PACING GUIDE SCIENCE
Grade 4th

Topic	Unit	Marking Period	Number of Days
Energy	Knowing Science-Physical Science Units 1.1, 1.2, 1.3, 1.4 Mystery Science Energizing Energy Mysteries 1, 2, 4, 5, 6, 7	MP 1	20-25 days
Waves and their Applications in Technologies for Information Transfer	Knowing Science-Physical Science Unit 2.1, 2.2, 2.3 Mystery Science Waves of Sound Mysteries 1, 2, 3	MP 1	20-25 days
From Molecules to Organisms: Structures and Processes	Knowing Science-Life Science Units 1.2, 1.3, 1.4 Mystery Science Human Machine Mysteries 1-4	MP 2	20-25 days
Earth's Place in the Universe	Knowing Science- Earth Science Unit 1.2 Mystery Science Birth of Rocks mysteries 1-3	MP 2	20-25 days
Earth's Systems	Knowing Science- Earth Science Unit 1.4, 1.5 Mystery Science Birth of Rocks mysteries 1, 3,4	MP 3	20-25 days
Earth and Human Activity	Mystery Science Energizing Everything mystery 8 Mystery Science Birth of Rocks mystery 4	MP 3	20-25 days
Engineering Design	Knowing Science-Physical Science Unit Mystery Science Energizing Everything mysteries 4,5	MP 4	40-45 days

Aug 2021
Reapproved by Board with updates Aug 2026

Alpha Public School
Science Curriculum Map

Grade: 4th

Standard: 4-PS3	**Content Topic:** Energy

Strand	Disciplinary Core Ideas / Essential Statement	Objective / Essential Questions	Science & Engineering Practices / Skills & Lesson
4-PS3-1	---the faster a given object is moving, the more energy it possesses (PS3.A)	Use evidence to construct an explanation relating the speed of an object to the energy of that object How can we relate the speed of an object to the energy of that object?	---use evidence (e.g., measurements, observations, patterns) to construct an explanation
4-PS3-2	---Energy is present whenever there are moving objects, sound, light, or heat. When objects collide, energy can be transferred from one object to another, thereby changing their motion. In such collisions, some energy is typically also transferred to the surrounding air; as a result, the air gets heated and sound is produced. (PS3.B) ---light also transfers energy from place to place (PS3.B) ---energy can also be transferred from place to place by electric currents, which can then be used locally to produce motion, sound, heat, or light. The currents may have been produced to begin with by transforming the energy of motion into electrical energy (PS3.B)	make observations to provide evidence that energy can be transferred from place to place by sound, light, heat and electric currents How can I provide evidence that energy can be transferred by sound, light, heat, and electric currents?	---make observations to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution.
4-PS3-3	---Energy is present whenever there are moving objects, sound, light, or heat. When objects collide, energy can be transferred from one object to another, thereby changing their motion. In such collisions, some energy is typically also transferred to the surrounding air; as a result, the air	ask questions and predict outcomes about the changes in energy that occur when objects collide How can we work with pennies to develop questions and make predictions about what happens	---ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships

	gets heated and sound is produced. (PS3.B) ---light also transfers energy from place to place (PS3.B) ---energy can also be transferred from place to place by electric currents, which can then by used locally to produce motion, sound, heat, or light. The currents may have been produced to begin with by transforming the energy of motion into electrical energy (PS3.B) ---when objects collide, the contact forces transfer energy so as to change the objects' motions (PS3.C)	when pennies collide?	
4-PS3-4	---energy can also be transferred from place to place by electric currents, which can then be used locally, to produce motion, sound, heat or light. The currents may have been produced to begin with by transforming the energy of motion into electrical energy (PS3.B) ---the expression "produce energy" typically refers to the conversion of stored energy into a desired form for practical use (PS3.D) ---possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account (ETS1.A)	apply scientific ideas to design, test, and refine a device that converts energy from one form to another How can I work with ice cubes and different colored paper to prove that energy can be transferred from the ice cube to the paper?	---apply scientific ideas to solve design problems

Alpha Public School
Science Curriculum Map

Formative, Summative and Alternative Assessments	Benchmark Assessments	Core Instructional and Supplemental Materials (including various texts at each grade level)
Science journal Lab- Time Scores Lab- Forms of Energy Lab- Which is faster? Lab- Energy at Work Lab- Making Electricity Lab- Energy Research Lab- ELectrical Circuits Lab- Taking Notes Teacher created; guideline 10-20 questions Alternative Assessment: Performance Task	Assessment Rubric (pg 15) Assessment Rubric (pg 27) Assessment Rubric (pg 43) Assessment Rubric (pg 56) Assessment Rubric (pg 57) Assessment Rubric (pg 85) Poster Project 2 Exit Questions	Knowing Science- Physical Science Unit 1.1, 1.2, and 1.3 Knowing Science- Physical Science- Unit 1.4 Knowing Science Literature Knowing Science Vocabulary Flashcards Mystery Science Holt: Science Better Lessons: Moving Pennies Better Lessons: Chilling with colored paper

Technology	Crosscutting Concepts / Interdisciplinary Connections across grade levels and content areas (at least 1)
Mystery Science Energizing Everything mysteries 1,2 Mystery Science Energizing Everything mysteries 6,7 Mystery Science Energizing Everything mysteries 2,3 Video- Penny Colliding Mystery Science Energizing Everything mysteries 1,4-7	---energy can be transferred in various ways and between objects engineers improve existing technologies or develop new ones ---most scientists and engineers work in teams ---science affects everyday life **ELA/Literacy – RI.4.1** Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text. (4-PS3-1) RI.4.3 Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text. (4- PS3-1) RI.4.9 Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably. (4-PS3-1) W.4.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. (4-PS3-1) W.4.7 Conduct short research projects that build knowledge through investigation of different aspects of a topic.

	(4-PS3-2),(4-PS3-3),(4-PS3-4) W.4.8 Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources. (4-PS3-1),(4-PS3-2),(4-PS3-3),(4-PS3-4) W.4.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. (4-PS3-1) **Mathematics – 4.OA.A.3** Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. (4-PS3-4)

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

Alpha Public School
Science Curriculum Map

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.

Alpha Public School
Science Curriculum Map

Standard: 4-PS4	**Content Topic:** Waves and their Applications in Technologies for Information Transfer

Strand	Disciplinary Core Ideas / Essential Statement	Objective / Essential Question	Science & Engineering Practices / Skills & Lesson
4-PS4-1	---The faster a given object is moving, the more energy it possesses (PS3.A)	Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move How can we develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move?	---develop a model using an analogy, example, or abstract representation to describe a scientific principle
4-PS4-2	----Energy can be moved from place to place by moving objects or through sound, light, or electric currents (PS3.A) ---Energy is present whenever there are moving objects, sound, light, or heat. When objects collide, energy can be transferred from one object to another, thereby changing their motion. In such collisions, some energy is typically also transferred to the surrounding air; as a result, the air gets heated and sound is produced (PS3.B) ----Light also transfers energy from place to place (PS3.B) ---Energy can also be transferred from place to place by electric currents, which can then be used locally to produce motion, sound, heat or light. The currents may have been produced to begin with by transforming the energy of motion into electrical energy (PS3.B)	develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen How can I develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen?	---develop a model to describe a phenomena

4-PS4-3	----Energy can be moved from place to place by moving objects or through sound, light, or electric currents (PS3.A) ---Energy is present whenever there are moving objects, sound, light, or heat. When objects collide, energy can be transferred from one object to another, thereby changing their motion. In such collisions, some energy is typically also transferred to the surrounding air; as a result, the air gets heated and sound is produced (PS3.B) ---When objects collide, the contact forces transfer energy so as to change the objects' motions (PS3.C)	generate and compare multiple solutions that use patterns to transfer information How can I generate and compare multiple solutions that use patterns to transfer information?	---generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution

Formative, Summative and Alternative Assessments	**Benchmark Assessments**	**Core Instructional and Supplemental Materials (including various texts at each grade level)**
Science journal Lab- Making Waves Lab- Making a Wave Generator Lab- How to make a model of an eye Lab- What is Code? Lab- Spy Work Lab- Digital and Analog Information Teacher created; guideline 10-20 questions Alternative Assessment: Performance Task	Assessment Rubric (pg 85) Assessment Rubric (pg 101) Assessment Rubric (pg 113)	Knowing Science Literature Knowing Science Vocabulary Flashcards Mystery Science Holt: Science Knowing Science- Physical Science Unit 2.1 Knowing Science- Physical Science Unit 2.2 Knowing Science- Physical Science Unit 2.3

Technology	Crosscutting Concepts / Interdisciplinary Connections across grade levels and content areas (at least 1)
Mystery Science Waves of Sound mysteries 1-3 Mystery Science Human Machine mysteries 2,3 Mystery Science Waves of Sound mystery 1	---similarities and differences in patterns can be used to sort and classify natural phenomena ---science findings are based on recognizing patterns ---cause and effect relationships are routinely identified ---knowledge of relevant scientific concepts and research findings is important in engineering. **ELA/Literacy – RI.4.1** Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text. (4-PS4-3) RI.4.9 Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably. (4-PS4-3) SL.4.5 Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes. (4-PS4-1),(4-PS4-2) **Mathematics – MP.4** Model with mathematics. (4-PS4-1),(4-PS4-2) 4.G.A.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures. (4-PS4-1),(4-PS4- 2)

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	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

	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.

Alpha Public School
Science Curriculum Map

Standard: 4-LS1	**Content Topic:** From Molecules to Organisms: Structures and Processes

Strand	Disciplinary Core Ideas / Essential Statement	Objective / Essential Question	Science & Engineering Practices / Skills & Lesson
4-LS1-1	---Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior and reproduction (LS1.A)	Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior and reproduction. How can I construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction?	---construct an argument with evidence, data, and / or a model.
4-LS1-2	---different sense receptors are specialized for particular kinds of information, which may be then processed by the animal's brain Animals are able to use their perceptions and memories to guide their actions (LS1.D)	Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways How can I use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways?	---use a model to test interactions concerning the functioning of a natural system.

Formative, Summative and Alternative Assessments	Benchmark Assessments	Core Instructional and Supplemental Materials (including various texts at each grade level)
Science journal Lab- What are you thinking? Lab- Survival Structures Survival Structures Cards Lab- Senses and Survival Lab- Crayfish Prosthetic Devices Lab- Animal Structures Crayfish Test Crayfish project	Assessment Rubric (pg 54) Assessment Rubric (pg 145) Plant Observation Journal	Knowing Science-Life Science Unit 1.2 and 1.3 and 1.4 Knowing Science Literature Knowing Science Vocabulary Flashcards Mystery Science Holt: Science

Lab- Raccoon and the Crayfish Lab- Imogine's Antlers Lab- Basic Needs of Plants Lab- Leaves Breathe Lab-Comparing Roots Lab- Flower Power Lab- Stems are like straws Lab- plant parts- Who am I? Lab- It's Chilly in there -Investigation It's Chilly in there- Inquiry Lab- Plants and Trees through the years Lab- Plant Chromatography Lab- Cool Crickets Lab- It's cold,now what? Interview Lab- Our Tree through the Seasons- Choice 1 Lab- Our Tree through the Seasons- Choice 2 Teacher created; guideline 10-20 questions Alternative Assessment: Performance Task		

Technology	Crosscutting Concepts / Interdisciplinary Connections across grade levels and content areas (at least 1)
Mystery Science Human Machine mysteries 1-4 Google Classroom- Internet Research	---a system can be described in terms of its components and their interactions. **ELA/Literacy – W.4.1** Write opinion pieces on topics or texts, supporting a point of view with reasons and information. (4-LS1-1) SL.4.5 Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes. (4-LS1-2) **Mathematics – 4.G.A.3**

	Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded across the line into matching parts. Identify lines symmetric figures and draw lines of symmetry. (4-LS1-1)

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 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.

Alpha Public School
Science Curriculum Map

Standard: 4-ESS1	**Content Topic:** Earth's Place in the Universe

Strand	Disciplinary Core Ideas / Essential Statement	Objective / Essential Question	Science & Engineering Practices / Skills & Lesson
4-ESS1-1	---Local, regional, and global patterns of rock formations reveal changes over time due to earth forces, such as earthquakes. The presence and location of certain fossil types indicate the order in which rock layers were formed (ESS1.C)	Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time. How can I identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time?	---identify the evidence that supports particular points in an explanation.

Formative, Summative and Alternative Assessments	Benchmark Assessments	Core Instructional and Supplemental Materials (including various texts at each grade level)
Science journal Lab- Pangea Lab- Pangea Puzzle Lab- Fossils Lab- Make a Fossil Lab- Geological Time Teacher created; guideline 10-20 questions Alternative Assessment: Performance Task	Assessment Rubric (pg 37)	Knowing Science- Earth Science Unit 1.2 Knowing Science Literature Knowing Science Vocabulary Flashcards Mystery Science Holt: Science

Technology	Crosscutting Concepts / Interdisciplinary Connections across grade levels and content areas (at least 1)
Mystery Science Birth of Rocks mysteries 1-3 Google classroom - Internet Research	---patterns can be used as evidence to support an explanation. ---Science assumes consistent patterns in natural systems. **ELA/Literacy – W.4.7**

	Conduct short research projects that build knowledge through investigation of different aspects of a topic. (4-ESS1-1) W.4.8 Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources. (4-ESS1-1) W.4.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. (4-ESS1-1) **Mathematics – MP.2** Reason abstractly and quantitatively. (4-ESS1-1) MP.4 Model with mathematics. (4-ESS1-1) 4.MD.A.1 Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. (4-ESS1-1)

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

Alpha Public School
Science Curriculum Map

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. 8 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: 4-ESS2	**Content Topic:** Earth's Systems

Strand	Disciplinary Core Ideas / Essential Statement	Objective / Essential Question	Science & Engineering Practices / Skills & Lesson
4-ESS2-1	---rainfall helps to shape the land and affects the types of living things found in a region. Weather, ice, wind, living organisms, and gravity breaks rocks, soils, and sediments into smaller particles and move them around (ESS2.A) ---Living things affect the physical characteristics of their regions (ESS2.E)	Make observations and / or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation How can I make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation?.	---make observations and / or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon.
4-ESS2-2	---the locations of mountain ranges, deep ocean trenches, ocean floor structures, earthquakes, and volcanoes occur in patterns. Most earthquakes and volcanoes occur in bands that are often along the boundaries between continents and oceans. Major mountain chains form inside continents or near their edges. Maps can help locate different land and water features areas of Earth (ESS2.B)	Analyze and interpret data from maps to describe patterns of Earth's features. How can I analyze and interpret data from maps to describe patterns of Earth's features?	---analyze and interpret data to make sense of phenomena using logical reasoning.

Formative, Summative and Alternative Assessments	Benchmark Assessments	Core Instructional and Supplemental Materials (including various texts at each grade level)
Science journal Lab- Weathering Lab- Bottle Weathering Lab- Robust Roots Lab- Shake, Rattle, and Roll	Assessment Rubric (pg 78) Assessment Rubric (pg 110)	Knowing Science- Earth Science Unit 1.2 Knowing Science- Earth Science Unit 1.5 Knowing Science Literature Knowing Science Vocabulary

Lab- Acid Rain Acid Rain Lab Lab- Erosion Lab- Erosion Expert Group Making A Glacier Lab- Alpha boxes Lab- Landforms and More Lab- Mighty Mountains Lab- Mapping Earth's Features Lab- Topographic Maps Teacher created; guideline 10-20 questions Alternative Assessment: Performance Task		Flashcards Mystery Science Holt: Science

Technology	Crosscutting Concepts / Interdisciplinary Connections across grade levels and content areas (at least 1)
Mystery Science Birth of Rocks mysteries 1-3, 4 Google classroom- Internet Research	---cause and effect relationships are routinely identified, tested, and used to explain change. ---patterns can be used as evidence to support an explanation **ELA/Literacy – RI.4.7** Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears. (4-ESS2-2) W.4.7 Conduct short research projects that build knowledge through investigation of different aspects of a topic. (4-ESS2-1) W.4.8 Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources. (4-ESS2-1) **Mathematics – MP.2** Reason abstractly and quantitatively. (4-ESS2-1) MP.4 Model with mathematics. (4-ESS2-1) MP.5 Use appropriate tools strategically. (4-ESS2-1) 4.MD.A.1

	Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. (4-ESS2-1) 4.MD.A.2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale. (4-ESS2-1),(4-ESS2-2)

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 Entrepreneurial Literacy Civic Literacy Health Literacy 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.

Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration Information Literacy Media Literacy ICT Literacy Life and Career 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: 4-ESS3	**Content Topic:** Earth and Human Activity / Natural Resources

Strand	Disciplinary Core Ideas / Essential Statement	Objective / Essential Question	Science & Engineering Practices / Skills & Lesson
4-ESS3-1	---Energy and fuels that humans use are derived from natural sources, and their use affects the environment in multiple ways. Some resources are renewable over time, and others are not (ESS3.A)	Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment. How can I construct and design a dam to address the human problem of flooding?	---obtain and combine information from books and other reliable media to explain phenomena
4-ESS3-2	---A variety of hazards result from natural processes (e.g., earthquakes, tsunamis, volcanic eruptions). Humans cannot eliminate the hazards but can take steps to reduce their impacts (ESS3.B) ---Testing a solution involves investigating how well it performs under a range of likely conditions (ETS1.B)	Generate and compare multiple solutions to reduce the impacts of natural Earth processes and climate change have on humans. How can I make basic comparisons between per capita water use in the United States and in other countries using liters?	---generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution.

Formative, Summative and Alternative Assessments	Benchmark Assessments	Core Instructional and Supplemental Materials (including various texts at each grade level)
Science journal Teacher created; guideline 10-20 questions Alternative Assessment: Performance Task	Building the dam Create a graph Student Reflection	Knowing Science Literature Knowing Science Vocabulary Flashcards Better Lessons-Test a Dam Better Lessons- Water Use and the World Mystery Science Holt: Science

Technology	Crosscutting Concepts / Interdisciplinary Connections across grade levels and content areas (at least 1)
Mystery Science Energizing Everything mystery 8 Mystery Science Birth of Rocks mystery 4 Video- waterfall Google classroom- Internet Research	---cause and effect relationships are routinely identified and used to explain change ---knowledge of relevant scientific concepts and research findings is important in engineering --- over time, people's needs and wants change, as do their demands for new and improved technologies. --engineers improve existing technologies or develop new ones to increase their benefits, to decrease known risks, and to meet societal demands. **ELA/Literacy – RI.4.1** Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text. (4-ESS3-2) RI.4.9 Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably. (4-ESS3-2) W.4.7 Conduct short research projects that build knowledge through investigation of different aspects of a topic. (4-ESS3-1) W.4.8 Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources. (4-ESS3-1) W.4.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. (4-ESS3-1) **Mathematics – MP.2** Reason abstractly and quantitatively. (4-ESS3-1),(4-ESS3-2) MP.4 Model with mathematics. (4-ESS3-1),(4-ESS3-2) 4.OA.A.1 Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations. (4-ESS3-1),(4-ESS3-2)

Differentiation (IEPs / 504s)	Differentiation (ELL)	Differentiation (G &T)
Visual aids Sentence Frames Modeling Anchor charts Modify rubric	Visual aids Sentence Frames Modeling Anchor charts Modify rubric	Independent research projects Advanced texts http://education.jlab.org/vocabhangman/ Science content vocabulary hangman http://kids.nationalgeographic.com/

Teacher directed grouping Chunk learning at teacher discretion Re-read text at teacher discretion Text in auditory format	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/	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 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: 3-5-ETS1	**Content Topic:** Engineering Design

Strand	Disciplinary Core Ideas / Essential Statement	Objective / Essential Question	Science & Engineering Practices / Skills & Lesson
3-5-ETS1-1	---possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account (ETS1.A)	Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost How can I define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost?	---define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost
3-5-ETS1-2	---Research on a problem, such as climate change, should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions (ETS1.B) ---at whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs (ETS1.B)	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem	---generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem
3-5-ETS1-3	---tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved (ETS1.B)	Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved	---plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered

	---different solutions need to be tested in order to determine which of them best solves the problem, given the criteria, and the constraints (ETS1.C)		

Formative, Summative and Alternative Assessments	Benchmark Assessments	Core Instructional and Supplemental Materials (including various texts at each grade level)
Science journal Teacher created; guideline 10-20 questions Alternative Assessment: Performance Task See Museum of Science Boston'sElectrical Engineering Adventure *Light Up the Night* Teacher created; guideline 10-20 questions	Engineering Journal Presentation of Model See Museum of Science Boston'sElectrical Engineering Adventure *Light Up the Night*	Knowing Science Knowing Science Literature Knowing Science Vocabulary Flashcards Museum of Science Boston'sElectrical Engineering Adventure *Light Up the Night* Science Fusion Mystery Science Holt: Science

Technology	Crosscutting Concepts / Interdisciplinary Connections across grade levels and content areas (at least 1)
Mystery Science Energizing Everything mysteries 4,5 Google Classroom- Internet Research	---people's needs and wants change over time, as do their demands for new and improved technologies ---engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands **ELA/Literacy – RI.5.1** Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (3-5-ETS1-2) RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (3-5- ETS1-2) RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably. (3-5-ETS1-2) W.5.7

	Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic. (3-5-ETS1-1),(3-5-ETS1-3) W.5.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources. (3-5-ETS1-1),(3-5-ETS1-3) W.5.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. (3-5-ETS1-1),(3-5-ETS1-3) **Mathematics – MP.2** Reason abstractly and quantitatively. (3-5-ETS1-1),(3-5-ETS1-2),(3-5-ETS1-3) MP.4 Model with mathematics. (3-5-ETS1-1),(3-5-ETS1-2),(3-5-ETS1-3) MP.5 Use appropriate tools strategically. (3-5-ETS1-1),(3-5-ETS1-2),(3-5-ETS1-3) 3-5.OA Operations and Algebraic Thinking (3-5-ETS1-1),(3-5-ETS1-2)

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 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.