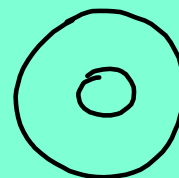


Protons



Location: in the nucleus of
an atom

Charge: positive charge (+)

~ Number determines Chemical properties of
an element

~ Every atom of the same element has the
same number of protons called the
atomic number (gold is gold no matter where it is
found)

~ Define atomic number: The number of protons in the
nucleus of an atom

What is the atomic number of potassium?

19, which means it has 19
protons

What is the atomic number of silver? (pg
316-317) 47, which means it has
47 protons

The Periodic table increases decreases by
the atomic number.

Neutrons

Location: Inside the
nucleus with the
protons

Charge:
no charge (neutral)

Protons and neutrons have about the
same atomic mass (amu) and make up
most of the mass of the atom

$$\begin{array}{r} \text{Atomic mass} \\ - \text{Atomic number} \\ \hline \text{neutrons} \end{array}$$

*

Electrons in the cloud

Location: The space outside the nucleus.

Charge: Negatively charged (-)

Mass of electrons compared to protons and neutrons is considerably less

neutral atoms: have equal number of protons and electron parts so to find the number of electrons you look at the atomic number



~ Electrons are hard to find because they move so fast in the cloud Shells / rings



electrons in the cloud are specific distances away from the nucleus.

~ The higher the atomic number (protons) the more electrons in the shells in the cloud

✓ Shell One: only 2 electrons

✓ shell two: Eight only (8) electrons

shell three: Eighteen (18) electrons but we are only learning up to 8. We are not drawing elements past period 3

★ Outer. shell is the valence shell

NaOH

11
Atomic
Number:
number of
protons and
electrons

Na — Chemical
Symbol

Chemical
name ← Sodium

the mass
Of The
entire
atom

Atomic
mass → 22.990

To Find
neutrons:
$$\frac{\text{Atomic mass} - \text{Atomic number}}{\text{Neutrons}}$$

sodium has
11.990
-neutrons

Periodic Table Practice

Use activity from class to answer the follow up questions

how. many electrons in outer valence

less reactive metals

period → rows tell us the number of

shells in an atom

group ↓ columns

have common properties - family

Of outer valence

electrons

1	hydrogen 1 H 1.0079	2	helium 2 He 4.0026
3	lithium 3 Li 6.941	4	beryllium 4 Be 9.0122
5	boron 5 B 10.811	6	carbon 6 C 12.011
7	nitrogen 7 N 14.007	8	oxygen 8 O 15.999
9	fluorine 9 F 18.998	10	neon 10 Ne 20.180
11	sodium 11 Na 22.990	12	magnesium 12 Mg 24.305
13	aluminum 13 Al 26.982	14	silicon 14 Si 28.086
15	phosphorus 15 P 30.974	16	sulfur 16 S 32.065
17	chlorine 17 Cl 35.453	18	argon 18 Ar 39.948
19	potassium 19 K 39.098	20	calcium 20 Ca 40.078
21	scandium 21 Sc 44.956	22	titanium 22 Ti 47.867
23	vanadium 23 V 50.942	24	chromium 24 Cr 51.996
25	manganese 25 Mn 54.938	26	iron 26 Fe 55.845
27	cobalt 27 Co 58.933	28	nickel 28 Ni 58.693
29	copper 29 Cu 63.546	30	zinc 30 Zn 65.39
31	gallium 31 Ga 69.723	32	germanium 32 Ge 72.61
33	arsenic 33 As 74.922	34	selenium 34 Se 78.96
35	bromine 35 Br 79.904	36	krypton 36 Kr 83.80
37	rubidium 37 Rb 85.468	38	strontium 38 Sr 87.62
39	yttrium 39 Y 88.906	40	zirconium 40 Zr 91.224
41	niobium 41 Nb 92.906	42	molybdenum 42 Mo 95.94
43	technetium 43 Tc [98]	44	ruthenium 44 Ru 101.07
45	rhodium 45 Rh 102.91	46	palladium 46 Pd 106.42
47	silver 47 Ag 107.87	48	cadmium 48 Cd 112.41
49	indium 49 In 114.82	50	tin 50 Sn 118.71
51	thallium 51 Tl 118.71	52	lead 52 Pb 127.60
53	bismuth 53 Bi 127.60	54	polonium 54 Po [209]
55	cesium 55 Cs 132.91	56	barium 56 Ba 137.33
57-70	Lanthanide series		
71	lutetium 71 Lu 174.97	72	hafnium 72 Hf 178.49
73	tantalum 73 Ta 180.95	74	tungsten 74 W 183.84
75	rhenium 75 Re 186.21	76	osmium 76 Os 190.23
77	iridium 77 Ir 192.22	78	platinum 78 Pt 195.08
79	gold 79 Au 196.97	80	mercury 80 Hg 200.59
81	thallium 81 Tl 204.38	82	lead 82 Pb 207.2
83	bismuth 83 Bi 208.98	84	polonium 84 Po [209]
85	astatine 85 At [210]	86	radon 86 Rn [222]
87	francium 87 Fr [223]	88	radium 88 Ra [226]
89-102	Actinide series		
103	lawrencium 103 Lr [262]	104	rutherfordium 104 Rf [261]
105	dubnium 105 Db [262]	106	seaborgium 106 Sg [266]
107	bohrium 107 Bh [264]	108	hassium 108 Hs [269]
109	meitnerium 109 Mt [268]	110	darmstadtium 110 Ds [271]
111	roentgenium 111 Rg [272]	112	copernicium 112 Cn [285]
113	nihonium 113 Nh [284]	114	flerovium 114 Fl [289]
115	moscovium 115 Mc [288]	116	livermorium 116 Lv [293]
117	tennessine 117 Ts [294]	118	oganeson 118 Og [294]

* Lanthanide series

** Actinide series

Alkali metals : Most reactive metals

- Alkaline Earth Metals: Reactive but not like Alkali
- Transition metals

Metals in a mixed group

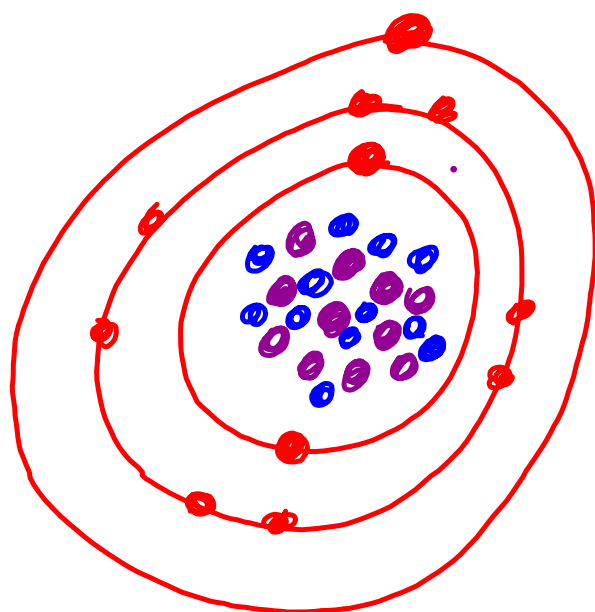
- Lanthanides and actinides

metalloids

REVIEW:

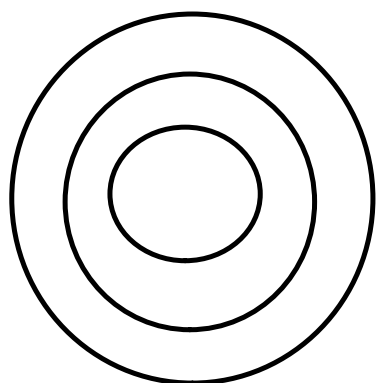
Organizing elements.docx

11



- ✓ ● electron
- ✓ ● protons
- ✓ ● neutrons

11



Sodium

 electrons protons neutrons

Atomic mass

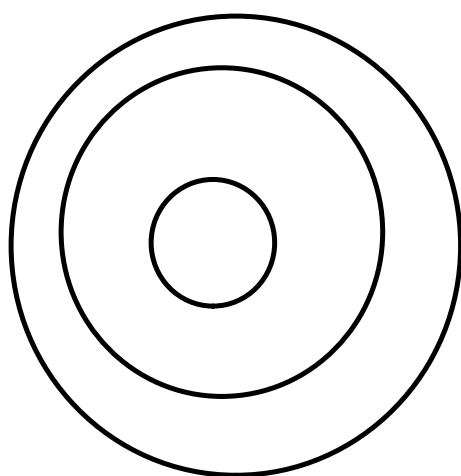
- Atomic numberkey to help you:

To find the # Of protons: look at
atomic number

2) To find The electrons: Look at the atomic
number

3) To find the neutrons: Subtract the atomic
number from the
atomic mass

Silicon



1st shell:

2nd shell:

3rd shell:

MY FAVORITE ALIEN.docx



Things to think about?

1. atomic number (electrons and shells)
2. atomic mass -neutrons ^{protons} ↳ electrons
in the
shell
3. Groups and periods
4. Properties of an element

Where is my favorite alien???



Key:

arms = shells




fingers = electrons

clothing = group/common properties

 faces = antennae - electrons in the outer valence
 smiles/frowns

group - tells me ... common properties

 # periods = tells me ... # of electrons in the outer valence
 There is change
 # of shells

 # in the box =  atomic #
 how many protons
 how many electron

I. Phosphorous

2. 10

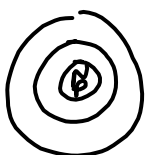
3. 8

4.4

5. 1st shell = 2 ^{electrons} 2nd=8 electrons

3rd= 8 electrons

6 1st=2 2nd=8 3rd =3



7. The smiles show that the outer valence

is either complete or near complete

frowns need to Find many electrons to complete

the Valence

8. The number of electrons in the

outer shell

9. 6 electrons

10. 4 electrons

11. Helium Neon Argon

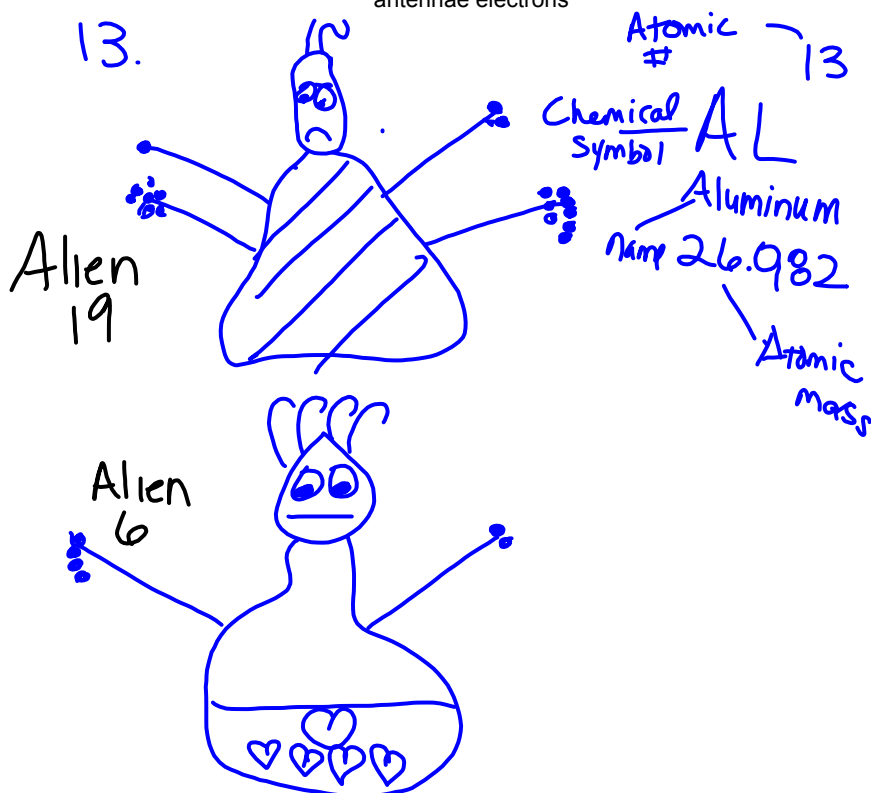
2, 10, 18

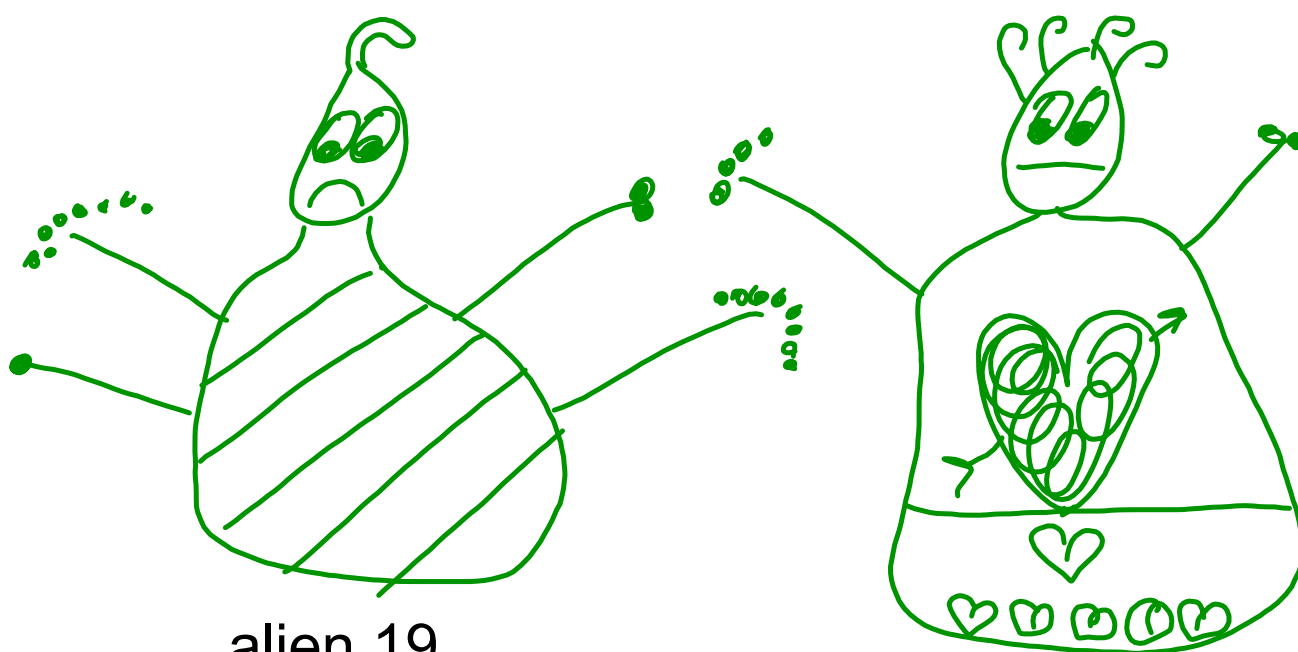
12. clothing

, outer valence

antennae electrons

13.






alien 19

alien 6


Metal Vocabulary

 Chapter 9, Lesson 1 Vocab.doc

Metals on the periodic table

 Types of Metals blank periodic table.docx

Properties of Metals

 WorksheetWorks_Properties_of_Metals_1.pdf

3

Metals are elements that have melting points which cause them to expand. They are good conductors of thermal energy and electrical energy. They are shiny, they are bendable.

-The majority of elements in our universe are metals.

Use: hinges, cart, signs, clips, lights, fan, light, chair legs, DVR, Jewellery, shelving unit, electrical outlet, wires, door knobs

✓ Thermal

conductivity: The ability for Thermal

(heat) energy to

pass through

reactivity:

The ease and speed

that an element

combines with other elements

✓ Luster: shiny

★ Group 1 most

reactive group

(Alkali) metals

✓ Malleable: Can be shaped

✓ electrical conductivity: an electric current

corrosion:

can pass through

✓ ductile-pulled or stretched

into a wire.

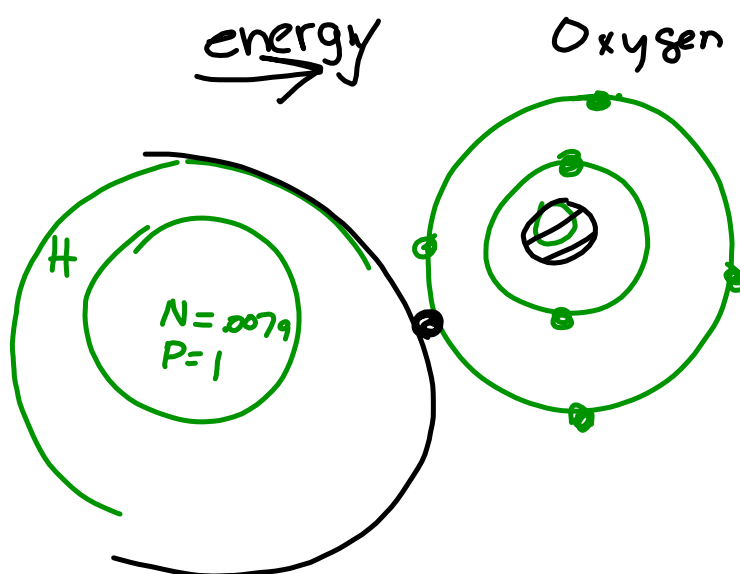
6 → reaction with O₂ (Oxygen)

that deteriorates the metal

It is the slow

ex. rusty car, Statue of Liberty


1. 2
2. 8
3. 8



What needs to be written for each of the non-metal groups

1. elements in the family (group)
2. properties in common
3. how used in real world

324-327

 WorksheetWorks_Compare__Contrast_Types_of_Metals_3.pdf

SCROLL DOWN



1	2	3-12	13-16
most reactive group	highly reactive	It get less reactive from group 3-12	less low reactivity
Solids - never found as uncombined	never found uncombined	Solid except for mercury	Solids liquids.
fireworks	Calcium-bones	coins	bike frames
salt	vitamins	astronaut visors, wires.	cans of paint, auto batteries
medicines			
batteries			
low	high	high	high
low	high	high	high

Work with your group to find the notes

low ~~melting~~ **melting**
point
high
melting
high
melting
except mercury

low
less than this
higher
Than
alkali
high

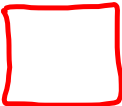
fireworks
plastic batteries
knives.
x-rays
bone health
calcium
food, med.
Jewelry
Astronaut
visors
Paint
frame of Canned
bikes foods
batteries
laser
-lights during
Surgeries
-hunting
laser range finders
Medical Prof.

Solid
solid
solid
liquid
Solid
used in pipes
made in
factories
labs.

most reactive
high
reaction
reactivity
gets less
b/w 3-12

Group 1
except hydrogen
Group 2
3-12
13-16
atoms, 6, 14, 32, 7, 15
33 51, 8.16
34, 52
Period 6
period 7

low
low
Unstable

high




 Metals scavenger hunt.docx

Non-metals

Chapter 9, Lesson 3 Vocab.doc



Non-metal Families

Hydrogen family

Carbon family

Nitrogen family

Oxygen family

Halogens

Noble gases

Atomic Number	Symbol	Name	Atomic Mass
1	H	Hydrogen	1.00784(1)
2	He	Helium	4.002602
3	Li	Lithium	6.941
4	Be	Beryllium	9.012182
5	B	Boron	10.811
6	C	Carbon	12.011
7	N	Nitrogen	14.00643
8	O	Oxygen	15.999
9	F	Fluorine	18.9984
10	Ne	Neon	20.18
11	Na	Sodium	22.989769
12	Mg	Magnesium	24.304
13	Al	Aluminum	26.981538
14	Si	Silicon	28.0855
15	P	Phosphorus	30.973761
16	S	Sulfur	32.06
17	Cl	Chlorine	35.453
18	Ar	Argon	39.948
19	K	Potassium	39.0983
20	Ca	Calcium	40.078
21	Sc	Scandium	44.955912
22	Ti	Titanium	47.88
23	V	Vanadium	50.9415
24	Cr	Chromium	51.9961
25	Mn	Manganese	54.938045
26	Fe	Iron	55.845
27	Co	Cobalt	58.933194
28	Ni	Nickel	58.6934
29	Cu	Copper	63.546
30	Zn	Zinc	65.38
31	Ga	Gallium	69.723
32	Ge	Germanium	72.630
33	As	Arsenic	74.921595
34	Se	Selenium	78.96
35	Br	Bromine	79.904
36	Kr	Krypton	83.798
37	Rb	Rubidium	85.4678
38	Sr	Strontium	87.62
39	Y	Yttrium	88.90584
40	Zr	Zirconium	91.224
41	Nb	Niobium	92.90638
42	Mo	Molybdenum	95.94
43	Tc	Technetium	-
44	Ru	Ruthenium	101.07
45	Rh	Rhodium	102.9055
46	Pd	Palladium	106.42
47	Ag	Silver	107.8682
48	Cd	Cadmium	112.411
49	In	Indium	114.818
50	Sn	Tin	118.710
51	Sb	Antimony	121.757
52	Te	Tellurium	127.6
53	I	Iodine	126.90447
54	Xe	Xenon	131.29
55	Cs	Cesium	132.90545
56	Ba	Barium	137.327
57-71		Lanthanides	
72	Hf	Hafnium	178.49
73	Ta	Tantalum	180.94788
74	W	Tungsten	183.84
75	Re	Rhenium	186.207
76	Os	Osmium	190.23
77	Ir	Iridium	192.222
78	Pt	Platinum	195.084
79	Au	Gold	196.966569
80	Hg	Mercury	200.59
81	Tl	Thallium	204.3833
82	Pb	Lead	207.2
83	Bi	Bismuth	208.9804
84	Po	Polonium	-
85	At	Astatine	-
86	Rn	Radon	-
87	Fr	Francium	-
88	Ra	Radium	-
89-103		Actinides	
104	Rf	Rutherfordium	-
105	Db	Dubnium	-
106	Sg	Seaborgium	-
107	Bh	Bohrium	-
108	Hs	Hassium	-
109	Mt	Meitnerium	-
110	Ds	Darmstadtium	-
111	Rg	Roentgenium	-
112	Cn	Copernicium	-
113	Uut	Ununtrium	-
114	Fl	Flerovium	-
115	Uup	Ununpentium	-
116	Lv	Livermorium	-
117	Uus	Ununseptium	-
118	Uuo	Ununoctium	-
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Properties of non-metals

Physical

- poor conductors of electrical energy
- dull (not shiny)
- brittle (break apart)
- less dense than metals
- poor conductor of heat

Chemical

reactive they
can join with other
atoms to form
new substances
except for noble gases

Mr. Parr atom song



Mr. Lee Atom song



Brain pop (will only pull up if you have an account)




Metals/ Non-metals quick activity
answers



<u>Non-Metal</u>	<u>Metal</u>
1. Poor conductor act act as insulators	1. Good 2. conductors of electricity
2. Poor conductors of heat act as insulators	3. Good conductors of heat
3. Produce a dull sound when struck	4. Make a clear ringing sound when struck (sonorous)
4. Dull in appearance	5. Shiny in appearance
5. Tend to shatter when hit hard	6. Easy to bend
6. Most are gases, some are solids	7. Most are solids
7. Low density	8. High Densities

Metals	Non-metals

Identifying Metals and Non-metals

 Identifying metals and nonmetals.doc

Unlocking the Big

Questions

Key Concept 1: what

information does the periodic table contain?

atomic #

atomic mass

periods / groups

made original?

periodic Table

practice

pgs 311-319 pg 12&13

NB

Key Concept 2: What are the properties of
metals? pg 321- pg 23N B

323

Key Concept 3: How are metals classified

Types of metal

/ Pg 20

NB pg 324 book

327

Key Concept 4: What are the properties of
non-metals pg 329-book Pg 23 NB

336

Key Concept 5: What are the families
containing non-metals

Pg 331-335

Chemical Reactions Vocabulary

Valence Electrons

Chemical Bond

Physical Change

Products

Exothermic Reactions

Matterelectron Dot Diagram

Chemical Change

Reactants

Precipitate

Endothermic Reactions

Law of Conservation



Where's the beef

Initial mass covered-

Initial temp

Take cover off
light stick, blow stick out

remove the cover and the place

The stick in the flask

Observations:

End mass

End temp

Make a claim about open systems
and their affect on mass during chemical change

Evidence:

Reasoning

Evidence

Reasoning

Matter: is anything that has mass and takes up space. It is made from atoms.



Properties

Physical Properties	Chemical Properties
<p>* <u>Observable</u> <small>(seen with our eyes)</small> characteristics that <u>do NOT</u> change the matter!</p> <p>Examples:</p> <ol style="list-style-type: none"> 1. <u>Color</u> <small>(spilling coffee On paper)</small> 2. <u>Smell</u> <small>scent diffuser</small> 3. <u>Freezing/ Melting point</u> Viscosity <small>(how thick & fluid is)</small> 	<p>* <u>Observable</u> characteristics that <u>DO</u> change the matter!</p> <p>Examples:</p> <ol style="list-style-type: none"> 1. <u>pH</u> <small>-Acid, base neutral</small> 2. <u>Reactivity with water</u> 3. <u>Tendency to corrode</u> 4. <u>Flammability</u>
Physical Changes	Chemical Changes
<p>* Changes that <u>do NOT</u> result in forming a new substance</p> <p>Evidence:</p> <ol style="list-style-type: none"> 1. Changes in <u>shape</u> or form 2. Breaking apart <u>Size</u> <p>Changing the <u>state</u> of matter (liquid, gas, solid)</p>	<p>* Changes that <u>DO</u> result in forming a new substance</p> <p>Evidence:</p> <ol style="list-style-type: none"> 1. Bubbling or fizzing 2. Change in color 3. Smoke 4. Visible flames 5. Heat or light given off 6. <u>Precipitate</u> <small>(liquid changes b/c of chemical reaction to a solid)</small>

Reactants: the original substances used in a chemical reaction prior the change.

↳ milk and vinegar reactants in cottage cheese.

Product: The new substance That forms when the reactants go through a chemical change. curds In cottage cheese

Exothermic → Energy is required for this type of reaction. Energy is given off at the end Of The reaction. More energy is given off Than is required to break and join atoms with another atom. Feels warm.

Endothermic → Energy is needed for this reaction and given off at the end of

the reaction. More energy is required in the beginning to break or join the atom's bonds, Than is given off at The end of The reaction. It feels cool

Law of conservation of Mass) Matter

-when atoms go Through. a chemical

or physical reaction the matter

is still present so the mass 'doesn't change.

Beware of open system because matter (gas, liquid or solid) Can enter or leave the system which will effect The mass

A closed system means no matter

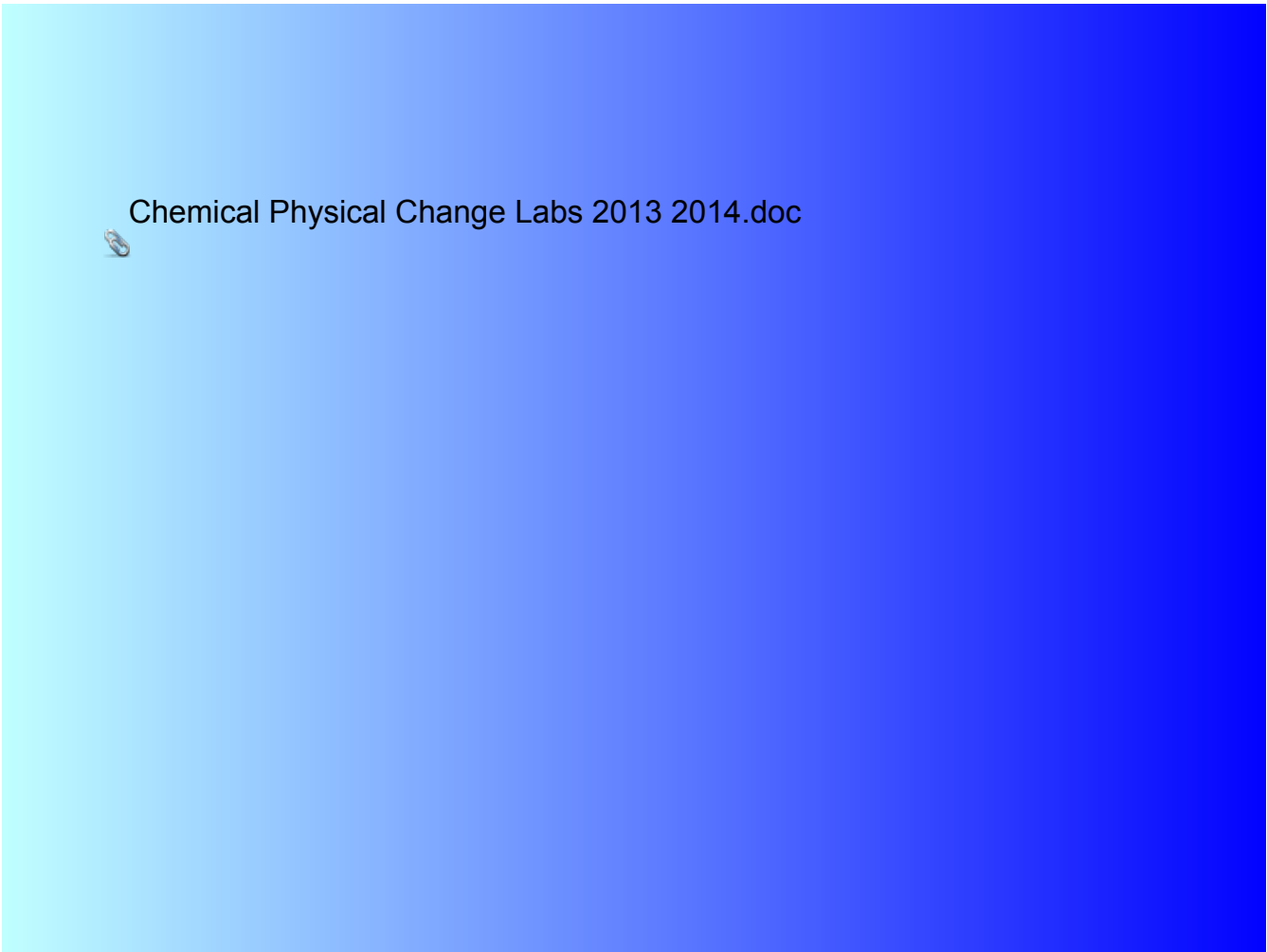
can leave or come in so the mass stays the same.



 Chemical Physical Change Labs 2013 2014.doc

Loopy electron bonds.docx






Chemical Physical Change Labs 2013 2014.doc

Grow Creature Lab

Matter Matters Lab.doc



 Ch. 11, Lesson 1 and 3.doc

pH analysis Lab

pH Gizmo

pH Analysis

Lesson Info ▾ + Add to Class

Tools

Substance in the tube:
Ammonia

pH indicator paper type:
0 - 14 paper

Test Reset

acids less
neutral
less bases/alkaline

most acidic
most basic

pH color chart

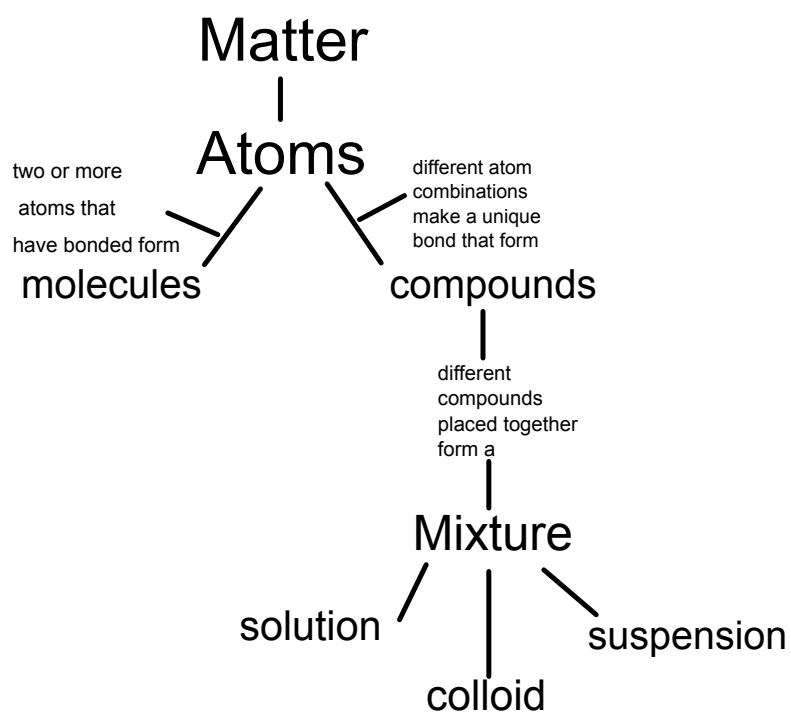
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

?



Solubility and Temperature Gizmo

pgs 402-407 in science book



* Mixtures: solution, Colloid, suspension

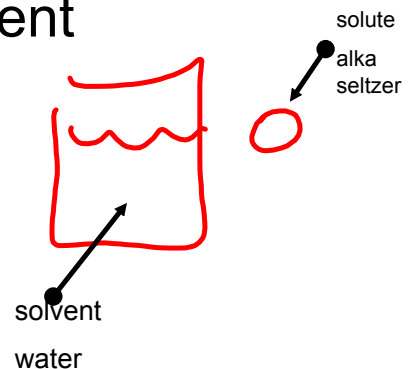
solute: a substance that is
(break apart)
dissolved by a solvent

Solvent: Is a part of
a solution. It is usually

The largest amount. It aids

The solute in dissolving






solubility: - How well substances
mix together



substance	dissolve
<u>sugar</u>	dissolved completely (solution)
pepper	did not dissolve completely (suspension)
vinegar	dissolved completely (solution)
sand	did not dissolve (suspension)
chalk	. dissolved Colloid (Could See The beam of light)

Did It Dissolve

Attachments

-  Virtual Lab link
-  Mr. Parr atom song
-  Mr. Lee Atom song
-  Brain pop (will only pull up if you have an account)
- Chemical Physical Change Labs 2013 2014.doc
- Chapter 9, Lesson 1 Vocab.doc
- Ch. 11, Lesson 1 and 3.doc
- Properties of Matter and the Changes Matter Can Go Through 370 377.doc
-  Solubility and Temperature