

**Colorado Academic Standards – High School  
Science Evidence Outcome Mapping**

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Earth Systems Science	Boardworks High School Earth Science Presentations
<b>Describe and interpret how Earth's geologic history and place in space are relevant to our understanding of the processes that have shaped our planet</b>	
<b>1. The history of the universe, solar system and Earth can be inferred from evidence left from past events</b>	
a. Develop, communicate, and justify an evidence-based scientific explanation addressing questions about Earth's history	The Atmosphere Earth's Structure Planets of the Solar System
b. Analyze and interpret data regarding Earth's history using direct and indirect evidence	The Atmosphere Earth's Structure Evidence for Climate Change Fossil Record
c. Analyze and interpret data regarding the history of the universe using direct and indirect evidence	Planets of the Solar System Observing the Universe Astronomical Distances
d. Seek, evaluate, and use a variety of specialized resources available from libraries, the Internet, and the community to find scientific information on Earth's history	–
e. Examine, evaluate, question, and ethically use information from a variety of sources and media to investigate the history of the universe, solar system and Earth	Observing the Universe
<b>2. As part of the solar system, Earth interacts with various extraterrestrial forces and energies such as gravity, solar phenomena, electromagnetic radiation, and impact events that influence the planet's geosphere, atmosphere, and biosphere in a variety of ways</b>	
a. Develop, communicate, and justify an evidence-based scientific explanation addressing questions around the extraterrestrial forces and energies that influence Earth	Gravity and Orbits Greenhouse Gases
b. Analyze and interpret data regarding extraterrestrial forces and energies	Gravity and Orbits Greenhouse Gases
c. Clearly identify assumptions behind conclusions regarding extraterrestrial forces and energies and provide feedback on the validity of alternative explanations	–
d. Use specific equipment, technology, and resources such as satellite imagery, global positioning systems (GPS), global information systems (GIS), telescopes, video and image libraries, and computers to explore the universe	Observing the Universe Satellites Telescopes

<b>Evaluate evidence that Earth's geosphere, atmosphere, hydrosphere, and biosphere interact as a complex system</b>	
<b>3. The theory of plate tectonics helps explain geological, physical, and geographical features of Earth</b>	
a. Develop, communicate, and justify an evidence-based scientific explanation about the theory of plate tectonics and how it can be used to understand geological, physical, and geographical features of Earth	Plate Tectonics Earthquake Causes
b. Analyze and interpret data on plate tectonics and the geological, physical, and geographical features of Earth	Plate Tectonics Earthquake Causes
c. Understand the role plate tectonics has had with respect to long-term global changes in Earth's systems such as continental buildup, glaciations, sea-level fluctuations, and climate change	Plate Tectonics
d. Investigate and explain how new conceptual interpretations of data and innovative geophysical technologies led to the current theory of plate tectonics	Plate Tectonics
<b>4. Climate is the result of energy transfer among interactions of the atmosphere, hydrosphere, geosphere, and biosphere</b>	
a. Develop, communicate, and justify an evidence-based scientific explanation that shows climate is a result of energy transfer among the atmosphere, hydrosphere, geosphere and biosphere	Heat Transfer and Global Interactions
b. Analyze and interpret data on Earth's climate	Predicting Climate Change Evidence for Climate Change Greenhouse Gases Climate Change Weather and Climate Heat Transfer and Global Interactions
c. Explain how a combination of factors such as Earth's tilt, seasons, geophysical location, proximity to oceans, landmass location, latitude, and elevation determine a location's climate	Weather and Climate The Rotation of the Earth
d. Identify mechanisms in the past and present that have changed Earth's climate	Greenhouse Gases Evidence for Climate Change
e. Analyze the evidence and assumptions regarding climate change	Evidence for Climate Change Climate Change Greenhouse Gases
f. Interpret evidence from weather stations, buoys, satellites, radars, ice and ocean sediment cores, tree rings, cave deposits, native knowledge, and other sources in relation to climate change	Evidence for Climate Change
<b>6. The interaction of Earth's surface with water, air, gravity, and biological activity causes physical and chemical changes</b>	
a. Develop, communicate, and justify an evidence-based scientific explanation addressing questions regarding the interaction of Earth's surface with water, air, gravity, and biological activity	Heat Transfer and Global Interactions Weather and Climate Gravity and Orbits The Water Cycle

b. Analyze and interpret data, maps, and models concerning the direct and indirect evidence produced by physical and chemical changes that water, air, gravity, and biological activity create	–
c. Evaluate negative and positive consequences of physical and chemical changes on the geosphere	–
d. Use remote sensing and geographic information systems (GIS) data to interpret landforms and landform impact on human activity	–
<b>7. Natural hazards have local, national and global impacts such as volcanoes, earthquakes, tsunamis, hurricanes, and thunderstorms</b>	
a. Develop, communicate, and justify an evidence-based scientific explanation regarding natural hazards, and explain their potential local and global impacts	<ul style="list-style-type: none"> <li>Earthquake Causes</li> <li>Earthquake Effects</li> <li>Hurricane Case Studies</li> <li>Managing Earthquakes</li> <li>Volcanoes</li> <li>ENSO</li> <li>Extreme Flooding</li> <li>Tropical Cyclones</li> </ul>
b. Analyze and interpret data about natural hazards using direct and indirect evidence	<ul style="list-style-type: none"> <li>Earthquake Causes</li> <li>Earthquake Effects</li> <li>Hurricane Case Studies</li> <li>Managing Earthquakes</li> <li>Volcanoes</li> <li>ENSO</li> <li>Extreme Flooding</li> <li>Tropical Cyclones</li> </ul>
c. Make predictions and draw conclusions about the impact of natural hazards on human activity – locally and globally	<ul style="list-style-type: none"> <li>Earthquake Effects</li> <li>Hurricane Case Studies</li> <li>Managing Earthquakes</li> <li>ENSO</li> <li>Extreme Flooding</li> <li>Tropical Cyclones</li> </ul>
<b>Describe how humans are dependent on the diversity of resources provided by Earth and Sun</b>	
<b>5. There are costs, benefits, and consequences of exploration, development, and consumption of renewable and nonrenewable resources</b>	

<p>a. Develop, communicate, and justify an evidence-based scientific explanation regarding the costs and benefits of exploration, development, and consumption of renewable and nonrenewable resources</p>	<p>Human Impact on the Environment  Climate Change  Greenhouse Gases  Water Pollution  Crude Oil  Loss of Diversity  Extinction  Formation of Fossil Fuels  Fossil Fuels  Air Pollution  The Impact of Mining  Nuclear Fusion  Nuclear Fission  Solar Energy</p>
<p>b. Evaluate positive and negative impacts on the geosphere, atmosphere, hydrosphere, and biosphere in regards to resource use</p>	<p>Water Pollution  Air Pollution  The Impact of Using CFCs  The Impact of Mining  Greenhouse Gases  Climate Change  Loss of Diversity  Extinction</p>
<p><i>c. Create a plan to reduce environmental impacts due to resource consumption</i></p>	<p>–</p>
<p><i>d. Analyze and interpret data about the effect of resource consumption and development on resource reserves to draw conclusions about sustainable use</i></p>	<p>–</p>