Predicting Outcomes

Ages: 5-7
Length: 1 hour
Equipment: PDF print out

Introduction

This lesson introduces the relevant words; **_outcome_** and **_output_** through activities that link to student's lives to help them relate to the concepts introduced. This lesson will build upon prior learning relating to algorithms.

Curriculum Alignment	• UK National Curriculum Computing Key Stage 1
Learning Objective	• To identify algorithms with clear instructions • To demonstrate building algorithms with clear instructions
Keywords	• Outcome • Output
Resources	• Space • Paper and pens
Lesson Sections	• Setting the Scene • Activity 1 – identifying the output • Activity 2 – MiRo simulator or robot • Summary

Setting the Scene

How do know what the output of our program will be?

The output is what we want to happen when the program runs successfully.

Concept	How it is used
An output can take on many forms depending on the computing system. What is the output on the computer?	When creating a program, it is important to understand what the program is intending to do and how it will **_output_**; seen or heard.

Pattern recognition is a skill that can help locate an error, for example an error in a sequence.

First let us look at what an **_output_** is.

Activity 1

Activity 1 is focused on getting students to think about what an **_output_** is and relate this to their everyday tasks.

Scenario 1	Scenario 2
You are sitting in front of a computer - How are you seeing what the computer is showing you? - What helps you hear anything from a computer?	You have been asked to help load the dishwasher. - What is the **_outcome_** of the dishwasher completing its program?

> Where else have you seen an output?

Whole Class Activity

Explain that the group is going to be taking part in a race from one side of the hall to another (space required). When the race starts it represents the 'running' of a computer system. Completing the race and standing at the finish line represents the **_output_**/**_outcome_**.

Small Group Activity

Split the students into small groups and give them a piece of paper.

> In your group, you are going to create a paper aeroplane.
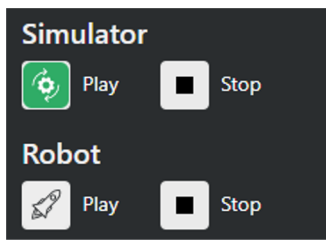> Think about the construction and what it is going to look like.

> Encourage discussion within the group, ask them to consider what the **_outcome_** of the completed paper aeroplane will be. Ask them to predict how far it will fly and compare **_outputs_** (designs) from each group.

> The **_outcome_** of the paper aeroplane example offers two **_outputs_** – one the actual created aeroplane that will differ from group to group. Second the flight; predicted the outcome for the flight will help the pupils discover how to predict the output from the given program (the paper aeroplane creation).

Differentiation
- If pupils need extra support, ask them to think about eating lunch; they are sitting down to eat, and the output of eating lunch is the empty plate at the end of lunch.
- For higher ability pupils ask them to think about what an input is and what this would be on a computer system.

Activity 2 Part 1

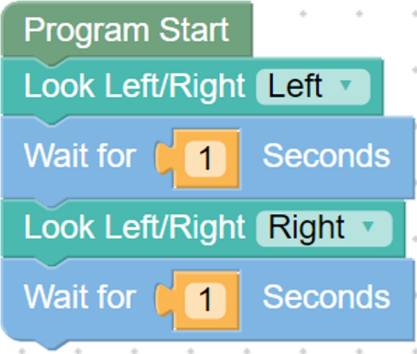**Simulator**
Play   Stop

Robot
Play   Stop

What is the output with MiRo?

The output for the program will be the robot MiRo moving within the simulator or the physical robot.

blocks need to change to show output - need to show simulator and robot - would be good to have a simulator view and the physical robot to demonstrate the output element of on screen and physical movement

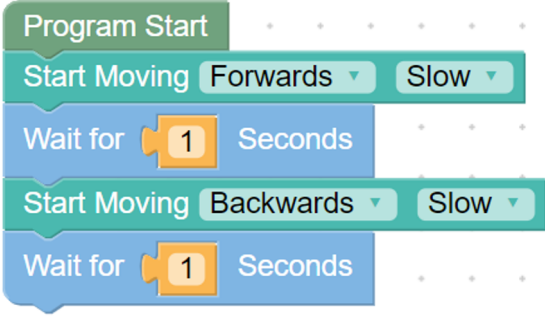How can we predict what will happen from the code we have?

Zoom in to see MiRo' face if using the simulator	** maybe a note that this is optional for higher ability pupils as this may be tricky for younger users???
Step 1-6 ➔Add 'program start' from 'Setup' ➔Add 2 x 'Look left/right [left]' blocks from 'Simple Motion' ➔Set 2nd direction to right ➔Add 2 x 'wait for 1 seconds' block from 'Control'	** The number of seconds cane be adjusted and experimenting with this is encouraged to predict the effect on the output. Program Start Look Left/Right Left ▾ Wait for 1 Seconds Look Left/Right Right ▾ Wait for 1 Seconds
Step 7 ➔Click Simulator Play OR ➔Click Robot play	** If you are using the physical MiRO ensure the IP address is correctly added to the onscreen code to allow the code to be communicated to MiRo to action. ** If you are using the simulator it is recommended to zoom in to see miRo clearly but not essential

1. What will happen when the program is run?
2. What will happen if the number of seconds is increased or decreased?
3. What will happen if both blocks had the same direction?

Activity 2 Part 2

> **Can you predict what the outcome will be from the program you create?**
> We are going to create a program and you can predict and observe the outcome.

Remember there is no fail in computing only debugging, fixing and learning!

Step 1 - Zoom in to see MiRo' face if using the simulator	** maybe a note that this is optional for higher ability pupils as this may be tricky for younger users???
Step 1-6 ➜Add 'program start' from 'Setup' ➜Add 2 x 'start moving [forwards][slow]' blocks from 'Simple Motion' ➜Set the 2nd block to the direction 'backwards' ➜Add 2 x 'wait' blocks	** Use the questions to ask the pupil's to predict what is going to happen and what will happen when aspects of the code are changed.
Step 7 ➜Click Simulator Play OR ➜Click Robot play	** If you are using the physical MiRO ensure the IP address is correctly added to the onscreen code to allow the code to be communicated to MiRO to action. ** If you are using the simulator it is recommended to zoom in to see miRo clearly but not essential

> 1. What will happen when the program is run?
> 2. What will happen if the setting is changed from 'slow' to 'fastest'?
> 3. What will happen if both blocks had the direction 'forwards'?

Summary

Have a discussion with the class about what they have learnt in the lesson. Discuss the new words learnt **_output_** and **_outcome_** and talk through any difficulties they had.

Ask students to complete the self-assessment and can be done by thumbs up, down and centre or using the images; on the following 3 questions.

Questions
Can you identify the output for the system?
Can you predict the outcome based on the code given?
Can you create a program and predict the output of MiRo?