

## Year 6 Computing – Programming: Variables in Games

### What I should already know

- Programming is when we make and input a set of instructions for computers to follow.
- We can use algorithms in order to create accurate and imaginative robotic actions.
- Input refers to the data which is entered into a computer or device and output device refers to the device which receives data from a computer or device.

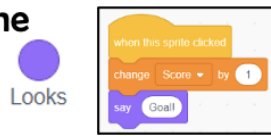
### What I will learn by the end of this unit

- Variables are changeable elements of a program.
- We can use algorithms to plan, model, trial and debug, in order to create accurate command sequences, that enable variables to be enacted in games.

### More Complex Variables

- Variables should always have a value and an appropriate name.

-**Adding Callouts:** Select 'Looks' from the menu on the left. Add it to the variable program. Edit the text to change the callout.



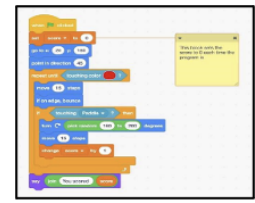
-**Adding Motion:** Many games require sprites to change position. This is achieved using the 'Motion' commands. Select 'Motion' from the menu on the left. Choose from the available motion commands.



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-**Adding Comments:** Comments are a good way of showing that you understand what your code is doing. Right click on the block that you want to comment on and add in your comment.



### Basic Variables

**Variables:** A variable is something that is changeable. A variable can be set and changed throughout the running of a program.



In computer programming we use variables to store information that might change and can be used later in our program. E.g. in a game a variable could be the current score of the player; we would add 1 to the variable whenever the player gained a point.

### Making Variables in Scratch – The Basics

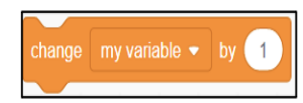
-Select 'Variables' (dark orange circle) from the menu on the left. Either choose from the available variables or 'Make A Variable.'



-Select 'Events' (light orange circle) from the menu on the left. Choose what needs to happen for the variable to change. E.g. 'When this sprite clicked' or 'when space key pressed.'



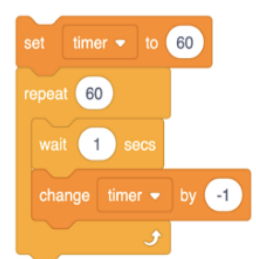
-Select 'Variables' again from the menu on the left. Choose what will happen when the event happens, e.g. 'change score by 1' (to add a point) or 'change score by -1' to remove a point.



### Sequencing and Algorithms

-A **sequence** is a pattern or process in which one thing follows another.

-We design **algorithms** (sets of instructions for performing a task) to help us program sequences involving multiple output devices (e.g. LEDs and motors).



-**Programming** is the process of keying in the code recognized by the computer into the software (using your algorithm).

### Trialling and Debugging

-Programmers do not put their computer programs straight to work. They **trial** them first to find any errors:



-**Sequence errors:** An instruction in the sequence is wrong or in the wrong place.

-**Keying errors:** Typing in the wrong code.

-**Logical errors:** Mistakes in plan/thinking.

-If your algorithm does not work correctly the first time, remember to **debug** it.

### Disciplinary Skills

- Design, write and debug programs that accomplish specific goals.
- Solve problems by decomposing them into smaller parts.
- Use sequence, selection and repetition in programs.
- Work with variables.
- Use logical reasoning to explain how simple algorithms work and to detect and correct errors in algorithms and programs.
- Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration.

### Key Vocabulary

variable	change	name	value
set	design	event	code
task	test	motion	callout