

Grade 4: Processes that Shape the Earth

Stage 1 Desired Results		
ESTABLISHED GOALS: <u>Competencies:</u> <u>Nature of Science and Engineering</u> - Students will demonstrate the ability to work collaboratively and individually to generate testable questions or define problems, plan and conduct investigations using a variety of research methods in various settings, analyze and interpret data, reason with evidence to construct explanations in light of existing theory and previous research, and effectively communicate the research processes and conclusions. <u>Patterns</u> - Students will demonstrate the ability to observe and describe patterns in natural and human designed phenomena and use those patterns to support claims about the observed or predicted relationships among phenomena. <u>Cause & Effect</u> - Students will demonstrate the ability to investigate, explain, and evaluate potential causal relationships by using evidence to support claims and predictions about the mechanisms that drive those relationships. <u>Content Standards:</u> 4-ESS1-1. Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time. 4-ESS2-1. Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation. 4-ESS2-2. Analyze and interpret data from maps to describe patterns of Earth's features. 4-ESS3-2. Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.	Transfer	
	<i>Students will be able to independently use their learning to recognize that any size causal event can produce profound or long-term effects.</i>	
	Meaning	
	ENDURING UNDERSTANDINGS <i>Students will understand that...</i> - patterns can be used as evidence to support an explanation. - cause and effect relationships are routinely identified, tested, and used to explain change. - engineers improve existing technologies or develop new ones to increase their benefits, to decrease known risks, and to meet societal demands. - science assumes consistent patterns in natural systems.	ESSENTIAL QUESTIONS Can we prevent the Earth from changing?
	Acquisition	
	<i>Students will know...</i> - that local, regional, and global patterns of rock formations reveal changes over time due to earth forces, such as earthquakes. - that the presence and location of certain fossil types indicate the order in which rock layers were formed. - that rainfall helps to shape the land and affects the types of living things found in a region. - that water, ice, wind, living organisms, and gravity break rocks, soils, and sediments into smaller particles and move them around. - that the locations of mountain ranges, deep ocean trenches, ocean floor structures, earthquakes, and volcanoes occur in patterns. - that most earthquakes and volcanoes occur in bands that are often along the boundaries between continents and oceans, and major mountain chains form inside continents or near their edges. - that maps can help locate the different land and water features areas of Earth.	<i>Students will be skilled at...</i> - identifying evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time. - making observations to provide evidence of the effects of weathering. - making observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation. - analyzing and interpreting data from maps to describe patterns of Earth's features. - generating and comparing multiple solutions to reduce the impacts of natural Earth processes on humans.

	• that living things affect the physical characteristics of their regions. • that a variety of hazards result from natural processes (e.g., earthquakes, tsunamis, volcanic eruptions). • that humans cannot eliminate the hazards of slow and fast Earth changes, but can take steps to reduce their impacts. • that testing a solution involves investigating how well it performs under a range of likely conditions. <u>vocabulary:</u> active volcano, boundaries, brainstorm, catastrophe, coal, erosion, erupt, experiment, felsite, fossil(s), fossil fuel, freeze, global, hazard, ice wedging, landslide, lava, local, model, mountain chain, natural hazard, natural process, predict, particle, regional, “Ring of Fire”, rock cycle, rock, rock formation, root wedging, sediment, sedimentary rock, shield volcano, steep, tsunami, volcano, weathering	
Content Area Literacy Standards	21st Century Skills	
not applicable	• solve problems • analyze media • access and evaluate information • communicate clearly	

Stage 2 - Evidence	
Evaluative Criteria	Assessment Evidence
	PERFORMANCE TASK(S):
	OTHER EVIDENCE:

Stage 3 – Learning Plan
Summary of Key Learning Events and Instruction

<i>Language Arts Integration</i>	<i>Mathematics Integration</i>
• RI.4.7 Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears. • RI.4.9 Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably. • W.4.7 Conduct short research projects that build knowledge through investigation of different aspects of a topic. • W.4.8 Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources. • W.4.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.	• MP.2 Reason abstractly and quantitatively. • MP.4 Model with mathematics. • MP.5 Use appropriate tools strategically. • 4.MD.A.1 Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. • 4.MD.A.2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale. • 4.OA.A.1 Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.
<i>Technology Integration</i>	<i>District Materials</i>