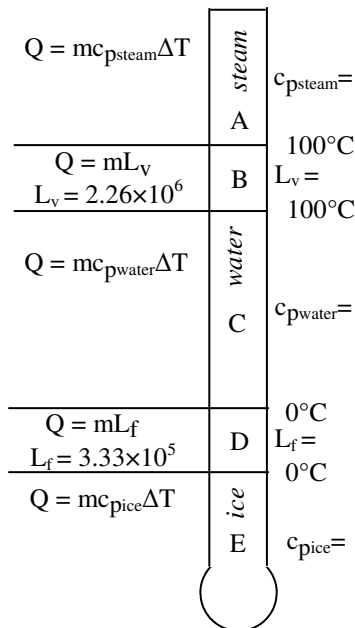


- Which do you use: Heat of fusion (L_f) or Heat of vaporization (L_v)?

A) _____ From a liquid to a gas?	D) _____ During melting?	G) _____ From a solid to a liquid?
B) _____ From a liquid to a solid?	E) _____ Turning to steam?	H) _____ During freezing?
C) _____ From a gas to a liquid?	F) _____ During condensation?	I) _____ During a temp change?
- Water freezes or melts at _____°C and boils or condensates at _____°C.
- (Or does it?) Why was I able to boil water with ice?
- Where will the boiling temperature of ice be lower: on Mt. Everest or at the ocean?
- Which equation do you use for the following situations: $Q = mL$ or $Q = mc_p\Delta T$?

A. _____ When something changes temperature.
B. _____ When something changes phase.
C. _____ When water cools from 50°C to 35°C.
D. _____ When water boils.
- 14 kg of water is condensed from steam to liquid AT THE BOILING POINT of water.

A. What is the water's initial temperature?	B. What is the water's final temperature?
C. Does the water gain or lose energy?	C. Calculate the heat for it to change phase.



- On the diagram at the left write the c_p 's and L 's for each part of the diagram. You will find these numbers on your "Heat" and "Latent Heat" notes.
- 6 kg of water at -20°C is put on a stove until its temperature raises to 35°C .

A. At -20°C what phase is the water: solid, liquid, or gas?
B. At 35°C , what phase is the water: solid, liquid, or gas?
C. Put these numbers on the diagram and label them "Ti" and "Tf".
D. Calculate the individual heats (Q) for each part of the diagram. (If you don't use that part of the diagram, don't do a calculation.)
E. How much TOTAL HEAT was necessary to raise the water from -20°C to 35°C ?
- 18 kg of gold at 80°C is dropped into 20 kg of water originally at 10°C . At what temperature will they come to thermal equilibrium?

A. What two things are the same for both objects?
B. Use the thermal equilibrium notes EXACTLY to solve for the final temperature:

- Endothermic (N) or Exothermic (X)?

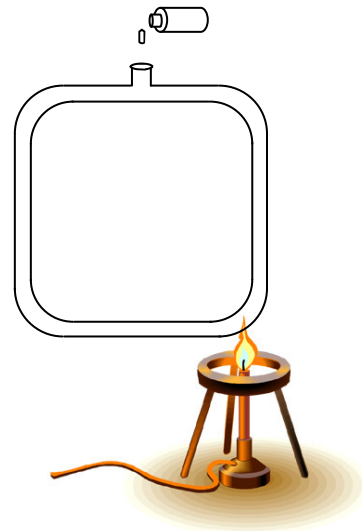
A) ___ Heat is added to a reaction
B) ___ A reaction gets cold.
C) ___ A reaction gets hot.
D) ___ Boiling water.

- Conduction (1), Convection (2), or Radiation (3)?

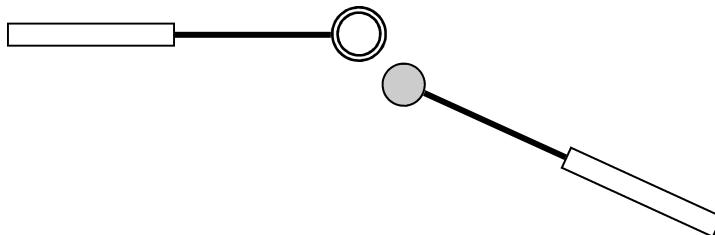
A) ___ How you could get heat thru a closed window.
B) ___ Cannot occur in a solid.
C) ___ Will be faster when something is wet.

- 12. (See HW: Heat 1) What is sublimation?
- 13. Think about water on your skin.
 - A) Does water have to be at 100°C to turn to a gas?
 - B) Evaporation is a _____ process. So the area around evaporating water (or any other liquid) will _____ down.
- 14. The diagram at the right is from our demo in class.
 - A. Show what will happen to the drop of food coloring.
 - B. The spreading out of the food coloring is called d_____.
 - C. What kind of heat transfer is this?
 - D. Why does the water circulate?

 - F. What would happen if the Bunsen burner was moved to the left side of the tube?



- 15. From another demo.
 - A. Did the ball fit thru the ring?
 - B. Finish the rest of the story.



TAKS—next page

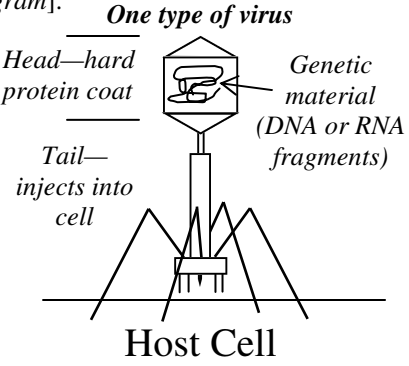
Day 13—Viruses and Bacteria

A Little About Bacteria (which are very little, themselves)...

- ...living, single-celled organisms.
- ...have cell membrane, actual DNA and ribosomes, but no organelles. (prokaryotes [no nucleus]).
- ...cause diseases such as **streptococcus** (strep throat; pneumonia) and **diphtheria** (rare in US).
- ...killed by **antibiotics**, but they adapt quickly, so overuse of antibiotics is bad.
- ...Spread by contact between people. Stopped by washing hands; hand sanitizer; coughing into your elbow; staying home when sick.
- ...are necessary for good health, especially in digestion (we can't digest plant matter [cellulose] without them).
- ...being "too clean" (or overusing antibiotics) can kill good bacteria (but they can be repopulated, like with yogurt).

Viruses

- ...surrounded by hard protein coat with DNA or RNA fragments (no genes) [see diagram].
- ...can't make their own energy or proteins and need a host cell to reproduce, **so VIRUSES ARE NOT ALIVE!**
- ...**CANNOT BE KILLED WITH ANTIBIOTICS** (which attacks cell membranes).
- ...cause **AIDS**: attacks helper T-cells [white blood cells]
- ...cause **smallpox**: like chickenpox, but more dangerous; eradicated throughout the world; US hasn't vaccinated for it since 1972.
- ...cause warts, common **cold**, influenza (**flu**) - again, antibiotics will not help. (Taking antibiotics for a cold will only help bacteria become resistant.)
- ...stopped by prevention (hand washing), antiviral medication, or **vaccines** (injection of weakened virus so immune system learns to fight it).



1. Virus or bacteria?

A. _____ Has genetic material.	I. _____ Are in yogurt.
B. _____ Are alive.	J. _____ Can replicate if given nutrients.
C. _____ Help us with digestion.	K. _____ Takes over a cell.
D. _____ Needs a host cell to reproduce.	L. _____ Has complete DNA.
E. _____ Have hard protein coating.	M. _____ Has a nucleus.
F. _____ Have a cell membrane.	N. _____ Can make its own proteins.
G. _____ Can cause diseases.	O. _____ Killed by antibiotics.
H. _____ Can be beneficial.	P. _____ Causes colds and flu.

2. Give three ways to help prevent the spread of viruses or bacteria.

3. Give two ways that viruses "seem" to be alive.

4. Give proof that virus are not alive.

5. You feel ill, go to the doctor, and ask for antibiotics. What should the doctor do?

6. Why can the overuse of antibiotics be harmful to us?

7. Bacteria cause disease. As a result a friend of yours says that all bacteria should be eliminated. Respond.

8. Give three diseases that cannot be cured by antibiotics.