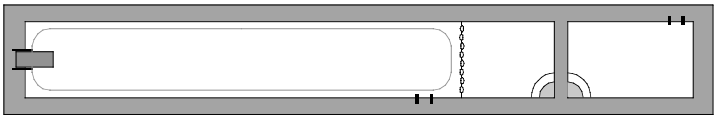
PhyzSpringboard: Heat Capacity



OBSERVATIONS AND CONCLUSIONS

1. Consider two samples of water at room temperature. Both samples have the same mass.

   a. If more heat were added to one than to the other, the temperature would rise more in

   ___the sample to which more heat was added.

   ___the sample to which less heat was added.

   b. From this observation, we would conclude that the change in temperature of an object being heated is

   ___directly proportional to the amount of heat added to the object.

   ___inversely proportional to the amount of heat added to the object.

   c .Write this proportionality using symbols.

2. Consider two samples of water at room temperature. One sample is larger than the other.

   a. If the same amount of heat were added to both samples, the temperature would rise more in

   ___the larger sample

   ___the smaller sample.

   b. From this observation, we would conclude that the change in temperature of an object being heated is

   ___directly proportional to the mass of the object

   ___inversely proportional to the mass of the object.

   c .Write this proportionality using symbols.

3. Consider two samples at room temperature. One sample is ethylene glycol (antifreeze), the other is mercury. Both samples are 300 grams. Both are given the same amount of heat. The mercury's temperature is observed to rise more than that of the antifreeze.

a. This is due to a difference in _____.

b. Think of this quantity as _____.

c. Which substance has a higher _____?

___antifreeze

___mercury

d. The change in temperature of an object being heated is
___directly proportional to the specific heat of the substance the object is made of.
___inversely proportional to the specific heat of the substance the object is made of.

e. Write a proportionality that incorporates this new quantity.

PUTTING IT ALL TOGETHER

1. Write an equation for the change in temperature of an object when it is heated.

2. What are the units of specific heat?

QUESTIONS

1. Consider two samples of water at room temperature. Both samples have the same mass. But one undergoes a greater change in temperature than the other. Explain using words and diagrams.

2. Consider two samples of water at room temperature. The same amount of heat was added to the two samples. But one sample underwent a greater change in temperature than the other. Explain using words and diagrams.

3. Consider two samples of water at room temperature. More heat was added to one sample than to the other. But both samples underwent the same change in temperature. Explain using words and diagrams.

4. Consider a sample of antifreeze and a sample of mercury. Both samples have the same mass. But when heated, both experience the same increase in temperature. How can this be? Explain using words and pictures.