

W-PS Physical Science Week 25

Almonds

1.5 grams (for 2)

Temp (initial)

21°C

Temp (final)

60.5°C

1/2 cup of water 237g of H<sub>2</sub>O

Calorie — amount of energy required to raise 1 gram of water by 1°C.

$$q = m c \Delta T$$

change in temperature

heat released

mass of H<sub>2</sub>O

specific heat of H<sub>2</sub>O

for water  $c = 1 \text{ }^\circ\text{C/g}$

$$q = (237\text{g})(1 \text{ cal/g}^\circ\text{C})(60.5 - 21)^\circ\text{C}$$

9361.5 calories

dietary calorie → 1000 cal → 1 Cal

1 almond → 9.3 Calories

Pecan

237g of water

20.4 °C → 71.1°C

mass 2 pecans  
2 grams

$$q = (\text{mass})(\text{change temp})$$

$$(237\text{g})(71.1 - 20.4)$$

$$= \frac{12015.9}{1000} = 12 \text{ Cal}$$

$$\left\{ \begin{array}{l} 2^{\text{nd}} \\ \text{pecan} \end{array} \right\} \rightarrow (237 \text{ g})(75 - 20.4)^{\circ}\text{C} \left\{ \right.$$

$$12940.2 \text{ cal} = \boxed{12.9 \text{ Cal}}$$

1 gram of "fat"  $\rightarrow$  9 Cal

1 gram of carbohydrates  $\rightarrow$  4 Cal

1 gram of protein  $\rightarrow$  4 Cal

Cashew

1<sup>st</sup>  
cashew

237g (20.3  $\rightarrow$  66.3)<sup>o</sup>C  
of  
water

2 cashews  $\rightarrow$  2 grams

$$(237 \text{ g})(66.3 - 20.3)$$

$$= 10902 \text{ cal}$$

$$= \boxed{10.9 \text{ Cal}}$$

HW  
online HW 25 3  
quiz 25 3  
April 14<sup>th</sup>