



K-6 STEAM Curriculum
Essex Fells School District

December 2022 Revision

Katie McNish
Kristin Gann
Rosalie Takkel
Susan Hacker
Jessica Lodato



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K-6 STEAM Curriculum

COURSE DESCRIPTION:

STEAM is an educational initiative created by the Rhode Island School of Design that adds the arts to the original STEM framework. According to the Rhode Island School of Design, “The goal is to foster the true innovation that comes with combining the mind of a scientist or technologist with that of an artist or designer.” The addition of the arts to the original STEM framework is important in practices such as modeling, developing explanations, engaging in critique and evaluation, and have too often been underemphasized in the context of science education. In the K-6 performance expectation, students are expected to demonstrate grade-appropriate proficiency in asking questions, developing and using models, planning and carrying out investigations, analyzing and interpreting data, designing solutions, engaging in argument from evidence, and obtaining, evaluating, and communicating information. Students are expected to use these practices to demonstrate understanding of the core ideas. The skills gained from STEAM offers preparedness for meeting the graduation requirements in the core subject areas.

NJSLS:

This curriculum works in tandem with the K-6 Math, Science, and Visual Arts Curricula. This is a guide set forth to develop pacing of projects that align with the New Jersey Student Learning Standards. Accommodations and modifications for students with IEP’s and 504’s, as well as gifted and talented students are made based on required need. This course has been designed with respect to and in compliance with the expectations set forth in the state-approved standards and existing grade level curriculum.

ASSESSMENTS:

A combination of formative and summative assessments will be utilized in this course including but not limited to teacher observation, student work and reflection, projects, and writing tasks. Benchmarks are set by teachers to evaluate what students need to focus on to achieve the knowledge required to master a specific skill.

BENEFITS OF STEAM EDUCATION:

STEAM incorporates hands-on learning that is fun! STEAM teaches independent innovation and allows students to explore greater depths of all of the subjects by utilizing the skills learned. These skills will be required in order for today's students to be tomorrow's global leaders. Students benefit every day from innovative approaches to curriculum and teaching that use real-world, interdisciplinary learning experiences. Not only are students being prepared for college and careers, they connect their learning to their communities through projects that address the issues that affect their daily lives. Through STEAM, students will gain the ability to think critically, be creative, and work individually or as a member of a team.

STEAM also has a place in Language Arts and Social Studies. You can be literate in math, art, reading, social studies, music and science. Literacy is an action with common components that are embedded into how we consume and share information. STEAM is the intentional alignment of standards within these identified content areas and includes equitable assessment of both areas in the lesson. It's guided by inquiry and is focused on application, creation and evaluation.

Any good STEAM lesson is grounded in inquiry, problem-solving and process-based learning. In fact, this is one of the distinguishing characteristics between Arts Integration and STEAM. So when viewing STEAM in the classroom, you want to pay close attention to the essential question and the process surrounding its exploration. What problems are being investigated and solved? How are both contents being used to explore the problems? Why is the process important to the question posed? These are all important components to a STEAM classroom or lesson.

INTEGRATION OF 21ST CENTURY SKILLS AND TECHNOLOGY THROUGH NJSL

21st Century teachers understand the level of flexibility and adaptation necessary for success in the field of education. Critical thinking and problem solving, creativity and innovation, communication and collaboration are all skills that model teachers demonstrate. Integrating these skills into classrooms at each grade level and subject area will give students the tools they will need to navigate life outside of the classroom and in the workforce. Technology is uniquely positioned to transform learning, to foster critical thinking, creativity, and innovation, and to prepare students to thrive in the global economy. As engaged digital learners, students are able to acquire and apply content knowledge and skills through active exploration, interaction, and collaboration with others, challenging them to design the future as envisioned.

Kindergarten STEAM Curriculum

Scope & Sequence of Content and Skills for Kindergarten STEAM/Science

Timeline	Unit Name	Objectives/NGSS
September - June	Motion & Stability: Forces and Interactions	<p>Design/conduct projects and design challenges to develop a better understanding of push, pull, direction and change.</p> <p>Supports standards K-PS2-1, K-PS2-2</p>
September - June	Energy	<p>To construct spoken and written scientific experiments that highlight the effects of heat on the Earth.</p> <p>Supports standards K-PS3-1, K-PS3-2</p>
September - June	Molecules to Organisms	<p>To create design models explaining the internal structure of plants and animals.</p> <p>Supports standards K-LS2-1</p>
September - June	Earth's Systems	<p>Students will demonstrate their understanding of analyzing data, engage in evidence-based projects and develop and refine models.</p> <p>Supports standards K-ESS2-1, K-ESS2-2</p>
September - June	Earth and Human Activity	<p>Establish evidence through artistic challenges that will support the students' knowledge of the relationships between plants and animals (including humans).</p> <p>Supports standards K-ESS3-1, K-ESS3-2, K-ESS3-3</p>
September - June	Engineering Design	<p>Develop drawings or models, analyze data, make observations, and gather information to solve a simple problem through the creation of an object or tool.</p> <p>Design/conduct projects and design challenges to develop a better</p>

understanding of the basic knowledge of engineering.
Supports standards K-2-ETS1-1, K-2-ETS1-2, K-2-ETS1-3

Scope & Sequence of Content and Skills for Kindergarten STEAM/Math

Timeline	Unit Name	Objectives/NJSLS
September-June	Counting and Cardinality	<p>Develop an understanding of the terms measurable attributes, count sequence, abstractly, quantitatively, and number comparisons.</p> <p>Through projects and challenges students will identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group.</p> <p>Supports standards: K.CC.A.1 , K.CC.A.2 , K.CC.A.3, K.CC.B.4, K.CC.B.5, K.CC.C.6, K.CC.C.7</p>
September-June	Operations and Algebraic Thinking	<p>Students will examine, devise and illustrate a plan that will support how to represent addition and subtraction with objects, mental images, drawings, sounds, acting out situations, verbal explanations, expressions, or equations.</p> <p>Conceive design plans that will enhance a clearer understanding for students to fluently add and subtract within 5.</p> <p>Encourage critical thinking and problem solving through challenges that will encourage students to understand how to decompose numbers less than or equal to 10 into pairs in more than one way by using objects or drawings.</p> <p>Supports standards: K.OA.A.1 , K.OA.A.2 , K.OA.A.3 , K.OA.A.4, K.OA.A.5</p>
September-June	Numbers and Operation in Base 10	<p>Design/conduct projects and design challenges to develop a better understanding of how to compose and decompose numbers from 11-19 into ten ones and some further ones, by using objects or drawings.</p>

		<p>Explore the use of art media to record compositions and decompositions with drawings or equations.</p> <p>Supports standards: K.NBT.A.1</p>
September-June	Measurement and Data	<p>Produce and build a scientific trial that will develop a clear view of reasoning about situations that involve measurable attributes of objects, such as length or weight.</p> <p>Encourage critical thinking and problem solving to teach an understanding of directly comparing two objects with a measurable attribute in common to determine which has “more of”/“less of” the attribute, e.g. heights of two children.</p> <p>Students will examine, devise and illustrate a plan that will support how to describe the difference between two objects with the common attribute that was compared, one child is taller/shorter than the other child.</p> <p>Supports standards: K.MD.A.1 , K.MD.A.2, K.MD.B.3</p>
September-June	Geometry	<p>Design/conduct projects and design challenges to develop a better understanding of how to analyze, compare, create, and compose shapes.</p> <p>Develop an understanding of the terms <i>above</i>, <i>below</i>, <i>beside</i>, <i>in front of</i>, <i>behind</i>, and <i>next to</i> by developing challenges for the students to conduct.</p> <p>Conceive design plans that will enhance a clearer understanding for students to model shapes in the world by building shapes from components and drawing shapes.</p> <p>Supports standards: K.G.A.1 ,K.G.A.2 , K.G.A.3, K.G.B.4 ,K.G.B.5 K.G.B.6</p>

1st Grade STEAM Curriculum

Scope & Sequence of Content and Skills for 1st Grade STEAM/Science

Timeline	Unit Name	Objectives/NGSS
September - June	Engineering Design	<p>Develop drawings or models, analyze data, make observations, and gather information to solve a simple problem through the creation of an object or tool.</p> <p>Design/conduct projects and design challenges to develop a better understanding of the basic knowledge of engineering.</p> <p>Supports standards K-2-ETS1-1, K-2-ETS1-2, K-2-ETS1-3</p>
October/ November/ December	Earth Science: Space Systems, patterns and Cycles	<p>Devise and illustrate a plan that will support student knowledge gained from studying the patterns and cycles of the sky.</p> <p>Supports standards 1-ESS1-1, 1-ESS1-2</p>
January/February	Physical Science: Waves, Light & Sound	<p>Plan and conduct an investigation to determine how light and sound travels.</p> <p>Create objects that show examples of the overall process of waves in regards to light and sound.</p> <p>Supports standards 1-PS4-1,1-PS4-2,1-PS4-3,1-PS4-4</p>
March/April/May	Life Science: Plants & Animals, Structure, Function, and Information	<p>Students will demonstrate their understanding of analyzing data, engage in evidence-based projects and develop and refine models. Conceive design plans that will enhance a clearer understanding of plant and animal structures.</p> <p>Supports standards 1-LS1-1, 1-LS1-2, 1-LS3-1</p>

Scope & Sequence of Content and Skills for 1st Grade STEAM/Math

Timeline	Unit Name	Objectives/NJSLS
September-October	Counting	<p>Students will build counting skills, practice opportunities for rote counting and rational counting.</p> <p>Design/conduct projects and design challenges to develop a better understanding of how numbers relate to one another.</p> <p>Provide opportunities for students to work in a collaborative environment to learn mathematical concepts and practices.</p> <p>Supports standards 1.OA.1, 1.OA.2, 1.OA.3, 1.OA.5, 1.OA.6, 1.NBT.1, 1.NBT.3, 1.G.1, SMP1, SMP2, SMP3, SMP4, SMP5, SMP6, SMP7</p>
October-November	Number Stories	<p>Students learn how to understand and apply properties of operations and the relationship between addition and subtraction.</p> <p>Encourage critical thinking and problem solving skills to allow students to make sense of problems and persevere in solving them.</p> <p>Develop lessons using objects such as dominoes, coins, and grids.</p> <p>Supports standards 1.OA.1, 1.OA.3, 1.OA.5, 1.OA.6, 1.OA.8, 1.NBT.1, 1.NBT.3, SMP1, SMP2, SMP4, SMP5, SMP6, SMP7, SMP8</p>
December	Length and Addition Facts	<p>Students will measure lengths using nonstandard units and work on addition-fact fluency.</p> <p>Use place value understanding and properties of operations to add and</p>

		<p>subtract.</p> <p>Encourage students to measure lengths indirectly and by iterating length units.</p> <p>Create lessons that will allow students to represent and interpret data.</p> <p>Supports standards 1.MD.1, 1.OA.1, 1.OA.3, 1.OA.5, 1.OA.6, 1.OA.8, 1.NBT.1, 1.NBT.3, SMP1, SMP2, SMP4, SMP5, SMP6, SMP7</p>
January	Place Value and Comparisons	<p>Investigate place-value concepts of tens and ones and compare and add 2-digit numbers.</p> <p>Encourage reasoning abstractly and quantitatively. Create a crooked path and have students find the length by iterating nonstandard units.</p> <p>Encourage students to explore the relationship between tens and ones with base ten exchanges.</p> <p>Supports standards 1.OA.1, 1.OA.3, 1.OA.5, 1.OA.6, 1.OA.8, 1.NBT.1, 1.NBT.3, SMP1, SMP2, SMP4, SMP5, SMP6, SMP7</p>
February	Addition Fact Strategies	<p>Explore addition fluency, telling time and solving number stories.</p> <p>Encourage students to solve multistep problems and discuss initial solutions.</p> <p>Supports standards 1.OA.1, 1.OA.3, 1.OA.6, 1.OA.8, 1.NBT.1, 1.NBT.2b, 1.NBT.2c., 1.NBT.3, SMP1, SMP2, SMP4, SMP5, SMP6, SMP8</p>
March-April	Subtraction Fact Strategies and Attributes of Shapes	<p>Explore the relationship between addition and subtraction, compare different subtraction strategies, and continue to work on fact families.</p> <p>Explore the defining and non defining attributes of 2-dimensional shapes.</p>

		Supports standards 1.OA.1, 1.OA.3, 1.OA.6, 1.OA.8, 1.NBT.1, 1.NBT.2b, 1.NBT.2c., 1.NBT.3, SMP1, SMP2, SMP4, SMP5, SMP6, SMP8
May-June	Geometry	<p>Explore attributes of 2- and 3-dimensional shapes, compose shapes and decompose composite shapes into halves and fourths.</p> <p>Supports standards 1.G.1, 1.G.2, 1.G.3, 1.NBT.1, 1.NBT.2, 1.NBT.4, SMP1, SMP2, SMP4, SMP5, SMP6, SMP8</p>

2nd Grade STEAM Curriculum

Scope & Sequence of Content and Skills for 2nd Grade STEAM/Science

Timeline	Unit Name	Objectives/NGSS
September	Science Launch	<p>Develop an understanding of what scientists do to solve problems through interactive projects.</p> <p>Supports standards 2-PS-1-1, 2-PS1-2, K-2-ETS1-1</p>
October/November	Earth's Systems: Processes that Shape the Earth	<p>To devise creative plans that support student knowledge gained regarding the shape of the earth.</p> <p>To construct spoken and written scientific experiments that highlight the effects of weather elements on the Earth.</p> <p>Supports standards 2-ESS1-1,2-ESS2-1,2-ESS2-2, 2-ESS2-3</p>
December/January	Structures and Properties of Matter	<p>Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.</p> <p>Students will demonstrate their understanding of analyzing data, engage in evidence-based projects and develop and refine models.</p> <p>Supports standards 2-PS1-1, 2-PS1-2, 2-PS1-3, 2-PS1-4</p>
February- May	Interdependent Relationships in Ecosystems	<p>Make observations of plants and animals to compare the diversity of life in different habitats.</p> <p>Establish evidence through artistic challenges that will support the students' knowledge of the relationships in ecosystems.</p> <p>Supports standards 2-LS2-1, 2-LS2-2, 2-LS4-1</p>
June	Engineering Design	<p>Develop drawings or models, analyze data, make observations, and gather information to solve a simple problem through the creation of</p>

		<p>an object or tool.</p> <p>Design/conduct projects and design challenges to develop a better understanding of the basic knowledge of engineering.</p> <p>Supports standards K-2-ETS1-1, K-2-ETS1-2, K-2-ETS1-3</p>
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Scope & Sequence of Content and Skills for 2nd Grade STEAM/Math

Timeline	Unit Name	Objectives/NJSLS
September-October	Establishing Routines	<p>Develop an understanding and explore number patterns, number names, comparisons of numbers</p> <p>Design/conduct projects and design challenges to develop a better understanding of place value</p> <p>Encourage critical thinking and problem solving through first hand investigation of time and money</p> <p>Support standards: 2.OA.B, 2.NBT.A, 2.MD.C</p>
October-November	Fact Strategies	<p>Students will use place value understanding and properties of operations to add and subtract.</p> <p>Develop an understanding of equal groups of objects to gain foundations for multiplication.</p> <p>Design/conduct projects and design challenges to develop a better understanding of adding and subtract within 20.</p> <p>Support standards: 2.OA.B, 2.NBT.B, 2.OA.C</p>
October-November	More Fact Strategies	<p>Students will focus on strategies for solving subtraction facts.</p>

		<p>Encourage critical thinking and problem solving through first hand investigation of properties of operation.</p> <p>Provide opportunities for students to work in a collaborative environment to learn mathematical concepts and practices.</p> <p>Support standards: 2.OA.B, 2.NBT.B</p>
November-December	Place Value and Measurement	<p>Students will explore standard tools and units for measuring length and time.</p> <p>Encourage students to estimate and measure lengths in standard units.</p> <p>Develop lessons that will allow students to represent and interpret data.</p> <p>Support standards: 2.NBT.A, 2.MD.A, 2.MD.C</p>
December-January	Addition and Subtraction	<p>Students will learn strategies for mentally adding and subtracting 10 and 100.</p> <p>Conceive design plans that will enhance a clearer understanding for students to compute addition and subtraction in the context of money and number stories.</p> <p>Support standards: 2.OA.A, 2.NBT.B, 2.MD.C</p>
January-March	Whole Number Operation and Number Stories	<p>Develop lessons that relate addition & subtraction to length.</p> <p>Students will be introduced to comparison number stories and 2 step number stories.</p> <p>Design/conduct projects that will allow students to collect data and display it in a table and plot line.</p> <p>Support standards: 2.OA.A, 2.NBT.B, 2.MD.B</p>
March-April	Whole Number Operations and Measurement and Data	<p>Explore addition and subtraction strategies and use them to add three or more numbers.</p>

		<p>Use units of yards and meters to measure distances.</p> <p>Students will measure and estimate lengths in standards units.</p> <p>Support Standards: 2.NBT.B, 2.MD.A, 2.MD.D</p>
April-May	Geometry and Arrays	<p>Explore 2 and 3 dimensional shapes and their attributes.</p> <p>Students learn how to use strategies for determining the total number of objects in equal groups and rectangular arrays.</p> <p>Reason with shapes and their attributes.</p> <p>Support Standards: 2.OA.C, 2.G.A</p>
May-June	Equal Shares and Whole Number Operations	<p>Students will partition shapes into equal shares and apply these ideas to further explore length and measurement.</p> <p>Explore a new subtraction strategy based on place value and continue working with equal groups.</p> <p>Use place value understanding and properties of operations to add and subtract.</p> <p>Support Standards: 2.NBT. A, 2.NBT.B, 2.OA.C, 2.G.A</p>

3rd Grade STEAM Curriculum

Scope & Sequence of Content and Skills for 3rd Grade STEAM/Science

Timeline	Unit Name	Objectives/NGSS
8 Weeks	Motion and Stability: Forces and Interactions	<p>Create and investigate different design problems that can be solved by applying scientific ideas about the forces and motion of an object.</p> <p>Solve simple challenges about magnets, objects at rest, and objects in motion.</p> <p>Supports standards 3-PS2-1,3-PS2-2,3-PS2-3,3-PS2-4, 3-5-ETS1-1, 3-5-ETS1-2, 3-5-ETS1-3</p>
8 Weeks	Molecules to Organisms: Structure and Processes	<p>Hands-on projects exploring the life cycles of birds, reptiles, fish, amphibians, insects, and mammals.</p> <p>Students will generate and compare multiple possible solutions to a problem through experiments of trial and error.</p> <p>Supports standards 3-LS1-1, 3-5-ETS1-1, 3-5-ETS1-2, 3-5-ETS1-3</p>
3-4 Weeks	Ecosystems: Interactions, Energy, and Dynamics	<p>Developing and refining models showing the necessary requirements in a healthy ecosystem.</p> <p>Develop an understanding of what scientists do to solve problems through interactive projects.</p> <p>Supports standards 3-LS2-1, 3-5-ETS1-1, 3-5-ETS1-2, 3-5-ETS1-3</p>
2-4 Weeks	Heredity: Inheritance and Variations	<p>Students will analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variations of these traits exists in a group of similar organisms. These findings will be used to create models and design challenges for the students to develop a better understanding of the subject matter.</p> <p>Supports standards 3-LS3-1, 3-LS3-2, 3-5-ETS1-1, 3-5-ETS1-2,</p>

		3-5-ETS1-3
2-4 Weeks	Biological Evolution: Unity and Diversity	<p>To devise creative plans that support student knowledge gained regarding fossils, living organism's survival, and biological characteristics of organisms.</p> <p>Develop drawings or models, analyze data, make observations, and gather information to solve a simple problem through the creation of an object or tool.</p> <p>Supports standards 3-LS4-1, 3-LS4-2, 3-LS4-3, 3-LS4-4, 3-5-ETS1-1, 3-5-ETS1-2, 3-5-ETS1-3</p>
2-3 Weeks	Earth's Systems	<p>Students will define a simple design problem reflecting a need or want that includes specified criteria for successes and constraints on materials, time, or cost.</p> <p>Establish evidence through artistic challenges that will support the students' knowledge of typical weather patterns.</p> <p>Supports standards 3-ESS2-1, 3-ESS2-2, 3-5-ETS1-1, 3-5-ETS1-2, 3-5-ETS1-3</p>
1-2 Weeks	Earth and Human Activity	<p>Students will design solutions to prevent weather related hazards.</p> <p>Develop drawings or models, analyze data, make observations, and gather information to solve a simple problem through the creation of an object or tool.</p> <p>Supports standards 3-ESS3-1, 3-5-ETS1-1, 3-5-ETS1-2, 3-5-ETS1-3</p>

Scope & Sequence of Content and Skills for 3rd Grade STEAM/Math

Timeline	Unit Name	Objectives/NJSLS
September-October	Math tools, Time, and Multiplication	<p>To devise creative plans that support student knowledge gained regarding the identifying of arithmetic patterns in addition and multiplication tables.</p> <p>Students will demonstrate their understanding of the proper use of math tools while solving design challenges based on basic multiplication.</p> <p>Supports standards: 3.NBT, 3.OA, 3.MD</p>
October-November	Number Stories and Arrays	<p>Develop an understanding of two step number stories with all operations using models, diagrams, pictures and words.</p> <p>Design/construct models, including arrays, to support student growth in making sense of multiplication and division.</p> <p>Supports standards: 3.OA,3.NF</p>
November-December	Operations	<p>Create plans to support student understanding of place value and patterns when performing operations.</p> <p>Develop/design visual representation of operations to explain different methods and provide students with opportunity to seek and understand multiple solutions.</p> <p>Supports standards: 3.OA, 3.NF, 3.NBT</p>
December-January	Measurement and Geometry	<p>Develop an understanding of polygons and their characteristics.</p> <p>Create plans for students to gain understanding of measurement</p>

		<p>of geometric shapes. Design projects for students to build various two dimensional objects using polygons, and recognize area as a measurement.</p> <p>Design models using tiling to concretely describe and understand the concept of area.</p> <p>Supports standards: 3.MD, 3.G</p>
January	Fractions and Multiplication Strategies	<p>Develop an understanding of fractions to visual and symbolic representations, including standard notation. Explore fraction equivalence.</p> <p>Develop/design visual representations of fractions to deepen an understanding of the correlation between part and whole.</p> <p>Supports standards: 3.OA, 3.NF, 3.NBT</p>
February-March	More Operations	<p>Develop various approaches and efficient strategies to solve and reflect on multi step number stories.</p> <p>To devise creative plans that support student knowledge gained through strengthening an understanding of operations to perform multi-digit arithmetic.</p> <p>Supports standards: 3.OA, 3.NF, 3.NBT</p>
March	Fractions	<p>Develop a deeper understanding of fractions in relation to volume measurement while focusing on comparing, estimating and measuring liquid volumes.</p> <p>Design and conduct projects to strengthen an understanding of fractions and numbers while developing problem solving skills through measurement and estimation.</p> <p>Supports standards: 3.NF</p>
March-April	Multiplication and Division	<p>Develop a deeper understanding of multiplication, division, measurement and attributes of shapes.</p>

		<p>Through projects and challenges that consist of multiplication and division, incorporate shapes and their attributes to apply an understanding of interpreting data.</p> <p>Supports standards: 3.OA, 3.NBT</p>
April-June	Multidigit Operations	<p>Further develop an understanding of multiplication and division while utilizing mental math skills to solve number stories and multiply larger fractions.</p> <p>Encourage critical thinking and problem solving through the development of number stories.</p> <p>Supports standards: 3.OA, 3.NBT, 3.MD</p>

4th Grade STEAM Curriculum

Scope & Sequence of Content and Skills for 4th Grade STEAM/Science

Timeline	Unit Name	Objectives/NGSS
September-October	Earth's Place in the Universe	<p>Through projects and challenges that support the objective of Earth's features, natural resources, natural processes on humans, and the effects of weathering, students will garner understanding.</p> <p>Students will define a simple design problem reflecting a need or want that includes specified criteria for successes and constraints on materials, time, or cost.</p> <p>Supports standards 4-ESS1-1, 4-ESS2-1, 4-ESS2-2, 4-ESS3-1, 4-ESS3-2</p>
November- January	Energy	<p>Students will apply scientific ideas to design, test, and refine a device that converts energy from one form to another, shows how energy travels from place to place, and explains relating the speed of an object to the energy in that object.</p> <p>Develop drawings or models, analyze data, make observations, and gather information to solve a simple problem through the creation of an object or tool.</p> <p>Supports standards 4-PS3-1, 4-PS3-2, 4-PS3-3, 4-PS3-4,</p>
February- March	Waves and their Applications	<p>Students will develop models, diagrams, or posters explaining their knowledge of amplitude, wavelength and the effect light has on an object.</p> <p>Establish evidence through artistic challenges that will support the students knowledge of waves and their applications.</p> <p>Supports standards 4-PS4-1, 4-PS4-2, 4-PS4-3,</p>
April- June	Molecules to Organisms: Structure and	Create diagrams, models and live experiments to develop a better

	Processes	<p>understanding of what plants and animals need to survive and how their structures/systems work together.</p> <p>Students will demonstrate their understanding of analyzing data, engage in evidence-based projects and develop and refine models.</p> <p>Supports standards 4-LS-1, 4-LS-2</p>
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Scope & Sequence of Content and Skills for 4th Grade STEAM/Math

Timeline	Unit Name	Objectives/NGSS
September-October	Place Value: Multidigit Addition and Subtraction	<p>Develop an understanding of what place value means and how it can compare to other numbers.</p> <p>Design/conduct projects and design challenges to develop a better understanding of inverse operations in addition, subtraction, multiplication, and division.</p> <p>Supports standards: 4.NBT.1, 4.NBT.2, 4.NBT.3</p>
October-November	Multiplication and Geometry	<p>To devise creative plans that support student knowledge gained regarding the multiplicative comparisons, factors and pairs, finding symmetry, and prime and composite numbers.</p> <p>Supports standards: 4.OA.1, 4.OA.2, 4.OA.3</p>
November-December	Fractions and Decimals	<p>Design/conduct projects and design challenges to develop a better understanding of fraction equivalence and ordering, and modeling decimals with base -10 blocks.</p> <p>To devise creative plans that support student knowledge gained regarding the comparing of fractions.</p>

		Supports standards: 4.NF.1, 4.NF.2
December- January	Multi Digit Multiplication	<p>To construct spoken and written knowledge of extended multiplication facts.</p> <p>To devise creative plans that support student knowledge gained regarding the metric units of mass, money number stories, multistep multiplication number stories, and money number stories.</p> <p>Supports standards: 4.OA.1, 4.OA.2, 4.OA.3</p>
January- February	Fraction and Mixed-Number Computation: Measurement	<p>Design/conduct projects and design challenges to develop a better understanding of fraction decomposition, the whole for fractions, adding fractions and mixed numbers.</p> <p>To devise creative plans that support student knowledge gained regarding the subtraction of mixed numbers, line plots, rotations and iterating angles, and creating symmetric figures.</p> <p>Supports standards: 4.NF.1, 4.NF.2</p>
February- March	Division; Angles	<p>Create diagrams, models and live experiments to develop a better understanding of the use of half-circle protractors.</p> <p>Students will demonstrate their understanding of extended division facts, finding missing side lengths, expressing and interpreting remainders, and angle measures as additives.</p> <p>Supports standards: 4.MD.5, 4.MD.6, 4.MD.7</p>
March- April	Multiplication of a Fraction by whole Number; Measurement	<p>Students will demonstrate their understanding of converting liquid measures, exploring fraction multiplication, multistep division, and generating and identifying patterns.</p> <p>Through projects and challenges that consist of number stories, students will garner understanding.</p> <p>Supports standards: 4.NF.1, 4.NF.2</p>
May- June	Fraction Operations; Applications	To devise creative plans that support student knowledge gained

		<p>regarding fractions and measurement, areas of rectangles with fractional side lengths, fractions and perimeters, and real-life angle measures as additives.</p> <p>Design/conduct projects and design challenges to develop a better understanding of extending multistep number stories and applying the understanding of place value and operations.</p> <p>Supports standards: 4.NF.1, 4.NF.2</p>
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5th Grade STEAM Curriculum

Scope & Sequence of Content and Skills for 5th Grade STEAM/Science

Timeline	Unit Name	Objectives/NGSS
September- November	Ecosystems: Structure & Process	<p>Developing and refining models showing the necessary requirements in a healthy ecosystem.</p> <p>To construct spoken and written scientific experiments that highlight a representation of matter, the importance of food for energy, and energy transfer in various ways between objects.</p> <p>Develop an understanding of what scientists do to solve problems through interactive projects.</p> <p>Supports standards 5-LS2-1, 5-PS3-1, 5-PS3.D, 5-LS1-1, LS1.C, LS2.A, LS2.B</p>
December- March	Earth's Systems: Human Activity infused	<p>Establish evidence through artistic challenges that will support the students' knowledge of Earth's major systems and its water cycle.</p> <p>Create and investigate different design problems that can be solved by applying scientific ideas about Earth's water distribution, how Earth's systems interact, and what positive and negative effects humans have on the environment.</p> <p>Supports standards 5-ESS2-1, 5-ESS2-2,5-ESS3-1, 3-5-ETS1-1, 3-5-ETS1-2, 3-5-ETS1-3</p>
February- April	Earth's Place in the Universe (Forces)	<p>Through projects and challenges that support the objective of Earth's features, natural resources, natural processes on humans, and the effects of weathering, students will garner understanding.</p> <p>Students will define a simple design problem reflecting a need</p>

		<p>or want that includes specified criteria for successes and constraints on materials, time, or cost.</p> <p>Supports standards 5-PS2-1, 5-ESS1-1, 5-ESS1-2, 3-5-ETS1-1, 3-5-ETS1-2, 3-5-ETS1-3</p>
April- June	Matter and its interactions	<p>Conduct investigations to determine the properties of matter and its physical and chemical changes.</p> <p>Students will demonstrate their understanding of analyzing data, engage in evidence-based projects and develop and refine models.</p> <p>Supports standards 5-PS1-1, 5-PS1-2, 5-PS1-3, 5-PS1-4, 3-5-ETS1-1, 3-5-ETS1-2, 3-5-ETS1-3</p>

Scope & Sequence of Content and Skills for 5th Grade STEAM/Math

Timeline	Unit Name	Objectives/NGSS
September-October	Area and Volume	<p>Develop an understanding of what area and volume means and how it differs from one another.</p> <p>To devise creative plans that support student knowledge gained regarding the exploring of standard and nonstandard volume units.</p> <p>Students find volumes of figures composed of rectangular prisms, and solve real-world problems involving area and volume.</p> <p>Supports standards:</p>
October-November	Whole Number Place Value and	Develop an understanding of what place value means and

	Operations	<p>how it can compare to other numbers.</p> <p>Design/conduct projects and design challenges to develop a better understanding of inverse operations in addition, subtraction, multiplication, and division.</p>
November-December	Fraction Concepts, Addition, and Subtraction	<p>Design/conduct projects and design challenges to develop a better understanding of fraction equivalence and ordering, and modeling decimals with base -10 blocks.</p> <p>To devise creative plans that support student knowledge gained regarding the comparing of fractions.</p> <p>Students will demonstrate their understanding of problem solving, and the building readiness for multiplying fractions by whole numbers.</p>
December- January	Decimal Concepts; Coordinate Grids	<p>To devise creative plans that support student knowledge gained regarding the comparing and ordering of decimals, rounding, coordinate grids, and decimal addition algorithms.</p> <p>Through projects and challenges that consist of addition and subtraction of decimals with hundredths grids, students will garner understanding.</p>
January- March	Operations and Fractions	<p>To devise creative plans that support student knowledge gained regarding fractions and measurement, areas of rectangles with fractional side lengths, fractions and perimeters, and real-life angle measures as additives.</p> <p>Design/conduct projects and design challenges to develop a better understanding of extending multistep number stories and applying the understanding of place value and operations.</p> <p>Students will demonstrate their understanding of area models for fraction multiplication and the explaining of the equivalent fraction rules.</p>
March	Investigations in Measurement; Decimal Multiplication and Division	<p>Students will demonstrate their understanding of multiplying and dividing decimals by powers of 10, and exploring decimal</p>

		<p>multiplication and division.</p> <p>Design/conduct projects and design challenges to develop a better understanding of converting measurements in the metric system.</p> <p>Through projects and challenges that consist of volume concepts to calculate the volume of a building, students will garner understanding.</p>
April	Multiplication of Mixed Numbers; Geometry; Graphs	<p>To devise creative plans that support student knowledge gained regarding the multiplicative comparisons, finding symmetry, and the hierarchy of polygons.</p> <p>Design/conduct projects and design challenges to develop a better understanding of triangles, quadrilaterals, and rectangles with fractional side lengths.</p> <p>To construct spoken and written knowledge of extended multiplication of mixed numbers.</p>
May- June	Applications of Measurement; Computation, and Graphing	<p>Create diagrams and graphs, models and live experiments to develop a better understanding of the use of real life methods for areas.</p> <p>Students will demonstrate their understanding of length, area, and volume concepts, problem solving, and apply knowledge of multiplication and unit conversion.</p>

6th Grade STEAM Curriculum

Scope & Sequence of Content and Skills for 6th Grade STEAM/Science

Timeline	Unit Name	Objectives/NGSS
September- October	Space Systems	<p>Develop an understanding of what scientists do to solve problems through interactive projects.</p> <p>To devise creative plans that support student knowledge gained regarding the objects found in our solar system.</p> <p>Supports standards MS-ESS1-1, MS-ESS1-2, MS-ESS1-3</p>
November- January	Weather and Climate	<p>Through projects and challenges that support the differences between weather and climate, students will garner understanding.</p> <p>Design/conduct projects and design challenges to develop a better understanding of the atmosphere, pressure affects, the ocean, climate changes over time, and global warming.</p> <p>Supports standards MS-ESS2-5, MS-ESS2-6, MS-ESS3-5</p>
February- March	Structure, Function, and Information Processing	<p>Create diagrams, models and live experiments to develop a better understanding of the building blocks of life.</p> <p>Students will demonstrate their understanding of analyzing data, engage in evidence-based projects and develop and refine models.</p> <p>Supports standards MS-LS1-1, MS-LS1-2, MS-LS1-3, MS-LS1-8</p>
April- June	Growth, Development, and Reproduction of Organisms	<p>Develop drawings or models, analyze data, make observations, and gather information to create a piece of artwork that examines how organisms develop and</p>

		<p>reproduce.</p> <p>To construct spoken and written scientific experiments that highlights the growth, development, and reproduction of organisms.</p> <p>Supports standards MS-LS1-4, MS-LS1-5, MS-LS3-1, MS-LS3-2, MS-LS4-5</p>
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Scope & Sequence of Content and Skills for 6th Grade STEAM/Math

Timeline	Unit Name	Objectives/NGSS
September-October	Area and Surface Area	<p>Develop an understanding of what the terms “base” and “height” means and find areas of parallelograms and triangles.</p> <p>Design/conduct projects and design challenges to develop a better understanding of finding areas of polygons by decomposing, rearranging, and composing shapes.</p> <p>Encourage critical thinking and problem solving through first hand investigation of surface area using nets.</p>
October-November	Introducing Ratios	<p>Students will demonstrate their understanding of problem solving, and the building readiness when working with ratios.</p> <p>Develop an understanding of what the terms “ratio,” “rate,” “equivalent,” and “constant speed and rate” mean when two ratios are not equivalent.</p> <p>Through projects and challenges that consist of color mixing, recipes, unit pricing, line diagrams and tables,</p>

		students will garner understanding on ratios.
November-December	Unit Rate and Percentage	<p>Students learn to understand the terms “unit rate,” “speed,” “pace,” and “percentage” to properly reason when faced with challenges involving unit price, constant speed, and measurement conversion.</p> <p>Encourage critical thinking and problem solving through first hand investigation of diagrams and tables.</p> <p>Explore the use of art media to solve rate problems and the comparison of speeds and prices.</p>
December- January	Dividing Fractions	<p>Students will examine, devise and illustrate a plan that will support how to compute quotients of fractions.</p> <p>Establish evidence through artistic challenges that will solve problems involving length and area of figures with fractional side lengths.</p> <p>Produce and build a scientific trial that will develop a clear view of reasoning about situations that involve multiplication and division of fractions.</p>
January- February	Arithmetic in Base Ten	<p>Through projects and challenges that consist of base ten arithmetic, students will garner understanding.</p> <p>Conceive design plans that will enhance a clearer understanding for students to compute sums, differences, products, and quotients of multi-digit whole numbers and decimals, using efficient algorithms.</p> <p>Student teams will share ideas, develop solutions, and communicate using calculations with whole numbers and decimals to solve problems set in real-word contexts.</p>
February- March	Expressions & Equations	<p>To devise creative plans that support student knowledge gained regarding the understanding of the terms “variable,” “coefficient,” “solution,” “equivalent expressions,” “exponent,” “independent variable,” and “dependent</p>

		<p>variable.”</p> <p>Create design solutions that represent collections of equivalent ratios as equations and use and make connections between tables, graphs, and linear equations that represent the same relationships.</p> <p>Encourage critical thinking and problem solving through first hand investigation of using properties of exponents strategically to evaluate expressions.</p>
March- April	Rational Numbers	<p>To construct spoken and written knowledge of the terms “positive number,” “negative number,” “rational number,” “opposite,” “sign,” “absolute value,” “less than”, and “greater than.”</p> <p>Design/conduct projects and design challenges to develop a better understanding of the use of absolute value notion and its distance from zero on a number line.</p> <p>Explore the use of art media and design to gain a better understanding of plotting pairs of signed number coordinates in the plane and its relationship as a vertical and horizontal line on a chart.</p>
May- June	Data Sets & Distribution	<p>Establish evidence through artistic challenges that will teach students about populations and the study of variables associated with population.</p> <p>Develop an understanding of “measures of center” by using the terms “mean,” “average,” and “medium” in specific design challenges.</p> <p>Through projects and challenges that consist of measurements of center and variability in context, students will garner a better understanding of data.</p>