

# General Chemistry Lab Course

## Scope and Sequence Chart

LAB TITLE/TEXT CHAPTER	OBJECTIVE	OVERVIEW	SCIENCE SKILL
<b>LAB 1 A/B</b> <b>Mixtures &amp; Compounds</b>	<ol style="list-style-type: none"> <li>1. Describe the Standard International System of measurement.</li> <li>2. Demonstrate skill in measuring liquid volume.</li> <li>3. Calculate the composition of a mixture.</li> </ol>	Students review the SI system of measurement and practice measuring volume using a graduated cylinder. They also determine the percent composition of a mixture.	Observing, measuring predicting, inferring, identifying/controlling variables, formulating/testing hypotheses, interpreting data, designing experiments, communicating
<b>LAB 2</b> <b>Energies of Electrons</b> <b>Chapter 4*</b>	<ol style="list-style-type: none"> <li>1. Identify an element by analyzing its spectra.</li> </ol>	Students use simple spectroscopes to examine the spectra produced by selected mineral salts. Students use these spectra to identify unknown salts.	Observing, classifying, measuring, predicting, inferring, interpreting data, formulating models, communicating
<b>LAB 3</b> <b>Periodic Trends</b> <b>Chapter 5*</b>	<ol style="list-style-type: none"> <li>1. Identify the physical and chemical properties of elements.</li> </ol>	Students identify the properties of several sample elements and then organize these elements based on their physical and chemical properties.	Observing, classifying, measuring, predicting, inferring, identifying/controlling variables, formulating/testing hypotheses, interpreting data, designing experiments, communicating
<b>LAB 4 A/B</b> <b>Bond Busting &amp; Molecular Models</b> <b>Chapter 6*</b>	<ol style="list-style-type: none"> <li>1. Identify the types of chemical bonds.</li> <li>2. Compare the strength of chemical bonds.</li> <li>3. Construct models of various molecules.</li> </ol>	Students compare the strength of chemical bonds. Students construct models of molecules using electron dot configurations and clay.	Observing, classifying, measuring, inferring, identifying/controlling variables, formulating/testing hypotheses, interpreting data, formulating models, designing experiments, communicating
<b>LAB 5</b> <b>Empirical Formulas</b> <b>Chapter 7*</b>	<ol style="list-style-type: none"> <li>1. Identify the formulas of common molecules.</li> <li>2. Calculate the percent composition of a compound and use this to derive its empirical formula.</li> </ol>	Students determine the percent composition of a compound mathematically and then use this information to derive its empirical formula.	Observing, measuring, predicting, inferring, identifying/controlling variables, formulating/testing hypotheses, interpreting data, communicating

*\*Modern Chemistry, Holt, Rinehart, Winston Publishers*

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## Scope and Sequence Chart (Cont.)

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<p style="text-align: center;"><b>LAB 6</b> <b>Chemical Equations and Reactions</b> <b>Chapter 8</b></p>	<ol style="list-style-type: none"> <li>1. Identify the types of chemical reactions.</li> <li>2. Distinguish between products and reactants.</li> <li>3. Use chemical equations to identify chemical reactions.</li> </ol>	<p>Students carry out a series of chemical reactions identifying the reactants and products of each. Students use chemical equations to identify what happens in a chemical reaction.</p>	<p>Observing, classifying, measuring, inferring, identifying/controlling variables, interpreting data, communicating</p>
<p style="text-align: center;"><b>LAB 7</b> <b>Charles' Law</b> <b>Chapter 10 &amp; 11</b></p>	<ol style="list-style-type: none"> <li>1. Identify the properties of a gas.</li> <li>2. Explain how temperature effect the pressure and volume of a gas.</li> </ol>	<p>Students use lab apparatus to measure experimentally calculate the volume of a gas and then use Charles' law to calculate the theoretical volume of the gas.</p>	<p>Observing, measuring predicting, inferring, identifying/ controlling variables, formulating/ testing hypotheses, interpreting data, communicating</p>
<p style="text-align: center;"><b>LAB 8 A/B</b> <b>Properties of Solids &amp; Surface Tension</b> <b>Chapter 13</b></p>	<ol style="list-style-type: none"> <li>1. Explain the kinetic theory.</li> <li>2. Compare/contrast the properties of solids and liquids.</li> <li>3. Identify variables that affect the property of a liquid.</li> </ol>	<p>Students compare the properties of solutions and the properties of the substance created by their combination. Students investigate the variables that affect the surface tension of a liquid.</p>	<p>Observing, classifying, measuring, predicting, inferring, identifying/ controlling variables, formulating/ testing hypotheses, interpreting data, communicating</p>
<p style="text-align: center;"><b>LAB 9</b> <b>Paper Chromatography</b> <b>Chapter 14</b></p>	<ol style="list-style-type: none"> <li>1. Use chromatography to separate a mixture.</li> <li>2. Identify unknown mixtures by comparing their chromatograms to the chromatograms of known mixtures.</li> </ol>	<p>Students use paper chroma- tography to separate the colors of several water soluble inks. They then use these chromatograms to identify unknown ink samples.</p>	<p>Observing, classifying, measuring, inferring, identifying/controlling variables, interpreting data, communicating</p>
<p style="text-align: center;"><b>LAB 10</b> <b>Formulas of Hydrates</b> <b>Chapter 15</b></p>	<ol style="list-style-type: none"> <li>1. Describe the chemical and physical properties of sample hydrates.</li> <li>2. Use laboratory analysis to determine the formula of an unknown hydrate.</li> </ol>	<p>Students identify the formula of an unknown hydrate by laboratory analysis.</p>	<p>Observing, measuring, inferring, identifying/controlling variables, formulating/testing hypotheses, interpreting data, formulating models, communicating</p>

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## Scope and Sequence Chart (Cont.)

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<b>LAB 11</b> <b>Antacids</b> <b>Chapter 16 &amp; 17</b>	<ol style="list-style-type: none"> <li>1. Distinguish between acids and bases.</li> <li>2. Describe the function of an antacid.</li> <li>3. Determine the relative value of several OTC antacids.</li> </ol>	Students determine the relative effectiveness and value of several antacids by determining the cost/gram of product and the grams of acid neutralized per gram of product.	Observing, classifying, measuring, predicting, inferring, identifying/controlling variables, formulating/testing hypotheses, interpreting data, communicating
<b>LAB 12</b> <b>Reaction Rates</b> <b>Chapter 18</b>	<ol style="list-style-type: none"> <li>1. Identify the factors that effect the rate of reaction.</li> <li>2. Use lab analysis to determine the concentration of an unknown based on this reaction rate.</li> </ol>	Students investigate the effect various variables have on the rate of a chemical reaction. They then use this information to determine the concentration of an unknown.	Observing, measuring, predicting, inferring, identifying/controlling variables, formulating/testing hypotheses, interpreting data, communicating
<b>LAB 13</b> <b>Chemical Equilibrium</b> <b>Chapter 19</b>	<ol style="list-style-type: none"> <li>1. Explain the concept of equilibrium.</li> <li>2. Describe Le Chatelier's principle.</li> <li>3. Determine how the equilibrium of a reaction is affected by selected variables.</li> </ol>	Students study equilibrium by investigating a series of chemical equations in which changes in equilibrium are indicated by color change.	Observing, measuring, inferring, identifying/controlling variables, interpreting data, communicating
<b>LAB 14</b> <b>Nylon Production</b> <b>Chapter 21 &amp; 22</b>	<ol style="list-style-type: none"> <li>1. Describe the characteristics of polymers.</li> </ol>	Students produce a polymer (nylon) by combining a dicarboxylic acid and a diamine.	Observing, interpreting data, formulating models, communicating
<b>LAB 15</b> <b>DNA Extraction</b> <b>Chapter 23</b>	<ol style="list-style-type: none"> <li>1. Describe DNA and its importance.</li> <li>2. Use laboratory procedures to extract animal and plant DNA.</li> </ol>	Students use thymus gland and wheat germ as a source of DNA. The students extract the DNA by separating it from the cell's nuclear membrane.	Observing, inferring, interpreting data, formulating models, communicating

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