

Computer Science Essentials

UNIT/ Weeks	Timeline/Topics	Essential Questions
9	Creative Computing: Building with Blocks <ul style="list-style-type: none"> • Introduction to Computer Science Essentials • Collaborating Around Computing • Innovation and Problem Solving 	<ul style="list-style-type: none"> • Why is it important to become a creator of apps and not just a user? • How does block-based programming make life easier when coding? • Why are independent and cooperative strategies so important in computer science? • How do I describe an algorithm to someone new to computer science? • What mathematical and logical concepts have I seen before in my other classes? • What makes a computer science concept fundamental or essential? • Why are decisions in programs narrowed down to two options such as “yes or no” or “true or false”. • What information is being hidden or abstracted by a program? • How did you deal with challenges you were confronted with? • How does the variable scope influence the structure of an algorithm? • Why are user stories and user-centered design so important when creating an app? • What mathematical and logical concepts do I keep using over and over? • What are the advantages and benefits of using loops in an algorithm? • What are the advantages and challenges of pair programming? What are all the different ways iteration plays a role in a program and in an app that is created for others? • What is the purpose of a program? • Where does a program integrate mathematical and/or logical concepts? • What does an algorithm do in the program?
9	Computing and Society: Transitions to Text <ul style="list-style-type: none"> • Computing and Careers in Our Society • Computing in Our World • Transitions to Text Based Coding 	<ul style="list-style-type: none"> • What are some advantages to programming in a text-based language compared to a block-based programming language? • What are some of the ways concepts in blocks are represented in languages like Python® and JavaScript™? (Example: What do loops look like in a text-based language compared to blocks?) • How realistic is it to expect coding professionals to be experts on all programming languages? What are they really experts at?

		<ul style="list-style-type: none"> • What challenges are there to programming a vehicle to navigate an environment even if it is well defined? • Why are different languages sometimes better suited for expressing different algorithms? • What are some advantages and disadvantages of working at high and low levels of abstraction? • What do coding constructs in blocks look like in text-based languages? (Loops) • Why do you think arrays are an essential concept in programs? • What was your role on the Scrum development team? • What is the purpose of your program? • Where does your program integrate mathematical and/or logical concepts? • What does one of the algorithms in your program do? • How does an abstraction you created manage complexity in the program? • What part of the code did you develop?
10	<p>Web Developing: Solving with Syntax</p> <ul style="list-style-type: none"> • Collaborating in Text • Text Based Solutions • The Power of Text Based Programming 	<ul style="list-style-type: none"> • What are some advantages and challenges of cloud computing? • How is abstraction in the programming language I'm using managing complexity in my program? • How am I applying independent, cooperative, and collaborative strategies to find my own answers? • Can I describe what an algorithm does to someone new to coding? • What are some mathematical and logical concepts that are used over and over? • What computer science terms keep confusing me? • Can I describe what an algorithm does to someone new to coding? • What are some mathematical and logical concepts that are used over and over? • What computer science terms keep confusing me?
8	<p>Computing with a Purpose</p> <ul style="list-style-type: none"> • Innovation of Computational Problem Solving 	<ul style="list-style-type: none"> • What are some advantages and challenges of cloud computing? • How is abstraction in the programming language I'm using managing complexity in my program? • How am I applying independent, cooperative, and collaborative strategies to find my own answers? • Can I describe what an algorithm does to someone new to coding?

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