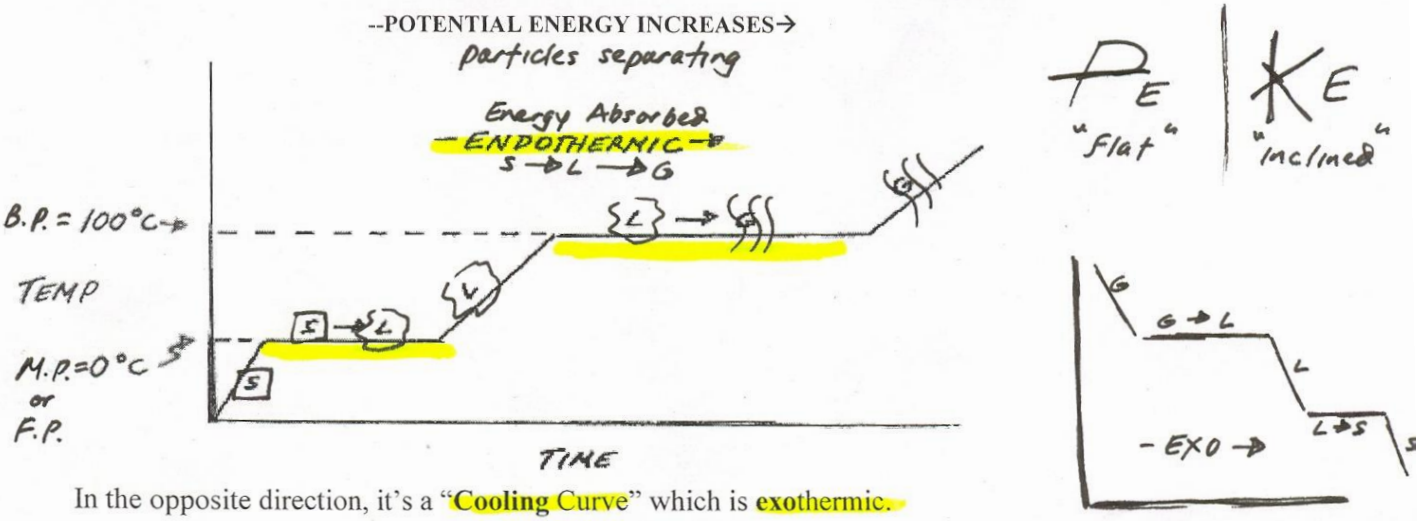
HEATING CURVE of Water

During a **phase change** (PE; position) there is **no change in temperature** (KE; speed).



In the opposite direction, it's a "**Cooling** Curve" which is **exo**thermic.

TABLE B

4.18 J/g °C

$\{q = m \cdot C \cdot \Delta T\}$

Calorimetry

334 J/g

$\{q = m \cdot H_f\}$

$\{q = m \cdot H_v\}$ 2,260 J/g

1) How many joules are needed to raise the temperature of 30.0 g H_2O from 50.0 °C to 70.0 °C?

$$q = m \cdot C \cdot \Delta T$$
$$= 30.0\,(4.18)(70.0 - 50.0) = 2{,}508\ J$$

(70.0 − 50.0 = 20.0)

REMEMBER: **1000 J = 1 kJ**; when converting from J to kJ divide by 1000 (move 3 decimal places to the left)

2.508 KJ

2) How many grams of ice can be melted by the absorption of 8,350 J at 0 °C?

$$q = m \cdot H_f$$
$$8{,}350 = x \cdot 334$$
$$x = 25.0\ g$$

Note: the same constant is used for freezing water, but it's energy released instead of absorbed.

3) How much heat is needed to boil 100. g H_2O at 100 °C?

$$q = m \cdot H_v$$
$$= 100.\,(2{,}260) = 226{,}000\ J$$

Note: the same constant is used for condensing water, but its energy released instead of absorbed.