

# Computer Science Principles 2021-2022

## At a Glance - Lamar CISD

Ongoing Skills Imbedded All Year	Professional Standards/Employability Skills/Technical Skills		
Grading Period	Unit Name	Estimated Time Frame	TEKS
<b>Grading Period 1</b> <b>8/23-10/1</b> <b>28 Days</b>	<b>Unit 0: Course Introduction</b>	<b>5 Days</b>	
	In this introduction to the expectations and course structures will be established. Students will establish accounts for the resources that will be used through the class.		
	<b>Unit 1: Basic Programming Language Features</b>	<b>7 Days</b>	3.1, 3.3
	In the first unit of the course, students get an overview of computers and programming. Students learn about variables, mathematical expressions, basic program input and output via console, and libraries.		
	<b>Unit 2: Control Structures &amp; Algorithms</b>	<b>10 Days</b>	3.5, 3.6, 3.7, 3.8, 3.8
	Students learn about decision and iterative control structures and their implementation in Python. In the second half students learn about creating different algorithms and learn to implement an algorithm into program code that can test the algorithm.		
	<b>Unit 3: Turtle Graphics &amp; Subprograms</b>	<b>6 Days</b>	3.12, 3.13
This unit has two important objectives. First, students learn how to create small subprograms, also called subroutines that perform a specific function to make program development more efficient and program code more understandable. Second, students are introduced to graphics and will demonstrate their creativity by completing their very first open-ended lab assignment.			
<b>Grading Period 2</b> <b>10/4-11/5</b> <b>25 Days</b>	<b>Unit 4: Boolean Statements &amp; Logic Gates</b>	<b>5 Days</b>	3.5
	The logic of computer circuits and computer programs is based on Boolean Algebra. In this unit students learn the general logic of Boolean Algebra and how Boolean logic is used in the conditional statements of program control structures.		
	<b>Unit 5: Data Structures, Strings, Lists, and Tuples</b>	<b>10 Days</b>	3.4, 3.10
	Students learn the difference between primitive data types that store one element and data structures that store one or more elements. Students will learn the Python procedures to manipulate String, List and Tuple data structures. Students are introduced to data processing by sorting and searching data elements in a List data structure.		
<b>Unit 6: Procedural Abstractions</b>	<b>10 Days</b>	3.12, 3.13, 3.14	
This unit continues the topic of subprograms started in Unit 3. In Unit 3 a variety of subprograms were shown with focus on the proper program syntax. This teaches students to look at the practical application of creating an entire library of similar routines that can be accessed with the Python import command.			

<b>Grading Period 3</b> <b>11/8-12/17</b> <b>25 Days</b>	<b>Unit 7: Managing Data in Programs</b>	<b>5 Days</b>	3.2, 3.10, 3.1, 3.17
	Students learn that data values stored during program execution are quite limited and temporary. Permanent data management requires storage outside the computer program and often the computer. In this unit students learn how to write to and read from external files. They also learn how to manipulate data. Students will need this knowledge for the upcoming Create Performance Task.		
	<b>Unit 9: Big Idea 1, Creative Development (AP Exam Weighting 10-13%)</b>	<b>5 Days</b>	1.1, 1.2, 1.3, 1.4
	Students learn the benefits of collaboration and the elements of successful program design and development.		
	<b>Unit 10: Big Idea 2, Data (AP Exam Weighting 17-22%)</b>	<b>5 Days</b>	2.1
	The Big Idea of Data is presented in three separate units. In the first semester student wrote a large program that manipulated the data of an external file. In this unit the objective is to learn how different data is represented in the computer. Since data representation is ultimately done in binary digits, numbers systems in Base-2, Base-10 and Base-16 are also part of this teaching unit.		
<b>Grading Period 4</b> <b>1/4-2/18</b> <b>33 Days</b>	<b>Unit 12: Big Idea 3.1-3.4 Algorithm and Programming (AP Exam Weighting 30-35%)</b>	<b>10 Days</b>	3.1, 3.2, 3.3, 3.4
	Students will learn pseudocode, as variables, mathematical abstractions, and strings are studied.		
	<b>Unit 8: Create Performance Task</b>	<b>25 Days</b>	
	The first objective for the Create PT is for students to practice and learn the logistics involved with the Create PT. The second objective is to learn the requirements of the Create PT. The third objective is for students to work on a Mock Create PT with the benefit of getting teacher feedback, feedback that is not allowed with the AP Exam Create PT. Every student is doing a Mock Create Performance Task with the same program outcome directions. Class time for students to develop their Create Performance Task project and submit to their AP Digital Portfolio.		
	<b>Unit 12: Big Idea 3.5-3.8 Algorithm and Programming (AP Exam Weighting 30-35%)</b>	<b>4 Days</b>	3.5, 3.6, 3.7, 3.8
	Students will study boolean expressions and use them to write and analyze conditional statements and looping structures (iteration).		
<b>Grading Period 5</b> <b>2/21-4/14</b> <b>34 Days</b>	<b>Unit 13: Big Idea 3.9-3.11 Algorithm and Programming (AP Exam Weighting 30-35%)</b>	<b>4 Days</b>	3.9, 3.10, 3.11
	Students will write and analyze algorithms, will study lists, and apply linear and binary searches of lists.		
	<b>Unit 14: Big Idea 3.12-3.14 Algorithm and Programming (AP Exam Weighting 30-35%)</b>	<b>5 Days</b>	3.12, 3.13, 3.14
	Students will write and analyze programs with procedures and use procedures that are made available through libraries.		
	<b>Unit 15: Big Idea 3.15-3.18 Algorithm and Programming (AP Exam Weighting 30-35%)</b>	<b>5 Days</b>	3.15, 3.16, 3.17, 3.18
	Students will write and analyze applications that use random values, for simulations. Students will also investigate algorithmic efficiency and be able to identify undecidable problems.		

	<b>Unit 16: Robots</b>	<b>5 Days</b>	3.9
	Students will analyze and trace the path of a robot from an algorithm given as pseudocode.		
	<b>(Placeholder Unit) Big Idea 4 Computer Systems &amp; Networks (AP Exam Weighting 11-15%)</b>	<b>10 Days</b>	4.1, 4.2, 4.3
	Students will study all topics within the unit including The Internet, fault tolerance, and parallel/distributed computing.		
	<b>(Placeholder Unit) Big Idea 5 Impact of Computing (AP Exam Weighting 21-26%)</b>	<b>5 Days</b>	5.1, 5.2, 5.3, 5.4, 5.5, 5.6
	Students will study all topics within the unit including the harmful/beneficial benefits of computing innovations, computing bias, the Digital Divide, legal and ethical concerns, crowd sourcing, and safe computing practices.		
	<b>AP Exam Review. Mock AP Exam</b>	<b>4 Days</b>	
AP Exam topic review. Mock AP Exam. Actual AP exam date will be scheduled in the first two weeks of May.			
<b>Grading Period 6 4/19-5/26 28 Days</b>	<b>AP Exam Review. Mock AP Exam</b>	<b>10 Days</b>	
	AP Exam topic review. Mock AP Exam. Actual AP exam date will be scheduled in the first two weeks of May.		
	<b>Placeholder: Special Topics/Project</b>	<b>18 Days</b>	
	Remainder of the six weeks period following the AP exam.		