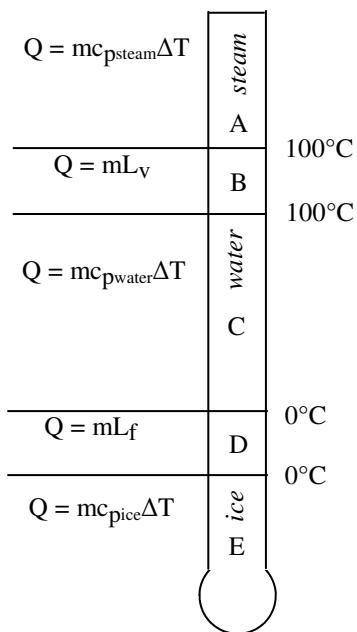


Remember: you will not be given this diagram on the test.



1. Water at 35°C is raised to 105°C.
 - A. What phase does it start as?
 - B. What phase does it end as?
 - C. Will the heat be positive or negative?
 - D. Calculate the total heat necessary to change the temperature of the water.

2. 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.*)

3. 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.

4. 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)?
5. 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?

6. 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)?

7. 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?

From the “Laws of Thermodynamics” notes:

8. Give two ways to increase the temperature of a gas.

9. 75 joules of work is done to compress a gas, while 20 joules of heat is removed as heat.
 - A. Since the gas is compressed, is the W done on the gas + or -?
 - B. Since heat is removed, is Q + or -?
 - C. Use the First Law of Thermodynamics to find the change of internal energy of the gas.
10. 35 joules of work is done by a gas as it expands, yet the gas doesn't change temperature.
 - A. Since the gas is expanded, is W + or -?
 - B. Since the gas doesn't change temperature, what is the ΔU (change of internal energy) for the gas?
 - C. How much heat (Q) was added?
11. What is entropy?
12. Which has more entropy?
 - A. A liquid or a gas?
 - B. An object with kinetic energy or after the kinetic energy turns to heat?
 - C. Billiard (pool) balls when they are racked or after they are broken apart (scattered around the table)?
13. An egg is bumped off of a table and breaks when it hits the ground.
 - A. What kind of energy does it gain as it drops?
 - B. Does the egg have more entropy before or after it falls?
 - C. If the egg were to move up and put back together, would that contradict the Law of Conservation of Energy (and the 1st Law of Thermodynamics)?
 - D. What Law would be violated by the egg moving back up to the table?

TAKS NEXT PAGE

Name: _____

Period: _____

Day 14—Classification of Matter

Physical vs. Chemical Change

Examples of physical changes:
change of temperature (due to external heat), ripping; cutting.

Afterward, is it still the same substance?

Yes —
Physical Change

No —
Chemical Change

Evidence of chemical change:
Bubbles; Turns cloudy; Temperature change when mixed; color change; change of smell.

If it can be separated thru physical means we call it a:

Mixtures

Heterogeneous Mixtures

Homogenous Mixtures

Different throughout.
Two samples might be different. Ex: Chicken soup; Chex mix; Rocky Road ice cream.

Same throughout. Any two samples are the same.
Ex: Milk; Salt water; Vanilla ice cream

Chemicals

If it cannot be separated physically we call it a:

Elements

Only one type of atom. Cannot be broken down further.
Gold (Au); Oxygen (O_2); Anything on the Periodic Table is an Element.

Compounds

When two or more elements are chemically combined. Can be chemically separated into elements.
Salt ($NaCl$); Carbon Dioxide (CO_2); Water (H_2O)

1. Chemical or physical change?

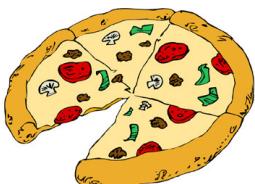
- A. Burning paper.
- B. Melting ice.
- C. Baking soda mixed into vinegar produces bubbles.
- D. Cutting up a piece of paper.
- E. Heating up metal with a flame.
- F. You mix two liquids together and they get colder.
- G. Dissolving sugar into water.
- H. You mix two liquids together and they change color.
- I. Chewing food.
- J. When acids in your stomach break down your food into nutrients your body can absorb.
- K. When enzymes in your saliva pre-digest and soften your food in your mouth before you swallow.
- L. The complete act of digestion (all of the above).

2. Salt is put into water. The water is stirred until the salt disappears.

- A. Is this a physical or chemical change?
- B. Could you filter the salt out?
- C. How can you get the salt out of salt water?

3. Element (E), Compound (C), Heterogeneous Mixture (He), or Homogeneous Mixture (Ho)?

- A. Water
- B. A bunch of gold atoms
- C. Sugar water
- D. Lithium and Oxygen combined chemically.
- E. Can be separated physically.
- F. A chocolate chip cookie.
- G. Has only one kind of atom.
- H. Can be separated by sorting.
- I. Needs a chemical to break it up.
- J. Found on the periodic table.
- K. A can of mixed nuts.
- L. An alloy of two metals (can be melted apart).



- 4. A. What kind of matter is a pizza?
- B. Why?