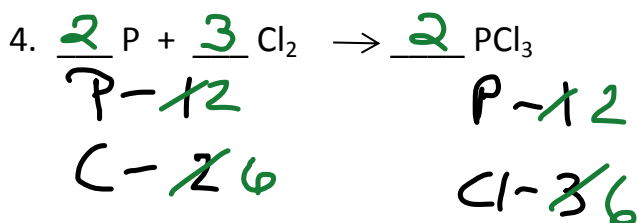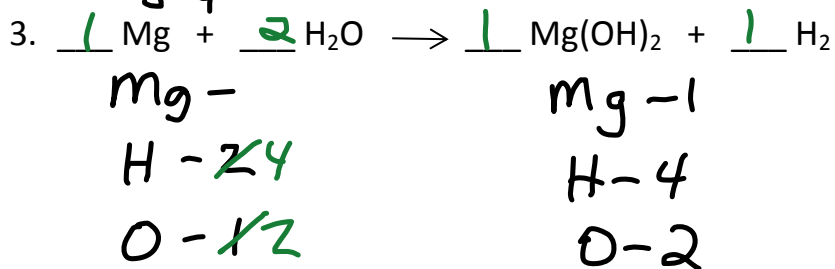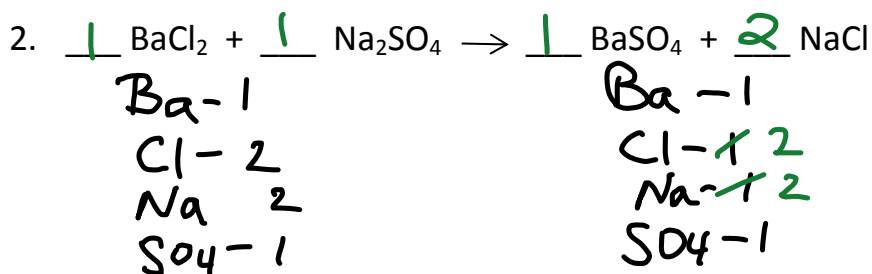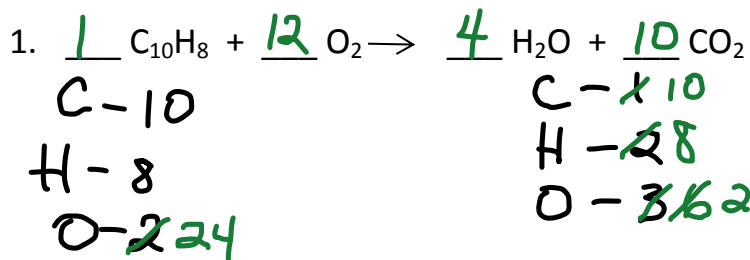# Chemistry End of Unit Test Review HSPS

Name:_____

SPS2e. Apply the Law of Conservation of Matter by balancing the following types of chemical equation – synthesis, decomposition, single replacement, double replacement.

1. __1__ $C_{10}H_8$ + __12__ $O_2 \rightarrow$ __4__ H_2O + __10__ CO_2

   C - 10   C - $\cancel{X}$ 10
   H - 8   H - $\cancel{2}$ 8
   O - $\cancel{2}$ 24   O - $\cancel{36}$ 24

2. __1__ $BaCl_2$ + __1__ $Na_2SO_4 \rightarrow$ __1__ $BaSO_4$ + __2__ $NaCl$

   Ba - 1   Ba - 1
   Cl - 2   Cl - $\cancel{X}$ 2
   Na   2   Na - $\cancel{1}$ 2
   SO_4 - 1 SO_4 - 1

3. __1__ Mg + __2__ $H_2O \rightarrow$ __1__ $Mg(OH)_2$ + __1__ H_2

   Mg -   Mg - 1
   H - $\cancel{2}$ 4   H - 4
   O - $\cancel{1}$ 2   O - 2

4. __2__ P + __3__ $Cl_2 \rightarrow$ __2__ PCl_3

   P - $\cancel{1}$ 2   P ~ $\cancel{X}$ 2
   C - $\cancel{X}$ 6   Cl - $\cancel{3}$ 6

5. __2__ HgO $\rightarrow$ __2__ Hg + __1__ O_2

   Hg - $\cancel{1}$ 2   Hg - $\cancel{1}$ 2
   O - $\cancel{X}$ 2   O - 2
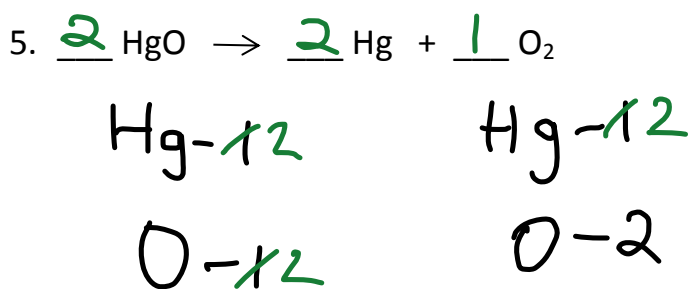
SPS3a. Students will differentiate among alpha and beta particles and gamma radiation.

6. This type of radiation is generated when an atom gives off a neutron.
   a. Alpha
   b. Beta
   c. Gamma
   d. Delta
7. This type of radiation needs to be blocked by at least two inches of concrete or steal.
   a. Alpha
   b. Beta
   c. Gamma
   d. Omega
8. Which type of radiation might TSA use at airports to see through clothes but not through skin as they check for weapons and contraband?
   a. Alpha
   b. Beta
   c. Gamma
   d. Psi

SPS3b. Students will differentiate between fission and fusion.

9. All stars, including our Sun, use this kind of nuclear energy:
   a. Fission
   b. Fusion
   c. Factual
   d. Fructis
10. This kind of nuclear energy is obtained when one large atom breaks down into 2 or more smaller atoms.
    a. Fission
    b. Fusion
    c. Funion
    d. Fussy Onion

SPS3c. Students will explain the process half-life as related to radioactive decay.

11. If the half-life of palladium-103 is 17 days, how long will it take a 32 g sample to decay to 4 g?

mass1 – 32g

mass2 – 4g

Total Time – ?

Half-life – 17 days

$$\frac{32}{2} = \frac{16}{2} = \frac{8}{2} = 4$$

1   2   3

3(17) = 81 days

12. A 208g sample of Sodium-24 decays to 13.0g in 60 hours. What is the half-life of Sodium-24?

mass 1 – 208g

mass 2 – 13g

Total time – 60hrs

Half-life – ?

$$\frac{208}{2} = \frac{104}{2} = \frac{52}{2} = \frac{26}{2} = 13$$

1   2   3   4

$4\overline{)60} = 15$ hrs

13. Potassium-42 has a half-life of 12.4 hours. How much of an 848 g sample of potassium-42 will be left after 62.0 hours?

mass1 – 848g

mass2 – ?

Total Time – 62hrs

Half-life – 12.4 hrs

$12.4\overline{)62} = 5$

$$\frac{848}{2} = \frac{424}{2} = \frac{212}{2} = \frac{106}{2} =$$

1   2   3   4

$$\frac{53}{2} = 26.5g$$

5

SPS6. Students will investigate the properties of solutions.

    a. Describe solutions in terms of

- **solute/solvent**
- **conductivity**
- **concentration**

    b. Observe factors affecting the rate a solute dissolves in a specific solvent.

    c. Demonstrate that solubility is related to temperature by constructing a solubility curve.

14. In a solution of sugar water, what acts as the solvent?
    a. Water
    b. Sugar
    c. Glass
    d. Air

15. In a carbonated beverage such as Coca-Cola, which acts as the solute?
    a. Water
    b. Carbon Dioxide
    c. Aluminum
    d. Plastic

16. Which will hold the most solute?
    a. 100 mL of water at 5°C
    b. 100 mL of water at 10°C
    c. 100 mL of water at 15°
    d. 100 mL of water at 20°C
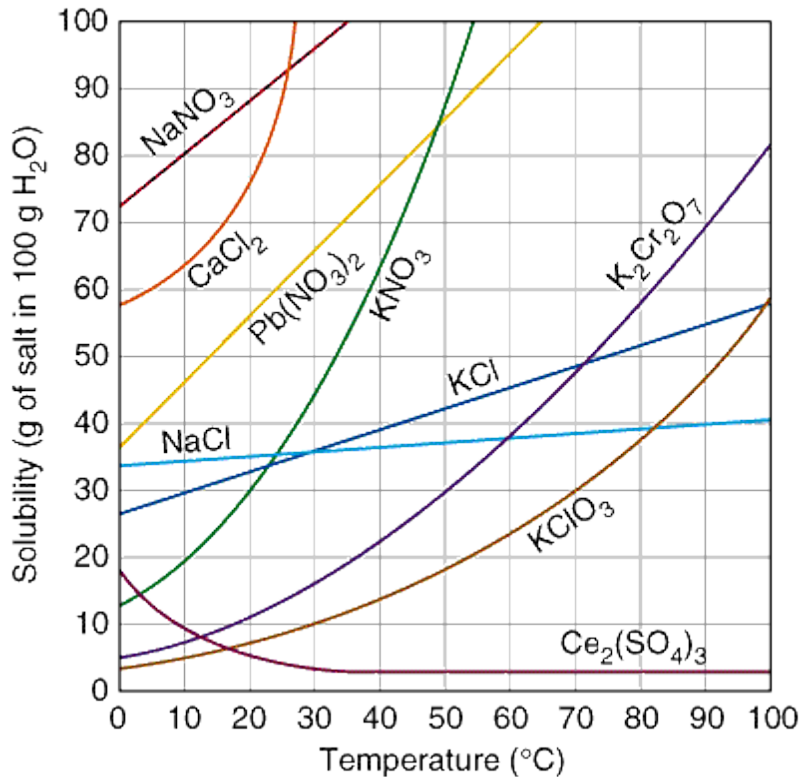
17. Which will dissolve the fastest?
    a. Rock candy
    b. A sugar cube
    c. Small sugar crystals like in a bag you buy.
    d. Powdered sugar

18. What is known as the "Universal Solvent"?
   a. Ethyl Alcohol
   b. Acetone
   c. Hydrochloric Acid
   d. Dihydrogen monoxide

Use the following diagram to answer Questions #19 & #20

19. At approximately what temperature does the solubility of sodium chloride, NaCl, match the solubility of potassium dichromate, $K_2Cr_2O_7$?
   a. 30°C
   b. 50°C
   c. 60°C
   d. 83°C

20. Which of the following is least soluble at 50°C?
   a. KNO_3
   b. $K_2Cr_2O_7$
   c. $Pb(NO_3)_2$
   d. $Ce_2(SO_4)_3$

S8P2b. Explain the relationship between potential and kinetic energy.

21. Which of the following has the *least* potential energy?
    a. A car driving on the highway
    b. A man on the top of a ladder.
    c. An orange sitting on top of a table.
    d. A ball in the pitcher's hand waiting to be thrown.

22. Which of the following has the least kinetic energy?
    a. Ice Cream. *Solid*
    b. Sweet Tea. *liquid*
    c. Helium in a balloon. *gas*
    d. Raindrops falling on my head. *liquid*

23. Where does a roller coaster have the most potential energy?
    a. At the top of a loop.
    b. A third of the way around a loop.
    c. At the exit of a loop.
    d. At the entrance of a loop.

24. Which has the least potential energy?
    a. A 150 pound man standing still.
    b. A 150 pound man walking at 2 miles per hour.
    c. A 150 pound man jogging at 10 miles per hour.
    d. A 150 pound man running at 18 miles per hour.

25. Wiley Coyote was chasing The Roadrunner and ran off a cliff. Where does he have equal amounts of potential and kinetic energy?
    a. When he holds up the sign saying "Yikes!" before he falls.
    b. Right after he starts to fall.
    c. Halfway to the ground as he falls.
    d. Just before he hits the ground at the bottom.

S8P2c. Compare and contrast the different forms of energy and their characteristics.

26. Which of the following describes the energy of moving parts?
    a. Chemical energy.
    b. Mechanical energy.
    c. Nuclear energy.
    d. Electromagnetic Energy.

27. Which of the following best represents chemical energy?
    a. Fireworks!
    b. The nuclear power plant where Homer Simpson works.
    c. A compact fluorescent light bulb.
    d. Asimo, the Honda Robot.

28. A source of electromagnetic energy is
    a. A pound of prime Wisconsin Cheddar cheese.
    b. A light emitting diode otherwise called an LED light
    c. A refrigerator magnet advertising dog grooming services.
    d. A group of 200 guys slamming into one another in a mosh pit.

29. Thermal energy is best represented by
    a. A flannel shirt because flannel is awesome.
    b. Two atoms being smashed together to make one bigger atom.
    c. The energy stored in the bonds between two atoms.
    d. The energy of particles in the different states of matter.

30. The energy you get due to an object's attraction to another object is called
    a. Electrical energy   ← *attraction or repulsion*
    b. Magnetic energy
    c. Thermal energy
    d. Gravitational energy   ← *attraction only*

31. The energy stored in the bonds between two atoms is
     a. Nuclear energy
     b. Chemical energy
     c. Thermal energy
     d. Electromagnetic energy

32. Light waves are representative of this form of energy:
     a. Sound energy
     b. Electromagnetic energy
     c. Mechanical energy
     d. Thermal energy

33. This kind of nuclear energy is obtained by combining 2 smaller atoms into one large atom.
     a. Fusion
     b. Fission
     c. Fructis
     d. Fussy onion

34. All stars, including The Sun, use this kind of nuclear energy:
     a. Fusion
     b. Fission
     c. Factual
     d. Fraggle

35. The energy generated when a speaker vibrates the air is this type of energy:
     a. Electromagnetic
     b. Electrical
     c. Thermal
     d. Sound