Programming Toys

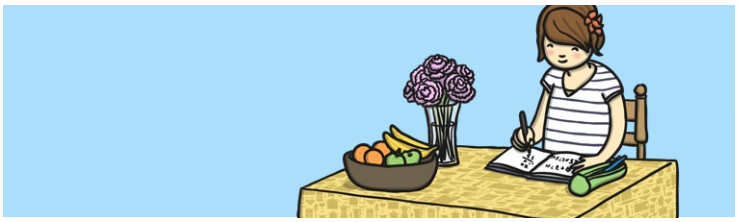
Computing I Year 1 I Unit Overview

Introduction

In this unit about programming toys, children will be introduced to the principles of programming through unplugged tasks and the use of Bee-Bots. They will be introduced to algorithms as a set of step-by-step instructions given to a device, will learn how to debug simple algorithms and how to use logical reasoning to predict how a program will behave.

Health & Safety

When asking the children to use scissors and glue, please take care to provide good supervision. When moving around the classroom or other spaces in school, ensure that children are aware of their surroundings. Ensure that rules are clear for taking photographs on tablet devices and using equipment safely, carefully and respectfully.



Home Learning

Ordering Instructions: In this task, children will be asked to number instructions for how to build a tower from toy bricks in the correct order, and to try explain what will happen if the instructions are in a different, incorrect order.

Using Symbols in Algorithms: In this task, children will be asked to draw arrows in a sequence which will direct a Bee-Bot to a toy of their choice on a grid.

Wider Learning

Children should be encouraged to apply the programming skills used to use basic coding software as well as a range of coding and algorithmical apps and programmable toys. Programming apps, available for iOS and Android, which work in a similar way to the programming in this unit may be used to enhance this unit. These may include: Bee-Bot, A.L.E.X., Think and Learn Code-a-Pillar.

There are strong links to direction in maths and writing instructions in English.

Assessment Statements

By the end of this unit...

...all children should be able to:

- create step-by-step instructions using pictures;
- write and follow detailed step-by-step instructions;
- direct a Bee-Bot to a toy;
- program a Bee-Bot, one instruction at a time, using the arrow buttons.

...most children will be able to:

- say what an algorithm is;
- say why it is important to be precise when writing an algorithm;
- check their work for mistakes (debug);
- program a Bee-Bot using the arrow buttons;
- start their programming sequence again if they need to;
- check their work for mistakes to debug a program;
- plan and check an algorithm.

...some children will be able to:

- see how a product changes when they change the instructions;
- evaluate and improve their sequence (debug).

To look at all the resources in the Programming Toys unit click here.

To find out more about PlanIt download our free guide here.

Lesson Breakdown

1. Building Bricks

Understand that programs execute by following precise and unambiguous instructions.

Create and debug simple programs.

Use technology purposefully to create digital content.

Children will work within the context of following picture instructions for building shapes.

- I can create instructions using pictures.

2. Potato Man Algorithms

Understand how [algorithms] are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions in the context of writing detailed instructions to build a face on a potato man toy.

- I can say why it is important to be precise when writing an algorithm.

3. Program a Person

Understand what algorithms are and that programs execute by following precise and unambiguous instructions.

Create and debug simple programs.

Children will work within the context of writing instructions to program a person.

- I can write instructions to program a person like a computer.

4. Bee-Bot Toy Shop Part 1

Understand what algorithms are and that programs execute by following precise and unambiguous instructions; create and debug simple programs in the context of programming a Bee-Bot to reach a set marker.

- I can program a Bee-Bot to move.

5. Debugging Bee-Bots

Create and debug simple programs in the context of fixing incorrect Bee-bot instructions.

- I can debug a Bee-Bot.

6. Bee-Bot Toy Shop Part 2

Understand what algorithms are and that programs execute by following precise and unambiguous instructions.

Create and debug simple programs.

Children will work in the context of programming a Bee-Bot to reach set markers.

- I can program a sequence to make a Bee-Bot move.

Resources

- Building bricks – 5 per pair
- Tablets with cameras – 1 per pair

- 10 building bricks
- Glue
- Scissors
- Flipchart or large whiteboard

- Shoes
- Whiteboards
- Scissors

- Bee-Bots
- Whiteboards and pens
- Camera

- Bee-Bots – 1 per pair or group
- Whiteboards

- Bee-Bots
- 3-4 toys
- Whiteboards and pens

To look at all the resources in the Programming Toys unit click here.

National Curriculum Aim Lesson Context Child Friendly