

Chemistry for Grade 7
2017 Science P.L.U.S. Institute
Roper Mountain Science Center
Greenville, South Carolina

Academic Course Description:

Hands-on, inquiry-based activities emphasizing science process skills will provide the vehicles for studying concepts that correlate to the South Carolina Science Academic Standards and Science and Engineering Practices for seventh grade chemistry. Course topics are designed to enhance the middle school teacher's chemistry knowledge base and provide appropriate lessons for the 7th grade science classroom. Activities are aimed at developing awareness in students of the basic processes of combining atoms into groups, covalent and ionic bonding of atoms, distinguishing elements from compounds, molecules and mixtures, characterizing compounds and molecules, distinguishing between acids and bases and recognizing chemical changes versus physical changes.. Participants receive a significant quantity of materials for performing the activities in their own classrooms. Hands- on lab activities and teacher demonstrations will allow participants to become familiar with products and lab supplies.

Outline of Course Content:

Physical Science: Classification and Conservation of Matter 7.P.2 - The student will demonstrate an understanding of the structure and properties of matter and that matter is conserved as it undergoes changes.

Unit Driving Question: What are the structures and properties of matter and how is matter conserved as it undergoes changes?

| | Topics | Activities or Assignments | Correlation to SC Science Academic Standards |
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| Monday | <ul style="list-style-type: none"> • Lab Safety • Interactive Notebook • Atomic Structure Atomic Model Pizza Box • Identifying Elements • Classification of Matter • Kesler Labs – Atoms & Molecules | <ol style="list-style-type: none"> 1. Create and compare various models of elements such as Bohr and Lewis Structure. 2. The Atoms Family Album 3. The Atoms Family Song 4. Atomic Basics 5. The Atoms Family Math Challenge 6. Bohr Bingo 7. Candy Bohr and Lewis Models 9. Virtual Labs (PHET and Gizmos) 10. Construct Molecular Models 11. Lab safety and MSD 12. Swoosh Bottle Rocket | <p>7.P.2.A All substances are composed of one or more elements. Elements are pure substances which contain only one kind of atom. The periodic table organizes these elements based on similar properties. Compounds are substances composed of two or more elements. Chemical formulas can be used to describe compounds</p> <p>7.P.2A.1 Develop and use simple atomic models to illustrate the components of elements (including the relative position and charge of protons, neutrons, and electrons).</p> |
| Tuesday | <ul style="list-style-type: none"> • Organization of the Periodic Table • History of the Periodic Table • Identifying Substances C, M, E | <ol style="list-style-type: none"> 1. Element/Periodic Table Matching Card Game 2. Discovering Elements in everyday life in The Element 3. Fabulous Periodic Eggs 4. Alien Periodic Table 5. Periodic Table Basics 6. History of the Periodic Table - That is NOT Where That Element Goes! - 7. Putting the World in a Box (Target Inquiry) 8. The Nuts & Bolts – illustrate C, M, E 9. Kesler Lab Periodic Table 10. Kesler Lab Compound, Mixture, & Element 11. Periodic Table Battleship 12. Lab Stations – Mixtures vs Solutions 13. Water Electrolysis 14. Mixtures in a Bag 15. Elephants Toothpaste | <p>7.P.2A.2 Obtain and use information about elements (including chemical symbol, atomic number, atomic mass, and group or family) to describe the organization of the periodic table</p> <p>7.P.2A.3 Analyze and interpret data to describe and classify matter as pure substances (elements or compounds) or mixtures (heterogeneous or homogeneous) based on composition</p> |

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| Wednesday | <ul style="list-style-type: none"> • Ionic and Covalent Bonds • Physical and Chemical Properties of substances • Physical and Chemical Changes | <ol style="list-style-type: none"> 1. Octet Rules; An Atom Bonding Dating Game 2. I Want to Bond With You (Target Inquiry) 3. Sugar or Salt? Ionic and Covalent Bonds 4. Rotation Labs set up to experiment with various substances, metals vs nonmetals 5. Density Column 6. Bonding Challenge 7. Lab Stations Ionic vs. Covalent 8. Lab Characteristics of Metals and Non metals 9. Lab Physical and Chemical Properties Lab 10. Lego Chemical Reactions 11. Yeast Lab 12. Change You Can Believe In (Target Inquiry) 13. The Only Thing Constant In Life is Change (Target Inquiry) 14. It's In the Bag - representing Chemical Change 15. Flame Test Demo | <p>7.P.2A.4 Construct explanations for how compounds are classified as ionic (metal bonded to nonmetal) or covalent (nonmetals bonded together) using chemical formulas.</p> <p>7.P.2B.1 Analyze and interpret data to describe substances using physical properties (including state, boiling/melting point, density, conductivity, color, hardness, and magnetic properties) and chemical properties (the ability to burn or rust).</p> <p>7.P.2B.4 Plan and conduct controlled scientific investigations to answer questions about how physical and chemical changes affect the properties of different substances.</p> |
| Thursday | <ul style="list-style-type: none"> • Acids and Bases • Density • Chemical Reactions | <ol style="list-style-type: none"> 1. Density Lab with sphere 2. Coke vs Diet Coke Density 3. Acids and Base Lab 4. Before and After Reactions Lab 5. Law of Conservation of Mass – I Am What I Am 6. Density Lab: Calculate density of common substances (use water displacement) 7. Red Cabbage Juice 8. Mystery Message 9. Counting Atoms 10. Balancing Equations using Candy 11. Balancing Chemical Equations Kit | <p>7.P.2B.2 Use mathematical and computational thinking to describe the relationship between the mass, volume, and density of a given substance.</p> <p>7.P.2B.3 Analyze and interpret data to compare the physical properties, chemical properties (neutralization to form a salt, reaction with metals), and pH of various solutions and classify solutions as acids or bases.</p> <p>7.P.2B.5 Develop and use models to explain how chemical reactions are supported by the law of conservation of matter.</p> |
| Friday | <ul style="list-style-type: none"> • Technology Integration in Chemistry • Fun Chemistry Experiments • Reading in Science • Inquiry Role Cards | <ol style="list-style-type: none"> 1. Teaching Chemistry with Toys 2. Turning it into Inquiry: Role Cards 4. Common Misconceptions 5. Flipping a Classroom 6. Creating Rotation Stations | <p>7.P.2 The student will demonstrate an understanding of the structure and properties of matter and that matter is conserved as it undergoes changes.</p> |