

Module 2 - Activity 5 & 6: Introducing a 'Pen Bot' & Removing the Robot

Overview

In this lesson pupils create a sequence of instructions using the turn, move and pen down blocks to program pen bot to draw a line between two locations.

Computing PoS Reference

- Write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.

Learning Objective

- Learn to code a pen bot to travel across a square.

Success Criteria

All: I can write code to make the pen bot move, turn, draw and speak.

Most: I can plan and debug code to make the pen bot move, turn, draw and speak.

Some: I can plan and debug code to make the pen bot move, turn, draw and speak and explain my coding.

Key Words

debugging, angle, direction, motion, block, pen, event.

Computer Science Concepts

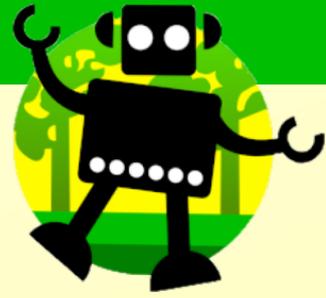
- Algorithm design
- Debugging

Cross Curricular Concepts

- Mathematics: turning, angles, degrees.

Introduction

Remind students of the adventure so far, then share the learning objective and success criteria for this lesson. Explain to students that they will use the event, pen and motion buttons to programme a pen bot to draw an escape line.



Activity 5: Introducing a 'Pen Bot'

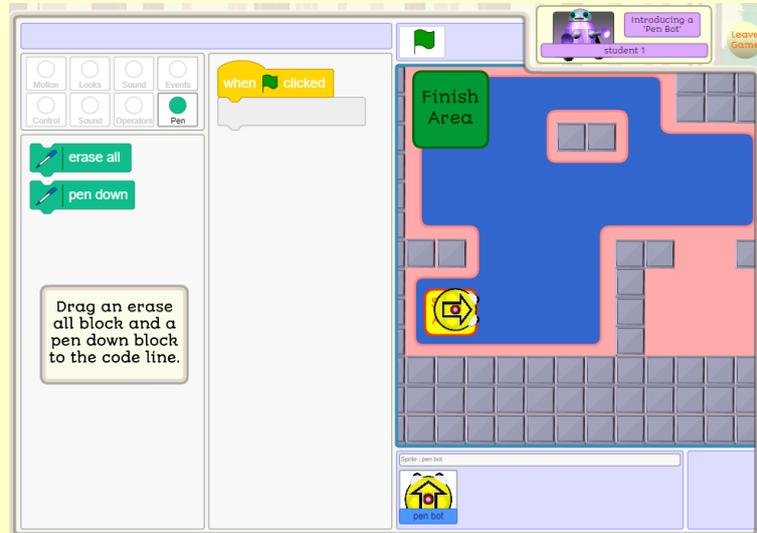
EXPLORE: Play **Introducing a 'Pen Bot'** until the PEN BLOCKS appear, left.

Q: What do you think the erase all and pen down blocks will do? What other blocks will we need to complete the challenge?

Drag the buttons into the code line and listen to the explanation.

Q: Were they correct?

Ask the children to write down the MOTION BLOCKS they think they will need to get the pen bot to the finish area.



OFFLINE ACTIVITY: Set up a similar scenario in the classroom and ask the students to walk through their instructions to test the distance and the turns.

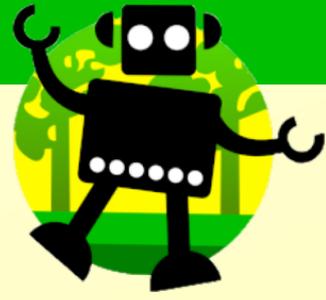
Try an example with the class.

Q: What do we need to do if the code doesn't work?

Discuss problem solving and debugging (as they have done previously) with the students.

CHALLENGE: Ask students to continue the challenge in pairs, testing the coding that they planned. Students should change their code until they are successful and record their attempts on the record sheet.

EVALUATE: Ask students to explain how they completed the challenge, pointing out that there are a number of different ways to solve the problem.



Activity 6: Removing the Robot

EXPLORE: Students should continue with the adventure until they reach the PEN BLOCKS.

Q: What do the erase all, pen up and pen down blocks do? What do you think the set pen size and set pen colour will do? What are they currently set to?

CHALLENGE: Ask students to plan their route on the resource sheet. Then they can test and debug their route, noting any changes on the sheet.

EVALUATE: Discuss and test the children's answers.

Q: How did they make sure the pen size and colour were correct? Which parts of the task did they find easiest and trickiest?

SEN Support

- Allow students to walk through their ideas and keep a record of their attempts.
- Provide a suggestion for the first coding block and ask the student to finish the task.

Resources

- Record sheet
- Whiteboard

Extension Activity

Ask students to figure out the shortest route to the square or gap that uses the least number of instructions. Can they find a route that does not use right angles?

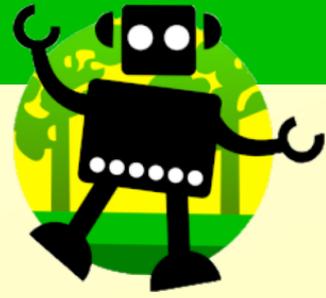
Possible Key Questions For Assessment

What did you learn about coding today?

Which coding block do we use to draw with pen bot? Pen down

What kind of blocks are the turn and move coding blocks? Motion blocks

What does the erase all button do? Clear the screen at the beginning of each sequence of code.



Activity 5: Record Sheet

Activity: Using the values shown, plan and test your Pen Bot's route. Keep changing the blocks and the values until you are successful, recording each attempt below.

Move values

move 80 steps

^

20	40
60	80
100	140
180	220
260	300

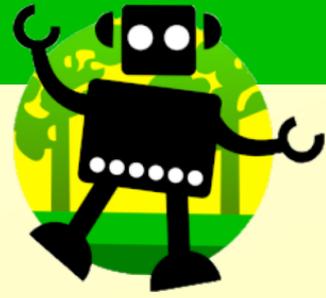
Turn values

turn 45 degrees

^

10	20
30	40
45	50
60	70
80	90

when  clicked



Activity 6: Record Sheet

Activity: Using the values shown, plan and test your Pen Bot's route. Keep changing the blocks and the values until you are successful, recording each attempt below.

Move values

move 80 steps

^

20	40
60	80
100	140
180	220
260	300

Turn values

turn 45 degrees

^

10	20
30	40
45	50
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when  clicked