

**MIDLAND ISD  
ADVANCED PLACEMENT CURRICULUM STANDARDS**

	<b>AP ENVIRONMENTAL SCIENCE</b>	
<b>TEKS</b>	<b>COLLEGE BOARD</b>	<b>COLLEGE AND CAREER READINESS STDS.</b>
	<p><b>Science Practices</b></p> <p><b>Standard SP.1: Scientific Questions and Predictions</b>  <b>Asking scientific questions that can be tested empirically and structuring these questions in the form of testable predictions</b></p> <p><b>SP.1.1 Scientific Questions</b>            Students recognize, formulate, justify and revise scientific questions that can be addressed by science in order to construct explanations.</p> <p><b>SP.1.2 Predictions</b>            Students make and justify predictions concerning natural phenomena. Predictions and justifications are based on observations of the world, on knowledge of the discipline and on empirical evidence.</p> <p><b>Standard SP.2: Generation of Evidence</b>  <b>Collecting data to address scientific questions and to support predictions</b></p> <p><b>SP.2.1 Data Collection</b>            Students select and use appropriate measurement methods and techniques for gathering data, and systematically record and organize observations and measurements.</p>	<p><b>I. Nature of Science: Scientific Ways of Learning and Thinking</b></p> <p><b>A. Cognitive skills in science</b></p> <ol style="list-style-type: none"> <li>1. Utilize skepticism, logic, and professional ethics in science.</li> <li>2. Use creativity and insight to recognize and describe patterns in natural phenomena.</li> <li>3. Formulate appropriate questions to test understanding of natural phenomena.</li> <li>4. Rely on reproducible observations of empirical evidence when constructing, analyzing, and evaluating explanations of natural events and processes.</li> </ol> <p><b>B. Scientific inquiry</b></p> <ol style="list-style-type: none"> <li>1. Design and conduct scientific investigations in which hypotheses are formulated and tested.</li> </ol> <p><b>C. Collaborative and safe working practices</b></p> <ol style="list-style-type: none"> <li>1. Collaborate on joint projects.</li> <li>2. Understand and apply safe procedures in the laboratory and field, including chemical, electrical, and fire safety and safe handling of live or preserved organisms.</li> <li>3. Demonstrate skill in the safe use of a wide variety of apparatuses, equipment, techniques, and procedures.</li> </ol> <p><b>D. Current scientific technology</b></p> <ol style="list-style-type: none"> <li>1. Demonstrate literacy in computer use.</li> <li>2. Use computer models, applications, and simulations.</li> </ol>

**MIDLAND ISD  
ADVANCED PLACEMENT CURRICULUM STANDARDS**

	<b>AP ENVIRONMENTAL SCIENCE</b>	
<b>TEKS</b>	<b>COLLEGE BOARD</b>	<b>COLLEGE AND CAREER READINESS STDS.</b>
	<p><b>SP.2.2 Evaluating Data for Evidence</b> Students determine which data from a specific investigation can be used as evidence to address a scientific question or to support a prediction or an explanation, and distinguish credible data from noncredible data in terms of quality.</p> <p><b>Standard SP.3: Data Analysis</b> <b>Searching for regularities and patterns in observations and measurements (i.e., data analysis)</b></p> <p><b>SP.3.1 Analyzing Data for Patterns</b> Students analyze data to discover patterns.</p> <p><b>Standard SP.4: Evidence-Based Explanations and Models</b> <b>Using evidence and science knowledge to construct scientific explanations, models and representations</b></p> <p><b>SP.4.1 Constructing Explanations</b> Students construct explanations that are based on observations and measurements of the world, on empirical evidence and on reasoning grounded in the theories, principles and concepts of the discipline.</p> <p><b>SP.4.2 Models and Representations</b> Students construct, use, re-express and revise models and representations of natural and designed objects, systems,</p>	<p><b>3.</b> Demonstrate appropriate use of a wide variety of apparatuses, equipment, techniques, and procedures for collecting quantitative and qualitative data.</p> <p><b>E. Effective communication of scientific information</b></p> <p><b>1.</b> Use several modes of expression to describe or characterize natural patterns and phenomena. These modes of expression include narrative, numerical, graphical, pictorial, symbolic, and kinesthetic.</p> <p><b>2.</b> Use essential vocabulary of the discipline being studied.</p> <p><b>II. Foundation Skills: Scientific Applications of Mathematics</b></p> <p><b>A. Basic mathematics conventions</b></p> <p><b>1.</b> Understand the real number system and its properties.</p> <p><b>2.</b> Use exponents and scientific notation.</p> <p><b>3.</b> Understand ratios, proportions, percentages, and decimal fractions, and translate from any form to any other.</p> <p><b>4.</b> Use proportional reasoning to solve problems.</p> <p><b>5.</b> Simplify algebraic expressions.</p> <p><b>6.</b> Estimate results to evaluate whether a calculated result is reasonable.</p> <p><b>7.</b> Use calculators, spreadsheets, computers,</p>

**MIDLAND ISD  
ADVANCED PLACEMENT CURRICULUM STANDARDS**

	<b>AP ENVIRONMENTAL SCIENCE</b>	
<b>TEKS</b>	<b>COLLEGE BOARD</b>	<b>COLLEGE AND CAREER READINESS STDS.</b>
	<p>phenomena and scientific ideas in the appropriate context and in formulating their explanation.</p> <p><b>SP.4.3 Evaluating Explanations</b> Students evaluate, compare and contrast explanations that are based on observations of the world, on empirical evidence and on reasoning grounded in the theories, principles and concepts of the discipline.</p> <p><b>Standard SP.5:Quantitative Applications Using mathematical reasoning and quantitative applications to interpret and analyze data to solve problems</b></p> <p><b>SP.5.1 Proportionality Between Variables</b> Students reason about relationships between variables (e.g., data, representations, uncertainty, samples) through the lens of ratios, rates, percentages, probability or proportional relationships when approaching or solving problems or when interpreting results or situations.</p> <p><b>SP.5.2 Patterns of Bivariate Relationships</b> Students apply, analyze and create algebraic representations, relationships and patterns of linear functions, systems of linear inequalities, and one- or two-dimensional changes to solve problems, interpret situations and address scientific questions.</p>	<p>etc., in data analysis.</p> <p><b>B. Mathematics as a symbolic language</b></p> <ol style="list-style-type: none"> <li>1. Carry out formal operations using standard algebraic symbols and formulae.</li> <li>2. Represent natural events, processes, and relationships with algebraic expressions and algorithms.</li> </ol> <p><b>C. Understand relationships among geometry, algebra, and trigonometry</b></p> <ol style="list-style-type: none"> <li>1. Understand simple vectors, vector notations, and vector diagrams, and carry out simple calculations involving vectors.</li> <li>2. Understand that a curve drawn on a defined set of axes is fully equivalent to a set of algebraic equations.</li> <li>3. Understand basic trigonometric principles, Including definitions of terms, such as sine, cosine, tangent, cotangent, and their relationship to triangles.</li> <li>4. Understand basic geometric principles.</li> </ol> <p><b>D. Scientific problem solving</b></p> <ol style="list-style-type: none"> <li>1. Use dimensional analysis in problem solving.</li> </ol> <p><b>E. Scientific application of probability and statistics</b></p> <ol style="list-style-type: none"> <li>1. Understand descriptive statistics.</li> </ol> <p><b>F. Scientific measurement</b></p> <ol style="list-style-type: none"> <li>1. Select and use appropriate Standard International (SI) units and prefixes to express measurements for real world problems.</li> </ol>

**MIDLAND ISD  
ADVANCED PLACEMENT CURRICULUM STANDARDS**

	<b>AP ENVIRONMENTAL SCIENCE</b>	
<b>TEKS</b>	<b>COLLEGE BOARD</b>	<b>COLLEGE AND CAREER READINESS STDS.</b>
	<p><b>Science, Technology and Society</b></p> <p><b>Standard STS.1:Science, Technology and Society</b>  <b>A critical interdependence exists among science, technology and society.</b></p> <p><b>STS.1.1 Interdependence of Science and Technology</b>            Students explain the interdependence of science and technology: how the ongoing development of technology relies on the advancements of science while scientific research relies on technological progress. Students understand how the evolution of various technologies (e.g., biotechnology, seismology, computational software, lasers) radically alters the practice of many science disciplines by affecting the quality and quantity of available data.</p> <p><b>STS.1.2 Advantages and Disadvantages to Society</b>            Students understand how science and technology together can be used for the benefit of society as well as their own lives (e.g., weather predictions, development of medications, creation of safety devices in cars), but that some technological capabilities (e.g., cloning, genetic recombination, nuclear energy studies, access to fossil fuels, chemical engineering)</p>	<p>2. Use appropriate significant digits            3. Understand and use logarithmic notation (base 10).</p> <p><b>III. Foundation Skills: Scientific Applications of Communication</b></p> <p><b>A. Scientific writing</b>            1. Use correct applications of writing practices in scientific communication.</p> <p><b>B. Scientific reading</b>            1. Read technical and scientific articles to gain understanding of interpretations, apparatuses, techniques or procedures, and data.            2. Set up apparatuses, carry out procedures, and collect specified data from a given set of appropriate instructions.            3. Recognize scientific and technical vocabulary in the field of study and use this vocabulary to enhance clarity of communication.            4. List, use, and give examples of specific strategies before, during, and after reading to improve comprehension.</p> <p><b>C. Presentation of scientific/technical information</b>            1. Prepare and present scientific/technical information in appropriate formats for various audiences.</p> <p><b>D. Research skills/information literacy</b>            1. Use search engines, databases, and other digital electronic tools effectively to locate</p>

**MIDLAND ISD  
ADVANCED PLACEMENT CURRICULUM STANDARDS**

	<b>AP ENVIRONMENTAL SCIENCE</b>	
<b>TEKS</b>	<b>COLLEGE BOARD</b>	<b>COLLEGE AND CAREER READINESS STDS.</b>
	<p>create ethical and economic dilemmas for society.</p> <p><b>STS.1.3 Evaluating Online Information</b> Students recognize that the amount of information, as well as access to information, has exploded since the creation of the Internet. Online information should be judged using the same science practices and critical and skeptical views that reflect the way science is conducted and evaluated. Students also recognize the relationship between digital technology and the <b>fact</b> that social networking is a source of information generation and of the determination of “truths” in our current society. Students understand that this information presents a specific perspective that is not backed by research; therefore, the information and the perspective do not represent the empirical reality of science.</p> <p><b>Earth Science</b></p> <p><b>Standard ES.1:Dynamic Earth Processes</b> <b>Dynamic processes shape and order Earth</b> <b>ES.1.1 Earth’s Surface</b> Students understand that physical and chemical changes in Earth’s materials result from the interactions of Earth’s surface with water, air, gravity, tectonic forces and</p>	<p>information.</p> <p><b>2.</b> Evaluate quality, accuracy, completeness, reliability, and currency of information from any sources.</p> <p><b>IV. Science, Technology, and Society</b> <b>A. Interactions between innovations and science</b> <b>1.</b> Recognize how scientific discoveries are connected to technological innovations. <b>B. Social ethics</b> <b>1.</b> Understand how scientific research and technology have an impact on ethical and legal practices. <b>2.</b> Understand how commonly held ethical beliefs impact scientific research. <b>C. History of science</b> <b>1.</b> Understand the historical development of major theories in science. <b>2.</b> Recognize the role of people in important contributions to scientific knowledge.</p> <p><b>V. Cross-Disciplinary Themes</b> <b>A. Matter/states of matter</b> <b>1.</b> Know modern theories of atomic structure. <b>2.</b> Understand the typical states of matter (solid, liquid, gas) and phase changes among these. <b>B. Energy (thermodynamics, kinetic, potential, energy transfers)</b></p>

**MIDLAND ISD  
ADVANCED PLACEMENT CURRICULUM STANDARDS**

	<b>AP ENVIRONMENTAL SCIENCE</b>	
<b>TEKS</b>	<b>COLLEGE BOARD</b>	<b>COLLEGE AND CAREER READINESS STDS.</b>
	<p>biological activity. These changes create landscapes on Earth’s surface.</p> <p><b>ES.1.2 Energy Transfer</b> Students understand that the uneven distribution of thermal energy and materials in Earth’s systems, combined with gravity, is the underlying cause of the movement of matter within the lithosphere (plate tectonics), hydrosphere (ocean currents) and atmosphere (winds).</p> <p><b>ES.1.3 Tectonism</b> Students understand that tectonic plates interact along their boundaries, resulting in folding, faulting, earthquakes and volcanoes.</p> <p><b>ES.1.4 Weather Processes</b> Students understand that weather is the result of short-term interactions (days) among the atmosphere, hydrosphere, lithosphere and biosphere.</p> <p><b>ES.1.5 Rock-Forming Environment</b> Students understand that the physical and chemical properties of rocks and fossil fuels indicate the environment in which they were formed.</p> <p><b>Standard ES.2:Independent and Interacting Systems</b> <b>Earth is composed of interdependent and interacting systems.</b></p>	<ol style="list-style-type: none"> <li>1. Understand the Laws of Thermodynamics.</li> <li>2. Know the processes of energy transfer.</li> </ol> <p><b>C. Change over time/equilibrium</b></p> <ol style="list-style-type: none"> <li>1. Recognize patterns of change.</li> </ol> <p><b>D. Classification</b></p> <ol style="list-style-type: none"> <li>1. Understand that scientists categorize things according to similarities and differences.</li> </ol> <p><b>E. Measurements and models</b></p> <ol style="list-style-type: none"> <li>1. Use models to make predictions.</li> <li>2. Use scale to relate models and structures.</li> <li>3. Demonstrate familiarity with length scales from sub-atomic particles through macroscopic objects.</li> </ol> <p><b>X.Environmental Science</b></p> <p><b>A. Earth systems</b></p> <ol style="list-style-type: none"> <li>1. Recognize the Earth’s systems.</li> <li>2. Know the major features of the geosphere and the factors that modify them.</li> <li>3. Know the major features of the atmosphere.</li> <li>4. Know the major features of the hydrosphere.</li> <li>5. Be familiar with Earth’s major biomes.</li> <li>6. Describe the Earth’s major biogeochemical cycles.</li> </ol> <p><b>B. Energy</b></p> <ol style="list-style-type: none"> <li>1. Understand energy transformations.</li> <li>2. Know the various sources of energy for humans and other biological systems.</li> </ol> <p><b>C. Populations</b></p> <ol style="list-style-type: none"> <li>1. Recognize variations in population sizes,</li> </ol>

**MIDLAND ISD  
ADVANCED PLACEMENT CURRICULUM STANDARDS**

	<b>AP ENVIRONMENTAL SCIENCE</b>	
<b>TEKS</b>	<b>COLLEGE BOARD</b>	<b>COLLEGE AND CAREER READINESS STDS.</b>
	<p><b>ES.2.1 Atmosphere as a System</b> Students understand that Earth’s atmosphere acts as a system that absorbs and distributes matter and energy.</p> <p><b>ES.2.2 Oceans as a System</b> Students understand that Earth’s oceans act as a system that absorbs and distributes matter and energy.</p> <p><b>ES.2.3 Lithosphere as a System</b> Students understand that the lithosphere is a system of large plates that move matter and energy in Earth’s systems.</p> <p><b>ES.2.4 Climate</b> Students understand that climate is the result of interactions among the atmosphere, hydrosphere, lithosphere and biosphere.</p> <p><b>ES.2.5 Planetary Evolution</b> Students understand that Earth is part of a solar system and has unique characteristics that are based on its position and its stage of planetary evolution.</p> <p><b>Standard ES.3: Earth’s History</b> <b>Earth’s history can be inferred from evidence left from past events.</b></p> <p><b>ES.3.1 Relative and Absolute Dating</b> Students understand that various dating methods — relative and absolute — have been used to determine the age of Earth.</p>	<p>including human population and extinction, and describe mechanisms and conditions that produce these variations.</p> <p><b>D. Economics and politics</b></p> <ol style="list-style-type: none"> <li>1. Name and describe major environmental policies and legislation.</li> <li>2. Understand the types, uses, and regulations of the various natural resources.</li> </ol> <p><b>E. Human practices and their impacts</b></p> <ol style="list-style-type: none"> <li>1. Describe the different uses for land (land management).</li> <li>2. Understand the use and consequences of pest management.</li> <li>3. Know the different methods used to increase food production.</li> <li>4. Understand land and water usage and management practices.</li> <li>5. Understand how human practices affect air, water, and soil quality.</li> </ol>

**MIDLAND ISD  
ADVANCED PLACEMENT CURRICULUM STANDARDS**

	<b>AP ENVIRONMENTAL SCIENCE</b>	
<b>TEKS</b>	<b>COLLEGE BOARD</b>	<b>COLLEGE AND CAREER READINESS STDS.</b>
	<p><b>ES.3.2 Rock and Fossil Records</b> Students understand that the rock and fossil records provide evidence of the evolution of Earth’s environment and the associated changes in life over time.</p> <p><b>Standard ES.4:Cycles of Matter and Energy</b> <b>Matter on Earth is finite and moves through various cycles that are driven by the transformation of energy.</b></p> <p><b>ES.4.1 Water Cycle</b> Students understand water cycles at various rates and at various scales within Earth’s systems.</p> <p><b>ES.4.2 Carbon Cycle</b> Students understand that the carbon cycle illustrates the transformation and pathways of carbon and carbon compounds through Earth’s systems.</p> <p><b>Standard ES.5:Humans and the Environment</b> <b>Humans and the environment impact each other.</b></p> <p><b>ES.5.1 Humans and Natural Resources</b> Students understand that human societies require natural resources derived from Earth. The amounts and types of resources required are a function of the size, growth and affluence of the human population. The value of a natural resource is dependent</p>	

**MIDLAND ISD  
ADVANCED PLACEMENT CURRICULUM STANDARDS**

	<b>AP ENVIRONMENTAL SCIENCE</b>	
<b>TEKS</b>	<b>COLLEGE BOARD</b>	<b>COLLEGE AND CAREER READINESS STDS.</b>
	<p>on its amount and its ease of extractability from Earth.</p> <p><b>ES.5.2 Humans and Natural Hazards</b> Students understand that natural hazards impact human society. Societies try to reduce the impacts of natural hazards through disaster reduction, which entails early warning and engineering projects that seek risk reduction.</p> <p><b>ES.5.3 Humans' Impact on the Environment</b> Students understand that all human activities, including use of resources, have environmental consequences that occur over a range of spatial and temporal scales. Because of the complexity of Earth's systems and because of the occurrence of unintended consequences, a systems framework is commonly used to understand important environmental issues such as pollution, climate change or ecosystem disruption. A systems analysis guides scientific investigations, decision making and the identification of potential solutions to environmental issues.</p>	