WHITEHALL-COPLAY SCHOOL DISTRICT CURRICULUM MAP

Course: Honors Chemistry I	**Unit** **Safety & Lab Experiments Throughout Course**	**Grade/Level: 10-12**

Standards: 3.2 Physical Science

Number of Instructional Days	**Concepts**	**Practices**	**Key Vocabulary**	**Materials, Resources, Activities, Technology, Literacy Strategies**	**Assessments**
1-3 days per unit	Analyze and explain the nature of Science in the search for understanding the natural world and its connection to technological systems. Analyze and explain how to verify the accuracy of scientific facts, principles, theories, and laws. Apply knowledge of scientific investigation or technological design to develop or critique aspects of the experimental or design process. Use data to make inferences and predictions, or to draw conclusions, demonstrating understanding of experimental limits. Identify and safely use a variety of tools, basic machines, materials and techniques to solve problems and answer questions.	Critique the results and conclusions of scientific inquiry for consistency and logic. Communicate results of investigations using multiple representations. Evaluate appropriate technologies for a specific purpose or describe the information the instrument can provide. Evaluate appropriate methods, instruments, and scale for precise quantitative and qualitative observations (e.g., to compare properties of materials). Compare observations of the real world to observations of a constructed model. Compare the accuracy of predictions represented in a model to actual observations and behavior.	lab equipment safety equipment	Labs / Experiments Lab Demonstrations Virtual Labs	Lab Quizzes

Course: Honors Chemistry I	Unit Scientific Measurement	Grade/Level: 10-12

Standards: 3.2 Physical Science

Number of Instructional Days	Concepts	Practices	Key Vocabulary	Materials, Resources, Activities, Technology, Literacy Strategies	Assessments
12	Structure and Properties of Matter	3.2.5.B Make and communicate observations and measurements to identify materials based on their properties. 3.2.5.C Interpret and analyze data to make decisions about how to utilize materials based on their properties.	accepted value, accuracy, calorie, Celsius scale, conversion factor, density, dimensional analysis, energy, error, experimental value, gram, International System of Units, joule, Kelvin scale, kilogram, liter, measurement, meter, percent error, precision, scientific notation, significant figures, temperature, weight	Guided Practice Sheets Possible Experiments: Sig Fig Ruler Measurement Scramble	Lab Quizzes Content Quizzes Vocab Quiz Test

Course: Honors Chemistry I	Unit	Grade/Level: 10-12

	Atomic Structure	

Standards: 3.2 Physical Science

Number of Instructional Days	Concepts	Practices	Key Vocabulary	Materials, Resources, Activities, Technology, Literacy Strategies	Assessments
12	Structure and Properties of Matter	3.2.5.A Develop a model to describe that matter is made of particles too small to be seen. 3.2.6-8.A Develop models to describe the atomic composition of simple molecules and extended structures.	atom, atomic mass, atomic mass unit (amu), atomic number, cathode ray, Dalton's atomic theory, electron, isotopes, mass number, neutron, nucleus, proton	Guided Practice Sheets Possible Experiments: Zephyr Boxes The Atomic Mass of Beanium Isotopes	Lab Quizzes Content Quizzes Vocab Quiz Test

	Electrons in Atoms	

Standards: 3.2 Physical Science

Number of Instructional Days	Concepts	Practices	Key Vocabulary	Materials, Resources, Activities, Technology, Literacy Strategies	Assessments
12	Wave Properties Electromagnetic Radiation	3.2.9-12.T Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media. 3.2.9-12.W Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter.	amplitude, atomic emission spectrum, atomic orbital, aufbau principle, electromagnetic radiation, electron configuration, energy levels, frequency, ground state, Heisenberg uncertainty principle, hertz, Hund's rule, Pauli exclusion principle, photons, quantum mechanical model, spectrum, wavelength	Guided Practice Sheets Possible Experiments: Wave View of H Atom Flame Test Atomic Emission Spectra	Lab Quizzes Content Quizzes Vocab Quiz Test

Course: Honors Chemistry I	Unit The Periodic Table	Grade/Level: 10-12

Standards: 3.2 Physical Science

Number of Instructional Days	Concepts	Practices	Key Vocabulary	Materials, Resources, Activities, Technology, Literacy Strategies	Assessments
12	Structure and Properties of Matter	3.2.9-12.A Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms. 3.2.9-12.C Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.	alkali metals, alkaline earth metals, anion, atomic radius, cation, electronegativity, halogens, inner transition metal, ion, ionization energy, metalloids, metals, noble gases, nonmetals, periodic law, representative elements, transition metal	Guided Practice Sheets Possible Experiments: Periodic Trends The Periodic Law	Lab Quizzes Content Quizzes Vocab Quiz Test

	Ionic and Metallic Bonding	

Standards: 3.2 Physical Science

Number of Instructional Days	Concepts	Practices	Key Vocabulary	Materials, Resources, Activities, Technology, Literacy Strategies	Assessments
12	Structure and Properties of Matter	3.2.9-12.B Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	alloys, chemical formula, electron dot structure, formula unit, ionic bonds, ionic compounds, metallic bonds, octet rule, valence electron	Guided Practice Sheets Possible Experiments: Ionic Vs. Covalent Bonds Gold Penny	Lab Quizzes Content Quizzes Vocab Quiz Test

Course: Honors Chemistry I	Unit Chemical Names & Formulas	Grade/Level: 10-12

Standards: 3.2 Physical Science

Number of Instructional Days	Concepts	Practices	Key Vocabulary	Materials, Resources, Activities, Technology, Literacy Strategies	Assessments
12	Structure and Properties of Matter	3.2.9-12.B Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	acid, base, binary compound, law of definite proportions, law of multiple proportions, monatomic ion, polyatomic ion	Guided Practice Sheets Possible Experiments: Ionic Chemical Names and Formulas	Lab Quizzes Content Quizzes Vocab Quiz Test

Course: Honors Chemistry I	Unit Chemical Quantities	Grade/Level: 10-12

Standards: 3.2 Physical Science

Number of Instructional Days	Concepts	Practices	Key Vocabulary	Materials, Resources, Activities, Technology, Literacy Strategies	Assessments
12			Avogadro's hypothesis, Avogadro's number, empirical formula, molar mass, molar volume, mole (mol), percent composition, representative particle, standard temperature and pressure (STP)	Guided Practice Sheets Possible Experiments: Determining Number Without Counting Hydrates	Lab Quizzes Content Quizzes Vocab Quiz Test

	Chemical Reactions	

Standards: 3.2 Physical Science

Number of Instructional Days	Concepts	Practices	Key Vocabulary	Materials, Resources, Activities, Technology, Literacy Strategies	Assessments
12	Structure and Properties of Matter Chemical Reactions	3.2.9-12.D Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy. 3.2.6-8.D Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.	activity series, balanced equation, catalyst, chemical equation, coefficients, combination reaction, combustion reaction, complete ionic equation, decomposition reaction, double-replacement reaction, single-replacement reaction, skeleton equation	Guided Practice Sheets Possible Experiments: Gummy Bear & PhET Types of Reactions	Lab Quizzes Content Quizzes Vocab Quiz Test

	Stoichiometry	

Standards: 3.2 Physical Science

Number of Instructional Days	Concepts	Practices	Key Vocabulary	Materials, Resources, Activities, Technology, Literacy Strategies	Assessments
12	Chemical Reactions	3.2.9-12.G Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction. 3.2.6-8.E Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.	actual yield, excess reagent, limiting reagent, mole ratio, percent yield, stoichiometry, theoretical yield	Guided Practice Sheets Possible Experiments: S'mores & PhET Making Silver	Lab Quizzes Content Quizzes Vocab Quiz Test