

## Overview

In this activity, children will learn to create a short sequence of instructions (algorithms) to program their Bee to move.

### Concepts:



Algorithms



Programming



Debugging

**Age group:** 5 – 11

**Duration:** 15 – 45 minutes

### Materials you will need:

-  A printed Bee Bot, or draw your own. You could even make a model Bee, using a cardboard tube for the body and sticking paper on for wings. Colour the stripes and patterns or get out the glitter to make it sparkle, the creativity is endless!
-  Printed direction cards or paper and pen to draw your own
-  A printed 3x2 square grid, or you could draw 15cm squares with chalk or make with masking tape indoors.
-  Drawings of flowers or flowers made with coloured paper – some are also available to print out.

## What will your child/children learn?

**Algorithms** – An algorithm is a precise sequence of instructions, or set of rules, for performing a task.

**Programming** – Programming is the process of designing and writing a set of instructions (a program) for a computer in a language it can understand. This can be simple, such as a program making a robot toy trace out a square, or incredibly sophisticated, such as those behind search engines and weather forecasting.

**Debugging** – Debugging is about finding out what is wrong in an algorithm or program and fixing it.

The behaviours **creating**, **persevering**, **collaborating** and **tinkering** (changing things to see what happens), are approaches to learning that are encouraged throughout our home activities.

## Getting started

- 1) Explain to your child/children that they are going to be controlling or **programming** their Bee to move to find a flower because bees like flowers.
- 2) Using the printed direction cards, show the forward arrow and ask what this arrow might mean. Show the action by moving the Bee forward one square and saying “forwards”. Ask your child/children to copy you and repeat the word if they can.
- 3) Repeat with the other directional cards, emphasising that the right and the left turns and quarter turns on the spot.
- 4) Explain: An algorithm is a sequence of instructions to get something done.

## Their turn

- 1) Place the Bee on the bottom left corner of the grid. Place the flower in a different square on the grid.
- 2) Ask your child/children to choose the direction cards that would program the Bee to move to the flower. Explain that this is their algorithm.
- 3) They should plan their simple program with just 3 or 4 steps in them to move the Bee to the flower square. Lay the cards out beside the grid or draw the direction shapes on a separate piece of paper.

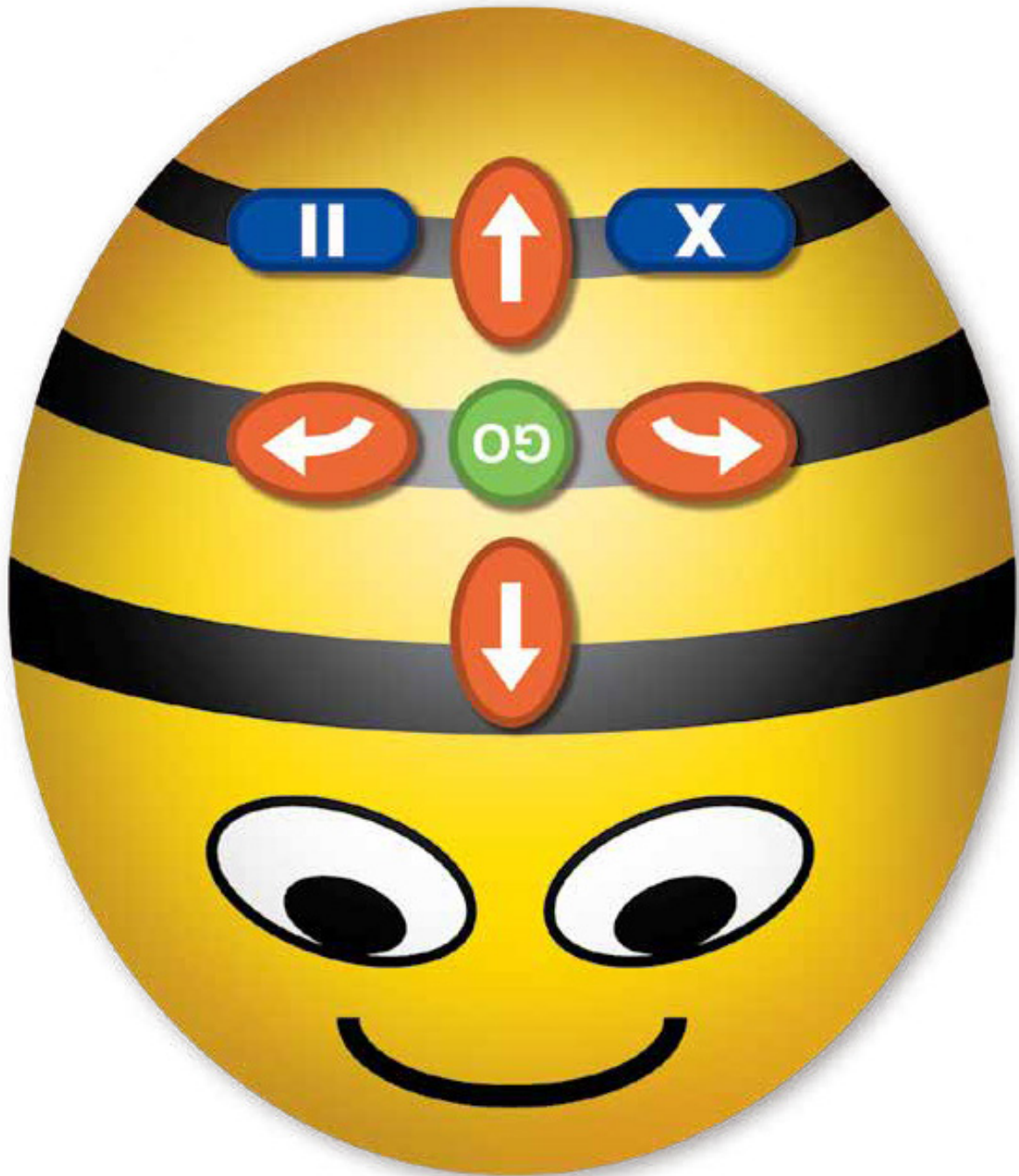
## Time to talk

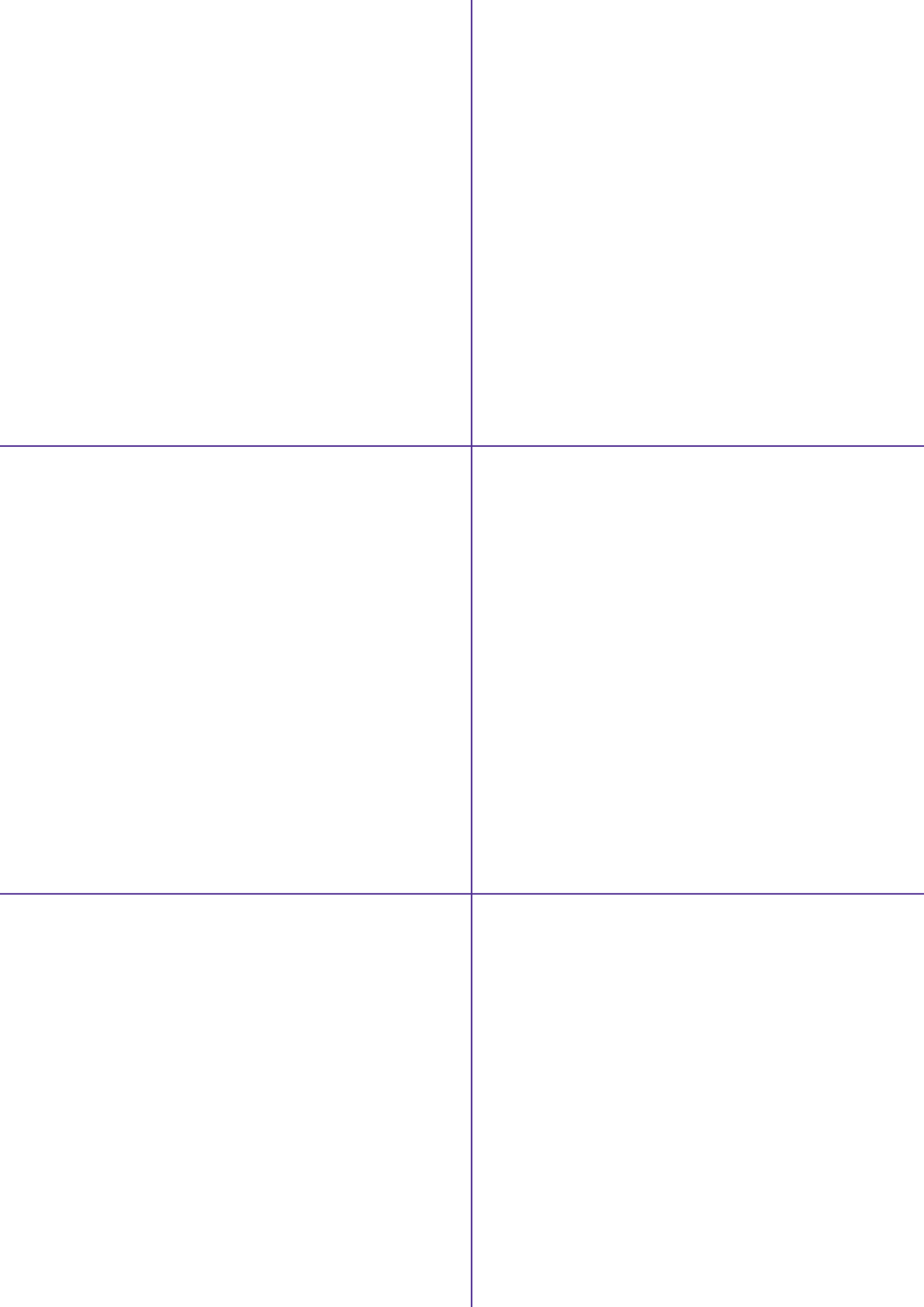
- 1) Explain that if the Bee didn't reach the flower, they will need to use their **debugging** skills to correct the instructions. Debugging is about finding out what is wrong in an algorithm or set of instructions and then fixing it.

## More ideas

- Make a grid outside with chalk so that you or your child/children could add in other objects from the garden or home that have to be avoided or reached.
- Add in more steps in the algorithm so the Bee has to go to more than one square. You can make your grid as big as you like!
- Look at other creatures that live in the garden or outside and find out where they like to live and what they like to eat. Make a 'fact file' or booklet to share with others.
- Explore robots as a theme: create a robot outfit for a favourite toy, build a robot out of small building bricks or junk modelling, watch a film such a WAL-E or have a look at the Honda robot Asimo together on YouTube.

# Bee-bot





# Direction cards

**Step forward**



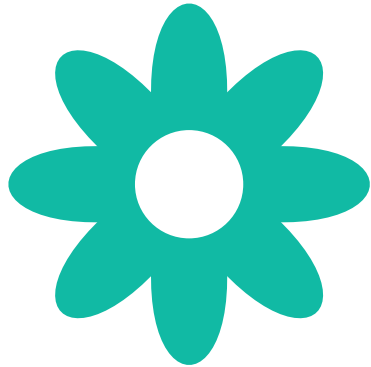
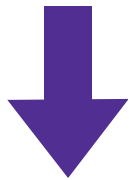
**Repeat x 2**



**Step forward**



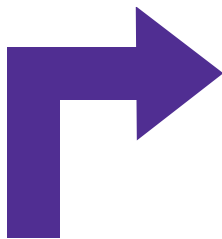
**Step backward**



**Step backward**



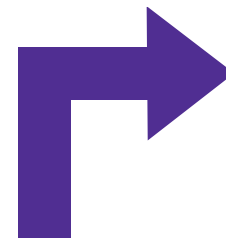
**Turn right**



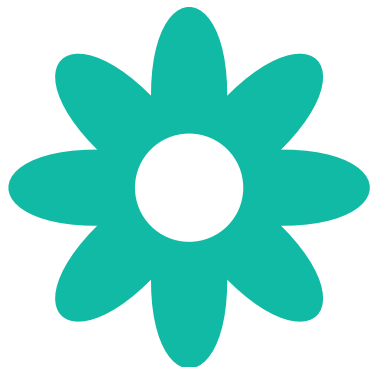
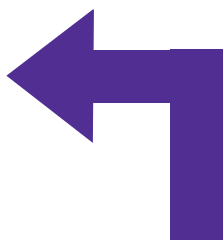
**Repeat x 3**



**Turn right**



**Turn left**



**Turn left**

