

Activity 5 – Lines & Curves



Aims:

- Introduce autonomous mode.
- Work out how to get robot to go in curved and straight lines by adjusting the speed difference between the two wheels.

Materials:

- Working robots (with switch controller disconnected)
- Activity 5 video (6.5 mins)
- Black tape to mark out a straight line (standard 19mm tape)
- Activity worksheet

Location:

Straight line work can be done on a desk or on a floor area.

Background:

- This is the first activity where the robot is not directly controlled by the switch controller. The robot will be working in autonomous mode, where the computer has to make decisions about what to do. The aim of much of current robot development is to make useful autonomous robots, which can be given tasks to do without a human operator having to direct every move (such as the robot vacuum cleaner).
- The basis of this activity is that although components are manufactured to be identical, they are never exactly the same. For example, the motors used in the robot are made in the same factory and on the same machines, but are slightly different. The result is that when the two motors are given the same battery voltage, they will run at slightly different speeds. The result is that the robot moves in a curve rather than in a straight line. This is a well-known effect. The solution is to get the computer in the robot to make a slight adjustment to one of the motors in order to get both motor speeds to be as equal as possible.
- This idea of using a small computer in a product to compensate for problems in the components is now very common. In fact, every product in a modern household has a computer similar to the one in our robot.

Running the Activity:

- Show Activity 5 video (6.5 mins). The video explains how to adjust the robot to move in a curved or straight line.
 - <https://www.youtube.com/watch?v=q0YKGWZdBmA>
- Hand out Activity 5 worksheet to guide pupils through the tasks.
 - Mark out a straight line using tape on the desk or on the floor. Take care if using desks – robots can get damaged if they fall on the floor. There are different settings depending on the location, detailed on the worksheet.
 - The children will vary POT-2 positions, observe the effect on the robot and complete worksheet. They can then experiment with changing POT-1 and POT-3 settings.