

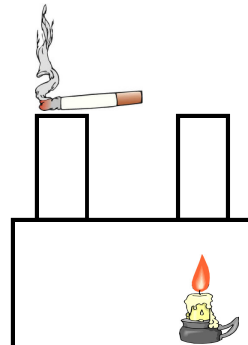
**B-Day: Due Mon., Mar 8**  
**A-Day: Due Tues., Mar 9**

## 2009-10 Heat 5 Test Review

1. How much heat is necessary for 3 kg of water to boil to steam?
2. How much heat is necessary to lower 25kg of water from 75°C to 20°C?
3. A. What is 20°C in Fahrenheit?  
  
B. What is 20°C in Kelvin
4. 8 kg of water at 40°C is lowered to -15°C. How much heat is removed?  
(The information you need is on your notes. Draw the diagram if you need it.)
5. 18 kg of water is at 90°C. A 12kg chunk of copper at -25°C is dropped into the water. What will be the final temperature of the two?

An isolated system means one that is not affected by the outside environment.

6. How does the entropy of an isolated system change in any process?
7. 60 joules of heat is added to a gas while the gas does 110 joules of work as it expands.  
A. What is the change of energy of the gas?  
  
B. Will the final temperature of the gas increase or decrease?
8. Explain what is happening in the diagram at the right and why.



**TAKS next page.**

## Day 15— Density, Viscosity, Buoyancy

### Density

Density is how compact an object is.

If two objects have the same size, the heavier one is denser. Density is a physical property of a substance. (If you divide an object, both sides will have the same density.) The density of water is 1 g/mL.

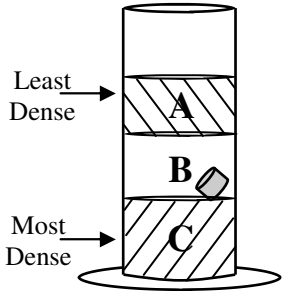
**Density**

$D = \frac{m}{v}$

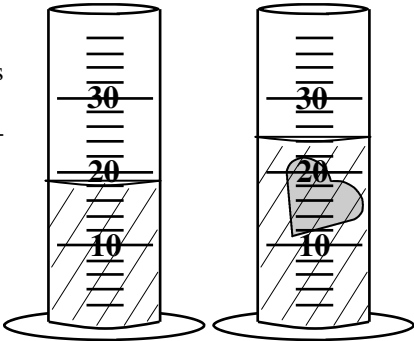
in g/mL or g/cm<sup>3</sup>      ←      Mass in grams (g)      ←      Volume in cm<sup>3</sup> or mL

**Density = Mass ÷ Volume**

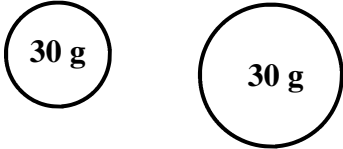
**Floating**—Less dense thing (and liquids) float on more dense liquids. The diagram shows a density column.



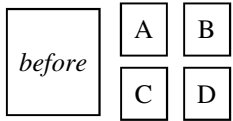
**Displacement Method:** Irregularly shaped objects (not easily measured) can be put in water to measure its volume.



1. Which is denser: a golf ball or a ping pong ball?
2. A. Is a penny heavy or light?      B. Will a penny sink or float in water?  
C. Why?
3. A. What is the volume of the heart-shaped object in the graduated cylinder?  
B. If the object is 8 gram, calculate its density.
4. A. Which of the 30 gram objects below is more dense?  
B. Why?

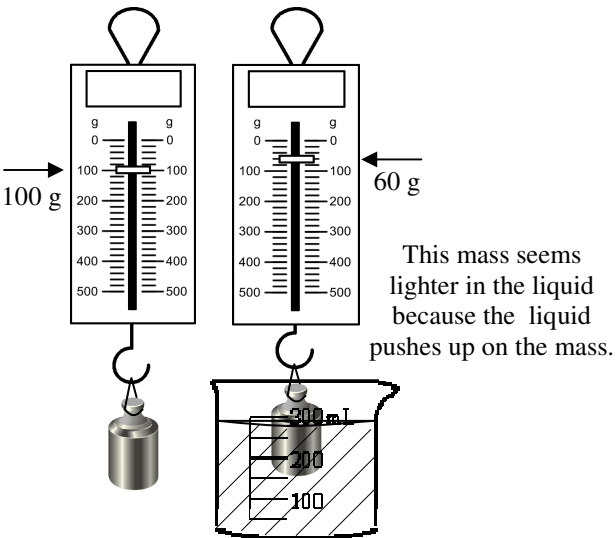


5. A block with a density of 1.60 g/cm<sup>3</sup> is cut into three pieces. What is the density of piece B?

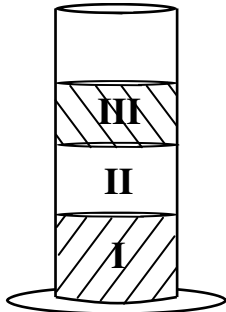


### Buoyancy

Buoyancy is the upward force of a liquid on what floats on it.



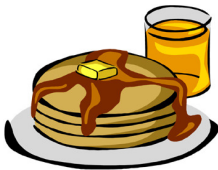
6. Use the density column at the right to answer the following questions. Draw where ice will float in the column.
  - A. Which liquid is the most dense?
  - B. Which liquid is the least dense?
  - C. Which liquid is which? A, B, or C?  
 D = 1.35 g/mL = Liquid \_\_\_  
 D = 0.86 g/mL = Liquid \_\_\_  
 D = 1.00 g/mL = Liquid \_\_\_
  - D. Label the liquid you know.
  - E. Draw where would ice float.



7. What is the buoyant force on the mass in the diagram at the left?
8. Why is it easier lift a person when you are in a pool?

### Viscosity

Viscosity is how slowly a liquid flows. Syrup has high viscosity. Water has low viscosity. Denser liquids tend to have greater viscosity. A liquid's viscosity decreases as it is heated (hot liquids flow easier).



9. Which is more viscous: water or honey?
10. Which would give more buoyant force: syrup or water?
11. How can a liquid be made less viscous?