

**8<sup>th</sup> Grade Science**  
**PISD Curriculum: Year at a Glance**

Bundle	<i>Title</i> Big Ideas/Enduring Understandings	Guiding Questions
1	<p><b><i>Force and Motion</i></b></p> <ul style="list-style-type: none"> <li>▪ Unbalanced forces cause changes in motion.</li> </ul>	<ul style="list-style-type: none"> <li>▪ How can we use forces and the laws of motion to understand the motion of objects?</li> <li>▪ How do objects respond when acted on by a force?</li> <li>▪ What is the relationship between distance and time?</li> </ul>
2	<p><b><i>Energy in Motion</i></b></p> <ul style="list-style-type: none"> <li>▪ Energy can take many forms but the total energy in a system is constant.</li> <li>▪ Radiation, conduction and convection transfer energy through Earth's systems.</li> </ul>	<ul style="list-style-type: none"> <li>▪ How is the transfer of energy controlled by the conservation of energy and by the tendency toward disorder?</li> <li>▪ What happens when energy interacts with matter?</li> <li>▪ How are matter and energy configured and reconfigured?</li> </ul>
3	<p><b><i>Matter: Its Structure and Properties</i></b></p> <ul style="list-style-type: none"> <li>▪ Everything in the universe is made up of atoms which are in turn made up of protons, neutrons and electrons.</li> <li>▪ The subatomic particle configuration determines how different atoms make different elements.</li> </ul>	<ul style="list-style-type: none"> <li>▪ How is it that everything is made from the elements on the periodic table?</li> <li>▪ What makes each atom/element unique?</li> <li>▪ How do observable properties of matter enable us to determine the structure of atoms?</li> </ul>
4	<p><b><i>Matter: Interactions and Reactions</i></b></p> <ul style="list-style-type: none"> <li>▪ The physical and chemical properties of substances are determined by their atomic and molecular structures.</li> </ul>	<ul style="list-style-type: none"> <li>▪ How are chemical and physical properties of matter related to the structure of matter?</li> <li>▪ Why do chemists use chemical symbols, formulas and equations?</li> <li>▪ What causes chemical reactions that affect our daily lives?</li> </ul>
5	<p><b><i>The Universe</i></b></p> <ul style="list-style-type: none"> <li>▪ Historical observations have led to models of the solar system, stars, galaxies and the universe.</li> <li>▪ These models continue to be revised in order to better explain observations generated by the advancements of technology.</li> </ul>	<ul style="list-style-type: none"> <li>▪ What evidence can we find that the universe is in the process of continuous change?</li> <li>▪ Is everything made up of star dust?</li> <li>▪ How far is far and where does the Milky Way begin and end?</li> </ul>
6	<p><b><i>Riding the Wave: Earth, Sun and Moon Interactions</i></b></p> <ul style="list-style-type: none"> <li>▪ The relative position and movements of the earth, moon and sun account for lunar and solar eclipses, the observed moon phases, tides and seasons.</li> <li>▪ Light exhibits properties of both waves and particles.</li> </ul>	<ul style="list-style-type: none"> <li>▪ What are the components and structure of the Earth system?</li> <li>▪ What patterns of movements are found in the sky and how does it affect my life on Earth?</li> <li>▪ How do waves affect our society?</li> </ul>

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7	<p><b><i>The Environment: Atmosphere and Weather</i></b></p> <ul style="list-style-type: none"> <li>▪ Recognizing patterns helps predict what will occur the next time and what can change over time.</li> <li>▪ Radiant energy from the sun creates temperature differences in water, land and the atmosphere which drive local, regional and long global patterns of atmospheric circulation like climate and short global patterns known as weather like storms, hurricanes, tornadoes</li> </ul>	<ul style="list-style-type: none"> <li>▪ How can we observe the effect of the Sun’s energy on the Earth’s surface and atmosphere?</li> <li>▪ Why is it important to collect and communicate weather information?</li> <li>▪ What technology insures clean air resources for me?</li> </ul>
8	<p><b><i>The Environment: Oceans and Ecosystems</i></b></p> <ul style="list-style-type: none"> <li>▪ Heating of Earth’s surface and atmosphere by the sun drives convection within the atmosphere and ocean, producing wind and ocean currents.</li> <li>▪ As energy flows through systems, at each step more of it becomes unusable.</li> </ul>	<ul style="list-style-type: none"> <li>▪ How do organisms depend on each other and on the cycling of matter and energy in an ecosystem?</li> <li>▪ How do behavioral responses to stimuli ensure individual survival and reproductive success for the species?</li> <li>▪ How do waves travel through different types of media (water) and what is the effect of various wave types on our Texas coast?</li> </ul>
9	<p><b><i>Rocks and Minerals</i></b></p> <ul style="list-style-type: none"> <li>▪ Earth’s surface is built up and worn down by natural processes, such as rock formation, erosion and weathering.</li> </ul>	<ul style="list-style-type: none"> <li>▪ What role do humans play in the alteration of the rock cycle?</li> <li>▪ How do factors like uplift, weathering, erosion and volcanic activity affect geographically landforms like rivers, mountains, and coastlines?</li> <li>▪ What are the components and structure of the Earth?</li> </ul>
10	<p><b><i>Earth Transitions (Geologic Time)</i></b></p> <ul style="list-style-type: none"> <li>▪ Species change over time by a process called evolution and evolution results in a diversity of life on Earth. Within this diversity, there are patterns of commonality.</li> <li>▪ The movement of Earth’s lithospheric plates cause both slow changes on the Earth’s surface like the formation of mountains and ocean basins as well as rapid changes like volcanic eruptions and earthquakes.</li> </ul>	<ul style="list-style-type: none"> <li>▪ What natural processes create observable changes/structures on the Earth’s surface that enable us to determine the internal energy sources present?</li> <li>▪ What evidence suggests that species change over time?</li> <li>▪ What Earth processes and catastrophes in Earth’s history continue today?</li> </ul>
11	<p><b><i>Adaptation &amp; Genetics</i></b></p> <ul style="list-style-type: none"> <li>▪ The continuity of life is based on heritable information in the form of DNA.</li> <li>▪ Traits of organisms are passed from</li> </ul>	<ul style="list-style-type: none"> <li>▪ How are organisms structured to ensure efficiency and survival?</li> <li>▪ What is the difference between traits that are inherited versus those that result from</li> </ul>

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	generation to generation according to genetic principles.	the interactions within the environment? ▪ Why am I taller than my whole family?
12	<b><i>Human Body Systems</i></b> ▪ Regulatory mechanisms ensure a dynamic balance in living systems.	▪ Can a person survive without one of the body systems? ▪ How does the body use feedback mechanisms to maintain homeostasis? ▪ What is the interrelationship between body systems?