

Unit 3: History of Earth

Driving Question: Can we really comprehend geologic time?
Anchor Phenomenon: The Cosmos “Cosmic Calendar” Scene
Duration: 17-20 days



Unit Overview: In this unit, students will investigate the major events that shaped Earth from its formation to the present day. Topics include the early Earth, the development of the atmosphere and oceans, and the rise of life that transformed the planet's systems. Students will then examine geologic processes such as plate tectonics, mountain building, and mass extinctions that create patterns in Earth's long term changes. Through models, fossil evidence, and investigations, students will understand how Earth's dynamic history influences the environment we live in today.

Performance Expectations [PE]:

- HS-ESS1-5: 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-ESS1-6: Apply scientific reasoning and evidence from ancient Earth materials, meteorites, and other planetary surfaces to construct an account of Earth's formation and early history.
- HS-ESS2-1: 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.
- PS1.C: Nuclear Processes: (NYSED) Spontaneous radioactive decay follows a characteristic exponential decay law allowing an element's half-life to be used for radiometric dating of rocks and other materials.

Anchor Phenomenon Activity	Identifying the Driving Question	Unit 3: History of Earth				Anchor Phenomenon Activity
		Precambrian Eon	Paleozoic Era	Mesozoic Era	Cenozoic Era	
Cosmic Calendar Video Clip	Can we really comprehend geologic time?	How did the Precambrian set the stage for us?	What events define the era and provide evidence for plate tectonics?	What events define the era and provide evidence for plate tectonics?	What events define the era and provide evidence for plate tectonics?	Cosmic Calendar Video Clip
Short-form Video	Driving question board.	How Earth Was Made Birth of the Earth	Burgess Shale	Quick Read Alfred Wegener	Quick Research Advancements in Tech	Short-form Video

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Anchor Phenomenon Activity

Can we really comprehend geologic time?

Scope and Sequence of Activities

Cosmic Calendar
from Cosmos



Short-form
Video

Life and Extinctions
Artifact Walk



Station Rotation
Activity

Student Lead
Question Creation



Driving Question
Board Activity

Identifying the
Driving Question



Driving Question
Board Activity

Resources and Links

Link: [Cosmic Calendar](#)

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Precambrian Eon

How did the Precambrian set the stage for us?

Key Concepts		Performance Expectations			
1. Evidences of the Age of Earth 2. Radiometric Dating / Nuclear Processes 3. ESSRT: Geologic History of New York State 4. ESSRT: Geologically Important Radioactive Elements		HS-ESS1-6: Apply scientific reasoning and evidence from ancient Earth materials, meteorites, and other planetary surfaces to construct an account of Earth's formation and early history. PS1.C: Nuclear Processes: (NYSED) Spontaneous radioactive decay follows a characteristic exponential decay law allowing an element's half-life to be used for radiometric dating of rocks and other materials.			
Scope and Sequence of Activities					
Introduction 	Discovery 	Notes 	Revisit 	Practice 	Evaluate 
How Earth Was Made Birth of the Earth	Investigation Radiometric Dating	Keynote w/ Class Notes	Wrap-up Radiometric Dating	Question Clusters	Assessment [10 question]
Supplemental Materials					
	Exploration Precambrian Eon				
Resources and Links					
Video - Link					

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Paleozoic Era

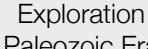
What events define the era and provide evidence for plate tectonics?

Key Concepts	Performance Expectations
<ol style="list-style-type: none">1. Plate Tectonics [continental evidences]2. Mountain Building Interactions3. ESSRT: Geologic History of New York State	<p>HS-ESS1-5: 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.</p> <p>HS-ESS2-1: 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.</p>

Scope and Sequence of Activities

Introduction	Discovery	Notes	Revisit	Practice	Evaluate
 Short-form Video Burgess Shale	 Investigation Mountain Building	 Keynote w/ Class Notes	 Investigation Wrap-up	 Question Clusters	 Assessment [10 question]

Supplemental Materials

	 Exploration Paleozoic Era				
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Resources and Links

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Mesozoic Era

What events define the era and provide evidence for plate tectonics?

Key Concepts	Performance Expectations
1. Plate Tectonics [Wegener's Evidences] 2. ESSRT: Geologic History of New York State	HS-ESS1-5: 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-ESS2-1: 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.

Scope and Sequence of Activities

Introduction	Discovery	Notes	Revisit	Practice	Evaluate
 Quick Read Alfred Wegener	 Investigation Continental Drift	 Keynote w/ Class Notes	 Investigation Wrap-up	 Question Clusters	 Assessment [10 question]

Supplemental Materials

	 Exploration Mesozoic Era				
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Resources and Links

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Cenozoic Era

What events define the era and provide evidence for plate tectonics?

Key Concepts	Performance Expectations
1. Plate Tectonics [oceanic evidences] 2. ESSRT: Geologically Important Radioactive Elements	HS-ESS1-2: Construct an explanation of the Big Bang theory based on astronomical evidence of light spectra, motion of distant galaxies, and composition of matter in the universe. HS-ESS2-1: 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.

Scope and Sequence of Activities

Introduction	Discovery	Notes	Revisit	Practice	Evaluate
 Advancements in Technology	 Investigation Sea-floor Spreading	 Keynote w/ Class Notes	 Investigation Wrap-up	 Question Clusters	 Assessment [10 question]

Supplemental Materials

Resources and Links

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Synthesizing the Driving Question

Can we really comprehend geologic time?

Scope and Sequence of Activities

Revisit the
Driving Question



Driving Question
Board Activity

Learning
Check-in



Significant Events
in Geologic Time

Model
Time



Humans and a
Piece of the Pie

Answering the
Question



Whole-class
Discussion

Investigation
Recap



More to
Explore

Resources and Links

