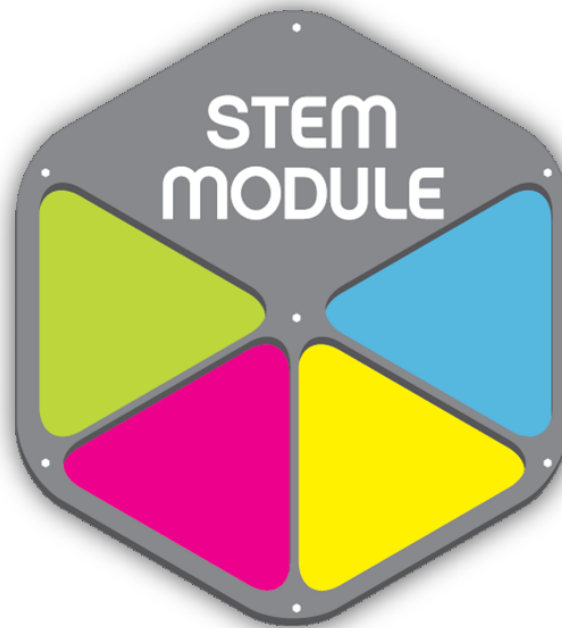


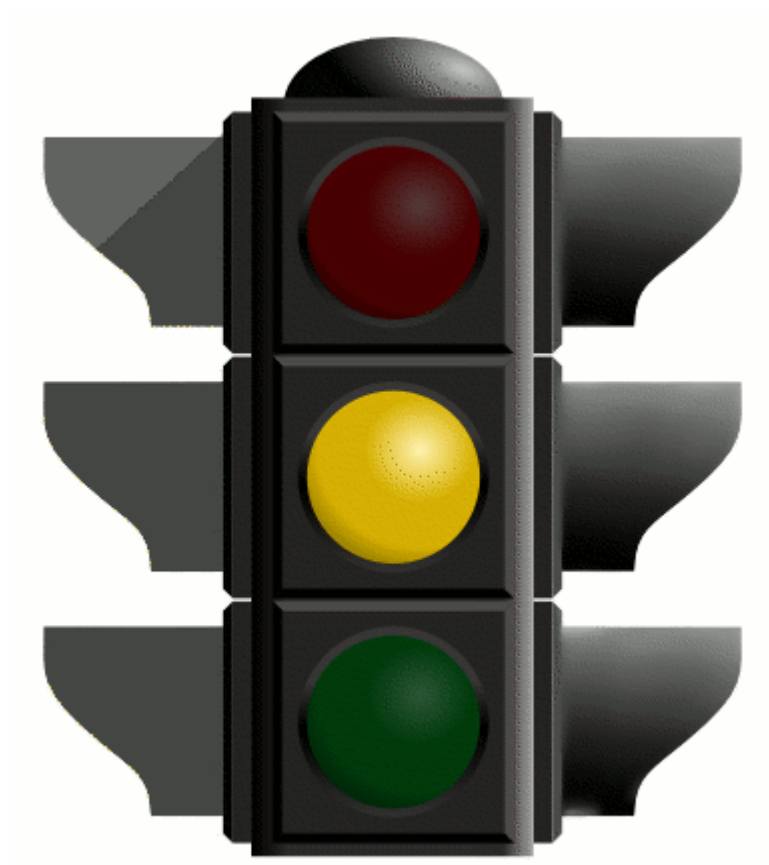
STEM MODULE

PIC Programming with Logicator

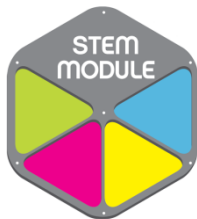
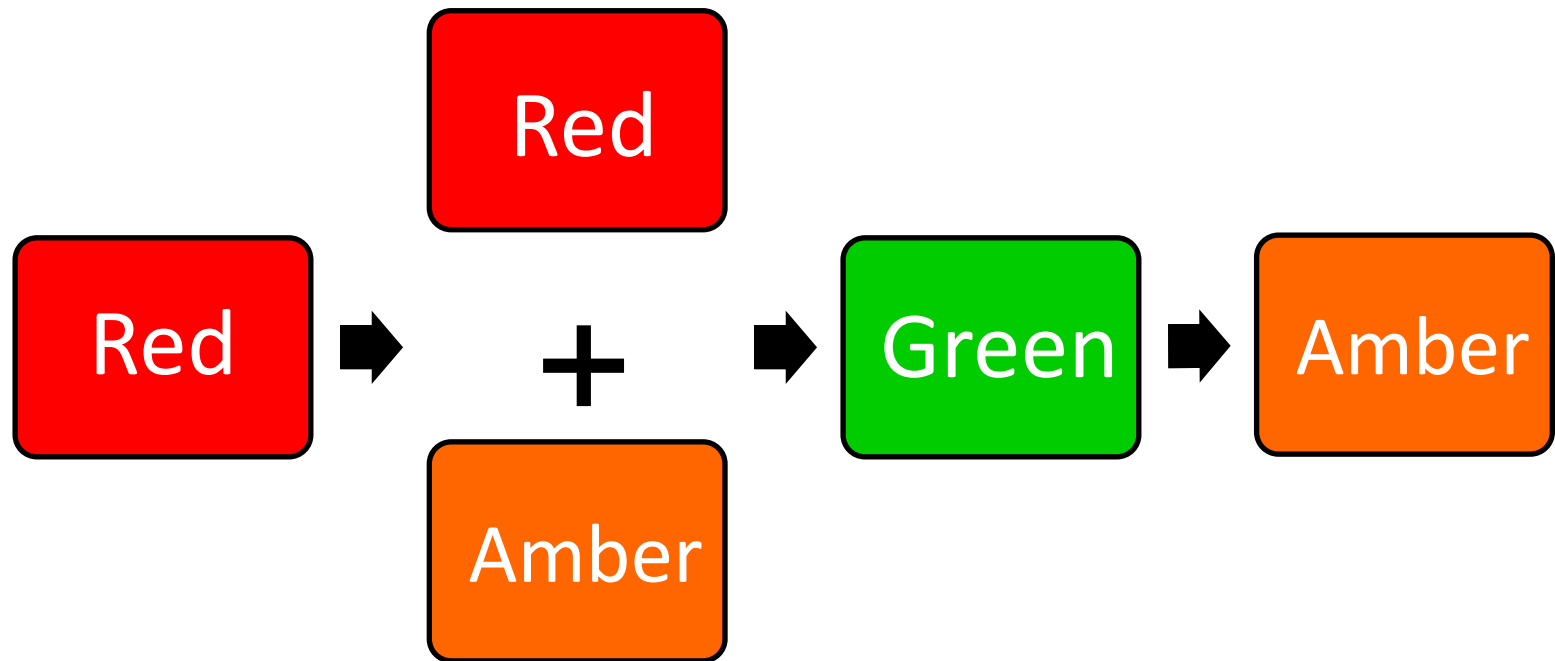


M. M. (a)

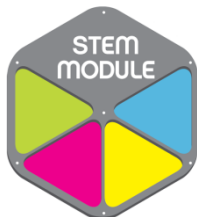
Exercise one: Traffic lights



Traffic lights sequence:

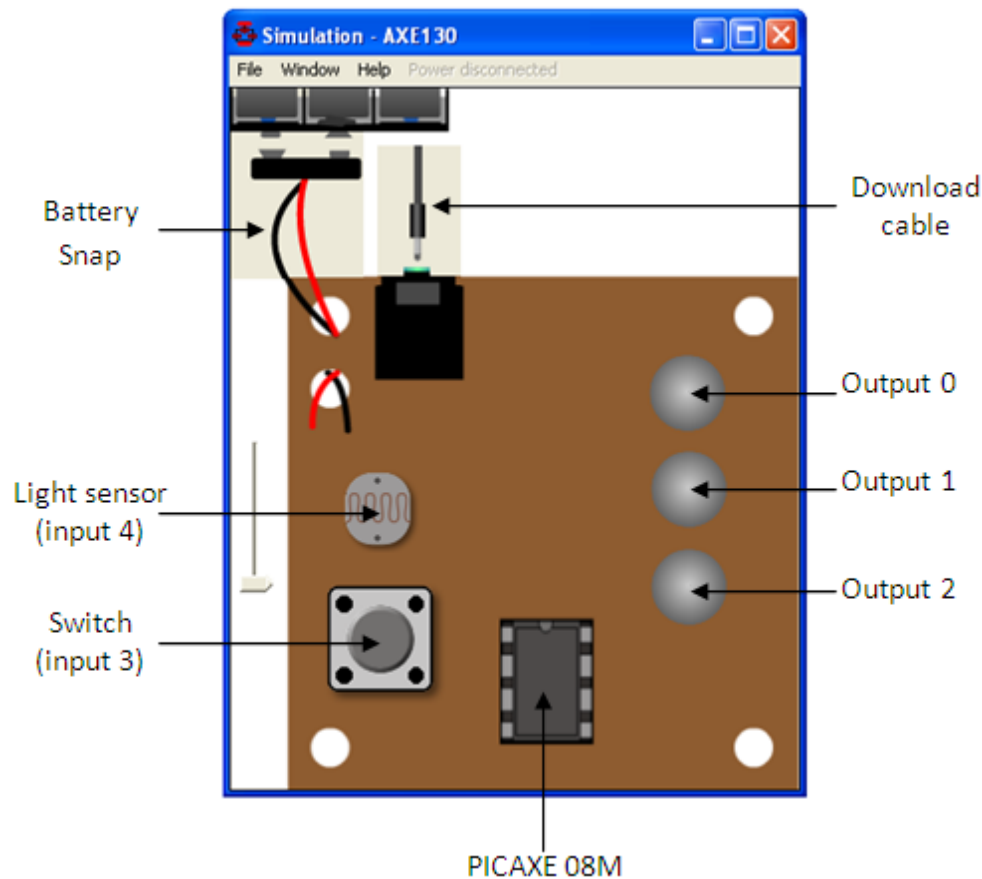


First open:

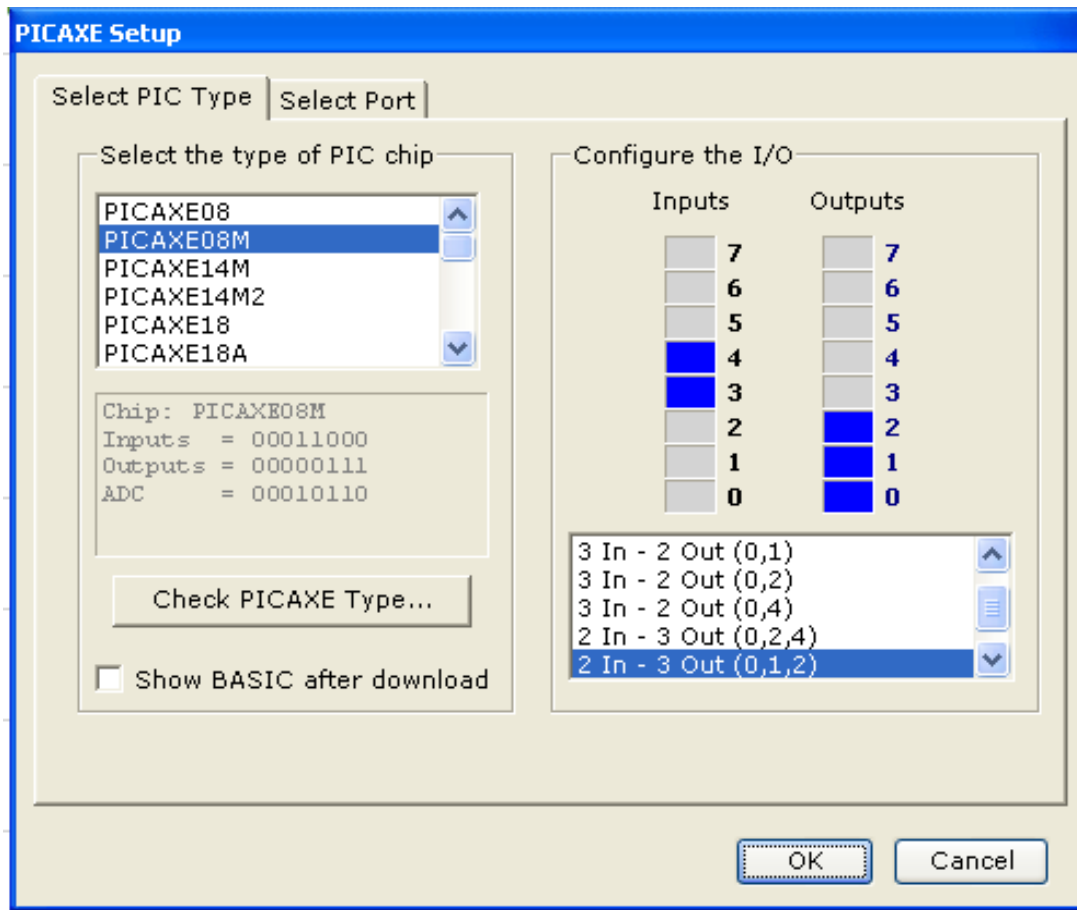


Choose simulate on the top menu:

Open simulation > PICAXE kits > AXE 130 simple PIC:



Options > select PIC type:

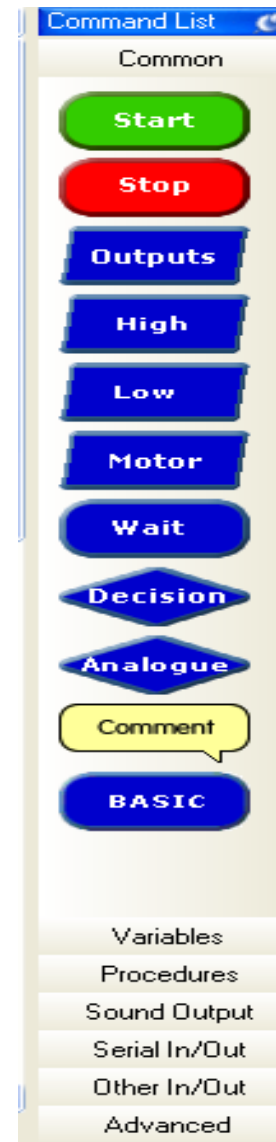


Beginning a Logicator Flow Chart:

On the right hand side of your screen you will see the Command List.

Start by clicking and dragging out the following command cells:

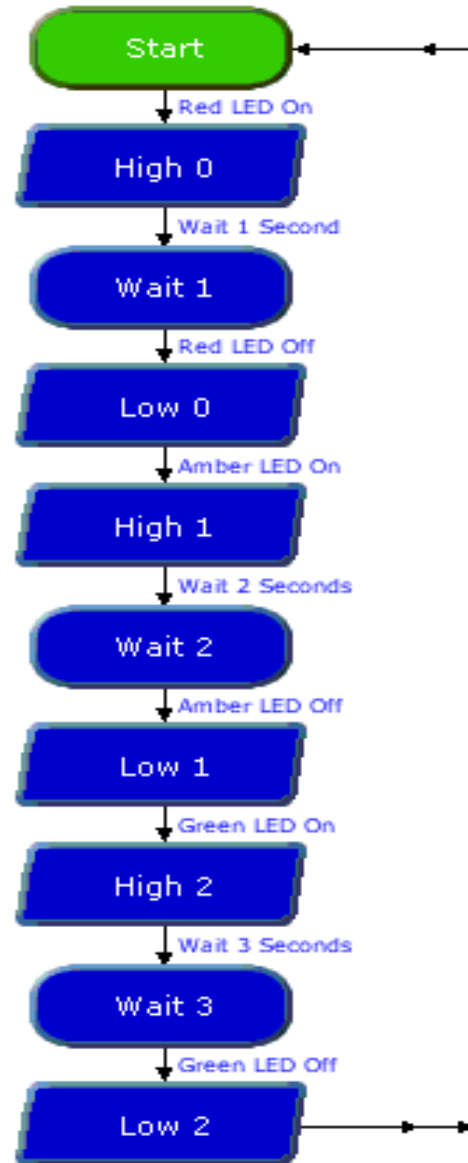
- 4 output commands
- 4 wait commands



Position the command cells as shown and connect them together using the line tool from the top command menu.



Or simple use the normal cursor, hold control and use the keyboard arrows to draw the lines.

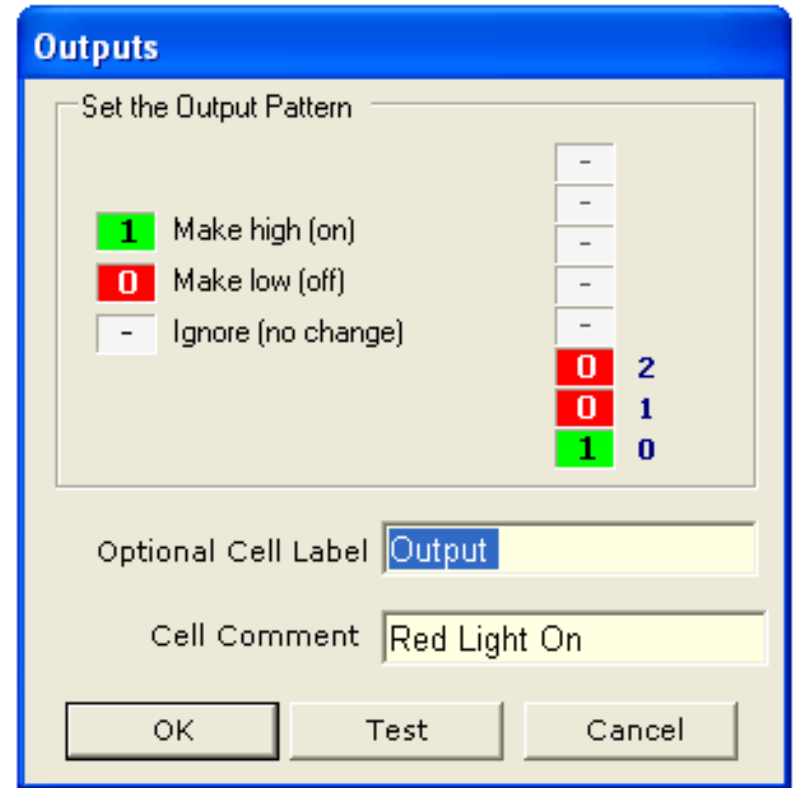


The first step in the traffic light sequence is Red.

To show this you must set the first output to turn on the correct pin for the Red LED.

To set an output double click on the output command cell to show the setup menu.

As the Red LED is attached to pin zero you would setup your first output cell as shown.

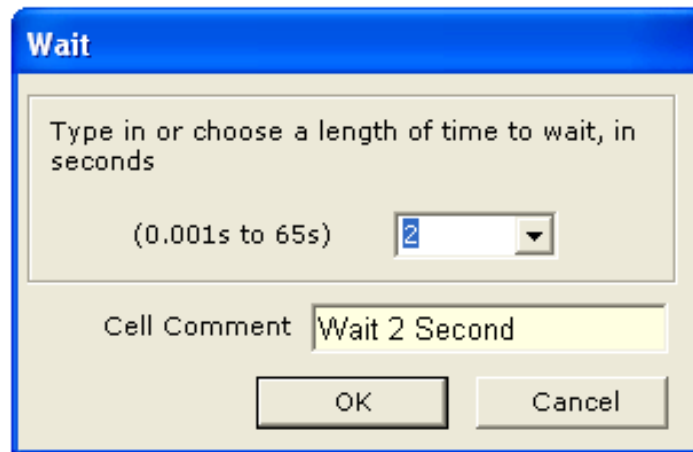


How do you think you would setup output two?

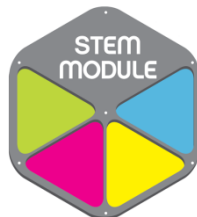


As well as the output commands you must also set wait commands to allow a pause which the light can be seen.

Again double click on the cell and to setup the output. Set the time to 2 and click ok.



Set all four wait command cells in the same way.



Once the program flowchart is completed you can then down load the program to the simulated chip.

Again select the program PIC command (jack plug) on the tool bar at the top of the screen.



Now watch the simulation of the programme you created!

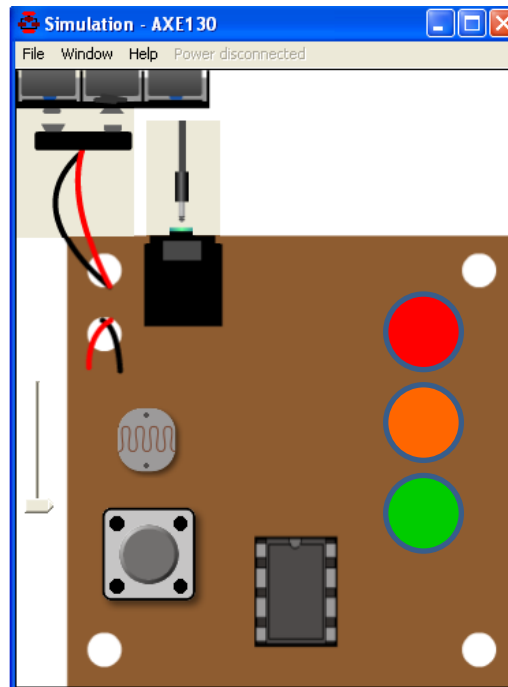


Results:

A traffic light sequence that is on a continuous loop

Problems:

The current flowchart uses a simple open loop system, meaning there is no feedback or user input.



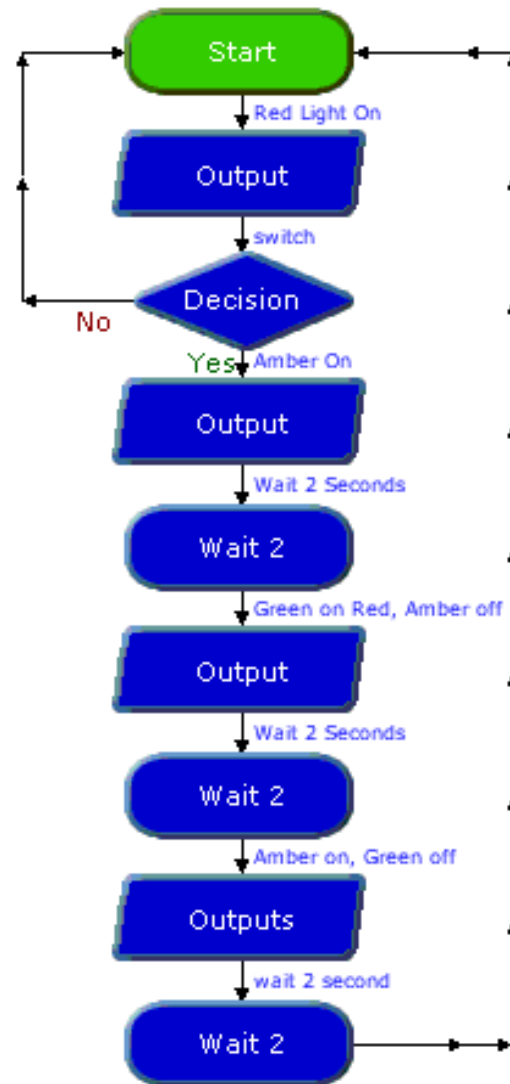
Exercise two: Adding a switch

In order to include the switch as part of your circuit you must add a decision command cell .

First delete the first wait command, then click and drag in the new cell and position it as shown.

Now Connect up the switch as shown .

Check the Yes and No are the right way round!



Setting up a Decision Cell:

First double click on the cell then set the input pattern so that pin 3 must be on for a Yes answer by placing a 1 in the box beside it as shown.

Decision

Set the Input Pattern

-	
-	
-	
-	4
1	3
-	
-	
-	

1 Input must be on
0 Input must be off
- Ignore input

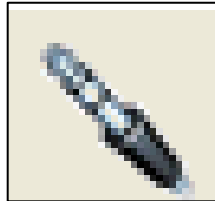
Optional Cell Label

Cell Comment



Once the program flowchart is completed you can then download the program to the simulated chip.

Again select the program PIC command (jack plug) on the tool bar at the top of the screen.



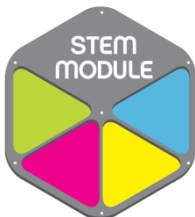
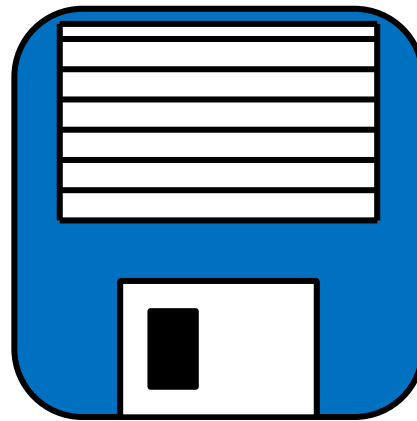
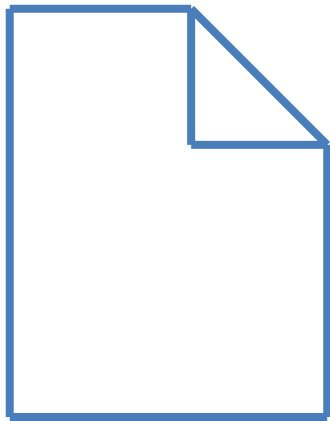
Now watch the simulation of the programme you created!



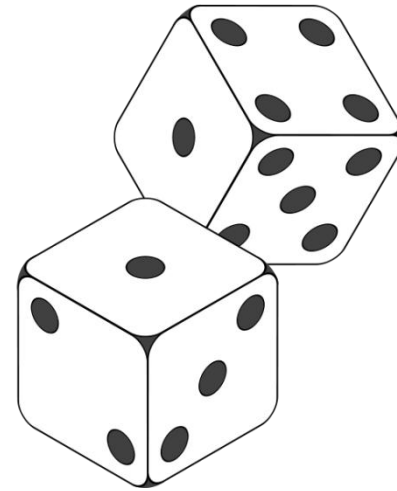
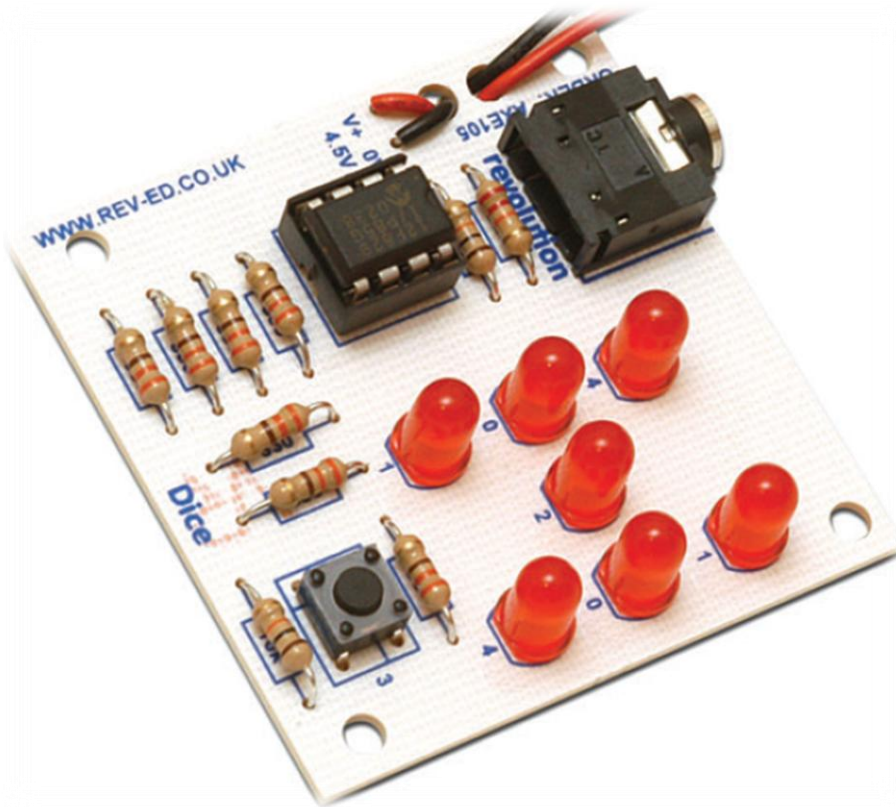
New Document:

Once you are sure that your programme is working you may now close the traffic light simulation and start a new document.

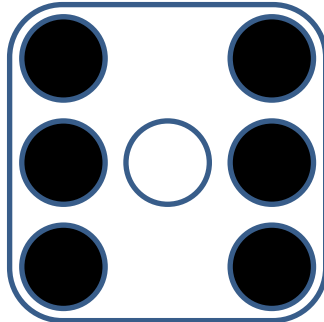
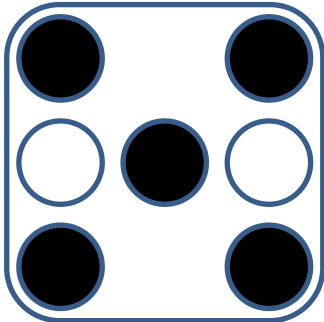
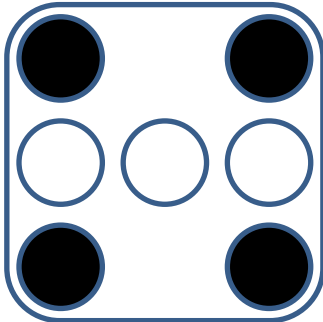
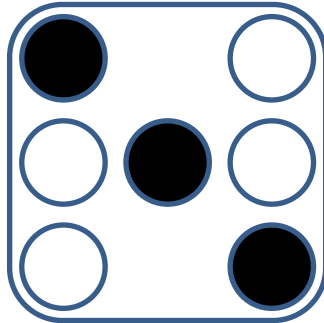
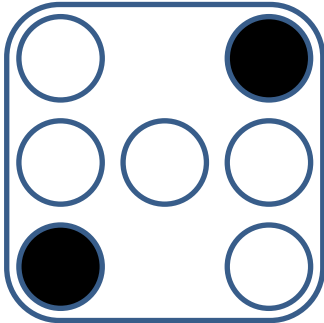
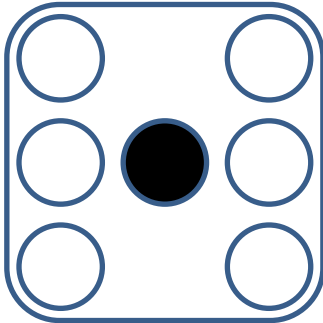
Do not save your work.



Exercise two: The Electronic Dice:

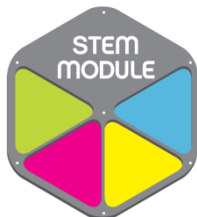
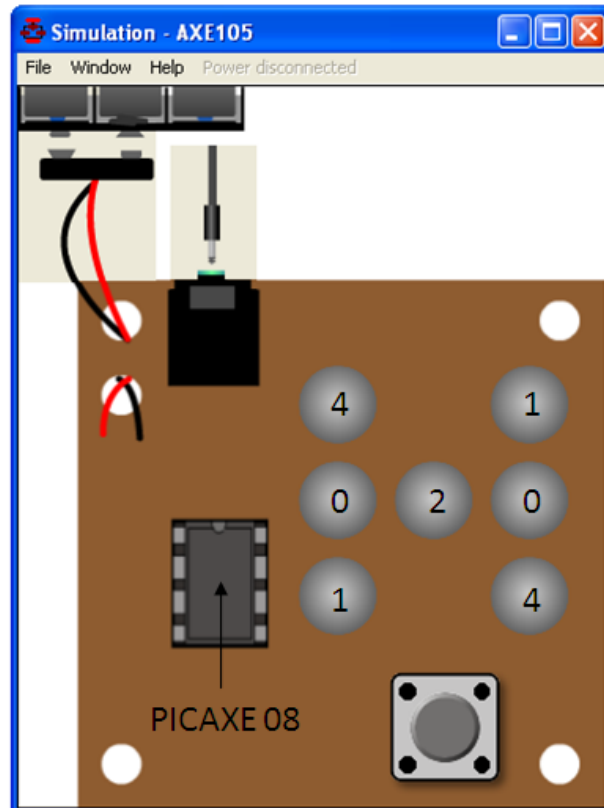


Dice Patterns:

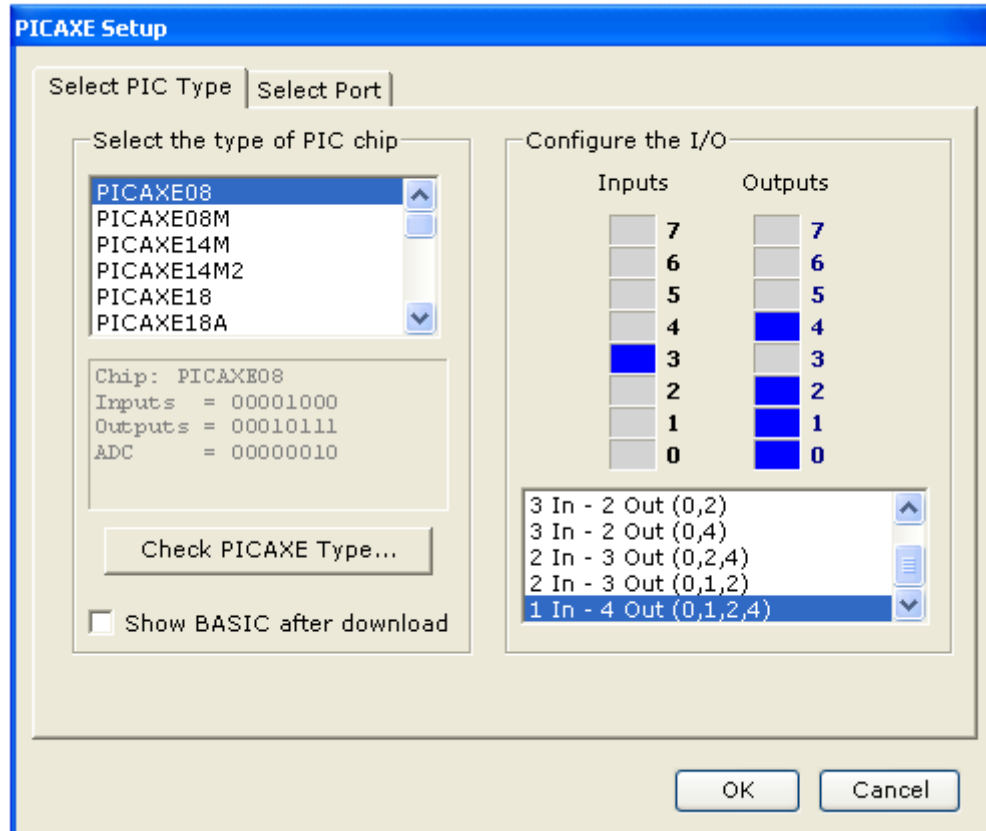


Choose simulate on the top menu:

Open simulation > PICAXE kits > AXE 105 DICE:

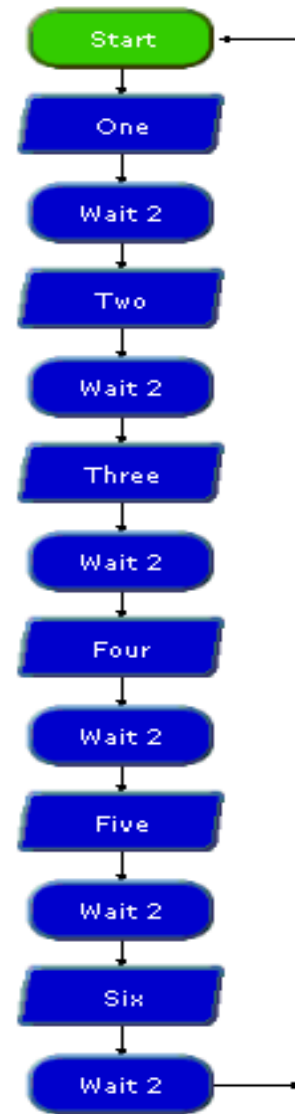


Options > select PIC type:



Pattern one to six:

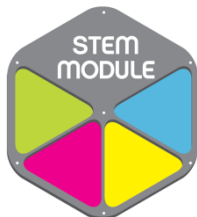
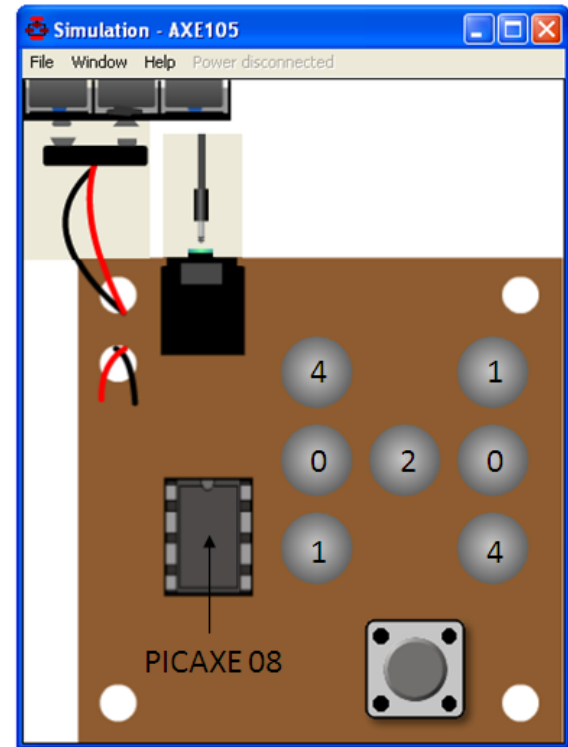
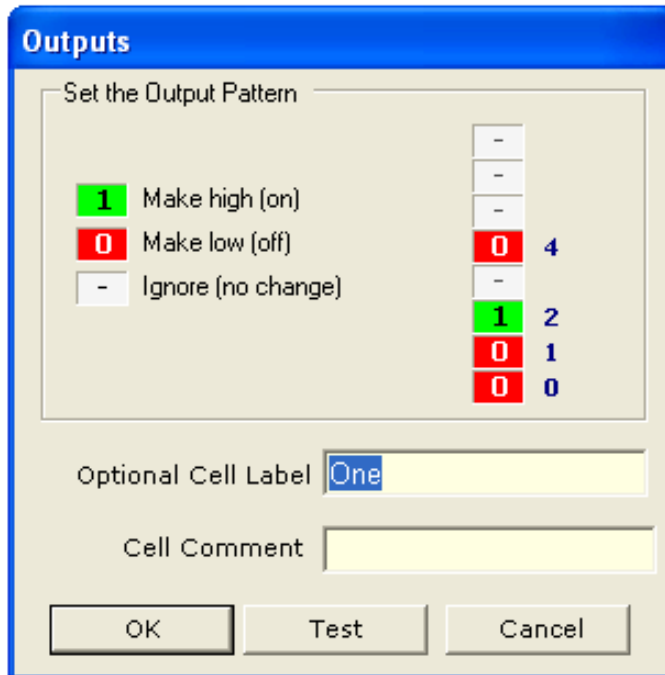
Use outputs and wait commands to make a sequence showing the number one to six on the electronic dice simulation.



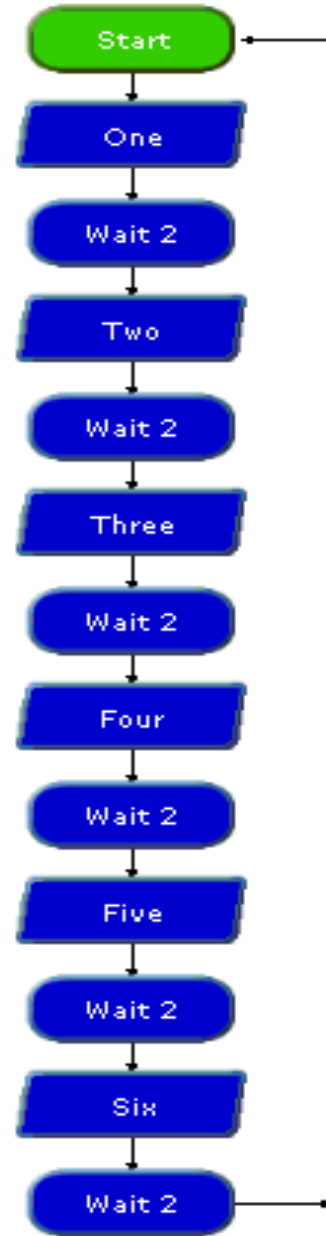
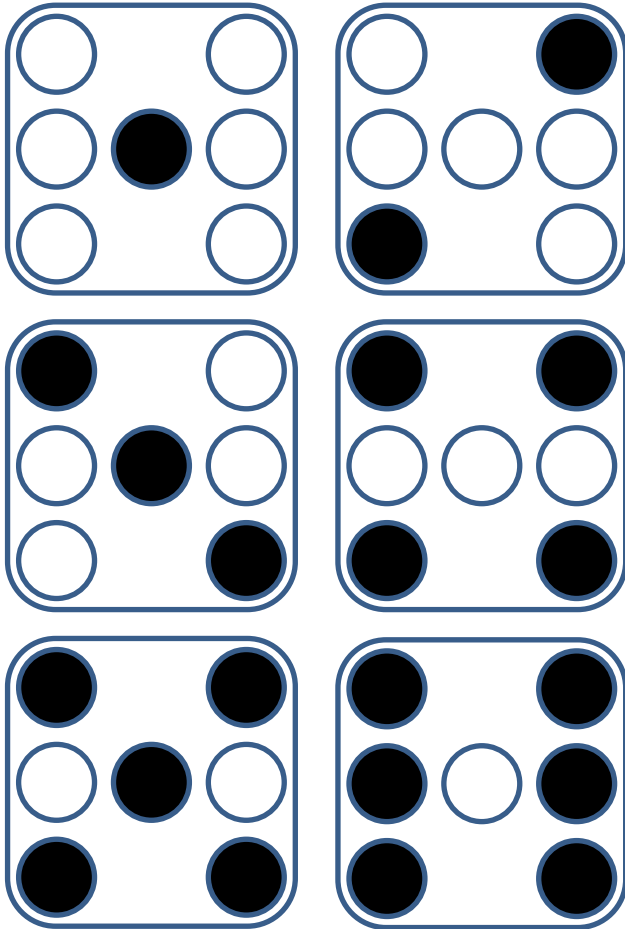
The first output command is to show the number one.

To show the number one on the dice which LED do you need?

Set as shown:

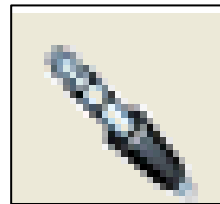


Now Complete the rest yourself:



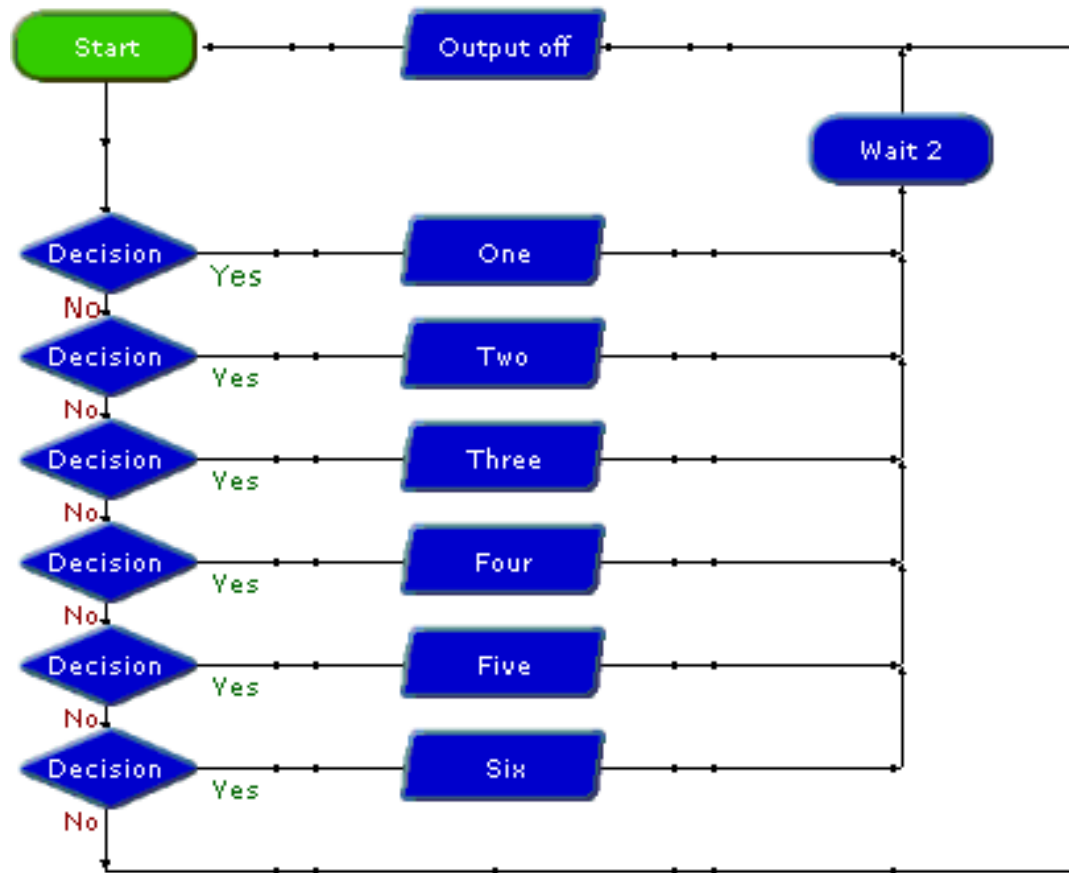
Once the program flowchart is completed you can then download the program to the chip and check the results.

The first thing to do is ensure the download cable and battery snap are connected. Then select the program PIC command (jack plug) on the tool bar at the top of the screen.



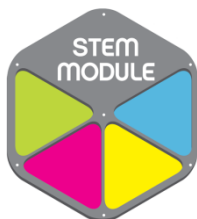
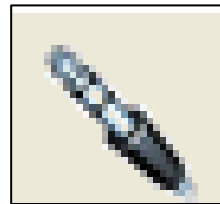
Random number program:

By adding decision command cells you can get a “random” effect like a real dice:



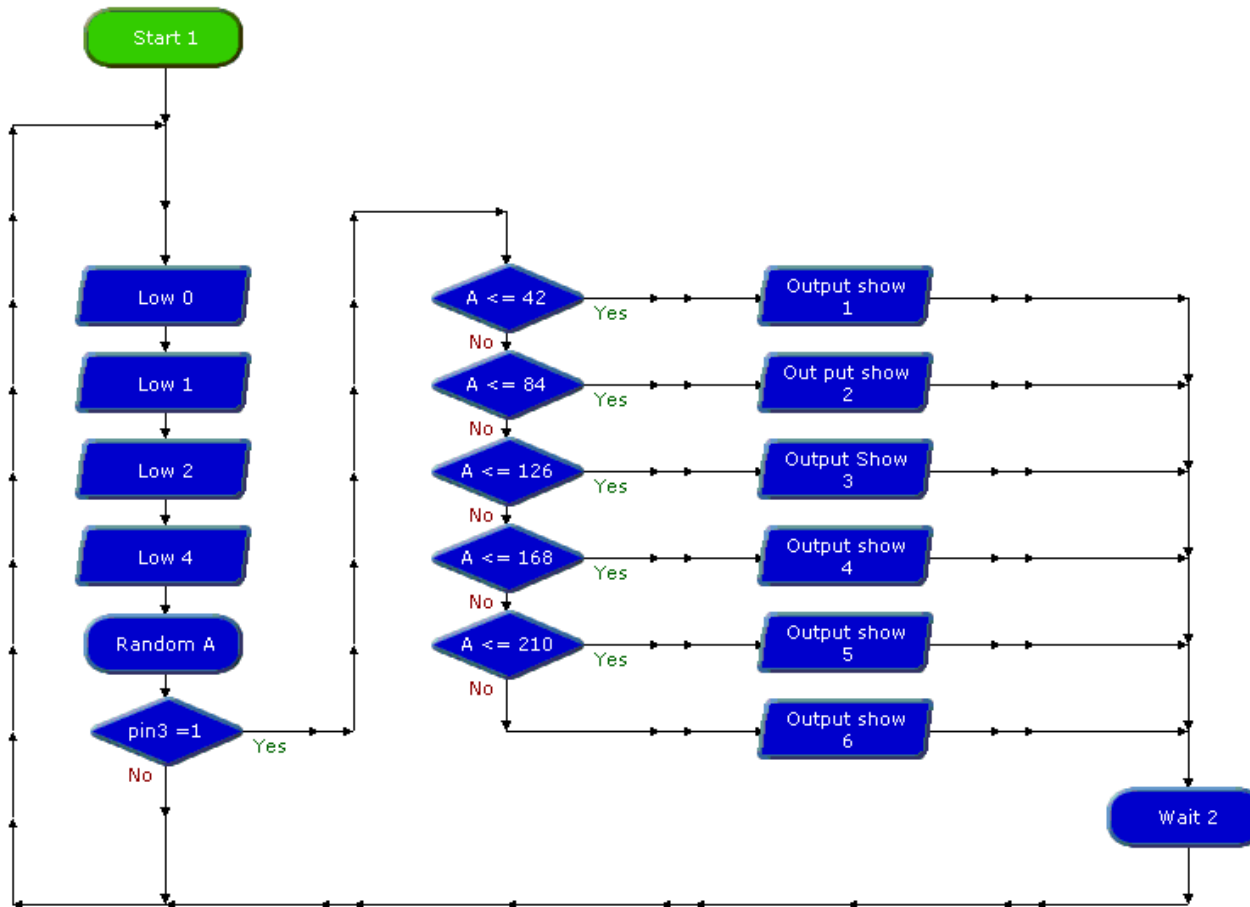
Again once the program flowchart is completed you can then download the program to the chip and check the results.

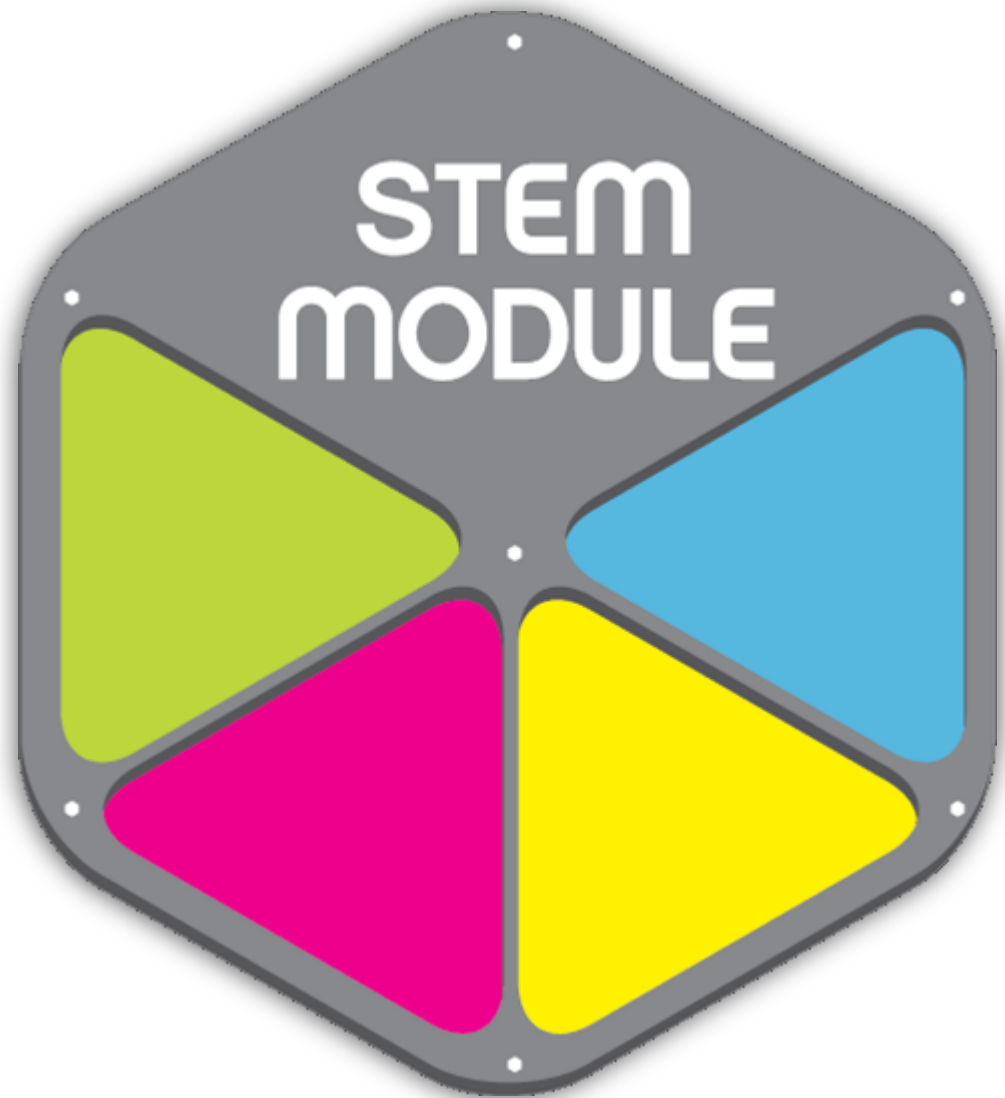
The first thing to do is ensure the download cable and battery snap are connected. Then select the program PIC command (jack plug) on the tool bar at the top of the screen.



Random number program two:

By adding decision command cells you can get a “random” effect like a real dice:





End Results