

# Earth and Space Curriculum Map

Standards	Content	Skills/Practices	Materials/ Resources	Assessments (All) Daily/Weekly/ Benchmarks	Timeline (Months/Weeks /Days)
<p>MP.2 Reason abstractly and quantitatively. (HS-ESS2-2),(HS-ESS2-3),(HS-ESS2-6) MP.4 Model with Mathematics. (HS-ESS2-3), (HS-ESS2-6) AI-N.Q.1 Select quantities and use units as a way to: i) interpret and guide the solution of multi-step problems; ii) choose and interpret units consistently in formulas; and iii) choose and interpret the scale and the origin in graphs and data displays.</p>	<p>Unit 1: Science Practices</p>	<p>Demonstrate an understanding of science as inquiry</p> <p>Formulate and evaluate questions that can be feasibly investigated</p> <p>Develop and use models based on evidence to describe systems or their components and how they work</p> <p>Use appropriate tools to collect data</p> <p>Use graphs to appropriate the data to visualize data and identify trends</p> <p>Explain results</p>	<p>School Issued Chromebook</p> <p>School provided Lab Materials</p> <p>Teacher generated google slides</p> <p>Schoology</p> <p>Ck-12 online textbook</p>	<p>Summative:</p> <ul style="list-style-type: none"> <li>● Quizzes</li> <li>● Tests</li> <li>● Analysing Data and Graphing Lab</li> </ul> <p>Formative:</p> <ul style="list-style-type: none"> <li>● Bell ringers</li> <li>● Formative questions in class</li> <li>● Jamboards</li> <li>● Classroom polls</li> </ul>	<p>Early to Mid September</p>

<p>(HS-ESS2-2),(HS-ESS2-3),(HS-ESS2-6) AI-N.Q.3 Choose a level of accuracy appropriate to limitations on measurement and context when reporting quantities. (HS-ESS2-2),(HS-ESS2-3),(HS-ESS2-5),(HSESS2-6)</p> <p>11-12.RST. 1 Cite specific evidence to support analysis of scientific and technical texts, charts, diagrams, etc., attending to the precise details of the source, and attending to important distinctions the author makes and to any gaps or inconsistencies in the account. (HS-ESS2-2),(HS-ESS2-3)</p>		<p>based on evidence and scientific ideas and principles</p> <p>Engage in arguments from evidence</p>			
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<p>11-12.RST.2 Determine the key ideas or conclusions of a source; summarize complex concepts, processes, or information presented in a source by paraphrasing in precise and accurate terms. (HS-ESS2-2)</p> <p>9-12.WHST.1 Write arguments focused on discipline-specific content. (HS-ESS2-2)</p>					
<p>ESS1.C: The History of Planet Earth ▪ Continental rocks, which can be older than 4 billion years, are generally much older than the rocks of the ocean floor, which are less than 200 million years old.</p>	<p>Unit 2: The History of Planet Earth</p>	<p>HS-ESS1-5. Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks.</p> <p>HS-ESS1-6. Apply</p>	<p>School Issued Chromebook</p> <p>School provided Lab Materials</p> <p>Teacher generated google slides</p> <p>Schoology</p> <p>Ck-12 online textbook</p>	<p>Summative:</p> <ul style="list-style-type: none"> <li>● Quizzes</li> <li>● Tests</li> <li>● Earth Timeline Lab</li> </ul> <p>Formative:</p> <ul style="list-style-type: none"> <li>● Bell ringers</li> <li>● Formative questions in class</li> <li>● Jamboards</li> </ul>	<p>Late September to Early October</p>

<p>(HS-ESS1-5) ▪ Although active geologic processes, such as plate tectonics and erosion, have destroyed or altered most of the very early rock record on Earth, other objects in the solar system, such as lunar rocks, asteroids, and meteorites, have changed little over billions of years. Studying these objects can provide information about Earth's formation and early history. (HS-ESS1-6)</p>		<p>scientific reasoning and evidence from ancient Earth materials, meteorites, and other planetary surfaces to construct an account of Earth's formation and early history.</p>		<ul style="list-style-type: none"> <li>• Classroom polls</li> </ul>	
<p>ESS2.A: Earth Materials and Systems ▪ Earth's systems, being dynamic and interacting, cause feedback effects that can increase</p>	<p>Unit 3: Earth's Materials and Systems</p>	<p>HS. ESS2-2. Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to</p>	<p>School Issued Chromebook  School provided Lab Materials  Teacher generated google slides</p>	<p>Summative:</p> <ul style="list-style-type: none"> <li>• Quizzes</li> <li>• Tests</li> </ul> <p>Formative:</p>	<p>Mid to Late October</p>

<p>or decrease the original changes. (HS-ESS2-1) (Note: This Disciplinary Core Idea is also addressed by HS-ESS2-2)</p>		<p>Earth's systems.  HS. ESS2-3. Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.</p>	<p>Schoology  Ck-12 online textbook</p>	<ul style="list-style-type: none"> <li>● Bell ringers</li> <li>● Formative questions in class</li> <li>● Jamboards</li> <li>● Classroom polls</li> </ul>	
<p>ESS2.B: Plate Tectonics and Large-Scale System Interactions ▪ Plate tectonics is the unifying theory that explains the past and current movements of the rocks at Earth's surface and provides a framework for understanding its geologic history. (ESS2.B Grade 8 GBE) (secondary to HS-ESS1-5),(HS-ESS2-1) ▪ Plate movements are responsible for</p>	<p>Unit 4: Plate Tectonics</p>	<p>HS-ESS2-1. Develop a model to illustrate how Earth's internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features  HS. ESS2-3. Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.</p>	<p>School Issued Chromebook  School provided Lab Materials  Teacher generated google slides  Schoology  Ck-12 online textbook</p>	<p>Summative:</p> <ul style="list-style-type: none"> <li>● Quizzes</li> <li>● Tests</li> <li>● Graham cracker Plate Lab</li> <li>● Continental Drift lab</li> </ul> <p>Formative:</p> <ul style="list-style-type: none"> <li>● Bell ringers</li> <li>● Formative questions in class</li> <li>● Jamboards</li> <li>● Classroom polls</li> </ul>	<p>Early to mid November</p>

<p>most continental and ocean-floor features and for the distribution of most rocks and minerals within Earth's crust. (ESS2.B Grade 8 GBE) (HS-ESS2-1)</p>					
<p>ESS2.C: The Roles of Water in Earth's Surface Processes ▪ The abundance of liquid water on Earth's surface and its unique combination of physical and chemical properties are central to the planet's dynamics. These properties include water's exceptional capacity to absorb, store, and release large amounts of energy, transmit sunlight, expand upon freezing,</p>	<p>Unit 5: Water in Earth's Surface Processes</p>	<p>HS-ESS2-5. Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.</p>	<p>School Issued Chromebook  School provided Lab Materials  Teacher generated google slides  Schoology  Ck-12 online textbook</p>	<p>Summative:</p> <ul style="list-style-type: none"> <li>● Quizzes</li> <li>● Tests</li> </ul> <p>Formative:</p> <ul style="list-style-type: none"> <li>● Bell ringers</li> <li>● Formative questions in class</li> <li>● Jamboards</li> <li>● Classroom polls</li> </ul>	<p>Late November</p>

<p>dissolve and transport materials, and lower the viscosities and melting points of rocks. (HS-ESS2-5)</p>					
<p>ESS2.D: Weather and Climate The foundation for Earth's global climate systems is the electromagnetic radiation from the sun, as well as its reflection, absorption, storage, and redistribution among the atmosphere, ocean, and land systems, and this energy's re-radiation into space. (HS-ESS2-2) • Gradual atmospheric changes were due to plants and other</p>	<p>Unit 6: Weather, Climate, and Biogeology</p>	<p>HS. ESS2-2. Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to Earth's systems.</p> <p>HS-ESS2-6. Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.</p> <p>HS-ESS2-7. Construct an argument based on evidence about the</p>	<p>School Issued Chromebook</p> <p>School provided Lab Materials</p> <p>Teacher generated google slides</p> <p>Schoology</p> <p>Ck-12 online textbook</p>	<p>Summative:</p> <ul style="list-style-type: none"> <li>● Quizzes</li> <li>● Tests</li> <li>● Weather tracking lab</li> <li>● Atmosphere and biosphere lab</li> </ul> <p>Formative:</p> <ul style="list-style-type: none"> <li>● Bell ringers</li> <li>● Formative questions in class</li> <li>● Jamboards</li> <li>● Classroom polls</li> </ul>	<p>December</p>

<p>organisms that captured carbon dioxide and released oxygen. (HS-ESS2-6),(HS-ESS2-7) ▪</p> <p>Changes in the atmosphere due to human activity have increased carbon dioxide concentrations and thus affect climate. (HS-ESS2-6)</p> <p>ESS2.E: Biogeology ▪ The many dynamic and delicate feedbacks between the biosphere and other Earth systems cause a continual coevolution of Earth's surface and the life that exists on it. (HS-ESS2-7)</p>		<p>coevolution of Earth's systems and life on Earth.</p>			
<p>ESS3.A: Natural Resources ▪ Resource</p>	<p>Unit 7: Natural Resources</p>	<p>HS-ESS3-1. Construct an explanation based</p>	<p>School Issued Chromebook</p>	<p>Summative:</p> <ul style="list-style-type: none"> <li>• Quizzes</li> <li>• Tests</li> </ul>	<p>Early to Mid January</p>



<p>availability has guided the development of human society. (HS-ESS3-1) ▪ All forms of energy production and other resource extraction have associated economic, social, environmental, and geopolitical costs and risks as well as benefits. New technologies and social regulations can change the balance of these factors. (HS-ESS3-2)</p>		<p>on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.</p> <p>HS.ESS3-6. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.*</p>	<p>School provided Lab Materials</p> <p>Teacher generated google slides</p> <p>Schoology</p> <p>Ck-12 online textbook</p>	<ul style="list-style-type: none"> <li>● Renewable v. Non renewable resources Lab</li> </ul> <p>Formative:</p> <ul style="list-style-type: none"> <li>● Bell ringers</li> <li>● Formative questions in class</li> <li>● Jamboards</li> <li>● Classroom polls</li> </ul>	
<p>ESS3.B: Natural Hazards ▪ Natural hazards and other geologic events have shaped the course of human history; [they] have significantly altered the sizes of human populations and have driven human</p>	<p>Unit 8: Natural Hazards</p>	<p>HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.</p>	<p>School Issued Chromebook</p> <p>School provided Lab Materials</p> <p>Teacher generated google slides</p> <p>Schoology</p>	<p>Summative:</p> <ul style="list-style-type: none"> <li>● Quizzes</li> <li>● Tests</li> <li>● Natural Hazards Lab</li> </ul> <p>Formative:</p> <ul style="list-style-type: none"> <li>● Bell ringers</li> <li>● Formative</li> </ul>	<p>Mid to Late January</p>

migrations. (HS-ESS3-1)			Ck-12 online textbook	<p>questions in class</p> <ul style="list-style-type: none"> <li>● Jamboards</li> <li>● Classroom polls</li> </ul>	
<p>ESS3.C: Human Impacts on Earth Systems ▪ The sustainability of human societies and the biodiversity that supports them requires responsible management of natural resources. (HS-ESS3-3) ▪ Scientists and engineers can make major contributions by developing technologies that produce less pollution and waste and that preclude ecosystem degradation. (HS-ESS3-4)</p>	Unit 9: Human Impacts on Earth Systems	<p>HS-ESS3-3. Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.</p> <p>HS-ESS3-4. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.*</p>	<p>School Issued Chromebook</p> <p>School provided Lab Materials</p> <p>Teacher generated google slides</p> <p>Schoology</p> <p>Ck-12 online textbook</p>	<p>Summative:</p> <ul style="list-style-type: none"> <li>● Quizzes</li> <li>● Tests</li> <li>● Human Impact project</li> </ul> <p>Formative:</p> <ul style="list-style-type: none"> <li>● Bell ringers</li> <li>● Formative questions in class</li> <li>● Jamboards</li> <li>● Classroom polls</li> </ul>	February
ESS3.D: Global Climate Change ▪ Through computer	Unit 10: Global Climate Change	HS-ESS3-4. Evaluate or refine a technological	School Issued Chromebook	<p>Summative:</p> <ul style="list-style-type: none"> <li>● Quizzes</li> <li>● Tests</li> </ul>	March

<p>simulations and other studies, important discoveries are still being made about how the ocean, the atmosphere, and the biosphere interact and are modified in response to human activities. (HSESS3-6) ETS1.B. Developing Possible Solutions When evaluating solutions, it is important to take into Crosscutting Concepts Cause and Effect ▪ Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects. (HS-ESS3-1) Systems and System Models ▪</p>		<p>solution that reduces impacts of human activities on natural systems.*</p> <p>HS.ESS3-6. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.*</p> <p>HS-ESS3-5. Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems.</p>	<p>School provided Lab Materials</p> <p>Teacher generated google slides</p> <p>Schoology</p> <p>Ck-12 online textbook</p>	<ul style="list-style-type: none"> <li>● Climate Change Lab</li> <li>● Climate change Project</li> </ul> <p>Formative:</p> <ul style="list-style-type: none"> <li>● Bell ringers</li> <li>● Formative questions in class</li> <li>● Jamboards</li> <li>● Classroom polls</li> </ul>	
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<p>When investigating or describing a system, the boundaries and initial conditions of the system need to be defined and their inputs and outputs analyzed and described using models. (HS-ESS3-6)</p> <p>Stability and Change ▪ Change and rates of change can be quantified and modeled over very short or very long periods of time. Some system changes are irreversible. (HSESS3-3) ▪</p> <p>Feedback (negative or positive) can stabilize or destabilize a system. (HS-ESS3-4)</p> <p>----- -----</p>					
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<p>Connections to Engineering, Technology, and Applications of Science Influence of Engineering, Technology, and Science on Society and the Natural World ▪ Modern civilization depends on major technological systems. (HS-ESS3-1),(HS-ESS3-3) ▪ Engineers continuously modify these systems to increase benefits while decreasing costs and risks. (HS-ESS3-2),(HS-ESS3-4) ▪ New technologies can have deep impacts on society and the environment, including some that were not anticipated. (HS-ESS3-3) ▪</p>					
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<p>Analysis of costs and benefits is a critical aspect of decisions about technology. (HS-ESS3-2)</p> <p>-----</p> <p>-----</p> <p>Connections to Nature of Science Science is a Human Endeavor New York State P-12 Science Learning Standards *The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea. The text in the “Disciplinary Core Ideas” section is reproduced verbatim from A Framework for K-12 Science</p>					
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<p>Education: Practices, Cross-Cutting Concepts, and Core Ideas unless it is preceded by (NYSED). Page82 and sufficient evidence and scientific reasoning to defend and critique claims and explanations about natural and designed world(s). Arguments may also come from current scientific or historical episodes in science. ▪ Evaluate competing design solutions to a realworld problem based on scientific ideas and principles, empirical evidence, and logical arguments regarding relevant factors (e.g. economic, societal,</p>					
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<p>environmental, ethical considerations). (HS-ESS3-2) account a range of constraints, including cost, safety, reliability, and aesthetics, and to consider social, cultural, and environmental impacts. (secondary to HS-ESS3-2),(secondary to HS-ESS3-4)</p>					
<p>ESS1.B: Earth and the Solar System • Kepler's laws describe common features of the motions of orbiting objects, including their elliptical paths around the sun. Orbits may change due to the gravitational effects from, or collisions with, other objects in the</p>	<p>Unit 11: Earth and the Solar system</p>	<p>HS-ESS1-1. Develop a model based on evidence to illustrate the life span of the Sun and the role of nuclear fusion in the Sun's core to release energy that eventually reaches Earth in the form of radiation.</p> <p>HS-ESS1-4. Use mathematical or</p>	<p>School Issued Chromebook</p> <p>School provided Lab Materials</p> <p>Teacher generated google slides</p> <p>Schoology</p> <p>Ck-12 online textbook</p>	<p>Summative:</p> <ul style="list-style-type: none"> <li>● Quizzes</li> <li>● Tests</li> <li>● Planets to scale lab</li> <li>● Scaled solar system lab</li> <li>● Moon phases lab</li> </ul> <p>Formative:</p> <ul style="list-style-type: none"> <li>● Bell ringers</li> <li>● Formative questions in class</li> <li>● Jamboards</li> </ul>	<p>April to Mid May</p>



<p>solar system. (HS-ESS1-4) ▪ (NYSED) Earth and celestial phenomena can be described by principles of relative motion and perspective. (HS-ESS1-7)</p>		<p>computational representations to predict the motion of orbiting objects in the solar system.</p> <p>HS-ESS1-7. Construct an explanation using evidence to support the claim that the phases of the moon, eclipses, tides and seasons change cyclically.</p>		<ul style="list-style-type: none"> <li>• Classroom polls</li> </ul>	
<p>ESS1.A: The Universe and Its Stars ▪ The star called the sun is changing and will burn out over a lifespan of approximately 10 billion years. (HS-ESS1-1) ▪ The study of stars' light spectra and brightness is used to identify compositional elements of stars, their movements,</p>	<p>Unit 12: The Universe and its Stars</p>	<p>HS-ESS1-2. Construct an explanation of the Big Bang theory based on astronomical evidence of light spectra, motion of distant galaxies, and composition of matter in the universe.</p> <p>HS-ESS1-3. Communicate scientific ideas about the way stars,</p>	<p>School Issued Chromebook</p> <p>School provided Lab Materials</p> <p>Teacher generated google slides</p> <p>Schoology</p> <p>Ck-12 online textbook</p>	<p>Summative:</p> <ul style="list-style-type: none"> <li>• Quizzes</li> <li>• Tests</li> <li>• HR Diagram Lab</li> <li>• Scale of the Universe Lab</li> <li>• Life of a star book project</li> </ul> <p>Formative:</p> <ul style="list-style-type: none"> <li>• Bell ringers</li> <li>• Formative questions in class</li> <li>• Jamboards</li> <li>• Classroom polls</li> </ul>	<p>Late May to June</p>

<p>and their distances from Earth.  (HS-ESS1-2),(HS-ESS1-3) ▪ The Big Bang theory is supported by observations of distant galaxies receding from our own, of the measured composition of stars and non-stellar gases, and of the maps of spectra of the primordial radiation (cosmic microwave background) that still fills the universe.  (HS-ESS1- 2) ▪ Other than the hydrogen and helium formed at the time of the Big Bang, nuclear fusion within stars produces all atomic nuclei lighter than and including iron, and the process</p>		<p>over their life cycle, produce elements.</p>			
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<p>releases electromagnetic energy. Heavier elements are produced when certain massive stars achieve a supernova stage</p> <p>PS3.D: Energy in Chemical Processes and Everyday Life ▪ Nuclear Fusion processes in the center of the sun release the energy that ultimately reaches Earth as radiation. (secondary to HS-ESS1-1)</p> <p>PS4.B Electromagnetic Radiation ▪ Atoms of each element emit and absorb characteristic frequencies of light. These characteristics allow identification of the presence of</p>					
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an element, even in microscopic quantities. (secondary to HS-E SS1-2)					
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