

Chapter 1 – Introduction to Chemistry – TEKS Obj. 3A, 3C

1. Demonstrate an understanding of lab safety, techniques, and scientific tools. (1A, 2B)

- Lab Safety Rules and Procedures pp.16 Table 2-1
- See http://www.chemistryclasses.com/Lab/lab_safety.htm
- Finding and Interpreting MSDS information to address first aid, clean up of spills, handling, storage, etc.
- See any MSDS source sheet (e.g.) Flinn MSDS Collection at <http://www.flinnsci.com/homepage/sindex.html>
- Know the best use of each type of glassware & when to use different types of instruments.
- Be familiar with common units of measurement.
- Know how to read instruments ACCURATELY.
 - a. For ex: what is the ACCURATE reading on Fig 2-5, 2-11?
- Be familiar with safe lab practices
 - a. List some common safe lab practices – ex – when to wear goggles, how to use a Bunsen burner?

2. The student uses critical thinking & scientific problem solving to make informed decisions. (3A-E)

1 (b). Apply the principles of experimental design in laboratory and field investigations. (2A, 2D, 2E)

- Scientific Methods as a Systematic Approach pp.10-13
- Proper Use and Selection of Lab Equipment and Correct Scale Interpretation
- See <http://lhs.lps.org/staff/squiring/chemistry/Intro/UseOfLabEquipment.pdf>
- See <http://www.hmpublishing.com/Brown/Chapter%204.pdf>
 - Explain how to set up an appropriate graph based on a data table of info.
 - Ex – how to determine which set of information goes on the X axis vs Y axis. How to determine an appropriate scale...do you always have to start at 0?
 - Discuss the implications of not recording measurements correctly in a lab setting.

Chapter 2 – Data Analysis – TEKS Obj. 2B, 2C, 2D

3. Solve problems involving significant figures, SI units and scientific notation.

- SI Units of Measurement- Base SI Units, pg.26 Table2-1, and Derived Units pp.25-30
- Scientific Notation pp.31-33; pp.889-892 Math Handbook
- Metric Conversions pp.34-35; pp.900-902 Math Handbook
- Be able to make conversions with various metric units, including conversions involving squaring. (e.g.) If a room were 6 meters by 10 meters, what would the area of the room be in cm^2 ?
- Pg 51:problems 80, 85; page 52 problems 90, 93; page 53 problems1-3
- Accuracy and Precision of Measurement pp.36-37
- Percent Error Calculations pp.37-38
- Significant Figures Determination pp. 38-42; pp.893-896 Math Handbook
- Know the SI base units – p 26; Table 2-1
- Be able to make conversions with various metric units, including conversions involving squaring.
 - a. EX – If a room is 6 meters by 10 meters, what would the area of the room be in cm^2 ?
- P51: 80, 85, 90, 93

4. Determine density by interpreting data on a graph and by using problem solving strategies.

- Density Calculations / Interpreting Density Graphs pp.27-29
- Set up a graph that would appropriately display density... which information would go on which axis? How would you determine the density from the graph? Page 52 do problem 87 using Table 2-7
- If you needed to determine the density of an irregularly shaped object (like in the density lab), outline a brief procedure to determine it. See <http://www.middleschoolscience.com/irregularvolume.htm>
- Page 29 problems 1, 3; page 30 problem 10
- Correct Set Up, Reading and Interpretation of Graphs pp.43-45; pp.903-907 Math Handbook

Chapter 3 – Matter – Properties and Change – TEKS Obj. 4A, 4B, 4C, 5A

5. Differentiate between physical and chemical properties of matter, as well as physical and chemical changes in matter. (4A)

- Properties of Matter: Intensive vs. Extensive / Physical vs. Chemical pp.55-59; pp.61-62; pg. 82: 39,41,70; pg. 85 problems 4,10
- If you have a substance that goes through a type of change that involves a color change, how can you determine if it was a chemical or physical change?
- Fill in the chart describing the differences between solid, liquid, & gas as they go through phase changes

	SOLID	LIQUID	GAS
Fluidity			
Compressibility			
Relative speed & movement of particles			
Space between particles			
Effects of container on Volume			

- Law of Conservation of Mass pp.63
- Law of Definite and Multiple Proportions pp.75-77

6. Classify and describe matter as it relates to solid, liquid, & gas (4B) & element, compound, and mixture. (4C)

- States of Matter: Comparing Solids, Liquids, and Gases pp.58-60
- Pure Substances, Elements, Mixtures, and Compounds pp.66-71
- Draw how you would represent an element, a compound, and a mixture of all.
- Periodic Table Elements, Element Symbols pp.72-73
- Pg. 82 problems 43, 46, 48, 49

Chapter 4 – Structure of the Atom – TEKS Obj. 3E, 6A, 6B, 11B

7. Summarize the history of chemistry in terms of significant scientists' experiments and their development of the atomic model. (3E, 6A)

- Early Theories (Democritus, Aristotle, Dalton, Crooke, Thomson, Millikan, Rutherford, Chadwick) pp.87-97
- Review yellow boxes on p 88,89

Theorist	Prior Understanding of the Atom	Basics of Experiment	Results of Experiment	What they got credit for finding	New Model of the Atom
Democritus					
Aristotle					
John Dalton					
William Crooke					

J.J.Thomson					
Ernest Rutherford					
James Chadwick					

8. Distinguish between atoms and their isotopes including:

- Characteristics and Properties of Subatomic Particles —including location, charge and relative mass pp.92-97
- Atomic Number, Atomic Mass, Isotopes, Isotope stability (6A, 6B) pp.98-104; pg. 836 problem 44
- Radioactivity / Types of Radiation pp.105-107; pp.806-809
- Pg 112 problem 48, 49, 50; pg. 113 problem 72 complete the table

	Location	Relative Mass	Charge	Changing the amt makes a(n)
Proton				
Neutron				
Electron				

Chapter 25 – Nuclear Chemistry – TEKS Obj. 9A, 9B, 9C, 9D, 11B

9. Using nuclear reactions be able to calculate half lives (9B), write and balance nuclear equations. (11B, 11C), and apply properties of radioactive particles.

- Types of Nuclear Radiation- alpha, beta, gamma, alpha, positron pp.806-809

	Composition	Charge	Penetrating Ability	How to write the symbol
Alpha				
Beta				
gamma				

- Pg. 819 problems 17-19. Be able to interpret $\frac{1}{2}$ life graphs – ex Fig 25-13 pg. 817; Pg. 839 problems 2,3
- Radioactive Decay / Nuclear Stability pp.810-812
- Writing and Balancing Nuclear Equations pp.813-814
- Transmutation and Calculating Radioactive Decay Half-Life Rates pp.815-818

10. Differentiate nuclear fission and nuclear fusion in terms of masses, reactants, products, amount of energy, and their properties. (9A)

- Fission and Fusion of Atomic Nuclei pp.821-826

	FISSION	FUSION
Fuel source		
End product		
Advantages		
Disadvantages		
Practical as energy source?		
Basic process		

10. a. Evaluate the commercial use of nuclear reactions and the environmental implications. (3C, 9C, 9D)

- Problems Associated with Nuclear Waste Disposal pp.824-826
- Applications and Effects of Nuclear Reactions pp.827-831
 - List several ways that radiation can be used in a positive way.

Chapter 5 – Electrons in Atoms (OMIT section 5.1 & section 5.2) NO TEK Obj.

11. Using electron configurations, identify atoms and ions.

- Ground state and ion electron configurations pp. 135-140
 - Aufbau Principle, Pauli Exclusion Principle, Hund's Rule
 - orbital diagrams

Chapter 6 – The Periodic Table and Periodic Law – TEKS Obj. 3E, 4D, 6C

12. Trace the development and identify key features of the periodic table. (3E, 6C)

- Historical Development (Newlands, Meyer, Mendeleev, Mosley) pp.151-153
 - Relate the chemical and physical properties of an element to its position in the periodic table and its electron configuration.
 - Based on location, make inferences about the chemical behavior of an element as it relates to radius, ionization energy and electronegativity. (4D)
- Be familiar with Fig 5-17 on pg.135 & how to use it, as well as Fig 6-10 on pg.161 (s,p,d,f block elements)
- Pg. 148 problem 93; pg.149 problem 6; pg. 162 problems 9, 10, 12; pg. 175 problems 56, 65, 73
- From an electron configuration perspective, explain how/why ions are formed.
- Classification of Elements pp.154-162
- Periodic Trends pp.163-169
 - atomic number, nuclear charge, atomic radii, ionic radii, ionization energy, electronegativity
 - Relate the chemical and physical properties of an element to its position in the periodic table and its electron configuration.
 - Based on location, make inferences about the chemical behavior of an element as it relates to radius, ionization energy and electronegativity. (4D)

Chapter 8 and 9– Ionic Bonding and Covalent Bonding - TEKS Obj. 8A, 8B, 8C, 11A

13. Compare and contrast ionic and covalent bonds, metallic substances, and polymers.

- Ionic Bond Formation and Ionic Compound Properties pp.211-220
- Metallic Bonds and Properties of Metals pp.228-231
- Covalent Bond Formation, Bond Types, Characteristics pp.241-247; Properties pp.266
- Be familiar with polyatomic ions
- Draw a molecular picture of a compound of salt.
- Draw a molecular picture of a compound of water

	Types of Elements Involved	What happens to electrons?	What types of compounds are made?	Which have higher melting points?	From what do you decide how to write the formula?	Given the formula, what needs to be added to the elements to name?
IONIC						
COVALENT						

14. Given the formula name, write the chemical formula or given name, write the formula. (11A)

- Naming and Writing Polyatomic Ions pp.919 Table C-8
- Naming and Writing Ionic Compound Formula pp.221-227
- Naming Molecules and Writing Molecular Compound Formulas pp.248-251
- P237: 78,88, 100; p273: 96, 97, 105 (ignore hybrid orbitals), 115, 116

15. Using Lewis structures, be able to determine bond polarity, predict the shapes of molecules, and determine if a molecule is polar or non-polar.

- Lewis Dot Structures pp.252-258
- Molecular Shapes pp.259-262; Table 9-3 pg. 260
- Polar and Non-polar Molecules pp.265

Chapter 10 - Chemical Reactions – TEKS Obj. 2C, 5A, 11B, 11C

16. Write balanced chemical equations and identify endothermic and exothermic reactions.

- Endothermic and Exothermic Energy in Reactions pp.247; pp.500
- Be able to interpret an energy diagram
- Writing and Balancing Chemical Reactions Equations pp.278-283
- Pg. 305 problems 72/76, 73/77
- Types of Chemical Reactions and Predicting Reaction Products pp.284-291
- Pg. 305 problems 81,82