TEACHER WORKSOP *PLEASE comment, mark suggest edits ……* *Feedback sought ☺*

Experiment: Physical Properties and Specific Heat Values

Background

●The ability of any material to retain heat energy is called that material's ***specific heat*** (or ***heat capacity***).

●Specific heat is the amount of energy (q, in Joules) needed to raise the temperature of one gram (g) of a substance one degree Celsius (℃), having the units J /g ℃.

●Substances with high specific heat values require more heat energy in order to raise their temperature.

●The amount of heat transferred depends directly on the mass (m), specific heat value (C) of that particular substance, and the change in temperature (ΔT) AND can be calculated as:

$$\boldsymbol{q = m \times C \times \Delta T}$$

Below are other properties of the four elements we will use.

TABLE ONE	**Atomic Number**	**Average Atomic Mass** *(amu)*	**Density** *(g/cm^3)*	**Melting point** *(K)*	**Specific Heat** *(J/g℃)*
aluminum	13	27	2.7	933	?
copper	29	63.5	8.96	1358	?
lead	82	207.2	11.34	600	?
zinc	30	65.4	7.14	693	?

Purpose

In your group, make a predictive explanation as to whether or not the specific heat values of these elements follow the same pattern as one or more of the other properties provided in the Table One.

!! ***Write your prediction in your Lab Book***.

Procedure

Your will measure the masses and changes in temperature of water in a calorimeter after a sample of an element is moved from boiling water to room temperature water.

Using the Law of Conservation of Energy, the amount of energy received by the room temperature water from the sample will equal the amount of energy removed by the sample as it left the boiling water.

******Listen, observe, and take notes during the demonstration in order to write your procedure.***

Data Table

Element	**Mass (g)**	**Metal $T_{initial}$ (K)**	**Metal T_{final} (K=273+°C)**	**Water Mass (g)**	**Water $T_{initial}$ (K=273+°C)**	**Water T_{final} (K=273+°C)**
Al		**195**		**200**		
Al		**195**		**200**		
Al		**195**		**200**		
Cu		**195**		**200**		
Cu		**195**		**200**		
Cu		**195**		**200**		
Pb		**195**		**200**		
Pb		**195**		**200**		
Pb		**195**		**200**		

PLEASE suggest: Analysis, Evaluative items, extensions, … …