



*The Natrona
County School
District
empowers every
learner to grow,
excel, and be
successful
contributors to
the local and
global
community.*

Computer Science Curriculum Grade 2 August 2022

Natrona County School District #1 Computer Science Curriculum

Timeline of NCSD Computer Curriculum Versions		
Date	Version	Details
August 2021	Draft K-12 Computer Science Curriculum	2020-2021 School Year • The Computer Science Subject Area Committee wrote the draft K-12 curriculum. ◦ Suggested curriculum integration opportunities were included in the following K-5 curricula: English Language Arts, Math, Science, and Social Studies. August 2021 • The Computer Science Draft Curriculum version was published and open for validation comments.
August 2022	Final K-12 Computer Science Curriculum	2021-2022 School Year • The Computer Science Subject Area Committee validated the K-12 computer science draft curriculum. August 2022 • The NCSD Board of Education approved the K-12 computer science final curriculum.

Acknowledgements

Thank you to the members of the Computer Science Subject Area Committee for your hard work on this curriculum:

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We would like to acknowledge and thank the creators of two documents that were used by permission for the development of this curriculum.

- [K12 Computer Science Framework](#)
- [Arizona Computer Science Standards](#)

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Introduction

NCS D#1 Computer Science Mission Statement

Students completing the NCS D #1 Computer Science Curriculum will become computer literate problem solvers, critical thinkers, collaborators, and be prepared for the ever changing technology they will encounter.

Purpose

The purpose of this document is to communicate the guaranteed and viable curriculum for Computer Science in Natrona County School District. This document has been aligned with the [2020 Computer Science Wyoming Content and Performance Standards](#). However, our curriculum will continue to evolve as we work to ensure our students have the knowledge and skills they need to be successful in the 21st Century.

Rationale

Computing is fundamental to understanding and participating in an increasingly technological society, and it is essential for every Wyoming student to learn as part of their education. Computer science is a subject that provides students with a critical lens for interpreting the world around them and challenges them to explore how computing and technology can expand Wyoming's impact on the world.

The computer science standards provide the necessary foundation for local school district decisions about curriculum, instruction, and assessment. Implementation of these standards will better prepare Wyoming high school graduates for the rigors of college and/or a career. In turn, Wyoming employers will be able to hire workers with a strong foundation in Computer Science — both in specific content areas and in critical thinking and inquiry-based problem solving.

Computer Science is the study of computing principles, design, and applications (hardware and software). It also embraces the creation, access, and use of information through algorithms and problem solving, and the impact of computing on society.

Computational thinking is a necessary and meaningful 21st-century skill. Computational thinking is defined as the thought process involved in formulating a problem and expressing solutions in such a way that a computer can effectively carry them out. Computational thinking develops into competencies in problem solving, critical thinking, productivity, and creativity. Over time, engaging in computational thought builds a student's capacity to persevere, work efficiently, gain confidence, recognize and resolve ambiguity, generalize concepts, and communicate effectively. In order to adapt to global advancements in technology, students will need to use their computational thinking skills to formulate, articulate, and discuss solutions in a meaningful manner.

Organization of Standards

Domain

The core concepts to be studied in computer science are as follows: 1) Computing Systems, 2) Networks and the Internet, 3) Data and Analysis, 4) Algorithms and Programming, and 5) Impacts of Computing.

Content Standards

Content standards define what students are expected to know and be able to do throughout their study of computer science. They do not dictate what methodology or instructional materials should be used.

Benchmarks

Benchmarks are the skills students must master in order to demonstrate proficiency of the content standards throughout the grade band. In grades 9- 12, benchmarks are organized into 2 levels. Generally, Level 1 is intended to represent the introductory level while Level 2 reaches a deeper level.

Benchmark Code: Grade.Domain.Standard.Benchmark#

Example: 2.CS.D.01 = 2nd Grade.Computing Systems.Devices.Benchmark #1

(see [2020 Computer Science Wyoming Content and Performance Standards](#) page 3)

Domain	Computing Systems (CS)	Networks and the Internet (NI)	Data and Analysis (DA)	Algorithms and Programming (AP)	Impacts of Computing (IC)
Standard	Devices (D)	Network Communication and Organization (NCO)	Storage (S)	Algorithms (A)	Culture (C)
	Hardware and Software (HS)	Cybersecurity (C)	Collection, Visualization, and Transformation (CVT)	Variables (V)	Social Interactions (SI)
	Troubleshooting (T)		Inference and Models (IM)	Control (C)	Safety, Law, and Ethics (SLE)
				Modularity (M)	
				Program Development (PD)	

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Computer Science Plugged-In Benchmarks and Computer Science Practices

Plugged-In Benchmarks

This symbol designates when a benchmark may require hardware, software, or both in order to fully address the intent of the benchmark.

NCSD #1 Computer Science Plugged In Benchmarks					
Domain	K-2	3-5	6-8	HS Level 1	HS Level 2
Computing Systems (CS)	2.CS.D.01 2.CS.T.01	5.CS.T.01	8.CS.HS.01*		
Networks and the Internet (NI)			8.NI.C.01*		
Data and Analysis (DA)	2.DA.S.01	5.DA.S.01*	8.DA.CVT.01* 8.DA.IM.01	L1.DA.CVT.01* L1.DA.IM.01	L2.DA.CVT.01 L2.DA.CVT.02*
Algorithms and Programming (AP)	2.APC.01* 2.APPD.03*	5.AP.V.01* 5.APC.01*	8.APC.01* 8.APPD.02	L1.APA.01* L1.AP.V.01 L1.APC.03* L1.APM.01* L1.APPD.01* L1.APPD.06	L2.APM.03 L2.APPD.01 L2.APPD.02 L2.APPD.03 L2.APPD.05*
Impacts of Computing (IC)	2.IC.SI.01*	5.IC.C.02 5.IC.SI.02*	8.IC.SI.02	L1.IC.C.02 L1.IC.SI.02	L2.IC.SI.01

*NCSD Priority Benchmark

Computer Science Practices

There are seven Computer Science Practices that can be used as the standards and benchmarks are taught and measured. These seven Computer Science Practices are listed below and are more deeply explored in [Appendix A: Descriptions of the CS Practices](#).

- Practice 1. Fostering an Inclusive Computing Culture
- Practice 2. Collaborating Around Computing
- Practice 3. Recognizing and Defining Computational Problems
- Practice 4. Developing and Using Abstractions
- Practice 5. Creating Computational Artifacts
- Practice 6. Testing and Refining Computational Artifacts
- Practice 7. Communicating About Computing

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Grades K-2 Summary of Purpose Statements

Grades K-2	A Purpose Statement describes the focus of the subject at this grade level. A Purpose Statement points out what is new or different at this level that the student will accomplish.
Kindergarten	By the end of Kindergarten, the computer science literate student will begin the practices of utilizing devices to perform basic computer operations, such as turning a computer on and off, and communicating basic hardware and software problems. Kindergarten students will be able to explain the importance of password protection and discuss how computer networks can connect people globally. With teacher assistance, kindergarten students will begin to develop an understanding of how to model and develop algorithms and programs, and collect data to make predictions. Students will be introduced to the impacts of computing, including how people lived and worked before and after the implementation of new technology, how to work responsibly online, and the importance of keeping login information private.
Grade 1	By the end of first grade, the computer science literate student will recognize user needs and preferences while utilizing devices to perform basic computer operations, hardware, software, and apply basic troubleshooting strategies. Students will explain the importance of and practice password protection. They will discuss how computer networks can connect people globally. With teacher guidance, students will collect, transform, and explain how different types of data can be stored and retrieved from a computing device. First grade students will develop an understanding of how to model and identify algorithms and programs using step by step instructions. First grade students will discuss the impacts of computing, how to work responsibly online, the importance of keeping login information private and logging off devices appropriately.
Grade 2	In second grade, students will expand their basic knowledge of digital literacy and computer science skills. By the end of second grade, students will be able to select appropriate devices and software to perform specific tasks. Students will understand that computing systems use both hardware and software to process information and will be able to use basic troubleshooting strategies with teacher guidance. Second grade students will independently collect, transform, and display data using digital devices. With guidance, students can store, copy, search, retrieve, modify, and delete information using a computing device. With guidance, second grade students will create and follow algorithms and programs to solve a problem. Students will decompose steps into simpler tasks and give credit to the ideas and creations of others. Second grade students will discuss the impacts of technology in their daily lives, and in their community. Students will identify appropriate manners while participating in an online environment, including the use of digital citizenship, and know how to identify and report inappropriate behavior.

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Grades K-5 District Priority Benchmarks

The district priority benchmarks are those benchmarks all students are expected to learn by the end-of-the grade band. They specify the specific degree of understanding or demonstration of knowledge and/or skills for a particular content standard. Teachers should provide extra focus, target supports, and offer multiple opportunities to demonstrate student understanding (mastery). They can be done through observation, student demonstration, and formative, interim, and summative assessments.

The NCSD Computer Science Priority Benchmarks are the Performance Standards identified in the 2020 Computer Science Wyoming Content and Performance Standards.

K-5 Locations of District Priority Benchmarks NCSD Computer Science Curriculum							
Domain	Outcome in Curriculum	Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Impacts of Computing (IC)	1	2.IC.SI.01				5.IC.SI.02	5.IC.SLE.01
Computing Systems (CS)	2	2.CS.HS.01				5.CS.HS.01	
Networks and the Internet (NI)	3		2.NI.C.01				5.NI.C.01
Data and Analysis (DA)	4				5.DA.IM.01		5.DA.S.01
Algorithms (AP)	5		2.APM.01	2.APA.01 2.APC.01 2.APPD.03	5.APA.01 5.APC.01	5.APPD.03	5.APV.01

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Grade 2 Computer Science Integration Opportunities

The Computer Science Final Curriculum includes suggested curriculum integration opportunities in the K-5 English Language Arts, math, science, and social studies curriculums.

Some computer science components can be taught in conjunction with specific English Language Arts, math, science, and social studies components. Throughout the computer science curriculum, there are links to those components within the English Language Arts, math, science, and social studies curriculums.

Within the English Language Arts, math, science, and social studies curriculums the integration opportunities are highlighted with a computer science symbol. There are links from those components back to the computer science components that are connected to the opportunity.

Grade 2 Location of Integration Opportunities in the NCSD Computer Science Curriculum											
Computer Science				Integration Opportunities							
Domain	Outcome	Standard	Benchmark	English Language Arts		Math		Science		Social Studies	
				Outcome	Component	Outcome	Benchmark	Outcome	Component	Outcome	Component
Impacts of Computing (IC)	1	Culture (C)	2.IC.C.01							ss.2.2	ss.2.2.5
										ss.2.4	ss.2.4.5
Data and Analysis (DA)	4	Inference and Models (IM)	2.DA.IM.01			7	2.MD.I.10.A-B	S.2.1	S.2.1.2		
								S.2.3	S.2.3.3		
Algorithms (AP)	5	Algorithms (A)	2.APA.01*	ELA.2.4	ELA.2.4.3						
		Control (C)	2.APC.01*	ELA.2.4	ELA.2.4.3						
					ELA.2.4.4						
		Program Development (PD)	2.APPD.01	ELA.2.4	ELA.2.4.3						
			2.APPD.02	ELA.2.4	ELA.2.4.3	3	2.NBTE.7.A				
						3	2.NBTE.7.B				
						3	2.NBTE.7.C				
						3	2.NBTE.9				

*NCSD Priority Benchmark

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Grades K-5 How to Read the NCSD Computer Science Curriculum

The **Purpose Statement** describes the focus of the subject at the grade level or course. It points out what is new or different at the level that the student will accomplish.

Kindergarten Purpose Statement

By the end of Kindergarten, the computer science literate student will begin the practices of utilizing devices to perform basic computer operations, such as turning a computer on and off, and communicating basic hardware and software problems. Kindergarten students will be able to explain the importance of password protection and discuss how computer networks can connect people globally. With teacher assistance, kindergarten students will begin to develop an understanding of how to model and develop algorithms and programs, and collect data to make predictions. Students will be introduced to the impacts of computing, including how people lived and worked before and after the implementation of new technology, how to work responsibly online, and the importance of keeping login information private.

The **Outcome Description** is aligned to the Standards and Performance Expectations (Benchmarks). Outcomes are the expected result of student learning for a grade level or course.

Kindergarten Outcome 1

Outcome Description

Computing affects many aspects of the world in both positive and negative ways at local, national, and global levels. Individuals and communities influence computing through their behaviors and cultural and social interactions, and in turn, computing influences new cultural practices. An informed and responsible person should understand the social implications of the digital world, including equity and access to computing.

Why Computer Science Content and Performance Standards in this outcome:

- IC.SI — Impacts of Computing. Social Interactions

NCSD Priority Benchmarks in this outcome:

- 2.IC.SI.01
 - Steps 1-2 and the benchmark are taught in Grades K-2.

The **Content and Performance Standards** addressed in the outcome are listed.

The **District Priority Benchmarks** addressed in the outcome are listed.

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The **components** are the specific concepts or skills necessary for students to know and do in order to meet an outcome. The components are listed in a suggested order to be taught in each outcome.

The components are either the benchmarks (word-for-word from the WY State standards) or steps that lead up to them. If the actual benchmark is found in the outcome, it is always last in the sequence of steps.

Notes are included for every benchmark sequence to help clarify.

The **Computer Science Practice Standard(s)** for each benchmark are listed.

Links to other curriculum are found in the **Suggested Curriculum Integration** column.

District **Priority** Benchmarks are noted under the benchmark code.

2.IC.SI.01
Priority



The **Plugged In Symbol** is noted under the benchmark code.

Benchmark	Components for Kindergarten Outcome 1			Suggested Curriculum Integration
Domain: Impacts of Computing (IC) / Standard: Social Interactions (SI)				
2.IC.SI.01 Notes Step 1 Step 2 Benchmark	Steps 1-2 and the benchmark are taught in Grades K-2. The priority benchmark is part of the Kindergarten District Assessment System. Practice 2.1 Collaborating Around Computing			
	With guidance, identify appropriate manners while participating in an online environment, including the use of digital citizenship.			
	With guidance, identify appropriate and inappropriate behavior. Act responsibly and use appropriate behavior while participating in an online community and know how to report concerns.			
	Practice grade-level appropriate behavior and responsibilities while participating in an online community. Identify and report inappropriate behavior. Learning Targets: - Identify appropriate behavior while participating in an online community. - Demonstrate appropriate behavior while participating in an online community. - Identify inappropriate behavior while participating in an online community. - Report inappropriate behavior while participating in an online community.			Social Studies ss.K.1.2

Every District Priority Benchmark has **Learning Targets** included. They are found in a shaded row.

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Grades K-2 Sequence of Steps and Benchmarks by Outcome

Grades K-2 Location of Steps and Benchmarks by Outcome in the NCSD Computer Science Curriculum						
Domain	Outcome in Curriculum	Standard	Benchmark	Kindergarten	Grade 1	Grade 2
Impacts of Computing (IC)	1	Culture (C)	2.IC.C.01			Steps 1-2 and Benchmark
		Social Interactions (SI)	2.IC.SI.01 (Priority)	Steps 1-2 and Benchmark	Steps 1-2 and Benchmark	Steps 1-2 and Benchmark
		Safety, Law, and Ethics (SLE)	There are no SLE benchmarks in the K-2 grade band.			
Computing Systems (CS)	2	Devices (D)	2.CS.D.01	Step 1	Step 2	Benchmark
		Hardware and Software (HS)	2.CS.HS.01 (Priority)	Steps 1-2 and Benchmark		
		Troubleshooting (T)	2.CS.T.01	Steps 1-2	Step 2 and Benchmark	
Networks and the Internet (NI)	3	Network Communication and Organization (NCO)	2.NI.NCO.01	Step 1	Step 2 and Benchmark	
		Cybersecurity (C)	2.NI.C.01 (Priority)	Step 1	Step 2 and Benchmark	
Data and Analysis (DA)	4	Storage (S)	2.DA.S.01	Step 1	Step 1	Step 2 and Benchmark
		Collection, Visualization, and Transformation (CVT)	2.DA.CVT.01	Step 1	Benchmark	
		Inference and Models (IM)	2.DA.IM.01	Step 1	Step 2	Benchmark
Algorithms (AP)	5	Algorithms (A)	2.APA.01 (Priority)		Step 1	Step 2 and Benchmark
		Variables (V)	2.AP.V.01	Step 1	Step 2	Benchmark
		Control (C)	2.APC.01 (Priority)		Steps 1-2	Benchmark
		Modularity (M)	2.APM.01 (Priority)	Steps 1-2	Step 3 and Benchmark	
		Program Development (PD)	2.APPD.01		Step 1	Benchmark
			2.APPD.02	Step 1	Step 2	Benchmark
			2.APPD.03 (Priority)	Step 1	Steps 1-2	Benchmark
			2.APPD.04		Steps 1-2	Benchmark

Grade 2 Outcomes and Components

Grade 2 Computer Science Purpose Statement

In second grade, students will expand their basic knowledge of digital literacy and computer science skills. By the end of second grade, students will be able to select appropriate devices and software to perform specific tasks. Students will understand that computing systems use both hardware and software to process information and will be able to use basic troubleshooting strategies with teacher guidance. Second grade students will independently collect, transform, and display data using digital devices. With guidance, students can store, copy, search, retrieve, modify, and delete information using a computing device. With guidance, second grade students will create and follow algorithms and programs to solve a problem. Students will decompose steps into simpler tasks and give credit to the ideas and creations of others. Second grade students will discuss the impacts of technology in their daily lives, and in their community. Students will identify appropriate manners while participating in an online environment, including the use of digital citizenship, and know how to identify and report inappropriate behavior.

Grade Outcome

2 1 Impacts of Computing

Grade 2 Outcome 1

Outcome Description

Computing affects many aspects of the world in both positive and negative ways at local, national, and global levels. Individuals and communities influence computing through their behaviors and culture and social interactions, and in turn, computing influences new cultural practices. An informed and responsible person should understand the social implications of the digital world, including equity and access to computing.

Standards are broken down by benchmarks and are listed in the component column of the document.

WY Computer Science Content and Performance Standards in this outcome:

- IC.C — Impacts of Computing. Culture
- IC.SI — Impacts of Computing. Social Interactions

District Priority Benchmarks in this outcome:

- 2.IC.SI.01
 - Steps 1-2 and the benchmark are taught in Grades K-2.

Benchmark

Components for Grade 2 Outcome 1

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Domain: Impacts of Computing (IC) / Standard: Culture (C)			
2.IC.C.01	2.IC.C.01 Notes	Steps 1-2 and the benchmark are taught in Grade 2. Practice 3.1 Recognizing and Defining Computational Problems	Suggested Curriculum Integration
	Step 1	Define technology and discuss different ways in which technology is used in your (student's) daily life.	Social Studies ss.2.2.5 ss.2.4.5
	Step 2	Identify how people use different types of technologies in their daily work and personal lives.	
	Benchmark	Describe how people use different types of technologies in their daily work and personal lives. Example(s) and/or Clarification: • Computing technology has positively and negatively changed the way people live and work. In the past, if students wanted to read about a topic, they needed access to a library to find a book about it. Today, students can view and read information on the Internet about a topic or they can download e-books about it directly to a device. Such information may be available in more than one language and could be read to a student, allowing for great accessibility. • Can be integrated with Social Studies standards (listed below). Consider including current events. • Students will describe tools and technology they use in their daily lives that make their lives easier and more sustainable. (SS.2.2.5) • Students will use digital tools to research current technology tools that will change their lives, or the lives of the people in their community. (SS.2.4.5)	

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Benchmark	Components for Grade 2 Outcome 1		
Domain: Impacts of Computing (IC) / Standard: Social Interactions (SI)			
2.IC.SI.01 Priority	2.IC.SI.01 Notes	Steps 1-2 and the benchmark are taught in Grades K-2. Practice 2.1 Collaborating Around Computing	Suggested Curriculum Integration
	Step 1	With guidance, identify appropriate manners while participating in an online environment, including the use of digital citizenship.	Computer Science
	Step 2	With guidance, identify appropriate and inappropriate behavior. Act responsibly and use appropriate behavior while participating in an online community and know how to report concerns.	
	Benchmark	Practice grade-level appropriate behavior and responsibilities while participating in an online community. Identify and report inappropriate behavior. Example(s) and/or Clarification: - Online communication facilitates positive interactions, such as sharing ideas with many people, but the public and anonymous nature of online communication also allows intimidating and inappropriate behavior in the form of cyberbullying. Students could share their work on blogs or in other collaborative spaces online, taking care to avoid sharing information that is inappropriate or that could personally identify them to others. Students could provide feedback to others on their work in a kind and respectful manner. They should tell an adult if others are sharing things they should not share or are treating others in an unkind or disrespectful manner online. Privacy should be considered when posting information online: such information can persist for a long time and be accessed by others, even unintended viewers. - Can be integrated with behavior expectations, anti-bullying discussions, and as part of a social emotional curriculum.	
		Learning Targets: - Demonstrate appropriate behavior while participating in an online community. (DOK 2 Skill/Concept) - Report inappropriate behavior while participating in an online community. (DOK 2 Skill/Concept)	

Grade	Outcome
2	2 Computing Systems
Grade 2 Outcome 2	
Outcome Description People interact with a wide variety of computing devices that collect, store, analyze, and act upon information in ways that can affect human capabilities both positively and negatively. The physical components (hardware) and instructions (software) that make up a computing system communicate and process information in digital form. An understanding of hardware and software is useful when troubleshooting a computing system that does not work as intended. Standards are broken down by benchmarks and are listed in the component column of the document. WY Computer Science Content and Performance Standards in this outcome: • CS.D — Computing Systems. Devices District Priority Benchmarks in this outcome: • none	

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Benchmark		Components for Grade 2 Outcome 2	
Domain: Computing Systems (CS) / Standard: Devices (D)			
2.CS.D.01 	2.CS.D.01 Notes	Step 1 is taught in Kindergarten. Step 2 is taught in Grade 1. The benchmark is taught in Grade 2. Practice 3.1 Recognizing and Defining Computational Problems	Suggested Curriculum Integration
	Benchmark	Independently select and use a computing device to perform a variety of tasks for an intended outcome (e.g., create an artifact). Example(s) and/or Clarification: ● People use computing devices to perform a variety of tasks accurately and quickly. Students should be able to select the appropriate app/program to use for tasks they are required to complete. For example, if students are asked to draw a picture, they should be able to open and use a drawing app/program to complete this task, or if they are asked to create a presentation, they should be able to open and use presentation software. In addition, with teacher guidance, students should identify and discuss preferences for software with the same primary functionality. ● Provide students with opportunities to independently complete tasks using a variety of computing devices and programs. For example, students can choose a project from a digital choice board and select the most appropriate device and program to complete the task.	Computer Science

Grade	Outcome
2	3 Networks and the Internet
Grade 2 Outcome 3	
There are no Networks and the Internet components for Grade 2.	

Grade Outcome

2 4 Data and Analysis

Grade 2 Outcome 4

Outcome Description

Computing systems exist to process data. The amount of digital data generated in the world is rapidly expanding, so the need to process data effectively is increasingly important. Data is collected and stored so that it can be analyzed to better understand the world and make more accurate predictions.

Standards are broken down by benchmarks and are listed in the component column of the document.

WY Computer Science Content and Performance Standards in this outcome:

- DA.S — Data and Analysis. Storage
- DA.IM — Data and Analysis. Inference and Models

District Priority Benchmarks in this outcome:

- none

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Benchmark		Components for Grade 2 Outcome 4	
Domain: Data and Analysis (DA) / Standard: Storage (S)			
2.DA.S.01 	2.DA.S.01 Notes	Step 1 is taught in Kindergarten and Grade 1. Step 2 and the benchmark are taught in Grade 2. Practice 4.2 Developing and Using Abstractions	Suggested Curriculum Integration
	Step 2	With guidance, locate, open, modify and save an existing file, and use appropriate file-naming conventions. Recognize that the file exists within an organizational structure (drive, folder, file).	Computer Science
	Benchmark	With guidance, develop and modify an organizational structure by creating, copying, moving, and deleting files and folders. Example(s) and/or Clarification: • When creating files teach students to name the files and create folders to organize their drive so they can locate files later • Teach students to copy, move, and delete files and folders.	
Domain: Data and Analysis (DA) / Standard: Inference and Models (IM)			
2.DA.IM.01	2.DA.IM.01 Notes	Step 1 is taught in Kindergarten. Step 2 is taught in Grade 1. The benchmark is taught in Grade 2. Practice 4.1 Developing and Using Abstractions	Suggested Curriculum Integration
	Benchmark	With guidance, interpret data and present it in a chart or graph (visualization) in order to make a prediction, with or without a computing device. Example(s) and/or Clarification: • In math, students can draw graphs for various purposes. For example, students can chart the weather or conduct surveys and share the results using a variety of graphs, such as bar graphs, pie charts, or pictographs. Students can interpret data and make predictions about that data. For example, they can compare the colors of candy in a bag, and make predictions about how many pieces of each color are in the bag. (2.MD.I.10.A-B) • In science, students will observe, collect and record data on properties of materials. (S.2.1.2) • In science, students will collect, record and organize data of living things in different habitats. (S.2.3.2) • Organize and represent data with digital tools such as Google Forms, Google Sheets, pictographs on abcya.com.	Science S.2.1.2 S.2.3.3 Math Outcome 7 2.MD.I.10.A-B

Grade Outcome

2 5 Algorithms and Programming

Grade 2 Outcome 5

Outcome Description

An algorithm is a sequence of steps designed to accomplish a specific task. Algorithms are translated into programs, or code, to provide instructions for computing devices. Algorithms and programming control all computing systems, empowering people to communicate with the world in new ways and solve compelling problems. The development process to create meaningful and efficient programs involves choosing which information to use and how to process and store it, breaking apart large problems into smaller ones, recombining existing solutions, and analyzing different solutions.

Standards are broken down by benchmarks and are listed in the component column of the document.

WY Computer Science Content and Performance Standards in this outcome:

- APA — Algorithms and Programming. Algorithms
- AP.V — Algorithms and Programming. Variables
- APC — Algorithms and Programming. Control
- AP.PD — Algorithms and Programming. Program Development

District Priority Benchmarks in this outcome:

- 2.APA.01
 - Step 1 is taught in Grade 1. Step 2 and the benchmark are taught in Grade 2.
- 2.APC.01
 - Steps 1-2 are taught in Grade 1. The benchmark is taught in Grade 2.
- 2.APPD.03
 - Step 1 is taught in Kindergarten. Steps 1-2 are taught in Grade 1. The benchmark is taught in Grade 2.

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Benchmark		Components for Grade 2 Outcome 5	
Domain: Algorithms (AP) / Standard: Algorithms (A)			
2.APA.01 <			

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Benchmark	Components for Grade 2 Outcome 5 Continued		
Domain: Algorithms (AP) / Standard: Variables (V)			
2.AP.V.01	2.AP.V.01 Notes	Step 1 is taught in Kindergarten. Step 2 is taught in Grade 1. The benchmark is taught in Grade 2. Practice 4.1 Developing and Using Abstractions	Suggested Curriculum Integration
	Benchmark	Model the way programs store and manipulate data by using numbers or other symbols to represent information (e.g., thumbs up/down as representations of yes/no, arrows when writing algorithms to represent direction, or encode and decode words using numbers, pictographs, or other symbols to represent letters or words).	Computer Science

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Benchmark	Components for Grade 2 Outcome 5 Continued		
Domain: Algorithms (AP) / Standard: Control (C)			
2.APC.01 Priority 	2.APC.01 Notes	Steps 1-2 are taught in Grade 1. The benchmark is taught in Grade 2. Practice 5.2 Creating Computational Artifacts	Suggested Curriculum Integration
	Benchmark	With guidance, independently and collaboratively create programs to accomplish tasks using a programming language, robot device, or unplugged activity that includes sequencing, conditionals, and repetition. Example(s) and/or Clarification: - Students can write procedural texts with step by step directions. Students would use transition words to indicate sequencing. Students give credit to where they got their information. (ELA.2.4.3) - Students can use online coding resources or robotic devices (code.org, pencil.net, scratch code, Ozobot, etc.) to create and follow algorithms to complete tasks.	Computer Science ELA ELA.2.4.3 ELA.2.4.4
		Learning Targets: - Create, collaboratively and independently, programs to accomplish tasks with an unplugged activity. (DOK 4 Extended Reasoning) - Create, collaboratively and independently, programs to accomplish tasks with a programming language or a robotic device. (DOK 4 Extended Reasoning) - Define conditionals. (DOK 1 Recall) - Create programs that include sequencing, conditionals, and repetition. (DOK 4 Extended Reasoning) Vocabulary: - conditionals	

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Benchmark	Components for Grade 2 Outcome 5 Continued		
Domain: Algorithms (AP) / Standard: Program Development (PD)			
2.AP.PD.01	2.AD.PD.01 Notes	Step 1 is taught in Grade 1. The benchmark is taught in Grade 2. Practice 5.1 Creating Computational Artifacts Practice 7.2 Communicating About Computing	Suggested Curriculum Integration
	Benchmark	Develop plans that describe a program's sequence of events, goals, and expected outcomes. Example(s) and/or Clarification: Students can write procedural texts with step by step directions. Students would use transition words to indicate sequencing. Students give credit to where they got their information. (ELA.2.4.3)	Computer Science ELA ELA.2.4.3
2.AP.PD.02	2.AP.PD.02 Notes	Step 1 is taught in Kindergarten. Step 2 is taught in Grade 1. The benchmark is taught in Grade 2. Practice 7.3 Communicating About Computing	Suggested Curriculum Integration
	Benchmark	Give credit to ideas, creations, and solutions of others while writing and developing programs. Example(s) and/or Clarification: - Students can write procedural texts with step by step directions. Students would use transition words to indicate sequencing. Students give credit to where they got their information. (ELA.2.4.3) - In Math, students develop and share strategies for adding and subtracting. Students will explain and give credit to how other strategies work. (2.NBTE.7.A-C) and (2.NBTE.9)	Computer Science ELA ELA.2.4.3 Math Outcome 3 2.NBTE.7.A 2.NBTE.7.B 2.NBTE.7.C 2.NBTE.9

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Benchmark	Components for Grade 2 Outcome 5 Continued		
2.AP.PD.03 Priority 	2.AP.PD.03 Notes	Step 1 is taught in Kindergarten. Steps 1-2 are taught in Grade 1. The benchmark is taught in Grade 2. Practice 6.2 Testing and Refining Computational Artifacts	Suggested Curriculum Integration
	Benchmark	Independently and collaboratively debug (identify and fix errors) programs using a programming language. Learning Targets: - Identify, collaboratively and independently, program errors, using a programming language. (DOK 1 Recall) - Fix, collaboratively and independently, program errors, using a programming language. (DOK 3 Strategic Thinking) Vocabulary: - debug, error	Computer Science
2.AP.PD.04	2.AP.PD.04 Notes	Steps 1-2 are taught in Grade 1. The benchmark is taught in Grade 2. Practice 7.2 Communicating About Computing	Suggested Curriculum Integration
	Benchmark	Use correct terminology (debug, program input/output, code) to explain the development of a program or an algorithm (e.g., in an unplugged activity, hands on manipulatives, or a programming language).	Computer Science



Long-Range Plan

Reviewed & Revised Annually

Subjects	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	28/29
ELA	C	VC	A/R	VA		*C/VC	*VC			C	VC	A/R	VA		
Health	C	VC	A/R	VA					C	VC	A/R	VA			
PE		C	VC	A/R	VA				C	VC	A/R	VA			
Social Studies		C	VC	**VC	A/R	VA	VA	***C/VC				C	VC	A/R	VA
FPA		C	VC	A/R	VA				C	VC	A/R	VA			
Foreign Language			C	VC	A/R	VA	VA			C	VC	A/R	VA		
CVE			C	VC	A/R	VA	VA					C	VC	A/R	VA
Science				C	VC	A/R	VA						C	VC	A/R
Math	VC, VA	A	VA			C	VC	A/R	VA						C
Computer Science							C	VC	A/R	VA					
Math Extended Standards				C/A	VA			C/A	VA				C/A	VA	
ELA Extended Standards					C/A			VA						C/A	VA
Science Extended Standards							C/A	VA							C/A

Key

C	Development of Draft Curriculum	VC	Implementation and Validation of Draft Curriculum	A/R	Development of Assessments / Resource Selection	VA	Implementation and Validation of Assessments
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Reviewed and revised annually

Date(s): Developed 12.1.15, Updated 3.31.16, Updated 5.4.17, Updated 2.14.18, Updated 2.1.19, Updated 7.16.19, Updated 1.9.20, Updated 5.12.20, Updated 10.22.20, Updated 5.13.21, Updated 1.5.22

*realignment of ELA curriculum grades 3-5

**addition of Native American Education for K-12

***realignment of SS curriculum grades 8-10