Computing 24-25

Year 6 – Programming with variables

Remember when: beebots, scratch, logo, sphero, drones	**Key vocabulary**
By the end of the unit children must be able to: I can identify examples of information that is variable I can explain that a variable has a name and a value I can decide where in a program to change a variable I can create algorithms for my project	Variable, change, name, value set, change design, event Design, algorithm, code Task, design, artwork, program, project, test, debug

In Year 1:	**In Year 2:**	**In Year 3:**	**In Year 4:**	**In Year 5:**
Move the beebot forwards, backwards and turn. Be able to move a beebot to a given area.	To create a new character. To move the character. Make the character bigger /smaller. Make the character talk. Create a link of 3 algorithms.	Change the colour of the pen. Draw at least 4 shapes or letters using algorithms. Complete level 1.	Make the sphero move Change the speed of the sphero ball. Change the direction of the sphero ball. Direct a sphero ball through a maze. Debug coding errors.	Send the drone to fly in the air and hover. Move the drone safely around the room. Land the drone carefully on a landing point. Debug errors in coding.

National curriculum:
- design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.
- use sequence, selection and repetition in programs; work with variables and various forms of input and output.
- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.

Software / Hardware

This unit explores the concept of variables in programming through games in Scratch. First, learners find out what variables are and relate them to real-world examples of values that can be set and changed. Then they use variables to create a simulation of a scoreboard. In Lessons 2, 3, and 5, which follow the Use-Modify-Create model, learners experiment with variables in an existing project, then modify them, before they create their own project

	Title / Focus	**Lesson outline**
Lesson 1 Introducing variables LO- To define a 'variable' as something that is changeable SK- I can identify examples of information that is variable		Learners are introduced to variables. They see examples of real-world variables (score and time in a football match) before they explore them in a Scratch project. Learners then design and make their own project that includes variables. Finally, learners identify that variables are named and that they can be letters (strings) as well as numbers.
Lesson 2 Variables in programming LO- To explain why a variable is used in a program SK- I can explain that a variable has a name and a value		Learners understand that variables are used in programs, and that they can only hold a single value at a time. They complete an unplugged task that demonstrates the process of changing variables. Then, learners explore why it is important to name variables and apply their learning in a Scratch project in which they make, name, and update variables.
Lesson 3 Improving a game LO- To choose how to improve a game by using variables SK- I can decide where in a program to change a variable		Learners apply the concept of variables to enhance an existing game in Scratch. They predict the outcome of changing the same change score block in different parts of a program, then they test their predictions in Scratch. Learners also experiment with using different values in variables, and with using a variable elsewhere in a program. Finally, they add comments to their project to explain how they have met the objectives of the lesson.
Lesson 4 Designing a game LO- To design a project that builds on a given example SK- I can create algorithms for my project		Learners work at the 'design' level of abstraction, where they create their artwork and algorithms. Learners first design the sprites and backgrounds for their project, then they design their algorithms to create their program flow.
Lesson 5 Design to code		Learners implement the algorithms that they created in Lesson 4. In doing this, they identify variables in an unfamiliar project and learn the importance of naming

LO- To use my design to create a project SK- I can choose a name that identifies the role of a variable	variables. They also have the opportunity to add another variable to enhance their project.
Lesson 6 To evaluate my project LO- I can evaluate my project SK- I can identify ways that my game could be improved	Learners build on the project that they created in Lesson 5. They consider how they could improve their own projects and make small changes to achieve this. Learners then have the opportunity to add a variable independently. Finally, learners evaluate each other's projects; they identify features that they liked and features that could be improved.

Working towards	**End of Unit Assessment** Working at Age related expectations	Working at a greater depth