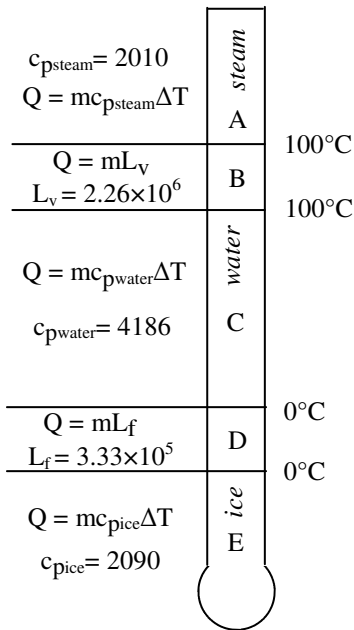


2009 Heat 4

I am not going to spend a lot of time repeating the other homework. You can go over that information on your own. Instead, I am going to try to explain "Total Heat" better. There are notes on the website for "Total Heat", too.



1. Water at 35°C is raised to 105°C.
 - A. What phase does it start at?
 - B. What phase does it end at?
 - C. How many equations would be necessary to calculate total heat?

2. 12 kg of water is at 80°C. How much heat is released when it lowers to -15°C?
 - A. Step 1: On the chart put the initial and final temperatures in the correct phases.
 - B. Step 2: Between the temperatures that you just filled in, fill in the other temperatures between them. Cross out any line that is not needed.
 - C. Step 3: Fill in the other information on the chart.
 - D. Step 4: Calculate Q for each line. E. Step 5: Add them together for total Q.

	mL or $mc_p\Delta T$ (which equat?)	M	Cp or L (give the #)	Tf	Ti	Calculate Q
Q_{steam}						
Q_{vapor}						
Q_{water}						
Q_{fusion}						
Q_{ice}						
$Q_{\text{total}} =$						

3. A 12 kg piece of copper at 200°C is dropped into a bucket of 6 kg of water at 30°C.
 - A. Will the final temperature be above or below 200°C?
 - B. Will the final temperature be above or below 30°C?
 - C. Use the "The Thermal Equilibrium" note to calculate the temperature of the two? (*You will be able to use these notes for this question on the test OR you can learn to do this without the notes and get extra credit.*)

4.
 - A. When water freezes, does it expand or contract?
 - B. Is this normal or exceptional (do a lot of other substance do this or is water special)?
 - C. Is ice more dense or less dense than liquid water?
 - D. Does ice float or sink?
 - E. Which is a better conductor, water or ice?
 - F. Which is a better insulator, water or ice?
 - G. Does a pond or lake freeze from the top down or from the bottom up?
 - H. OK— put ALL of the above together and explain to me why the properties of water allow fish to survive in the winter.

5.
 - A. Which is harder to cool down: water or air?
 - B. Why is it that places that are close to oceans don't have a large temperature change throughout the year (compared with inland)?
6. Which are moving faster:

A. Cold atoms or hot atoms?	C. Molecules before or after condensation?
B. Liquid molecules or solid molecules?	D. Water at 20°C or at 50°C?

7. A) Which is harder to cool down: water or air?
B) Why is it that places that are close to oceans don't have a large temperature change throughout the year (compared with inland)?
8. Why is it that after a hot day the water in a pool does not heat up much, but the concrete along side the pool does?
9. TAKS—know about Solutions and Acids and Bases.
- A. Salt is dissolved in water.
 - i. Is this a physical or chemical change?
 - ii. Which is the solvent: salt or water?
 - B. A powder is stirred into water and it dissolves.
 - i. If it makes OH^- ions, is it an acid or a base?
 - ii. If it makes H^+ ions, is it an acid or a base?
 - C. To lower the pH of a solution what do you add?
10. Which piece of safety equipment should you use to handle a hot beaker?
- A. plastic or rubber gloves
 - B. beaker tongs
 - C. safety goggles
 - D. A lab apron
11. A student wants to test the hypothesis that plants need soil to grow. What is the independent variable of the experiment. (Independent: the one that you change.)
- A. Air temperature
 - B. amount of water
 - C. amount of light
 - D. presence of soil
12. The density of an object is calculated by dividing the mass of the object by its volume. Which tools can be used to find the density of a bar of silver?
- A. beaker and pipette
 - B. pan balance and triple-beam balance
 - C. beaker and metric ruler
 - D. triple-beam balance and metric ruler
13. Sam examines the cell of a protest with a compound microscope. Which visual display can Sam best use to record what he observes?
- A. data table
 - B. labeled sketch
 - C. line graph
 - D. circle graph
14. An explanation of the data that tells what relationship exists between the variables in the investigation is a/an—
- A. hypothesis
 - B. scientific law
 - C. bias
 - D. conclusion