### APPROVED FACILITY SCHOOLS CURRICULUM GUIDE

**SUBJECT:** Science  
**GRADE:** 8

<table>
<thead>
<tr>
<th>Strand/Concept</th>
<th>Student Friendly Learning Objective</th>
<th>Level of Thinking</th>
<th>Academic Vocabulary</th>
</tr>
</thead>
</table>
| **Earth and Space: Earth’s Place in the Universe** | 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** | 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 |

**TIMELINE:** Quarter 1
# APPROVED FACILITY SCHOOLS CURRICULUM GUIDE

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</thead>
</table>
| **Earth and Space: Earth’s Place in the Universe** | 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** | 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 |
<table>
<thead>
<tr>
<th>Strand/Concept</th>
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</thead>
<tbody>
<tr>
<td>Student Expectation</td>
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RESOURCES AND NOTES FOR QUARTER 1:
<table>
<thead>
<tr>
<th>Strand/Concept</th>
<th>Student Friendly Learning Objective</th>
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<tbody>
<tr>
<td>Earth and Space: Earth’s Systems</td>
<td>I can develop a model of the processes used throughout the rock cycle.</td>
<td>Synthesis</td>
<td>Asthenosphere</td>
</tr>
<tr>
<td>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</td>
<td>I can develop a model to describe the flow of energy that drives the cycling of Earth’s rocks and minerals.</td>
<td>Synthesis</td>
<td>Cementation</td>
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<td>Lava</td>
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<td>Lithosphere</td>
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<td>Magma</td>
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<td>Metamorphic</td>
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<td>Minerals</td>
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<td>Model</td>
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<td>Process</td>
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<td>Sedimentary</td>
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<td>Sedimentation</td>
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<td>Weathering</td>
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</tbody>
</table>
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</thead>
</table>
| **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. IC | 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. IC 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 | Eon  
Era  
Evidence  
Evolution  
Extinction  
Fossils  
Geologic column  
Geologic time Scale  
Geology  
Period  
Relative  
Rock formations  
Strata  
Superposition  
Trace fossils |
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</thead>
</table>
| **Earth and Space: Earth’s Systems**  | 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**                | 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     | Accuracy  
  Constraints  
  Criteria  
  Design  
  Limit  
  Potential  
  Precision  
  Principles  
  Relevant  
  Solution |

| **Engineering Design**                | 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 |
RESOURCES AND NOTES FOR QUARTER 2:
## APPROVED FACILITY SCHOOLS CURRICULUM GUIDE

### SUBJECT: Science  
### GRADE: 8

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</tr>
</thead>
</table>
| Earth and Space: Earth and Human Activity | 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 | Catastrophic  
Forecast  
Geologic forces  
Interior processes  
Magnitude  
Mass wasting  
Monitor  
Natural hazards  
Phenomena  
Precede  
Predictions  
Reservoir  
Surface processes  
Tsunami |
| Earth and Space: Earth and Human Activity | 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 | 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 |

**TIMELINE:** Quarter 3
# APPROVED FACILITY SCHOOLS CURRICULUM GUIDE

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<th>Academic Vocabulary</th>
</tr>
</thead>
</table>
| **Earth and Space: Earth’s Systems** | 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. I C M | 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** | 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 |
# APPROVED FACILITY SCHOOLS CURRICULUM GUIDE

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<th>Academic Vocabulary</th>
</tr>
</thead>
</table>
| **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  
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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</tbody>
</table>

**RESOURCES AND NOTES FOR QUARTER 3 :**
### Strand/Concept: 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**

<table>
<thead>
<tr>
<th>Student Friendly Learning Objective</th>
<th>Level of Thinking</th>
<th>Academic Vocabulary</th>
</tr>
</thead>
<tbody>
<tr>
<td>I can identify the characteristics of an air mass.</td>
<td>Knowledge</td>
<td>Air masses, Anti-cyclone</td>
</tr>
<tr>
<td>I can explain how air masses flow from regions of high pressure to low pressure, causing weather.</td>
<td>Application</td>
<td>Atmosphere, Barometer</td>
</tr>
<tr>
<td>I can explain how sudden changes in weather can result when different air masses collide.</td>
<td>Synthesis</td>
<td>Condensation, Continental</td>
</tr>
<tr>
<td>I can describe how weather can be predicted.</td>
<td></td>
<td>Currents, Cyclone</td>
</tr>
<tr>
<td>I can compile data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.</td>
<td>Analysis</td>
<td>Density, Forecast</td>
</tr>
</tbody>
</table>

**TIMELINE:** Quarter 4
### APPROVED FACILITY SCHOOLS CURRICULUM GUIDE

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<th>Strand/Concept</th>
<th>Student Expectation</th>
<th>Student Friendly Learning Objective</th>
<th>Level of Thinking</th>
<th>Academic Vocabulary</th>
</tr>
</thead>
</table>
| 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 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. | Synthesis          | Altitude  
Atmospheric  
Circulation  
Climate  
Convection  
Coriolis effect  
Density  
Distribution  
Latitude  
Models  
Ocean currents  
Oceanic  
Prevailing winds  
Regional  
Rotation  
Salinity  
System  
Temperature  
Variation  
Weather |
## 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

<table>
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<th>Level of Thinking</th>
<th>Academic Vocabulary</th>
</tr>
</thead>
</table>
| Earth and Space: Earth and Human Activity | 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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</thead>
<tbody>
<tr>
<td>Earth and Space: Earth and Human Activity</td>
<td>I can explain the effects of human activities on Earth’s systems.</td>
<td>Analysis</td>
<td>Acid rain</td>
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<td></td>
<td>I can design a method for monitoring and minimizing human impact on the environment.</td>
<td>Evaluation</td>
<td>Agriculture</td>
</tr>
<tr>
<td>MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.</td>
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<td>Aquifers</td>
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<td>Biosphere</td>
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<td>Consumption</td>
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<td>Environment</td>
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<td>Extinction</td>
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<td>Principle</td>
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<td>Reduce-reuse-recycle</td>
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<td>Species</td>
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<td>Wetlands</td>
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<tr>
<td>Earth and Space: Earth and Human Activity</td>
<td>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.</td>
<td>Analysis</td>
<td>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</td>
</tr>
</tbody>
</table>

**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.  

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</thead>
<tbody>
<tr>
<td>Earth and Space: Earth and Human Activity</td>
<td>I can critique evidence of the factors that have caused the rise in global temperatures over the past century.</td>
<td>Evaluation</td>
<td>Agricultural, Atmospheric, Carbon dioxide, Carbon fixation, Century, Combustion, Evidence, Factors, Fossil fuel, Global warming, Greenhouse gases, Methane, Natural process, Ozone, Regional, Solar radiation</td>
</tr>
</tbody>
</table>

**MS-ESS3-5.** Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

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January, 2014
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<tr>
<td>Engineering Design</td>
<td>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.</td>
<td>Application</td>
<td>Accuracy, Constraints, Criteria, Design, Limit, Potential, Precision, Principles, Relevant, Solution</td>
</tr>
<tr>
<td>Engineering Design</td>
<td>I can evaluate investigations to determine how well they meet the norms and limits of the problem.</td>
<td>Evaluation</td>
<td>Constraints, Criteria, Design, Evaluate, Principles, Solution, Systematic</td>
</tr>
<tr>
<td>Engineering Design</td>
<td>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.</td>
<td>Analysis, Evaluation, Synthesis</td>
<td>Analyze, Characteristics, Compare, Constraints, Contrast, Criteria, Design, Evaluate, Identify, Incorporate, Modify, Results, Solution, System</td>
</tr>
</tbody>
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January, 2014
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<tbody>
<tr>
<td>Engineering Design</td>
<td>I can develop a model to generate data for repetitive testing and modification so an optimal design of that model can be achieved.</td>
<td>Analysis</td>
<td>Data</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Synthesis</td>
<td>Generate</td>
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<td>Evaluation</td>
<td>Model</td>
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<td>Optimal</td>
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<td>Refine</td>
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</tbody>
</table>

**Student Expectation:**

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**
RESOURCES AND NOTES FOR QUARTER 4: