

Name \_\_\_\_\_

## Energy and Temperature

Convert the following energies: (remember 1 cal = 4.184J)

9)  $534\text{J} = ? \text{ cal}$       128cal

13)  $18,200 \text{ cal} = ? \text{ Cal}$       18.2Cal

10)  $4.5 \times 10^3 \text{J} = ? \text{ Cal}$       1.08Cal

14)  $52.5 \text{ kcal} = ? \text{ kJ}$       220.kJ

11)  $900. \text{ kJ} = ? \text{ Cal}$       215Cal

15)  $782 \text{ Cal} = ? \text{ J}$        $3.27 \times 10^6 \text{J}$

12)  $2.3 \times 10^{-4} \text{ kcal} = ? \text{ J}$       0.96J

16)  $9.69 \times 10^5 \text{J} = ? \text{ kcal}$       232kcal

Solve the following problems (remember it takes 1 cal of energy to heat each gram of  $\text{H}_2\text{O}$   $1^\circ\text{C}$ ):

17) How many Joules of heat were absorbed by 50.g of water if its temperature increased  $30.^\circ\text{C}$ ?

$6.3 \times 10^3 \text{J}$

18) The temperature of a 1kg sample of water increased from  $10^\circ\text{C}$  to 313K. How many calories of energy were absorbed by the water?

$3 \times 10^4 \text{cal}$

19) How many Joules of energy are contained in a candy bar that is listed to contain 250.Cal?

$1.05 \times 10^6 \text{J}$

20) How much would the temperature of 50. grams of water change if all the energy was transferred to thermal energy as it was stirred by the dropping of a 50.0kg weight that fell a distance of 2.00m. The unit Joule is equal to a  $\text{kg m}^2/\text{s}^2$ , and the acceleration due to gravity is  $9.80\text{m}/\text{s}^2$ .

$4.7^\circ\text{C}$

21) A teenager should have about a 2200. Cal a day diet. The average person contains about 56.0 kg of water in their body. If all of that energy was used to rapidly heat the 56.0 kg of water, then how much would the temperature of the water change?

$39.3^\circ\text{C}$