

7th Grade Earth Science Power Standard Rubrics 3,2,1

Overall Scoring		
Mastery of Standard	Approaching the Standard	Beginning to Learn
Demonstrates mastery of individual goals.	Demonstrates partial mastery of individual goals.	Developing prerequisite skills for mastery of individual goals.

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Power Standard (Performance Expectation)	MS-ESS1-1. Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.	
Learning Targets	<ul style="list-style-type: none"> • I can create a model demonstrating the relationships between the Earth-sun-moon. • I can describe the cyclic patterns of lunar phases. • I can describe the patterns of eclipses of the sun and moon • I can create a model that accurately demonstrates the seasons. 	
Common Misconceptions	Planet orbits are strongly elliptical Pluto lies at limit of solar system Moon is typical size for moons in general Life exists on Earth because the Earth is the right distance from the Sun for water to exist in liquid form.	
Mastery of Standard	Approaching the Standard	Beginning to Learn
Student can explain and create a model that accurately describes the relationship between the Earth, the sun, and moon with appropriate components accounted for and can predict the pattern of moon phases, seasons, and eclipses.	Student can explain or create a model that describes the relationship between the Earth, the sun and the moon with several components accounted for and may be able to predict the pattern of moon phases, seasons, or eclipses.	Student needs support to explain or create a model that describes the relationship between the Earth, the sun, and the moon.
Previous Level	Stars range greatly in size and distance from Earth and this can explain their relative brightness. The Earth's orbit and rotation, and the orbit of the moon around the Earth cause observable patterns. Certain features on Earth can be used to order events that have occurred.	
Next Level	Light spectra from stars are used to determine their characteristics, processes, and lifecycles. Solar activity creates the elements through nuclear fusion. The development of technologies has provided the astronomical data that provide the empirical evidence for the Big Bang Theory. Kepler's laws describe common features of the motions of orbiting objects. Observations from astronomy and space probes provide evidence for explanations of solar system formation. Changes in Earth's tilt and orbit cause climate changes such as Ice Ages. The rock record resulting from tectonic and other geoscience processes as well as objects from the solar system can provide evidence of Earth's early history and relative ages of major geologic formations.	

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Power Standard (Performance Expectation)	MS-ESS2-2. Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.	
Learning Targets	<ul style="list-style-type: none"> • I can construct an explanation based on evidence how geoscience has changed the Earth's surface. • I can use rock strata to construct an explanation for earth's current geography. • I can use examples of Earth's processes include surface weathering and deposition by the movements of water, ice, and wind. 	
Common Misconceptions	Students tend to view the earth as static, stable, and unchanging. They often have difficulty believing that rocks can change or be worn down through the process of weathering. Students also tend to confuse weathering (the physical or chemical breakdown of rock) with erosion (the process of transporting sediments).	
Mastery of Standard	Approaching the Standard	Beginning to Learn
Student constructs an explanation using claim, evidence and reasoning format to prove how Earth's processes have both shaped the Earth's geography in the past, present and future.	Student constructs an explanation which includes the claim and evidence to prove how Earth's processes have both shaped the Earth's geography in the past, present and future.	Student needs support to construct an explanation using claim or evidence to prove how Earth's processes have both shaped the Earth's geography in the past, present and future.
Previous Level	Earth's physical features occur in patterns, as do earthquakes and volcanoes. Maps can be used to locate features and determine patterns in those events.	
Next Level	Radioactive decay with Earth's interior contributes to thermal convection in the mantle.	

Power Standard (Performance Expectation)	MS-ESS2-1. Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.	
Learning Targets	<ul style="list-style-type: none"> • I can create a model that demonstrates the cycling of Earth's materials. • I can create a model that describes the process of how energy flows through Earth's materials. • I can develop a scientific explanation describing the distribution of Earth's minerals and energy using evidence derived from current geoscience processes. 	
Common Misconceptions	<ul style="list-style-type: none"> • The atmosphere, hydrosphere, lithosphere, and biosphere operate independently of one another. • The carbon cycle was caused by humans burning fossil fuels. • Increases in global temperatures in the atmosphere and the consequent warming of the oceans, will only create a problem for people living along the coast. • Humans are the only cause of global warming. • All bedrock is solid, non-porous material. • Earth's mass never changes. • Moving lithospheric plates caused glaciation. • A majority of the rocks from a glacier move throughout the places the glacier moves. • Glaciers have nothing to do with the existence of sand pits. • Only gravel and sand are residual effects of glaciers. • We are done with ice age events on Earth. • All clouds are rain clouds. • Events that occur on a continent do not affect oceans or the atmosphere. 	
Mastery of Standard	Approaching the Standard	Beginning to Learn
Student creates a conceptual model to accurately explain how Earth's materials cycle and the process of energy flow. Student also explain using Claim, Evidence and Reasoning to explain the distribution of Earth's minerals and energy.	Student creates a conceptual model to explain how Earth's materials cycle and the process of energy flow. Student explains using Claim and Evidence for the distribution of Earth's minerals and energy.	Student needs support to create a model to explain how Earth's materials cycle and the process of energy flow. Students need support to explain using Claim but lacking Evidence and Reasoning for the distribution of Earth's minerals and energy
Previous Level	Four major Earth systems interact. Rainfall helps to shape the land and affects the types of living things found in a region. Water, ice, wind, organisms, and gravity break rocks, soils, and sediments into smaller pieces and move them around.	
Next Level	Feedback effects exists within and among Earth's systems.	

Power Standard (Performance Expectation)	MS-ESS2-4. Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity	
Learning Targets	<ul style="list-style-type: none"> • I can describe the cycle of water through Earth's systems. • I can follow a lab procedure to create a physical model that demonstrates the cycling of water driven by the sun and force of gravity • I can create a conceptual model demonstrates the cycling of water driven by the sun and force of gravity. • I can explain how the transfer of energy can result in the movement of water and its change of state. 	
Common Misconceptions	<p>Rain falls when the clouds are too full of water and it drips down. • The atmosphere is made up solely of air. • Air and oxygen are the same thing. • The greenhouse effect is bad and will eventually cause all living things to die. • When bottled water is labeled as coming from "pure, still water," it means it has to come from water that is pure and still. • All rivers in northern hemisphere flow south. • The 'Ice Ages' happened in the past and are now over. • The present Ice Caps have always existed on Earth, although their size has changed through time. • Water exists in the ground in actual rivers or lakes that are constantly renewed. • Groundwater is in large rivers or oceans underground. • The distance from the sun causes the seasons. • The toilets in the southern hemisphere flush in the opposite direction than the northern hemisphere. • Vegetation in an area is the same, regardless of the solar exposure. • Water levels on the Earth have always been the same. • Glaciers move backwards. • Sand is deposited by wind in dunes.</p>	
Mastery of Standard	Approaching the Standard	Beginning to Learn
Student accurately creates both a physical and conceptual model that demonstrates the cycling of water and changes of state driven by the sun and force of gravity.	Student creates a physical or conceptual model that demonstrates the cycling of water and changes of state driven by the sun and force of gravity.	Student needs support to be able to create a physical or conceptual model that demonstrates the cycling of water and changes of state driven by the sun and force of gravity.
Previous Level	Climate describes patterns of typical weather conditions over different scales and variations. Historical weather patterns can be analyzed.	
Next Level	The role of radiation from the sun and its interactions with the atmosphere, ocean,, and land are the foundation for the global climate system. Global climate models are used to predict future changes, including changes influenced by human behavior and natural factors.	

Power Standard (Performance Expectation)	MS-ESS2-5. Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.	
Learning Targets	<ul style="list-style-type: none"> • I can collect data to determine the relationship between air masses & changes in weather. • I can use data collected to predict the probability of potential weather events. 	
Common Misconceptions	Students may think that the Earth is no longer changing. They may think that processes have only occurred in the past and are not ongoing.	
Mastery of Standard	Approaching the Standard	Beginning to Learn
Student can collect and use data to accurately determine the relationship between air masses and changes in weather that forecast potential weather events.	Student can collect or use data to determine the relationship between air masses and changes in weather that forecast potential weather events.	Student needs support to collect and/or use data to determine the relationships between air masses and changes in weather that forecast potential weather events
Previous Level	Climate describes pattern of typical weather conditions over different scales and variations. Historical weather patterns can be analyzed.	
Next Level	The role of radiation from the sun and its interactions with the atmosphere, ocean, and land are the foundation for the global climate system. Global climate models are used to predict future changes influenced by human behavior and natural factors.	

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Power Standard (Performance Expectation)	MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.	
Learning Targets	<ul style="list-style-type: none"> ● I can design a possible solution to a current environmental problem. ● I can explain the methods and ways humans have negatively impacted Earth's resources. ● I can identify and explain the positive ways humans can impact Earth's environment. ● I can apply scientific principles to design an object, tool, process or system. 	
Common Misconceptions	Students may think that the Earth is no longer changing. They may think that processes have only occurred in the past and are not ongoing. Students do not know individual impact on the larger ecosystem. Students may not realize there are solutions to today's environmental concerns.	
Mastery of Standard	Approaching the Standard	Beginning to Learn
<p>Student accurately applies scientific principles to design a feasible solution to a current environment problem.</p> <p>Student accurately identifies and explains with evidence the ways humans both negatively and positively impact Earth's resources and environment.</p>	<p>Student applies scientific principles to design a possible solution to a current environmental problem. Student identifies or explains the ways humans negatively or positively impact the Earth's resources and environment.</p>	<p>Student needs support to apply scientific principles to design a solution to a current environment problem. Student may be able to identify the ways humans both negatively or positively impact Earth's resources and environment.</p>
Previous Level	Societal activities have had major effects on the land, ocean, atmosphere, and even outer space. Societal activities can also help protect Earth's resources and environments.	
Next Level	Sustainability of human societies and the biodiversity that supports them requires responsible management of natural resources, including the development of technologies.	