

# K-12 CSTA Standards Alignment



Grades K-5					
Identifier	Grade Level	Description	Concept	Tynker Courses	
				Core	Elective
1A-CS-01	K-2	Select and operate appropriate software to perform a variety of tasks, and recognize that users have different needs and preferences for the technology they use.	Computing Systems	<a href="#">Icon Coding</a> <a href="#">All About Computers I</a> <a href="#">Space Cadet</a> <a href="#">Dragon Spells</a> <a href="#">Programming 1A</a> <a href="#">Programming 1B</a>	<a href="#">Barbie You Can Be Anything</a>
1A-CS-02	K-2	Use appropriate terminology in identifying and describing the function of common physical components of computing systems (hardware).	Computing Systems	<a href="#">All About Computers I</a>	
1A-CS-03	K-2	Describe basic hardware and software problems using accurate terminology.	Computing Systems	<a href="#">All About Computers I</a>	
1A-NI-04	K-2	Explain what passwords are and why we use them, and use strong passwords to protect devices and information from unauthorized access.	Networks & the Internet	<a href="#">All About Computers I</a>	

1A-DA-05	K-2	Store, copy, search, retrieve, modify, and delete information using a computing device and define the information stored as data.	Data & Analysis	<a href="#">All About Computers I</a>	
1A-DA-06	K-2	Collect and present the same data in various visual formats.	Data & Analysis	<a href="#">All About Computers I</a>	
1A-DA-07	K-2	Identify and describe patterns in data visualizations, such as charts or graphs, to make predictions.	Data & Analysis	<a href="#">All About Computers I</a>	
1A-AP-08	K-2	Model daily processes by creating and following algorithms (sets of step-by-step instructions) to complete tasks.	Algorithms & Programming	<a href="#">All About Computers I</a> <a href="#">Programming 1A</a> <a href="#">Programming 1B</a>	
1A-AP-09	K-2	Model the way programs store and manipulate data by using numbers or other symbols to represent information.	Algorithms & Programming	<a href="#">Icon Coding</a> <a href="#">Space Cadet</a> <a href="#">Dragon Spells</a> <a href="#">Programming 1A</a> <a href="#">Programming 1B</a>	<a href="#">Barbie You Can Be Anything</a>
1A-AP-10	K-2	Develop programs with sequences and simple loops, to express ideas or address a problem.	Algorithms & Programming	<a href="#">Space Cadet</a> <a href="#">Programming 1A</a> <a href="#">Programming 1B</a>	<a href="#">Barbie You Can Be Anything</a>
1A-AP-11	K-2	Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions.	Algorithms & Programming	<a href="#">Space Cadet</a> <a href="#">Dragon Spells</a> <a href="#">Programming 1A</a> <a href="#">Programming 1B</a>	<a href="#">Barbie You Can Be Anything</a>
1A-AP-12	K-2	Develop plans that describe a program's sequence of events, goals, and expected outcomes.	Algorithms & Programming	<a href="#">Programming 1A</a>	
1A-AP-13	K-2	Give attribution when using the ideas and	Algorithms & Programming	<a href="#">All About Computers I</a>	

		creations of others while developing programs.			
1A-AP-14	K-2	Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops.	Algorithms & Programming	<a href="#">Space Cadet Programming 1A</a> <a href="#">Programming 1B</a>	<a href="#">Barbie You Can Be Anything</a>
1A-AP-15	K-2	Using correct terminology, describe steps taken and choices made during the iterative process of program development.	Algorithms & Programming	<a href="#">Programming 1A</a> <a href="#">Programming 1B</a>	<a href="#">Barbie You Can Be Anything</a>
1A-IC-16	K-2	Compare how people live and work before and after the implementation or adoption of new computing technology.	Impacts of Computing	<a href="#">All About Computers I</a>	
1A-IC-17	K-2	Work respectfully and responsibly with others online.	Impacts of Computing	<a href="#">All About Computers I</a>	
1A-IC-18	K-2	Keep login information private, and log off of devices appropriately.	Impacts of Computing	<a href="#">All About Computers I</a>	
1B-CS-01	3-5	Describe how internal and external parts of computing devices function to form a system.	Computing Systems	<a href="#">All About Computers II</a>	<a href="#">WeDo Coding micro: bit 101</a>
1B-CS-02	3-5	Model how computer hardware and software work together as a system to accomplish tasks.	Computing Systems	<a href="#">All About Computers II</a>	<a href="#">WeDo Coding micro: bit 101</a>
1B-CS-03	3-5	Determine potential solutions to solve simple hardware and software problems using common troubleshooting strategies.	Computing Systems	<a href="#">All About Computers II</a>	<a href="#">WeDo Coding micro: bit 101</a>
1B-NI-04	3-5	Model how information is broken down into smaller pieces, transmitted as packets through multiple devices over networks and the Internet, and reassembled at the destination.	Networks & the Internet	<a href="#">All About Computers II</a>	

1B-NI-05	3-5	Discuss real-world cybersecurity problems and how personal information can be protected.	Networks & the Internet	<a href="#">All About Computers II</a>	
1B-DA-06	3-5	Organize and present collected data visually to highlight relationships and support a claim.	Data & Analysis	<a href="#">All About Computers II</a>	
1B-DA-07	3-5	Use data to highlight or propose cause-and-effect relationships, predict outcomes, or communicate an idea.	Data & Analysis	<a href="#">All About Computers II</a>	
1B-AP-08	3-5	Compare and refine multiple algorithms for the same task and determine which is the most appropriate.	Algorithms & Programming	<a href="#">Dragon Spells Programming 100</a> <a href="#">Life Science 101</a> <a href="#">All About Computers II</a>	<a href="#">micro:bit 101</a>
1B-AP-09	3-5	Create programs that use variables to store and modify data.	Algorithms & Programming	<a href="#">Physical Science 101</a> <a href="#">Math 101</a> <a href="#">English 101</a>	<a href="#">Augmented Reality</a> <a href="#">WeDo Coding</a> <a href="#">micro:bit 101</a> <a href="#">Artificial Intelligence 101</a>
1B-AP-10	3-5	Create programs that include sequences, events, loops, and conditionals.	Algorithms & Programming	<a href="#">Dragon Spells Programming 100</a> <a href="#">Programming 101</a> <a href="#">Programming 102</a> <a href="#">Programming 201</a> <a href="#">Programming 202</a> <a href="#">Life Science 101</a> <a href="#">Physical Science 101</a> <a href="#">Earth Science 101</a> <a href="#">Math 101</a> <a href="#">Social Studies 101</a> <a href="#">English 101</a>	<a href="#">Barbie You Can Be Anything</a> <a href="#">Augmented Reality</a> <a href="#">WeDo Coding</a> <a href="#">micro:bit 101</a> <a href="#">Artificial Intelligence 101</a>
1B-AP-11	3-5	Decompose (break down) problems into smaller, manageable subproblems to facilitate	Algorithms & Programming	<a href="#">Dragon Spells Programming 100</a>	<a href="#">Barbie You Can Be Anything</a> <a href="#">Augmented Reality</a>

		the program development process.		<a href="#">Programming 101</a> <a href="#">Programming 102</a> <a href="#">Programming 201</a> <a href="#">Programming 202</a> <a href="#">Life Science 101</a> <a href="#">Physical Science 101</a> <a href="#">Earth Science 101</a> <a href="#">Math 101</a> <a href="#">Social Studies 101</a> <a href="#">English 101</a> <a href="#">All About Computers II</a>	<a href="#">WeDo Coding</a> <a href="#">micro:bit 101</a> <a href="#">Artificial Intelligence 101</a>
1B-AP-12	3-5	Modify, remix, or incorporate portions of an existing program into one's own work, to develop something new or add more advanced features.	Algorithms & Programming	<a href="#">Dragon Spells</a> <a href="#">Programming 100</a> <a href="#">Programming 101</a> <a href="#">Programming 102</a> <a href="#">Programming 201</a> <a href="#">Programming 202</a> <a href="#">Life Science 101</a> <a href="#">Physical Science 101</a> <a href="#">Earth Science 101</a> <a href="#">Math 101</a> <a href="#">Social Studies 101</a> <a href="#">English 101</a> <a href="#">All About Computers II</a>	<a href="#">Barbie You Can Be Anything</a> <a href="#">Augmented Reality</a> <a href="#">WeDo Coding</a> <a href="#">micro:bit 101</a> <a href="#">Artificial Intelligence 101</a>
1B-AP-13	3-5	Use an iterative process to plan the development of a program by including others' perspectives and considering user preferences.	Algorithms & Programming	<a href="#">Programming 101</a> <a href="#">Programming 102</a> <a href="#">Life Science 101</a> <a href="#">Physical Science 101</a> <a href="#">Earth Science 101</a> <a href="#">Math 101</a> <a href="#">English 101</a>	<a href="#">micro:bit 101</a> <a href="#">Artificial Intelligence 101</a>

				<a href="#"><i>All About Computers II</i></a>
1B-AP-14	3-5	Observe intellectual property rights and give appropriate attribution when creating or remixing programs.	Algorithms & Programming	<a href="#"><i>All About Computers II</i></a> <a href="#"><i>Augmented Reality</i></a>
1B-AP-15	3-5	Test and debug (identify and fix errors) a program or algorithm to ensure it runs as intended.	Algorithms & Programming	<a href="#"><i>Dragon Spells</i></a> <a href="#"><i>Programming 100</i></a> <a href="#"><i>Programming 101</i></a> <a href="#"><i>Programming 102</i></a> <a href="#"><i>Programming 201</i></a> <a href="#"><i>Programming 202</i></a> <a href="#"><i>Life Science 101</i></a> <a href="#"><i>Physical Science 101</i></a> <a href="#"><i>Earth Science 101</i></a> <a href="#"><i>Math 101</i></a> <a href="#"><i>Social Studies 101</i></a> <a href="#"><i>English 101</i></a> <a href="#"><i>All About Computers II</i></a>
1B-AP-16	3-5	Take on varying roles, with teacher guidance, when collaborating with peers during the design, implementation, and review stages of program development.	Algorithms & Programming	<a href="#"><i>Programming 201</i></a> <a href="#"><i>Earth Science 101</i></a>
1B-AP-17	3-5	Describe choices made during program development using code comments, presentations, and demonstrations.	Algorithms & Programming	<a href="#"><i>Programming 100</i></a> <a href="#"><i>Programming 201</i></a> <a href="#"><i>Earth Science 101</i></a>
1B-IC-18	3-5	Discuss computing technologies that have changed the world, and express how those technologies influence, and are influenced by, cultural practices.	Impacts of Computing	<a href="#"><i>All About Computers II</i></a>
1B-IC-19	3-5	Brainstorm ways to improve the accessibility	Impacts of	<a href="#"><i>All About Computers II</i></a>

		and usability of technology products for the diverse needs and wants of users.	Computing	
1B-IC-20	3-5	Seek diverse perspectives for the purpose of improving computational artifacts.	Impacts of Computing	<a href="#">Programming 201</a> <a href="#">Programming 202</a> <a href="#">Programming 301</a> <a href="#">Programming 302</a> <a href="#">All About Computers II</a>
1B-IC-21	3-5	Use public domain or creative commons media, and refrain from copying or using material created by others without permission.	Impacts of Computing	<a href="#">All About Computers II</a>

6-12

Grade  
Level

38

CSTA  
Programming  
Standards

24

Tynker  
Courses

100%

CSTA Coverage  
in Programming

Grades 6-12

Identifier	Grade Level	Description	Concept	Tynker Courses	
				Core	Elective
2-CS-01	6-8	Recommend improvements to the design of computing devices, based on an analysis of how users interact with the devices.	Computing Systems	<a href="#">MicroPython</a>	<a href="#">Drones 101</a>
2-CS-02	6-8	Design projects that combine hardware and software components to collect and exchange data.	Computing Systems	<a href="#">MicroPython</a>	<a href="#">Drones 101</a>
2-CS-03	6-8	Systematically identify and fix problems with computing devices and their components.	Computing Systems	<a href="#">MicroPython</a>	<a href="#">Drones 101</a>
2-NI-04	6-8	Model the role of protocols in transmitting data across networks and the Internet.	Networks & the Internet	--	
2-NI-05	6-8	Explain how physical and digital security measures protect electronic information.	Networks & the Internet	--	
2-NI-06	6-8	Apply multiple methods of encryption to model the secure transmission of information.	Networks & the Internet	--	
2-DA-07	6-8	Represent data using multiple encoding	Data & Analysis	--	



		schemes.		<a href="#">Web Development 101</a>	
2-DA-08	6-8	Collect data using computational tools and transform the data to make it more useful and reliable.	Data & Analysis	<a href="#">Web Development 101</a>	<a href="#">MicroPython</a>
2-DA-09	6-8	Refine computational models based on the data they have generated.	Data & Analysis	--	
2-AP-10	6-8	Use flowcharts and/or pseudocode to address complex problems as algorithms.	Algorithms & Programming	<a href="#">Programming 201</a> <a href="#">Programming 202</a> <a href="#">Programming 300</a> <a href="#">Programming 301</a> <a href="#">Programming 302</a> <a href="#">Life Science 201</a> <a href="#">Physical Science 201</a> <a href="#">Earth Science 201</a> <a href="#">Math 201</a> <a href="#">Social Studies 201</a> <a href="#">English 201</a> <a href="#">Web Development 101</a> <a href="#">JavaScript 101</a> <a href="#">Python 101</a> <a href="#">Python 201</a>	<a href="#">Augmented Reality</a> <a href="#">Drones 101</a> <a href="#">MicroPython</a>
2-AP-11	6-8	Create clearly named variables that represent different data types and perform operations on their values.	Algorithms & Programming	<a href="#">Programming 201</a> <a href="#">Programming 202</a> <a href="#">Programming 300</a> <a href="#">Programming 301</a> <a href="#">Programming 302</a> <a href="#">Life Science 201</a> <a href="#">Physical Science 201</a> <a href="#">Earth Science 201</a> <a href="#">Math 201</a>	<a href="#">Augmented Reality</a> <a href="#">Drones 101</a> <a href="#">MicroPython</a> <a href="#">Artificial Intelligence 401</a>

				<a href="#">Social Studies 201</a> <a href="#">English 201</a> <a href="#">JavaScript 101</a> <a href="#">Python 101</a> <a href="#">Python 201</a>	
2-AP-12	6-8	Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals.	Algorithms & Programming	<a href="#">Programming 201</a> <a href="#">Programming 202</a> <a href="#">Programming 301</a> <a href="#">Programming 302</a> <a href="#">Math 201</a> <a href="#">Social Studies 201</a> <a href="#">English 201</a> <a href="#">Python 101</a> <a href="#">Python 201</a>	<a href="#">Artificial Intelligence 101</a> <a href="#">Artificial Intelligence 401</a>
2-AP-13	6-8	Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs.	Algorithms & Programming	<a href="#">Programming 201</a> <a href="#">Programming 202</a> <a href="#">Programming 300</a> <a href="#">Programming 301</a> <a href="#">Programming 302</a> <a href="#">Life Science 201</a> <a href="#">Physical Science 201</a> <a href="#">Earth Science 201</a> <a href="#">Math 201</a> <a href="#">Social Studies 201</a> <a href="#">English 201</a> <a href="#">Web Development 101</a> <a href="#">JavaScript 101</a> <a href="#">Python 101</a> <a href="#">Python 201</a>	<a href="#">Augmented Reality</a> <a href="#">Drones 101</a> <a href="#">MicroPython</a> <a href="#">Artificial Intelligence 101</a> <a href="#">Artificial Intelligence 401</a>
2-AP-14	6-8	Create procedures with parameters to organize	Algorithms & Programming	<a href="#">Programming 201</a> <a href="#">Programming 202</a>	<a href="#">Augmented Reality</a> <a href="#">Drones 101</a>

		code and make it easier to reuse.		<a href="#">Programming 300</a> <a href="#">Programming 301</a> <a href="#">Programming 302</a> <a href="#">Life Science 201</a> <a href="#">Physical Science 201</a> <a href="#">Earth Science 201</a> <a href="#">Math 201</a> <a href="#">Social Studies 201</a> <a href="#">English 201</a> <a href="#">Web Development 101</a> <a href="#">JavaScript 101</a> <a href="#">Python 101</a> <a href="#">Python 201</a>	<a href="#">MicroPython</a>
2-AP-15	6-8	Seek and incorporate feedback from team members and users to refine a solution that meets user needs.	Algorithms & Programming	<a href="#">Programming 201</a> <a href="#">Programming 202</a> <a href="#">Programming 300</a> <a href="#">Programming 301</a> <a href="#">Programming 302</a> <a href="#">Life Science 201</a> <a href="#">Physical Science 201</a> <a href="#">Earth Science 201</a> <a href="#">Math 201</a> <a href="#">Social Studies 201</a> <a href="#">English 201</a> <a href="#">Web Development 101</a> <a href="#">JavaScript 101</a> <a href="#">Python 101</a> <a href="#">Python 201</a>	<a href="#">Augmented Reality</a> <a href="#">Drones 101</a> <a href="#">MicroPython</a>
2-AP-16	6-8	Incorporate existing code, media, and libraries into original programs, and give attribution.	Algorithms & Programming	<a href="#">Programming 201</a> <a href="#">Programming 202</a>	<a href="#">Augmented Reality</a> <a href="#">Drones 101</a>

				<a href="#">Programming 300</a> <a href="#">Programming 301</a> <a href="#">Programming 302</a> <a href="#">Life Science 201</a> <a href="#">Physical Science 201</a> <a href="#">Earth Science 201</a> <a href="#">Math 201</a> <a href="#">Social Studies 201</a> <a href="#">English 201</a> <a href="#">Web Development 101</a> <a href="#">JavaScript 101</a> <a href="#">Python 101</a> <a href="#">Python 201</a>	<a href="#">MicroPython</a> <a href="#">Artificial Intelligence 101</a>
2-AP-17	6-8	Systematically test and refine programs using a range of test cases.	Algorithms & Programming	<a href="#">Programming 201</a> <a href="#">Programming 202</a> <a href="#">Programming 300</a> <a href="#">Programming 301</a> <a href="#">Programming 302</a> <a href="#">Life Science 201</a> <a href="#">Physical Science 201</a> <a href="#">Earth Science 201</a> <a href="#">Math 201</a> <a href="#">Social Studies 201</a> <a href="#">English 201</a> <a href="#">Web Development 101</a> <a href="#">JavaScript 101</a> <a href="#">Python 101</a> <a href="#">Python 201</a>	<a href="#">Augmented Reality</a> <a href="#">Drones 101</a> <a href="#">MicroPython</a> <a href="#">Artificial Intelligence 101</a> <a href="#">Artificial Intelligence 401</a>
2-AP-18	6-8	Distribute tasks and maintain a project timeline when collaboratively developing computational	Algorithms & Programming	<a href="#">Programming 201</a> <a href="#">Programming 202</a>	<a href="#">MicroPython</a>

		artifacts.		<a href="#">Programming 301</a> <a href="#">Programming 302</a> <a href="#">Web Development 101</a> <a href="#">JavaScript 101</a> <a href="#">Python 101</a> <a href="#">Python 201</a>	
2-AP-19	6-8	Document programs in order to make them easier to follow, test, and debug.	Algorithms & Programming	<a href="#">Programming 300</a> <a href="#">Web Development 101</a> <a href="#">JavaScript 101</a> <a href="#">Python 101</a> <a href="#">Python 201</a>	<a href="#">MicroPython</a>
2-IC-20	6-8	Compare tradeoffs associated with computing technologies that affect people's everyday activities and career options.	Impacts of Computing	--	
2-IC-21	6-8	Discuss issues of bias and accessibility in the design of existing technologies.	Impacts of Computing	--	
2-IC-22	6-8	Collaborate with many contributors through strategies such as crowdsourcing or surveys when creating a computational artifact.	Impacts of Computing	--	
2-IC-23	6-8	Describe tradeoffs between allowing information to be public and keeping information private and secure.	Impacts of Computing	--	
3A-CS-01	9-10	Explain how abstractions hide the underlying implementation details of computing systems embedded in everyday objects.	Computing Systems	<a href="#">AP CSA</a> <a href="#">AP CSP</a>	
3A-CS-02	9-10	Compare levels of abstraction and interactions between application software, system software, and hardware layers.	Computing Systems	--	

3A-CS-03	9-10	Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.	Computing Systems	--	
3A-NI-04	9-10	Evaluate the scalability and reliability of networks, by describing the relationship between routers, switches, servers, topology, and addressing.	Networks & the Internet	--	
3A-NI-05	9-10	Give examples to illustrate how sensitive data can be affected by malware and other attacks.	Networks & the Internet	--	
3A-NI-06	9-10	Recommend security measures to address various scenarios based on factors such as efficiency, feasibility, and ethical impacts.	Networks & the Internet	<a href="#">Web Development 101</a>	
3A-NI-07	9-10	Compare various security measures, considering tradeoffs between the usability and security of a computing system.	Networks & the Internet	<a href="#">AP CSA</a>	
3A-NI-08	9-10	Explain tradeoffs when selecting and implementing cybersecurity recommendations.	Networks & the Internet	--	
3A-DA-09	9-10	Translate between different bit representations of real-world phenomena, such as characters, numbers, and images.	Data & Analysis	<a href="#">AP CSP</a>	
3A-DA-10	9-10	Evaluate the tradeoffs in how data elements are organized and where data is stored.	Data & Analysis	<a href="#">AP CSP</a> <a href="#">AP CSA</a> <a href="#">Data Science 1</a>	
3A-DA-11	9-10	Create interactive data visualizations using software tools to help others better understand real-world phenomena.	Data & Analysis	<a href="#">AP CSP</a> <a href="#">AP CSA</a> <a href="#">Data Science 1</a>	

3A-DA-12	9-10	Create computational models that represent the relationships among different elements of data collected from a phenomenon or process.	Data & Analysis	<a href="#">AP CSP</a> <a href="#">AP CSA</a> <a href="#">Data Science 1</a>	
3A-AP-13	9-10	Create prototypes that use algorithms to solve computational problems by leveraging prior student knowledge and personal interests.	Algorithms & Programming	<a href="#">Web Development 101</a> <a href="#">JavaScript 101</a> <a href="#">Python 101</a> <a href="#">Python 201</a> <a href="#">AP CSP</a> <a href="#">AP CSA</a> <a href="#">Data Science 1</a>	<a href="#">MicroPython</a> <a href="#">Intro to Programming and Art</a> <a href="#">Artificial Intelligence 401</a>
3A-AP-14	9-10	Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.	Algorithms & Programming	<a href="#">AP CSP</a> <a href="#">AP CSA</a> <a href="#">Data Science 1</a>	
3A-AP-15	9-10	Justify the selection of specific control structures when tradeoffs involve implementation, readability, and program performance, and explain the benefits and drawbacks of choices made.	Algorithms & Programming	<a href="#">AP CSP</a> <a href="#">AP CSA</a>	
3A-AP-16	9-10	Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions.	Algorithms & Programming	<a href="#">Web Development 101</a> <a href="#">JavaScript 101</a> <a href="#">Python 101</a> <a href="#">Python 201</a> <a href="#">AP CSP</a> <a href="#">AP CSA</a> <a href="#">Data Science 1</a>	<a href="#">MicroPython</a> <a href="#">Intro to Programming and Art</a>
3A-AP-17	9-10	Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.	Algorithms & Programming	<a href="#">Web Development 101</a> <a href="#">JavaScript 101</a> <a href="#">Python 101</a> <a href="#">Python 201</a>	<a href="#">MicroPython</a> <a href="#">Intro to Programming and Art</a> <a href="#">Artificial Intelligence 401</a>

				<a href="#">AP CSP</a> <a href="#">AP CSA</a> <a href="#">Data Science 1</a>	
3A-AP-18	9-10	Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs.	Algorithms & Programming	<a href="#">Data Science 1</a>	
3A-AP-19	9-10	Systematically design and develop programs for broad audiences by incorporating feedback from users.	Algorithms & Programming	<a href="#">Web Development 101</a> <a href="#">JavaScript 101</a> <a href="#">Python 101</a> <a href="#">Python 201</a> <a href="#">AP CSA</a> <a href="#">Data Science 1</a>	<a href="#">MicroPython</a>
3A-AP-20	9-10	Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries.	Algorithms & Programming	--	
3A-AP-21	9-10	Evaluate and refine computational artifacts to make them more usable and accessible.	Algorithms & Programming	<a href="#">Web Development 101</a> <a href="#">JavaScript 101</a> <a href="#">Python 101</a> <a href="#">Python 201</a> <a href="#">AP CSP</a> <a href="#">AP CSA</a> <a href="#">Data Science 1</a>	<a href="#">Intro to Programming and Art</a> <a href="#">MicroPython</a> <a href="#">Artificial Intelligence 401</a>
3A-AP-22	9-10	Design and develop computational artifacts working in team roles using collaborative tools.	Algorithms & Programming	<a href="#">AP CSP</a> <a href="#">AP CSA</a> <a href="#">Data Science 1</a>	
3A-AP-23	9-10	Document design decisions using text, graphics, presentations, and/or demonstrations in the development of	Algorithms & Programming	<a href="#">AP CSP</a> <a href="#">AP CSA</a>	<a href="#">MicroPython</a>



		complex programs.			
3A-IC-24	9-10	Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.	Impacts of Computing	<a href="#">Web Development 101</a> <a href="#">AP CSP</a> <a href="#">AP CSA</a> <a href="#">Data Science 1</a>	<a href="#">Intro to Programming and Art</a> <a href="#">MicroPython</a> <a href="#">Artificial Intelligence 401</a>
3A-IC-25	9-10	Test and refine computational artifacts to reduce bias and equity deficits.	Impacts of Computing	<a href="#">AP CSP</a> <a href="#">Data Science 1</a>	
3A-IC-26	9-10	Demonstrate ways a given algorithm applies to problems across disciplines.	Impacts of Computing	<a href="#">Web Development 101</a> <a href="#">JavaScript 101</a> <a href="#">Python 101</a> <a href="#">Python 201</a> <a href="#">AP CSP</a> <a href="#">AP CSA</a> <a href="#">Data Science 1</a>	<a href="#">MicroPython</a> <a href="#">Artificial Intelligence 401</a>
3A-IC-27	9-10	Use tools and methods for collaboration on a project to increase connectivity of people in different cultures and career fields.	Impacts of Computing	<a href="#">AP CSA</a>	
3A-IC-28	9-10	Explain the beneficial and harmful effects that intellectual property laws can have on innovation.	Impacts of Computing	<a href="#">AP CSP</a>	
3A-IC-29	9-10	Explain the privacy concerns related to the collection and generation of data through automated processes that may not be evident to users.	Impacts of Computing	<a href="#">Web Development 101</a>	<a href="#">Artificial Intelligence 401</a>
3A-IC-30	9-10	Evaluate the social and economic implications of privacy in the context of safety, law, or ethics.	Impacts of Computing	<a href="#">AP CSP</a> <a href="#">AP CSA</a>	

3B-CS-01	11-12	Categorize the roles of operating system software.	Computing Systems	--	
3B-CS-02	11-12	Illustrate ways computing systems implement logic, input, and output through hardware components.	Computing Systems		<a href="#">MicroPython</a>
3B-NI-03	11-12	Describe the issues that impact network functionality (e.g., bandwidth, load, delay, topology).	Networks & the Internet	<a href="#">AP CSA</a>	
3B-NI-04	11-12	Compare ways software developers protect devices and information from unauthorized access.	Networks & the Internet	--	
3B-DA-05	11-12	Use data analysis tools and techniques to identify patterns in data representing complex systems.	Data & Analysis	<a href="#">Data Science 1</a> <a href="#">AP CSA</a>	
3B-DA-06	11-12	Select data collection tools and techniques to generate data sets that support a claim or communicate information.	Data & Analysis	<a href="#">Data Science 1</a> <a href="#">AP CSA</a>	
3B-DA-07	11-12	Evaluate the ability of models and simulations to test and support the refinement of hypotheses.	Data & Analysis	<a href="#">Data Science 1</a>	
3B-AP-08	11-12	Describe how artificial intelligence drives many software and physical systems.	Algorithms & Programming	<a href="#">AP CSP</a>	<a href="#">MicroPython</a> <a href="#">Artificial Intelligence 401</a>
3B-AP-09	11-12	Implement an artificial intelligence algorithm to play a game against a human opponent or solve a problem.	Algorithms & Programming	<a href="#">JavaScript 101</a> <a href="#">Python 101</a> <a href="#">Python 201</a> <a href="#">AP CSP</a> <a href="#">Data Science 1</a>	<a href="#">MicroPython</a> <a href="#">Artificial Intelligence 401</a>

3B-AP-10	11-12	Use and adapt classic algorithms to solve computational problems.	Algorithms & Programming	<a href="#">Web Development 101</a> <a href="#">JavaScript 101</a> <a href="#">Python 101</a> <a href="#">Python 201</a> <a href="#">AP CSP</a> <a href="#">AP CSA</a> <a href="#">Data Science 1</a>	<a href="#">Intro to Programming and Art</a> <a href="#">MicroPython</a> <a href="#">Artificial Intelligence 401</a>
3B-AP-11	11-12	Evaluate algorithms in terms of their efficiency, correctness, and clarity.	Algorithms & Programming	<a href="#">Web Development 101</a> <a href="#">JavaScript 101</a> <a href="#">Python 101</a> <a href="#">Python 201</a> <a href="#">AP CSP</a> <a href="#">AP CSA</a> <a href="#">Data Science 1</a>	<a href="#">Intro to Programming and Art</a> <a href="#">MicroPython</a> <a href="#">Artificial Intelligence 401</a>
3B-AP-12	11-12	Compare and contrast fundamental data structures and their uses.	Algorithms & Programming	<a href="#">Web Development 101</a> <a href="#">Python 201</a> <a href="#">AP CSP</a> <a href="#">AP CSA</a> <a href="#">Data Science 1</a>	<a href="#">Intro to Programming and Art</a>
3B-AP-13	11-12	Illustrate the flow of execution of a recursive algorithm.	Algorithms & Programming	<a href="#">AP CSP</a> <a href="#">AP CSA</a>	
3B-AP-14	11-12	Construct solutions to problems using student-created components, such as procedures, modules and/or objects.	Algorithms & Programming	<a href="#">AP CSP</a> <a href="#">AP CSA</a>	
3B-AP-15	11-12	Analyze a large-scale computational problem and identify generalizable patterns that can be applied to a solution.	Algorithms & Programming	<a href="#">AP CSP</a> <a href="#">AP CSA</a> <a href="#">Data Science 1</a>	
3B-AP-16	11-12	Demonstrate code reuse by creating programming solutions using libraries and	Algorithms & Programming	<a href="#">AP CSP</a> <a href="#">AP CSA</a>	

		APIs.			
3B-AP-17	11-12	Plan and develop programs for broad audiences using a software life cycle process.	Algorithms & Programming	--	
3B-AP-18	11-12	Explain security issues that might lead to compromised computer programs.	Algorithms & Programming	--	
3B-AP-19	11-12	Develop programs for multiple computing platforms.	Algorithms & Programming	--	
3B-AP-20	11-12	Use version control systems, integrated development environments (IDEs), and collaborative tools and practices (code documentation) in a group software project.	Algorithms & Programming	--	
3B-AP-21	11-12	Develop and use a series of test cases to verify that a program performs according to its design specifications.	Algorithms & Programming	<a href="#">Programming 201</a> <a href="#">Programming 202</a> <a href="#">Programming 300</a> <a href="#">Programming 301</a> <a href="#">Programming 302</a> <a href="#">AP CSP</a> <a href="#">AP CSA</a> <a href="#">Data Science 1</a>	
3B-AP-22	11-12	Modify an existing program to add additional functionality and discuss intended and unintended implications (e.g., breaking other functionality).	Algorithms & Programming	<a href="#">Web Development 101</a> <a href="#">Data Science 1</a> <a href="#">JavaScript 101</a> <a href="#">Python 101</a> <a href="#">Python 201</a> <a href="#">AP CSP</a> <a href="#">AP CSA</a>	<a href="#">MicroPython</a> <a href="#">Intro to Programming and Art</a>
3B-AP-23	11-12	Evaluate key qualities of a program through a process such as a code review.	Algorithms & Programming	<a href="#">Web Development 101</a> <a href="#">JavaScript 101</a>	<a href="#">MicroPython</a> <a href="#">Intro to Programming and Art</a>

				<a href="#">Python 101</a> <a href="#">Python 201</a> <a href="#">AP CSP</a> <a href="#">AP CSA</a>	
3B-AP-24	11-12	Compare multiple programming languages and discuss how their features make them suitable for solving different types of problems.	Algorithms & Programming	<a href="#">JavaScript 101</a> <a href="#">Python 101</a> <a href="#">Python 201</a>	<a href="#">Intro to Programming and Art</a>
3B-IC-25	11-12	Evaluate computational artifacts to maximize their beneficial effects and minimize harmful effects on society.	Impacts of Computing	<a href="#">AP CSP</a> <a href="#">AP CSA</a>	
3B-IC-26	11-12	Evaluate the impact of equity, access, and influence on the distribution of computing resources in a global society.	Impacts of Computing	--	
3B-IC-27	11-12	Predict how computational innovations that have revolutionized aspects of our culture might evolve.	Impacts of Computing	--	
3B-IC-28	11-12	Debate laws and regulations that impact the development and use of software.	Impacts of Computing	--	