For each of the situations below:

- Think about what is happening to the ice/water/steam.
- Decide which equation makes the most sense to use → write the original equation!
- Identify what each of the numbers means.
- Plug in numbers with units and solve, answer with the correct number of sig figs.
- 1. How much energy is required to raise 125 g of liquid water from 20.°C to 100.°C?

m= 1259 (2-mcD1 15T=1000 -20°C = 80°C Q=125g x1.0 Cal x80, C=10000. cal

2. Once that liquid water (from #1) is at 100.°C, how much energy is required to vaporize all of

(3=mH, Q=1251 x 539.4 cal Q=67485 Cal = 67400 Cal

Hy = 537.4 cal (x - 6.1485) cal = 10.1400 cal | 3. If you add 3750 cal of energy to solid ice at 0.0°C, how many grams (mass) of ice can be melted?

Q=mHe 3750, cal = mx 79,72 cal m=47.03969=47.049 Q=3750.cal m = ?

4. Once the ice in #3 is melted (at 0.0°C), if you add another 3750 cal of energy to it, what temperature will the

liquid water be? Q=mcDT Q=3750 cal m=47.049

5. How many calories are needed to raise 38 g of liquid water by 40.°C?

Q=mcoT a = 38g x 1 cal x 40.°C Q = 1520 cal = 1500 cal m=389

6. If you add 4500 cal of energy to liquid water that is already at 100.°C, how many grams of water can be vaporized?

4500 cal = m x 539.4 cal Q=mHu m=8.3426g=18.3g Q=4500 col

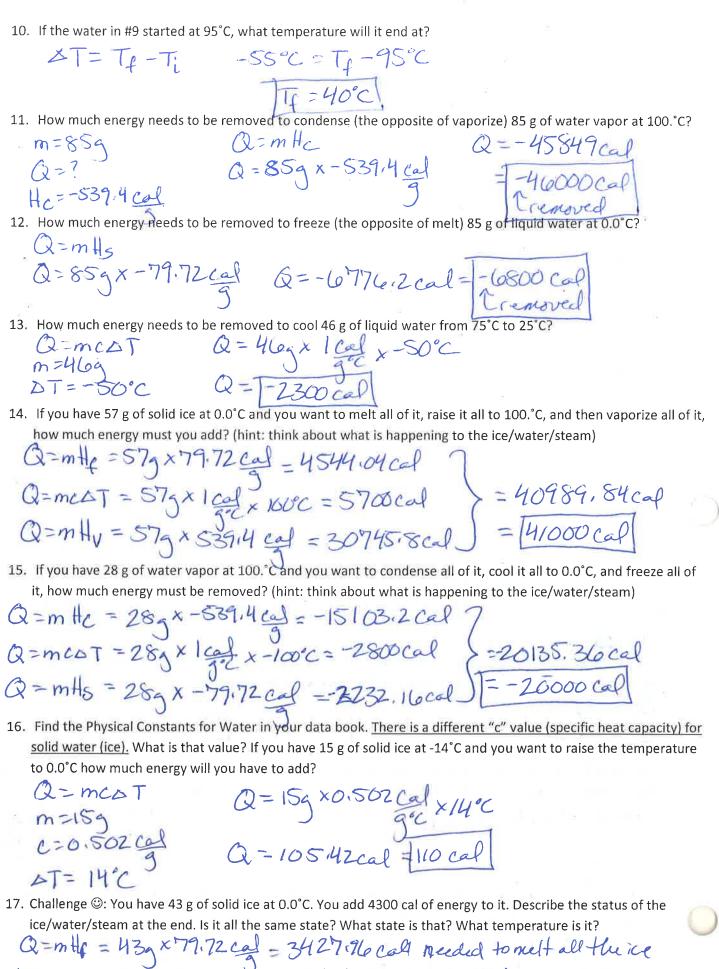
7. How much energy does it take to melt 1 g of ice at 0°C? How much energy does it take to vaporize 1 g of water at 100°C? What is the name of each of those constants (the number you just found)?

melt: 79.72 cal of heat of fusion vagorize: 539.4 cal or heat of vagorization

8. Propose one reason why the two numbers in #7 are so different from one another. (hint: think about why one phase change might take more energy)

thates much more energy to vaporite 1 g of a material (pull the particles completely apost from one another) than to melt 1 g of a 9. If you remove 3200 cal from 58 g of liquid water, how much will the temperature decrease?

DTESS.17° Q=mCDI Q=3200cal 3200 cal = 58g x 1 cal x DT = -55°C (a clecrease) m=584



ice/water/steam at the end. Is it all the same state? What state is that? What temperature is it?

Q=mHg = 43g × 79.72 caf = 3427.96 call needed to neelf all the ice

4300 - 3427.96 = 872.04 call left to add after it has neelfed

Q=mcDT 872.04 caf = 43g × 1 caf x DT AT = 20.28°C

**Started at 0°C so find 5 20.°C