



## Chemistry Curriculum Bundle # 1

Title		Suggested Dates
Safety and Measurements	 	8/24 - 9/10 (13 days)

Big Idea/Enduring Understanding	Guiding Questions
Science is a process of inquiry that includes repeatable observations and testable hypotheses.	Why are safety protocols necessary? Why is measurement important in science?

The resources included here provide teaching examples and/or meaningful learning experiences to address the District Curriculum. In order to address the TEKS to the proper depth and complexity, teachers are encouraged to use resources to the degree that they are congruent with the TEKS and research-based best practices. Teaching using only the suggested resources does not guarantee student mastery of all standards. Teachers must use professional judgment to select among these and/or other resources to teach the district curriculum.

Useful science websites for the entire year that includes simulations are:

<http://phet.colorado.edu/simulations/>

<http://www.absorblearning.com/media/search.action#search>

Knowledge & Skills with Student Expectations	District Specificity/Examples	Suggested Resources (See note above)
<p><b>1 The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices.</b></p> <p><b>1A</b> demonstrate safe practices during laboratory and field investigations, including the appropriate use of safety showers, eyewash fountains, safety goggles, and fire extinguishers</p> <p><b>2 The student uses scientific methods to solve investigative questions.</b></p> <p><b>2E</b> plan and implement investigative procedures, including asking questions, formulating testable hypotheses, and selecting equipment and technology, including graphing calculators, computers and probes, sufficient scientific glassware such as beakers, Erlenmeyer flasks, pipettes, graduated cylinders, volumetric flasks, safety goggles, and burettes, electronic balances, and an adequate supply of consumable chemicals;</p>	<p><b>Including</b></p> <ul style="list-style-type: none"> <li>• Describe safety rules, such as heating safety, acid/base safety, and broken glass</li> <li>• Identify and explain purpose of lab equipment such as beakers, graduated cylinders, thermometers, pH paper/litmus paper, triple beam/electronic balance, and burets</li> </ul>	<p><b>Safety</b> Flinn Scientific, Inc. <a href="http://www.flinnsci.com/Sections/Safety/safety.asp">http://www.flinnsci.com/Sections/Safety/safety.asp</a> Flinn Safety DVD</p> <p><b>Lab: Bunsen Burner Technique Lab</b> See chemistry resource folder</p> <p><b>Following Directions Lab</b> See chemistry resource folder</p> <p><b>Safety Poster Activity</b> See chemistry resource folder</p> <p><b>I Have Who Has_LabEquipment</b> Fun and Games in Chemistry Claudia Wallace and Jane Smith</p> <p><b>Lab: Laboratory equipment</b> See chemistry resource folder</p>

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<p><b>1 The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices.</b></p> <p><b>1B</b> know specific hazards of chemical substances such as flammability, corrosiveness, and radioactivity as summarized on the Material Safety Data Sheets MSDS</p>	<p><b>Including</b></p> <ul style="list-style-type: none"> <li>• Interpret and read chemical and safety labels</li> </ul>	<p><a href="#">Texas Safety Standards</a></p> <p>Coding Diamond Presentation  MSDS-Labels Presentation  MSDS Reading and Interpreting Lab</p> <ul style="list-style-type: none"> <li>• MSDS Ammonium Nitrate Aldon</li> <li>• MSDS Ammonium Nitrate Flinn</li> <li>• MSDS cupric sulfate Aldon</li> <li>• MSDS Phosphorus Flinn</li> <li>• NFPA Hazard Diamond</li> <li>• Hazard info</li> </ul>
<p><b>1 The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices.</b></p> <p><b>1C</b> demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials.</p> <p><b>2 The student uses scientific methods to solve investigative questions.</b></p> <p><b>2A</b> know the definition of science and understand that it has limitations, as specified in subsection (b)(2) of this section;</p>	<p><b>Such as</b></p> <p>Disposal of chemicals and nuclear waste</p>	<p><b>Video: Chem Games</b></p>

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<p><b>2 The student uses scientific methods to solve investigative questions.</b></p> <p><b>2B</b> know that scientific hypotheses are tentative and testable statements that must be capable of being supported or not supported by observational evidence. Hypotheses of durable explanatory power which have been tested over a wide variety of conditions are incorporated into theories</p> <p><b>2 The student uses scientific methods to solve investigative questions.</b></p> <p><b>2C</b> know that scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explanations, but may be subject to change as new areas of science and new technologies are developed</p> <p><b>2 The student uses scientific methods to solve investigative questions.</b></p> <p><b>2D</b> distinguish between scientific hypotheses and scientific theories;</p> <p><b>2 The student uses scientific methods to solve investigative questions.</b></p> <p><b>2E</b> plan and implement investigative procedures, including asking questions, formulating testable hypotheses, and selecting equipment and technology, including graphing calculators, computers and probes, sufficient scientific glassware such as beakers, Erlenmeyer flasks, pipettes, graduated cylinders, volumetric flasks, safety goggles, and burettes, electronic balances, and an adequate supply of consumable chemicals;</p>	<p><b>Including</b></p> <ul style="list-style-type: none"> <li>• Identify control variable, independent variable, and dependent variable</li> <li>• Apply the scientific method to various hypotheses</li> <li>• Be able to choose the appropriate lab equipment/technology to use in their experiment</li> <li>• Be able to design an experiment given a problem</li> </ul>	<p><b>Lab: How to Write a Procedure</b> See chemistry resource folder</p> <p><b>The Scientific Method Activity: Exploring Experimental Design (Scientific Method Practice 1)</b> See Laying the foundation Book</p> <p><b>Lab: Rainbow Milk Lab (observation lab)</b> See chemistry resource folder</p>
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<p><b>2 The student uses scientific methods to solve investigative questions.</b></p> <p><b>2F</b> collect data and make measurements with accuracy and precision;</p> <p><b>2 The student uses scientific methods to solve investigative questions.</b></p> <p><b>2G</b> express and manipulate chemical quantities using scientific conventions and mathematical procedures, including dimensional analysis, scientific notation, and significant figures;</p>	<p><b>Including</b></p> <ul style="list-style-type: none"> <li>• Use lab equipment such as graduated cylinders, burets, and balances to make measurements</li> <li>• Identify the precision/accuracy of different lab equipment such as beakers vs. graduated cylinders</li> <li>• Understand significant figures in relation to precision of a measurement</li> <li>• Identify the number of significant figures in a number</li> <li>• Describe the SI base units</li> <li>• Apply the rules of significant figures in calculations</li> </ul>	<p><b>Accuracy vs. Precision Lab</b> See chemistry resource folder</p> <p><b>Significant Squares</b> Fun and Games in Chemistry Claudia Wallace and Jane Smith</p> <p><b>Lab: Measurement-Birdhouse</b> See chemistry resource folder</p>
<p><b>2 The student uses scientific methods to solve investigative questions.</b></p> <p><b>2H</b> organize, analyze, evaluate, make inferences, and predict trends from data</p>	<p><b>Including</b></p> <ul style="list-style-type: none"> <li>• Convert units using dimensional analysis (Option - introduce mole for use on mole day)</li> <li>• Draw line graphs</li> <li>• Analyze graphs</li> <li>• Extrapolate and interpolate graphs</li> </ul>	<p><b>Metric Conversions Puzzle</b> Fun and Games in Chemistry Claudia Wallace and Jane Smith</p> <p><b>The Scientific Method: Exploring Experimental Design (Penny Test Lab)</b> See Laying the Foundation Book</p>
<p><b>2 The student uses scientific methods to solve investigative questions.</b></p> <p><b>2I</b> communicate valid conclusions supported by the data through methods such as lab reports, labeled drawings, graphs, journals, summaries, oral reports, and technology-based reports.</p>	<p><b>Including</b></p> <ul style="list-style-type: none"> <li>• Lab reports, presentations, written or oral projects, etc.</li> </ul>	

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<p><b>3 The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom.</b></p> <p><b>3A</b> in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student;</p> <p><b>3B</b> communicate and apply scientific information extracted from various sources such as current events, news reports, published journal articles, and marketing materials;</p> <p><b>3C</b> draw inferences based on data related to promotional materials for products and services;</p> <p><b>3D</b> evaluate the impact of research on scientific thought, society, and the environment;</p> <p><b>3E</b> describe the connection between chemistry and future careers</p> <p><b>3F</b> research and describe the history of chemistry and contributions of scientists</p>	<p><b>Including</b></p> <ul style="list-style-type: none"><li>• Using current research findings to make informed decisions</li><li>• Using current research findings to make informed decisions</li><li>• development of atom and the periodic table</li><li>• environmental impact of pollutants like CFC, sulfur dioxide, etc.</li></ul>	<p><b>Carbon dioxide Greenhouse effect</b> <a href="http://science.howstuffworks.com/question445.htm">http://science.howstuffworks.com/question445.htm</a></p> <p><b>Careers in Chemistry (American Chemical Society)</b> <a href="http://portal.acs.org/portal/acs/corg/content?_nfpb=true&amp;_pageLabel=PP_SUPERARTICLE&amp;node_id=1188&amp;use_sec=false&amp;sec_url_var=region1">http://portal.acs.org/portal/acs/corg/content?_nfpb=true&amp;_pageLabel=PP_SUPERARTICLE&amp;node_id=1188&amp;use_sec=false&amp;sec_url_var=region1</a></p>
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