PACING GUIDE SCIENCE
Grade 6

Topic	Unit	Marking Period	Number of Days
Earth's Place in the Universe	Fusion 6th Module G Plus history of Earth from Module E Unit 2	1	40
Earth's Systems	Fusion 6th Module F and plate tectonics form Module E Unit 4	2 and 3 4	70
Earth and Human Activity	Fusion 6th Module E Unit 1 Earth's surface Fusion 6th Module E Unit 2 Geological Change Fusion 6th Module F Unit 4 Some of these standards are included in 7th grade curriculum	4	50
Engineering Design	Module K	throughout	20

Aug 2021
Reapproved by Board with updates Aug 2026

Alpha Public School
Science Curriculum Map

Grade: 6th

Standard: MS-ESS1	**Content Topic:** Earth's Place in the Universe

Strand	Disciplinary Core Ideas / Essential Statement	Objective	Science & Engineering Practices / Skills & Lesson
MS-ESS1-1	---patterns of the apparent motion of the sun, the moon, and stars in the sky can be observed, described, predicted, and explained with models (ESS1.A)	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.	https://betterlesson.com/lesson/635174/apparent-motion-of-the-sun?from=search https://betterlesson.com/lesson/636034/phases-of-the-moon?from=search https://betterlesson.com/lesson/645433/seasons-tides?from=search
MS-ESS1-2	---Earth and its solar system are part of the Milky Way galaxy, which is one of many galaxies in the universe (ESS1.A)	Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system	https://betterlesson.com/lesson/645431/gravity?from=search
MS-ESS1-3		Analyze and interpret data to determine scale properties of objects in the solar system	https://betterlesson.com/lesson/638770/planetary-distances-using-toilet-paper?from=search
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.	https://betterlesson.com/lesson/638784/history-of-earth-part-1-discovery?from=search

Formative, Summative and Alternative Assessments	Benchmark Assessments	Core Instructional and Supplemental Materials (including various texts at each grade level)
Unit Tests in 2 formats Visualizing and Verbalizing Quizzes for each section Marzano Vocabulary Slides Formative Assessment Questions on every page of text Probing Questions on every page Why It Matters Text to Life Questions	End of the Module Tests Use of portfolio assessments and rubric Performance Based Assessments for every unit	Text: Science Fusion Holt: Science Middle School Chemistry Better Lessons Khan Academy

Alternative Assessment- Alternative Assessment Science Fusion for every section Test Doctor for every assessment 1-3 Performance Based Quick Labs for every lessons: Labs- D-Model Moon Phases Eclipses of the Sun and Moon-D-Exploring Eclipses-Model Solar and Lunar Eclipse Seasons-D-Changes in Stars Seen in the Night Sky and Navigation Using the Stars Model Sunlight Distribution Analyze an Earth/Sun Model to Explain Seasons Mass vs Weight Lab Egg Drop Engineering Project PhET simulations-My Solar System Explore the Motion of a Falling Object Schoolyard Solar System Model Rock Layers to Determine Relative Age Construct a Timeline Model Analysis of the Fossil Record Alternative Assessment- Alternative Assessment Book-Science Fusion		Edpuzzle

Technology	Crosscutting Concepts / Interdisciplinary Connections across grade levels and content areas (at least 1)
● Book Available On line ● Lab Posted on Google Classroom and done in Kami ● Middle School Chemistry Multimedia	ELA-technical lab report Math-computation

Animations https://www.middleschoolchemistry.com/ • Better Lessons https://betterlesson.com/search?from=mtp_intro&types=lesson&subjects=2 • Khan Academy https://www.khanacademy.org/ • Bozeman Science http://www.bozemanscience.com/next-generation-science-standards • Quizlet	

Differentiation (IEPs / 504s)	Differentiation (ELL)	Differentiation (G &T)
Visual aids Sentence Frames Modeling Anchor charts Modify rubric Teacher directed grouping Chunk learning at teacher discretion Re-read text at teacher discretion Text in auditory format	Visual aids Sentence Frames Modeling Anchor charts Modify rubric Teacher directed grouping Chunk learning at teacher discretion Re-read text at teacher discretion Text in auditory format Pre-teach vocabulary Non-linguistic cues Manipulatives Graphic organizers Use of educational websites: www.khanacademy.org www.colorincolorado.org/	Independent research projects Advanced texts http://education.jlab.org/vocabhangman/ Science content vocabulary hangman http://kids.nationalgeographic.com/ National Geographic online http://www.bbc.co.uk/schools/scienceclips/ages/10_11/science_10_11.shtml Interactive science activities http://classroom.jc-schools.net/sci-units/plants-animals.htm#Interactive

21st Century Education	Career Education
THEMES: Global Awareness Financial, Economic, Business and	Career Ready Practices describe the career-ready skills that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. Career Ready Practices should be taught and reinforced in all career exploration

Entrepreneurial Literacy Civic Literacy Health Literacy <u>SKILLS:</u> Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration Information Literacy Media Literacy ICT Literacy Life and Career Skills	and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study. CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP5. Consider the environmental, social and economic impacts of decisions. CRP6. Demonstrate creativity and innovation. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP10. Plan education and career paths aligned to personal goals. CRP11. Use technology to enhance productivity. CRP12. Work productively in teams while using cultural global competence.

Alpha Public School
Science Curriculum Map

Standard: MS-ESS2	**Content Topic:** Earth's Systems

Strand	Disciplinary Core Ideas / Essential Statement	Objective	Science & Engineering Practices / Skills & Lesson
MS-ESS2-1	---all Earth processes are the result of energy flowing and matter cycling within and among the planet's systems. This energy is derived from the sun and Earth's hot interior. The energy that flows and matter that cycles produce chemical and physical changes in Earth's materials and living organisms (ESS2.A)	Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process	---develop and use a model to describe phenomena Air, Air, It's Really There Middle School Chemistry Better Lessons What is Air? What is a Gas? https://betterlesson.com/lesson/616057/eliciting-student-ideas-what-is-air-what-is-a-gas?from=search
MS-ESS2-2	---the planet's systems interact over scales that range from microscopic to global in size, and they operate over fractions of a second to billions of years. These interactions have shaped Earth's history and will determine its future. (ESS2.A) ---Water's movements- both on the land and underground- cause weathering and erosion, which change the land's surface features and create underground formations (ESS2.C)	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales	---construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe nature operate today as they did in the past and will continue to do so in the future What is Heat/What is Temperature? https://betterlesson.com/lesson/627828/eliciting-student-ideas-what-is-heat-what-is-temperature?from=search Mechanical Weathering Lab Fusion
MS-ESS2-3	---Tectonic processes continually generate new ocean sea floor at ridges and destroy old sea floor at trenches (ESS1.C) ---maps of ancient land and water patterns, based on in investigations of rocks and fossils, make clear how Earth's plates have moved great distances, collided, and spread apart (ESS2.B)	Analyze and interpret data on the distribution of fossils and rocks, continental shapes and seafloor structures to provide evidence of the past plate motions	---analyze and interpret data to provide evidence for phenomena ---Science findings are frequently revised and / or reinterpreted based on new evidence Tectonic Ice Cubes-Fusion Science Reconstructing Land Masses-Fusion Science Seafloor Spreading-Fusion Science

			What Happens When Objects Collide-Fusion Science
MS-ESS2-4	---Water continually cycles among land, ocean, and atmosphere via transpiration, evaporation, condensation and crystallization, and precipitation, as well as downhill flows on land (ESS2.C) ---Global movements of water and its changes in form are propelled by sunlight and gravity (ESS2.C)	Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity	---develop a model to describe unobservable mechanisms Modeling the Water Cycle-Fusion Science Can You Make It Rain in a Jar Fusion Science Reaching the DewPoint-Fusion Science
MS-ESS2-5	---The complex patterns of the changes and the movement of water in the atmosphere, determined by winds, landforms, and ocean temperatures and currents are major determinants of local weather patterns (ESS2.C) ---Because these patterns are so complex, weather can only be predicted probabilistically (ESS2.D)	Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions	----Collect data to produce data to serve as the basis for evidence to answer scientific questions or test design solutions under a range of conditions **Fusion Science** Classifying Clouds Comparing Different Ways to Estimate Wind Speed Out of Thin Air Analyze Weather Patterns **Better Lessons** Air Masses and Fronts https://betterlesson.com/lesson/631782/air-masses-and-fronts?from=search
MS-ESS2-6	---Variations in density due to variations in temperature and salinity drive a global pattern of interconnected ocean currents (ESS2.C) ---Weather and climate are influenced by interactions involving sunlight, the ocean, the atmosphere, ice, landforms, and living things. These interactions vary with latitude, altitude, and local and regional geography, all of which can	Develop and use a model to describe how unequal heating and rotation of the Earth causes patterns of atmospheric and oceanic circulation that determine regional climates	---develop and use a model to describe phenomena **Science Fusion** Ocean Density Evaporation Rates Measuring Salinity Factors in Wave Formation Modeling the Coriolis Effect The Formation of Deep Currents Can Messages Travel on Ocean Water

	affect oceanic and atmospheric flow patterns (ESS2.D) -----The ocean exerts a major influence on weather and climate by absorbing energy from the sun, releasing it over time, and globally redistributing it through ocean currents (ESS2.D)		

Formative, Summative and Alternative Assessments	Benchmark Assessments	Core Instructional and Supplemental Materials (including various texts at each grade level)
Unit Tests in 2 formats Visualizing and Verbalizing Quizzes for each section Marzano Vocabulary Slides Formative Assessment Questions on every page of text Probing Questions on every page Why It Matters Text to Life Questions **Alternative Assessment**- Alternative Assessment Science Fusion for every section Test Doctor for every assessment 1-3 Performance Based Quick Labs for every lessons: LABS- Modeling Weathering, Erosion, and Deposition Rock Cycle Model (RESA) Model the Movement of Continents Analyze Visual Evidence Modeling the Water Cycle Identify Weather Associated with Pressure Systems Model an Air Mass Interaction Model Your Climate Alternative Assessments:	End of the Module Tests Use of portfolio assessments and rubric Performance Based Assessments for every unit	Text: Science Fusion Holt: Science Middle School Chemistry Better Lessons Khan Academy Edpuzzle

Alternative Assessment Book from Science Fusion		

Technology	Crosscutting Concepts / Interdisciplinary Connections across grade levels and content areas (at least 1)
• Book Available On line • Lab Posted on Google Classroom and done in Kami • Middle School Chemistry Multimedia Animations https://www.middleschoolchemistry.com/ • Better Lessons https://betterlesson.com/search?from=mtp_intro&types=lesson&subjects=2 • Khan Academy https://www.khanacademy.org/ • Bozeman Science http://www.bozemanscience.com/next-generation-science-standards • Quizlet	---explanations of stability and change in natural or designed systems can be constructed by examining the changes over time and processes at different scales, including the atomic scale ---time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small ---patterns in rates of change and other numerical relationships can provide information about natural systems ---within a natural or designed system, the transfer of energy drives the motion and / or cycling of matter ---cause and effect relationships may be used to predict phenomena in natural and designed systems ---models can be used to represent systems and their interactions---such as inputs, processes and outputs--- and energy, matter, and information flows within systems

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	Non-linguistic cues Manipulatives Graphic organizers Use of educational websites: www.khanacademy.org www.colorincolorado.org/	

21st Century Education	Career Education
THEMES: Global Awareness Financial, Economic, Business and Entrepreneurial Literacy Civic Literacy Health Literacy SKILLS: Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration Information Literacy Media Literacy ICT Literacy Life and Career Skills	Career Ready Practices describe the career-ready skills that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study. CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP5. Consider the environmental, social and economic impacts of decisions. CRP6. Demonstrate creativity and innovation. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP10. Plan education and career paths aligned to personal goals. CRP11. Use technology to enhance productivity. CRP12. Work productively in teams while using cultural global competence.

Standard: MS-ESS3	**Content Topic:** Earth and Human Activity

Strand	Disciplinary Core Ideas / Essential Statement	Objective	Science & Engineering Practices / Skills & Lesson
MS-ESS3-1	---humans depend on Earth's land, ocean, atmosphere, and biosphere for many different resources. Minerals, fresh water, and biosphere resources are limited, and many are not renewable or replaceable over human lifetimes. These resources are distributed unevenly around the planet as a result of past geologic processes (ESS3.A)	Construct a scientific explanation based on evidence for how the uneven distribution of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes	---construct a scientific explanation based on valid and reliable evidence obtained from sources (inducing the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.
MS-ESS3-2	---Mapping the history of natural hazards in a region, combined with an understanding of related geologic forces can help forecast the locations and likelihoods of future events (ESS3.B)	Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their efforts	---analyze and interpret data to determine similarities and differences in findings
MS-ESS3-3	---Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth's environments can have different impacts (negative and positive) for different living things (ESS3.C) --------Typically, as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise (ESS3.C)	apply scientific principles to design a method for monitoring and minimizing a human impact on the environment	---apply scientific principles to design an object, tool, process or system

MS-ESS3-4	---Typically, as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise (ESS3.C)	construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's system	---construct an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem
MS-ESS3-5	---human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming). Reducing the level of climate change and reducing human vulnerability to whatever climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior and on applying that knowledge wisely in decisions and activities (ESS3.D)	ask questions to clarify evidence of the factors that have caused climate change over the past century	---ask questions to identify and clarify evidence of an argument

Formative, Summative and Alternative Assessments	Benchmark Assessments	Core Instructional and Supplemental Materials (including various texts at each grade level)
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Energy Debate Chocolate Earth (RESA) Catastrophism vs Uniformitarianism Assess Building sites near a volcano Analyze Eruption Data Severe Weather Webquest Design an Experiment to Monitoring Recycling and then Increase efforts to recycle The Great Pacific Garden Patch The Majestic Plastic Bag Sludge is in the Air Heat and Pressure in the atmosphere Model the Greenhouse Effect Identify Global Climate Change Factors Analyzing Recent Climate Change Understanding the Effects of Climate Change Alternative Assessment: Alternative Assessment Book-Science Fusion		

Technology	Crosscutting Concepts / Interdisciplinary Connections across grade levels and content areas (at least 1)
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• Bozeman Science http://www.bozemanscience.com/next-generation-science-standards • Quizlet	---The uses of technologies and any limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions. Thus, technology use varies from region to region over time ---relationships can be classified as casual or correlational, and correlation does not necessarily imply causation ---Scientific knowledge can describe the consequences of actions but does not necessarily prescribe the decisions that society takes ---stability might be disturbed either by sudden events or gradual changes that accumulate over time

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21st Century Education	Career Education

THEMES: Global Awareness Financial, Economic, Business and Entrepreneurial Literacy Civic Literacy Health Literacy SKILLS: Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration Information Literacy Media Literacy ICT Literacy Life and Career Skills	Career Ready Practices describe the career-ready skills that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study. CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP5. Consider the environmental, social and economic impacts of decisions. CRP6. Demonstrate creativity and innovation. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP10. Plan education and career paths aligned to personal goals. CRP11. Use technology to enhance productivity. CRP12. Work productively in teams while using cultural global competence.

Standard: MS-ETS1	**Content Topic:** Engineering Design

Strand	Disciplinary Core Ideas / Essential Statement	Objective	Science & Engineering Practices / Skills & Lesson
MS-ETS1-1	---The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that are likely to limit possible solutions (ETS1.A)	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	Design a Water Treatment System-STEM Lab 1 Engineering, Technology, and Society Earthquake Engineering Design Challenge STEM Lab 1 Science, Technology, and Society
MS-ETS1-2	---There are systematic processes for evaluation solutions with respect to how well they meet the criteria and constraints of a problem (ETS1.B)	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem	Design a Water Treatment System-STEM Lab 1 Engineering, Technology, and Society Earthquake Engineering Design Challenge STEM Lab 1 Science, Technology, and Society
MS-ETS1-3	---There are systematic processes for evaluation solutions with respect to how well they meet the criteria and constraints of a problem (ETS1.B) ---Sometimes parts of different solutions can be combined to create a solution that is better than any of its predecessors (ETS1.B) ---Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process---that is, some of those characteristics may be	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	Design a Water Treatment System-STEM Lab 1 Engineering, Technology, and Society Earthquake Engineering Design Challenge STEM Lab 1 Science, Technology, and Society

	incorporated into the new design (ETS1.C)		
MS-ET1-4	---A solution needs to be tested, and then modified on the basis of the test results, in order to improve it (ETS1.B) ---Models of all kinds are important for testing solutions (ETS1.B) ---The iterative process of testing the most promising solutions and modifying what is proposed on the basis of the test results leads to greater refinement and ultimately to an optimal solution (ETS1.C)	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	Design a Water Treatment System-STEM Lab 1 Engineering, Technology, and Society Earthquake Engineering Design Challenge STEM Lab 1 Science, Technology, and Society

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Investigating Water Usage Investigating Density Alternative Assessment- Alternative Assessment Book- Science Fusion		

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	Manipulatives Graphic organizers Use of educational websites: www.khanacademy.org www.colorincolorado.org/	

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