Curriculum Map: Intro to Computer Science (Python) 2022-23

Course: WEB DESIGN Sub-topic: General

Grade(s): 9

Course Description:	This year long course provides a robust introduction to computer programming through graphics and animations. Students will use the Python programming language.
Course Textbooks, Workbooks, Materials Citations:	Carnegie Mellon University Computer Science Academy curriculum website at https://academy.cs.cmu.edu

Unit: Unit 1: Creating Drawings

Timeline: Week 1 to 3

Unit Description:	This unit will focus on teaching students how to create drawings using shapes, colors, and opacity. Students will create and modify the following shapes: rectangles, ovals, circles, lines, labels, polygons, regular polygons, and shapes.

Topic: 1.1 Basics
Minutes for Topic: 132

Topic: 1.2 Colors
Minutes for Topic: 132

Topic: 1.3 Shapes
Minutes for Topic: 132

Topic: 1.4 End of Unit Exercises
Minutes for Topic: 88

Topic: Unit 1 Creative Tasks
Minutes for Topic: 132

Topic: Review/Quizzes
Minutes for Topic: 88

Unit: Unit 2 - Functions, Mouse Events, and Properties

Timeline: Week 4 to 6

Unit Description:	This unit will focus on teaching students about how to use functions, onMousePress and onMouseRelease functions, and shape properties

Topic: 2.1 Functions
Minutes for Topic: 88

Topic: 2.2 Mouse Events
Minutes for Topic: 88

Topic: 2.3 Properties
Minutes for Topic: 44

Topic: 2.4 End of Unit Exercises
Minutes for Topic: 44

Topic: Creative Tasks
Minutes for Topic: 132

Topic: Review/Quizzes
Minutes for Topic: 88

Unit: Unit 3 - Mouse Motion Events, Conditionals, and Helper Functions

Timeline: Week 7 to 9

Unit Description:	This unit will focus on teaching students about how to use the onMouseMove and onMouseDrag functions, conditionals, and helper functions.

Topic: 3.1 Mouse Motion Events
Minutes for Topic: 88

Topic: 3.2 Conditionals (if statements)
Minutes for Topic: 88

Topic: 3.3 Helper Functions
Minutes for Topic: 132

Topic: 3.4 End of Unit Exercises
Minutes for Topic: 44

Topic: Creative Tasks
Minutes for Topic: 132

Topic: Review/Quizzes
Minutes for Topic: 88

Unit: Unit 4 - More Conditionals, Key Events, and Methods

Timeline: Week 10 to 12

Unit Description: This unit will focus on teaching students how to use elif statements, onKeyPress and onKeyRelease functions, and shape methods.

Topic: 4.1 More Conditionals (if-elif-else Statements)
Minutes for Topic: 88

Topic: 4.2 Key Events
Minutes for Topic: 88

Topic: 4.3 Methods
Minutes for Topic: 88

Topic: 4.4 End of Unit Exercises
Minutes for Topic: 44

Topic: Creative Tasks
Minutes for Topic: 132

Topic: Review/Quizzes
Minutes for Topic: 88

Unit: Unit 5 - Complex Conditionals and More Key Events

Timeline: Week 13 to 15

Unit Description: This unit will focus on teaching students to use compound and nested conditionals and the onKeyHold functions.

Topic: 5.1 Complex Conditionals and More Key Events
Minutes for Topic: 88

Topic: 5.2 More Key Events
Minutes for Topic: 88

Topic: 5.3 End of Unit Exercises
Minutes for Topic: 44

Topic: Creative Tasks
Minutes for Topic: 132

Topic: Review/Quizzes
Minutes for Topic: 88

Unit: Unit 6 - Groups, Step Events, and Motions

Timeline: Week 16 to 19

Unit Description: This unit will focus on teaching students how to create and work with Groups and use the onStep function to create animation and motion.

Topic: 6.1 Groups

Minutes for Topic: 88

Topic: 6.2 Group Methods
Minutes for Topic: 88

Topic: 6.3 Step Events and Motion
Minutes for Topic: 88

Topic: 6.4 End of Unit Exercises
Minutes for Topic: 88

Topic: Mid-Year/Semester Creative Tasks
Minutes for Topic: 132

Topic: Review/Quizzes
Minutes for Topic: 88

Unit: Unit 7 - New Shapes, Local Variables, and For Loops

Timeline: Week 20 to 22

Unit Description: This unit will focus on teaching students how to create and modify new shapes (arcs and arrows), local variables, and for loops.

Topic: 7.1 New Shapes
Minutes for Topic: 88

Topic: 7.2 Local Variables
Minutes for Topic: 44

Topic: 7.3 For Loops
Minutes for Topic: 88

Topic: 7.4 End of Unit Exercises
Minutes for Topic: 88

Topic: Creative Tasks
Minutes for Topic: 132

Topic: Review/Quizzes
Minutes for Topic: 88

Unit: Unit 8 - Math Functions, Random Variables, and Nested Loops

Timeline: Week 23 to 26

Unit Description: This unit will focus on teaching students how to use math functions, random numbers, and nested loops. They will learn to use integer division, the mod operator (or remainder operator), and absolute value. They will also learn to use built-in functions to find the distance between two points, the angle between two points, and the distance from a given point at a certain angle and distance.

Topic: 8.1 Math Functions
Minutes for Topic: 132

Topic: 8.2 Random Values
Minutes for Topic: 132

Topic: 8.3 Nested For Loops
Minutes for Topic: 176

Topic: 8.4 End of Unit Exercises
Minutes for Topic: 132

Topic: Creative Task
Minutes for Topic: 132

Topic: Review/Quizzes
Minutes for Topic: 88

Unit: Unit 9 - Types, Strings, and While Loops

Timeline: Week 27 to 29

Topic: 9.1 Types and Input
Minutes for Topic: 88

Topic: 9.2 Looping & Indexing with Strings
Minutes for Topic: 88

Topic: 9.3 String Methods
Minutes for Topic: 132

Topic: 9.4 While Loops
Minutes for Topic: 88

Topic: 9.5 End of Unit Exercises
Minutes for Topic: 88

Topic: Creative Task
Minutes for Topic: 132

Topic: Review/Quizzes
Minutes for Topic: 88

Unit: Unit 10 - Lists and Return Values
Timeline: Week 30 to 32

Topic: 10.1 Lists
Minutes for Topic: 88

Topic: 10.2 List Methods
Minutes for Topic: 88

Topic: 10.3 Return Values
Minutes for Topic: 88

Topic: 10.4 End of Unit Exercises
Minutes for Topic: 88

Topic: Creative Task
Minutes for Topic: 132

Topic: Review/Quizzes
Minutes for Topic: 88

Unit: Unit 11 - Lists and Board Games
Timeline: Week 33 to 66

Topic: 11.1 2D Lists
Minutes for Topic: 88

Topic: 11.2 Board Games
Minutes for Topic: 264

Topic: Review/Quizzes
Minutes for Topic: 88

Unit: Unit 12 - Final Project
Timeline: Week 33

Topic: 12.1 FInal Project
Minutes for Topic: 220