AP Computer Science Principles B		Scope and Sequence
Unit	**Lesson**	**Objectives**
MODULARITY, MODELING, AND DATA CONTAINERS		
	Libraries	
		Describe the Python standard library.
	Pseudorandom Numbers	
		Interpret expressions to generate pseudorandom numbers.
	The Secrets Module	
		Describe and interpret the secrets module.
	Simulations	
		Describe how simulations can be used to represent real-world phenomena.
	Bias in Simulations	
		Describe possible sources of bias in simulations.
	Project: A Real-World Simulation	
		Describe a real-world simulation and document your source in your report.
	Using a Two-Dimensional List to Extract Data	
		Interpret programs that extract information from data.
	Dictionaries	
		Interpret dictionaries.
	The Heuristic Approach	
		Describe the heuristic approach and why it is used.
	Is Your Algorithm Efficient?	
		Determine algorithmic efficiency.
	Problems Computers Cannot Solve	

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Unit	**Lesson**	**Objectives**
		Describe problems computers cannot solve.
	Project: A Simulation Program	
		Write a program that uses a random number generator in a loop to simulate a choice and report your results.
	Review: Modularity, Modeling, and Data Containers	
		Describe the Python standard library.
		Interpret expressions to generate pseudorandom numbers.
		Describe and interpret the secrets module.
		Describe how simulations can be used to represent real-world phenomena.
		Describe possible sources of bias in simulations.
		Interpret programs that extract information from data.
		Interpret dictionaries.
		Describe the heuristic approach and why it is used.
		Determine algorithmic efficiency.
		Describe problems computers cannot solve.
	Test	
DATA		
	What Can Data Tell You?	
		Describe the collection of facts and patterns that can be extracted from data.
	Data about Data	
		Describe metadata.
	Processing Data	

AP Computer Science Principles B		Scope and Sequence
Unit	**Lesson**	**Objectives**
		Describe the process of analyzing data.
	Problems with Data	
		Describe problems encountered analyzing data.
	Solutions to Data Problems	
		Describe solutions to problems encountered in analyzing data.
	Project: Collect Data	
		Ask a question and collect data to answer the question.
	Data Tools	
		Interpret visualizations of data.
	Searching for Data	
		Describe how to find reliable data.
	Spreadsheets	
		Interpret data visualizations using spreadsheets.
	Data Transformations	
		Describe data transformations and filters.
	Data Cleaning Benefits	
		Describe how filtering and cleaning can lead to new knowledge and insights.
	Project: Analyze Your Data	
		Write a program using a list and a function to analyze your data.
	Review: Data	
		Describe the collection of facts and patterns that can be extracted from data.
		Describe metadata.

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Unit Lesson	**Objectives**
	Describe the process of analyzing data.
	Describe problems encountered analyzing data.
	Describe solutions to problems encountered in analyzing data.
	Interpret visualizations of data.
	Describe how to find reliable data.
	Interpret data visualizations using spreadsheets.
	Describe data transformations and filters.
	Describe how filtering and cleaning can lead to new knowledge and insights.
Test	
DATA RISKS	
Risks to Private Information	
	Describe risks to personally identifiable information (PII).
Authentication Measures	
	Describe authentication measures.
Computer Viruses	
	Describe computer viruses and the protections against them.
Making Web Pages Safe	
	Describe how web pages can be made safer.
Who Is Listening?	
	Describe how voice-activated devices are vulnerable to cybercriminals and how they can be safeguarded.
Project: Security Plan	
	Write a plan to protect your personally identifiable information (PII).

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Unit	**Lesson**	**Objectives**
	Bits with Unusual Consequences	
		Describe some of the limitations due to a fixed number of bits.
	A Duck Might Not Be a Duck	
		Describe the issue of data typing.
	Mistaken Identity	
		Describe the issue of object identity for small integers in Python.
	Potential List Problem	
		Describe problems that can occur from deleting items in a list while looping through it.
	Debugging	
		Describe ways to debug a program.
	Project: Research a Recent Cyberattack	
		Describe a recent cyberattack, its consequences, and how it was resolved.
	Review: Data Risks	
		Describe risks to personally identifiable information (PII).
		Describe authentication measures.
		Describe computer viruses and the protections against them.
		Describe how web pages can be made safer.
		Describe how voice-activated devices are vulnerable to cybercriminals and how they can be safeguarded.
		Describe some of the limitations due to a fixed number of bits.
		Describe the issue of data typing.
		Describe the issue of object identity for small integers in Python.
		Describe problems that can occur from deleting items from a list while looping through it.

AP Computer Science Principles B		Scope and Sequence
Unit	**Lesson**	**Objectives**
		Describe ways to debug a program.
	Test	
SAFETY AND ETHICAL CONCERNS		
	Can Computing Innovations Be Harmful?	
		Describe unintended ways computing innovations can have harmful consequences.
	Accessibility in the World Wide Web	
		Describe factors that contribute to bias in access to the internet.
	Bias in Computing Algorithms	
		Describe bias issues in computer algorithms.
	Hackers	
		Describe the role of cybercriminals.
	Intellectual Property Rights	
		Describe the issues concerning intellectual property rights.
	Project: Research a Security Risk	
		Write a research report on a security risk.
		Acknowledge your sources of information.
	Code Sharing	
		Describe ethical ways to share code.
	Digital Divide	
		Describe the digital divide.
	Crossing the Digital Divide	
		Describe efforts being made to address digital divide inequities.

AP Computer Science Principles B		Scope and Sequence
Unit	**Lesson**	**Objectives**
	When Collaborations Fail	
		Describe problems that occur when collaborating.
	Project: Code Review	
		Perform a code review of another student's project.
	Review: Safety and Ethical Concerns	
		Describe unintended ways computing innovations can have harmful consequences.
		Describe factors that contribute to bias in access to the internet.
		Describe bias issues in computer algorithms.
		Describe the role of cybercriminals.
		Describe the issues concerning intellectual property rights.
		Describe ethical ways to share code.
		Describe ethical ways to share code.
		Describe efforts being made to address digital divide inequities.
		Describe problems that occur when collaborating.
	Test	
COMPUTERS CHANGING THE WORLD		
	The Internet Is Not What It Was Planned to Be	
		Describe how the Internet began and changed.
	Surprises in the Computing World	
		Describe how computing innovations have sometimes led to unintended advances in other fields.
	Open Source and Other Amazing Examples of Generosity	
		Describe examples where sharing open-source programs has led to significant impacts.

AP Computer Science Principles B		Scope and Sequence
Unit	**Lesson**	**Objectives**
	Crowdsourcing	
		Describe crowdsourcing.
	APIs	
		Describe application programming interfaces (APIs).
	Project: Plan Your Performance Task	
		Plan your Create Performance Task
	Combining Data	
		Describe how combining data from multiple sources has led to discoveries that would have been missed otherwise.
	Medical Data Breakthroughs	
		Describe insights resulting from merging vast datasets.
	Are You Ready for the CTP?	
		Identify requirements of the Create Performance Task.
	Project: Practice Explaining Your Program	
		Present one of your previous programs to an audience and record a video, demonstrating the purpose, the input, and the output.
	Review: Computers Changing the World	
		Describe how the Internet began and changed.
		Describe how computing innovations have sometimes led to unintended advances in other fields.
		Describe examples where sharing open-source programs has led to significant impacts.
		Describe crowdsourcing.?
		Describe application programming interfaces (APIs).
		Describe how combining data from multiple sources has led to discoveries that would have been missed otherwise.

AP Computer Science Principles B		Scope and Sequence
Unit	**Lesson**	**Objectives**
		Describe insights resulting from merging vast datasets.
		Identify requirements of the Create Performance Task.
	Test	
SEMESTER REVIEW AND EXAM		
	Project: Create Performance Task	
	Semester Review	
		Describe the Python standard library.
		Describe and interpret the secrets module.
		Describe how simulations can be used to represent real-world phenomena.
		Describe possible sources of bias in simulations.
		Interpret dictionaries.
		Describe the heuristic approach and why it is used.
		Determine algorithmic efficiency.
		Describe the collection of facts and patterns that can be extracted from data.
		Describe the process of analyzing data.
		Describe solutions to problems encountered in analyzing data.
		Interpret visualizations of data.
		Describe how to find reliable data.
		Interpret data visualizations using spreadsheets.
		Describe data transformations and filters.
		Describe risks to personally identifiable information (PII).
		Describe computer viruses and the protections against them.

AP Computer Science Principles B		Scope and Sequence
Unit	**Lesson**	**Objectives**
		Describe how voice-activated devices are vulnerable to cybercriminals and how they can be safeguarded.
		Describe the issue of data typing.
		Describe ways to debug a program.
		Describe unintended ways computing innovations can have harmful consequences.
		Describe bias issues in computer algorithms.
		Describe the issues concerning intellectual property rights.
		Describe the digital divide.
		Describe problems that occur when collaborating.
		Describe how the Internet began and changed.
		Describe examples where sharing open-source programs has led to significant impacts.
		Describe application programming interfaces (APIs).
		Describe insights resulting from merging vast datasets.
	Semester Exam	
AP CSP PRACTICE EXAMS		
	AP CSP Review	
	AP CSP Practice Exam	
	Alternate AP CSP Practice Exam	