Unit 2 Matter and Energy **Name _____ Block ____**
Specific Heat Practice Problems

1) Calculate the amount of energy required to raise the temperature of 73.2 grams of water from 23.1˚C to 98.6˚C. (Specific Heat of Water = 4.184 J/ g·C)

2) The specific heat capacity of iron is 0.3845 J/ g·C. If 245 Joules of energy is required to raise the temperature of a sample of iron from 25.0˚C to 50.0˚C, what is the mass of the sample?

3) A 30.0 gram sample requires 930 Joules of energy to increase the temperature by 25˚C. What is the specific heat capacity of the sample? Identify the sample using the table to the right.

Element	Specific Heat (J/g·°C)
Beryllium	1.824
Sodium	1.224
Magnesium	1.024
Aluminum	0.9025
Calcium	0.6315

4) A 10.0 g brass sample is heated to 82.3°C and dropped into a calorimeter containing 25.0 g of liquid water at 22.0°C. The accepted specific heat of brass is known to be 0.377 J/g·°C**.** Calculate the final temperature of the mixture?

Unit 2 Matter and Energy **Name _____ Block ____**
Density Practice Problems

1. The density of a piece of metal is determined by the water displacement method. The metal had a mass of 23.47 g. A graduated cylinder was filled with 27.3 mL of water and after the metal was added the volume was 33.7 mL. What is the density?

2. The largest commonly available gold bar for individual investors is the 1 kilo bar. While still far shy of the 400 Troy oz "good delivery bar" that is traded on the Commodities Exchange, the kilo bar is quite hefty and feels amazing in your hand. Though it's essentially the same size as an iPhone 6, it weighs substantially more since gold is so dense. The dimensions of this bar are 1.58 inches x 3.15 inches x 0.71 inches. Calculate the density of this gold bar in g/cm^3 based this information. Pure gold has an accepted density of 19.32 g/cm^3. What is the percent error of the density based on the accepted value?

3. Arsenic has recently been found in baby foods. The maximum amount of arsenic found in a 250 g jar of baby food is 22 ng [Pure Appl. Chem. 2012]. The minimal lethal dose of arsenic is in the range of 1 to 3 mg/kg [ATSDR 2007].

    a. Show calculations to determine how dangerous it is for a 25 lb baby to eat this food.
    b. Should parents panic and throw away all their baby food?
    c. How many jars of baby food must the baby consume to ingest a lethal dose?