

Course Overview/Year-At-A-Glance

Text Source(s): "California Inspire Science" and California State Framework

N G S B i o l o g y	Big Ideas (Enduring Understanding)	<u>"The Times They Are A'Changin'"</u>
	Story Line	Change is the act or an instance of making or becoming different. How do I impact change in my community and how does that change impact the world around me? How have the changes of the past impacted the world I'm about to inherit?
	Essential Questions by Unit	<p><u>Unit #1 Humans And Their Place In The Universe</u>(McGraw-Hill Unit 4)</p> <ol style="list-style-type: none"> 1. How does human population growth and increases in per capita consumption of natural resources affect Earth's systems? 2. How can a model of the Sun-Earth-Moon system be used to explain the cyclic patterns of the seasons, lunar phases, and eclipses of the Sun and Moon? 3. What is the role of gravity in the Milky Way Galaxy and the solar system? 4. How do objects within the solar system compare and contrast? <p><u>Unit #2 Change Over Time</u>(McGraw-Hill Unit 1)</p> <ol style="list-style-type: none"> 1. How can the analyses of rock strata and the fossil record be used to establish the relative ages of major events in Earth's history? 2. How can rocks tell the story of Earth's long history? 3. How can rock layers and geologic features be used to sequence past geologic events? 4. How do organisms adapt for survival? 5. How can a variation in a population result in an adaptation? 6. What evidence supports the theory that living things evolve over time? <p><u>Unit #3 Energy and Motion</u>(McGraw-Hill Unit 2)</p> <ol style="list-style-type: none"> 1. What determines an object's motion? 2. How does a push or pull affect motion? 3. How do objects interact with contact and noncontact forces? 4. How does mechanical energy determine the motion of an object? 5. What factors determine potential and kinetic energy of an object? 6. How are different types of energy used? 7. How are electric and magnetic forces used to transfer energy? <p><u>Unit #4 Understanding Waves</u>(McGraw-Hill Unit 3)</p>

		<ol style="list-style-type: none"> 1. How do waves travel through matter? 2. How do the properties of waves correspond with observations of waves? 3. Why can light be modeled as a wave? 4. How does light reflect and refract through materials? 5. How are colors formed? 6. How does technology allow humans to share information? 		
	Evidence Statements	NGSS Performance Expectations (Clarification Statements)	Essential Outcomes	Laboratory Exercises/Activities
U N I T 1	<p>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. [Clarification Statement: Examples of models can be physical, graphical, or conceptual</p> <p>MS-ESS1-2. Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.</p> <p>MS-ESS1-3. Analyze and interpret data to determine scale properties of objects in the solar system.</p> <p>MS-ESS3-4. Construct an argument supported by evidence for how increases in human population and per capita consumption of natural</p>	<p>https://www.nextgenscience.org/dci-arrangement/ms-ess1-earths-place-universe</p> <p>www.nextgenscience.org/sites/default/files/evidence_statement/black_white/MS-ESS3-4%20Evidence%20Statements%20June%202015%20asterisks.pdf</p>	<p>The students will understand how human populations affect the size and health of natural resources by analyzing and interpreting existing data.</p> <p>The students will understand the relationship between the Earth, Sun, and Moon and their place in the solar system by developing and using models.</p>	

	resources impact Earth's systems.			
UNIT 2	<p>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</p> <p>MS-LS3-1. Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.</p> <p>MS-LS4-1. Analyze and interpret data for patterns in the fossil record that documents the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.</p> <p>MS-LS4-2. Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil</p>	<p>https://www.nextgenscience.org/dci-arrangement/ms-ess1-earths-place-universe</p> <p>https://www.nextgenscience.org/dci-arrangement/ms-ls3-heredity-inheritance-and-variation-traits</p> <p>https://www.nextgenscience.org/dci-arrangement/ms-ls4-biological-evolution-unity-and-diversity</p>	<p>Students will understand how rocks tell the history of the Earth by analyzing evidence from rock strata.</p> <p>Students will understand how the variation of genes in a species help them to adapt to a changing environment by analyzing new and existing data, and constructing models.</p>	

	<p>organisms to infer evolutionary relationships.</p> <p>MS-LS4-3. Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.</p> <p>MS-LS4-4. Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.</p> <p>MS-LS4-5. Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms</p> <p>MS-LS4-6. Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time</p>			
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UNIT 3	<p>MS-PS2-2. Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.</p> <p>MS-PS2-3. Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.</p> <p>MS-PS2-4. Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.</p> <p>MS-PS2-5. Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.</p> <p>MS-PS3-1. Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and the speed of an object.</p>	https://www.nextgenscience.org/dci-arrangement/ms-ps2-motion-and-stability-forces-and-interactions	<p>Students will understand how forces, electric and magnetic, affect an object with or without contact by designing an experiment, developing models, and analyzing data.</p>	
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	<p>MS-PS3-2. Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system</p> <p>MS-PS3-5. Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.</p> <p>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.</p> <p>MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.</p> <p>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.</p>	<p>https://www.nextgenscience.org/dci-arrangement/ms-ps3-energy</p> <p>https://www.nextgenscience.org/dci-arrangement/ms-ets1-engineering-design</p>		
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	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.			
UNIT 4	<p>MS-PS4-1. Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave</p> <p>MS-PS4-2. Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.</p> <p>MS-PS4-3. Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.</p> <p>MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.</p> <p>MS-ETS1-4. Develop a model to generate data for iterative</p>	<p>https://www.nextgenscience.org/dci-arrangement/ms-ps4-waves-and-their-applications-technologies-information-transfer</p> <p>https://www.nextgenscience.org/dci-arrangement/ms-ets1-engineering-design</p>	Students will understand how waves are reflected, refracted, or absorbed, how they create colors, and transmit technological information by designing and developing models.	

	testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.			
Performance Task	Assessment of Standards (Summative)	Quarter 1 (F): Quarter 2 (F): Quarter 3 (F): Quarter 4 (F): Summative (1): Summative (2):		

[Links to performance tasks](#)