

## Seventh Grade Science Curriculum Bundle #1

<b>Title</b>	<b>Suggested Dates</b>
Introduction to Life Science	Aug 24 - Sept 10, 2010 (13 days)



<b>Big Idea/Enduring Understanding</b>	<b>Guiding Questions</b>
Organisms share common characteristics that enable them to live within the natural world.	What is life? What are the characteristics of life? Why is it important to study life? How do we study life?

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.

<b>Knowledge &amp; Skills with Student Expectations</b>	<b>Specificity &amp; Examples</b>	<b>Suggested Resources</b> (Read the note above)
Time has been allocated in Bundle 1 for teachers to introduce campus and classroom expectations, Capturing Kids Hearts, and safety guidelines.  ***Reminder: The state <i>requires</i> 40% of instructional time be spent conducting lab and field investigations. (approximately 2 investigations per week) ***Safety equipment should be used throughout the entire school year. ***Process skills (TEKS 7.1, 7.2, 7.3, and 7.4) should be used throughout the school year.		
<b>7<sup>th</sup> grade introductory strand</b> <b>(ii)</b> Students learn that all organisms obtain energy, get rid of wastes, grow, and reproduce. During both sexual and asexual reproduction, traits are passed onto the next generation. These traits are contained in genetic material that is found on genes within a chromosome from the parent. Changes in traits sometimes occur in a population over many generations. One of the ways a change can occur is through the process of natural selection. Students extend their understanding of structures in living systems from a previous focus on external structures to an understanding of internal structures and functions within living things.	<b>Characteristics of Life</b> <ul style="list-style-type: none"> <li>• Cellular basis</li> <li>• Process energy (metabolism of organic compounds)</li> <li>• Reproduction, grow, and develop</li> <li>• Heritability of traits (DNA)</li> <li>• Response to stimulus and environment (maintains homeostasis)</li> </ul> <p><u>Teacher Note:</u> Each one of these characteristics of life will be discussed in greater detail throughout the school year in subsequent bundles. What is more important is setting up the foundations for understanding the properties of living things.</p>	Vocabulary: life, cell theory, organic compound, equilibrium (Teachers may want to look over this activity “Biological Root Words” as a way to help students decipher biological vocabulary.)  <b>Power Point:</b> <ul style="list-style-type: none"> <li>• What is Life.ppt</li> </ul> <b>Activities:</b> <ul style="list-style-type: none"> <li>• Living or Not Living.doc (graphic organizer)</li> <li>• Characteristics of Life lab.doc</li> <li>• Am I Living song.pdf</li> </ul> <b>PreAP Activities:</b>

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	<p><u>Teacher Note:</u> Research studies regarding student learning progressions indicate that elementary and middle school students tend to use macroscopic criteria such as movement, breathing, reproduction to determine what is “living vs. non-living” rather than criteria associated with the cellular level. (AAAS, 1993; Bahar, 2003)</p>	<ul style="list-style-type: none"> <li>• Is Yeast Alive?</li> <li>• What is Life lab (folder)</li> </ul> <p><b>Teacher Resources:</b></p> <ul style="list-style-type: none"> <li>• Living vs. Nonliving.doc</li> <li>• Biological Root Words.pdf</li> </ul> <p><b>Reading Supplement:</b></p> <ul style="list-style-type: none"> <li>• What is Life.pdf</li> <li>• What are the characteristics of life.doc</li> <li>• Textbook: p. 170-173</li> </ul> <p><b>Assessment:</b></p> <ul style="list-style-type: none"> <li>• Uncovering Student Ideas, Volume 1, p. 123 (Is it Living? – pre-assessment)</li> <li>• Uncovering Student Ideas, Volume 1. p 131 (Is it Made of Cells, pre-assessment)</li> </ul>
<p><b>1 The student, for at least 40% of instructional time, conducts laboratory and field investigations following safety procedures and environmentally appropriate and ethical practices.</b></p> <p>1A demonstrate safe practices during laboratory and field investigations as outlined in the Texas Safety Standard</p>	<p><u>Teacher Note:</u> Scientific inquiry should integrate naturally into the knowledge content to be most effective. Students should have the opportunity to investigate, to observe, to collect information and to derive conclusions on their own through discovery.</p> <p><u>Teacher Note:</u> Teachers are recommended to allow students the opportunity to design their own investigative studies to derive conclusions through discovery learning.</p>	<p>The share drive contains a folder (Scientific Inquiry, Equipment, Safety) with resources for <u>safety information</u> from the district website.</p> <p><b>Power Point:</b></p> <ul style="list-style-type: none"> <li>• Safety.ppt</li> </ul> <p><b>Documents:</b></p> <ul style="list-style-type: none"> <li>• PISD Secondary Science Safety Contract.pdf</li> </ul> <p><b>Activities:</b></p> <ul style="list-style-type: none"> <li>• Safety game-PISD.pdf</li> <li>• Recognizing Lab Safety</li> </ul>

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<p><b>1 The student, for at least 40% of instructional time, conducts laboratory and field investigations following safety procedures and environmentally appropriate and ethical practices.</b></p> <p><b>1B</b> practice appropriate use and conservation of resources, including disposal, reuse, or recycling of materials</p>		
<p><b>2 The student uses scientific inquiry methods during laboratory and field investigations.</b></p> <p><b>2A</b> plan and implement comparative and descriptive investigations by making observations, asking well-defined questions, and using appropriate equipment and technology</p>	<p><u>Teacher Note:</u> Students will have learned the history of the scientific method and basic applications from 6th grade.</p>	
<p><b>2 The student uses scientific inquiry methods during laboratory and field investigations.</b></p> <p><b>2B</b> design and implement experimental investigations by making observations, asking well-defined questions, formulating testable hypotheses, and using appropriate equipment and technology</p>		<p>The share drive contains a folder (Scientific Inquiry, Equipment, Safety) with materials specifically about scientific inquiry for teachers who may need additional resources to help students.</p> <p><b>Activities:</b></p> <ul style="list-style-type: none"> <li>• What Do Scientists Do.pdf</li> <li>• Applying the Scientific Method</li> </ul> <p><b>PreAP Activities:</b></p> <ul style="list-style-type: none"> <li>• LTF 01 The Scientific Method.pdf (includes Come Fly With Us and Penny Test Lab)</li> </ul>
<p><b>2 The student uses scientific inquiry methods during laboratory and field investigations.</b></p> <p><b>2C</b> collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers</p>		<p>The share drive contains a folder (Scientific Inquiry, Equipment, Safety) with materials specifically about scientific inquiry for teachers who may need additional resources to help students.</p> <p><b>Activities:</b></p> <ul style="list-style-type: none"> <li>• Making Metric Measurements</li> </ul>
<p><b>2 The student uses scientific inquiry methods during laboratory and field investigations.</b></p> <p><b>2D</b> construct tables and graphs, using repeated trials and means, to organize data and identify patterns</p>		<p>The share drive contains a folder (Scientific Inquiry, Equipment, Safety) with materials specifically about scientific inquiry for teachers who may need additional resources to help students.</p> <p><b>Activities:</b></p>

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		<ul style="list-style-type: none"> <li>• Presenting Data</li> <li>• Graphing Skills</li> </ul>
<p><b>2 The student uses scientific inquiry methods during laboratory and field investigations.</b></p> <p>2E analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends</p>		
<p><b>3 The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions and knows the contributions of relevant scientists.</b></p> <p>3A 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>3 The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions and knows the contributions of relevant scientists.</b></p> <p>3B use models to represent aspects of the natural world such as human body systems and plant and animal cells</p>		
<p><b>3 The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions and knows the contributions of relevant scientists.</b></p> <p>3C identify advantages and limitations of models such as size, scale, properties, and materials</p>		

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<p><b>3 The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions and knows the contributions of relevant scientists.</b></p> <p><b>3D</b> relate the impact of research on scientific thought and society, including the history of science and contributions of scientists as related to the content</p>		
<p><b>4 The student knows how to use a variety of tools and safety equipment to conduct science inquiry.</b></p> <p><b>4A</b> use appropriate tools to collect, record, and analyze information, including life science models, hand lens, stereoscopes, microscopes, beakers, Petri dishes, microscope slides, graduated cylinders, test tubes, meter sticks, metric rulers, metric tape measures, timing devices, hot plates, balances, thermometers, calculators, water test kits, computers, temperature and pH probes, collecting nets, insect traps, globes, digital cameras, journals/notebooks, and other equipment as needed to teach the curriculum</p>	<p><u>Teacher Note:</u> Students will have familiarity with science notebooks from 6<sup>th</sup> grade (Bundle 1).</p> <ul style="list-style-type: none"> <li>• <u>PISD guidelines for science notebooks</u></li> </ul> <p><u>Teacher Note:</u> Each campus should have the following technologies and related materials.</p> <ul style="list-style-type: none"> <li>• ActivExpressions Classroom Response system</li> <li>• Middle School with Vernier (book)</li> <li>• LabPro Interface</li> <li>• Conductivity probe</li> <li>• Dual-range force sensor</li> <li>• Gas pressure sensor</li> <li>• Hand-grip heart grip monitor</li> <li>• Light sensor</li> <li>• Logger pro software</li> <li>• Motion detector</li> <li>• pH sensor</li> <li>• ProScope HR Kit</li> <li>• TI-84 calculators</li> </ul>	<p>The share drive contains a folder (Scientific Inquiry and Equipment) with materials specifically about tools and safety equipment for teachers who may need additional resources to help students.</p> <p><b>Activities</b></p> <ul style="list-style-type: none"> <li>• Identifying Lab Equipment</li> <li>• Using a Microscope</li> </ul> <p><b>Documents:</b></p> <ul style="list-style-type: none"> <li>• Microscope.pdf</li> </ul> <p><b>Power Points:</b></p> <ul style="list-style-type: none"> <li>• Microscope.ppt</li> </ul> <p><b>Teacher resource:</b></p> <ul style="list-style-type: none"> <li>• <u>PISD guidelines for science notebooks</u></li> </ul>
<p><b>4 The student knows how to use a variety of tools and safety equipment to conduct science inquiry.</b></p> <p><b>4B</b> use preventative safety equipment, including chemical splash goggles, aprons, and gloves, and be prepared to use emergency safety equipment, including an eye/face wash, a fire blanket, and a fire extinguisher</p>		