

Storyline – Part 1: Characteristic Properties of Matter

<p>Lesson One</p> <p>Our Ideas About Matter</p>	<p>Part One</p> <p>What is matter?</p> <p>1.1 - 1.8</p> <p>Students engage in a circuit of eight mini-inquiries to observe and question how matter behaves.</p>		
<p>Lesson Two</p> <p>Determining Density</p>	<p>2.1</p> <p>How do we measure the mass and volume of water?</p> <p>Measuring the Mass & Volume of Water</p> <p>Students measure the mass and volume of two samples of water.</p>	<p>2.2</p> <p>Do all substances have the same density?</p> <p>Comparing the Densities of Different Substances</p> <p>Students measure and compare the densities of four substances as regular-shaped objects.</p>	<p>2.3</p> <p>How do we measure the density of irregular objects?</p> <p>Measuring the Density of Irregular Objects</p> <p>Students measure and compare the densities of three substances as irregular-shaped objects.</p>
<p>Lesson Three</p> <p>Density Predictions</p>	<p>3.1</p> <p>What is the relationship between density and floating and sinking?</p> <p>Building a Density Column</p> <p>Students measure and use the density of three liquids to predict how the liquids and two solids will behave when mixed.</p>		
<p>Lesson Four</p> <p>Do Gases Have Density?</p>	<p>4.1</p> <p>How do we measure the density of air?</p> <p>Finding the Density of Air</p> <p>Students measure the mass and volume of a sample of air and discuss the accuracy of the procedure.</p>		

<p>Lesson Five</p> <p>Temperature and Density</p>	<p>5.1</p> <p>How do liquid thermometers measure temperature?</p> <p>Building a Thermometer</p> <p>Students build a working liquid thermometer and explain how expansion and contraction lead to changes in volume and density of the liquid.</p>	<p>5.2</p> <p>How do gas thermometers measure temperature?</p> <p>Replacing the Liquid with Air</p> <p>Students build a working gas thermometer and compare its calibration response time to their liquid thermometers.</p>	<p>5.3</p> <p>What happens to a metal strip when heated?</p> <p>Heating the Metal Strip</p> <p>Students predict and observe what happens to a bimetal strip when heated and try to explain their observations.</p>
<p>Lesson Six</p> <p>Applying the Heat</p>	<p>6.1</p> <p>What happens to substances when they are heated?</p> <p>Heating Substances</p> <p>Students observe the properties of seven substances before, during, and after heating to look for chemical changes.</p>		
<p>Lesson Seven</p> <p>Just a Phase</p>	<p>7.1</p> <p>What happens to ice as it is heated to boiling and beyond?</p> <p>Heating Ice Water</p> <p>Students measure and graph the temperature of ice water as it is heated. Students interpret their graphs and draw conclusions about phase change.</p>		
<p>Lesson Eight</p> <p>Changing Matter and Mass</p>	<p>8.1</p> <p>What is the effect of melting on the mass of a sample of ice?</p> <p>Investigating Mass and Melting</p> <p>Students measure the mass of some ice in a closed system before and after melting to determine if there are any changes.</p>	<p>8.2</p> <p>What is the effect of freezing on the mass of a sample of water?</p> <p>Investigating Mass and Freezing</p> <p>Students measure the mass of some water in a closed system before and after freezing to determine if there are any changes.</p>	

<p>Lesson Nine</p> <p>The Mystery Object</p>	<p style="text-align: center;">9.1</p> <p style="text-align: center;">How can the properties of a substance determine its composition?</p> <p style="text-align: center;">What Substance Makes up My Mystery Object?</p> <p style="text-align: center;"><i>Performance Assessment</i></p> <p style="text-align: center;">Students use their own ideas to measure and test their mystery objects to determine the substance from which the objects are made.</p> <p style="text-align: center;"><i>Written Assessment</i></p> <p style="text-align: center;">Students complete a written assessment of the material covered in Part 1 of this module.</p>
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Storyline – Part 2: Mixtures and Solutions

<p>Lesson Ten</p> <p>Starting the Anchor Activity</p>	<p>What is my product made of?</p> <p>Introducing the Anchor Activity</p> <p>Students choose a simple product and complete a research project about its composition.</p>	
<p>Lesson Eleven</p> <p>Pure Substance or Mixture?</p>	<p>11.1</p> <p>How can we distinguish between pure substances and mixtures?</p> <p>Determining Whether Substances are Pure or Mixtures</p> <p>Students use their own methods to test 8 samples of matter and determine whether they are pure substances or mixtures, based on a class discussion about these classifications.</p>	
<p>Lesson Twelve</p> <p>What Happens When Substances Are Mixed With Water?</p>	<p>12.1</p> <p>What happens to substances when water is added to them?</p> <p>Adding Water to Substances</p> <p>Students observe what happens when 5 substances are mixed with water and begin to identify the characteristics of solutions.</p>	
<p>Lesson Thirteen</p> <p>How Much Solute Dissolves in a Solvent?</p>	<p>13.1</p> <p>How do we determine when a solution is saturated?</p> <p>Saturating a Solution</p> <p>Students make a saturated solution of sodium chloride and water.</p>	<p>13.2</p> <p>How do we determine the solubility of a substance?</p> <p>Determining Solubility</p> <p>Students measure and compare the solubility of sodium chloride to sodium nitrate.</p>

<p>Lesson Fourteen</p> <p>Mass, Volume, and Dissolving</p>	<p>14.1</p> <p>How does making a solution affect the mass and volume of its components?</p> <p>Mixing Water and Alcohol</p> <p>Students measure the mass and volume of a solute and solvent and compare to the mass and volume of the resulting solution.</p>	<p>14.2</p> <p>What happens to the mass of a substance when the substance dissolves?</p> <p>Dissolving a Solid and Measuring Mass</p> <p>Students measure the mass of a sample of sodium chloride before and after dissolving in water.</p>	
<p>Lesson Fifteen</p> <p>Separating a Soluble and an Insoluble Substance</p>	<p>15.1</p> <p>How does dissolving affect filtration?</p> <p>Filtering a Solution</p> <p>Students use a filter to try to separate a soluble and insoluble substance from water.</p>	<p>15.2</p> <p>How is rock salt purified?</p> <p>Cleaning Rock Salt</p> <p>Students design a procedure to clean rock salt using the processes of filtration and evaporation.</p>	
<p>Lesson Sixteen</p> <p>Researching Solvents</p>	<p>16.1</p> <p>How do we know what solvents to use to remove stains?</p> <p>Removing Stains</p> <p>Students design an investigation to test the effectiveness of several solvents in removing various stains from fabric.</p>		
<p>Lesson Seventeen</p> <p>Separating Solutes</p>	<p>17.1</p> <p>How can we tell if one ink is a mixture of pigments?</p> <p>Analyzing Inks</p> <p>Students will use chromatography paper to separate the components of a sample of green ink.</p>	<p>17.2</p> <p>How do the components of an ink affect the color of the ink?</p> <p>Comparing Inks</p> <p>Students will compare the chromatograms from four different colors of ink.</p>	<p>17.3</p> <p>How can we tell if two black inks are made from the same components?</p> <p>Identifying Inks</p> <p>Students will use the process of chromatography to solve a “crime.”</p>

<p>Lesson Eighteen</p> <p>Changing Mixtures</p>	<p>18.1</p> <p>How do impurities affect the melting point of a substance?</p> <p>Adding Salt to Ice</p> <p>Students will measure the temperature of ice before and after adding salt.</p>	<p>18.2</p> <p>How do impurities affect the boiling point of a substance?</p> <p>Adding Salt to Boiling Water</p> <p>Students will measure the boiling point of water and add salt to see if the boiling point is affected.</p>	<p>18.3</p> <p>How does the composition of a solution affect its characteristic properties?</p> <p>Investigating Solid Solutions</p> <p>Students will measure the melting point of three alloys.</p>
<p>Lesson Nineteen</p> <p>Assessing Our Progress</p>	<p>19.1</p> <p>How do the properties of substances help identify the components of a mixture?</p> <p>Describing the Components of a Mixture</p> <p><i>Performance Assessment</i></p> <p>Students use their own ideas to determine the physical properties of the components of a mixture.</p> <p><i>Written Assessment</i></p> <p>Students complete a written assessment of the material covered in Part 2 of this module.</p>		

Storyline – Part 3: Compounds, Elements, and Chemical Reactions

<p>Lesson Twenty</p> <p>Breaking Down a Compound</p>	<p>20.1</p> <p>What happens when electricity is passed through water?</p> <p>Splitting Water</p> <p>Students decompose water into hydrogen and oxygen gases.</p>	
<p>Lesson Twenty-One</p> <p>Examining and Grouping Elements</p>	<p>21.1</p> <p>How were elements originally classified?</p> <p>Investigating and Classifying Elements</p> <p>Students observe and test elements to determine their physical properties and create a classification system.</p>	
<p>Lesson Twenty-Two</p> <p>Combining Elements</p>	<p>22.1</p> <p>Why is the periodic table divided into two main categories?</p> <p>Splitting the Periodic Table</p> <p>Students determine the basis for the classifications of metals and non-metals.</p>	<p>22.2</p> <p>Where do compounds come from?</p> <p>Reacting Two Elements</p> <p>Students create a chemical reaction and construct a simple formula to represent the reaction.</p>
<p>Lesson Twenty-Three</p> <p>Chemical Reactions Involving Metals</p>	<p>23.1</p> <p>How do various metals react to acid?</p> <p>Comparing the Reactions of Different Metals with Acid</p> <p>Students submerge four metals in dilute hydrochloric acid and record the reactions.</p>	<p>23.2</p> <p>What is corrosion?</p> <p>Investigating Corrosion</p> <p>Students design an investigation to test the corrosion of four metals in air and water.</p>

<p>Lesson Twenty-Four</p> <p>Countering Corrosion</p>	<p style="text-align: center;">24.1</p> <p style="text-align: center;">What substances can prevent rusting?</p> <p style="text-align: center;">Can Rusting Be Stopped?</p> <p style="text-align: center;">Students design an investigation to compare the effectiveness of five rust-prevention techniques.</p>
<p>Lesson Twenty-Five</p> <p>Mass and Chemical Reactions</p>	<p style="text-align: center;">25.1</p> <p style="text-align: center;">Does the Law of Conservation of Mass Apply to Chemical Reactions?</p> <p style="text-align: center;">Measuring the Mass of Reactants and Products</p> <p style="text-align: center;">Students measure the mass of the reactants and products of a chemical reaction in a closed and in an open system.</p>
<p>Lesson Twenty-Six</p> <p>End of Module Assessment</p>	<p style="text-align: center;">26.1</p> <p style="text-align: center;">How well can you apply what you have learned during our study of Properties of Matter?</p> <p style="text-align: center;"><i>Performance Assessment</i></p> <p style="text-align: center;">Students follow a procedure to investigate changes in mass by making solutions and reacting substances.</p> <p style="text-align: center;"><i>Written Assessment</i></p> <p style="text-align: center;">Students complete a written assessment of the material covered in Part 3 of this module.</p>