Beech Hill Primary School Knowledge Organiser

Topic: Computing – Computer Science	Year group	Term
Discovery Coding: More complex variables	Year 6	Autumn 2 4 sessions

Background knowledge

Children will have completed two unit of Espresso block coding in Year 5, Speed, direction and coordinates and random numbers and simulations.

What should I already know?

Children know how computers use numbers to represent things such as how fast things are moving, and where they are. Children know how computers can generate random numbers and how these can be used in simulations. They use this knowledge to create their own games showing their awareness of the difference between set speed and set heading and variables like change speed and change heading. They will use coordinates to return objects to a starting position.

National Curriculum Objectives / Key Skills

Pupils should be taught to:

To design, write and debug programs using if, then, else statements and with guidance begin to program simple hardware.

To use sequence, selection, and repetition in programs; work with variables.

To use logical reasoning to explain how some simple algorithms work and to begin to detect and correct errors independently.

Links to CAS progression pathways

Programming and development

•Executes, checks and changes programs.

The Journey

1. To write code that prompts the user to input the value of a variable, and use this to create an interactive block chart. (Shape Shifting)
2. To use my knowledge of variables to make a balloon pop game that gets harder as users score more points. (Pop challenge)
3. To write the code for a shopping till using variables to store and calculate values. (Toy shop till)
4. To create a stopwatch with stop, start, and reset buttons, and both digital and analogue displays (Stopwatch)

• Understands that programs execute by following precise instructions. • Understands what an algorithm is and is able to express simple linear (non-branching) algorithms symbolically. • Detects and corrects errors, i.e. debugging in algorithms. • Designs simple algorithms using loops and selection, i.e. if statements. • Designs solutions (algorithms) that use repetition and two-way selection, i.e. if, then, and else. • Uses diagrams to express solutions. • Declares and assigns variables. **Links to Curriculum for Excellence** • I understand that sequences of instructions are used to control computing technology. • I can develop a sequence of instructions and run them using programmable devices or equivalent.	

Outcomes
An overview of what children will know / can do Working towards: Children begin learn to use variables in more complex ways, and to manipulate inputs to create useful outputs with support understanding some of the mathematical concepts, eg. reading analogue clocks. Expected: Children learn to use variables in more complex ways, and to manipulate inputs to create useful outputs. Children can see and explain the link between maths and the outputs produced by their codes. Exceeding: Children learn to use variables in more complex ways, and to manipulate inputs to create useful outputs. Using their mathematical knowledge, they make predictions about the outputs based on the inputs they use throughout the unit (for example, I know the area of a 3cm

x 5cm unit is 15cm2, does my code produce that answer?). They use their knowledge of the activities in the unit to create their own game which produces mathematical outputs.

Key Vocabulary

1. input, variable, property, background, grid, pixel, block, convert, value, alignment, unit, scale
2. variable, condition, event, random, loop, if statement
3. variable, discount, calculate, total, percentage
4. Boolean, analogue, digital, variable, loop, condition

Key people / places

Charles Babbage (1791-1871) A mathematician, philosopher, inventor and mechanical engineer, Babbage originated the concept of a digital programmable computer.

Question of the week.

1. How will you represent this data on the screen? What changes do you need to make to your code to help you represent the data?
2. Have you made something similar before?
3. How did you check the code to see if the till was working properly?
4. What is making the numbers change and how?