Science Honors Geophysical Science Unit 8: Chemical Bonding

	Causation: Nothing "just happens". Everything is caused.
	 Interrelatedness: Everything in the universe is connected to
	everything else in the universe.
Essential	 Dynamism: Everything is changing in some way all the time.
Understandings	Entropy: Change has direction. Generally, simple precedes
	complex. Generally, order changes toward disorder.
	 Uniformitarianism: The way the universe works today is the way it
	worked yesterday and the way it will work tomorrow.
	How do atoms combine?
	• Under what circumstances do atoms combine?
Essential	 How is the Law of Conservation of Mass demonstrated when
Questions	atoms combine?
	What determines the polarity of molecules?
	How are molecules different from ionic compounds?
	What are chemical reactions?
	What are the basic chemical reactions?
	 How can balanced chemical equations be used to predict the
	outcomes of reactions?
	What is Avogadro's Law?
	What is molarity?
	What is stoichiometry?
	 Covalent bonds are formed by sharing of electrons.
Essential	 lonic bonds are formed by transferring of electrons.
Knowledge	 Compounds are formed with outer shell electrons.
	Atoms combine in whole number ratios.
	Molecular symmetry determines polarity. - Delanced shaming a gustiana are important shaming to all.
	 Balanced chemical equations are important chemical tools. Stoichiometry is using balanced equations to determine
	 Stoichiometry is using balanced equations to determine quantitative results.
	There are six basic chemical reactions. There are six basic chemical reactions.
	Terms:
Vocabulary	o chemical bonding, ionic bond, covalent bond, ion, polar and
Vocabulary	nonpolar molecule, oxidation number/state, molecules,
	compound, Avogadro's Law, molarity, stoichiometry.
	 Writing chemical formulae with correct subscripts.
	 Predicting how atoms will combine using the Periodic Table.
Essential	Demonstrating the Law of Conservation of Matter by writing
Skills	chemical formulae and balancing chemical equations.
	 Using balanced equations to solve word problems, predicting the
	quantitative outcome of reactions.
	 Describing how molecules and ionic compounds differ.

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Related Maine Learning Results

Science and Technology

A. Unifying Themes

A2.Models

Students evaluate the effectiveness of a model by comparing its predications to actual observations from the physical setting, the living environment, and the technological world.

B. The Skills and Traits of Scientific Inquiry and Technological Design B1. The Skills and Traits of Scientific Inquiry

Students methodically plan, conduct, analyze data from, and communicate results of in-depth scientific investigations, including experiments guided by a testable hypothesis.

- a. Identify questions, concepts, and testable hypotheses that guide scientific investigations.
- b. Design and safely conduct methodical scientific investigations, including experiments with controls.
- c. Use statistics to summarize, describe, analyze, and interpret results.
- d. Formulate and revise scientific investigations using logic and evidence.
- e. Use a variety of tools and technologies to improve investigations and communications.
- f. Recognize and analyze alternative explanations and models using scientific criteria.
- g. Communicate and defend scientific ideas.

D. The Physical Setting

D3.Matter and Energy

Students describe the structure, behavior, and interactions of matter at the atomic level and the relationships between matter and energy.

- Describe the structure of atoms in terms of neutrons, protons, and electrons and the role of the atomic structure in determining chemical properties.
- b. Describe how the number and arrangement of atoms in a molecule determine a molecule's properties, including the types of bonds it makes with other molecules and its mass, and apply this to predictions about chemical reactions.
- c. Explain the essential roles of carbon and water in life processes.
- d. Describe how light is emitted and absorbed by atoms' changing energy levels, and how the results can be used to identify a substance.
- e. Describe factors that affect the rate of chemical reactions (including concentration, pressure, temperature, and the presence of molecules that encourage interaction with other molecules.

Science Honors Geophysical Science Unit 8: Chemical Bonding

f. Apply an understanding of the factors that affect the rate of chemical reactions. g. Describe nuclear reactions, including fusion and fission, and the energy they release. h. Describe the radioactive decay and half-life. i. Explain the relationship between kinetic and potential energy and apply the knowledge to solve problems. j. Describe how in energy transformations the total amount of energy remains the same, but because of inefficiencies (heat, sound, and vibration) useful energy is often lost through radiation or conduction. k. Apply an understanding of energy mains the same, but because of inefficiencies (heat, sound, and vibration) useful energy is often lost through radiation or conduction. k. Apply an understanding of energy transformations the total amount of energy remains the same, but because of inefficiencies (heat, sound, and vibration) useful energy is often lost through radiation or conduction. k. Apply an understanding of energy transformation to solve problems. l. Describe the relationship among heat, temperature, and pressure in terms of the actions of atoms, molecules, and ions. Lecture Chemical reactions demonstration Sample Lessons Activities Radian problemical equations Copper extraction laboratory Solving chemical equations Copper extraction laboratory Solving chemical equation word problems Laboratory experiments and reports Laboratory experiments and reports Chapter tests Laboratory experiments and reports Formative classroom assessments Portfolio Project (science content and literacy) Publications: Glencoe Physical Science MARVEL Data bases* Addiovisual:		f And an about the state of the
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