Coding in Minecraft - JavaScript Expert Coding – Exam Objective Domain

ID	Exam & Learning Objectives	Evidence	CSTA Standards Alignment	AP CSP Learning Objectives Alignment
1	**Variables & Data Types**			
1.1	Identify and use variables in JavaScript and assign appropriate data types	Be able to define a variable using JavaScript Be able to choose an appropriate data type of String, Number, Boolean and explain why	3B-AP-12 Compare and contrast fundamental data structures and their uses.	AAP-1.A Represent a value with a variable. 3.A
1.2	Convert between data types	Be able to convert from one data type to another	3B-AP-12 Compare and contrast fundamental data structures and their uses.	AAP-1.B Determine the value of a variable because of an assignment. 4.B
1.3	Identify and use Operators	Be able to identify and use Operators in JavaScript - assignment, comparison, logical, arithmetic Be able to determine operator precedence and sequence of execution	3B-AP-12 Compare and contrast fundamental data structures and their uses.	AAP-2.C Evaluate expressions that use arithmetic operators. 4.B AAP-2.E For relationships between two variables, expressions, or values: a. Write expressions using relational operators. 2.B b. Evaluate expressions that use relational operators. 4.B

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2	**Selection/Branching - If Statements**			
2.1	Identify and build If statements	Be able to identify and build code using if statements	3A-AP-15 Justify the selection of specific control structures when tradeoffs involve implementation, readability, and program performance, and explain the benefits and drawbacks of choices made.	AAP-2.H For selection: a. Write conditional statements. 2.B b. Determine the result of conditional statements. 4.B
2.2	Identify and build complex if statements	Be able to identify and build code using else if and else statements to create complex selections	3A-AP-15 Justify the selection of specific control structures when tradeoffs involve implementation, readability, and program performance, and explain the benefits and drawbacks of choices made.	AAP-2.I For nested selection: a. Write nested conditional statements 2.B b. Determine the result of nested conditional statements. 4.B
2.3	Identify and use If statements that contain compound conditionals	Be able to identify and build code using complex compound conditionals (Or, And) and Not operator	3A-AP-15 Justify the selection of specific control structures when tradeoffs involve implementation, readability, and program performance, and explain the benefits and drawbacks of choices made.	AAP-2.F For relationships betweenBoolean values: a. Write expressions using logical operators. 2.Bb. Evaluate expressions that use logic operators. 4.B

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3	**Iteration - Loops**			
3.1	Identify and build while loops	Be able to identify and build code which uses while loop statements	3A-AP-15 Justify the selection of specific control structures when tradeoffs involve implementation, readability, and program performance, and explain the benefits and drawbacks of choices made.	AAP-2.K For iteration: a. Write iteration statements. 2.B b. Determine the result or side effect of iteration statements. 4.B
3.2	Identify and build for loops	Be able to identify and build code which uses for loop statements	3A-AP-15 Justify the selection of specific control structures when tradeoffs involve implementation, readability, and program performance, and explain the benefits and drawbacks of choices made.	AAP-2.K For iteration: a. Write iteration statements. 2.B b. Determine the result or side effect of iteration statements. 4.B
3.3	Identify and build nested loops	Be able to identify and build code which uses nested loops	3A-AP-15 Justify the selection of specific control structures when tradeoffs involve implementation, readability, and program performance, and explain the benefits and drawbacks of choices made.	AAP-2.K For iteration: a. Write iteration statements. 2.B b. Determine the result or side effect of iteration statements. 4.B
3.4	Identify and build loops that use complex compound conditionals	Be able to identify and build loops that use complex compound conditionals (Or, And, Not)	3A-AP-15 Justify the selection of specific control structures when tradeoffs involve implementation, readability, and program performance, and explain the benefits and drawbacks of choices made.	AAP-2.F For relationships between Boolean values: a. Write expressions using logical operators. 2.B b. Evaluate expressions that use logic operators. 4.B

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3.5	Identify and use loop controls	Be able to identify, understand and implement continue and break statements in loops	3A-AP-15 Justify the selection of specific control structures when tradeoffs involve implementation, readability, and program performance, and explain the benefits and drawbacks of choices made.	AAP-2.K For iteration: a. Write iteration statements. 2.B b. Determine the result or side effect of iteration statements. 4.B

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4	**Collections**			
4.1	Identify and use arrays	Be able to identify, understand when to use and build code which uses arrays (creation, indexing, modifying, traversing, common methods)	3A-AP-14 Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.	AAP-1.C Represent a list or string using a variable. 3.A AAP-1.D For data abstraction: a. Develop data abstraction using lists to store multiple elements 3.B b. Explain how the use of data abstraction manages complexity in program code. 3.C AAP-2.N For list operations: a. Write expressions that use list indexing and list procedures. 2.B b. Evaluate expressions that use list indexing and list procedures. 4.B
4.2	Identify and use Objects	Be able to identify, understand when to use and build code which uses objects (creation, modification, common methods)	3A-AP-14 Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.	AAP-1.C Represent a list or string using a variable. 3.A AAP-1.D For data abstraction: a. Develop data abstraction using lists to store multiple elements 3.B b. Explain how the use of data abstraction manages complexity in program code. 3.C AAP-2.N For list operations: a. Write expressions that use list indexing and list procedures. 2.B b. Evaluate expressions that use list indexing and list procedures. 4.B

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5	**Structure and document code appropriately**			
5.1	Use indentation and format code	Be able to correctly use indentation to structure code appropriately	3A-AP-21 Evaluate and refine computational artifacts to make them more usable and accessible. 3A-AP-23 Document design decisions using text, graphics, presentations, and/or demonstrations in the development of complex programs.	CRD-2.G Describe the purpose of a code segment or program by writing documentation. 4.A
5.2	Document code	Be able to document code using comments and documentation stings	3A-AP-21 Evaluate and refine computational artifacts to make them more usable and accessible. 3B-AP-20 Use version control systems, integrated development environments (IDEs), and collaborative tools and practices (code documentation) in a group software project.	CRD-2.G Describe the purpose of a code segment or program by writing documentation. 4.A CRD-2.H Acknowledge code segments used from other sources. 1.C
5.3	Code review	Be able to perform a code review of another person's code	3B-AP-23 Evaluate key qualities of a program through a process such as a code review.	

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6	**Error handling**			
6.1	Understand the different types of errors and causes	Be able to identify, understand, differentiate, and perform basic troubleshooting procedures and fix syntax errors, semantic/logic error, and runtime errors	3B-AP-18 Explain security issues that might lead to compromised computer programs.	CRD-2.I For errors in an algorithm or program: a. Identify the error. 4.C b. Correct the error. 4.C
6.2	Understand code testing and create tests	Be able to understand the need for and importance of testing and be able to create tests to validate code	3B-AP-21 Develop and use a series of test cases to verify that a program performs according to its design specifications.	CRD-2.J Identify inputs and corresponding expected outputs or behaviours that can be used to check the correctness of an algorithm or program. 4.C
6.3	Identify and build code that handles errors and exceptions	Be able to identify, understand when to use and build code which uses exception handling - try, else, finally, throw	3B-AP-18 Explain security issues that might lead to compromised computer programs.	

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7	**Modularity**			
7.1	Understand modularity and identify when to use	Be able to understand the concept of modularity and identify when modularity can or should be used in code	3A-AP-17 Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects. 3B-AP-15 Analyse a large-scale computational problem and identify generalizable patterns that can be applied to a solution.	AAP-3.B Explain how the use of procedural abstraction manages complexity in a program. 3.C CRD-2.B Explain how a program or code segment functions. 4.A
7.2	Identify and build functions	Be able to identify, understand, use (call) and build functions - function statement	3A-AP-16 Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions. 3A-AP-18 Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs. 3B-AP-14 Construct solutions to problems using student-created components, such as procedures, modules and/or objects.	AAP-3.A For procedure calls: a. Write statements to call procedures. 3.B b. Determine the result or effect of a procedure call. 4.B AAP-3.C Develop procedural abstractions to manage complexity in a program by writing procedures. 3.B

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7.3	Identify and build functions that take or return data	Be able to identify, understand, use (call) and build functions that take parameters or return data - passing parameters/arguments (inc optional and keyword arguments) and return statement	3A-AP-16 Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions. 3A-AP-18 Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs. 3B-AP-14 Construct solutions to problems using student-created components, such as procedures, modules and/or objects.	AAP-3.A For procedure calls: a. Write statements to call procedures. 3.B b. Determine the result or effect of a procedure call. 4.B AAP-3.C Develop procedural abstractions to manage complexity in a program by writing procedures. 3.B

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8	**Input and Output**			
8.1	Identify and build code that performs console input operations	Be able to identify and build code which reads input from the console and stores or processes appropriately		
8.2	Identify and build code that performs console output operations	Be able to identify and build code that outputs to the console and format output appropriately		
8.3	Identify and build code that performs file input operations	Be able to identify and build code that opens, reads, and closes text files including using the with statement		

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