A-Day: Due Wed., Jan 21
B-Day: Due Thurs., Jan 22

2009 Heat 2

1. Conduction (1), Convection (2), or Radiation (3)?
   A. ____Your hand gets warm while underneath (but not touching) a hot pot of water.
   B. ____Your hand cools down when pushed against the metal on your desk.
   C. ____Why smoke rises above a campfire.
   D. ____Molecules bumping against each other.
2. Does heat rise?

S	T	U
0 K	20 K	10 K

V	W	X
40° C conductor	0° C conductor	40° C insulator

3. A. Use arrows to show which way heat will move between three objects above.
   B. Which object/s lose heat?
   D. Which object/s gain heat?
   E. For which object/s will Q be negative?
   F. For which object/s will Q be positive?
   G. Which object has no internal energy?

4. A. Use arrows to show the direction of heat flow.
   B. Use two arrows to show if heat flows quickly and only 1 arrow if heat flows slowly.
   C. Which object has no internal energy?
   D. Will the final temperature be above 40° C?
   E. Why?

5. You put ice into a cup of hot chocolate. The ice gives its cold to the liquid. Yes or no and why?

6. A. Convert 15ºC to Kelvin. B. Convert 80ºF to Celsius.

7. How much heat is necessary to raise 8 kg of water from 20ºC to 40ºC? (*Cp is on the chart on the "Heat" notes.)*

8. Using the same mass and temperatures as in Q7, how much heat is necessary for copper?

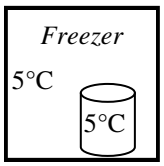
9. Use Q7-8 to answer the following:
   A. Does it take more heat to raise the temperature of copper or water?
   B. So, if the c_p of iron = 448 and c_p of aluminum = 899, which one will require the most Q to change its temperature?

10. A. Which part of the desk feels colder: the metal or the wood?
    B. Which one is actually colder: the metal or the wood?
    C. Why do they feel different?

11. Why did the colder of the two black squares melt the ice faster?
12. Which has more internal energy?
    A. _____2 atoms of super heated helium gas or 25 gallons of freezing water?
    B. _____Object H or Object I at the right?

H: 500 kg iron at 10°C

I: 200 kg iron at 10°C



13. An object at 5°C is inside a freezer which is also at 5°C. Will heat go into or out of the object?

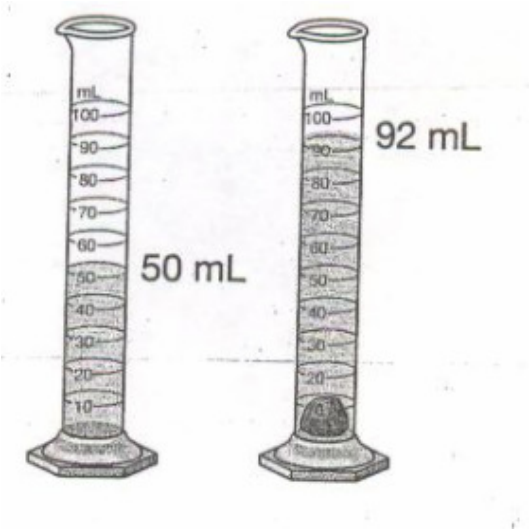
14. Salt is dissolved in water.
    A. Is this a chemical or physical change?
    B. How can you prove it?
    C. Which is the solvent: salt or water?
15. 16 g of salt can dissolve in a cup of water.
    A. 8 g of salt would be saturated, unsaturated, or supersaturated?
    B. 18 g of salt would be saturated, unsaturated, or supersaturated?
    C. 16 g of salt would be saturated, unsaturated, or supersaturated?

The following 5 questions are for TAKS and are for the entire school. Just answer them the best you can.

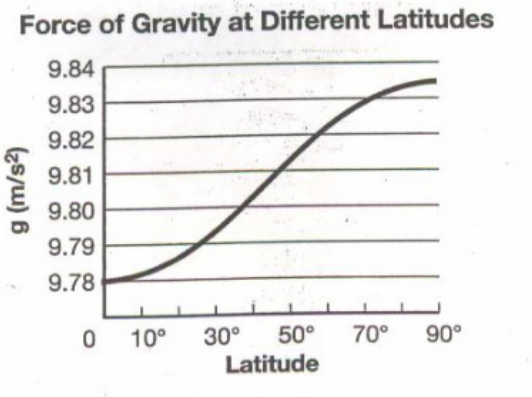
16. You are heating a substance in test tube over a Bunsen burner. While heating the material you should—
    A. smell the fumes given off by the substance.
    B. point the test tube away from yourself and other.
    C. put a stopper in the test tube.
    D. discuss the results with your lab partner.

17. Which of the following is an example of a scientific question?
    A. Does a slice of pizza have more fat than a serving of green beans?
    B. Does pizza taste better than green beans?
    C. Is pepperoni a better pizza topping than mushrooms?
    D. Are store brand green beans tastier than brand-name green beans?

18. The volume of an irregular solid can be determined by finding the amount of water that the solid displaces. Each mL of displaced water has a volume of 1 cm^3. Based on the data provided in the illustration, what is the volume of the rock in cm^3?



19. The graph below shows how the force of gravity changes with latitude. Which mathematical relationship is represented in the graph?
    A. As latitude increases, gravitational force increases.
    B. As latitude increases, gravitational force decreases.
    C. As latitude decreases, gravitational force is unchanged.
    D. There is no obvious mathematical relationship.



20. The table below shows the speed of sound as it travels through air, water, and glass. Which conclusion is supported by the data?
    A. The speed of sound increases as it travels through air, water, and then glass.
    B. The speed of sound decreases as it travels through air, water, and then glass.
    C. The speed of sound is not affected by the substances through which it travels.
    D. The speed of sound decreases as it moves from a liquid to a solid.

Speed of Sound in Different Media

Medium	Speed of Sound (meters/second)
Air (20°C)	343
Water (20°C)	1,482
Glass	5,640