Physical Science: Thermal Energy
Specific Heat
Specific Heat is the amount of heat required to raise the temperature of one gram (or sometimes one kilogram) of a substance by one degree Celsius.

On a beach in the summer, the sand and the ocean both absorb the same amount of sunlight. The sand heats up much faster. The ocean would have to absorb 6 times more energy to heat the same mass of water to the same temperature, so the ocean's specific heat is 6 times larger than the sand.

How does specific heat (C) relate to Thermal Energy?
Thermal Energy changes when the temperature changes

Change in TE = (mass) x (change in temperature in ℃) x (specific heat)

$Q = mC\Delta T$

Note: While thermal energy is always measured in Joules, ΔT is either measured in Kelvin or degrees Celsius. The units for mass can be either grams or kilograms, but they must match the unit for specific heat: J/g℃ or J/kg℃.

Substance	Specific Heat (J/kg℃)
Carbon (graphite)	710
Copper	385
Glass	664
Gold	449
Iron	450
Lead	129
Tin	228
Water	4184
Zinc	388

Use the table to the left and the equation above to calculate the following. Circle the answers!

1. How much heat energy is required to raise the temperature of 3 kg of Copper from 0℃ to 10℃?

2. A piece of zinc with a mass of 0.027 kg is heated from 22℃ to 100℃. What amount of heat was added?

3. A 6-kg piece of which material requires 2,700 J to raise its temperature by 1℃?

4. 12,973 J of heat are applied to 3 kg of water. What is the temperature difference?