

Earth Science Grade Span

4.2a Structures and Properties

PreK-12 EU: <u>Students will understand that all objects have discrete properties which help us define the universe</u>			
PreK-12 EQ: <i>What are some observable properties of the objects in the universe and how do they affect each other?</i>			
9-12 EU: The universe is regular and predictable.			
9-12 EU: Students will understand where matter in the universe comes from and how matter is changed.			
Grade 9 -12			
<p>Students will know: - The Universe expanded explosively into being around 14 billion years ago .</p> <p>Students will be able to: - Give evidence for the big bang theory and describe how the universe evolved under the influence of gravitational force.</p> <p>Students will know: -the role of electromagnetic radiation (EM) in the universe</p> <p>Students will be able to: - identify and compare the spectral patterns of different electromagnetic wave signatures and the impact they have in the environment</p>	<p>Students will know: -Scientific theories on the nature of the Universe have evolved significantly over the past 2000 years</p> <p>Students will be able to: -Explain how technology over time has influenced our understanding of the nature of the Universe:</p>	<p>Students will know: - that nuclear reactions generate energy to produce stars and form elements larger than H and He.</p> <p>Students will be able to: -Describe the process of star formation in relation to its size, including the interaction of the force gravity, fusion, and energy release</p>	

Earth Science Grade Span

4.1b Patterns and Cycles

PreK-12 EU: **Students will understand that the relationship between the earth and sun creates changes over time encompassing the water cycle, climate, weather and seasonal patterns.**

PreK-12 EQ: *How does the sun create and affect the water cycle, climate and weather patterns on Earth?*

9 -12 EU: Students will understand that Earth's climate patterns and weather are governed by the transfer of heat energy between the atmosphere, land and oceans which affects weather related phenomena. **ACROSS TIME**

Grade 9 - 12

<p>Students will know:</p> <p>how the changes to Earth over time have been governed by changes Earth's system and energy within all of Earth's systems.</p> <p>Students will be able to:</p> <ul style="list-style-type: none">- make a prediction using evidence in what might happen to in one or multiple earth system based on the evidence of what has happen in the past. (i.e. predicting next ice ages, global climate change, etc.)			
---	--	--	--

Earth Science Grade Span

4.2b Structures and Properties

<p>PreK-12 EU: <u>Students will understand that forces shape the Earth and the Earth is made up of basic materials.</u></p> <p>PreK-12 EQ: <i>In what ways has Earth changed throughout its history AND what evidence can be shown to support it? How do natural forces shape and change the Earth? What are the basic materials that make up the Earth and how have they changed over time?</i></p> <p>9-12 EU: Students will understand that the rock cycle provides evidence of the forces within the earth and the connection between different types of rock.</p> <p>9-12 EU: Students will understand that internal heat sources which cause convection currents in the mantle create tectonic movement, plate tectonics.</p>			
<p>Grade 9 -12</p>			
<p>Know: Igneous, sedimentary and metamorphic rocks are made up of minerals. The structure of the minerals varies depending on the rock type.</p> <p>Over time, rocks undergo both physical and chemical changes.</p> <p>Rocks are composed of minerals, which each have their own unique properties.</p> <p>The tectonic plates are driven by the convection currents within Earth.</p> <p>Over time, Earth's surface undergoes both physical and chemical changes (ie weathering/erosions, glacial, surface water, soils, etc.).</p>	<p>Be Able to: Classify different rocks based on their formation, structure and mineralogy</p> <p>Describe / model the processes that change one rock type to another.</p> <p>Explain the formation of a rock based on its mineralogy and specific properties.</p> <p>Investigate and explain plate movement based on evidence.</p> <p>Describe / model the processes that change Earth's surface.</p>		

Earth Science Grade Span

4.3 Sustainability

PreK-12 EU: **Students will understand that humans depend on the earth for different resources and human activities can affect the earth's systems.**

PreK-12 EQ: *How has life changed the planet over time?
How have humans influenced earth's changes?*

9 – 12 EU: Students will understand that human sustainability requires continued efforts to responsibly manage natural resources.

Grade 9 - 12

Students will know:

That the renewability of a resource is based on many factors.

Each resource has own set of cost and benefits for use and sustainability.

Resources are local and global commodity.

Be Able to do:

Trace a resource from extraction, through manufacture to disposal.

Student will be able to analyze resources, as non-renewable, potentially renewable and perpetually renewable and cite which factors make this determination.

Analyze and debate the responsible use and impact of the different management plans for a particular resource.