Demo: Copper cube vs. ice cube in fire

1)	**Copper Cube**	**vs**	**Ice Cube**
	"gets hotter"		"melts"
	WHY?		
	Heat causes the particles to move faster		Heat causes particles to move further apart
	In other words, heat is converted to KE.		In other words, heat is converted to PE.
	{ q → KE → ΔT }		**{ q → PE → ΔPhase }**

Remember: ***During a phase change there is no change in temperature.***

2) **Picture this**: A beaker full of ice sitting on a hot plate with a thermometer inside the beaker. The hot plate is turned "on". Its **rate of heating** is **12,540J/min**. Let's track what happens in terms of temp, time and phases. The result is called a **Heating Curve.**

Refer to handout: Heating Curve of Water

Aim: What does a heating curve show us?

SEE HANDOUT FILLED OUT ON NEXT PAGE.

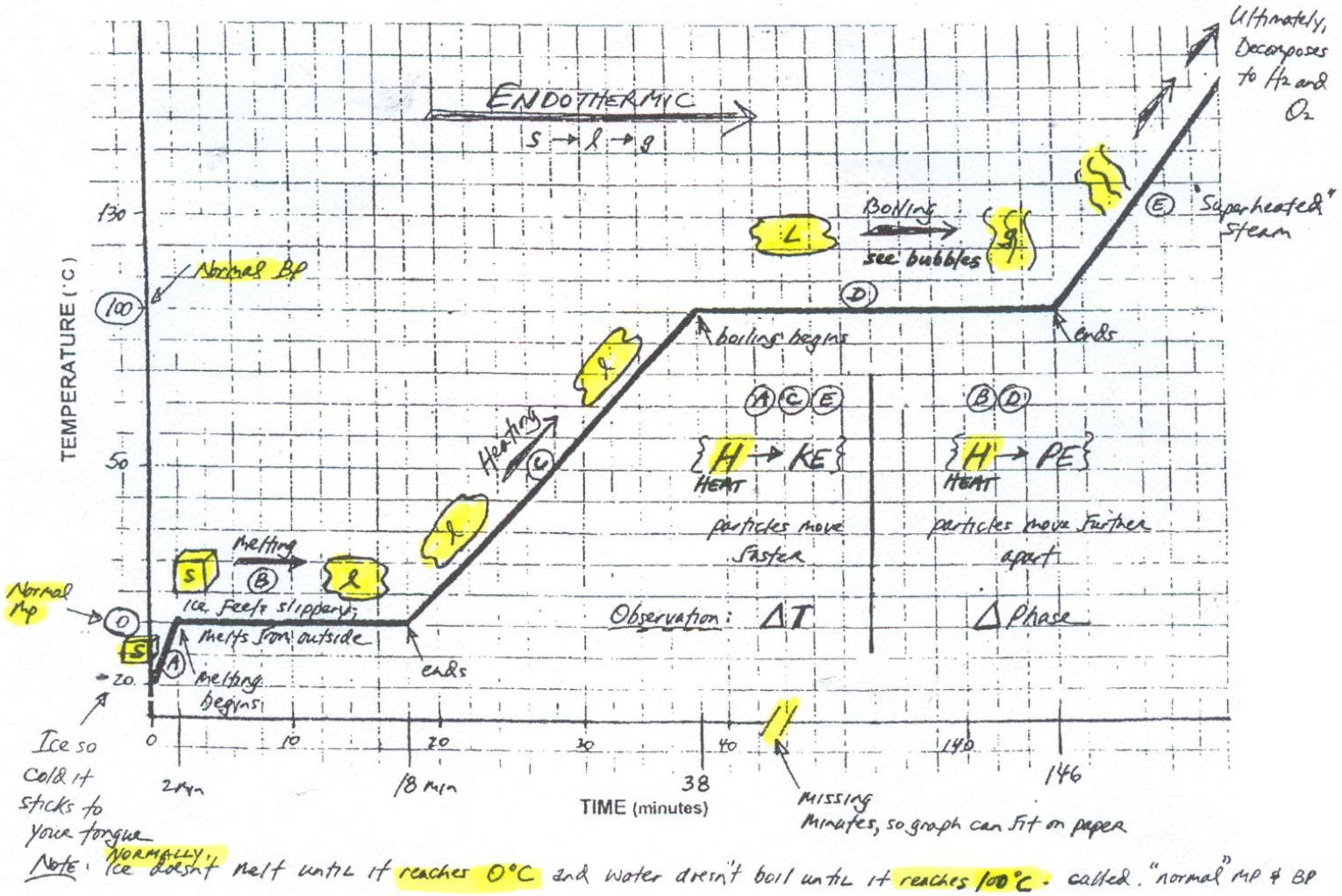
And, don't forget the calculations on pg3.

Chemistry 1 / Chille

HEATING CURVE of WATER

Starting with 600. g ice, at – 20°C.

RATE of HEATING = 12, 540 J / min



FINALLY, let's do a little math!
How long did it take the ice to completely melt starting from its melting point?

From 2min to 18min, 16min elapsed.

How much heat did this require? Use the rate of heating given at the top of the page.

16min x 12,540 J/min = 200,640 J

Let's do the same for boiling.

From 38min to 146min, 108 min elapsed.

108 min x 12,540 J/min =1,354,320 J

Obviously, it takes a lot more energy to boil a liquid than to melt the same mass of solid b/c vaporization requires more attractions to be broken.