



**Science and Math Alignment
STEAM Facilitation Guide
2023-2024**

E³ Big Idea: Cultivating Community

Hillsboro Charter Academy Science Curriculum Alignment Map 2023-2024

		Ongoing	1st Marking Period	2nd Marking Period			3rd Marking Period		
Unit Theme		Science and Engineering Practices	Physical Science (Virginia Natural Resources for 4th)	Life Science (More Physical Science for 5th)			Earth Science		
Key Concepts		<i>Procedures, Myself as a Scientist, Measurement</i>	<i>Matter</i>	<i>Force, Motion and Energy</i>	<i>Life Processes, Living Systems</i>	<i>Life Processes, Cycles</i>	<i>Life Processes, Plants</i>	<i>Weather, Earth Resources, Conservation,</i>	<i>Patterns, Cycles, Change Earth/Space Systems</i>
K	Topic: SOLs:	Scientific and Engineering Practices K.1	Physical Properties of Objects and Water K.3, K.4	Force and Motion: Pushes and Pulls K.2	5 Senses, Living/Nonliving Classifying K.5, K.6	Animals K.7a,b, c	Plants K.7a,b, c	Weather Patterns, Reduce, Reuse, Recycle Conservation K.9a, K.10, K.11	Patterns in nature, Changes over time Shadows K. 8, K.9b,c, K.10
1	Topic: SOLs:	Scientific and Engineering Practices, Measurement 1.1	Matter 1.3	Force, Motion and Energy 1.2	Animals 1.5, 1.7c	Animals/Plants 1.4, 1.5, 1.7c	Plants 1.4, 1.7c	Natural Resources 1.8	Sun and Earth, Seasons 1.6, 1.7a, b
2	Topic: SOLs:	Scientific and Engineering Practices, Measurement 2.1	Matter: Solids, Liquids, Gasses; Heating/Cooling 2.3	Force and Motion including Gravity and Magnetism 2.2	Habitats 2.5, 2.8	Life Cycles of Plants and Animals 2.4	Plants and Plant Products 2.7b, 2.8	Weather, Weather Patterns 2.6, 2.7	Seasonal Change 2.7
3	Topic: SOLs:	Scientific and Engineering Practices, Measurement 3.1	Matter: Water Interaction 3.3	Simple/Compound Machines, Direction and Size of Force 3.2	Terrestrial and Aquatic Environments 3.5	Animal Adaptations, Survival of Organisms, Fossils 3.4	Soil in Ecosystems 3.6, 3.8d	Water Cycle, Energy Resources 3.6, 3.7	Earth Resources: Natural and Human Events 3.8
4	Topic: SOLs:	Scientific and Engineering Practices. Measurement 4.1	VA Natural Resources 4.8	VA Natural Resources 4.8	Ecosystems 4.3	Survival of Plants/Animals 4.2	Ocean Environment 4.7	Weather, Weather Tools 4.4	Solar System, Earth/Moon/Sun 4.5, 4.6
5	Topic:	Scientific and Engineering Practices, Measurement	Matter: Properties and interactions 5.7	Energy, Force and Motion	Electricity	Sound/Light	Light/Changing Earth	Changing Earth/ Plate Tectonics/Rock Cycle/ Weathering/Fossils 5.8	Conservation of Energy/Review

SOLs:	5.1		5.2, 5.3	5.4	5.5, 5.6	5.6/5.8		5.9
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Resource Documents for Hillsboro Charter Academy STEAM Curriculum Alignment/Scope & Sequence

- Virginia Department of Education: Science Standards of Learning for Virginia Public Schools, Grades K-5
http://www.doe.virginia.gov/testing/sol/standards_docs/science/index.shtml
- Virginia Department of Education: Science Standards of Learning Curriculum Framework, Grades K-5
http://www.doe.virginia.gov/testing/sol/standards_docs/science/index.shtml
- Virginia Department of Education: Science Standards of Learning (Adopted 2018) Curriculum Framework, Grades K-5
https://doe.virginia.gov/testing/sol/standards_docs/science/2018/index.shtml
- Virginia Department of Education: Grade 3 Science Blueprints
http://www.doe.virginia.gov/testing/sol/blueprints/science_blueprints/2010/2010_blueprint_science_3.pdf
- Virginia Department of Education: Grade 5 Science Blueprints
http://www.doe.virginia.gov/testing/sol/blueprints/science_blueprints/2010/2010_blueprint_science_5.pdf
- Virginia Department of Education: Practices for Science Investigation
http://www.doe.virginia.gov/instruction/science/resources/practices_for_science_investigation_progression.pdf
- Virginia Department of Education: K-3 Science Progression http://www.doe.virginia.gov/instruction/science/resources/science_progression_k-3.pdf
- Virginia Department of Education: Math Standards of Learning for Virginia Public Schools, Grades K-5
http://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/index.shtml
- Virginia Department of Education: Math Standards of Learning Curriculum Framework, Grades K-5
http://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/index.shtml
- Virginia Department of Education: Computer Science Standards of Learning for Virginia Public Schools, Grades K-5
https://www.doe.virginia.gov/testing/sol/standards_docs/computer-science/index.shtml
- Virginia Department of Education: English Language Arts Standards of Learning for Virginia Public Schools, Grades K-5
https://www.doe.virginia.gov/testing/sol/standards_docs/english/index.shtml
- Virginia Department of Education: History and Social Science Standards of Learning for Virginia Public Schools, Grades K-5
https://www.doe.virginia.gov/testing/sol/standards_docs/history_socialscience/index.shtml
- Loudoun County Public Schools 2018 Science Vocabulary Vertical Alignment:
https://docs.google.com/document/d/1oAnigqBqZ4NgHhTE4ZarA5hTwzNaN-D6_FxBlupyU2Y/edit?usp=sharing
- Loudoun County Public Schools 2022-2023 Science Curriculum Guides K-5 (Internal Link in Schoology)
- Loudoun County Public Schools 2022-2023 Math Curriculum Guides K-5 (Internal Link in Schoology)
- ITEEA Standards for Technological and Engineering Literacy: The Role of Technology and Engineering in STEM Education
<https://www.iteea.org/Activities/2142/STEL.aspx#tabs>
- Next Generation Science Standards/NSTA Engineering Grades K-2 <https://ngss.nsta.org/DisplayStandard.aspx?view=topic&id=10>
- Next Generation Science Standards/NSTA Engineering Grades 3-5 <https://ngss.nsta.org/DisplayStandard.aspx?view=topic&id=23>

2023-2024 HCA Kindergarten STEAM Curriculum Map-at a Glance (Scope and Sequence)

Marking Period	Science Topic: <i>"Using my senses to understand my world"</i>	Sci SOL	Math Topic	Math SOL
1	Scientific and Engineering Practices	K.1 (Ongoing)	<ul style="list-style-type: none"> Identify and Describe Two-Dimensional Shapes Represent, Count and Write Numbers 0-5 Compare Numbers to 5 	K.10a, K.10b, K.10c
	Physical Properties of Objects and Water	K.3, K.4		K.1a, K.1b, K.3a, K.4a
2	Forces and Motion: Pushes and Pulls	K.2	<ul style="list-style-type: none"> Represent, Count and Write Numbers 6-9 Represent and Compare Numbers to 10 Addition Subtraction 	K.1a, K.1b, K.2a
	5 Senses	K.5		K.1a, K.1b, K.2b, K.3b, K.3a, K.3c, K.4b, K.5
	Living/Nonliving Classifying	K.6		K.4a, K.4b, K.6
	Animals	K.7a, b, c		K.6
3	Plants	K.7a, b, c	<ul style="list-style-type: none"> Represent, Count and Write Numbers 11 to 19 Represent, Count and Write 20 and Beyond Measurement Classify and Sort Data 	K.1a, K.1b, K.2a, K.6
	Weather Patterns	K.9a		K.1a, K.1b, K.2a, K.3a, K.3d, K.6
	Reduce Reuse, Recycle	K.10		K.7, K.8, K.9
	Conservation	K.11		K.10b, K.11a, K.11b, K.12, K.13
	Shadows	K.8		
	Changes over time	K.9 b,c		
Patterns in nature	K.10			

Essential Skills are listed with each SOL in the framework that follows. All essential skills should be covered with the related SOL.

Kindergarten Science: *Using my senses to understand my world*

Scientific and Engineering Practices:

K.1 The student will demonstrate an understanding of scientific and engineering practices by a)asking questions and defining problems; b) planning and carrying out investigations; c)interpreting, analyzing, and evaluating data; d)constructing and critiquing conclusions and explanations; e)developing and using models; f)obtaining, evaluating, and communicating information

Matter

K.3 The student will investigate and understand that physical properties of an object can be described. Properties include a)colors; b)shapes and forms; c)textures and feel; and d)relative sizes and weights of objects.

K.4 The student will investigate and understand that water is important in our daily lives and has properties. Key ideas include a)water has many uses; b)water can be found in many places; c)water occurs in different phases; and d)water flows downhill.

Force, Motion, and Energy:

K.2 The student will investigate and understand that pushes and pulls affect the motion of objects. Key ideas include a)pushes and pulls can cause an object to move; b)pushes and pulls can change the direction of an object; and c)changes in motion are related to the strength of the push or pull.

Living Systems and Processes

K.5 The students will investigate and understand that senses allow humans to seek, find, take in, and react or respond to different information. Key ideas include a)the five basic senses correspond to specific human body structures; and b)senses are used in our daily lives.

K.6 The student will investigate and understand that there are differences between living organisms and nonliving objects. Key ideas include a)all things can be classified as living or nonliving; and b)living organisms have certain characteristics that distinguish them from nonliving objects.

K.7 The student will investigate and understand that plants and animals have basic needs and life processes. Key ideas include a)living things need adequate food, water, shelter, air, and space to survive; b)plants and animals have life cycles; and c)offspring of plants and animals are similar but not identical to their parents or to one another.

Earth and Space Systems

K.8 The student will investigate and understand that light influences temperature on Earth's surfaces and can cause shadows. Key ideas include a)the sun provides light and warms Earth's surface; b)shadows can be produced when sunlight or artificial light is blocked by an object; and c)objects in shadows and objects in sunlight have different temperatures.

K.9 The student will investigate and understand that there are patterns in nature. Key patterns include a)daily weather; b)seasonal changes; and c)day and night.

K.10 The student will investigate and understand that change occurs over time. Key ideas include a)natural and human-made things change over time; b)living and nonliving things change over time; c)changes can be observed and measured; and d)changes may be fast or slow.

Earth Resources

K.11 The student will investigate and understand that humans use resources. Key ideas include a) some materials and objects can be used over and over again; b) materials can be recycled; and c) choices we make impact the air, water, land and living things.

Kindergarten Yearly Math Overview

Marking Period 1 8/24/23-10/27/23	Identify and Describe Two-Dimensional Shapes K.10a, K.10b, K.10c	Represent, Count and Write Numbers 0 to 5 K.1a, K.1b, K.3a, K.4a	Compare Numbers to 5 K.1a, K.1b, K.2a	
Marking Period 2 11/1/23-3/1/24	Represent, Count and Write Numbers 6 to 9 K.1a, K.1b, K.2a	Represent and Compare Numbers to 10 K.1a, K.1b, K.2b, K.3a, K.3b, K.3c, K.4b, K.5	Addition K.4a, K.4b, K.6	Subtraction K.6
Marking Period 3 3/5/24-6/11/24	Represent, Count, and Write Numbers 11 to 19 K.1a, K.1b, K.2a, K.6	Represent, Count and Write 20 and Beyond K.1a, K.1b, K.2a, K.3a, K.3d, K.6	Measurement K.7, K.8, K.9	Classify and Sort Data K.10b, K.11a, K.11b, K.12, K.13

VDOE Process Goals

- To build new mathematical knowledge through problem solving and to develop a repertoire of skills and strategies for solving a variety of problem types (**Problem Solving**)
- To communicate mathematical ideas coherently and clearly and to analyze and evaluate the mathematical thinking of others (**Communication**)
- To use logical reasoning in solving mathematical problems and to explain and justify mathematical ideas (**Reasoning**)
- To understand how mathematical ideas interconnect and build on one another and to use those connections to solve problems (**Connections**)
- To create and use a variety of representations in learning, doing, and communicating mathematics (**Representations**)

2023-2024 HCA 1st Grade STEAM Curriculum Map-at a Glance (Scope and Sequence)

Marking Period	Science Topic: <i>"How I interact with my world"</i>	Sci SOL	Math Topic	Math SOL
1	Scientific and Engineering Practices	1.1 (Ongoing)	<ul style="list-style-type: none"> Addition Concepts Subtraction Concepts Addition Strategies 	1.6, 1.7a, 1.7b, 1.15 1.6, 1.7a, 1.7b 1.6, 1.7a, 1.7b, 1.15
	Matter	1.3		
2	Forces, Motion and Energy	1.2	<ul style="list-style-type: none"> Subtraction Strategies Addition and Subtraction Relationships Count and Model Numbers Compare Numbers 	1.6, 1.7a, 1.7b 1.6, 1.7a, 1.7b, 1.15 1.1a, 1.1b, 1.1c, 1.1d, 1.2a, 1.3 1.2a, 1.2b, 1.2c, 1.5a, 1.5b
	Animals	1.5, 1.7c		
	Animals/Plants	1.4, 1.5, 1.7c		
3	Plants	1.4, 1.7c	<ul style="list-style-type: none"> Two-Digit Addition and Subtraction Measurement Represent Data Two-Dimensional Geometry 	1.1d, 1.2a, 1.6, 1.7a, 1.7b 1.8, 1.9a, 1.9b, 1.10 1.12a, 1.12b 1.4a, 1.4b, 1.11a, 1.11b, 1.13, 1.14
	Natural Resources	1.8		
	Sun and Earth	1.6		
	Seasons	1.7a, 1.7b		

Essential Skills are listed with each SOL in the framework that follows. All essential skills should be covered with the related SOL

1st Grade Science: *How I interact with my world*

Scientific and Engineering Practices

1.1 The student will demonstrate an understanding of scientific and engineering practices by a)asking questions and defining problems; b)planning and carrying out investigations; c)interpreting, analyzing, and evaluating data; d)constructing and critiquing conclusions and explanations; e)developing and using models; f)obtaining, evaluating, and communicating information

Force, Motion, and Energy

1.2 The student will investigate and understand that objects can move in different ways. Key ideas include a)objects may have straight, circular, spinning, and back-and-forth motions; and b)objects may vibrate and produce sound.

Matter

1.3 The student will investigate and understand that objects are made from materials that can be described by their physical properties. Key ideas include a)objects are made of one or more materials with different physical properties and can be used for a variety of purposes; b)when a material is changed in size most physical properties remain the same; and c)the type and amount of material determine how much light can pass through an object.

Living Systems and Processes

1.4 The student will investigate and understand that plants have basic life needs and functional parts that allow them to survive. Key ideas include a)plants need nutrients, air, water, light, and a place to grow; b)structures of plants perform specific functions; and c)plants can be classified based on a variety of characteristics.

1.5 The student will investigate and understand that animals, including humans, have basic life needs that allow them to survive. Key ideas include a)animals need air, food, water, shelter, and space (habitat); b)animals have different physical characteristics that perform specific functions; and c)animals can be classified based on a variety of characteristics.

Earth and Space Systems

1.6 The student will investigate and understand that there is a relationship between the sun and Earth. Key ideas include a)the sun is the source of energy and light that warms the Earth's land, air, and water; and b)the sun's relative position changes in the Earth's sky throughout the day.

1.7 The student will investigate and understand that there are weather and seasonal changes. Key ideas include a)changes in temperature, light, and precipitation occur over time; b)there are relationships between daily weather and the season; and c)changes in temperature, light, and precipitation affect plants and animals, including humans.

Earth Resources

1.8 The student will investigate and understand that natural resources can be used responsibly. Key ideas include a)most natural resources are limited; b)human actions can affect the availability of natural resources; and c)reducing, reusing, and recycling are ways to conserve natural resources.

Grade 1 Yearly Math Overview

Marking Period 1 8/24/23-10/27/23	Addition Concepts 1.6, 1.7a, 1.7b, 1.15	Subtraction Concepts 1.6, 1.7a, 1.7b	Addition Strategies 1.6, 1.7a, 1.7b, 1.15	
Marking Period 2 11/1/23-3/1/24	Subtraction Strategies 1.6, 1.7a, 1.7b	Addition and Subtraction Relationships 1.6, 1.7a, 1.7b, 1.15	Count and Model Numbers 1.1a, 1.1b, 1.1c, 1.1d, 1.2a, 1.3	Compare Numbers 1.2a, 1.2b, 1.2c, 1.5a, 1.5b
Marking Period 3 3/5/24-6/11/24	Two-Digit Addition and Subtraction 1.1d, 1.2a, 1.6, 1.7a, 1.7b	Measurement 1.8, 1.9a, 1.9b, 1.10	Represent Data 1.12a, 1.12b	Two-Dimensional Geometry 1.4a, 1.4b, 1.11a, 1.11b, 1.13, 1.14

VDOE Process Goals

- To build new mathematical knowledge through problem solving and to develop a repertoire of skills and strategies for solving a variety of problem types (**Problem Solving**)
- To communicate mathematical ideas coherently and clearly and to analyze and evaluate the mathematical thinking of others (**Communication**)
- To use logical reasoning in solving mathematical problems and to explain and justify mathematical ideas (**Reasoning**)
- To understand how mathematical ideas interconnect and build on one another and to use those connections to solve problems (**Connections**)
- To create and use a variety of representations in learning, doing, and communicating mathematics (**Representations**)

2023-2024 HCA 2nd Grade STEAM Curriculum Map-at a Glance (Scope and Sequence)

Marking Period	Science Topic: <i>"Change occurs all around us"</i>	Sci SOL	Math Topic	Math SOL
1	Scientific and Engineering Practices	2.1 (Ongoing)	<ul style="list-style-type: none"> Number Concepts Numbers to 100 Basic Facts and Relationships 	2.2a, 2.2b, 2.2c, 2.3a, 2.3b, 2.16 2.1a, 2.1b, 2.1c, 2.1d, 2.2b, 2.16, 2.17 2.5a, 2.5b
	Matter: Solids, Liquids, Gases Heating/Cooling	2.3		
2	Force and Motion including Gravity and Magnetism	2.2	<ul style="list-style-type: none"> 2-Digit Addition 2-Digit Subtraction 3-Digit Addition and Subtraction Money and Time 	2.6a, 2.6b, 2.6c 2.6a, 2.6b, 2.6c 2.6b, 2.6c 2.7a, 2.7b, 2.8b, 2.9, 2.10a, 2.10b, 2.11
	Habitats	2.5, 2.8		
	Life Cycles of Plants and Animals	2.4		
3	Plants and Plant Products	2.7b, 2.8	<ul style="list-style-type: none"> Length in Customary Units Data Geometry and Fractions 	2.6c, 2.8a 2.14, 2.15a, 2.15b 2.4a, 2.4b, 2.4c, 2.12b, 2.13
	Weather	2.6		
	Weather Patterns	2.7		
	Seasonal Change	2.7		

Essential Skills are listed with each SOL in the framework that follows. All essential skills should be covered with the related SOL

2nd Grade Science: *Change occurs all around us*

Scientific and Engineering Practices

2.1 The student will demonstrate an understanding of scientific and engineering practices by a) asking questions and defining problems; b) planning and carrying out investigations; c) interpreting, analyzing, and evaluating data; d) constructing and critiquing conclusions and explanations; e) developing and using models; f) obtaining, evaluating, and communicating information

Force, Motion, and Energy

2.2 The student will investigate and understand that different types of forces may cause an object's motion to change. Key ideas include a) forces from direct contact can cause an object to move; b) some forces, including gravity and magnetism, can cause objects to move from a distance; and c) forces have applications in our lives.

Matter

2.3 The student will investigate and understand that matter can exist in different phases. Key ideas include a) matter has mass and takes up space; b) solids, liquids, and gases have different characteristics; and c) heating and cooling can change the phases of matter.

Living Systems and Processes

2.4 The student will investigate and understand that plants and animals undergo a series of orderly changes as they grow and develop. Key ideas include a) animals have life cycles; and b) plants have life cycles.

2.5 The student will investigate and understand that living things are part of a system. Key ideas include a) plants and animals are interdependent with their living and nonliving surroundings; b) an animal's habitat provides all of its basic needs; and c) habitats change over time due to many influences.

Earth and Space Systems

2.6 The student will investigate and understand that there are different types of weather on Earth. Key ideas include a) different types of weather have specific characteristics; b) measuring, recording, and interpreting weather data allows for identification of weather patterns; and c) tracking weather allows us to prepare for the weather and storms.

2.7 The student will investigate and understand that weather patterns and seasonal changes affect plants, animals, and their surroundings. Key ideas include a) weather and seasonal changes affect the growth and behavior of living things; b) wind and weather can change the land; and c) changes can happen quickly or slowly over time.

Earth Resources

2.8 The student will investigate and understand that plants are important natural resources. Key ideas include a) the availability of plant products affects the development of a geographic area; b) plants provide oxygen, homes, and food for many animals; and c) plants can help reduce the impact of wind and water.

Grade 2 Yearly Math Overview

Marking Period 1 8/24/23-10/27/23	Number Concepts 2.2a, 2.2b, 2.2c, 2.3a, 2.3b, 2.16	Numbers to 1,000 2.1a, 2.1b, 2.1c, 2.1d, 2.2b, 2.16, 2.17	Basic Facts and Relationships 2.5a, 2.5b	
Marking Period 2 11/1/23-3/1/24	2-Digit Addition 2.6a, 2.6b, 2.6c	2-Digit Subtraction 2.6a, 2.6b, 2.6c	3-Digit Addition and Subtraction 2.6b, 2.6c	Money and Time 2.7a, 2.7b, 2.8b, 2.9, 2.10a, 2.10b, 2.11
Marking Period 3 3/5/24-6/11/24	Length in Customary Units 2.6c, 2.8a	Data 2.14, 2.15a, 2.15b	Geometry and Fraction Concepts 2.4a, 2.4b, 2.4c, 2.12b, 2.13	

VDOE Process Goals

- To build new mathematical knowledge through problem solving and to develop a repertoire of skills and strategies for solving a variety of problem types (**Problem Solving**)
- To communicate mathematical ideas coherently and clearly and to analyze and evaluate the mathematical thinking of others (**Communication**)
- To use logical reasoning in solving mathematical problems and to explain and justify mathematical ideas (**Reasoning**)
- To understand how mathematical ideas interconnect and build on one another and to use those connections to solve problems (**Connections**)
- To create and use a variety of representations in learning, doing, and communicating mathematics (**Representations**)

2023-2024 HCA 3rd Grade STEAM Curriculum Map-at a Glance (Scope and Sequence)

Marking Period	Science Topic: <i>"Interactions in our world"</i>	Sci SOL	Math Topic	Math SOL
1	Scientific and Engineering Practices	3.1 (Ongoing)	<ul style="list-style-type: none"> Addition and Subtraction Within 1,000 Represent and Interpret Data Understand Multiplication 	3.1a, 3.1b, 3.1c, 3.3a, 3.3b, 3.16 3.14, 3.15a, 3.15b 3.4a, 3.4b, 3.4c
	Matter: Water Interaction	3.3		
2	Simple/Compound Machines, Direction and Size of Force	3.2	<ul style="list-style-type: none"> Multiplication Facts and Strategies Use Multiplication Facts Understand Division Division Facts and Strategies Understand Fractions 	3.4a, 3.4b, 3.4c 3.4b, 3.4d, 3.16 3.3b, 3.4a, 3.4b 3.4a, 3.4b, 3.17 3.2a, 3.2b
	Terrestrial and Aquatic Environments	3.5		
	Animal Adaptations, Survival of Organisms, Fossils	3.4		
3	Soil in Ecosystems	3.6, 3.8d	<ul style="list-style-type: none"> Compare Fractions Time, Length, Liquid Volume, and Mass Perimeter and Area Two-Dimensional Shapes 	3.2b, 3.2c, 3.5 3.6a, 3.6b, 3.6c, 3.7a, 3.7b, 3.9a, 3.9b, 3.9c, 3.10 3.8a, 3.8b 3.11, 3.12a, 3.12b, 3.12c, 3.13, 3.16
	Water Cycle	3.6		
	Energy Resources	3.7		
	Earth Resources: Natural and Human Events	3.8		

Essential Skills are listed with each SOL in the framework that follows. All essential skills should be covered with the related SOL

3rd Grade Science: *Interactions in our world*

Scientific and Engineering Practices

3.1 The student will demonstrate an understanding of scientific and engineering practices by a)asking questions and defining problems; b) planning and carrying out investigations; c)interpreting, analyzing, and evaluating data; d)constructing and critiquing conclusions and explanations; e) developing and using models; f) obtaining, evaluating, and communicating information

Force, Motion, and Energy

3.2 The student will investigate and understand that the direction and size of force affects the motion of an object. Key ideas include a)multiple forces may act on an object; b)the net force on an object determines how an object moves; c)simple machines increase or change the direction of a force; and d)simple and compound machines have many applications.

Matter

3.3 The student will investigate and understand how materials interact with water. Key ideas include a)solids and liquids mix with water in different ways; and b) any solids dissolve more easily in hot water than in cold water.

Living Systems and Processes

3.4 The student will investigate and understand that adaptations allow organisms to satisfy life needs and respond to the environment. Key ideas include a)populations may adapt over time; b)adaptations may be behavioral or physical; and c)fossils provide evidence about the types of organisms that lived long ago as well as the nature of their environments.

3.5 The student will investigate and understand that aquatic and terrestrial ecosystems support a diversity of organisms. Key ideas include a)ecosystems are made of living and nonliving components of the environment; and b)relationships exist among organisms in an ecosystem.

Earth and Space Systems

3.6 The student will investigate and understand that soil is important in ecosystems. Key ideas include a)soil, with its different components, is important to organisms; and b)soil provides support and nutrients necessary for plant growth.

3.7 The student will investigate and understand that there is a water cycle and water is important to life on Earth. Key ideas include a)there are many reservoirs of water on Earth; b)the energy from the sun drives the water cycle; and c)the water cycle involves specific processes.

Earth Resources

3.8 The student will investigate and understand that natural events and humans influence ecosystems. Key ideas include a)human activity affects the quality of air, water, and habitats; b)water is limited and needs to be conserved; c)fire, flood, disease, and erosion affect ecosystems; and d)soil is a natural resource and should be conserved.

Grade 3 Yearly Math Overview

Marking Period 1 8/24/23-10/27/23	Addition and Subtraction Within 1,000 3.1a, 3.1b, 3.1c, 3.3a, 3.3b, 3.16		Represent and Interpret Data 3.14, 3.15a, 3.15b		Understand Multiplication 3.4a, 3.4b, 3.4c	
Marking Period 2 11/1/23-3/1/24	Multiplication Facts and Strategies 3.4a, 3.4b, 3.4c	Use Multiplication Facts 3.4b, 3.4d, 3.16	Understand Division 3.3b, 3.4a, 3.4b	Division Facts and Strategies 3.4a, 3.4b, 3.17	Understand Fractions 3.2a, 3.2b	
Marking Period 3 3/5/24-6/11/24	Compare Fractions 3.2b, 3.2c, 3.5	Time, Length, Liquid Volume, and Mass 3.6a, 3.6b, 3.6c, 3.7a, 3.7b, 3.9a, 3.9b, 3.9c, 3.10	Perimeter and Area 3.8a, 3.8b	Two-Dimensional Shapes 3.11, 3.12a, 3.12b, 3.12c, 3.13, 3.16	Review	

VDOE Process Goals

- To build new mathematical knowledge through problem solving and to develop a repertoire of skills and strategies for solving a variety of problem types (**Problem Solving**)
- To communicate mathematical ideas coherently and clearly and to analyze and evaluate the mathematical thinking of others (**Communication**)
- To use logical reasoning in solving mathematical problems and to explain and justify mathematical ideas (**Reasoning**)
- To understand how mathematical ideas interconnect and build on one another and to use those connections to solve problems (**Connections**)
- To create and use a variety of representations in learning, doing, and communicating mathematics (**Representations**)

2023-2024 HCA 4th Grade STEAM Curriculum Map-at a Glance (Scope and Sequence)

Marking Period	Science Topic: <i>"Our place in the solar system"</i>	Sci SOL	Math Topic	Math SOL
1	Scientific and Engineering Practices	4.1 (Ongoing)	<ul style="list-style-type: none"> Place Value, Addition and Subtraction to One Million Multiply by 1-Digit Numbers Multiply by 2-Digit Numbers 	4.1a, 4.1b, 4.1c, 4.4b, 4.4d 4.4a, 4.4b, 4.4d 4.4b, 4.4d
	VA Natural Resources	4.8		
2	VA Natural Resources	4.8	<ul style="list-style-type: none"> Divide by 1-Digit Numbers Factors, Multiples and Patterns Fraction Equivalences and Comparison Add and Subtract Fractions Relate Fractions and Decimals 	4.4c, 4.4d 4.4a, 4.5a, 4.14a, 4.14b, 4.14c, 4.15, 4.16 4.2a, 4.2b, 4.2c, 4.13a, 4.13b, 4.13c 4.5b, 4.5c, 4.15 4.3a, 4.3b, 4.3c, 4.3d, 4.6a, 4.6b
	Ecosystems	4.3		
	Survival of Plants and Animals	4.2		
3	Ocean Environment	4.7	<ul style="list-style-type: none"> Two-Dimensional Figures Measurement Benchmarks Algebra: Perimeter and Area 	4.10a, 4.10b, 4.11, 4.12, 4.15 4.8a, 4.8b, 4.8c, 4.8d, 4.9, 4.15 4.7
	Weather and Weather Tools	4.4		
	Solar System	4.5		
	Earth/Moon/Sun	4.6		

Essential Skills are listed with each SOL in the framework that follows. All essential skills should be covered with the related SOL

4th Grade Science: *Our place in the solar system*

Scientific and Engineering Practices

4.1 The student will demonstrate an understanding of scientific and engineering practices by a) asking questions and defining problems; b) planning and carrying out investigations; c) interpreting, analyzing, and evaluating data; d) constructing and critiquing conclusions and explanations; e) developing and using models; f) obtaining, evaluating, and communicating information

Living Systems and Processes

4.2 The student will investigate and understand that plants and animals have structures that distinguish them from one another and play vital roles in their ability to survive. Key ideas include a) the survival of plants and animals depends on photosynthesis; b) plants and animals have different structures and processes for obtaining energy; and c) plants and animals have different structures and processes for creating offspring.

4.3 The student will investigate and understand that organisms, including humans, interact with one another and with the nonliving components in the ecosystem. Key ideas include a) interrelationships exist in populations, communities, and ecosystems; b) food webs show the flow of energy within an ecosystem; c) changes in an organism's niche and habitat may occur at various stages in its life cycle; and d) classification can be used to identify organisms.

Earth and Space Systems

4.4 The student will investigate and understand that weather conditions and phenomena affect ecosystems and can be predicted. Key ideas include a) weather measurements create a record that can be used to make weather predictions; b) common and extreme weather events affect ecosystems; and c) long term seasonal weather trends determine the climate of a region.

4.5 The student will investigate and understand that the planets have characteristics and a specific place in the solar system. Key ideas include a) planets rotate on their axes and revolve around the sun; b) planets have characteristics and a specific order in the solar system; and c) the sizes of the sun and planets can be compared to one another.

4.6 The student will investigate and understand that there are relationships among Earth, the moon, and the sun. Key relationships include a) the motions of Earth, the moon, and the sun; b) the causes for Earth's seasons; c) the causes for the four major phases of the moon and the relationship to the tide cycles; and d) the relative size, position, age and makeup of Earth, the moon, and the sun.

4.7 The student will investigate and understand that the ocean environment has characteristics. Key characteristics include a) geology of the ocean floor; b) physical properties and movement of ocean water; and c) interaction of organisms in the ocean.

Earth Resources

4.8 The student will investigate and understand that Virginia has important natural resources. Key resources include a) watersheds and water; b) plants and animals; c) minerals, rocks, and ores; and d) forests, soil, and land.

Grade 4 Yearly Math Overview

Marking Period 1 8/24/23-10/27/23	Place Value, Addition, and Subtraction to One Million 4.1a, 4.1b, 4.1c, 4.4b, 4.4d	Multiply by 1-Digit Numbers 4.4a, 4.4b, 4.4d		Multiply by 2-Digit Numbers 4.4b, 4.4d	
Marking Period 2 11/1/23-3/1/24	Divide by 1-Digit Numbers 4.4c, 4.4d	Factors, Multiples, and Patterns 4.4a, 4.5a, 4.14a, 4.14b, 4.14c, 4.15, 4.16	Fraction Equivalence and Comparison 4.2a, 4.2b, 4.2c, 4.13a, 4.13b, 4.13c	Add and Subtract Fractions 4.5b, 4.5c, 4.15	Relate Fractions and Decimals 4.3a, 4.3b, 4.3c, 4.3d, 4.6a, 4.6b
Marking Period 3 3/5/24-6/11/24	Two-Dimensional Figures 4.10a, 4.10b, 4.11, 4.12, 4.15	Measurement Benchmarks 4.8a, 4.8b, 4.8c, 4.8d, 4.9, 4.15	Algebra: Perimeter and Area 4.7	Review	

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- To create and use a variety of representations in learning, doing, and communicating mathematics (**Representations**)

2023-2024 HCA 5th Grade STEAM Curriculum Map-at a Glance (Scope and Sequence)

Marking Period	Science Topic: <i>"Transforming matter and energy"</i>	Sci SOL	Math Topic	Math SOL
1	Scientific and Engineering Practices	5.1 (Ongoing)	<ul style="list-style-type: none"> Place Value, Multiplication, and Expressions Divide Whole Numbers Add and Subtract Decimals 	5.4, 5.7, 5.19a, 5.19b, 5.19c, 5.19d 5.4 5.1, 5.2b, 5.5b, 5.18
	Matter: Properties and Interactions	5.7		
2	Energy	5.2	<ul style="list-style-type: none"> Multiply Decimals Divide Decimals Add and Subtract Fractions with Unlike Denominators Multiply Fractions Algebra: Patterns and Graphing 	5.5a, 5.5b 5.5a, 5.5b 5.2a, 5.2b, 5.3a, 5.3b, 5.6a, 5.18 5.6b 5.15, 5.16a, 5.16b, 5.16c, 5.17a, 5.17b, 5.17c, 5.18
	Force and Motion	5.3		
	Electricity	5.4		
	Sound	5.5		
	Light	5.6		
3	Changing Earth	5.8	<ul style="list-style-type: none"> Convert Units of Measure Geometry and Volume 	5.4, 5.9a, 5.9b, 5.11 5.8a, 5.8b, 5.10, 5.12, 5.13a, 5.13b, 5.14a, 5.14b, 5.18
	Plate Tectonics	5.8		
	Rock Cycle	5.8		
	Conservation of Energy	5.9		

*5th Grade Science Scope and Sequence may vary this year due to the implementation process for the 2018 VDOE Science Standards. Essential Skills are listed with each SOL in the framework that follows. All essential skills should be covered with the related SOL.

5th Grade Science: *Transforming matter and energy*

Scientific and Engineering Practices

5.1 The student will demonstrate an understanding of scientific and engineering practices by a)asking questions and defining problems; b)planning and carrying out investigations; c)interpreting, analyzing, and evaluating data; d)constructing and critiquing conclusions and explanations; e)developing and using models; f)obtaining, evaluating, and communicating information

Force, Motion, and Energy

5.2 The student will investigate and understand that energy can take many forms. Key ideas include a)energy is the ability to do work or to cause change; b)there are many different forms of energy; c)energy can be transformed; and d)energy is conserved.

5.3 The student will investigate and understand that there is a relationship between force and energy of moving objects. Key ideas include a)moving objects have kinetic energy; b)motion is described by an object's direction and speed; c)changes in motion are related to net force and mass; d)when objects collide, the contact forces transfer energy and can change objects' motion; and e)friction is a force that opposes motion.

5.4 The student will investigate and understand that electricity is transmitted and used in daily life. Key ideas include a)electricity flows easily through conductors but not insulators; b)electricity flows through closed circuits; c)static electricity can be generated by rubbing certain materials together; d)electrical energy can be transformed into radiant, mechanical, and thermal energy; and e)a current flowing through a wire creates a magnetic field.

5.5 The student will investigate and understand that sound can be produced and transmitted. Key ideas include a)sound is produced when an object or substance vibrates; b)sound is the transfer of energy; c)different media transmit sound differently; and d)sound waves have many uses and applications.

5.6 The student will investigate and understand that visible light has certain characteristics and behaves in predictable ways. Key ideas include a)visible light is radiant energy that moves in transverse waves; b)the visible spectrum includes light with different wavelengths; c)matter influences the path of light; and d)radiant energy can be transformed into thermal, mechanical, and electrical energy.

Matter

5.7 The student will investigate and understand that matter has properties and interactions. Key ideas include a)matter is composed of atoms; b) substances can be mixed together without changes in their physical properties; and c) energy has an effect on the phases of matter.

Earth and Space Systems

5.8 The student will investigate and understand that Earth constantly changes. Key ideas include a)Earth's internal energy causes movement of material within the Earth; b)plate tectonics describe movement of the crust; c)the rock cycle models the transformation of rocks; d)processes such as weathering, erosion, and deposition change the surface of the Earth; and e) fossils and geologic patterns provide evidence of Earth's change.

Earth Resources

5.9 The student will investigate and understand that the conservation of energy resources is important. Key ideas include a)some sources of energy are considered renewable and others are not; b) individuals and communities have means of conserving both energy and matter; and c)advances in technology improve the ability to transfer and transform **energy**.

Grade 5 Yearly Math Overview

Marking Period 1 8/24/23-10/27/23	Place Value, Multiplication, and Expressions 5.4, 5.7, 5.19a, 5.19b, 5.19c, 5.19d		Divide Whole Numbers 5.4		Add and Subtract Decimals 5.1, 5.2b, 5.5b, 5.18
Marking Period 2 11/1/23-3/1/24	Multiply Decimals 5.5a, 5.5b	Divide Decimals 5.5a, 5.5b	Add and Subtract Fractions with Unlike Denominators 5.2a, 5.2b, 5.3a, 5.3b, 5.6a, 5.18	Multiply Fractions 5.6b	Algebra: Patterns and Graphing 5.15, 5.16a, 5.16b, 5.16c, 5.17a, 5.17b, 5.17c, 5.18
Marking Period 3 3/5/24-6/11/24	Convert Units of Measure 5.4, 5.9a, 5.9b, 5.11	Geometry and Volume 5.8a, 5.8b, 5.10, 5.12, 5.13a, 5.13b, 5.14a, 5.14b, 5.18		Review	

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