Unit 3 Extra Credit: *Your grade on this will determine amount of extra credit on Unit 3 Test.*

1. Complete the units' table to the right.

2. **(show work)** A block of aluminum occupies a volume of 15.0 mL and has a mass of 40.5 grams. What is the density?

3. **(show work)** What is the mass of ethyl alcohol that fills a 200.0 mL container? The density of ethyl alcohol is 0.8g/mL.

4. **(show work)** How much (what Volume) of silver metal will weigh exactly 2500.0 grams. The density of silver (Ag) is 10.0 g/cm³

Term/Concept	Unit
Mass	
Energy	
Specific Heat (3)	
Temperature (3)	
Atomic Mass	
Charge (2)	
Distance	
Volume (2)	
Change	
Density (2)	
Wavelength	
Frequency	

KEY all must be used once; some concepts will have more than one item.

g, λ, g/cm³, L, m, J, J/g°C, °C, +/-, °F, K, cal/g°C, J/gK, cm³, g/mL, Δ, amu, Hz

USE the Substance & Density table to the right to answer items 6 - 8

5. The Bandit has 250 gram sample of Air, Oak Wood, H2O, Ice, Aluminum, and Lead (Pb). All samples have the same mass, but which sample would take up the most room in storage (most volume)?

6. The Snowman has a 5-gallon bucket of each of the substances mentioned in the table, meaning he has the same volume of each substance. Which 5 gallon bucket would be the heaviest to pick up?

7. Which substances would float on water?

Substance	Density
Air	0.0013 g/cm³
Oak Wood	0.85 g/cm³
H_2O	1.0 g/cm³
Solid H_2O (Ice)	0.93 g/cm³
Al	2.7 g/cm³
Pb	11.3 g/cm³

8. **(show work)** Naomi is investigating the properties of a solid material. It takes 120 joules to raise the temperature of 10 grams of the material by 5 degrees. What is the specific heat of the material?

9. **(show work)** The specific heat of iron is 0.45 J/gK. What is the amount of heat needed to raise the temperature of 12 g of iron by exactly 15 K?

10. **(show work)** The heat capacity of H_2O is 4 J/g°C. A 100-gram sample of H_2O (100ml) has an original temperature of 10°C. If 5000 Joules of energy was added to this sample of water, what will the final temperature of the water be?
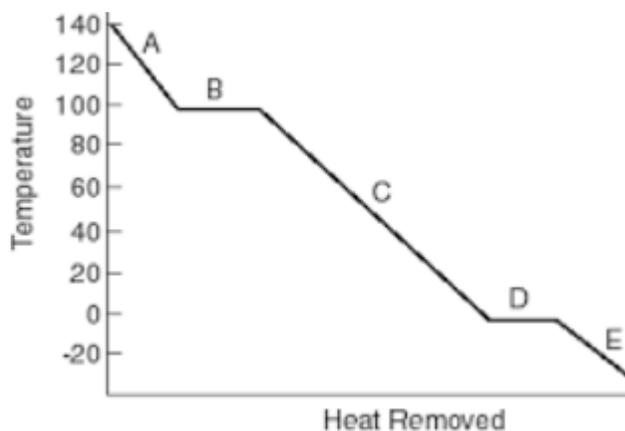
Use the Material & Heat Capacity table to answer items 11 - 14

11. Which material requires the least energy to increase temperature?

12. Which material requires the most energy to increase temperature?

13. Which material will cool off in the least amount of time?

14. Which material will require the most time to cool?

Material	Heat Capacity (J/°C)
aluminum	0.90
beryllium	1.82
gold	0.13
graphite	0.83

Use the cooling curve to answer items 15 - 19

15. Identify the state of matter present at each of the following:
    @ **A:**
    @ **B:** *(2 of 'em)*
    @ **C:**
    @ **D:** *(2 of 'em)*
    @ **E**

16. The Temperature is changing (decreasing) at intervals A, B, & C. What does this mean? Be specific & use Vocab.

17. The Temperature is NOT changing (staying constant) at intervals B & D (Phase Changes). So what is happening?

18. What is the condensation point based on the graph?

19. What is the freezing point based on the graph?