

Learning Objectives

To plan and follow a set of instructions precisely

Success criteria:

- I can take on all of the following roles:
 - Bee-Bot (following instructions given by the controller)
 - Controller (giving instructions to the Bee-Bot)
 - Judge (checking that the instructions given by the 'controller' are correct)

National curriculum links:

- Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions

Before the Lesson

- Watch teacher video *Precise Instructions*
- One charged Bee-Bot
- *Bee-Bot Mask and Controller*, both pages printed (per group of three pupils); optional – these could be laminated
- A large space, the school hall or playground
- Several coloured cones, this will depend on the size of the space you are using

Attention Grabber (10 minutes)

This lesson is 'unplugged' – this means that the children won't be using technology but instead acting out how technology works.

Show the children the *Bee-Bot Mask and Controller* resources and explain that they are going to be set a task which will show how good they are at following instructions.

Ask who they think will be better at following instructions – Bee-Bot or them!

Children will work in groups of three and each group will be given a mask and a controller. Explain that it is a rotational activity, so that at any one time during the lesson, each person in the group has a role as follows:

1. Controller – says the instruction and presses the corresponding button on the controller.
2. Bee-Bot – listens to and watches the controller press the button and then follows these instructions accordingly.
3. Judge – watches the instructions given and what the controller does to make sure they're correct, ie: press 'x' (clear) and 'Go'.

Place cones at random all over the large space you are using. These are for the children to direct their partner to – without bumping into another group of three or going in the wrong direction on their way.

Key Questions

Did you remember to give clear instructions?

Did you wait until you were told to GO?

Did you direct your partner to where you were meant to?

The Main Event (30 minutes)

To begin with, tell children that when they are the controller, they should only give the human Bee-Bot one directional arrow at a time. An example would be pressing on the cardboard controller as follows:

'x' (clear) > 'forward' (direction) > 'Go'

This is to get the children used to pressing 'clear' every time and 'Go' to get their code to run. Get the children started and observe to check they've got the hang of it and are swapping roles.

Stop the children when they have conquered giving one direction using 'x' and 'Go' and are ready for a new challenge. To introduce this new challenge, ask for a volunteer to be your Bee-Bot.

Differentiation

Pupils needing extra support:
Keep executing the programs with single directional commands.

Pupils working at greater depth:
Challenge the pupils by starting the Bee-Bot child facing away from the goal.

Have a cone in mind, then model pressing two to three directions on your program, then set your volunteer Bee-Bot off! Discuss:

- What cone did you have in mind?
- Did they reach it?
- Did they turn on the spot and not move in the direction of the turn? (When children think about Bee-Bots they often think turning is like you taking a step to your left. In reality, a Bee-Bot stays on the spot and just rotates. If you want to move left one and you're not facing that direction, you would need to turn to face that direction first and then move forward one to reach that space.)

If your volunteer Bee-Bot didn't follow your instructions correctly, take their place and model what should have happened.

Now set groups the task of getting the 'Bee-Bot' to chosen cones - the cones should be quite near as the controller shouldn't enter more than three direction directions.

The controller should (secretly) tell the 'judge' which cone they're aiming for before they show the 'Bee-Bot' by 'pushing' buttons on the controller and saying out loud what the instructions are.

Use a whistle or another signal every few minutes to indicate to children that they need to swap roles within their group.

It's really important to circulate and listen to what the children are saying and pressing on the controller, as clear instructions are crucial at this point both for the 'Bee-Bot' and the 'judge'.

Wrapping Up (10 minutes)

Compare the human children Bee-Bot to the Bee-Bot robot. Write a set of instructions on the board and then input them into the Bee-Bot.

Ask a child where they think the Bee-Bot will stop (remember they only need to do baby steps). Ask a volunteer to follow the instructions and, when they have, to stand on the spot. Then press 'Go' on the Bee-Bot – how close were they?

Complete this a couple of times with different children. Focus on the clarity of the instructions.

Assessing Pupils' Understanding and Progress

Pupils with secure understanding indicated by: Recognising which buttons are necessary in the sequence of instructions. Predicting correct instructions to reach a pre-planned destination.

Pupils working at greater depth indicated by: Predicting/planning an increasing number of steps. Correcting instructions that do not work first time.

Next Steps

Computing > Year 1 >
Programming > Lesson 4: Bee-Bot World