APPROVED FACILITY SCHOOLS CURRICULUM GUIDE

SUBJECT: Science GRADE: 8

Strand/Concept Student Expectation	Student Friendly Learning Objective	Level of Thinking	Academic Vocabulary
TIMELINE: Quarter 1			
Earth and Space: Earth's Place in the Universe 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. **I C M**	I can 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. • Seasons.	Synthesis Application	Apparent motion Astronomy Axis Eclipse Equator Equinox Lunar Natural satellite Phase Revolution Rotation Season Solar Solar system Solstice Star
Earth and Space: Earth's Place in the Universe MS-ESS1-2. Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system. **I C M**	I can develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.	Synthesis Application	Asteroid Force Galaxy Gravity Mass Natural satellite Orbit Planet Revolution Solar nebula Solar system Universe

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Strand/Concept Student Expectation	Student Friendly Learning Objective	Level of Thinking	Academic Vocabulary
Earth and Space: Earth's Place in the Universe MS-ESS1-3. Analyze and interpret data to determine scale properties of objects in the solar system. **I C M**	I can analyze and interpret data to determine similarities and differences of objects in the solar system by comparing physical properties: • scale of objects • sizes of an object's layers (such as crust and atmosphere) • surface features (such as volcanoes) • orbital radius	Analysis	Asteroid Atmosphere Crust Orbital radius Planet Properties Scale Solar system Telescope
Engineering Design MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. **I** .	I can define the norms of an investigation with sufficient precision to ensure a successful solution. I can define the constraints of an investigation which include consideration of scientific principles and other relevant knowledge that are likely to limit possible solutions.	Comprehension Analysis Synthesis	Accuracy Constraints Criteria Design Limit Potential Precision Principles Relevant Solution

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RESOURCES AND NOTES FOR QUARTER 1:

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SUBJECT: Science GRADE: 8

Strand/Concept Student Expectation	Student Friendly Learning Objective	Level of Thinking	Academic Vocabulary
TIMELINE: Quarter 2			
Earth and Space: Earth's Systems MS-ESS2-. Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process. **I C M**	I can develop a model of the processes used throughout the rock cycle. I can develop a model to describe the flow of energy that drives the cycling of Earth's rocks and minerals.	Synthesis Synthesis	Asthenosphere Cementation Compaction Crystallization Cycle Deformation Deposition Erosion Igneous Lava Lithosphere Magma Metamorphic Minerals Model Process Sedimentary Sedimentation Weathering

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Strand/Concept Student Expectation	Student Friendly Learning Objective	Level of Thinking	Academic Vocabulary
Earth and Space: Earth's Systems MS-ESS2-2. Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales. **I C**	I can construct an explanation based on evidence for how Earth's processes have changed Earth's surface: • Gradual or catastrophic • Small or large. • Formation of Great Lakes.	Application Synthesis	Catastrophic Deposition Earthquake Evidence Geographic feature Geologic formation Geoscience Geoscience processes Gradual Interactions Landslides Mass wasting Spatial scales Uplift Vary Volcano Weathering
Earth and Space: Earth's Place in the Universe MS-ESS1-4. Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history. **I C M**	I can analyze rock formations and the fossils they contain to establish relative age of major events in Earth's history. I can construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.	Analysis Synthesis Application Analysis	Eon Era Evidence Evolution Extinction Fossils Geologic column Geologic time Scale Geology Period Relative Rock formations Strata Superposition Trace fossils

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Strand/Concept Student Expectation	Student Friendly Learning Objective	Level of Thinking	Academic Vocabulary
Earth and Space: Earth's Systems 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. **I C M**	I can analyze and interpret data of past plate motions based on: • The distribution of rocks and fossils. • Continental shapes. • Seafloor structures.	Analysis	Continental drift Continental Shelves Convection Convergent Distribution Divergent Fossils Fracture zones Lithosphere Plate tectonics Ridges Seafloor spreading Subduction zone Tectonic plates Trenches
Engineering Design MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. **C**	I can define the norms of an investigation with sufficient precision to ensure a successful solution. I can define the constraints of an investigation which include consideration of scientific principles and other relevant knowledge that are likely to limit possible solutions.	Comprehension Analysis	Accuracy Constraints Criteria Design Limit Potential Precision Principles Relevant Solution
Engineering Design MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. **I**	I can evaluate design solutions to determine how well they meet the norms and limits of the problem.	Evaluation	Constraints Criteria Design Evaluate Principles Solution Systematic

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Strand/Concept Student Expectation	Student Friendly Learning Objective	Level of Thinking	Academic Vocabulary

RESOURCES AND NOTES FOR QUARTER 2 :

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SUBJECT: Science GRADE: 8

Strand/Concept Student Expectation	Student Friendly Learning Objective	Level of Thinking	Academic Vocabulary
TIMELINE: Quarter 3			
Earth and Space: Earth and Human Activity MS-ESS3-2. Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects. **I C**	I can analyze and interpret data on natural hazards to predict future catastrophic events. • volcanoes • earthquakes • tsunami • mass wasting I can explain the development of systems to monitor or lessen the effects of natural hazards.	Analysis Evaluation Application Analysis	Catastrophic Forecast Frequency Geologic forces Interior processes Magnitude Mass wasting Monitor Natural hazards Phenomena Precede Predictions Reservoir Surface processes Tsunami
Earth and Space: Earth and Human Activity 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. **I C M**	I can locate the distributions of Earth's resources that are typically non-renewable. • petroleum • metal ores • soil I can relate geologic processes to the formation of Earth's non-renewable resources. • burial of organic marine sediments and subsequent geologic traps • past volcanic and hydrothermal activity associated with subduction zones • active weathering and/or deposition of rock I can 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.	Knowledge Comprehension Application Synthesis Application Analysis	Deposition Distribution Energy Evidence Geologic traps Geoscience processes Groundwater Hydrothermal Marine Metal ores Mineral Non-renewable resources Organic Petroleum Renewable resources Sediments Subduction zones Weathering

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Strand/Concept Student Expectation	Student Friendly Learning Objective	Level of Thinking	Academic Vocabulary
Earth and Space: Earth's Systems 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. **I C M**	I can develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.	Synthesis	Atmosphere Condensation Crystallization Cycle Energy Evaporation Force Gravity Hydrologic cycle Percolation Precipitation Runoff State Sublimation System Transpiration Water vapor
Earth and Space: Earth's Systems MS-ESS2-2. Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales. **M**	I can construct an explanation based on evidence for how Earth's processes have changed Earth's surface features and underground formations.	Application	Catastrophic Deposition Earthquake Evidence Geographic feature Geologic formation Geoscience Gradual Interactions Landslides Mass wasting Processes Spatial scales Uplift Volcano Weathering

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Strand/Concept Student Expectation	Student Friendly Learning Objective	Level of Thinking	Academic Vocabulary
Engineering Design MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. **C**	I can define the norms of an investigation with sufficient precision to ensure a successful solution. I can define the constraints of an investigation which include consideration of scientific principles and other relevant knowledge that are likely to limit possible solutions.	Comprehension Analysis	Accuracy Constraints Criteria Design Potential Precision Principles Relevant Solution
Engineering Design MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. **C**	I can evaluate design solutions to determine how well they meet the norms and limits of the problem.	Evaluation	Constraints Criteria Design Evaluate Norms Principles Solution Systematic
Engineering Design MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success. **I**	I can analyze data from investigations to determine similarities and differences between those investigations. I can create a new solution using the best characteristics of different solutions.	Analysis Evaluation Synthesis	Analyze Characteristics Compare Constraints Contrast Criteria Design Evaluate Identify Incorporate Modify Perform Results Solution System

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RESOURCES AND NOTES FOR QUARTER 3 :

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SUBJECT: Science GRADE: 8

Strand/Concept Student Expectation	Student Friendly Learning Objective	Level of Thinking	Academic Vocabulary
TIMELINE: Quarter 4			
Earth and Space: Earth's Systems MS-ESS2-5. Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions. **ICM**	I can identify the characteristics of an air mass. I can explain how air masses flow from regions of high pressure to low pressure, causing weather. I can explain how sudden changes in weather can result when different air masses collide. I can describe how weather can be predicted. I can compile data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.	Knowledge Application Synthesis Synthesis Analysis Analysis Synthesis	Air masses Anti-cyclone Atmosphere Barometer Condensation Continental Currents Cyclone Density Forecast Front Humidity Hygrometer Isobars Isotherms Jet stream Maritime Meteorology Occluded Polar Precipitation Prediction Pressure Psychrometer Temperature Thermometer Tropical

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Strand/Concept Student Expectation	Student Friendly Learning Objective	Level of Thinking	Academic Vocabulary
Earth and Space: Earth's Systems MS-ESS2-6. Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates. **I C M**	I can describe how circulation patterns in the atmosphere and ocean vary by latitude, altitude, and geographic land distribution. I can explain how prevailing winds are the result of atmospheric circulation caused by unequal heating of the Earth and the Coriolis effect. I can explain how heat is transferred in the global ocean convection cycle. I can develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.	Application Synthesis Synthesis Synthesis	Altitude Atmospheric Circulation Climate Convection Coriolis effect Density Distribution Latitude Models Ocean currents Oceanic Prevailing winds Regional Rotation Salinity System Temperature Variation Weather

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Strand/Concept Student Expectation	Student Friendly Learning Objective	Level of Thinking	Academic Vocabulary
Earth and Space: Earth and Human Activity MS-ESS3-2. Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects. **M**	I can analyze and interpret data on natural hazards to predict future catastrophic events. • hurricanes • tornadoes • floods I can explain the development of systems to monitor or lessen the effects of natural hazards.	Analysis Evaluation Application Analysis	Catastrophic Cause/effect Forecast Frequency Geologic forces Interior processes Magnitude Mass wasting Mitigate Monitor Natural hazards Phenomena Precede Predictions Reservoir Surface processes Tsunami

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Strand/Concept Student Expectation	Student Friendly Learning Objective	Level of Thinking	Academic Vocabulary
Earth and Space: Earth and Human Activity MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. **I C M**	I can explain the effects of human activities on Earth's systems. I can design a method for monitoring and minimizing human impact on the environment.	Analysis Evaluation	Acid rain Agriculture Aquifers Assess Biosphere Consumption Contaminate Environment Evaluate Extinction Feasible Habitats Impact Land usage Levee Minimize Monitor Pollution Principle Reduce-reuse-recycle Species Wetlands

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Strand/Concept Student Expectation	Student Friendly Learning Objective	Level of Thinking	Academic Vocabulary
Earth and Space: Earth and Human Activity MS-ESS3-4. Construct an argument supported by evidence for how increases in human population and per-capital consumption of natural resources impact Earth's systems. **I C M**	I can construct an argument supported by evidence for how increases in human population and per-capital consumption of natural resources impact Earth's systems.	Analysis Synthesis	Composition Consumption Energy Erosion Exhaust Freshwater Global warming Greenhouse effect Impact Industrial waste Mineral Natural resources Non-renewable resources Ozone Per-capita Preservation Renewable resources Toxic waste
Earth and Space: Earth and Human Activity MS-ESS3-5. Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. **I C M**	I can critique evidence of the factors that have caused the rise in global temperatures over the past century.	Evaluation	Agricultural Atmospheric Carbon dioxide Carbon fixation Century Combustion Evidence Factors Fossil fuel Global warming Greenhouse gases Methane Natural process Ozone Regional Solar radiation

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Engineering Design MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. **M**	I can define the norms of an investigation with sufficient precision to ensure a successful solution. I can define the constraints of an investigation which include consideration of scientific principles and other relevant knowledge that are likely to limit possible solutions.	Application Application	Accuracy Constraints Criteria Design Limit Potential Precision Principles Relevant Solution
Engineering Design MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. **M**	I can evaluate investigations to determine how well they meet the norms and limits of the problem.	Evaluation	Constraints Criteria Design Evaluate Principles Solution Systematic
Engineering Design MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success. **C M**	I can analyze data from investigations to determine similarities and differences between those investigations. I can create a new solution using the best characteristics of different solutions.	Analysis Evaluation Analysis Synthesis	Analyze Characteristics Compare Constraints Contrast Criteria Design Evaluate Identify Incorporate Modify Results Solution System

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Strand/Concept Student Expectation	Student Friendly Learning Objective	Level of Thinking	Academic Vocabulary
Engineering Design MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved. **I C M**	I can develop a model to generate data for repetitive testing and modification so an optimal design of that model can be achieved.	Analysis Synthesis Evaluation	Data Generate Model Modification Optimal Refine

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Strand/Concept Student Expectation	Student Friendly Learning Objective	Level of Thinking	Academic Vocabulary

RESOURCES AND NOTES FOR QUARTER 4 :