

Rocky Mountain Math and Science Middle School Project

Syllabus: Chemistry Course 1-Atoms, Molecules, and Properties of Matter

Instructors: Doris Kimbrough, Scott Wallace, and Sharon Johnson

6/4/07

Big Ideas	Atoms & Atomic Theory Continued	Nuclear Chemistry	Periodic Properties of Elements	Periodic Properties Continued	Molecules, Compounds and Chemical Reactions
Chemistry Concepts	<p>B. Electrons & Atoms</p> <ul style="list-style-type: none"> • Bohr Model • Law Vs. Theory • Electromagnetic Spectrum • Electron Energy Levels • Probability Density Functions (Beyond the Bohr Model) 	<p>A. Nuclear Stability</p> <p>B. Radioactivity</p> <ul style="list-style-type: none"> • Alpha Emission • Beta Emission • Gamma Emission • Half-life <p>C. Nuclear Fission</p> <ul style="list-style-type: none"> • Nuclear Power <p>D. Nuclear Fusion</p>	<p>A. Periodic Table</p> <ul style="list-style-type: none"> • metals/nonmetals • main group • ionic charges <ul style="list-style-type: none"> • Noble gases • Transition Metals • Lanthanides and Actinides 	<p>B. Periodic Properties</p> <ul style="list-style-type: none"> • atomic size • atomic radius • Ionic Size • Ionization Energy <p>C. Other Trends</p> <ul style="list-style-type: none"> • Physical Properties • Ion Formation • Reactivity 	<p>A. Compounds</p> <ul style="list-style-type: none"> • chem formulas • ionic compounds • polyatomic ions • molecular formula <p>B. Bonding</p> <ul style="list-style-type: none"> • covalent • Lewis dot • multiple
Hands-on Labs & Activities	<p>#15. Spectroscopy (Gas Tubes)</p> <p>#16. Orbitals Chart</p> <p>#17. Marshmallow Atoms</p>	<p>#18. Nuclear Chain Reaction</p> <p>#19. Half-Life</p> <p>#20. Power Plant Simulation (CL)</p>	<p>#21. Periodic Table Websites (CL)</p> <p>#22. Metal Reactivity Series</p>	<p>#23. Reaction in A Baggie</p>	<p>#24. Dry Ice & Mag</p>
CL=Computer Lab Activity					
Minds-on Readings, Problems, Activities	<p>PP#4. Atoms and Atomic Theory</p> <ul style="list-style-type: none"> • Problems <p>Reading: Electromagnetic Spectrum</p>	<p>PP#5. Nuclear Chemistry</p> <ul style="list-style-type: none"> • Problems 	<p>PP#6. Periodic Table</p> <ul style="list-style-type: none"> • Problems <p>Reading: Elements</p>	<p>PP#6. Cont.</p> <ul style="list-style-type: none"> • Problems <p>Mixer: Elements</p>	<p>PP#7. Molecules, Compounds and Chemical Reactions</p> <ul style="list-style-type: none"> • Problems
Pedagogy	<p>Strategy: Word Splash</p>	<p>Strategy: Using Technology to Develop Concepts</p>	<p>Strategy: Graphic Organizer</p>	<p>Strategy: Student Questioning</p>	<p>Strategy: Sheltered Lesson</p>
Assignments & Assessments	<p>Atom Model</p> <p><i>Notebook Entries</i> <i>Exit Cards</i></p>	<p><i>Notebook Entries</i> <i>Exit Cards</i></p>	<p>Element Poster</p> <p><i>Notebook Entries</i> <i>Exit Cards</i></p>	<p>Gate 2: Periodic Table</p> <p><i>Notebook Entries</i> <i>Exit Cards</i></p>	<p><i>Notebook Entries</i> <i>Exit Cards</i></p>

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Big Ideas	Molecules, Compounds and Chemical Reactions	Molecules Continued	Polymers	Induced Dipoles	Review
Chemistry Concepts	C. Molecular Geometry Valence Shell Electron Pair Repulsion (VSEPR) •Tetrahedral •Trigonal pyramid •Bent or Nonlinear	D. Polar Covalent Bonds •Molecular Polarity E. Chemical Reactions •Equations •The Mole	A. Polymer •definition •structure •synthetic •Types •condensation •cross-linked •Biological •carbohydrates •proteins	A. Induced Dipoles •Temporary •Polarizability B. Properties of Liquids •Stronger IMAF •Boiling Point •Surface Tension •Capillary Action •Density	As requested by class
Hands-on Labs & Activities	25. CHIME (CL) 26. Molecular Model Building	27. Electrolysis of Water 28. Balancing Equations (CL) 29. Snowmen Equations 30. Molar Koolaid	31. Gloop 32. Ghost Crystals	33. Surface Tension Series (Pepper & Pins) 34. Cat's Meow 35. Chromatography 36. Density Explorations •Ice/Oil, raisins, column, grapes, spheres, liquids, wands & jars, cubes & cylinders	37. Physical vs. Chemical Change Stations
CL=Computer Lab Activity					
Minds-on Readings, Problems, Activities	PP#7. Cont. •Problems	PP#7 Cont. •Problems	PP#8. Polymers •Problems	PP#9. Induced Dipoles	PP#9. Cont.
Pedagogy	Science & Literacy Connection	Strategy: Guided Practice	Strategy: Student Generated Labs	Assessing Learning	Performance Assessment
Assignments & Assessments	Gate 3: Bonding and Molecular Geometry <i>Notebook Entries</i> <i>Exit Cards</i>	Gate 4: Molecular Molarity & Chemical Reactions <i>Notebook Entries</i> <i>Exit Cards</i>	Gate 5: Polymers <i>Notebook Entries</i> <i>Exit Cards</i>	Density Learning Cycle Mini-unit <i>Notebook Entries</i> <i>Exit Cards</i>	TCl: Post-assess <i>Notebook Entries</i> Final Evaluation