Virginia Standards of Learning Alignment

English (2017)

Legend

●	The standard is clearly addressed by program activities.
-	This standard potentially could be addressed as part of *FIRST*® LEGO® League Explore either by actions that the coach or teacher takes when working with the students or by conditions established by the program.

Grade 2

Cluster	Indicator	Indicator Statement	Addressed
Communication and Multimodal Literacies	2.1	The student will use oral communication skills.	●
	2.2	The student will demonstrate an understanding of oral early literacy skills.	●
Reading	2.3	The student will orally identify, produce, and manipulate various phonemes within words to develop phonemic awareness.	-
	2.4	The student will use phonetic strategies when reading and spelling.	●
	2.5	The student will use semantic clues and syntax to expand vocabulary when reading.	●
	2.6	The student will expand vocabulary and use of word meanings.	●
	2.7	The student will read and demonstrate comprehension of fictional texts.	-
	2.8	The student will read and demonstrate comprehension of nonfiction texts.	-
Writing	2.9	The student will maintain legible printing and begin to make the transition to cursive.	-
	2.10	The student will write in a variety of forms to include narrative, descriptive, opinion, and expository.	-
	2.11	The student will edit writing for capitalization, punctuation, spelling and Standard English.	-
Research	2.12	The student will conduct research by using available resources to gather information and answer questions to complete a research product.	-

Grade 3

Cluster	Indicator	Indicator Statement	Addressed
Communication and Multimodal Literacies	3.1	The student will use effective communication skills in a variety of settings.	●
	3.2	The student will give oral presentations.	●
Reading	3.3	The student will apply word-analysis skills when reading.	●
	3.4	The student will expand vocabulary when reading.	●
	3.5	The student will read and demonstrate comprehension of fictional texts, literary nonfiction, and poetry.	-
	3.6	The student will read and demonstrate comprehension of nonfiction texts.	-
Writing	3.7	The student will write legibly in cursive.	-
	3.8	The student will write in a variety of forms to include narrative, descriptive, opinion, and expository.	-
	3.9	The student will edit writing for capitalization, punctuation, spelling, and Standard English.	-
Research	3.10	The student will demonstrate comprehension of information resources to research a topic and complete a research product.	-

Grade 4

Cluster	Indicator	Indicator Statement	Addressed
Communication and Multimodal Literacies	4.1	The student will use effective oral communication skills in a variety of settings.	●
	4.2	The student will create and deliver multimodal, interactive presentations.	●
	4.3	The student will learn how media messages are constructed and for what purposes.	-
Reading	4.4	The student will expand vocabulary when reading.	●
	4.5	The student will read and demonstrate comprehension of fictional texts, literary nonfiction texts, and poetry.	-
	4.6	The student will read and demonstrate comprehension of nonfiction texts.	-
Writing	4.7	The student will write in a variety of forms to include narrative, descriptive, opinion, and expository.	-
	4.8	The student will self- and peer-edit writing for capitalization, spelling, punctuation, sentence structure, paragraphing, and Standard English.	-
Research	4.9	The student will demonstrate comprehension of information resources to create a research product.	-

Virginia Standards of Learning Alignment

Mathematics (2016)

Legend

•	The standard is clearly addressed by program activities.
-	This standard potentially could be addressed as part of *FIRST*® LEGO® League Explore either by actions that the coach or teacher takes when working with the students or by conditions established by the program.

Grade 2

Cluster	Indicator	Indicator Statement	Addressed
Number and Number Sense	2.1	The student will a. read, write, and identify the place and value of each digit in a three-digit numeral, with and without models; b. identify the number that is 10 more, 10 less, 100 more, and 100 less than a given number up to 999; c. compare and order whole numbers between 0 and 999; and d. round two-digit numbers to the nearest ten.	-
	2.2	The student will a. count forward by twos, fives, and tens to 120, starting at various multiples of 2, 5, or 10; b. count backward by tens from 120; and c. use objects to determine whether a number is even or odd.	
	2.3	The student will a. count and identify the ordinal positions first through twentieth, using an ordered set of objects; and b. write the ordinal numbers 1st through 20th.	-
	2.4	The student will a. name and write fractions represented by a set, region, or length model for halves, fourths, eighths, thirds, and sixths; b. represent fractional parts with models and with symbols; and c. compare the unit fractions for halves, fourths, eighths, thirds, and sixths, with models.	
Computation and Estimation	2.5	The student will a. recognize and use the relationships between addition and subtraction to solve single-step practical problems, with whole numbers to 20; and b. demonstrate fluency with addition and subtraction within 20.	
	2.6	The student will a. estimate sums and differences; b. determine sums and differences, using various methods; and c. create and solve single-step and two-step practical problems involving addition and subtraction.	
Measurement and Geometry	2.7	The student will a. count and compare a collection of pennies, nickels, dimes, and quarters whose total value is $2.00 or less; and b. use the cent symbol, dollar symbol, and decimal point to write a value of money.	
	2.8	The student will a. length to the nearest inch; and b. weight to the nearest pound.	-
	2.9	The student will tell time and write time to the nearest five minutes, using analog and digital clocks.	

	2.10	The student will a. determine past and future days of the week; and b. identify specific days and dates on a given calendar.	
	2.11	The student will read temperature to the nearest 10 degrees.	
	2.12	The student will a. draw a line of symmetry in a figure; and *b.* identify and create figures with at least one line of symmetry.	-
	2.13	The student will identify, describe, compare, and contrast plane and solid figures (circles/spheres, squares/cubes, and rectangles/rectangular prisms).	-
Probability and Statistics	2.14	The student will use data from probability experiments to predict outcomes when the experiment is repeated.	
	2.15	The student will a. collect, organize, and represent data in pictographs and bar graphs; and b. read and interpret data represented in pictographs and bar graphs.	
Patterns, Functions, and Algebra	2.16	The student will identify, describe, create, extend, and transfer patterns found in objects, pictures, and numbers.	-
	2.17	The student will demonstrate an understanding of equality through the use of the equal symbol and the use of the not equal symbol.	

Grade 3

Cluster	Indicator	Indicator Statement	Addressed
Number and Number Sense	3.1	The student will a. read, write, and identify the place and value of each digit in a six-digit whole number, with and without models; b. round whole numbers, 9,999 or less, to the nearest ten, hundred, and thousand; and c. compare and order whole numbers, each 9,999 or less.	-
	3.2	The student will a. name and write fractions and mixed numbers represented by a model; b. represent fractions and mixed numbers with models and symbols; and c. compare fractions having like and unlike denominators, using words and symbols (>, <, =, or ≠), with models.	
Computation and Estimation	3.3	The student will a. estimate and determine the sum or difference of two whole numbers; and b. create and solve single-step and multistep practical problems involving sums or differences of two whole numbers, each 9,999 or less.	
	3.4	The student will a. represent multiplication and division through 10 × 10, using a variety of approaches and models; b. create and solve single-step practical problems that involve multiplication and division through 10 x 10; and c. demonstrate fluency with multiplication facts of 0, 1, 2, 5, and 10; and d. solve single-step practical problems involving multiplication of whole numbers, where one factor is 99 or less and the second factor is 5 or less.	
	3.5	The student will solve practical problems that involve addition and subtraction with proper fractions having like denominators of 12 or less.	
Measurement and Geometry	3.6	The student will a. determine the value of a collection of bills and coins whose total value is $5.00 or less; b. compare the value of two sets of coins or two sets of coins and bills; and c. make change from $5.00 or less.	
	3.7	The student will estimate and use U.S. Customary and metric units to measure a. length to the nearest $\frac{1}{2}$ inch, inch, foot, yard, centimeter, and meter; and b. liquid volume in cups, pints, quarts, gallons, and liters.	-

	3.8	The student will estimate and a. measure the distance around a polygon in order to determine its perimeter using U.S. Customary and metric units; and b. count the number of square units needed to cover a given surface in order to determine its area.	
	3.9	The student will a. tell time to the nearest minute, using analog and digital clocks; b. solve practical problems related to elapsed time in one-hour increments within a 12-hour period; and c. identify equivalent periods of time and solve practical problems related to equivalent periods of time.	
	3.10	The student will read temperature to the nearest degree.	
	3.11	The student will identify and draw representations of points, lines, line segments, rays, and angles.	-
	3.12	The student will a. define polygon; b. identify and name polygons with 10 or fewer sides; and c. combine and subdivide polygons with three or four sides and name the resulting polygon(s).	
	3.13	The student will identify and describe congruent and noncongruent figures.	
Probability and Statistics	3.14	The student will investigate and describe the concept of probability as a measurement of chance and list possible outcomes for a single event.	
	3.15	The student will a. collect, organize, and represent data in pictographs or bar graphs; and b. read and interpret data represented in pictographs and bar graphs.	
Patterns, Functions, and Algebra	3.16	The student will identify, describe, create, and extend patterns found in objects, pictures, numbers and tables.	-
	3.17	The student will create equations to represent equivalent mathematical relationships.	

Grade 4

Cluster	Indicator	Indicator Statement	Addressed
Number and Number Sense	4.1	The student will a. read, write, and identify the place and value of each digit in a nine-digit whole number; b. compare and order whole numbers expressed through millions; and c. round whole numbers expressed through millions to the nearest thousand, ten thousand, and hundred thousand.	-
	4.2	The student will a. compare and order fractions and mixed numbers, with and without models; b. represent equivalent fractions; and c. identify the division statement that represents a fraction, with models and in context.	
	4.3	The student will a. read, write, represent, and identify decimals expressed through thousandths; b. round decimals to the nearest whole number; c. compare and order decimals; and d. given a model, write the decimal and fraction equivalents.	
Computation and Estimation	4.4	The student will a. demonstrate fluency with multiplication facts through 12 x 12, and the corresponding division facts; b. estimate and determine sums, differences, and products of whole numbers; c. estimate and determine quotients of whole numbers, with and without remainders; and d. create and solve single-step and multistep practical problems involving addition, subtraction, and multiplication, and single-step practical problems involving division with whole numbers.	

	4.5	The student will a. determine common multiples and factors, including least common multiple and greatest common factor; b. add and subtract fractions and mixed numbers having like and unlike denominators; and c. solve single-step practical problems involving addition and subtraction with fractions and mixed numbers.	
	4.6	The student will a. add and subtract with decimals; and b. solve single-step and multistep practical problems involving addition and subtraction with decimals.	
Measurement and Geometry	4.7	The student will solve practical problems that involve determining perimeter and area in U.S. Customary and metric units.	
	4.8	The student will a. estimate and measure length and describe the result in U.S. Customary and metric units; b. estimate and measure weight/mass and describe the result in U.S. Customary and metric units; c. given the equivalent measure of one unit, identify equivalent measures of length, weight/mass, and liquid volume between units within the U.S. Customary system; and d. solve practical problems that involve length, weight/mass, and liquid volume in U.S. Customary units.	
	4.9	The student will solve practical problems related to elapsed time in hours and minutes within a 12-hour period.	
	4.10	The student will a. identify and describe points, lines, line segments, rays, and angles, including endpoints and vertices; and b. identify and describe intersecting, parallel, and perpendicular lines.	
	4.11	The student will identify, describe, compare, and contrast plane and solid figures according to their characteristics (number of angles, vertices, edges, and the number and shape of faces) using concrete models and pictorial representations.	
	4.12	The student will classify quadrilaterals as parallelograms, rectangles, squares, rhombi, and/or trapezoids.	
Probability and Statistics	4.13	The student will a. determine the likelihood of an outcome of a simple event; b. represent probability as a number between 0 and 1, inclusive; and c. create a model or practical problem to represent a given probability.	
	4.14	The student will a. collect, organize, and represent data in bar graphs and line graphs; b. interpret data represented in bar graphs and line graphs; and c. compare two different representations of the same data (e.g., a set of data displayed on a chart and a bar graph, a chart and a line graph, or a pictograph and a bar graph).	
Patterns, Functions, and Algebra	4.15	The student will identify, describe, create, and extend patterns found in objects, pictures, numbers, and tables.	-
	4.16	The student will recognize and demonstrate the meaning of equality in an equation.	

Virginia Standards of Learning Alignment

Science (2018)

Legend

●	The standard is clearly addressed by program activities.
-	This standard potentially could be addressed as part of *FIRST*® LEGO® League Explore either by actions that the coach or teacher takes when working with the students or by conditions established by the program.

Grade 2

Cluster	Indicator	Indicator Statement	Addressed
Scientific and Engineering Practices	2.1	The student will demonstrate an understanding of scientific and engineering practices by	●
	2.1.a	*asking questions and defining problems* • *ask questions that can be investigated* • *make predictions based on observations and prior experiences* • *identify a simple problem that can be solved through the development of a new tool or improved object*	●
	2.1.b	*planning and carrying out investigations* • *with guidance, plan and conduct simple investigations to produce data* • *use appropriate tools to measure length, weight, and temperature of common objects using U.S. Customary units* • *measure time intervals using proper tools*	-
	2.1.c	*interpreting, analyzing, and evaluating data* • *organize and represent data in pictographs and bar graphs* • *read and interpret data represented in pictographs and bar graphs*	-
	2.1.d	*constructing and critiquing conclusions and explanations* • *make simple conclusions based on data or observations* • *distinguish between opinion and evidence* • *recognize unusual or unexpected results*	-
	2.1.e	*developing and using models* • *use models to demonstrate simple phenomena and natural processes*	●
	2.1.f	*obtaining, evaluating, and communicating information* • *communicate observations and data using simple graphs, drawings, numbers, speech, and/or writing*	●
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.	●
Matter	2.3	The student will investigate and understand that matter can exist in different phases.	
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.	
	2.5	The student will investigate and understand that living things are part of a system.	
Earth and Space Systems	2.6	The student will investigate and understand that there are different types of weather on Earth.	
	2.7	The student will investigate and understand that weather patterns and seasonal changes affect plants, animals, and their surroundings.	
Earth Resources	2.8	The student will investigate and understand that plants are important natural resources.	

Grade 3

Cluster	Indicator	Indicator Statement	Addressed
Scientific and Engineering Practices	3.1	The student will demonstrate an understanding of scientific and engineering practices by	●
	3.1.a	*asking questions and defining problems* • *ask questions that can be investigated and predict reasonable outcomes* • *ask questions about what would happen if a variable is changed* • *define a simple design problem that can be solved through the development of an object, tool, process, or system*	●
	3.1.b	*planning and carrying out investigations* • *with guidance, plan and conduct investigations* • *use appropriate methods and/or tools for collecting data* • *estimate length, mass, volume, and temperature* • *measure length, mass, volume, and temperature in metric and U.S. Customary units using proper tools* • *measure elapsed time* • *use tools and/or materials to design and/or build a device that solves a specific problem*	●
	3.1.c	*interpreting, analyzing, and evaluating data* • *organize and represent data in pictographs or bar graphs* • *read, interpret, and analyze data represented in pictographs and bar graphs* • *analyze data from tests of an object or tool to determine if it works as intended*	-
	3.1.d	*constructing and critiquing conclusions and explanations* • *use evidence (measurements, observations, patterns) to construct or support an explanation* • *generate and/or compare multiple solutions to a problem* • *describe how scientific ideas apply to design solutions*	●
	3.1.e	*developing and using models* • *use models to demonstrate simple phenomena and natural processes* • *develop a model (e.g., diagram or simple physical prototype) to illustrate a proposed object, tool, or process*	●
	3.1.f	*obtaining, evaluating, and communicating information* • *read and comprehend reading-level appropriate texts and/or other reliable media* • *communicate scientific information, design ideas, and/or solutions with others*	●
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.	●
Matter	3.3	The student will investigate and understand how materials interact with 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.	
	3.5	The student will investigate and understand that aquatic and terrestrial ecosystems support a diversity of organisms.	
Earth and Space Systems	3.6	The student will investigate and understand that soil is important in ecosystems.	
	3.7	The student will investigate and understand that there is a water cycle and water is important to life on Earth.	
Earth Resources	3.8	The student will investigate and understand that natural events and humans influence ecosystems.	

Grade 4

Cluster	Indicator	Indicator Statement	Addressed
Scientific and Engineering Practices	4.1	The student will demonstrate an understanding of scientific and engineering practices by	●
	4.1.a	*asking questions and defining problems* • *identify scientific and non-scientific questions* • *develop hypotheses as cause-and-effect relations* • *define a simple design problem that can be solved through the development of an object, tool, process, or system*	●
	4.1.b	*planning and carrying out investigations* • *identify variables when planning an investigation* • *collaboratively plan and conduct investigations* • *use tools and/or materials to design and/or build a device that solves a specific problem* • *take metric measurements using appropriate tools* • *measure elapsed time*	●
	4.1.c	*interpreting, analyzing, and evaluating data* • *organize and represent data in bar graphs and line graphs* • *interpret and analyze data represented in bar graphs and line graphs* • *compare two different representations of the same data (e.g., a set of data displayed on a chart and a graph)* • *analyze data from tests of an object or tool to determine whether it works as intended*	-
	4.1.d	*constructing and critiquing conclusions and explanations* • *use evidence (i.e., measurements, observations, patterns) to construct or support explanations and to make inferences*	-
	4.1.e	*developing and using models* • *develop and/or use models to explain natural phenomena* • *identify limitations of models*	●
	4.1.f	*obtaining, evaluating, and communicating information* • *read and comprehend reading-level-appropriate texts and/or other reliable media* • *communicate scientific information, design ideas, and/or solutions with others*	●
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.	
	4.3	The student will investigate and understand that organisms, including humans, interact with one another and with the nonliving components in the ecosystem.	
Earth and Space Systems	4.4	The student will investigate and understand that weather conditions and phenomena affect ecosystems and can be predicted.	
	4.5	The student will investigate and understand that the planets have characteristics and a specific place in the solar system.	
	4.6	The student will investigate and understand that there are relationships among Earth, the moon, and the sun.	
	4.7	The student will investigate and understand that the ocean environment has characteristics.	
Earth Resources	4.8	The student will investigate and understand that Virginia has important natural resources.	

Virginia Standards of Learning Alignment

Computer Science (2017)

Legend

●	The standard is clearly addressed by program activities.
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Grade 2

Cluster	Indicator	Indicator Statement	Addressed
Algorithms and Programming	2.1	The student will construct sets of step-by-step instructions (algorithms) both independently and collaboratively a. using sequencing; b. using loops (a wide variety of patterns such as repeating patterns or growing patterns); and c. identifying events.	●
	2.2	The student will construct programs to accomplish tasks as a means of creative expression using a block based programming language or unplugged activities, both independently and collaboratively a. using sequencing; b. using loops (a wide variety of patterns, such as repeating patterns or growing patterns); and c. identifying events.	●
	2.3	The student will analyze, correct, and improve (debug) an algorithm that includes sequencing and simple loops, with or without a computing device.	-
	2.4	The student will plan and create a design document to illustrate thoughts, ideas, and stories in a sequential (step-by-step) manner (e.g., story map, storyboard, sequential graphic organizer).	-
	2.5	The student will compare and contrast a group of items based on the attributes or actions of each item, with or without a computing device.	-
	2.6	The student will acknowledge that materials are created by others (e.g., author, illustrator, and website).	
Computing Systems	2.7	The student will describe the characteristics of computing systems to include hardware, software, input, and output.	-
	2.8	The will identify, using accurate terminology, simple hardware and software problems that may occur during use (e.g., app or program not working as expected, no sound, device won't turn on).	-
Cybersecurity	2.9	The student will explain what is allowed and what is not allowed at school associated with the use of technology (e.g., class rules).	
	2.10	The student will identify and create strong passwords, explain why strong passwords should be used. (e.g., protect name, address, and telephone number).	
Data and Analysis	2.11	The student will construct and analyze data and organize it in a chart or graph in order to make a prediction, with or without a computing device.	
	2.12	The student will create a model of a physical object or process in order to show relationships with or without a computing device (e.g., water cycle, butterfly life cycle, seasonal weather patterns).	●
Impacts of Computing	2.13	The student will compare and contrast examples of how computing technology has changed and improved the way people live, work, and interact.	-

	2.14	The student will identify and model responsible behaviors when using information and technology.	-
Networking and the Internet	2.15	The students will discuss, between partners and as a class, how information can be communicated electronically (e.g., email, social media, video conferencing, blogging).	-

Grade 3

Cluster	Indicator	Indicator Statement	Addressed
Algorithms and Programming	3.1	The student will construct sets of step-by-step instructions (algorithms) both independently and collaboratively a. using sequencing; b. using loops; c. using variables to store and process data; and d. performing number calculations on variables (e.g., addition, subtraction, multiplication and division).	●
	3.2	The student will construct programs to accomplish a task as a means of creative expression using a block or text based programming language, both independently and collaboratively a. using sequencing; b. using loops; c. using variables; and d. performing number calculations (e.g., addition, subtraction, multiplication and division) on variables.	●
	3.3	The student will analyze, correct, and improve (debug) an algorithm that includes sequencing, events, loops and variables.	-
	3.4	The student will create a plan as part of the iterative design process, both independently and collaboratively using strategies such as pair programming (e.g., storyboard, flowchart, pseudocode, story map).	-
	3.5	3The student will compare and contrast a group of items based on attributes or actions classified into at least two sets and two subsets.	
	3.6	The student will break down (decompose) a larger problem into smaller sub-problems, both independently and collaboratively.	-
	3.7	The student will give credit to sources when borrowing or changing ideas (e.g., using information, pictures created by others, using music created by others, remixing programming projects).	
Computing Systems	3.8	The student will model how a computing system works including input and output, processors, and sensors.	-
	3.9	The student will identify, using accurate terminology, simple hardware and software problems that may occur during use, and apply strategies for solving problems (e.g., rebooting the device, checking for power, checking for network availability, closing and reopening an app).	-
Cybersecurity	3.10	The student will identify and explain problems that relate to inappropriate use of computing devices and networks.	
	3.11	The student will create examples of strong passwords, explain why strong passwords should be used, and demonstrate proper use and protection of personal passwords.	
Data and Analysis	3.12	The student will use a computer to observe, analyze, and manipulate data in order to draw conclusions and make predictions.	
	3.13	The student will create an artifact using computing systems to model the attributes and behaviors associated with a concept (e.g., solar system).	●
	3.14	The student will use numeric values to represent non-numeric ideas in the computer (binary, ASCII, pixel attributes such as RGB).	

Impacts of Computing	3.15	The student will identify computing technologies that have changed the world and express how those technologies influence, and are influenced by, cultural practices.	-
	3.16	The student will identify the positive and negative impacts of the pervasiveness of computers and computing in daily life (e.g., downloading videos and audio files, electronic appliances, wireless Internet, mobile computing devices, GPS systems, wearable computing).	-
	3.17	The student will identify social and ethical issues that relate to computing devices and networks.	
Networking and the Internet	3.18	The students will discuss in partners and as a class that information can be transmitted using computing devices via a network (e.g., email, blogging, video messaging).	-

Grade 4

Cluster	Indicator	Indicator Statement	Addressed
Algorithms and Programming	4.1	The student will construct sets of step-by-step instructions (algorithms) both independently and collaboratively a. using sequencing; b. using loops; c. using variables to store and process data; and d. performing number calculations on variables (e.g., addition, subtraction, multiplication and division).	●
	4.2	The student will construct programs to accomplish tasks as a means of creative expression using a block or text based programming language, both independently and collaboratively a. using sequencing; b. using loops; c. using variables; and d. performing number calculations (e.g., addition, subtraction, multiplication and division) on variables.	●
	4.3	The student will analyze, correct, and improve (debug) an algorithm that includes sequencing, events, loops and variables.	-
	4.4	The student will create a plan as part of the iterative design process, both independently and collaboratively using strategies such as pair programming (e.g., storyboard, flowchart, pseudocode, story map).	-
	4.5	The student will classify and arrange a group of items based on the attributes or actions.	-
	4.6	The student will break down (decompose) a larger problem into smaller sub-problems, both independently and collaboratively.	-
	4.7	The student will give credit to sources when borrowing or changing ideas (e.g., using information, pictures created by others, using music created by others, remixing programming projects).	
Computing Systems	4.8	The student will model how a computing system works including input and output, processors, and sensors.	-
	4.9	The student will identify, using accurate terminology, simple hardware and software problems that may occur during use, and apply strategies for solving problems (e.g., rebooting the device, checking for power, checking for network availability, closing and reopening an app).	-
Cybersecurity	4.10	The student will identify and explain problems that relate to inappropriate use of computing devices and networks.	
	4.11	The student will create examples of strong passwords, explain why strong passwords should be used, and demonstrate proper use and protection of personal passwords.	

Data and Analysis	4.12	The student will use a computer to observe, analyze, and manipulate data in order to draw conclusions and make predictions.	
	4.13	The student will create an artifact using computing systems to model the attributes and behaviors associated with a concept (e.g., solar system).	●
	4.14	The student will use numeric values to represent non-numeric ideas in the computer (binary, ASCII, pixel attributes such as RGB).	-
Impacts of Computing	4.15	The student will give examples of computing technologies that have changed the world and express how those technologies influence, and are influenced by, cultural practices.	
	4.16	The student will describe the positive and negative impacts of the pervasiveness of computers and computing in daily life (e.g., downloading videos and audio files, electronic appliances, wireless Internet, mobile computing devices, GPS systems, wearable computing).	-
	4.17	The student will describe social and ethical issues that relate to computing devices and networks.	
Networking and the Internet	4.18	The student will identify and explain different ways information can be transmitted using computing devices via a network (e.g., email, images, and videos).	-