8/17/18

2018-2019 MIDDLE SCHOOL TRANSITION PLAN
Use this plan for 2018-2019 ONLY

8th Grade Unit 4 (~21 Days)

The Dynamic Earth

Performance Expectations included in Unit 4

8-MS-ESS2-2: Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.

8-MS-ESS2-3: Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.

8-MS-ESS3-1: Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.

Unit 4 Anchor Phenomenon: Tsunami

8-MS-ESS2-2 (Earth's Systems) Investigative Phenomenon: Top 10 Landslides

8-MS-ESS2-2 (Earth's Systems)		Concepts
Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.		Geoscience processes have changed Earth's surface at varying time and spatial scales.
Clarification Statement		Processes change Earth's surface at time and spatial scales that can be large or small; many geoscience processes usually behave gradually but are punctuated by catastrophic events.
Emphasis is on how processes change Earth's surface at time and spatial scales that can be large (such as slow plate motions or the uplift of a large mountain ranges) or small (such as rapid landslides on microscopic geochemical reactions), and how many geosciences processes usually behave gradually but are punctuated by catastrophic events (such as earthquakes, volcanoes, and meteor impacts). Examples of geoscience processes include surface weathering and deposition by the movements of water, ice, and wind. Emphasis is on geoscience processes that shape local geographic features, where appropriate.		Geoscience processes shape local geographic features. The planet's systems interact over scales that range from microscopic to global in size, and they operate over fractions of a second to billions of years. Interactions among Earth's systems have shaped Earth's history and will determine its future.
Science and Engineering Practice	**Disciplinary Core Idea**	Water's movements—both on the land and underground—cause weathering and erosion, which change the land's surface features and create underground formations.
Constructing explanations and designing solutions: Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and	**EARTH'S MATERIALS AND SYSTEMS** The planet's systems interact over scales that range from microscopic to global in size, and they operate over fractions of a second to billions of years. These interactions have shaped Earth's history and will determine its future. (MS.ESS2A.b)	Time, space, and energy phenomena within Earth's systems can be observed at various scales using models to study systems that are too large or too small.

designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.

• Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

THE ROLE OF WATER IN EARTH'S SURFACE PROCESSES
Water's movements—both on the land and underground—cause weathering and erosion, which change the land's surface features and create underground formations. (MS.ESS2C.e)

Crosscutting Concepts

SCALE, PROPORTION, AND QUANTITY
Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small.

Students should be able to: Use estimation to help them not only develop a sense of the size and time scales relevant to various objects, systems, and processes but also to consider whether a numerical result sounds reasonable. They should be able to move back and forth between models at various scales, and develop a sense of the powers-of-10 scales and what phenomena correspond to what scale. Students will explore and interpret different graphs to represent data collected, for example, that a plant gets bigger as time passes or that the hours of daylight decrease and increase across the months. They should be able to examine their scientific data to predict the effect of a change in one variable on another, and recognize and apply more complex mathematical and statistical relationships in science.

Sample Guiding Questions

Earth's systems are dynamic.

Earth's systems interact over a wide range of temporal (fractions of a second to billions of years) and spatial (microscopic to global) scales.

Earth's systems, microscopic to global in size, have cycles that interact with each other. Most changes occur gradually, but larger and rapid catastrophic events (e.g., volcanic eruptions, earthquakes, hurricanes) also account for changes to Earth's surface.

These processes and their interactions have shaped and will continue to shape the Earth.

Some satellites allow scientists to observe, over time, large-scale changes in the geosphere.

Sedimentary rocks are formed through the processes of weathering, erosion, and deposition.

Erosion shapes rock particles.

Erosion shapes and reshapes the land surface (e.g., coastal erosions land loss).

Over time, microscopic particle movement that takes place during weathering and erosion by the water cycle's continuous movement change the land's surface features (e.g., deposition by the movement of water, ice and wind).

Over time, the water cycle's continuous movement create underground formations (e.g., aquifers).

Ways to check for understanding

Construct a scientific explanation for how geoscience processes have changed Earth's surface at varying time and spatial scales based on valid and reliable evidence obtained from sources (including the students' own experiments).

Construct a scientific explanation for how geoscience processes have changed Earth's surface at varying time and spatial scales based on the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Collect evidence about processes that change Earth's surface at time and spatial scales that can be large (such as slow plate motions or the uplift of large mountain ranges).

What processes change the Earth's surface?
What are the slowest and fastest processes?
What are the largest and smallest changing spaces?
What are the causes and effects of tectonic plate motion?
What are the causes and effects of orogeny?
What are the causes and effects of landslides?
What chemical reactions can change the surface?
What are different examples of gradual and catastrophic events?
How does surface weathering change the Earth's surface?
How does deposition change the Earth's surface?
How does water, ice and wind change the Earth's surface?
What are some local geographic features? How were they created?
How have earthquakes, volcanoes and meteor impacts changed the Earth's surface?

Key Vocabulary

Geoscience processes, Surface processes (i.e. weathering, erosion, deposition), plate motion, uplift of large mountains, landslide, microscopic geochemical reactions, earthquake, volcanoes, meteor impact

Sample 5E Lesson Plan

8-MS-ESS2-2 Sample Lesson Plan

uplift of large (mountain ranges).

Collect evidence about processes that change Earth's surface at time and spatial scales that can be small (such as rapid landslides or microscopic geochemical reactions), and how many geoscience processes (such as earthquakes, volcanoes, and meteor impacts) usually behave gradually but are punctuated by catastrophic events.

Additional Teacher Resources

ESS2A - Earth Materials and Systems
ESS2B - Plate Tectonics and Large-Scale System Interactions
ESS2C - The Role of Water in Earth's Surface Processes
ESS2D - Weather and Climate
ESS2E - Biogeology

MS-ESS2-2 NGSS Evidence Statement

Sample Activities

CK12: Tuoleumne River
The Rain Man
Modeling Weather Fronts
Analyzing Visual Representations: How Earthquakes Cause Tsunamis
Flash Flood Fantasy
Cliffside Homes Near Collapse in California Due to El Nino Erosion
Hot Spot Activity
Erosion Investigation

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8-MS-ESS2-3 (Earth's Systems) Investigative Phenomenon: Continental drift map

8-MS-ESS2-3 (Earth's Systems)	Concepts
Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.	Tectonic processes continually generate new seafloor at ridges and destroy old sea floor at trenches.

Clarification Statement
Examples of data include similarities of rock and fossil types on different continents, the shapes of the continents (including continental shelves), and the locations of ocean structures (such as ridges, fracture zones, and trenches).

Science and Engineering Practice	Disciplinary Core Idea
Analyzing and interpreting data: Analyzing data in 6-8 builds on K-5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis. • Analyze and interpret data to provide evidence for phenomena.	**THE HISTORY OF PLANET EARTH** Tectonic processes continually generate new ocean sea floor at ridges and destroy old sea floor at trenches. (MS. ESS1C.c) **PLATE TECTONICS AND LARGE-SCALE SYSTEM INTERACTIONS** Maps of ancient land and water patterns, based on investigations of rocks and fossils, make clear how Earth's plates have moved great distances, collided, and spread apart. (MS.ESS2B.a)

Crosscutting Concepts
PATTERNS Patterns in rates of change and other numerical relationships can provide information about natural and human designed systems.
Develop ways to recognize, classify, and record patterns in the phenomena they observe, and by middle school, students can begin to relate patterns to the nature of microscopic and atomic-level structures—for example, they may note that chemical molecules contain particular ratios of different atoms.

Sample Guiding Questions
What patterns are found in the distribution of fossils?
What patterns are found in the distribution of rocks?
What determines the shape of a continent?
How do seafloor structures form?
What evidence describes past tectonic plate motion?
What patterns are found in comparing the shapes of continents?
What is the relationship between a continent and a continental shelf?

Maps of ancient land and water patterns, based on investigations of rocks and fossils, make clear how Earth's plates have moved great distances, collided, and spread apart.
Patterns in rates of change and other numerical relationships can provide information about past plate motions.
The distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of past plate motions.
Similarities of rock and fossil types on different continents, the shapes of the continents (including continental shelves), and the locations of ocean structures (such as ridges, fracture zones, and trenches) provide evidence of past plate motions
Tectonic processes cause the movement of Earth's plates and sea floor spreading.
Large plates of Earth's surface have moved and continue to move due to natural forces in the Earth's interior.
These movements generate new ocean sea floor at mid-ocean ridges.
These movements destroy old ocean floor at trenches (e.g., subduction zones) as plates overlap or pull away from each other.
In sea floor spreading, molten material forms new rock along the mid-ocean ridge.
All subducted plates are oceanic, which keeps the ocean floor in a constant stat e of change; whereas, the continents change much more slowly in geologic time.
The theory of plate tectonics explains plate movements and how they cause continental drift. Scientist believe that at one time the continents were connected and then gradually separated by lithospheric plate movement.
The shapes of the continents (fit like a jigsaw puzzle) demonstrate lithospheric plate movement.
Evidence of the continents being connected include the shapes of the continent s, and fossil and rock similarities from continents no longer connected.
Fossil comparisons along the edges of continents demonstrate lithospheric plate movement

What is an ocean ridge? How does it form?	lithospheric plate movement.
What is an oceanic fracture zone?	Data analysis, including maps, the distribution of fossils and rocks, continental shapes, and sea floor spreading provide evidence of past plate motion.
What is an oceanic trench?	
What examples can we provide of ocean structures?	
What is the difference between the density of continental and oceanic crust?	**Ways to check for understanding**
Key Vocabulary	Analyze and interpret data such as distributions of fossils and rocks, continental shapes, and seafloor structures to provide evidence of past plate motions.
	Analyze how science findings have been revised and/or reinterpreted based on new evidence about past plate motions.
Sample 5E Lesson Plan	**Additional Teacher Resources**
8-MS-ESS2-3 Sample Lesson Plan	ESS2A - Earth Materials and Systems
	ESS2B - Plate Tectonics and Large-Scale System Interactions
	ESS2C - The Role of Water in Earth's Surface Processes
	ESS2D - Weather and Climate
	ESS2E - Biogeology
	MS-ESS2-3 NGSS Evidence Statement
	Sample Activities
	Continental Drift Activity
	Seafloor Spreading
	Dinosaurs in Antarctica? Video Report #1
	Sediment Deposition Supprots Seafloor Spreading
	Plate Tectonics Puzzle
	Modeling Sea Level: Lateral and Vertical Facies Changes
	Dynamic Earth
	Understanding Seafloor Spreading with Nanofossils

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8-MS-ESS3-1 (Earth and Human Activity) Investigative Phenomenon: Human population and natural resources map

8-MS-ESS3-1 (Earth and Human Activity)	Concepts

Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.

Clarification Statement

Emphasis is on how these resources are limited and typically non-renewable, and how their distributions are significantly changing as a result of removal by humans. Examples of uneven distributions of resources as a result of past processes include but are not limited to petroleum (locations of the burial of organic marine sediments and subsequent geologic traps), metal ores (locations of past volcanic and hydrothermal activity associated with subduction zones), and soil (locations of active weathering and/or deposition of rock).

Science and Engineering Practice	Disciplinary Core Idea
Constructing explanations and designing solutions: Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories. • Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.	**NATURAL RESOURCES** Humans depend on Earth's land, ocean, atmosphere, and biosphere for many different resources. Minerals, fresh water, and biosphere resources are limited, and many are not renewable or replaceable over human lifetimes. These resources are distributed unevenly around the planet as a result of past geologic processes. (MS.ESS3A.a) **LOUISIANA'S NATURAL RESOURCES** Non-renewable resources such as our state's fossil fuels are vast but limited. (MS.EVS1A.b)

Crosscutting Concepts

CAUSE AND EFFECT
Cause and effect relationships may be used to predict phenomena in natural or designed systems.

Students should be able to:
Argue, with evidence, an explanation of an observed phenomenon to a specific cause.
Routinely connect and explain cause and effect relationships

Humans depend on Earth's land, ocean, atmosphere, and biosphere for many different resources.

Minerals, fresh water, and biosphere resources are distributed unevenly around the planet as a result of past geologic processes.

Cause-and-effect relationships may be used to explain how uneven distributions of Earth's mineral, energy, and groundwater resources have resulted from past and current geosciences processes.

Resources that are unevenly distributed as a result of past processes include but are not limited to petroleum, metal ores, and soil.

Mineral, fresh water, ocean, biosphere, and atmosphere resources are limited, and many are not renewable or replaceable over human lifetimes.

The distribution of some of Earth's land, ocean, atmosphere, and biosphere resources are changing significantly due to removal by humans.

Humans rely on natural resources from the Earth to meet their ever changing needs.

Many of these resources are not renewable or replaceable over a human lifetime.

Some natural resources, called renewable resources, are naturally replaced in a relatively short time.

Natural resources that are not replaced as they are used are called non-renewable resources.

Natural resources occur all around the world, but are not distributed evenly.

In some locations on Earth, where geological processes have concentrated resources, they may be readily available.

Louisiana has a variety of natural resources that are important for human life.

Non-renewable resources, like the state's fossil fuels we burn for energy, are not replaceable over human lifetimes.

Ways to check for understanding

Construct a scientific explanation based on valid and reliable evidence of how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geosciences processes.

Sample Guiding Questions	
What are some of the most valuable and necessary resources on Earth?	Obtain evidence from sources, which must include the student's own experiments. Construct a scientific explanation based on the assumption that theories and laws that describe the current geosciences process operates today as they did in the past and will continue to do so in the future
What do we need to know in order to find fossil fuels?	
Where do we get precious metals?	
What regions have the richest supply of mineral resources?	
How can we predict the most promising locations for agriculture and mining?	
How does the distribution of resources change over time?	
What is the human impact on distribution of resources?	**Additional Teacher Resources**
What past processes have developed the resources that we will need today?	ESS3A - Natural Resources
What is the difference between a metal and an ore?	ESS3B - Natural Hazards
What resources can be found in organic marine sediment?	ESS3C - Human Impacts on Earth Systems
Where do populations get the salt that they need?	ESS3D - Global Climate Change
What is a geologic trap?	
How does hydrothermal activity change the distribution of resources?	**MS-ESS3-1 NGSS Evidence Statement**
How is volcanic activity good or bad for providing people with resources they need?	**Sample Activities**
What is a subduction zone, and how can it help us predict the location of resources?	Minerals on the Edge - Plate Boundaries and Minerals
How does soil form, and where does it form?	Patterns of Natural Resources
How does weathering and deposition make access to resources easier or more difficult?	A Graphic Look at the State of our World
Key Vocabulary	US Total Crude Oil and Product Imports
Uneven distribution of Earth's resources, Mineral resources (e.g. metal ores, soils), Energy resources (e.g. petroleum), Groundwater resources, Non-renewable resources, Geoscience processes (e.g. volcanic activity, sedimentary processes), Cause and Effect	World Map 250 MYA What the World might look like in the future **Sample 5E Lesson Plan** 8-MS-ESS3-1 Sample Lesson Plan

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