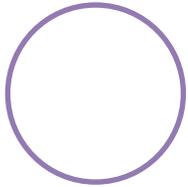


Key:



Hula hoop



Bean bag



Cone



Start position

You will need: Some room to be able to set out the course (a hall or playground is ideal). Paper, pens, some sports equipment as shown above, and blindfolds.

The aim: To understand computers can only do what they do because we have to give them instructions to follow. Computers cannot ask questions but they still need to understand what we are asking them, this means our instructions need to be precise.

Key skills: Teamwork, communication, problem solving, and oracy.

The activity:

As a starter task, set up the course as shown below. Every pupil is given a piece of paper and pen. They must write out a list of instructions to get from the start of the course to the end. They then need to give their list of instructions to someone else in the class. That person must only follow what has been written down. Discuss with the class what they think went wrong? Did they need more instructions? Did the instructions need to be more detailed?

You can explain that the pupils have just written out an algorithm. An algorithm is a step by step series of instructions we give to the computer. We give a computer a list of instructions/commands and the computer will do as we've asked. If our instructions are wrong, or if the computer can't make sense of our instructions then we don't get the desired outcome – just like writing the list of instructions to get our classmate through the obstacle course.

The activity is split into level 1 and level 2. The children will work in pairs. One pupil acts as a robot, the other acts as a programmer.

Level 1: The programmer needs to navigate their robot through the obstacle course (as shown below) – they are not allowed to touch their robot. The robot can only ever do what the programmer tells them. If the robot is not sure what the programmer means they do not move. This means the programmer's instructions need to be clear and precise.

Level 2: Do not alter the course. We do the same course again, however this time the robots are blindfolded. This means the programmers will have to make sure their instructions are clear and precise because the robots can't see where they are going. The programmers will realise that sometimes we think we are giving clear instructions, but when trying to navigate something that has no idea of their environment (the robot), it's very hard to explain ourselves and give precise instructions.

More often than not programmers will write a piece of code they believe is precise and clear but for some reason the computer gives us an error (the computer doesn't understand part of the code). This can be very frustrating. As computer scientists we need to re-read our code and investigate where in our computer is getting confused. We need to change our instructions to make them even more precise so the computer can understand what we are asking it to do.

A key element of this activity is to remember computers aren't human and they don't ask questions.

An example of what our instructions need to be like:

Robot needs to stand between the 2 starting cones.

- Take 2 medium steps forward
- Jump over the cones
- Take 1 big step forward
- Bend down
- Extend right hand
- Lower right hand
- Close hand (around bean bag)
- Stand up
- Put right arm down
- Take 1 medium step forward
- Bring right arm up 90 degrees

