

McKinley Presidential Library & Museum
Discover World Tour Ohio Science Standards
High School



MCKINLEY PRESIDENTIAL
 Library & Museum

Course	Study of Matter	Energy and Waves	
Physical Science	<p><i>Reactions of matter</i></p> <ul style="list-style-type: none"> • Chemical reactions • Nuclear reactions 	<p><i>Conservation of energy</i></p> <ul style="list-style-type: none"> • Quantifying kinetic energy • Quantifying gravitational potential energy • Energy is relative <p><i>Transfer and transformation of energy (including work)</i></p> <p><i>Waves</i></p> <ul style="list-style-type: none"> • Refraction, reflection, diffraction, absorption, superposition • Radiant energy and the electromagnetic spectrum • Doppler shift <p><i>Thermal energy</i></p> <p><i>Electricity</i></p> <ul style="list-style-type: none"> • Movement of electrons • Current • Electric potential (voltage) • Resistors and transfer of energy 	
	Evolution	Diversity and Interdependence of Life	
Biology	<p><i>Diversity of Life</i></p> <ul style="list-style-type: none"> • Speciation and biological classification based on molecular evidence • Variation of organisms within a species due to population genetics and gene frequency 	<p><i>Classification systems</i> are frameworks created by scientists for describing the vast diversity of organisms indicating the degree of relatedness between organisms.</p> <p><i>Ecosystems</i></p> <p><i>Homeostasis</i></p> <ul style="list-style-type: none"> • Carrying capacity • Equilibrium and disequilibrium 	
	Structure and Property of Matter	Interactions of Matter	
Chemistry	<p><i>Intermolecular chemical bonding</i></p> <ul style="list-style-type: none"> • Types and strengths • Implications for properties of substances <ul style="list-style-type: none"> • Melting and boiling point • Solubility • Vapor pressure 	<p><i>Chemical reactions</i></p> <ul style="list-style-type: none"> • Types of reactions • Kinetics • Energy • Equilibrium • Acids/bases <p><i>Gas laws</i></p> <ul style="list-style-type: none"> • Pressure, volume and temperature • Ideal gas law 	
	Earth's Systems	Earth's Resources	Global Environmental Problems and Issues

Environmental Science	<p><i>Biosphere</i></p> <ul style="list-style-type: none"> • Evolution and adaptation in populations • Biodiversity • Ecosystems (equilibrium, species interactions, stability) • Population dynamics <p><i>Lithosphere</i></p> <ul style="list-style-type: none"> • Geologic events and processes <p><i>Movement of matter and energy through the hydrosphere, lithosphere, atmosphere and biosphere</i></p> <ul style="list-style-type: none"> • Energy transformations on global, regional and local scales • Biogeochemical cycles • Ecosystems • Climate and weather 		<p><i>Energy and Energy Resources</i></p> <ul style="list-style-type: none"> • Renewable and nonrenewable energy sources and efficiency • Alternate energy sources and efficiency • Resource availability • Mining and resource extraction 	<ul style="list-style-type: none"> • Human population • Potable water quality, use and availability • Climate change • Sustainability • Species depletion and extinction • Air quality • Food production and availability • Deforestation and loss of biodiversity • Waste management (solid and hazardous) 		
	Minerals	Rocks	Earth's History	Plate Tectonics	Glacial Geology	
Physical Geology	<p><i>Criteria of a mineral</i> (crystalline solid, occurs in nature, inorganic, defined chemical composition)</p> <p><i>Properties of minerals</i> (hardness, luster, cleavage, streak, crystal shape, fluorescence, flammability, density/specific gravity, malleability)</p>	<p><i>Igneous</i></p> <p><i>Metamorphic</i></p> <p><i>Sedimentary</i></p>	<p><i>The geologic rock record</i></p> <p><i>The geologic time scale</i></p> <ul style="list-style-type: none"> • Comprehending geologic time • Climate changes evident through the rock record • Fossil record 	<p><i>Historical review</i></p> <ul style="list-style-type: none"> • Paleomagnetism and magnetic anomalies • Paleoclimatology <p><i>Plate motion</i></p> <ul style="list-style-type: none"> • Causes and evidence of plate motion • Measuring plate motion • Characteristics of oceanic and continental plates • Relationship of plate movement and geologic events and features 	<p><i>Glaciers and glaciation</i></p> <ul style="list-style-type: none"> • Evidence of past glaciers • Glacial deposition and erosion • Data from ice cores • Historical changes • Evidence of climate changes throughout Earth's history • Glacial distribution and causes of glaciation • Types of glaciers • Glacial structure, formation and movement 	
	Electricity and Magnetism					

Physics	<p><i>Charging objects (friction, contact and induction)</i> <i>Coulomb's law</i> <i>Electric fields and electric potential energy</i></p> <ul style="list-style-type: none">• DC circuits• Ohm's law• Series circuits• Parallel circuits• Mixed circuits• Applying conservation of charge and energy (junction and loop rules) <p><i>Magnetic fields and energy</i> <i>Electromagnetic interactions</i></p>
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During the years of grades 9 through 12, all students must use the following scientific processes with appropriate laboratory safety techniques to construct their knowledge and understanding in all science content areas:

- ***Identify questions and concepts that guide scientific investigations***
- ***Design and conduct scientific investigations***
- ***Use technology and mathematics to improve investigations and communications***
- ***Formulate and revise explanations and models using logic and evidence (critical thinking)***
- ***Recognize and analyze explanations and models***
- ***Communicate and support a scientific argument.***

(Ohio Dept. of Education, adopted 2011)