STEAM Year 9 - Programming

You will learn about:

- Basic programming structures
- Python programming syntax
- The user interface (inputs and outputs)
- Decomposition of problems

STEAM SKILLS

- Using failure to learn and grow
- Accuracy
- Logical reasoning

You will do this by developing programming skills using the Lego Prime system to work through various Coding Success Tasks

Lesson Overview	Key Words
Lesson 1 – Earthquake Simulator	Python
	IDE (Pycharm)
	Decomposition
Lesson 2 – Making decisions 1	Abstraction
Being able to control the flow of a program based on conditions by creating a basic number challenge game.	
	Assignment
Lesson 3 – Making decisions 2	Data type
Control the flow of a program to create a system that will take café orders and create a bill.	Integer
	Character
	Float
Lesson 4 – Using lists.	boolean
Learn how to create a list that can be added to and altered instead of multiple variables.	Identifiers
	Camel case
Lesson 5 – Design a basic game.	
Decompose a problem into smaller parts and understand how to create these parts using functions.	**Selection**
	expression
	Boolean condition (TRUE,FALSE)
Lesson 6 – Creating the playing grid	Boolean logic (AND, OR, NOT)
Use a 2-dimensional array to create and display a playing grid for the robot.	
	Iteration
	Definite (for loops)
Lesson 7 - Add the player movement	In-definite (while loops)
Understand the basic principles of moving a player within a grid.	
	Array
	List
Lesson 8 – Scoring and rules	2D table\matrix
Be able to identify when objects are in certain positions to allow scoring and applying rules.	Index
	Function
Lesson 9 - enhancing and debugging	Input
Adding enhancements to the game and also developing more advance debugging skills.	Output
	Parameter\argument
	Local scope
	Debugging

	Syntax error Runtime error Breakpoint Step (into, over, out) Watch window
Suggested reading or support available **Look in your OneNote library where I will put references and links.** **Python.org** - main reference for Python **TutorialsPoint.com** - good python reference with examples **Pygame.org** - add-on to allow graphics (complicated, do the basics first!) YouTube!	**Cross curricular** Maths coordinate systems Algorithms to manage movement **Literacy links** ….

SUCCESS

CRITERIA

AND

FEEDBACK
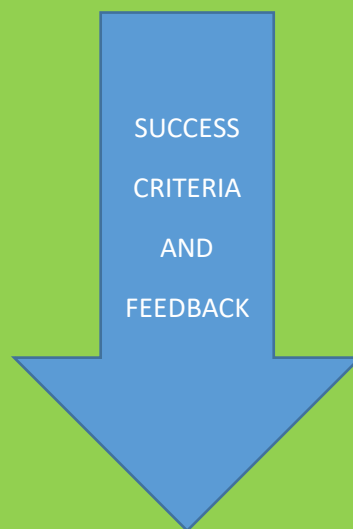
SUCCESS CRITERIA

Highlight your starting point for each skill in **PINK**, at the end of the project highlight where you think you got to in **BLUE**.

Grade Range	Using failure to learn and grow	Accuracy	Logical reasoning
0	I presented no work.	I presented no work.	I presented no work.
1	WWW: I can identify some basic errors and mistakes with my work. EBI: I need to reflect more on my mistakes and try to not repeat them.	WWW: I have made an attempt to complete the task with some success. EBI: I need to try and take more time and care with my work to avoid mistakes.	WWW: I understand some of the cause and effect in my work. EBI: I need to try to work out what the other possible choices and results could be in the task.
4	WWW: I can identify some issues and mistakes and overcome them. I can reflect on the causes of mistakes and see why they happened. EBI: I need to think more carefully about past experiences\mistakes so that I do not make the same mistake again.	WWW: I have completed the task with reasonable accuracy and have created a successful piece of work EBI: I need to make sure I have planned and prepared my work beforehand and take more care to avoid errors.	WWW: I clearly understand cause and effect and use them as I work. I make predictions whether something will or will not work and test my hypothesis out. EBI: I need to ensure that I cover more\all possibilities when I test or try to solve my problem..
6	WWW: I managed to independently identify and fix issues and mistakes. EBI: I should refer to my past errors (looking at my past work) and attempt to resolve potential mistakes at the design stages.	WWW: I have consistently completed tasks with care and with few mistakes resulting in a successful piece of work. EBI: I need to ensure my work is planned and prepared thoroughly to ensure I can complete a task without any errors.	WWW: I can apply clear logic thinking as part of my problem solving and regularly rely upon this to know whether something is likely to work or not. I can identify faults effectively. EBI: I should make sure that I work out the logical opposites to my work and use them to aid testing and fault finding.
8	WWW: I can shown and explain, using previous issues and mistakes, why my work or solutions will be more likely to succeed than in previous efforts. EBI: When testing a problem, I need to make sure that I also try to prove something doesn't work as well as what does work to gain a better understanding.	WWW: I always complete the tasks with a high level of precision and accuracy and have produced a quality outcome which is both functional and elegant. EBI I should consider ways of producing every part of my work to a consistently high quality.	WWW: I use logical processes and arguments to confidently ensure an efficient solution is found. I use logic for fault finding frequently and successfully. I understand that inverse operations are used for checking and proof. EBI: Make use of logic tables to prove and test more advanced ideas or concepts.