

Grade 8 Science (Master)

	Essential Questions	Content	Skills
Fall	<p>Safety Why is lab safety essential?</p> <p>How is equipment set-up used to record and analyze data?</p> <p>Why are data variations reported when measuring the same object with the same measurement tool?</p>	<p>A. Lab safety - Personal Safety - equipment use/safety - Chemical use/safety - Reporting accidents/breakage</p> <p>B. Mixtures/pure substance - differences of each type</p>	<p>A. Demonstrate safety skills in all laboratory activities</p> <p>B. Identifying a substance as a mixture or pure substance B. Investigate the composition of a substance using distillation techniques B. Analyze the products collected for the distillation of a substance</p>
	<p>How is the conservation of mass related to the Laws of Nature and are volume and mass always conserved in an experiment?</p> <p>What are the various sources of error that must be accounted for in an experiment?</p>	<p>A. Volume - regular/irregular objects -direct/indirect measurement</p> <p>B. Mass/weight - difference between - proper use of equipment</p> <p>C. Instrument/Data Precision</p> <p>D. Laws of nature - Newton’s laws of motion - Conservation of mass - Egg drop project</p>	<p>A/B/C/D. Integrate technology and tools of science to observe, measure, and record data A/B/C/D. Establish a method of standardizing student estimates of measurement A/B/C/D. Analyze individual and class data by evaluating histogram graphs A/B/C/D. Identify forms of avoidable and unavoidable error in an experiment A/B/C/D. Recognize that mass and volume are not characteristic properties of matter but quantities of matter</p> <p>D. Design and create egg container for drop project</p>
	<p>What variables may influence the boiling point of a liquid?</p> <p>What is the relationship between the freezing point and melting point of a substance?</p> <p>What are characteristic property tests and what do they reveal about substances?</p> <p>How does graphing data help students to interpret results?</p> <p>Why is it important to compare data results with the class/team?</p> <p>How do scientists ensure the accuracy of their data in an experiment?</p>	<p>A. Phase changes -freezing point -melting point -boiling point</p> <p>B. Graphing techniques</p>	<p>A/B. Apply characteristic properties to explain experimental observations and phenomena A/B. Design and perform experiments to determine characteristic properties of matter A/B. Identify and control experimental settings in the determination of the characteristic properties of matter A/B. Minimize avoidable error A/B. Analyze data using mathematical concepts and histograms/line graphs A/B. Integrate technology and tools of science to observe, measure, and record data -Freezing and melting experiment -Boiling point experiment -Density of solids experiment -Density of Liquids experiment A/B. Analyze individual and class data by evaluating histogram/line graphs</p>

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	<p>What are characteristic property tests and what do they reveal about substances?</p> <p>How does the size of an object affect its density?</p> <p>How do objects gain or lose energy?</p> <p>What are the effects of force and mass on motion?</p> <p>How does friction affect motion?</p> <p>How does force affect the design of structures?</p> <p>What variables contribute to strength/performance of a structure?</p>	<p>A. Density</p> <ul style="list-style-type: none"> -solid -liquid -gas <p>B. Laws of nature</p> <ul style="list-style-type: none"> - force and motion 	<p>A/B. Apply concepts to explain experimental observations and phenomena</p> <p>A/B. Design and perform experiments to determine characteristic properties of matter</p> <p>A/B. Identify and control experimental settings in the determination of the characteristic properties of matter</p> <p>A/B. Minimize avoidable error</p> <p>A/B. Analyze data using mathematical concepts and histograms/line graphs</p> <p>A/B. Integrate technology and tools of science to observe, measure, and record data</p> <p>A/B. Analyze individual and class data by evaluating histogram/line graphs</p> <p>B. Design and construct a structure to specifications.</p>
Winter	<p>What are characteristic property tests and what do they reveal about substances?</p> <p>Why is accurate data determination essential to characteristic properties?</p> <p>How does unreliable lab data influence your analysis/conclusions?</p> <p>How can scientists determine the density of an object?</p>	<p>A. Density</p> <ul style="list-style-type: none"> -solid -liquid -gas <p>B. Laws of nature</p> <ul style="list-style-type: none"> - force and motion 	<p>A/B. Apply concepts to explain experimental observations and phenomena</p> <p>A/B. Design and perform experiments to determine characteristic properties of matter</p> <p>A/B. Identify and control experimental settings in the determination of the characteristic properties of matter</p> <p>A/B. Minimize avoidable error</p> <p>A/B. Analyze data using mathematical concepts and histograms/line graphs</p> <p>A/B. Integrate technology and tools of science to observe, measure, and record data</p> <p>A/B. Analyze individual and class data by evaluating histogram/line graphs</p>

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<p>How does the solubility of a substance affect its properties?</p> <p>What variables affect the solubility of a substance?</p> <p>How are solubility graphs related to temperature and concentration?</p> <p>Can a solvent ever become a solute?</p> <p>How do chemical processes impact our daily lives?</p> <p>How does carbonation change with temperature?</p>	<p>A. Concepts of solubility - Concentration - Terminology definitions</p> <p>B. Effect of temperature on solubility - Solubility curves - Solids as solutes - Gasses as solutes</p> <p>C. Solubility as a characteristic property</p> <p>D. Properties of gasses</p>	<p>A/B/C/D. Apply concepts to qualitatively explain experimental observations and phenomena</p> <p>A/B/C/D. Design and perform experiments to determine solubility and identify properties of gasses</p> <p>A/B/C/D. Identify and control experimental settings in the determination of solubility and properties of gasses</p> <p>A/B/C/D. Minimize avoidable error</p> <p>A/B/C/D. Quantitatively analyze data using mathematical concepts and histograms/line graphs</p> <p>A/B/C/D. Integrate technology and tools of science to observe, measure, and record data</p> <p>A/B/C/D. Analyze individual and class data by evaluating histogram/line graphs</p>
<p>How does the solubility of a substance affect its properties?</p> <p>How is the solubility of a gas ratio connected to its solubility?</p>	<p>A. Concepts of solubility - Concentration - Terminology definitions</p> <p>B. Effect of temperature on solubility - Solubility curves - Solids as solutes - Gasses as solutes</p> <p>C. Solubility as a characteristic property</p> <p>D. Properties of gasses</p>	<p>A/B/C/D. Apply concepts to qualitatively explain experimental observations and phenomena</p> <p>A/B/C/D. Design and perform experiments to determine solubility and identify properties of gasses</p> <p>A/B/C/D. Identify and control experimental settings in the determination of solubility and properties of gasses</p> <p>A/B/C/D. Minimize avoidable error</p> <p>A/B/C/D. Quantitatively analyze data using mathematical concepts and histograms/line graphs</p> <p>A/B/C/D. Integrate technology and tools of science to observe, measure, and record data</p> <p>A/B/C/D. Analyze individual and class data by evaluating histogram/line graphs</p>
Spring	How do mixtures differ from compounds?	<p>A. Separation of a mixture of liquids based on boiling point</p> <p>A/B/C. Design and perform experiments to separate and prove that collected materials have different characteristic</p>

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<p>What understanding of characteristic properties can help us to separate mixtures?</p>	<p>-Fractional distillation</p> <p>B. Separation of solid substances based on solubility differences</p> <ul style="list-style-type: none"> - salt and sulfur - Fractional crystallization <p>C. Other separation methods</p> <ul style="list-style-type: none"> - separation of a mixture of solids with similar solubilities - separation of a mixture of solids with similar solubilities using density <p>D. Analyzing data; flow charts</p>	<p>properties and to make appropriate decisions on selection of equipment to perform experiments</p> <p>A/B/C. Apply concepts to qualitatively explain experimental observations and phenomena</p> <p>A/B/C. Minimize avoidable error</p> <p>A/B/C. Quantitatively analyze data using mathematical concepts and histograms/line graphs</p> <p>A/B/C. Integrate technology and tools of science to observe, measure, and record data</p> <p>A/B/C. Analyze individual and class data by evaluating histogram/line graphs</p> <p>D. Develop a flow chart to show separation process of a mixture</p>
<p>What understanding of characteristic properties can help us to separate and identify mixtures?</p> <p>How can technology enhance the presentation of data?</p> <p>What are the essential components of a quality lab report?</p>	<p>A. Independence in the laboratory to separate a mixture of solids and liquids and to prove through characteristic properties that they are different (sludge test)</p> <p>B. Time management</p> <p>C. Collaboration</p>	<p>A. Design and perform experiments to separate and prove that collected materials have different characteristic properties and to make appropriate decisions on selection of equipment to perform experiments</p> <p>A. Apply concepts to qualitatively explain experimental observations and phenomena</p> <p>A. Minimize avoidable error</p> <p>A. Quantitatively analyze data using mathematical concepts and line graphs</p> <p>A. Integrate technology and tools of science to observe, measure, and record data</p> <p>A. Analyze individual and class data by evaluating line graphs</p> <p>A. Develop a flow chart to show separation process of a mixture</p> <p>A. Manage time appropriately to complete projects</p>

Essential Questions	Content	Skills
		<p>A. Collaboratively work with lab partner to divide responsibilities to complete project</p> <p>A. Apply all course concepts learned during the eighth grade school year to the sludge test</p>
<p>What characteristic properties can help us to separate and identify mixtures?</p>	<p>A. Independence in the laboratory to separate a mixture of solids and liquids and to prove through characteristic properties that they are different (sludge test)</p> <p>B. Time management</p> <p>C. Collaboration</p>	<p>A. Design and perform experiments to separate and prove that collected materials have different characteristic properties and to make appropriate decisions on selection of equipment to perform experiments</p> <p>A. Apply concepts to qualitatively explain experimental observations and phenomena</p> <p>A. Minimize avoidable error</p> <p>A. Quantitatively analyze data using mathematical concepts and line graphs</p> <p>A. Integrate technology and tools of science to observe, measure, and record data</p> <p>A. Analyze individual and class data by evaluating line graphs</p> <p>A. Develop a flow chart to show separation process of a mixture</p> <p>A. Manage time appropriately to complete projects</p> <p>A. Collaboratively work with lab partner to divide responsibilities to complete project</p> <p>A. Apply all laboratory skills developed throughout the school year to the sludge test</p> 