Cornwall-Lebanon School District Curriculum Overview

High School- AP Computer Science Principles

length of time in weeks	Concepts & Competencies	Common Assessments	Academic Standards
Unit 1 — 6	<u>Algorithms</u> Student will be able to develop an algorithm for implementation in a program. Student will be able to express an algorithm in a language. Student will be able to explain the difference between algorithms that run in a reasonable time and those that do not. Student will be able to explain the difference between solvable and unsolvable problems in computer science. Student will be able to evaluate algorithms analytically and empirically for efficiency, correctness and clarity. Student will be able to explain the existence of undecidable problems in computer science.	➢ Programming Project Completion ➢ Unit 1 Test	APCSP Learning Objectives: 4.1.1, 4.1.2 4.2.1-4.2.4
Unit 2 — 9	<u>Programming</u> Student will be able to develop a program for creative expression, to satisfy personal curiosity or to create new knowledge. Student will be able to develop a correct program to solve problems. Student will be able to collaborate to develop a program. Student will be able to explain how programs implement algorithms. Student will be able to use abstraction to manage complexity in programs. Student will be able to evaluate the correctness of a program. Student will be able to employ appropriate mathematical and logical concepts in programming. Student will be able to apply a creative development process when creating computational artifacts.	➢ Programming Project Completion ➢ Unit 2 Test	APCSP Learning Objectives: 5.1.1-5.1.3 5.2.1 5.3.1 5.4.1 5.5.1 1.1.1 1.2.1-1.2.5 1.3.1

	Student will be able to create a computational artifact for creative expression. Student will be able to create a computational artifact using computing tools and techniques to solve a problem. Student will be able to create a new computational artifact by combining or modifying existing artifacts. Student will be able to collaborate in the creation of a computational artifact. Student will be able to analyze the correctness, usability, functionality and suitability of computational artifacts. Student will be able to use computing tools and techniques for creative expression.		
Unit 3 9	<u>Data and Abstraction</u> Student will be able to use computers to process information, find patterns, test hypotheses about digitally processed information to gain insight and knowledge. Student will be able to collaborate when processing information to gain insight and knowledge. Student will be able to explain the insight and knowledge gained from digitally processed data by using appropriate visualizations, notations, precise language. Student will be able to extract information from data to discover and explain connections, patterns or trends. Student will be able to use large data sets to explore and discover information and knowledge. Student will be able to analyze how data representation, storage, security and transmission of data involve computational manipulation of information. Student will be able to describe the variety of abstractions used to represent data. Student will be able to explain how binary sequences are used to represent digital data. Student will be able to develop an abstraction when writing a program or creating other computational artifacts. Student will be able to use multiple levels of abstraction to write programs. Student will be able to identify multiple levels of abstractions that are used when writing programs. Student will be able to use models and simulations to represent phenomena.	➢ Programming Project Completion ➢ Unit 3 Test	APCSP Learning Objectives: 3.1.1-3.1.3 3.2.1, 3.2.2 3.3.1 2.1.1, 2.1.2 2.2.1-2.2.3 2.3.1, 2.3.2

	Student will be able to use models and simulations to formulate, refine and test hypotheses.		
Unit 4 9	<u>The Internet and Global Impact</u> Student will be able to explain the abstractions in the Internet and how the Internet functions. Student will be able to explain characteristics of the Internet and the systems built on it. Student will be able to explain how the characteristics of the Internet influence the systems built on it. Student will be able to identify existing cybersecurity concerns and potential options to address these issues with the Internet/the systems built on it. Student will be able to explain how computing innovations affect communication, interaction and cognition. Student will be able to explain how people participate in a problem-solving process that scales. Student will be able to explain how computing has impacted innovations in other fields. Student will be able to analyze the beneficial and harmful effects of computing. Student will be able to explain the connections between computing and economical, social and cultural contexts.	➢ Programming Project Completion ➢ Unit 4 Test	APCSP Learning Objectives: 6.1.1 6.2.1, 6.2.2 6.3.1 7.1.1, 7.1.2 7.2.1 7.3.1 7.4.1