 1 A gas is at the pressure of 1.25 atm. What is that pressure in kPa?
- 2 How many mm Hg is the pressure of 135 kPa equal to?
- 3 On Mount Everest the air pressure is about 0.305 atm. How many pounds per square inch is that?
- 4 Convert 0.705 atm into mm Hg.

- 5 What are the temperature and pressure of STP in °C and kPa?
- 6 Express the temperature of STP in Kelvin.
- 7 Convert 125 kPa to psi.
8. Convert 75.00 psi into mm Hg.

1	2	3	4
5	6	7	8

Below is a mercury barometer. Label each part onto the list at right.



- 1 Mercury
- 2 Zero pressure zone
- 3 Air pressure pushes on Hg
- 4 Hg pushes up the tube
- 5 Height (mm of Hg) indicating the air pressure.

PHASE HW 4

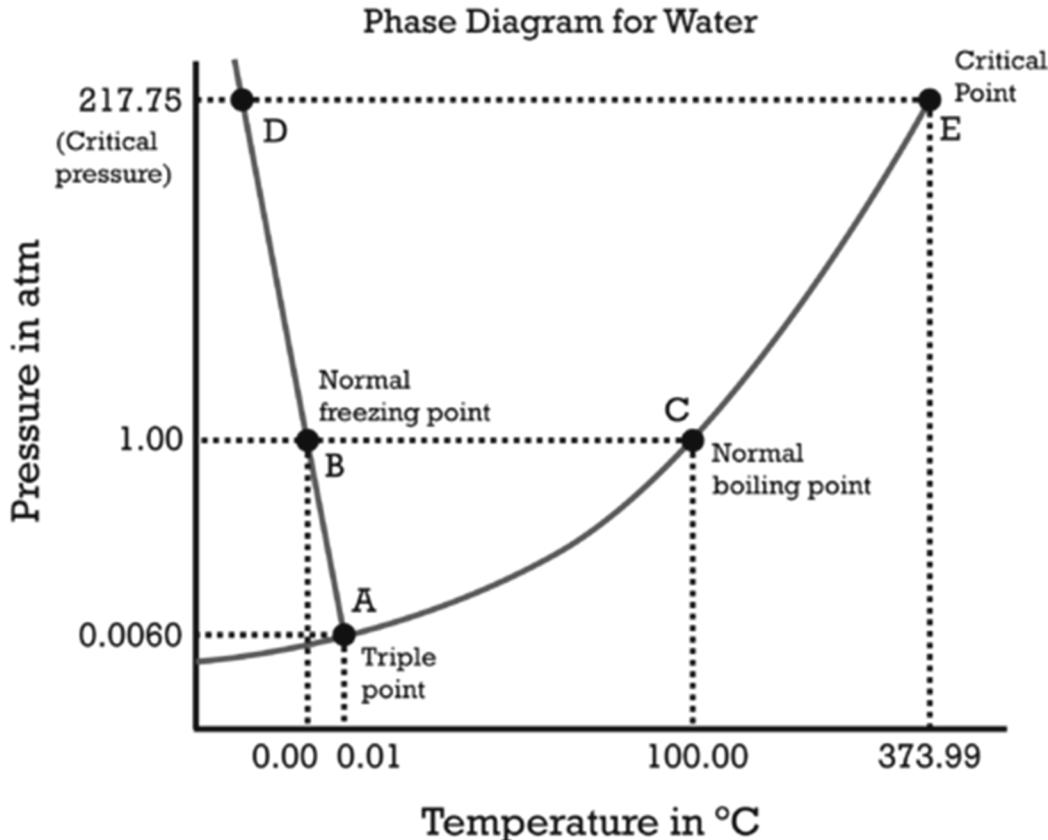
Drawing a Phase Diagram:
Phase diagrams show the phases of a substance at all temperatures and pressures.
They are used to determine which phase a substance is at a given temperature & pressure

Below is the PHASE DIAGRAM for WATER.
Note: pressure is in ATM not kPa.

Please RE-DRAW the phase diagram below really big on white paper.

1. Label the triple point (TP)
2. Label the critical point (CP)
3. Label the normal freezing point (NFP) which is also the normal melting point
4. Label and the normal boiling point (NBP) which is also the normal condensing point
5. Label the three sections of the graph as solid, liquid and gas phase
6. Draw a pair of arrows showing freezing (FR) and melting (M)
7. Draw a pair of arrows showing sublimation (SUB) and deposition (DEP)
8. Draw a pair of arrows showing vaporization (VAP) and condensing (CON)
9. Define Triple Point
10. Define Critical Point
11. Define normal freezing point
12. Define normal boiling point

PHASE DIAGRAM FOR WATER



PHASE HW 5

name: _____

Directions: Answer the questions, SHOW ALL MATH with formulas. No shortcuts.
Get our table H, you can' do this without looking (and reading first).

The normal BP for water means the boiling point for water at normal pressure.
Put your finger on the point on the graph now. Do you get this? _____ yes or no?

In Boulder, Colorado, the air pressure is much less because it's so high up into the air (above sea level).
The air pressure in Boulder today is 90 kPa. Find 90 kPa on the Y axis, and slide your finger right until you
touch the water curve. The Boiling point for water at 90 kPa is 97°C. Do you get this? _____ yes or no?

Table H can show you the vapor pressure of 4 different liquids at any temperature, or can show you the boiling
point at any pressure. This table can show you different things.

It can show you the Boiling Point at any pressure, or show you the Vapor Pressure at any temperature.

1. What the BP of ethanol at 90 kPa? _____
2. What the BP of ethanoic acid at 80 kPa? _____
3. What is the Vapor Pressure of ethanol at 30°C? _____
4. Change the BP from question one into Kelvin. _____
5. What is the Vapor Pressure of propanone at 25°C? _____
6. Change the VP from question five into psi. _____
7. What the BP of ethanol at 150 kPa? _____
8. Which compounds on Table H are liquid at 60°C & 10 kPa? (circle) P Et W EA
9. Which compounds on Table H are gas at 75°C & 30 kPa? (circle) P Et W EA
10. Which compounds on Table H are liquid at 100°C & 200 kPa? (circle) P Et W EA