

Barefoot

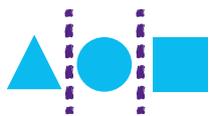
Recommended for
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Bee-Bot Route Decomposition

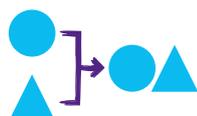
Principal partners

BT  **COMPUTING AT SCHOOL**

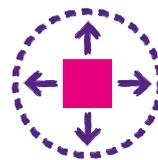
Concepts and approaches covered



Decomposition



Algorithms



Programming



Debugging



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Main activity

Creating the algorithm:

- Split the class into groups and assign a section of the route to each one. Place a numbered fake-bot card at the start of each section to show where each group should start their program from and a cross to show where their program should finish
- Give each group a Bee-Bot and a set of command cards
- Ask each group to plan out the program for their section by moving the Bee-Bot one move at a time and recording the moves using the command cards. By doing so, they are creating an **algorithm** (a sequence of instructions to get something done)

Programming the Bee-Bot:

- Ask the pupils to enter their program into the Bee-Bot to test their program. They will likely need to **debug** their program, by identifying and correcting any errors and testing again
- Once they are happy with their program, ask pupils to stick their sequence of command cards down in order onto a piece of paper with the number of the section on it. This is a record of their algorithm
- Nominate one pupil from each group to read out their commands in order, and one pupil to program the complete sequence into the Bee-Bot. They should then place the Bee-Bot at the start of the course and press go to test out the full program
- If the Bee-Bot fails to make it round the course, ask the pupils in which section the error occurred. As a class, debug this section and re-program the Bee-Bot. Repeat as necessary to complete the course

Plenary

- Discuss with the pupils what they have learnt by doing this task. Ask if they can remember any of the keywords (algorithm, program, decompose, debug) and what they mean
- Can they think of any other problems or real-world tasks that would be easier to solve if broken down into smaller steps? (For example maths problems, designing a supermarket, going on holiday)

Differentiation

Support:

Plan out a route using a ready-made Bee-Bot mat, or create your own grid. This makes it easier to break down the moves using the squares. Make each section only 2 or 3 moves long.

Stretch & Challenge:

Ask the pupils to decide how to decompose the problem – where will each section start and finish? Once the section programs are completed, change one of the command cards to force an error for the class to debug.

Extension ideas

Each group can plan their own simple maze and challenge another group to create the algorithm and program the Bee-Bot to move around it.

Teaching notes

Concepts and approaches:

- Pupils use **decomposition** to break down the task into smaller parts
- As pupils create a sequence of command cards to move the Bee-Bot they are creating an **algorithm**
- Pupils **program** their Bee-Bot using their algorithm
- As pupils identify and correct errors in their program they are **debugging**

Curriculum links

- Computing: create and debug simple programs
- PSHE: working with others

Resources

(downloadable from website)

- Bee-Bot command cards
- Numbered Fake Bot cards and crosses

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!



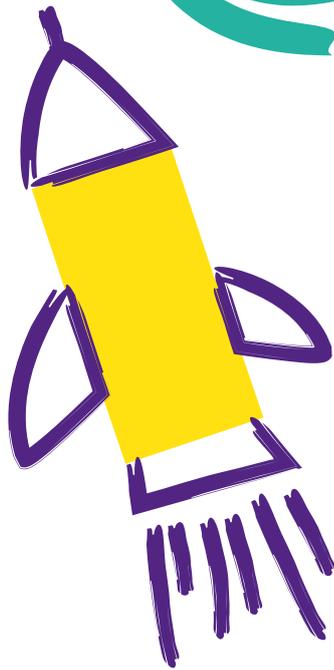
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