Year 1 – Programming A – Moving a robot

Unit introduction

Learners will be introduced to early programming concepts. Learners will explore using individual commands, both with other learners and as part of a computer program. They will identify what each command for the floor robot does, and use that knowledge to start predicting the outcome of programs. The unit is paced to ensure time is spent on all aspects of programming, and builds knowledge in a structured manner. Learners are also introduced to the early stages of program design through the introduction of algorithms.

Overview of lessons

Lesson	Brief overview	Learning objectives
1 Buttons	Learners will be introduced to floor robots. They will talk about what the buttons on a floor robot might do and then try the buttons out. They will spend time linking an outcome to a button press. Learners will consider the direction command buttons, as well as the 'clear memory' and 'run program' buttons.	To explain what a given command will do • I can predict the outcome of a command on a device • I can match a command to an outcome • I can run a command on a device
2 Directions	Learners will think about the language used to give directions and how precise it needs to be. They will also work with a partner to give and follow instructions.	To act out a given word • I can follow an instruction

	These real-world activities should, at suitable points during this lesson, be related to the floor robot introduced in Lesson 1.	• I can recall words that can be acted out • I can give directions
3 Forwards and backwards	Learners will focus on programming the floor robot to move forwards and backwards. They will see that the robot moves forwards and backwards a fixed distance. This highlights the idea that robots follow a clear, fixed command in a precise and repeatable way. Learners will think about starting the robot from the same place each time. Using the same starting position with fixed commands will allow learners to predict what a program will do. **Note:** This lesson focuses specifically on forward and backward movement only. This is to ensure that learners are developing a depth of knowledge in the concepts surrounding programming, as well as developing their ability to make the robot move. The success criteria for this lesson highlight this and ensure that the learners' knowledge is built in a suitably paced way.	To combine 'forwards' and 'backwards' commands to make a sequence • I can compare forward and backward movements • I can start a sequence from the same place • I can predict the outcome of a sequence involving 'forwards' and 'backwards' commands
4 Four directions	Learners will use 'left turn' and 'right turn' commands along with 'forwards' and 'backwards' commands. Doing this will allow learners to develop slightly more complex programs. Learners will create their programs in this lesson through trial and error, before moving on to planning out their programs in Lesson 5. In Activity 3, learners will predict where given programs will move the robot to. Learners will make their predictions by looking at the commands and matching the program steps to movements.	To combine four direction commands to make sequences • I can compare left and right turns • I can experiment with 'turn' and 'move' commands to move a robot • I can predict the outcome of a sequence involving up to four commands

5 Getting there	Learners will decide what their program will do. They will then create their program and test it on the robot. Where needed, learners will also debug their program.	To plan a simple program • I can explain what my program should do • I can choose the order of commands in a sequence • I can debug my program
6 Routes	Learners will be encouraged to plan routes around a mat before they start to write programs for those routes. The activities in this lesson also introduce the concept of there being more than one way to solve a problem. This concept is valid for a lot of programming activities: the same outcome can be achieved through a number of different approaches, and there is not necessarily a 'right' approach. The lesson also introduces the idea of program design, where learners need to plan what they want their program to achieve before they start programming.	To find more than one solution to a problem • I can identify several possible solutions • I can plan two programs • I can use two different programs to get to the same place