Chemistry Learning Targets

#	I can…	Scoring Guide			
		I understand it completely	*I understand most of it*	*I understand some of it*	*I don't understand*
Quarter 1					
Matter, Periodic Table, & Trends					
1	define Chemistry.				
2	define matter and distinguish between matter and not matter.				
3	draw the matter flow chart.				
4	distinguish between a mixture and a substance.				
5	classify a mixture as either homogeneous or heterogeneous.				
6	define a solution as a homogeneous mixture.				
7	define element and compound.				
8	determine if will sink or float based on its density.				
9	list and describe the four (4) separation techniques.				
10	explain Democritus' contribution to atomic theory.				
11	explain Dalton's atomic theory.				
12	explain the development of J.J. Thompson's "plum pudding" model cathode ray experiment.				
13	explain Milliken's contribution to atomic theory (charge and mass of an electron).				
14	explain the development of Rutherford's nuclear model and gold foil experiment.				
15	discuss the development of the Periodic Table (Mendeleev & Moseley).				
16	define an atom and the subatomic particles.				
17	state the mass, charge, and location of the subatomic particles.				
18	determine the identity of an atom based on its atomic number.				
19	determine the number of protons, neutrons, and electrons using atomic number and mass number.				
20	distinguish between the isotopes of an atom.				
21	write a complete symbol notation for an element.				
22	define the average atomic mass of an element.				
23	identify and label the parts of the Periodic Table.				
24	distinguish between periods and groups on the Periodic Table.				
25	classify elements as metals, nonmetals, and metalloids.				
26	define orbital and assign its Principal Quantum number.				

27	identify the shape and number of the s, p, d, and f orbitals.				
28	identify the s, p, d, and f blocks on the Periodic Table.				
29	distinguish between Quantum number, sublevel, and orbital.				
30	write a full electron configuration for any element #1-36.				
31	write a Noble Gas electron configuration for any element.				
32	define valence electron and determine the number of valence electrons for an element.				
33	draw electron dot structures to represent an atom's valence electron.				
34	define the four Periodic Table trends (Atomic Size, Ionic Radii, Ionization Energy, and Electronegativity) and relate them to the rows/periods of the Periodic Table.				
35	use the four Periodic Trends to distinguish between the properties of atoms.				
36	understand that elements have different uses based on their properties.				
Quarter 2					
Compounds & Equations					
37	define and compare atoms and ions.				
38	define chemical bond.				
39	describe Ionic Bonding.				
40	describe how a cation and anion are formed.				
41	explain why ions form.				
42	predict which type of elements will gain or lose electrons.				
43	distinguish between cation and anion (positive/negative).				
44	write electron configuration for ions.				
45	write Lewis Dot structures for ions.				
46	predict the charge of an ion from Group A Metals and Group A Non-metals based on its location on the Periodic Table.				
47	write the correct formula for binary ionic compounds.				
48	name and write formulas for ionic compounds.				
49	identify metals with multiple charges.				
50	define a covalent bond.				
51	define and identify a molecule.				
52	apply the Octet Rule to covalent bonds.				

53	describe the single, double, and triple bonds.				
54	relate the strengths of covalent bonds to bond length.				
55	distinguish between Endothermic and Exothermic reactions.				
56	identify and write the correct formula for the seven diatomic molecules.				
57	name and write binary molecular compounds.				
58	name and write binary acids and oxyacids.				
59	identify reactants and products in a chemical reaction.				
60	write a skeleton equation given reactants and products.				
61	identify the common symbols in a chemical equation.				
62	state the Law of Conservation of Mass.				
63	relate the Law of Conservation of Mass to a balanced chemical equation.				
64	balance a chemical equation.				
65	interpret subscripts and coefficients in chemical equations.				
66	classify and distinguish between the five types of chemical reactions.				
67	predict products for synthesis, decomposition, combustion, single replacement, and double replacement reactions.				
68	use the Activity Series to determine the outcome of a single-replacement reaction.				
69	describe aqueous solutions.				
Physical/Chemical Properties & Intermolecular Forces					
70	perform mass, volume, and density calculations.				
71	identify the physical and chemical properties of matter.				
72	distinguish physical and chemical changes of matter.				
73	list five (5) indications of a chemical change.				
74	differentiate between the shape, volume, and compressibility properties of solids, liquids, and gases.				
75	describe the properties of a solid as crystalline or amorphous.				
76	describe the properties of an ionic compound.				
77	describe the properties of an metallic bond.				
78	relate "sea of electrons" to bonding.				
79	define and describe alloys.				

80	differentiate between accuracy and precision.				
81	define and determine the correct number of significant figures needed.				
82	describe the six principles of kinetic molecular theory.				
83	list and describe three types of intermolecular forces (dispersion, dipole-dipole, and hydrogen bonding).				
84	list and describe the properties of liquid based on viscosity, surface tension, capillary action, cohesive and adhesive forces.				
85	describe the beginning and ending phase of the six phase changes.				
86	describe the movement of energy and affects on temperature during a phase change.				
87	describe the behavior of gases and how properties of a gas is affected by temperature, pressure, volume, and number of particles.				
88	calculate the number of bonds in a molecule using "NAS" method.				
89	draw molecule Lewis Dot structures for a molecule.				
90	determine the number of bonded and lone pairs of electrons around the central atom.				
91	describe how electronegativity is used to determine bond polarity.				
92	predict the polarity of bonds.				
93	determine and compare properties (IMF) of polar and nonpolar bonds.				
94	predict polymer properties based on molecular structures.				
95	identify molecular structures of designed materials.				
96	describe the effects that attractive and repulsive electrical forces between molecules.				
Quarter 3					
Solutions and Kinetics					
97	identify the characteristics of a solution.				
98	define solubility and the factors that affect it.				
99	increase the rate of solution.				
100	qualitatively define concentration.				
101	quantatively determine concentration using molarity				

102	explain the three colligative properties of solutions (boiling point elevation, freezing point depression, and vapor pressure lowering).				
103	Calculate average rates of chemical reactions from experimental data				
104	Relate rates of chemical reactions to collisions between reacting particles				
105	Identify factors that affects the rates of chemical reactions				
106	Explain the role of a catalyst				
107	Express the relationship between reaction rate and concentration				
108	Determine reaction orders using the method of initial rates				
109	understand and convert between the Celsius and Kelvin scales.				
Equilibrium & Acids/Bases					
110	explain how gas pressure is measured and affected by altitude.				
111	state the standard pressure in mmHg, torr, atms, and kPa).				
112	perform conversions between units of pressure.				
113	identify and differentiate between saturated, unsaturated, and supersaturated solutions.				
114	Recognize the characteristics of chemical equilibrium				
115	Write equilibrium expression for systems that are at equilibrium				
116	Calculate equilibrium constants from concentration data				
117	Describe how various factors affect chemical equilibrium				
118	Explain how Le Chatelier's principle applies to equilibrium systems				
119	describe the properties of acids.				
120	describe the properties of bases.				
121	define Bronsted-Lowry and Arrhenius acid/bases.				
122	identify the conjugate acid/base pairs.				
123	define weak and strong acids and bases by their ion concentrations.				
124	use the pH Scale to determine if a chemical is acidic or basic.				
125	calculate the pH, pOH, kw, [H+], [OH-] of acid or base.				

	Quarter 4				
	Law of Conversion, Mole Calculations, & Stoichiometry				
126	distinguish between the products and reactants of a chemical reaction.				
127	apply the Law of Conservation of Mass to chemical reactions.				
128	Students can interpret the law of conservation in terms of atoms				
129	describe the use of the mole in chemistry.				
130	recite the value of the mole (6.02 x1023 particles) (Avogadro's Number).				
131	explain how prefixes change the unit.				
132	input Scientific Notation correctly into my calculator.				
133	convert moles to particles.				
134	convert mass to particles.				
135	convert particles to atoms.				
136	calculate the molar mass of atoms and compounds.				
137	calculate the percent composition of a compound.				
138	determine the atom/ion ratio of a compound.				
139	explain and name hydrates.				
140	define stoichiometry.				
141	interpret balanced equations.				
142	determine the mole ratio using the coefficients in a balanced chemical equation.				
143	use mole ratio to convert between chemicals.				
144	use the stoichiometry flow chart to perform multi-step conversions.				
145	distinguish between theoretical and actual yield of a chemical reaction.				
146	determine the percent yield for a chemical reaction.				

	Thermo & Nuclear Chemistry				
147	Explain what energy is and distinguish between potential and kinetic energy				
148	Relate chemical potential energy to heat lost or gained in chemical reactions				
149	Calculate the amount of heat absorbed or released by a substance as its temperature changes				
150	Describe how calorimeter is used to measure energy absorbed or released				
151	differentiate between nuclear and chemical reactions.				
152	Students are able to describe the scale of energy changes of nuclear vs. chemical processes				
153	define radiation and explain its discovery.				
154	identify the symbol, penetrating ability, and relative mass of the six nuclear particles (alpha, beta, gamma, neutron, positron, proton).				
155	identify and write balanced equations for the five types of radioactive decay (alpha, beta, gamma, positron emission, and electron capture).				
156	Compare and contrast nuclear fission and nuclear fusion				
157	Explain the process by which nuclear reactors generate electricity				
158	Illustrate fission and fusion using a model				
	I & E - Skills learned throughout the year				
159	determine the relative density of various objects.				
160	determine the relative density of solutions.				
161	create and interpret graphs to represent my data.				
162	draw best fit line and calculate slope.				
163	properly dress for lab activities.				
164	read and write a lab report prior to the lab.				
165	apply lab safety guidelines.				
166	identify and locate the safety equipment in the classroom.				
167	name and identify the various lab equipment.				
168	inspect lab equipment for damage prior to use.				
169	record observations.				
170	make inferences about my results based my observations.				
171	use equipment to measure/determine mass and volume.				
172	set up and properly filter a solution.				
173	completely transfer a solid without losing any portion.				

174	separate a solution using chromatography.				
175	properly connect and adjust a Bunsen Burner.				
176	perform flame tests to identify unknown elements.				
177	use a spectroscope to identify unknown elements.				
178	assemble models to represent different molecular compounds.				