How important are algorithms?

This unit introduces principles of coding and encourages basic understanding of algorithms and how to create precise instructions for visual working programs. It begins to develop a sense of creating, debugging and logical reasoning, which are required for further programming at KS2.

In this unit children will:

- Be able to understand and create their own algorithms using different software.
- Use Bee-Bots to write down and follow different instructions for direction.
- Use the app – Scratch Jnr- to create simple algorithms to make the character Scratch move and understand how this works.
- Also use the online programme of Scratch to create algorithms to sequence different events.
- Make Spheros move by creating algorithms and sequencing on an app.
- Understanding what programming is and how it is used in daily life.

Prior Learning
Year 1 use of Bee Bots and directions.
Year 2 use of directions and instructions.

Cross Curricular Links
PSHCE – discussing the impact of computers on daily lives. Also, the use of internet safety.

Key Vocabulary

- **sequence** – the order in which instructions are placed for the computer to read the algorithm.
- **programming** – how the computer follows the algorithms (instructions) in the correct order.
- **algorithms** - a process or set of rules to be followed in calculations or other problem-solving operations, especially by a computer.
- **debug** – identify and remove errors from the computer or software to help it run better.
- **App** – short for application. These can be opened on electronic devices.
- **download** – to take information from the internet, this can be photographs, films and more!
- **backdrop** – the picture or colour that the story takes place on (Scratch).
- **Sprite** – the character.
- **Code** – the technical name for an instruction.

Key Knowledge

- Sequencing is the process of organising instructions into a sensible and logical order, so that the computer programme can correctly carry out the instructions.

- Bee Bots are little electronic creatures that are moved by inputting directions into device. What happens when the children change the directions inputted?

- Scratch has an instruction block for the children to add their pieces of algorithms.

- Scratch allows the use blocks for movement and different end blocks including repeat and forever.

- Scratch allows the creation of longer sequences of more complex instructions.

- The children can learn to program two or more characters with instructions at the same time.

- Sphero is a small robotic sphere moved via an app.

- If your code does not work, it means it has got a Bug! This could mean that your instructions could be in the wrong order!

Key Questions

- Who invented algorithms?

- What happens when there's a problem in the algorithm?

- Why is the cat called Scratch?

- Can you make the Sphero go in a straight line?