

CRM 5 Dynamic Earth

Pacing

- 33 days
- Jan. 7-Feb.22
- Week 18-24

DESIRED RESULTS

Making Meaning

Concepts in the study of Earth science help explain many changes we observe around us. Investigations in the physical sciences help lay a foundation for students to understand the size, age, construction, and behavior of Earth. In addition, studies in life science are partially rooted in Earth science since Earth is the only planet known to support life. Earth science concepts connect with all the other disciplines and connect the concepts in the other strands of science together. These concepts build a foundation for the study of geology, geological history, geophysics, geochemistry, geobiology, climate change, and environmental sciences. Students build an understanding of the Earth and our place in the solar system and the universe.

The following make meaning valuable for learners and are investigated in this unit:

- Earth is a unique water planet that supports life.
- Earth’s surface is constantly changing due to the forces of moving wind, water, and ice.
- Forces below the surface of the Earth cause dramatic, quick changes to Earth’s surface.
- Earth produces natural resources that meet the needs of humans and other organisms.
- Earth recycles its materials.
- Humans have an impact on Earth.

Transfer: Students understand that models of the Earth’s surface and processes are simplified representations of real objects and processes, and that models serve as a means to communicate ideas and knowledge about how these Earth processes work.

Enduring Understandings:

- Rock and soil bear evidence of the minerals, temperatures, and forces that created them.
- Earth’s surface is constantly changing due to forces.
- Characteristics of resources make them useful and worth conserving.

Essential Questions:

- How do rocks and soil tell about Earth’s past?
- How do forces shape Earth’s land?
- What makes a natural resource useful?

Essential Vocabulary

- alternative energy/ fuentes alternativas de energía
- biofuels/ biocombustibles
- basin / cuenca
- channel / canal
- canyons/ cañón
- chemical weathering/ degradación química, meteorización química
- coal/ carbón mineral
- delta/ delta
- drought/ sequía
- erosion / erosión
- deposition / deposición
- environment/ medio ambiente
- extinct/ extinguirse
- floodplain/llanura aluvial
- fossil fuel/ combustibles fósil
- fossil/ fósil

- geothermal energy/ energía geotérmica
- hydroelectric energy/ energía hidroeléctrica
- layers/capas
- natural gas/ gas natural
- nutrients/nutrientes
- organic matter/material organismo
- petroleum / petróleo
- physical weathering/ degradación física, meteorización física
- sand dune/colina de arena
- sediment/sedimento
- sedimentary rock
- stream table/ corriente de agua sobre mesa
- solar energy/ energía solar
- weathering/desgaste o degradación
- wind energy/ energía del viento

Supporting Vocabulary Link

- [Elementary School Supporting Vocabulary](#)

Student Prerequisite Knowledge

Students should know:

- soil formation is part of the rock cycle.
- soil is made of particles of rock, the remains of decaying organisms, and living organisms.
- understand that forces acting on matter create change.
- waves, wind, water, and ice shape and reshape the Earth’s surface by eroding rock and soil in some areas and depositing it in others.
- weathering is the breaking down of rock by water, wind, and ice.
- erosion carries away Earth materials by wind, water, and ice.
- deposition is the process by which eroded earth materials settle out in another place.
- man uses resources to make things for everyday use.
- some resources cannot be reproduced in our lifetime and are classified as nonrenewable. Other resources can be renewed in our lifetime and are classified as renewable.
- resources that are plant and animal based are usually renewable.
- resources that come from the Earth are usually non-renewable.
- conservation is necessary to make sure we have enough of these resources.

Resources: Scott Foresman, [Science](#), FOSS, [Landforms Investigations](#), AISD Module Kit, [STEMScopes](#), [Scientist’s Notebook Samples and Resources](#), [Pearson Online Readers](#)

ELPS: Mandated by Texas Administrative Code (19 TAC §74.4), click on the link for [English Language Proficiency Standards \(ELPS\)](#) to support English Language Learners.

TEKS Knowledge & Skills	Acquisition	
STAAR: RC = Reporting Category; DC = Dual Coded Skills; Readiness Standard ; Supporting Standard Concepts are addressed in another unit.	Students Will Know	Students Will Be Able To

5.7: Earth and space. The student knows Earth’s surface is constantly changing and consists of useful resources. The student is expected to:

<p><u>5.7A: explore the processes that led to the formation of sedimentary rocks and fossil fuels.</u></p>	<ul style="list-style-type: none"> • Particles of sand and silt (some containing the remains of organisms) settle in layers over time and are gradually buried together and harden to form solid rock again. • A fuel is a material we burn in order to generate energy. • Fossil fuels formed in Earth's crust when buried layers of decaying organic matter are chemically changed by pressure, bacterial processes and heat. It took millions of years for these organisms to change into fossil fuels. 	<ul style="list-style-type: none"> • Explore the processes that led to the formation of sedimentary rocks. • Understand and identify the oldest/youngest layers in sedimentary rock. • Explore how fossil fuels are formed. • Identify the environment that created the fossil fuel.
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<p><u>5.7B: recognize how landforms such as deltas, canyons, and sand dunes are the result of changes to Earth's surface by wind, water, and ice.</u></p>	<ul style="list-style-type: none"> • Earth's surface and landforms are constantly being changed and shaped by the forces of moving water, wind, and ice. • Erosion carries away Earth materials by wind, water, and ice. • Deposition is the process by which eroded earth materials settle out in another place. • A landform is a shape of the land. 	<ul style="list-style-type: none"> • Explore the processes that led to the formation of landforms. • Recognize landforms created by moving wind, water, and ice. • Demonstrate examples and non-examples of landforms. • Model and explain a landform. • Explain and identify examples of deposition, weathering, and erosion.
<p><u>5.7C: identify alternative energy resources such as wind, solar, hydroelectric, geothermal, and biofuels.</u></p>	<ul style="list-style-type: none"> • Alternative energy resources are those that do not require fossil fuels, and they include biofuels (ethanol and diesel), wind, solar, geothermal, and hydroelectric resources. • Increased demand for and use of energy resources leads to more rapid depletion of Earth's energy resources and to environmental risks associated with fossil fuels. • Finding alternative resources that are renewable helps reduce pollution and availability of energy resources and creates jobs for our future. 	<ul style="list-style-type: none"> • Identify current energy resources and their benefits or challenges. • Identify why and how we might use the following alternative energy resources: wind, solar, hydroelectric, geothermal, and biofuels. • Compare advantages and disadvantages of alternative energy sources to fossil fuels.
<p><i>5.7D: identify fossils as evidence of past living organisms and the nature of the environments at the time using models.</i></p>	<ul style="list-style-type: none"> • Layers of sedimentary rock provide evidence of Earth's history and of changing life forms over time. • Fossils can be in different forms. • We can infer conditions of past environments by examining fossils from different times. 	<ul style="list-style-type: none"> • Identify fossils as evidence of past living organisms. • Use fossil models to identify what the nature of the environment was like at that time.

4.7: Earth and space. The students know that Earth consists of useful resources and its surface is constantly changing. The student is expected to:		
<p>4.7A: examine properties of soils, including color and texture, capacity to retain water, and ability to support the growth of plants.</p>	<ul style="list-style-type: none"> • Soil is made of particles of rock and the remains of decaying and live organisms. • We can observe soils for properties of color, texture, how well they appear to support plant life, and their tendency to retain or drain water. • Sand, silt, and clay are particles of different sizes, and their proportion in a soil determines its tendency to retain water. • Soils containing large particles such as sand have space for air but let water drain out quickly. • Soils containing small particles such as clay have little space for air but do retain water. • A mixture of these particles is best for retaining the right amount of water. • Decaying organisms add nutrients to the soil that support plant life. 	<ul style="list-style-type: none"> • Investigate and describe soil components. • Compare soil samples' colors, textures, and water drainage. • Compare particle and pore size to determine water retention.
<p>4.7C identify and classify Earth's nonrenewable resources, including coal, oil, and natural gas; and the importance of conservation</p>	<ul style="list-style-type: none"> • Natural resources are materials found in nature that are useful for survival, for energy, and for making things. • Resources are removed from the Earth at great energy "costs." • Resources may be classified as renewable or nonrenewable. • Conservation is necessary to make sure we have enough of these resources. 	<ul style="list-style-type: none"> • Identify and classify resources as renewable or nonrenewable. • Analyze advantages and disadvantages of using fossil fuels. • Make informed decisions in the conservation, disposal, and recycling of materials.
3.7: Earth and space. The student knows that Earth consists of natural resources and its surface is constantly changing. The student is expected to:		
<p>3.7B: investigate rapid changes in Earth's surface such as volcanic eruptions, earthquakes, and landslides.</p>	<ul style="list-style-type: none"> • Volcanoes are formed when magma pushes upward, causing the land to rise, and pressure forms a vent, allowing lava to escape on Earth's surface. • Earthquakes are the result of rock plates below the Earth's surface, creating vibrations. • Landslides are the result of forces of gravity pulling on rock, mud, and land. 	<ul style="list-style-type: none"> • Investigate rapid changes on Earth's surface. • Investigate volcanic eruptions, earthquakes, and landslides.

The study of science is taught through the lens of [Scientific Processes \(TEKS 5.1-5.4\)](#); therefore, these TEKS should be taught in conjunction with content throughout the year. Suggestions for TEKS to embed in each unit are provided in the Yearly Itinerary; however, the TEKS that can be addressed within a unit depends greatly on the learning activities in which students are engaged. Therefore, teachers must be deliberate in their choice of learning activities to ensure that all Scientific Processes TEKS are appropriately embedded within the course. In 5th grade, districts are encouraged to facilitate laboratory and field investigations for at least 50% of instructional time.

ASSESSMENT EVIDENCE

Student Work Products/Assessment Evidence

Performance Tasks	Other Evidence (i.e. unit tests, open ended exams, quiz, essay, student work samples, observations, etc.)
<p>Students investigate the following with hands-on labs and research:</p> <ul style="list-style-type: none"> • TEA Constant Changes • FOSS: Landforms stream table investigations • Weathering, erosion, and deposition • Sedimentary rock formation and layering • Fossil formation and evidence of past environments • Changing Earth Labs • Fossil fuel formation • Natural Resources Classification • Conservation Plan • Alternative energy resource research and exploration <p>Optional Review Lessons and Labs:</p> <ul style="list-style-type: none"> • Science Fair Project • Volcanoes • Landslides • Earthquakes • Soil 	<p>Short Cycle Assessment</p> <ul style="list-style-type: none"> • <i>SCA Testing Window: Jan.28-Feb.1, 2013</i> <i>Tested TEKS: 5.7B, 3.7B, 3.8D</i> • <i>SCA Testing Window: Feb.25-March1, 2013</i> <i>Tested TEKS: 5.7A, 5.7C, 5.7D, 4.7A, 4.7C</i> <p>Additional Suggestions for Assessment</p> <ul style="list-style-type: none"> • Student responses in notebooks • Teacher observations and questioning • Team products and decisions • Graphic organizers • Constant Changes – Evaluate page 108, RM 12 • TEA Constant Changes Labs • FOSS Landforms Lab Notes and Sheets • Student-developed surveys, graphs, and analyses using computers • Problem solving projects and communication

LESSON PLANNING TOOLS

In the course of lesson planning, it is the expectation that teachers will include whole child considerations when planning such as differentiation, special education, English language learning, dual language, gifted and talented, social emotional learning, physical activity, and wellness.

Science Fair 5 Days

Use questions and student interest from the beginning and throughout the year to guide students through a descriptive investigation. If you have made an Inquiry Board to showcase student questions and ideas, validate student thinking with reading and talking about how as a scientist, each of their questions might be answered using scientific investigations. Remember that scientists answer questions in many ways, not just experimental investigations: building models, observations, observations and data collection over time, research and collaboration with other scientists.

Model Lesson- [Changes to Earth's Surface](#)

- Erosion
 - Stream Tables 1: Erosion and Deposition
 - Stream Tables 2: Moving Water
 - Landforms
 - Ice-carved Landforms
- Review Lessons (Optional)
- Weathering Review
 - Rapid Changes to Earth's Surface Water and
 - Caves
- Suggested Pacing: (9 days)
TEKS: 5.7B, 3.7B

Model Lesson- [Properties of Soil](#)

- Soil Properties
 - Testing Soil
 - Suggested Pacing (4 days)
- TEKS: 5.7A, 4.7A

Model Lesson- [Sedimentary Rock & Fossil Formation](#)

- Sedimentary Rock and Fossil Formation
 - Inferring Past Environments
- Suggested Pacing: (5 days)
TEKS: 5.7A, 5.7D

Model Lesson- [Renewable and Nonrenewable Resources \(Fossil Fuels as a resource\)](#)

- Natural Resources
 - Fossil Fuels
- Suggested Pacing: (5 days)
TEKS: 5.7A, 4.7C

Model Lesson- [Alternate Energy Resources](#)

- Alternative Energy
- Suggested Pacing: (5 days)
TEKS: 5.7C