

# Barefoot



Recommended for  
**ages 5-7**

## Stay Safe Online with Bee-Bots, Snakes & Ladders!

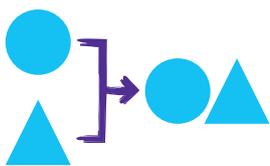
An introduction to rule based algorithms

Activity duration: **45 minutes**

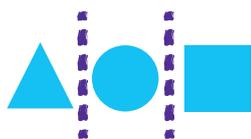
Principal partners



### Concepts and approaches covered



**Algorithms**



**Decomposition**



**Logic**



**Debugging**



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# Overview

In this activity, pupils play a special online safety edition of snakes and ladders as they program Bee-Bots to move around a mat. The snakes and ladders board includes a variety of online safety 'Dos and Don'ts'. If their Bee-Bot lands on a 'Do' they climb a ladder, but land on a 'Don't' and they slither down the board on a snake! Pupils have to correctly program their Bee-Bot to move around the board, else they go back to where they started!



# No Bee-Bots? No problem!

Don't worry if you don't have Bee-Bots in your school. We have created a Scratch simulation of a Bee-Bot on the online safety snakes and ladders board which you can use instead. You'll find it at this link <https://scratch.mit.edu/projects/186342387/> or we've included the Scratch file with this resource.

Simply follow the lesson plan below, but model to pupils how to use the Scratch simulation instead. Then set pupils off at a computer each, or in pairs, with a dice and the winner is the first in the class to get their Bee-Bot to the finish!

**Note** - The writing on the online Bee-Bot simulation can be a little tricky to read so make sure you have made the stage area fill the screen by clicking  v458

We also suggest leaving slide 2 from the presentation up on the board for pupils to refer to, or printing this slide out for pupils to have at their computers.

The simulation is very straightforward to use, simply click on the commands you want to enter and run the program by clicking 'Go'. An optional slide at the end of the presentation has been included to help you demonstrate this to pupils. We would also recommend giving pupils time to **tinker** with this program first, so they learn how it works themselves.



**Stay Safe Online**

How it works: Staying safe online has never been more important. However, by following a few simple steps (and avoiding a few others!), you'll be keeping your information secure. To pick up a few tips, try our Snakes & Ladders Bee-Bot challenge. Roll a dice and move your Bot to the right square. If you stick to the right tips you'll finish safely, but get it wrong and be prepared to start again!

13 ✔ Your cousin has posted a new YouTube video – you and your parent leave a positive comment.	12 ✘ A pop up appears on your screen, you click it before checking with a grown up.	11 ✘ A new player messages you within your game – they ask you which school you go to and which year group you are in.	10
5 ✘ Your favourite game wants you to pay £££ for more tokens in order to skip 2 levels.	6 ✔ You and your parent agree which fun websites and games you can use at home.	8 ✘ You tell your friend the password to your favourite game and they tell you theirs.	9 ✔ There's an amazing news story online about a flying rabbit – you and your parent check other websites to see if it's real (it's not).
4 ✔ You and your parent make a cool avatar for your favourite game!	3 ✘ You are up late using your device instead of going to sleep.	2 ✘ You clicked on a link from someone you don't know and something strange has started downloading.	1 Start
Finish	7 ✔ You and your parent agree which fun websites and games you can use at home.	8 ✘ You tell your friend the password to your favourite game and they tell you theirs.	9 ✔ There's an amazing news story online about a flying rabbit – you and your parent check other websites to see if it's real (it's not).

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# Pupil objectives

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- ✓ I can write an algorithm
- ✓ I can program a Bee-Bot
- ✓ I can debug an algorithm and program
- ✓ I know and understand a variety of 'top tips' to stay safe online

## Introduction whole class (5-10 mins)

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- Has anyone played 'Snakes and Ladders' before? Encourage a pupil to explain how it is played
- **Introduce the Stay Safe Online Bee-Bot mat on Slide 2 of the presentation. Explain pupils will be playing a special game of snakes and ladders, in that:**
  - They will be programming Bee-Bots to move around the board instead of moving counters
  - The board contains a range of online safety 'Dos and Don'ts' which they will be revising as they play
- Introduce the Learning Objectives on slide 3 of the presentation



## Bee-Bots: recap if required

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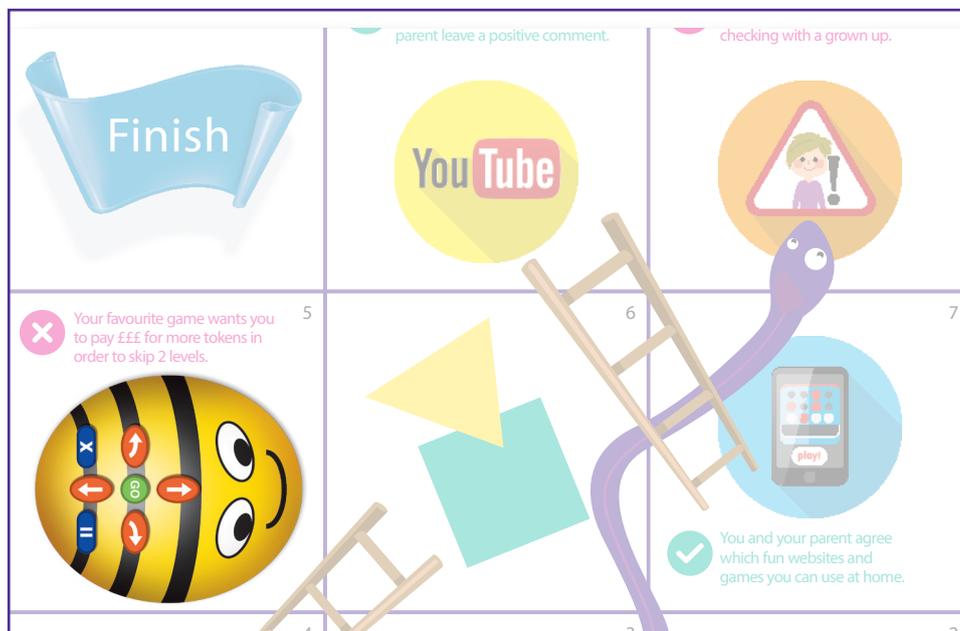
- If required, spend some time recapping how we can program Bee-Bots. Slide 4 from the presentation could help you with this. This may include giving pupils 'tinker time' to familiarise themselves again with the bot. Run a mini-plenary to ensure pupils:
  - Know how to program the Bee-Bot
  - Know the purpose of each of the Bee-Bot commands
  - Know how to run and clear the program stored by the Bee-Bot
- **Note** - If your pupils have not used Bee-Bots before, we suggest trying our **Bee-Bot Tinkering** activity first.

# Algorithms: recap if required

- If required, spend some time recapping what algorithms are (a sequence of instructions or set of rules). Recap how when programming the Bee-Bots, we first write an algorithm showing the sequence of commands for the Bee-Bot on our mini-whiteboards. The picture on slide 5 (and below) shows an example algorithm for a Bee-Bot written on a mini whiteboard. Can you predict from this sequence where the Bee-Bot will end up?



**An algorithm written for the Bee-Bot. Can you work out where the Bee-Bot will end up?**



## Optional - Creating your own online safety Bee-Bot mat

- Within the resources pack for this activity we have included a blank template for a single square of a Bee-Bot mat. A suggested optional activity, is that pupils make their own online safety Bee-Bot mat which they then use within this activity
- If you choose to do this, print enough squares for pupils (or one between two if you'd like them to work in pairs) and have one half the class decorate the square with different top tips to stay safe online, and the other half to illustrate definite don'ts for online safety. You may wish to run a session recapping these to generate ideas
- You can then construct the mat by cutting and sticking the squares together along the lines indicated and add some snakes and ladders across the whole mat

# Group task (30 mins)

## How do we play the game?

- Arrange pupils to sit in a circle around one of the Safety Snakes Bee-Bot mats
- Model playing the game with two pupils by following the steps on slide 6 - take as many turns as required until pupils are confident in how the game is played
- **Key steps in the game include:**
  - Pupils roll a dice to find where their Bee-Bot will land (including travelling up or down snakes and ladders)
  - Pupils write the algorithm to move their Bee-Bot to the correct square and test this using a fake-bot. The testing is important, as they can debug their algorithm if required!
  - Pupils code their Bee-Bots. If it lands on the correct square they stay there but if it doesn't they go back to the square they were on! (Unless they were due to land on a snake, in which case they still have to move their Bee-Bot to the end of the snake!)
  - If they land on a square with an Online Safety tip they share this with their partner and give one reason it is a good/bad idea. E.g. Using a digital device just before bed isn't a good idea as it can make it harder to fall asleep!
  - **Note** - An 'Online Safety Dos and Don'ts Teaching Points' resource has been provided to support pupils' discussion around the online safety tips they might land on. This includes information on how the tips link to Year 1 and 2 objectives
- **Top tip** - Pupils can keep track of where their Bee-Bot is on the mat with a counter so only one Bee-Bot is needed per mat



## Bee-Bots are you ready!?

- Give pupils time to play the game following the steps you have modelled and which are displayed on slide 6
- Organise this element of the lesson to suit your class. For example, if you have less Bee-Bots than one per pair, you may choose to group pupils in teams of two (so there are 4 pupils per Bee-Bot) and assign roles to the pupils - one pupil could write the algorithm and one could test it with the fake bot, for example
- Run regular mini-plenaries to share good examples with the class. This will include discussions about the online safety tips, as well as how pupils are getting on programming their Bee-Bots

# Plenary (5 mins)

- Select a variety of pupils to share a selection of the 'Online Safety Dos and Don'ts' they have landed on and why these are or aren't a good idea
- As a class consolidate understanding of key terminology (algorithm, code, program, online safety)
- Ask pupils to explain what they found challenging and why? What bugs did they find in their algorithm or code? How did they fix these?

# Differentiation

## Support

- Pupils may need supportive pairings or adult support, particularly when writing their algorithm
- Pupils can construct their algorithm using printed versions of the command cards included with this resource

## Challenge

- Additional challenges can be given to more confident pupils, these could link to maths, such as:
  - Can you get the Bee-Bot to pause on squares with odd numbers?
  - Can you get the Bee-Bot to avoid numbers which are a multiple of .... ?
  - Can you get the Bee-Bot to pass over every square in the .... times table?



# Assessment opportunities

- Informal teacher assessment of progress during the activity. Focus on pupils creating correctly sequenced algorithms, accurately entering their algorithms into the Bee-Bot and using logical reasoning to debug their algorithm or code if required
- Check pupils' understanding of the online safety tips. Do they understand why these suggestions have been made? Can they make links to other online safety tips?

# Concepts and approaches

- Pupils create sets of instructions (**algorithms**) for the Bee-Bots as they move around the snakes and ladders board
- Pupils are **programming** as they write the algorithm for their move in the game and use these to code the Bee-Bots
- Digital devices are any electronic item that can be programmed. In this activity pupils use a Bee-Bot. There are alternatives to Bee-Bots listed on the **Input, output, control equipment page**.
- Pupils use fake-bots to test and **debug** their algorithm if required
- Pupils **decompose** the moves into smaller steps to help them write the algorithm

# Resources

- Dice
- Online Safety Bee-Bot mat
- Bee-Bots
- Teacher Presentation
- Online Safety Dos and Don'ts Teaching Points Resource
- Mini-whiteboards and pens
- Fake Bots per group, printed as required
- Bee-Bot command cards, printed to support pupils as required
- **Optional:** Create your own Bee-Bot mat templates, printed as required
- **Optional:** Use of online Bee-Bot simulator if required or downloaded to school computers



# Get more Barefoot

Have you had a great Barefoot workshop, or delivered a fun computer science lesson? Send us your comments and pictures via our social channels to help get more teachers involved!



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