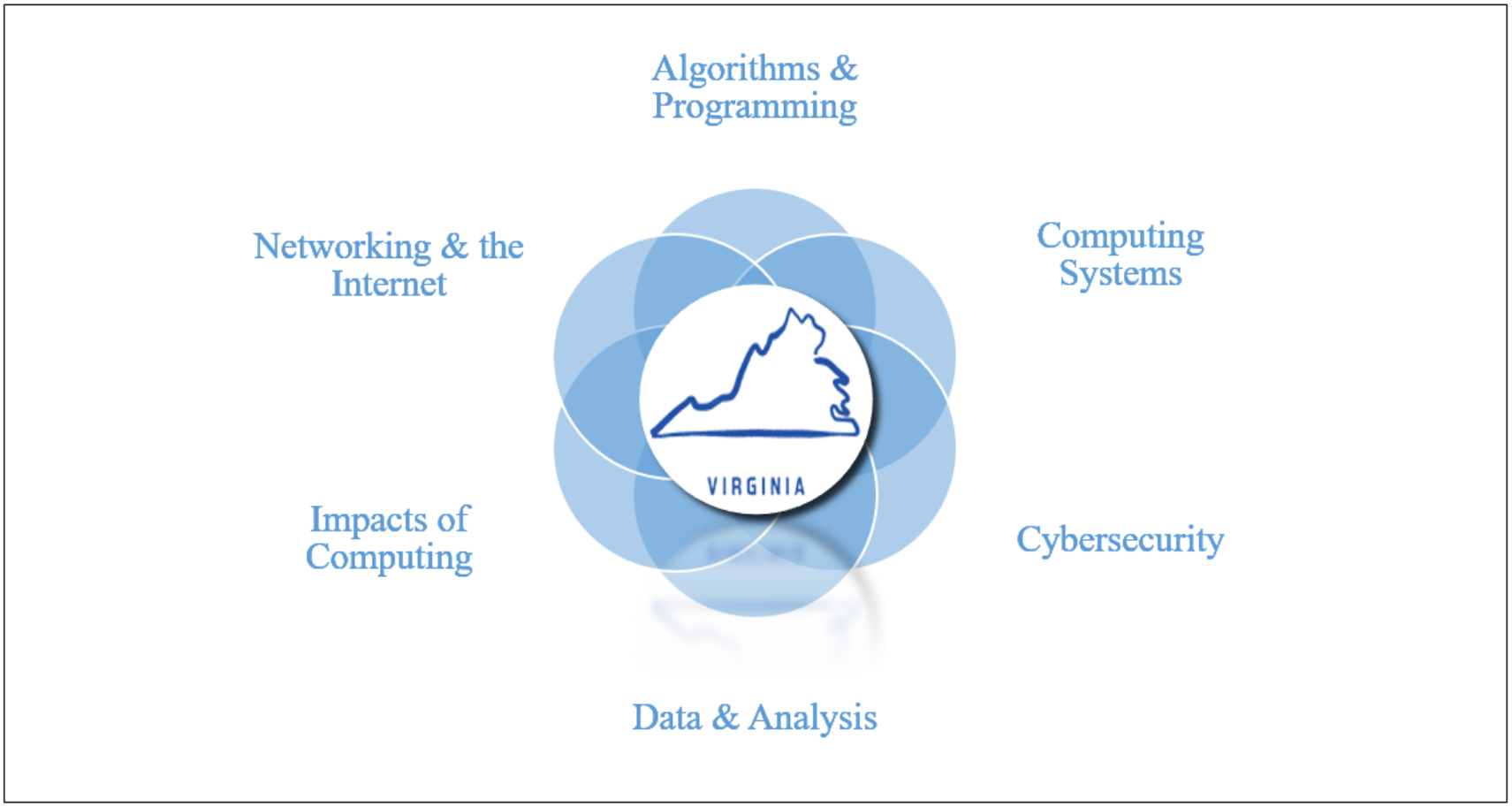
Computer Science Standards of Learning

Curriculum Framework



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The 2017 *Computer Science Curriculum Framework* can be found on the Virginia Department of Education's Web site.

Introduction

The *Computer Science Standards of Learning* Curriculum Framework amplifies the *Computer Science Standards of Learning for Virginia Public Schools* and defines the content knowledge, skills, and understandings that are measured by the Standards of Learning. The Computer Science Curriculum Framework provides additional guidance to school divisions and their teachers as they develop an instructional program appropriate for their students. It assists teachers as they plan their lessons by identifying essential questions and vocabulary to drive instruction and defining the essential skills students should demonstrate. This supplemental framework delineates in greater specificity the minimum content that all teachers should teach and all students should learn.

School divisions should use the *Computer Science Curriculum Framework* as a resource for developing sound curricular and instructional programs. This framework should not limit the scope of instructional programs. Additional knowledge and skills that can enrich instruction and enhance students' understanding of the content identified in the Standards of Learning should be included as part of quality learning experiences.

Each topic in the *Computer Science Standards of Learning* Curriculum Framework is developed around the Standards of Learning. The format of the Curriculum Framework facilitates teacher planning by broadening the context of the standards and identifying essential student skills that should be the focus of instruction for each standard.

Context of the Standard

The Context of the Standard provides educators an explanation of the standard, including a description and the vertical development of the concept. This context will support teachers in incorporating computer science content into discipline-specific lessons. The intention of the Computer Science standards in grades K-8 is that Computer Science principles be integrated throughout content area instruction.

Essential Skills

The Essential Skills define student performance expectations aligned to each standard. The intent of the K-8 computer science standards is that the concepts are integrated into existing disciplines and this will result in these skills being emphasized differently in each content area. The expectation is that these Essential Skills are partnered with content area performance expectations as appropriate in instruction. At the high school level, the expectations in the 2017 *Computer Science Standards of Learning Curriculum Framework* are to be used in the support of standalone computer courses; the essential skills outlined in the document are not intended to be integrated into other coursework unless a teacher chooses to use the content to support discipline practices.

Essential Questions
Each standard has identified key questions to drive classroom instruction. These questions lead teachers and students toward the big ideas of each concept and provide a more holistic viewpoint used to lead instruction relating to the context of each standard.

Essential Vocabulary
In order to effectively communicate Computer Science concepts, essential vocabulary terms are defined in grade-level appropriate terms. These definitions are found in the glossary (Appendix A).

Grade Three

The standards for third grade place an emphasis on decomposing larger problems and utilizing the iterative design process to develop a plan to construct and execute programs. Students in third grade are introduced to using computing systems to model attributes and behaviors associated with a concept. The accurate use of terminology as well as the responsible use of technology will continue to be built upon. The foundational understanding of computing and the use of technology will be an integral component of successful acquisition of skills across content areas.

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 (a wide variety of patterns such as repeating patterns or growing patterns); and
c. using events.

Context of the Standard
Algorithms are commonly used in school and at home as students engage in step by step activities that are done on a routine basis. Students can create algorithms as they describe and sequence tasks that are part of daily activities. Students can also use loops to repeat steps when a task requires a repeated action or actions. In third grade, the construction of loops becomes more complex as students use a wide variety of patterns to include repeating and growing patterns. In a repeating pattern the units of the pattern repeat and remain the same. In a growing pattern, an addition is added to the pattern causing the pattern to change every time it repeats. Growing patterns involve a progression from step to step which make them more difficult for students than repeating patterns. Repeating and growing patterns are foundational in mathematics in the development of algebraic reasoning and in computer science in developing computational thinking. Sample numeric patterns include: 6, 9, 12, 15, 18,....(growing pattern); 1, 2, 4, 7, 11, 16,….(growing pattern); 20, 18, 16, 14,…..(growing pattern); and

Context of the Standard
1, 3, 5, 1, 3, 5, 1, 3, 5,.....(repeating pattern). Students in third grade are expected to use events when constructing algorithms. In computer science, an event is an action or occurrence detected by a program. Events can be user actions, such as clicking a mouse button or pressing a key, or system occurrences, such as a timer or low battery.

Essential Skills	**Essential Questions**	**Essential Vocabulary**
Students should *demonstrate* these skills: • Identify and describe algorithms used to accomplish a variety of tasks. • Differentiate between growing and repeating patterns. • Describe how an event signals the start of an algorithm. • Construct algorithms that use loops and events. • Compare and contrast a repeating pattern and a growing pattern.	Students should *investigate* these concepts: • How do you decide when to use a loop in a sequence? • What are examples of repeating patterns and growing patterns? • What are examples of events in a plugged or an unplugged activity?	Students should *apply* these terms in context: • Algorithm • Loop • Event

3.2 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 (a wide variety of patterns such as repeating patterns or growing patterns); and
c. identifying events.

Context of the Standard
Computing enables people to use creative development processes to create computational artifacts for creative expression or to solve a problem. A computational artifact is anything created by a human using a computer. Examples of computation artifacts include programs, images, audio, videos, presentations, or web page files. Computing has the potential to provide students' opportunities to extend their creative expression to solve problems, create computational artifacts, and develop new knowledge. As students create block- and text-based programs, they move from being mere consumers of content to engaging in the subject matter by creating computational artifacts. In third grade, students are expected to use block-based or text-based programming to develop basic programs that include sequences, loops, and events. This may be the first time a student uses a text or block-based application to construct programs. Prior grades may have used unplugged activities when integrating computer science standards into instruction.

Essential Skills	**Essential Questions**	**Essential Vocabulary**
Students should *demonstrate* these skills: • Construct programs using text or block-based applications. • Modify programs to use loops when appropriate.	Students should *investigate* these concepts: • How would you write instructions for an action that repeats itself? • What are different ways that you can signal the start of a program? • How are loops and events used when constructing programs?	Students should *apply* these terms in context: • Algorithm • Loop • Repeat • Event

Essential Skills	Essential Questions	Essential Vocabulary
	• What are examples of creative products that you can use a sequence to make?	

3.3 The student will analyze, correct, and improve (debug) an algorithm that includes sequencing, events, and loops.

Context of the Standard
In order to determine if an algorithm is an appropriate reflection of the steps that must occur in order to complete a task, the students should check that the sequence of steps and any embedded loops that compose the algorithm work as intended. If the algorithm does not work as intended, the students should determine what changes could be made to the algorithm in order to complete the task. These changes may include adding, deleting, rearranging, or changing a step in order to obtain the intended outcome. This process can be conducted for both computer programs and unplugged activities. The process of revising a program so that is works as intended is called debugging.

Essential Skills	Essential Questions	Essential Vocabulary
Students should *demonstrate* these skills: • Describe how an algorithm did not work (e.g., character is not moving as intended). • Analyze a sequence of steps that is flawed and determine possible solution(s).	Students should *investigate* these concepts: • If your algorithm is not working, how could you find the error? • Once you have found an error in your algorithm, how do you decide what adjustment needs to be made? • How can the order of your steps affect what happens?	Students should *apply* these terms in context: • Bug • Debug • Program

Essential Skills	Essential Questions	Essential Vocabulary
• Implement a proposed adjustment to a sequence that did not work as intended.		

3.4 The student will create a plan as part of the iterative design process, independently and/or collaboratively using a variety of strategies (e.g., pair programming, storyboard, flowchart, pseudo-code, story map).

Context of the Standard
An iterative design process is a process in which there is repetition of steps of a process in order to generate a sequence of outcomes. Many occupations and content areas use an iterative design process, including computer science and engineering. In computer science, the development of programs uses an iterative process involving design, implementation, and review. The design stage occurs before writing code. This is a planning stage in which the programmers gather information about the problem and sketch out a solution. This design process may include the use of pseudocode - writing out the steps of a program in English to make sure the flow of control and logic make sense. During the implementation stage, the planned design is expressed in a programming language (code) that can be made to run on a computing device. During the review stage, the design and implementation are checked for adherence to program requirements, correctness, and usability. This review could lead to changes in implementation and possibly design, which demonstrates the iterative nature of the process. The student should focus on the planning portion of the iterative design process in third grade.

Essential Skills	Essential Questions	Essential Vocabulary
Students should *demonstrate* these skills:	Students should *investigate* these concepts:	Students should *apply* these terms in context:

Essential Skills	Essential Questions	Essential Vocabulary
• Design an algorithm using a planning tool. • Review and revise a plan to better fit the needs of a task. • Communicate how an iterative design process can improve an algorithm.	• How can you use planning tools to create a program (just like you would for a story)? • Why is reviewing and revising your work important? • Why is planning out a story or program an important part of the writing process?	• Storyboard • Graphic organizer • Pair programming

3.5 The student will compare and contrast a group of items based on attributes or actions classified into at least two sets and two subsets.

Context of the Standard
Objects and actions have attributes; these attributes allow people to group items into sets. Attributes may be physical properties, behaviors, or actions. Actions in computer science can be displayed as step-by-step sequences (algorithms). Categorizing of attributes or actions relies on careful observation of patterns and similarities and differences. In this standard, students are expected to analyze sets of items and compare and contrast the attributes that led to the development of the set. Students can use additional attributes to categorize sets into subsets. In block-based programming environments, commands are grouped into categories based on function. In higher level programming languages, data are often classified by the type and format of the information.

Essential Skills	Essential Questions	Essential Vocabulary
Students should *demonstrate* these skills: • Name multiple ways to sort a set of objects. • Sort and group (classify) objects into appropriate sets (categories) based on multiple attributes. • Classify objects into subsets based on a secondary attribute. • Label attributes of a set of objects that has been sorted.	Students should *investigate* these concepts: • Why is it useful to sort objects into sets and why is it helpful in our daily lives? • (Given a set of objects) How many different ways can you find to organize these objects? • How are items organized with multiple attributes? • What attributes can be used to divide a set into subsets? • Why is the sorting of attributes important for computer science?	Students should *apply* these terms in context: • Subset

3.6 The student will break down (decompose) a larger problem into smaller subproblems, independently or collaboratively.

Context of the Standard
When approaching a task it is sometimes easier to break the problem down into manageable chunks. Programs can also be broken down into smaller parts to facilitate their design, implementation, and review. This is called program decomposition. Decomposition helps in addressing aspects of program development, such as testing, by allowing people to focus on one piece at a time. Decomposition also enables different people to work on different parts of a program at the same time. An example of decomposition at this level is creating an animation by separating a story into different scenes. For each scene, a background needs to be selected, characters placed, and actions programmed. The instructions required to program each scene may be similar to instructions in other programs. Programs can also be built by adding together these smaller components to complete a task. In third grade, students are expected to break down large problems into subproblems when designing or debugging programs.

Essential Skills	Essential Questions	Essential Vocabulary
Students should *demonstrate* these skills: • Analyze a problem and determine sets of smaller problems. • Explain why dividing problems into subproblems will help in completing a project and in planning or testing programs.	Students should *investigate* these concepts: • If you have a big job to do, what are ways you can break it down to make it easier? • Why does breaking a problem down into smaller problems make the overall task easier?	Students should *apply* these terms in context: • Decompose

3.7 The student will give credit to sources when borrowing or changing ideas (e.g., using information and pictures created by others, using music created by others, remixing programming projects).

Context of the Standard
As students start to work with different artifacts (reference materials, resources, etc.) they should understand that these sources of information were created by others. Authors, illustrators, and programmers are responsible for the creation of many sources of information that are used in the classroom and at home. As students choose to use, reference, or modify some of these sources in their own work, they are expected to recognize the original creator of the source. This practice should be reiterated throughout a student's K-12 education and beyond. Other topics related to copyright are plagiarism, fair use, and properly citing online sources. Knowledge of specific copyright laws is not an expectation at this level. This standard supports English standards as they learn about plagiarism in writing. *Students are introduced to these concepts but are not responsible for specific citing practices in third grade.*

Essential Skills	Essential Questions	Essential Vocabulary
Students should *demonstrate* these skills: • Review a program they created and identify portions that are created by others. • Explain why it is important to give credit to authors. • Describe when it is acceptable to use people's work, and how to give credit to sources.	Students should *investigate* these concepts: • How can you find the creator of an artifact? • What are examples of artifacts that need to need to have their creators credited? • Why is important to give credit for using someone else's idea, even if you aren't quoting them directly?	Students should *apply* these terms in context: • Author • Illustrator • Composer

Computing Systems

3.8 The student will model how a computing system works including input and output.

Context of the Standard
A system is defined as a regularly interacting or interdependent group of items forming a unified whole. Systems always have inputs and outputs. In computer science, input and output, also referred to as I/O, is the communication between an information processing system, such as a computer, and the outside world, possibly a human or another information processing system. Inputs are the signals or data received by the system; these include electricity, the movements and clicks of your mouse, and the keys you type on a keyboard. An output is whatever comes out of the system; for example, outputs include data and what can be seen on the computer screen.

Essential Skills	**Essential Questions**	**Essential Vocabulary**
Students should *demonstrate* these skills: • Describe how a computing system may take in input. • Describe how a computing system may produce output. • Model a simple computing system indicating inputs and outputs.	Students should *investigate* these concepts: • What is a system? • Why are computers considered a system? • What are the different types of output that a computer can produce?	Students should *apply* these terms in context: • Computing system • Input • Output

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 network availability, closing and reopening an app).

Context of the Standard
As with any system, there are times that a computer system does not work as intended. Although computing systems may vary, common troubleshooting strategies can be used on them, such as checking connections and power, or swapping a working part in place of a potentially defective part. Rebooting a machine is commonly effective because it resets the computer. Since computing devices are composed of an interconnected system of hardware and software, troubleshooting strategies may need to address both. Common troubleshooting strategies, such as checking that power is available, checking that physical and wireless connections are working, and clearing out the working memory by restarting programs or devices, are effective for many systems. Students in third grade are expected to use accurate terminology to describe simple problems with computer hardware and software.

Essential Skills	**Essential Questions**	**Essential Vocabulary**
Students should *demonstrate* these skills: • Identify when a device or program is not working properly. • Communicate that a device or program is not working. • Perform simple troubleshooting tasks (e.g., rebooting the computer).	Students should *investigate* these concepts: • How can you tell a computer is not working as intended? • How can you find out specifically why your computer is not working? • What are different troubleshooting tactics you should try if a program is not working? • Why is it important to be as specific as possible when you are describing a problem?	Students should *apply* these terms in context: • Reboot • Troubleshoot

Cybersecurity

3.10 The student will identify problems that relate to inappropriate use of computing devices and networks.

Context of the Standard
Computer networks, including the Internet, can be used to connect people to other people, places, information, and ideas. In order to keep students safe, schools and divisions have rules on the appropriate use of technology. As students increase their use of the networks and interact with others outside of the school or home environment, digital safety is an increasing concern. Students should be aware of what is allowed and not allowed when using division/school technology. Appropriate use of technology as well as school and division rules when using technology should be reviewed with students on a regular basis. Consistent monitoring of students when engaged with technology should be conducted at all times.

Essential Skills	**Essential Questions**	**Essential Vocabulary**
Students should *demonstrate* these skills: • Identify causes and effects related to inappropriate use of computing devices. • Identify real-life situations they encounter while using computing devices that could cause problems in school or at home. • Describe how a technology-related problem could be avoided or prevented.	Students should *investigate* these concepts: • What is appropriate use of technology? • If you see someone using technology inappropriately in school, how should you notify the proper person? • What are some consequences of inappropriate use of computing technology?	Students should *apply* these terms in context: • Computing device

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.

Context of the Standard
Connecting devices to a network or the Internet provides great benefit, but care must be taken to protect private information such as a student's name, phone number, and address. Passwords are used to protect devices and information from unauthorized access. Because computer programs can be used to guess passwords, strong passwords have characteristics that make them more difficult to guess. Many sites have rules as to the length and composition of passwords; these rules help create stronger passwords. The practice of not sharing passwords should be emphasized in the classroom and at home. At the elementary level, students are encouraged to use passwords. These passwords may not be as complex as those used by adults in protecting information. Suggestions for creating strong passwords for students include: 1. Use uppercase and lowercase letters. 2. Use numbers. 3. Use symbols. 4. Use at least 8 characters. 5. Don't use words from a dictionary. 6. Don't use the same password twice. 7. Don't use personal information.

Essential Skills	**Essential Questions**	**Essential Vocabulary**
Students should *demonstrate* these skills: • Explain how a password helps protect the privacy of information. • Respect other students' password privacy. • Explain how logging off devices can protect your information. • Classify passwords as strong or weak.	Students should *investigate* these concepts: • What are the components of a strong password? • Why should you change your password periodically? • Why should you have a different password for different accounts?	Students should *apply* these terms in context: • Password

Data and Analysis

3.12 The student will use a computer to observe and analyze data in order to draw conclusions and make predictions.

Context of the Standard
When answering questions about text in history or English or investigating a question in science, evidence should be used to support your answer. Data are a form of evidence that can be used when answering questions or in making predictions. One way to access data is through the computer. The computer can be used to construct tables and graphs from data collected in class; it can also be the source of existing data sets that have been compiled by others. The ability to determine what type of data is needed to answer a question and use a computer to find these data are skills needed in many career and academic fields.

Essential Skills	**Essential Questions**	**Essential Vocabulary**
Students should *demonstrate* these skills: • Use a computer to organize data using various forms of data collection. • Analyze a data set to identify a pattern or make a prediction. • Use data to answer a question or make a prediction.	Students should *investigate* these concepts: • What can you learn from looking at your data in different ways? • How can you use the data you have collected to make a prediction or answer a question? • How does a computer help you to look at data in different ways?	Students should *apply* these terms in context: • Data • Prediction

3.13 The student will create an artifact using computing systems to model the attributes and behaviors associated with a concept (e.g., day and night, animal life cycles, plant life cycles).

Context of the Standard
Scientists, computer scientists, mathematicians, and programmers construct and use models to better conceptualize and understand phenomena under investigation or to develop a possible solution to a proposed problem. Models include diagrams, physical replicas, mathematical representations, analogies, and computer simulations. Models are used to represent a system (or parts of a system) under study, to aid in the development of questions and explanations, to generate data that can be used to make predictions, and to communicate ideas to others.

Essential Skills	**Essential Questions**	**Essential Vocabulary**
Students should *demonstrate* these skills: • Create an artifact to model a concept using a computing system. • Describe how a model reflects the attributes or behaviors of a concept.	Students should *investigate* these concepts: • What are examples of models that we see and use regularly? • What are examples of things in the world that you can model? • What kinds of things do you need to know before you begin to make a model? • How does a computer model help us learn and predict things about systems?	Students should *apply* these terms in context: • Model

Impacts of Computing

3.14 The student will identify computing technologies that have changed the world and express how those technologies influence, and are influenced by, cultural practices.

Context of the Standard
The development and modification of computing technology is driven by people's needs and wants. New computing technology is created and existing technologies are modified to increase their benefits (e.g., Internet search recommendations), decrease their risks (e.g., autonomous cars), and meet societal demands (e.g., smartphone apps). Computing technologies influence, and are influenced by, cultural practices. Increased Internet access and speed have allowed people to share cultural information but have also affected the practice of traditional cultural customs. An example of this is that people collaborate and communicate in different ways than they did decades ago. Storytelling and the sharing of information that was conducted between people in a face-to-face environment now happens virtually much of the time.

Essential Skills	**Essential Questions**	**Essential Vocabulary**
Students should *demonstrate* these skills: • Identify computing technologies that have changed the world. • Explain how the technology is influenced by culture. • Explain how the culture can affect the technology.	Students should *investigate* these concepts: • What are examples of computing technologies that changed the world? • How has technology, like mobile phones, changed society? • How does society influence the technology that we invent? • If you could design a new computing technology, what would it do, and why?	Students should *apply* these terms in context: • Internet

3.15 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).

Context of the Standard
The use of technology, including computers, has allowed for global communication and has revolutionized the everyday access of information, whether for business, scientific or personal use. Although there are many positive impacts in using technology, there are also times when computer use has impacted us in undesirable ways. As computer technology continues to advance and new generations of machines grow faster and have greater capabilities, the machines become more deeply fixed in daily life, magnifying both the benefits and the downside risks. Positive impacts include easy access to information, automated machinery, and fast and accurate data processing. Negative impacts include an increase in sedentary lifestyles, family and leisure interruption, and loss of privacy.

Essential Skills	**Essential Questions**	**Essential Vocabulary**
Students should *demonstrate* these skills: • Identify how the use of computers and computing positively influences daily life. • Identify how the use of computers and computing negatively influences daily life.	Students should *investigate* these concepts: • How do computing devices make your life easier? • How have computing devices made people's lives more complicated? • What are ways to limit the negative influences of computing devices?	Students should *apply* these terms in context:

3.16 The student will identify social and ethical issues that relate to computing devices and networks.

Context of the Standard
People can work in different places and at different times to collaborate and share ideas when they use technologies that reach across the globe. These social interactions affect how local and global groups interact with each other. As with any social interaction, there are manners that people should use when interacting with others. The use of manners when collaborating or interacting with others through computing devices or networks is more complex since many times the communication is done without seeing the person on the other side of the communication. Care should be taken when sharing information so that the intent of the message is not misunderstood by the person on the other end of the communication. In addition, due to the anonymous nature of online communication, intimidating and inappropriate behavior in the form of cyberbullying may occur. Cyberbullying is a form of bullying that occurs when online communications are sent that are intimidating or threatening in nature.

Essential Skills	**Essential Questions**	**Essential Vocabulary**
Students should *demonstrate* these skills: • Identify problems that arise from computer use. • Determine solutions to common computer use issues.	Students should *investigate* these concepts: • How could computing technology make it easier for people to engage in negative behavior? • What should you do if you see other people using a computer to do harm to others? • What is cyberbullying?	Students should *apply* these terms in context: • Cyberbullying

Networking and the Internet

3.17 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).

Context of the Standard
Just like electricity travels through a closed circuit, information in a computing system needs a physical or wireless path to travel to be sent and received. Information is broken into smaller pieces that are sent independently and reassembled at the destination. There are physical paths for communicating information, such as ethernet cables, and wireless paths, such as WiFi. Often, information travels on a combination of physical and wireless paths; for example, wireless paths originate from a physical connection point. At this level, the priority is understanding that there are different ways to transfer information, rather than the details of how routers and switches work and how to compare paths. *Students are not expected to know the exact mechanisms for conducting the transmission in third grade.*

Essential Skills	**Essential Questions**	**Essential Vocabulary**
Students should *demonstrate* these skills: • Identify types of electronic communications (e.g., email, blogging, text messaging, video messaging). • Discuss the different types of information that can be communicated through different transmission media. • Explain that electronic pathways are needed to transfer information within computing systems.	Students should *investigate* these concepts: • What are the different types of electronic communication? • How do you decide which method of communication is best for a particular situation? • How does information travel from computing device to computing device?	Students should *apply* these terms in context: • Network • Email • Blog • Text message • Video conferencing

Grade 3

Term	Definition
Algorithm	Sequence of steps that completes a task
Attribute	Physical description of an object (e.g., color, shape, size)
Author	The creator of a book, image, song, or object
Blog	An informal website that is regularly updated by an individual or group
Bug	An error or flaw in a program that causes it to give the wrong answer or crash
Composer	The creator of an audio artifact (e.g., song)
Computing device	An electronic device that can store and receive information
Computing system	Interconnected computers or computer components that work to accomplish large tasks
Cyberbullying	The use of electronic communication to bully a person
Data	Individual facts and information
Debug	Find and fix problems in a program
Decompose	Breaking a complex problem into parts that are easier to understand and solve
Email	Program used to communicate online
Event	Something that causes a portion of a program to run (e.g., a mouse click)
Graphic organizer	A visual display of facts, terms, and ideas
Illustrator	Creator of a visual artifact (e.g., image or painting)

Term	Definition
Input	Data that is taken in by a computer for processing
Internet	A global computer network that allows people to communicate, create, and share content
Loop	A set of actions repeated until a condition is met
Model	Creating a representation of an idea, object, or a process
Network	A group of computers that can communicate directly with each other
Output	Data that is produced by a computer as a result of a program
Pair Programming	Two people working at one computer to create a program
Password	A secret word or phrase that must be used to gain admission to something
Planning tool	A document or other resource to help organize thoughts in the creation of a product
Prediction	Making a guess of what will happen based on current facts
Program	An algorithm that has been coded into something that can be run by a machine
Reboot	Turn off a computer and then turn it on again
Repeat	To perform an action or set of actions multiple times in a row
Storyboard	A sequence of drawings that represent the order of a program happening
Subset	A group within a group
Text message	Electronic communication usually sent between mobile phones
Troubleshoot	Identify and correct faults in a computing system

Term	Definition
Video conferencing	Communicating with someone on the Internet with both audio and video