## Solutions to ST Review #2

1. D
2. C
3. D; although you can argue that chemical changes occur if you cut live grass
4. B
5. A
6. B
7. B
8. C      Technically this is an STE question; but simply add protons and neutrons to get mass number =56
9. B      Mass is also conserved in physical changes
10. B
11. D see comment in #8
12. C ( A describes Dalton's model; B is Thomson;
13. A (# of protons always = atomic number)
14. A (Lithium and all alkali metals have 1 last shell electron)
15. C
16. C
17. B (simply count the number of electrons in the second shell)
18. Formulas should have been given here:

   $H_2O$, $H_2$, $O_2$, $CO_2$, $CH_4$, CO



19.a)
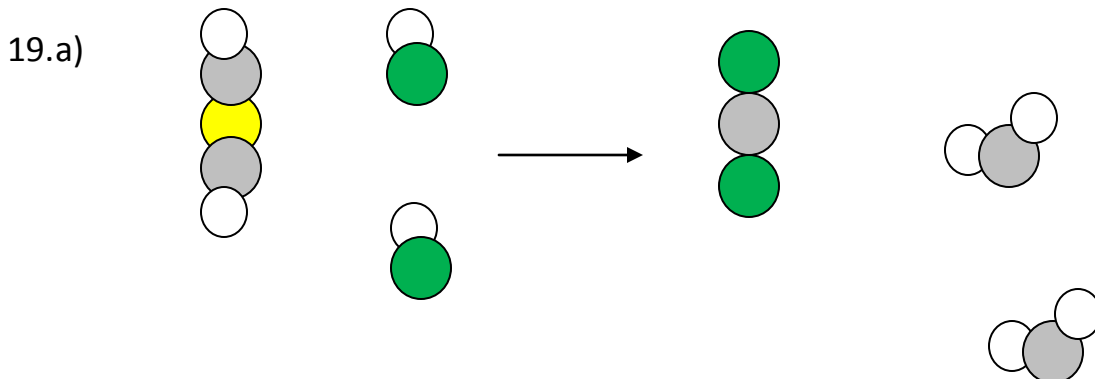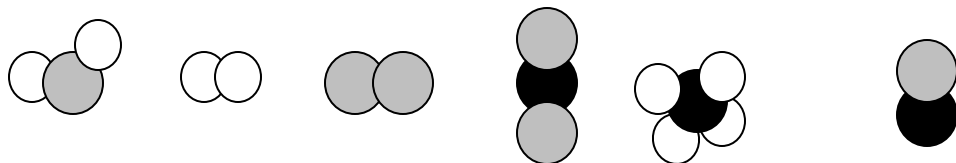
20. The elements in a column have the same number of valence(last shell) electrons. This leads to similar chemical properties among those elements.

21. A) noble gases (last column; don't worry about the number)

b) halogens; can't be metals because (+)metal ions cannot bond to $H^+$.; second-last column

c) alkali metals or alkaline earths; first two columns.

d) halogen


22. A)chemical

b)chemical

c)chemical( a lot of compound have to be created during growth or just in staying alive

d) physical

e) chemical; you are creating two new compounds(salt and water after starting with acid and base)

f) chemical (new skin is grown; there are colour changes)

g) chemical(paint chemicals combine with oxygen; dried paint can no longer be washed off; it's a new compound)

h) physical

i) chemical; reactions produce crust, which has a different colour. The inside of bread is white, which was not the original colour of dough

k) chemical; alcohol is formed from sugar; the question should have read fermentation of sugars. The wine does not actually ferment.

l) physical

22.    a)     H : 2   S:1     O:4

b)     N:1    H:5    O:1

c)     Ca:1   H:1(2) = 2    C:2     O:2(3)=6

d)     C:2    H:3+1=4      O:2

e)     N:2    H:8    C:2    O:4

23.    1.    $4Fe + 3 O_2 \rightarrow 2 Fe_2O_3$          oxidation

       2.    $2 H_2O \rightarrow 2H_2 + O_2$           electrolysis

       3.    $2 KOH + H_2SO_4 \rightarrow K_2SO_4 + 2 H_2O$       neutralization

       4.    $CuSO4 + 2 NaOH \rightarrow Cu(OH)_{2(ppt)} + Na_2SO_4$     precipitation


24.    a)    191+ 756 = 563 + 108 + x

       x = 276 g

       b) 1 : 4


25.    a)    since the original substance is a base(turns litmus blue) we
       need to add an acid to neutralize it.

       b)     salt and water.


26.    Add indicator to the acidic solution. Then slowly add base until the
    indicator's colour  indicates that it's  a neutral solution.

27.    Electrolytes are solutions that conduct electricity because they
    contain ions.

28.    Ions are charged atoms.

29.    Use the formula protons – charge = electrons.

       $Ca^{+2}$ = 18

       $C^{-4}$ = 10

       $O^{-2}$ = 10

       $K^{+}$ = 18


30. A) acid $HBr \rightarrow H^{+} + Br^{-}$

    b) neutral

    c) acid $HCl \rightarrow H^{+} + Cl^{-}$

    d) salt $CaCl_2 \rightarrow Ca^{+2} + 2 Cl^{-}$

    e) base $NaOH \rightarrow Na^{+} + OH^{-}$


31. The solution is an electrolyte. The negative ions return electricity tot the
    circuit; the positive ions attract it. The electrodes are attached to a battery
    with wires.

32.    a) 4000mg/L = 4000 ppm

b) 5000 mg/L = 5000 ppm; 1 kg of water = 1 L

c) 60 mg/0.1 L = 600 ppm

d) 700 mg/0.100L = 7000 ppm


33.    1g/0.100L = 10 g/L

6.0 g/3 L = 2 g/L

4.000 g /L

5g/0.2L = 25g/L

Least concentrated: 2 g/L

most concentrated: 25 g/L


34.    a)    solar

b)    chemical

c)    hydro

d)    electrical


35.    a)    0.15*2000 = 300 kJ

b)    3(300kJ) = 900 kJ

36.    Solar, atomic or chemical, chemical, chemical, hydroelectric, wind

37.    Skip

38.    Skip

39.    Igneous(granite --counters), metamorphic(marble—statues), sedimentary(limestone---used to make cement)

40.    It involves the combustion of a compound containing carbon and often hydrogen; the carbon portion reacts with oxygen to produce $CO_2$

$C + O_2 \rightarrow CO_2$