



Geology

Course Description:

The curriculum for this introductory elective course is developed from Project Earth Science and the [Next Generation Science Standards](#) with an emphasis on the dynamic nature of the geologic Earth. Through topics such as plate tectonics and volcanism, the course will explore how the surface of the Earth has changed over time, the scientific methods used to determine past changes, and predict the potential for possible changes to the Earth in the future. We will complete our analysis of the Earth with a look at it's most famous fossils...the dinosaurs! Grades are determined by quizzes, tests, projects and daily work. The information in this course overview outlines what students should understand and be able to do by the end of the semester/year.

Mastery Standards:

Because this is a course designed for students who have previously taken their core science classes, some of the standards have been introduced in previous classes.

Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks. (HS-ESS1-5)

Apply scientific reasoning and evidence from ancient Earth materials, meteorites, and other planetary surfaces to construct an account of Earth's formation. (HS-ESS1-6)

Develop a model to illustrate how Earth's internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features.(HS-ESS2-1)

Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth.(HS-ESS2-7)

Other standards covered (not necessarily to mastery):

Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motion of particles (objects) and energy associated with the relative positions of particles (objects). (HS-PS3-2)

Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems. (HS-ESS2-2)

Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection. (HS-ESS2-3)

Possible additions would be:

Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth's systems. (HS-ESS3-5)

Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity. (HS-ESS3-6)

Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate. (HS-ESS2-4)

Unit	Description of Unit and Learning Targets
<p>Unit Title: Understanding Science</p> <p><u>Essential Questions:</u></p> <ul style="list-style-type: none"> • What is the nature of science? 	<p>Students will.....</p> <p><u>Learning Targets:</u></p> <ul style="list-style-type: none"> • Use the tools of science to investigate natural phenomenon. • Understand the usefulness and limitations of science. • Communicate ideas and observations using scientific conventions (e.g. graphing, CER statements)
<p>Unit Title: The Earth</p> <p><u>Essential Questions:</u></p> <ul style="list-style-type: none"> • What changes the Earth? 	<p>Students will...</p> <p><u>Learning Targets:</u></p> <ul style="list-style-type: none"> • Compare and contrast theories about the development of our solar system and planet. • Identify the major areas of the Earth and their characteristics. • classify faults by tectonic movement.
<p>Unit Title: Geologic Time</p> <p><u>Essential Questions:</u></p> <ul style="list-style-type: none"> • How can we know about the past of our planet? 	<p>Students will...</p> <p><u>Learning Targets:</u></p> <ul style="list-style-type: none"> • Appreciate the vast amount of time elapsed on Earth • Be able to identify the major time divisions of the Earth • Use different methods (rock record or radiodating) to identify major events of the past.
<p>Unit Title: Volcanoes</p> <p><u>Essential Questions:</u></p> <ul style="list-style-type: none"> • What is a volcano? 	<p>Students will...</p> <p><u>Learning Targets:</u></p> <ul style="list-style-type: none"> • Know the anatomy of a volcano • Understand why volcanoes exist and their function • Be able to predict why a volcano will look the way it does • Explain how a volcano can impact the life that exists near it.
<p>Unit Title: The Dinosaurs</p> <p><u>Essential Questions:</u></p> <ul style="list-style-type: none"> • How does the Earth affect life? 	<p>Students will...</p> <p><u>Learning Targets:</u></p> <ul style="list-style-type: none"> • Classify dinosaurs by characteristics • Determine why dinosaurs changed • Debate current topics on dinosaur / extinct animal cloning
<p>Unit Title: Earthquakes (if time allows)</p> <p><u>Essential Questions:</u></p> <ul style="list-style-type: none"> • Why do earthquakes happen? 	<p>Students will...</p> <p><u>Learning Targets:</u></p> <ul style="list-style-type: none"> • Understand why earthquakes occur and their function • Be able to predict where an earthquake will occur • Determine the epicenter of an earthquake from seismic data.