CHEMICAL SYSTEMS
1st SEMESTER
CURRICULUM MAP

UNIT	NAME	Chapter
I	General Science Skills	
II	Matter and Its Properties	16.1,2,3 & 17.1,2
III	Atoms, Elements, & the Periodic Table	18
IV	Molecules & Compounds	19
V	Chemical Equations	20.2,3,4
VI	Reaction Types	21
VII	Chemistry & the Environment	22

Chemical Systems One-Year Curriculum Map
1st semester, weeks 1- 6

Month	**August**			**September**		
Week	**1**	**2**	**3**	**4**	**5**	**6**
Weeks on unit	**3**			**2.5**		
Unit Name	**General Science Skills**			**Matter and Its Properties**		
Chapters				16.1,2,3 and 17.1,2		
Essential Questions	▪ What is the scientific method? (VII.1.A.a-d) ▪ What type of measurements are made in chemical systems? (VII.1.B.a-d) ▪ How do you organize the measurements you take? (VII.1.B.a-d) ▪ How do you identify the independent and dependent variables in an experiment? ▪ How do you construct a graph? (VII.1.C.E.a.) ▪ What are safe procedures in the laboratory?			▪ How is matter classified? (I.1.A.b.c.) ▪ What are the three physical states of matter? (I.1.D.a.) ▪ How is the density of a material determined? (I.1.A.a.)		
Content	▪ Scientific Method ▪ Measurements o Qualitative o Quantitative o Metric System o Tools used o Accuracy o Precision o Percent error ▪ Collecting and organizing data ▪ Constructing graphs ▪ Scientific notation ▪ Safety in the laboratory			▪ Matter ▪ Mixtures and substances o Homogeneous o Heterogeneous o Elements and Compounds ▪ Density o Regular & irregular samples o Solids & Liquids ▪ States of matter ▪ Kinetic theory of matter and how it relates to phases. ▪ Physical and chemical properties and changes.		
Skills	▪ Interpret scientific investigations using the scientific method. ▪ Formulate testable questions and hypothesis. ▪ Make qualitative and quantitative measurements. ▪ Perform metric conversions. ▪ Demonstrate proper and safe laboratory techniques. ▪ Construct a data table and graph. ▪ Identify the independent and dependent variables of an experiment. ▪ Convert between scientific and standard notation.			▪ Classify matter as either a mixture or a substance. ▪ Identify a mixture as homogeneous or heterogeneous. ▪ Measure the mass and volume of both solids and liquids, then calculate their density. ▪ Calculate the density of both regular and irregular shaped objects. ▪ Distinguish between physical and chemical properties. ▪ Identify physical and chemical changes. ▪ Explain the changes that occur between particles in the three phases of matter when the Kinetic energy changes.		
Assessments	▪ Laboratory safety exam ▪ Measurement experiment ▪ Design and conduct experiment utilizing scientific method, measuring skills, and laboratory safety. ▪ Metric Conversion quiz ▪ Unit I exam			▪ Classifying matter lab ▪ States of matter lab ▪ Density lab ▪ Density quiz ▪ Physical and chemical change lab ▪ Design and conduct experiment on density ▪ Unit II exam		

Chemical Systems One Year Curriculum Map
1st Semester, weeks 6-10

Month	**September**			**October**	
Week	**6**	**7**	**8**	**9**	**10**
Weeks on Unit	**2.5**			**2**	
Unit Name	**Atoms, Elements, and the Periodic Table**			**Molecules and Compounds**	
Chapter(s)	18			19	
Essential Questions	▪ What is an atom made out of? (I.1.E.a.b.c.) ▪ How are the subatomic particles of an atom arranged? (I.1.E.a.b.c.) ▪ What information can we get from the periodic table? (I.1.F.a.b.c.) ▪ How is the periodic table organized? (I.1.F.a.b.c.)			▪ How do atoms form compounds? (I.1.H.a.b.c.) ▪ What is a chemical bond? (I.1.I.a.b.) ▪ What are some important molecules for life? (I.1.I.d.) ▪ Is recycling plastic a viable option to help the environment? (I.3.A.a.b.c.)	
Content	▪ Atomic Theory and history ▪ Formation of the atoms via nuclear fusion. ▪ The 3-main subatomic particles and how to determine the number of each. ▪ Atomic structure ▪ Atomic mass and number ▪ Isotopes ▪ Periodic table organization and trends ▪ Energy levels ▪ Valance electrons			▪ Valance electrons ▪ Types of bonds o Ionic/Covalent ▪ Energy changes in bonding ▪ Electronegativity ▪ Ions o Cation/Anions o Monatomic/Polyatomic ▪ Chemical formulas ▪ Molecular/ionic compounds	
Skills	▪ Describe the history of the atomic model. ▪ Calculate the number of protons, neutrons, and electrons in a given atom. ▪ Construct a model of an atom, identifying the different regions and particles in the model. ▪ Describe how changes in the nucleus of an atom results in energy released in the form of radiation. ▪ Describe the relationship of elements in the groups and periods on the periodic table. ▪ Identify metals, nonmetals, and metalloids by their placement on the periodic table. ▪ Identify properties of metals, nonmetals, and metalloids.			▪ Use the valance electron configuration to determine the interaction between atoms and ions. ▪ Use P-table to determine the bond type. ▪ Compare and contrast the types of chemical bonds. ▪ Recognize that chemical energy is stored energy in the bonds of atoms and ions. ▪ Predict the properties of elements and the bonds that may result between elements using the periodic table. ▪ Forming ionic compounds ▪ Naming ionic and molecular formulas. ▪ Name a sample as either, element, compound (ionic or molecular). ▪ Identify the top ten molecules important for life, and the top ten that make up the Earth, crust, interior, and atmosphere.	
Assessment	▪ Atomic structure project/lab ▪ Family values/periodic table activity ▪ Subatomic particle quiz ▪ Isotope lab ▪ Periodic table family quiz. ▪ Unit III Exam			▪ Valance electron modeling and bonding lab. ▪ Molecular models lab ▪ Ionic formula activity ▪ Molecular and Ionic compound quiz. ▪ Molecule Project ▪ Bonding Quiz ▪ Unit IV Exam	

Chemical Systems One Year Curriculum Map
1st Semester, weeks 11-15

Month	**November**				**December**
Week	**11**	**12**	**13**	**14**	**15**
Weeks on Unit	**3**			**2**	
Unit Name	**Chemical Equations**			**Reaction Types**	
Chapter(s)	20.2,3,4			21	
Essential Questions	▪ What is evidence that a chemical equation occurred? (I.1.G.a.) ▪ How do you balance a chemical equation? (I.1.I.a.b.) ▪ How can you prove that mass is conserved during a chemical reaction? (I.1.I.a.b.)			▪ Describe the five types of chemical reactions? (I.1.H.d.) ▪ How can you classify reactions based upon temperature change (energy)? (I.2.D.a.) ▪ What affects the rate (speed) of a reaction? (I.1.H.b.) ▪ Identify the consequences of different types of reactions to humans and human activity. (I.1.H.d.)	
Content	▪ Chemical equations ▪ Products and reactants ▪ Evidence of a chemical reaction occurring. ▪ Predicting products ▪ Balancing chemical equations ▪ Conservation of mass and energy ▪ Reactant atoms to product atoms conversions. ▪ Percent yield			▪ Reaction types o Single replacement o Double replacement o Combination o Decomposition o Combustion ▪ Solubility rules ▪ Predicting products ▪ Endo- and exothermic reactions.	
Skills	▪ Identify the components of a chemical reaction. ▪ Determine if a chemical reaction occurred based on observations. ▪ Distinguish between the five different reaction types. ▪ Recognize whether the number of atoms of the reactants and products in a chemical equation are balanced. ▪ Calculate the percent yield when given the actual yield and predicted yield. ▪ Identify the limiting reagent. ▪ Use a balanced equation to determine the amount of product you should produce. ▪ Explain why we don't always make the predicted amount of product.			▪ Distinguish between the five different reaction types. ▪ Predict the possible products of a chemical reaction based upon the reactants and the five different reaction types. ▪ Identify the consequences of different types of reactions to humans and human activity. ▪ Determine the solubility of a compound in water based upon solubility rules/chart. ▪ Use change in temperature and energy to determine whether a reaction is exothermic or endothermic.	
Assessments	▪ Evidence of a chemical reaction lab. ▪ Balancing equation quiz ▪ Percent yield lab ▪ Conservation of mass lab. ▪ Unit V Exam			▪ Reaction types lab ▪ Predicting products lab ▪ Predicting products quiz ▪ Exo-/endothermic lab ▪ Reaction rate lab ▪ Unit VI Exam	

Chemical Systems One Year Curriculum Map
1st Semester, weeks 16-17

Month	**December**	
Week	**16**	**17**
Weeks on Unit	**2**	
Unit Name	**Chemistry and the Environment**	
Chapter(s)	22	
Essential Questions	▪ How do we generate power for human use? (V.3.A.a.) ▪ How does human activity affect the environment? (V.3.A.c.) ▪ Describe alternatives sources that are available to humans. (V.3.A.a.b.c.) ▪ Describe how nuclear power can impact our need for energy and the environment. (VIII.1.C.a.) (I.2.E.a.b.)	
Content	▪ Where our energy comes from o Coal o Gas o Steam o Nuclear o Alternative ▪ The impact of obtaining useful energy on the environment. ▪ Alternative energy o Nuclear o Fuel cell o Hydrogen o Solar o Wind o Geothermal o Etc.	
Skills	▪ Identify how the US generates its power. ▪ Classify energy source as renewable or non-renewable. ▪ Describe how obtaining the oil and coal has impacted the environment. ▪ Identify and describe alternative energy sources. ▪ Compare and contrast the current and future of sources of energy.	
Assessments	▪ Alternative energy project ▪ Ecological footprint activity ▪ Energy Consumption quiz ▪ Position paper on nuclear power. ▪ Unit VII Exam	