

MCS MYP Advanced Studies 6 Science Subject Group Overview

Unit Name		Solar System and Beyond	Earth-Moon-Sun	Earth’s Changing Landscape I	Earth’s Changing Landscape II	Water in Earth’s Processes	Climate and Weather	STEM Conservation Capstone
CAPSTONE Connective Theme		Energy Harvested In Our Solar System	Seasonal Energy Resources	Energy in Earth Surfaces I	Energy in Earth Surfaces II	Hydroelectric Energy	Atmospheric Energy	Community Conservation
Time Frame		4.5 Weeks	4.5 Weeks	4 Weeks	5 Weeks	5 Weeks	8 Weeks	5 Weeks
	Standards	S6E1.a., b., c., d., e. S6E6.a <b>MCS Gifted Standards</b> MCSS5A MCSS2C MCSS4C MCSS3A MCSS3B MCSS3C	S6E2.a., b., c. S6E3.d. S6E6.a <b>MCS Gifted Standards</b> MCSS5B MCSS4A MCSS2B MCSS3A MCSS3B MCSS3C	S6E3.c. S6E5.a., f. S6E6.a <b>MCS Gifted Standards</b> MCSS5C MCSS2D MCSS4E MCSS3A MCSS3B MCSS3C	S6E5.b., c., d., e., g., h. S6E6.c <b>MCS Gifted Standards</b> MCSS5D MCSS4B MCSS2A MCSS3A MCSS3B MCSS3C	S6E3.a., b.,c. S6E6.b. <b>MCS Gifted Standards</b> MCSS5E MCSS3A MCSS3B MCSS3C MCSS4D	S6E4.a., b., c., d., e. <b>MCS Gifted Standards</b> MCSS2D MCSS3A MCSS3B MCSS3C	S6E6.b <b>MCS Gifted Standards</b> MCSS2D MCSS3A MCSS3B MCSS3C MCSS5A MCSS2C

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	<b>Science &amp; Engineering Practices</b> <ul style="list-style-type: none"> <li>Students will ask questions to determine changes in models of Earth's position in the Solar System and origins of the universe.</li> <li>Students will develop a model to represent the position of the solar system and develop a model to explain the interaction of gravity and inertia.</li> <li>Students will ask questions to compare and contrast comets, asteroids, and meteoroids.</li> <li>Students will ask questions to determine the differences between renewable/sustainable energy resources.</li> </ul>	<b>Science &amp; Engineering Practices</b> <ul style="list-style-type: none"> <li>Students will develop and use models to demonstrate the phases of the moon.</li> <li>Students will construct an explanation of the cause of solar and lunar eclipses.</li> <li>Students will analyze and interpret data to relate the tilt of the Earth to the distribution of sunlight.</li> <li>Students will analyze and interpret data to create graphic representations of the causes and effects of waves, currents, and tides.</li> <li>Students will ask questions to determine the differences between renewable/sustainable energy resources.</li> </ul>	<b>Science &amp; Engineering Practices</b> <ul style="list-style-type: none"> <li>Students will ask questions to identify and communicate, using graphs and maps, the composition, location, and subsurface topography of the world's oceans.</li> <li>Students will ask questions to compare and contrast Earth's crust, mantle, inner and outer core.</li> <li>Students will construct an explanation of how movement of lithospheric plates can cause major geologic events.</li> <li>Students will ask questions to determine the differences between renewable/sustainable energy resources.</li> </ul>	<b>Science &amp; Engineering Practices</b> <ul style="list-style-type: none"> <li>Students will plan and carry out an investigation of the characteristics of soil, minerals and how minerals contribute to rock formation.</li> <li>Students will construct an explanation of how to classify rocks.</li> <li>Students will ask questions to identify types of weathering, agents of erosion and deposition.</li> <li>Students will develop a model to demonstrate how natural processes and human activity change Earth's surface.</li> <li>Students will construct an argument using maps and data to support a claim of how fossils show evidence of Earth's changing surface, climate, and rise in global temperatures over the past century.</li> </ul>	<b>Science &amp; Engineering Practices</b> <ul style="list-style-type: none"> <li>Students will ask questions to determine where water is located on Earth's surface.</li> <li>Students will plan and carry out investigations to illustrate the role of the Sun's energy in the cycling of water.</li> <li>Students will ask questions to communicate, using graphs and maps, the composition, location, and subsurface topography of oceans.</li> <li>Students will design and evaluate solutions for sustaining water, soil, and air.</li> </ul>	<b>Science &amp; Engineering Practices</b> <ul style="list-style-type: none"> <li>Students will analyze and interpret data to compare and contrast Earth's atmospheric layers.</li> <li>Students will plan and carry out investigations to demonstrate how energy from the sun transfers heat to air, land, and water.</li> <li>Students will develop a model demonstrating unequal heating and global winds systems.</li> <li>Students will analyze and interpret weather data to explain the effects of moisture evaporating from the ocean on weather patterns and events.</li> <li>Students will construct an explanation of the relationship between air pressure, weather fronts, and air masses.</li> </ul>	<b>Science &amp; Engineering Practices</b> <ul style="list-style-type: none"> <li>Students will design and evaluate solutions for sustaining water, soil, and air.</li> <li>Students will ask questions to determine the differences between renewable/sustainable energy resources and how they are used in our everyday lives.. (Renewable - Sustainable resource examples: Hydro, solar, wind, geothermal, tidal, biomass) (Nonrenewable energy resource examples: fossil fuels, oil, coal, and natural gas)</li> </ul>
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	<b>Approaches To Learning Instructional Strategies</b>	<p><b>Critical Thinking:</b> Use models and simulations to explore complex systems and issues.</p> <p>Gather and organize relevant information to formulate an argument.</p> <p><b>Research:</b> Finding, interpreting, judging and creating information.</p> <p><b>Collaboration:</b> Working effectively with others.</p>	<p><b>Critical Thinking:</b> Use models and simulations to explore complex systems and issues.</p> <p>Gather and organize relevant information to formulate an argument.</p> <p><b>Research:</b> Finding, interpreting, judging and creating information.</p> <p><b>Collaboration:</b> Working effectively with others.</p>	<p><b>Critical Thinking:</b> Use models and simulations to explore complex systems and issues.</p> <p>Gather and organize relevant information to formulate an argument.</p> <p><b>Research:</b> Collect and analyze data to identify solutions and make informed decisions.</p> <p><b>Collaboration:</b> Working effectively with others.</p>	<p><b>Critical Thinking:</b> Use models and simulations to explore complex systems and issues.</p> <p>Gather and organize relevant information to formulate an argument.</p> <p><b>Communication:</b> Collaborate with peers and experts using a variety of digital environments and media.</p> <p><b>Collaboration:</b> Working effectively with others.</p>	<p><b>Critical Thinking:</b> Use models and simulations to explore complex systems and issues</p> <p><b>Research:</b> Collect and analyze data to identify solutions and make informed decisions.</p> <p><b>Collaboration:</b> Working effectively with others.</p>	<p><b>Critical Thinking:</b> Use models and simulations to explore complex systems and issues</p> <p><b>Research:</b> Collect and analyze data to identify solutions and make informed decisions.</p> <p><b>Collaboration:</b> Working effectively with others.</p>	<p><b>Creative Thinking:</b> Generating novel ideas and considering new perspectives.</p> <p>Transfer skills: Combine knowledge, understanding and skills to create products or solutions.</p> <p><b>Research:</b> Collect and analyze data to identify solutions and make informed decisions.</p>
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	<b>Statement of Inquiry</b>	<p>Scientific and technical advancements have led to changes in the models used to explain the motion and orientation of objects in space.</p> <p><b>Phenomenon:</b> Why is Earth the only planet in our solar system that is able to support life?</p> <p><b>CER:</b> Students answer the phenomenon in a Claim-Evidence-Reasoning constructed response as a formative assessment. Allow students to make edits to their constructed response throughout the unit for a final summative submission.</p>	<p>System models can be used to demonstrate and explain the motion and orientation of the Earth, Moon, and Sun.</p> <p><b>Phenomenon:</b> Why doesn't everyone experience four seasons?</p> <p><b>CER:</b> Students answer the phenomenon in a Claim-Evidence-Reasoning constructed response as a formative assessment. Allow students to make edits to their constructed response throughout the unit for a final summative submission.</p>	<p>Scientific and technical innovations allow us to visualize, model, and explain changes to the Earth's surface.</p> <p><b>Phenomenon:</b> Why do we see major geologic events in the Ring of Fire?</p> <p><b>CER:</b> Students answer the phenomenon in a Claim-Evidence-Reasoning constructed response as a formative assessment. Allow students to make edits to their constructed response throughout the unit for a final summative submission.</p>	<p>Scientific and technical innovations allow us to visualize, model, and explain changes to the Earth's surface.</p> <p><b>Phenomenon:</b> What drives weathering, erosion, and deposition and how do these processes impact Earth's surface?</p> <p><b>CER:</b> Students answer the phenomenon in a Claim-Evidence-Reasoning constructed response as a formative assessment. Allow students to make edits to their constructed response throughout the unit for a final summative submission.</p>	<p>Sustainable management of the Earth's water resources means that human needs must be balanced with those of the natural world.</p> <p><b>Phenomenon:</b> How does human activity impact the water cycle?</p> <p><b>CER:</b> Students answer the phenomenon in a Claim-Evidence-Reasoning constructed response as a formative assessment. Allow students to make edits to their constructed response throughout the unit for a final summative submission.</p>	<p>Innovations and advancements in science and technology allow meteorologists to identify patterns and more accurately predict weather systems.</p> <p><b>Phenomenon:</b> Why do different parts of the Earth experience different climates?</p> <p><b>CER:</b> Students answer the phenomenon in a Claim-Evidence-Reasoning constructed response as a formative assessment. Allow students to make edits to their constructed response throughout the unit for a final summative submission.</p>	<p>Scientific and technological advancements have allowed for the use of renewable and sustainable energy resources.</p> <p><b>Phenomenon:</b> How can we expand the use of natural resources, such as hydro, solar, wind, geothermal, and tidal as sources of energy without contributing to pollution of land, air, or water?</p>
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## MCS MYP Advanced Studies 6 Science Subject Group Overview

	<b>Global Context</b>  Students will explore the natural world and its laws; the interaction between people and the natural world; how humans use their understanding of scientific principles; the impact of scientific and technological advances on communities and environments; the impact of environments on human activity; how humans adapt environments to their needs.	<b>Scientific and Technical Innovation</b>  Students will explore the natural world and its laws; the interaction between people and the natural world; how humans use their understanding of scientific principles; the impact of scientific and technological advances on communities and environments; the impact of environments on human activity; how humans adapt environments to their needs.	<b>Orientation in Time and Space</b>  Students will explore personal histories; homes and journeys; turning points in humankind; discoveries; explorations and migrations of humankind; the relationships between, and the interconnectedness of, individuals and civilizations, from personal, local and global perspectives.	<b>Scientific and Technical Innovation</b>  Students will explore the natural world and its laws; the interaction between people and the natural world; how humans use their understanding of scientific principles; the impact of scientific and technological advances on communities and environments; the impact of environments on human activity; how humans adapt environments to their needs.	<b>Scientific and Technical Innovation</b>  Students will explore the natural world and its laws; the interaction between people and the natural world; how humans use their understanding of scientific principles; the impact of scientific and technological advances on communities and environments; the impact of environments on human activity; how humans adapt environments to their needs.	<b>Globalization and Sustainability</b>  Students will explore the interconnectedness of human-made systems and communities; the relationship between local and global processes; how local experiences mediate the global; the opportunities and tensions provided by world interconnectedness; the impact of decision-making on humankind and the environment.	<b>Scientific and Technical Innovation</b>  Students will explore the natural world and its laws; the interaction between people and the natural world; how humans use their understanding of scientific principles; the impact of scientific and technological advances on communities and environments; the impact of environments on human activity; how humans adapt environments to their needs.	<b>Globalization and Sustainability</b>  Students will explore the interconnectedness of human-made systems and communities; the relationship between local and global processes; how local experiences mediate the global; the opportunities and tensions provided by world interconnectedness; the impact of decision-making on humankind and the environment.
	<b>UN Sustainable Development Goals</b>  <b>Goal 7</b> - Ensure access to affordable, reliable, sustainable and modern energy for all. <b>Goal 12</b> - Ensure sustainable consumption and production patterns.	<b>Goal 7</b> - Ensure access to affordable, reliable, sustainable and modern energy for all. <b>Goal 12</b> - Ensure sustainable consumption and production patterns.	<b>Goal 7</b> - Ensure access to affordable, reliable, sustainable and modern energy for all. <b>Goal 12</b> - Ensure sustainable consumption and production patterns.	<b>Goal 15</b> - Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.	<b>Goal 15</b> - Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.	<b>Goal 6</b> - Ensure availability and sustainable management of water and sanitation for all. <b>Goal 14</b> - Conserve and sustainably use the oceans.	<b>Goal 13</b> - Take urgent action to combat climate change. <b>Goal 14</b> - Conserve and sustainably use the oceans, seas and marine resources for sustainable development.	<b>Goal 11</b> - Make cities and human settlements inclusive, safe, resilient and sustainable. <b>Goal 17</b> - Strengthen the means of implementation and revitalize the global partnership for sustainable development.

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	<b>Key Concepts</b>	<b>Systems and system models (MYP/CCC)</b> Systems are sets of interacting or interdependent components. Systems provide structure and order in human, natural and built environments. Systems can be static or dynamic, simple or complex.	<b>Change (MYP/CCC)</b> Change is a conversion, transformation or movement from one form, state, or value to another. Inquiry into the concept of change involves understanding and evaluating causes, processes and consequences.	<b>Change (MYP/CCC)</b> Change is a conversion, transformation or movement from one form, state, or value to another. Inquiry into the concept of change involves understanding and evaluating causes, processes and consequences.	<b>Change (MYP/CCC)</b> Change is a conversion, transformation or movement from one form, state, or value to another. Inquiry into the concept of change involves understanding and evaluating causes, processes and consequences.	<b>Systems and system models (MYP/CCC)</b> Systems are sets of interacting or interdependent components. Systems provide structure and order in human, natural and built environments. Systems can be static or dynamic, simple or complex.	<b>Systems and system models (MYP/CCC)</b> Systems are sets of interacting or interdependent components. Systems provide structure and order in human, natural and built environments. Systems can be static or dynamic, simple or complex.	<b>Relationships (MYP)</b> Relationships are the connections and associations between properties, objects, people and ideas - including the human community's connections with the world in which we live. Any change in a relationship brings consequences.
	<b>Related Concepts</b>	Movement (MYP) Models (MYP/CCC)	Movement (MYP) Models (MYP/CCC)	Transformation (MYP) Energy (MYP/CCC)	Transformation (MYP) Energy (MYP/CCC)	Environment (MYP) Balance (MYP)	Environment (MYP) Patterns (MYP/CCC)	Environment (MYP)
	<b>Design Cycle Transdisciplinary</b>	<u>Connecting Core Ideas</u> ●Origins of the Universe ●Milky Way Galaxy ●Engineering & Technology ●Gravity ●Inertia ●Formation of the Solar System ●Structure of the Solar System Human Energy Needs	<u>Connecting Core Ideas</u> ●Lunar Cycle (Eclipses) ●Day/Night ●Seasons ●Elliptical Orbit ●Tilt of the Earth ●Revolution/Rotation ●Direct/Indirect Sunlight ●Gravity ●Tides Human Energy Needs	<u>Connecting Core Ideas</u> ●Plate Tectonics ●Land Features ●Catastrophic Events Human Energy Needs	<u>Connecting Core Ideas</u> ●Rock Strata ●Rock Cycle ●Thermal Energy Transfer ●Mineral Formation ●Weathering ●Erosion ●Deposition ●Land Features Human Energy Needs	<u>Connecting Core Ideas</u> ●Water Cycle ●Thermal Energy Transfer ●Sunlight ●Temperature ●Salinity Human Energy Needs	<u>Connecting Core Ideas</u> ●Ocean and Atmosphere Patterns ●Waves, Currents ●Water Cycle ●Air Masses ●Unequal Heating and Rotation of the Earth ●Weather ●Natural Hazards Human Energy Needs	<u>Connecting Core Ideas</u> ● Direct/Indirect Sunlight ● Weathering ● Erosion ● Deposition ● Water Cycle ● Thermal Energy Transfer ● Temperature ● Renewable and Non-Renewable Resources ● Global Climate Change

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	<b>MYP Assessments/ Performance Tasks</b>	<b>Common Assessments Title and Criterion:</b>  Solar System & Beyond Common Formative Assessments  Solar System & Beyond Unit Assessment Paper I and Paper II (A,D)  Scientific Investigation: Relative Distance from the Sun  Scientific Investigation: Planets in our Solar System (B,C)	<b>Common Assessments Title and Criterion:</b>  Earth-Moon-Sun Common Formative Assessments  Earth-Moon-Sun Unit Assessment Paper I and Paper II (A,D)	<b>Common Assessments Title and Criterion:</b>  Earth’s Changing Landscape I Common Formative Assessments  Earth’s Changing Landscape Unit Assessment Paper I and Paper II (A,D)	<b>Common Assessments Title and Criterion:</b>  Earth’s Changing Landscape II Common Formative Assessments  Earth’s Changing Landscape II Unit Assessment Paper I and Paper II (A,D)  Earth’s Changing Landscape Scientific Investigation (B,C)	<b>Common Assessments Title and Criterion:</b>  Water in Earth’s Processes Common Formative Assessments  Water in Earth’s Processes Unit Assessment Paper I and Paper II (A,D)  Water in Earth’s Processes Scientific Investigation (B,C)  Capstone Action Proposal MYP Design A.i., ii., iv. MYP Design B.i., iv. MYP Design C.i.	<b>Common Assessments Title and Criterion:</b>  Climate and Weather Common Formative Assessments  Climate and Weather Unit Assessment Paper I and Paper II (A,D)  Climate and Weather Scientific Investigation (B,C)  Capstone Project Summary MYP Design C.iii. MYP Design D.ii., iii., iv.	<b>Common Assessments Title and Criterion:</b>  Culminating Capstone Product/Presentation MYP Design B.iii. MYP Design C.iv. MYP Science A.ii. MYP Science D.ii., iii.
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	<b>Differentiation For Tiered Learners</b>	Lab-Aids Experiences  Capstone Connections  Discovery Education High School Environmental Science Techbook  NGSS Case Study 7: Gifted and Talented Students  NGSS: All Standards, All Students  Extensions - Enrichment Tasks/Projects	Lab-Aids Experiences  Capstone Connections  Discovery Education High School Environmental Science Techbook  NGSS Case Study 7: Gifted and Talented Students  NGSS: All Standards, All Students  Extensions - Enrichment Tasks/Projects	Lab Aids Experiences  Capstone Connections  Discovery Education High School Environmental Science Techbook  NGSS Case Study 7: Gifted and Talented Students  NGSS: All Standards, All Students  Extensions - Enrichment Tasks/Projects	Lab Aids Experiences  Capstone Connections  Discovery Education High School Environmental Science Techbook  NGSS Case Study 7: Gifted and Talented Students  NGSS: All Standards, All Students  Extensions - Enrichment Tasks/Projects	Lab Aids Experiences  Capstone Action Proposal  Discovery Education High School Environmental Science Techbook  NGSS Case Study 7: Gifted and Talented Students  NGSS: All Standards, All Students  Extensions - Enrichment Tasks/Projects	Lab Aids Experiences  Capstone Project Summary  Discovery Education High School Environmental Science Techbook  NGSS Case Study 7: Gifted and Talented Students  NGSS: All Standards, All Students  Extensions - Enrichment Tasks/Projects	Culminating Capstone Product/Presentation
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	Capstone Elements	<p>Capstone Connections Launch Task: Designing and Building a Solar Oven</p> <p>Capstone Connections Task: MSGA Weathering, Erosion, and Deposition Survey (Pre-Game #1)</p>	<p>Mercedes-Benz Stadium Field Trip #1: We Can Work Together</p> <p>Capstone Connections Task: Field Trip Reflection and MSGA Applications (MYP D)</p>	<p>Capstone Connections Task: MSGA Energy Audit</p> <p>Capstone Connections Task: Discussion: Energy Sources, Pollution Reduction, Minimizing Erosion (Pre-Game #2)</p>	<p>Capstone Connections Task: MSGA Weathering, Erosion, and Deposition Exploring Solutions (Post-Game #1)</p> <p>Mercedes-Benz Stadium Field Trip #2: Building Sustainability</p> <p>Capstone Connections Task: Field Trip Reflection and MSGA Applications/Solutions (Post-Game #2) (MYP D)</p>	<p>Capstone Action Proposal</p> <p>Capstone Connections Task: The Interaction of Abiotic and Biotic Factors Influencing Ecosystems (Pre-Game #3)</p>	<p>Mercedes-Benz Field Trip #3: Depending on Each Other</p> <p>Capstone Connections Task: Field Trip Reflection and MSGA Applications (Post-Game #3) (MYP D)</p> <p>Capstone Project Summary</p>	Culminating Capstone Product/Presentation
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