Input / Output

Introduction

You will aim to learn the following objectives and keywords during this lesson.

Learning Objective	• To identify the input and output within a computing system • To demonstrate how input, process, output can be used in a robotic system
Keywords	• Control • Input • Process • Output

Setting the Scene

How do we control the systems we create?

We create programs to control computer systems by inputs and outputs.

Concept	How it is used
A computer system is any device that receives an input, processes it and outputs it.	When you write code, you need to think about how the program will start; the input. What the program needs to do; the process. What the final program will produce; the output.

Can you think of a computer system you use that has an input and output?

Testing any program you create is essential to ensure it works correctly. Through testing on a physical device, if applicable, can help develop the program to create the desired output.

First let us look at how computing systems use ***input, process, output***.

Activity 1

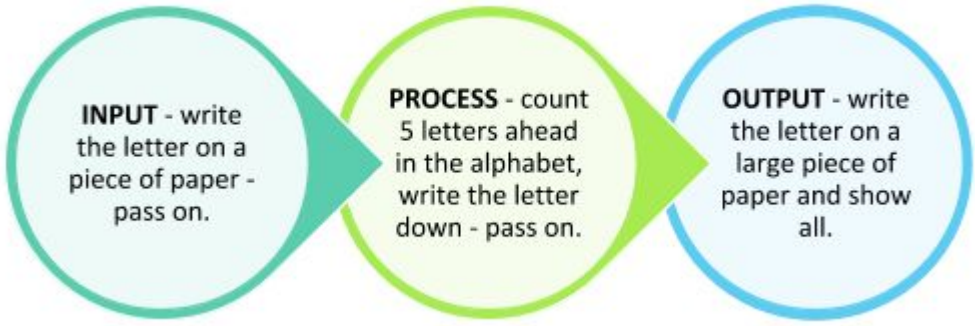
Scenario 1	Scenario 2
You turn on the TV and your favourite program is on and you sit down to watch it. • The **input**; how did you turn the TV on? • The **process**; how did the TV get the programme to watch? • The **output**; what do you see the programme on?	You have been asked to put the washing on? • The **input**; how do you set the washing cycle? • The **process**; how does the washing machine know the cycle to run? • The **output**; what does the washing machine do?

Where else have you seen this process?

Whole Class Activity

A way to hide a message when it is sent to another is to encrypt it. To encrypt means to change the letter to a new letter so that it cannot be read without knowing how to decrypt it (find the true letter).

You will be working in teams of 3 to solve a problem.
One person will be the input, one the process and one the output.



Small Group Activity

In your group, I want you to mind map all the computing systems around you.

Now select a few to highlight what the input and output is and then consider what happens within the process between.

In the world today we rely heavily on computing systems and without thinking you will interact with numerous ones throughout your day.

Activity 2

What are the blocks available for starting the computing system 'MiRo'?

The block shows the start of the program, but it is you pressing the play button that is the true input in this computing system.

There are also other inputs available on MiRo, the sensors and hearing a 'clap' sound.

It is good practice when creating any computer program, that it is checked at regular intervals. Using a simulator like MiRo can help build a successful program and check each output works as expected.

Part 1

Simulate MiRo to output a sequence of **sounds** when the input **'clap'** is heard.

Part 2

Simulate MiRo to output a sequence of **sounds** and **light** when the input **'clap'** is heard.

(see Step-by-Step Worksheet)

Why should you test your computer program?

How can we get MiRo to move towards the cans and knock them down?
We are going to create a program that will control the movement of MiRo.

How are we going to control how long the movement continues?
How can we get the program right?

Algorithm planning

1. Move forward
2. Turn left
3. Move forward

Using this algorithm as your plan, create and run the program in the MiRoSIM.

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

Summary Self-Assessment

Question	Got it	Got it with help	Unsure
Can you identify the input and output within a computing system?	☐	☐	☐
Can you describe the input, process, output model within a computer system?	☐	☐	☐
Can you create a program to control the output from MiRo?	☐	☐	☐