

## 8<sup>th</sup> Grade Science Curriculum Bundle #5

<b>Title</b>		<b>Suggested Dates</b>
The Universe		11/16-12/4 (12 days)

<b>Big Idea/Enduring Understanding</b>	<b>Guiding Questions</b>
Historical observations have led to models of the solar system, stars, galaxies and the universe. These models continue to be revised in order to better explain observations generated by the advancements of technology.	<p>What evidence can we find that the universe is in the process of continuous change?</p> <p>Is everything made up of star dust?</p> <p>How far is far and where does the Milky Way begin and end?</p>

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.

Knowledge & Skills with Student Expectations	Specificity & Examples	Suggested Resources (Read the note above)
<p><b>8.13 The student knows characteristics of the universe.</b></p> <p>8.13C Research and describe historical scientific theories of the origin of the universe.</p>	<p>Including:</p> <ul style="list-style-type: none"> <li>--- Early astronomy theories</li> <li>--- The Big Bang</li> <li>--- Big Crunch</li> <li>--- Big Rip</li> <li>--- Inflation universe theories</li> <li>--- Oscillating universe theory</li> </ul>	<p><b><u>VOCABULARY:</u></b> astronomy, astronomer, cosmology, cosmologist, cosmos, universe, classification, star, universe, nebula(e), comets, galaxies, light year, H-R Diagram, vacuum, elliptical, spiral, irregular, scientific notation, satellites, debris, main sequence, dwarf, red/blue giant, black hole, pulsar, neutron star, supergiant, quasar, spectroscope, diffraction grating, constellation, solar system, apparent/absolute magnitude, luminosity and binary star.</p> <p>AVID Activity- Writing in Science pages 22-23 “Pre-write and Quickwrite”</p> <p><b><u>CORE ACTIVITY:</u></b> Big Bang Activity (Balloon Demo)</p> <p>Ch. 22 Reinforcement Worksheet (One Stop Planner)</p> <p>Create Your Own Galaxy Project</p>

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<p><b>8.13 The student knows characteristics of the universe.</b></p> <p>8.13A Describe characteristics of the universe such as stars and galaxies.</p>	<p><b>Such as:</b></p> <p>--- Stars</p> <ul style="list-style-type: none"> <li>• Life cycle of stars small/large stars</li> <li>• Classification</li> <li>• Use a H-R diagram to analyze and describe a variety of stars</li> </ul> <p>--- Galaxies</p> <ul style="list-style-type: none"> <li>• Types of Galaxies</li> </ul> <p>o Elliptical</p> <p>o Spiral</p> <p>o Irregular</p> <p><i>Describe components of the universe, including stars, nebulae, and galaxies, and use models such as the Hertzsprung-Russell diagram for classification.</i></p> <p><i>Recognize that the Sun is a medium-sized star near the edge of a disc-shaped galaxy of stars and that the Sun is many thousands of times closer to Earth than any other star.</i></p>	<p><b><u>CORE ACTIVITY:</u></b> Power of 10 Power point</p> <p>Life of a Star Power point</p> <p>The Cosmic Survey</p> <p>Constellation Study Guide</p> <p><a href="#">Pictures of Galaxies Hyperlink</a></p> <p>BLM Classifying Galaxies</p> <p><a href="#">Star Life Cycle Pictures Hyperlink</a></p> <p>Life Cycle Star 4 Upload</p> <p>The Star Cycle or equivalent</p> <p><b><u>Uncovering Student Ideas in Science</u></b>, Keeley. Vol. 2 #25, Objects in the Sky</p> <p>PREAP Only: LTF # 45: Black Holes and Beyond Life/Earth p. 744</p>
<p><b>8.13 The student knows characteristics of the universe.</b></p> <p>8.13B Explain the use of light years to describe distances in the universe.</p>	<p><b>Including:</b></p> <p>--- Light-year is a unit of measurement of length—the distance that light travels in a vacuum in one year (<math>9.461 \times 10^{15}</math> m)</p> <p>--- The speed of light in a vacuum is constant (<math>3 \times 10^8</math> m/s)</p>	<p>Speed of Light Power point</p> <p>Light Years-Extreme Speed Practice Sheet</p>
<p><b>8.1 The student conducts field and laboratory investigations using safe, environmentally appropriate and ethical practices.</b></p> <p>8.1A Demonstrate safe practices during field and laboratory investigations.</p>	<p><b>Including:</b></p> <p>--- Lab Cleanup Procedures</p> <p>--- Equipment cleaning and storage</p> <p>---Safety Contract</p> <p>In accordance with the Texas Safety Standards: : <a href="#">Pflugerville ISD :: Online Curriculum :: Science</a></p> <p><u>Teacher Note:</u> Safety skills and process TEKS should be embedded and reinforced throughout the year.</p>	<p><a href="#">Texas Safety Standards</a></p>

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<p><b>8.1 The student conducts field and laboratory investigations using safe, environmentally appropriate and ethical practices.</b></p> <p>8.1B Make wise choices in the use and conservation of resources and the disposal and recycling of materials.</p>	<p>Including:</p> <ul style="list-style-type: none"> <li>--- Lab material disposal</li> <li>---Space pollution such as old satellites, debris</li> <li>---Reused space vehicles such as the space shuttle</li> </ul>	
<p><b>8.2 The student uses scientific inquiry methods during fields and laboratory investigations.</b></p> <p>8.2B Collect data by observing and measuring.</p>	<p>Including:</p> <ul style="list-style-type: none"> <li>--- Measuring mass and volume to calculate density</li> <li>--- Measuring temperature</li> <li>--- Measuring length using metric ruler</li> <li>--- Using dimensional analysis to convert from English to metric units and reinforcing the use of scientific notation</li>   <li>--- (Pre-AP: Emphasis on using probeware in a variety of situations)</li> </ul> <p><u>Teacher Note:</u> Measurement exercises should progress across the middle school grade levels and begin by developing conceptual understanding. In 8th grade, students can begin to convert from one unit to another.</p>	<p>AVID Activity- Writing in Science pages 26-28 “ Observation Narrative”</p>
<p><b>8.2 The student uses scientific inquiry methods during fields and laboratory investigations.</b></p> <p>8.2C Organize, analyze, evaluate, make inferences, and predict trends from direct and indirect evidence.</p>	<p>Including:</p> <ul style="list-style-type: none"> <li>--- graph interpretation and extrapolation</li> <li>--- predicting outcomes based on data tables</li> </ul>	<p>AVID Activity- Writing in Science pages 29-30 “Comparative Analysis”</p>
<p><b>8.2 The student uses scientific inquiry methods during fields and laboratory investigations.</b></p> <p>8.2D Communicate valid conclusions</p>	<p>Including:</p> <ul style="list-style-type: none"> <li>--- Experimental conclusions</li> <li>--- Supporting conclusions with data</li> <li>--- Analyze error sources and fix experiment to reduce outside variables</li> <li>--- Graph/Chart/Table extrapolation for conclusion</li> <li>--- Analysis of graphs including the use of H-R diagrams</li> </ul>	<p>AVID Activity- Reading in Science pages 111-132 “ Additional Active Reading Graphic Organizers”</p>
<p><b>8.2 The student uses scientific inquiry methods during fields and laboratory investigations.</b></p> <p>8.2E Construct graphs, tables, maps, and charts using tools including computers to organize, examine and evaluate data.</p>	<p>Such as:</p> <ul style="list-style-type: none"> <li>--- Bar graphs, line graphs, pie charts, data tables and determine which is best for each set of data.</li> </ul>	<p><b>Science Graphing Pack</b> -Changing Weight to Mass Graph -How Fast Does Sound Travel Graph</p>

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<p><b>8.3 The student uses critical thinking and scientific problem solving to make informed decisions.</b></p> <p>8.3A Analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information.</p>	<p>Such as:            --- Critique a conclusion of a modeled experiment like the Big Bang Balloon Demo.</p> <p><u>Teacher Note:</u> Current event analysis that critiques a scientific explanation. Relate to labs throughout the year. Should emphasize the nature of scientific explanations: testability, repeatability, evidence, predictive nature.</p>	
<p><b>8.3 The student uses critical thinking and scientific problem solving to make informed decisions.</b></p> <p>8.3C Represent the natural world using models and identify their limitations.</p>	<p>Including:            --- Distinguish between limitations and advantages of models</p> <p>Such as:            --- space and/or geological features in space</p> <p><i>Use models to represent aspects of the natural world such as an atom, a molecule, space, or a geologic feature.</i></p> <p><i>Identify advantages and limitations of models such as size, scale, properties, and materials.</i></p>	
<p><b>8.3 The student uses critical thinking and scientific problem solving to make informed decisions.</b></p> <p>8.3D Evaluate the impact of research on scientific thought, society, and the environment.</p>	<p><u>Teacher Note:</u>            Do a current event impact analysis that looks at how scientific research has impacted thought, society and the environment. Such as why is Pluto a dwarf planet now and it used to be a planet.</p>	<p><u>AVID Activity:</u> Writing in Science page 24 “Brief Autobiography”.</p>
<p><b>8.3 The student uses critical thinking and scientific problem solving to make informed decisions.</b></p> <p>8.3E Connect Grade 8 science concepts with the history of science and contributions of scientists.</p>	<p>Such as:            --- Hubble, Ptolemy, Copernicus, Brahe, Kelper, Galilei, Hertzprung-Russell, Maria Mitchell, Sally, Ride, Jocelyn Bell, Burnell, Kyle Dawson, Carl Sagan, Hawkins.</p>	
<p><b>8.4 The student knows how to use a variety of tools and methods to conduct science inquiry.</b></p> <p>8.4A Collect, record, and analyze information using tools including beakers, petri dishes, meter sticks, graduated cylinders, weather instruments, hot plates, dissecting equipment, test tubes, safety goggles, spring scales, balances, microscopes, telescopes, thermometers, calculators, field equipment, computers, computer probes, water test kits, and timing devices.</p>	<p>Such as :            ---spectroscopes</p>	

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**8.4 The student knows how to use a variety of tools and methods to conduct science inquiry.**

8.4B Extrapolate from collected information to make predictions.

Such as:

--- extrapolating using graph and data tables to predict expected results.