Computers 8

Unit 1   (Conditionals)

Estimated Unit Time Frames	Big Ideas	Essential Questions	Concepts (Know)	Competencies (Do)	Lessons/ Suggested Resources	Vocabulary	Standards/ Eligible Content
9 Days	This set of puzzles will work to solidify and build on the knowledge of loops and introduce conditionals. By pairing these two concepts together, students will be able to explore the potential for creating fun and innovative programs in a new and exciting environment.	Can you draw a scene where someone is using a conditional?	Students will be able to explore the potential for creating fun and innovative programs in a new and exciting environment.	SWBAT Define circumstances when certain parts of a program should run and when they shouldn't. Determine whether a conditional is met based on criteria.	Express Course Code.org: Lesson 17 While Loops in Farmer	Condition - Something a program checks to see if it is true before allowing an action. Conditionals - Statements that only run under certain conditions.	1B-AP-10 - Create programs that include sequences, events, loops, and conditionals.

		What's the difference between a until loop and a while loop?	Students will build programs that have the main character repeat actions until they reach their desired stopping point.	SWBAT Build programs with the understanding of multiple strategies to implement conditionals. Translate spoken language conditional statements and loops into a program.	Express Course Code.org: Lesson 18 Until Loops in Maze	Condition - Something a program checks to see if it is true before allowing an action. Conditionals - Statements that only run under certain conditions. Loop - The action of doing something over and over again. Repeat - To do something again. Until - A command that tells you to do something only up to the point that something becomes true.	1B-AP-11 - Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process.
		How can you see conditionals being useful in programs? What if people only spoke in if/else statements? What would be some advantages and disadvantages of this?	Students will use conditionals to help the farmer know when to harvest crops.	SWBAT Nest conditionals to analyze multiple value conditions using if, else if, else logic. Pair a loop and conditional statement together.	Express Course Code.org: Lesson 19 Harvesting with Conditionals	Condition - Something a program checks to see if it is true before allowing an action. Conditionals - Statements that only run under certain conditions. Loop - The action of doing	1B-AP-11 - Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process.

| | | | | | | | something over and over again. Repeat - To do something again. While Loop - A loop that continues to repeat while a condition is true. | |

Unit 2   (Functions)

Estimated Unit Time Frames	Big Ideas	Essential Questions	Concepts (Know)	Competencies (Do)	Lessons/ Suggested Resources	Vocabulary	Standards/ Eligible Content
9 Days	Students will discover the versatility of programming by practicing functions in different environments. Here, students will recognize reusable patterns and be able to incorporate named blocks to call predefined functions.	What did your functions do in the programs you wrote today? How did that help you? When should you use a function instead of a loop?	Students will recognize reusable patterns and be able to incorporate named blocks to call predefined functions.	SWBAT Use functions to simplify complex programs. Use predetermined functions to complete commonly repeated tasks.	Express Course Code.org: Lesson 20 Functions in Minecraft	Function - A piece of code that you can easily call over and over again.	1B-AP-08 - Compare and refine multiple algorithms for the same task and determine which is the most appropriate. 1B-AP-11 - Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process.
		What makes you realize a function could	Students will learn there are many ways to approach a problem, but	SWBAT Recognizes when a function could help to simplify a program.	Express Course Code.org: Lesson 21 Functions in Harvester	Function - A piece of code that you can	1B-AP-08 - Compare and refine multiple algorithms for the same task and determine

		Essential Questions	Concepts (Know)	Competencies (Do)	Lessons/ Suggested Resources	Vocabulary	Standards/ Eligible Content
		help your program? How do while loops and if / else statements help your program?	some are more efficient than others.	Use predetermined functions to complete commonly repeated tasks.		easily call over and over again.	which is the most appropriate. 1B-AP-11 - Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process.
		What are some differences between functions and loops? Sketch out a drawing you made today. Can you write the code needed to create this?	Students will complete puzzles and progress to more and more complex images, but each new puzzle only builds off the previous puzzle. At the end of this lesson, students will feel confident and proud of their hard work.	SWBAT Categorize and generalize code into useful functions. Recognize when a function could help to simplify a program.	Express Course Code.org: Lesson 22 Functions with Artist	Function - A piece of code that you can easily call over and over again.	1B-AP-08 - Compare and refine multiple algorithms for the same task and determine which is the most appropriate. 1B-AP-11 - Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process.

Unit 3   (Variables)

Estimated Unit Time Frames	Big Ideas	Essential Questions	Concepts (Know)	Competencies (Do)	Lessons/ Suggested Resources	Vocabulary	Standards/ Eligible Content
9 Days	Variables will be used in this course to store and modify data. students will begin learning	How is a variable like a box? How is it different?	Variables will be used in this course to store and modify data. At this point, students will simply be storing	SWBAT Actions Use variables to hold words and phrases. Use variables in conjunction with prompts.	Express Course Code.org: Lesson 23 Text and Prompts	Variable - A label for a piece of information used in a program. prompt - A message on the computer screen	1B-AP-08 - Compare and refine multiple algorithms for the same task and determine which is the most appropriate.

	to modify the data stored in a variable.	Why do programmers need variables?	and retrieving values without changing them. In later lessons, students will store numerical values and modify them over time to keep track of things like a player's score in a game.			that waits for input from the user.	1B-AP-09 - Create programs that use variables to store and modify data. 1B-AP-10 - Create programs that include sequences, events, loops, and conditionals. 1B-AP-11 - Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process.
		How did you use variables in your game?	Students will begin learning to modify the data stored in a variable.	SWBAT Create a clicker game in Sprite Lab where sprites can be removed to score points Create a variable that stores information and changes over time	Express Course Code.org: Lesson 24 Counting with Variables	N/A	1B-AP-09 - Create programs that use variables to store and modify data. 1B-AP-10 - Create programs that include sequences, events, loops, and conditionals.
		Have you tried mixing multiple variables into one program? What might that look like? When would it be helpful?	Students will explore the creation of repetitive designs using variables in the Artist environment.	SWBAT Assign values to existing variables. Use variables to change values inside of a loop. Utilize variables in place of repetitive values inside of a program.	Express Course Code.org: Lesson 25 Using Variables with the Artist	Variable - A label for a piece of information used in a program.	1B-AP-09 - Create programs that use variables to store and modify data. 1B-AP-11 - Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process.

		What are some ways you have used variables so far? What else do you think you can do with variables?	Students will code with changing values that can be helpful and prepare students to understand how "for loops" work in upcoming lessons.	SWBAT Examine code to find places where variables can be substituted for specific values. Identify areas where they can use variables to modify quantities during runtime.	Express Course Code.org: Lesson 26 Variables with Bee	Variable - A label for a piece of information used in a program.	1B-AP-09 - Create programs that use variables to store and modify data. 1B-AP-11 - Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process.

Unit 4 (For Loops)

Estimated Unit Time Frames	Big Ideas	Essential Questions	Concepts (Know)	Competencies (Do)	Lessons/ Suggested Resources	Vocabulary	Standards/ Eligible Content
9 Days	Students will have plenty of practice critically thinking through problems by determining the starting, ending, and stepping values for each for loop. Students will continue their practice with for loops and variables while they create	How is a for loop different from a repeat loop? Why do you think for loops could be useful?	Students will have plenty of practice critically thinking through problems by determining the starting, ending, and stepping values for each for loop.	SWBAT Determine starting value, stopping value, and stepping value for a for loop. Recognize when to use a for loop and when to use other loops such as repeat and while loops.	Express Course Code.org: Lesson 27 For Loops with Bee	For Loop - Loops that have a predetermined beginning, end, and increment (step interval).	1B-AP-09 - Create programs that use variables to store and modify data. 1B-AP-11 - Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process.

		jaw-dropping images.					
		Draw one of the designs you made today. What was the code needed to create it? What are some designs you would like to create? How do you think loops or variables could help create those?	Students will continue their practice with for loops and variables while they create jaw-dropping images.	SWBAT Recognize when to use a for loop and when to use other loops such as repeat and while loops. Use for loops to change the loop several times with different values.	Express Course Code.org: Lesson 28 For Loops with Artist	For Loop - Loops that have a predetermined beginning, end, and increment (step interval).	1B-AP-09 - Create programs that use variables to store and modify data. 1B-AP-11 - Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process.
		How can you use code to bring your creative ideas to life? Design, plan, and code your own unique project while following a structured process that balances careful planning with boundless creativity.	This lesson provides students with space to create a project of their own design, using a step-by-step process that requires planning but also allows for broad creativity.	SWBAT Overcome obstacles such as time constraints or bugs.	Express Course Code.org: Lesson 29 End of Course Project	Define - Figure out the details of the problems that you are trying to solve Prepare - Research, plan, and acquire materials for the activity you are about to do Reflect - Carefully think back on something with the intention of improving the outcome in the future Try - Attempt to do something	1B-AP-09 - Create programs that use variables to store and modify data. 1B-AP-11 - Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process.