















Controlling Devices: Flowol: Multiple Outputs

<p>Aim: Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.</p> <p>Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.</p>	<p>Success Criteria:</p> <p>I can identify the conventional sequence for a set of traffic lights.</p> <p>I can create a flowchart to program one set of traffic lights.</p> <p>I can edit a flowchart to control two sets of traffic lights at the same time.</p>	<p>Resources: Lesson Pack</p> <p>PC /laptop with Flowol 4 software (Although it can be adapted for previous versions of the software.)</p>
<p>Children control a pair of traffic lights in sequence, which must run simultaneously.</p> <p>I can control multiple outputs at the same time.</p>	<p>Key/New Words: Flowol, flowchart, algorithm, control, output, mimic, simulation, insert, symbol, start, stop, delay, process, decision.</p>	<p>Preparation: Traffic Light Sequence and Bridge Lights Activity Sheets - per child</p>

Prior Learning: Children will have created flowcharts to control simple road crossings with one or two outputs in lesson 2.

Learning Sequence

	<p>Traffic Light Sequence: Begin by challenging children to complete the Traffic Light Sequence Activity Sheet in pairs. Ask children to indicate the correct sequence of lights and comment on what the opposite set of lights will show. Discuss and reveal the solutions.</p>	
	<p>Flowol: Bridge Lights: Recap opening the Flowol software and using a mimic. Instruct children to load the 'Bridge Lights' mimic, then save the file as a new flowchart.</p>	
	<p>Show and Test Outputs: What are the outputs in the sets of traffic lights? You can show the output labels on a mimic (simulation) by clicking in the top left corner. Test each output by clicking on it, to make it appear 'on'.</p>	
	<p>Creating Your Flowcharts: Can children create a flowchart to control multiple outputs in sequence?</p> <div style="display: flex; justify-content: space-around;"> <div>  <p>Children create a flowchart for just one set of lights (Set 1 in the main window) using the Bridge Lights Activity Sheet as a guide.</p> </div> <div>  <p>Children create a flowchart for the first set of lights (Set 1 in the main window) then edit symbols to simultaneously control the second set, using the Bridge Lights Activity Sheet as a guide.</p> </div> </div>	
	<p>Correcting Mistakes: To check the children's progress, stop and ask how to correct a mistake in a flowchart or if you change your mind? How do you edit a symbol? How do you remove it altogether?</p>	
	<p>Check and Edit: Choose one or more flowcharts to open and view on interactive whiteboard. Run the program and ask the children to check that the sequence is correct. If not, can it be debugged and edited to make it work correctly?</p>	

Taskit

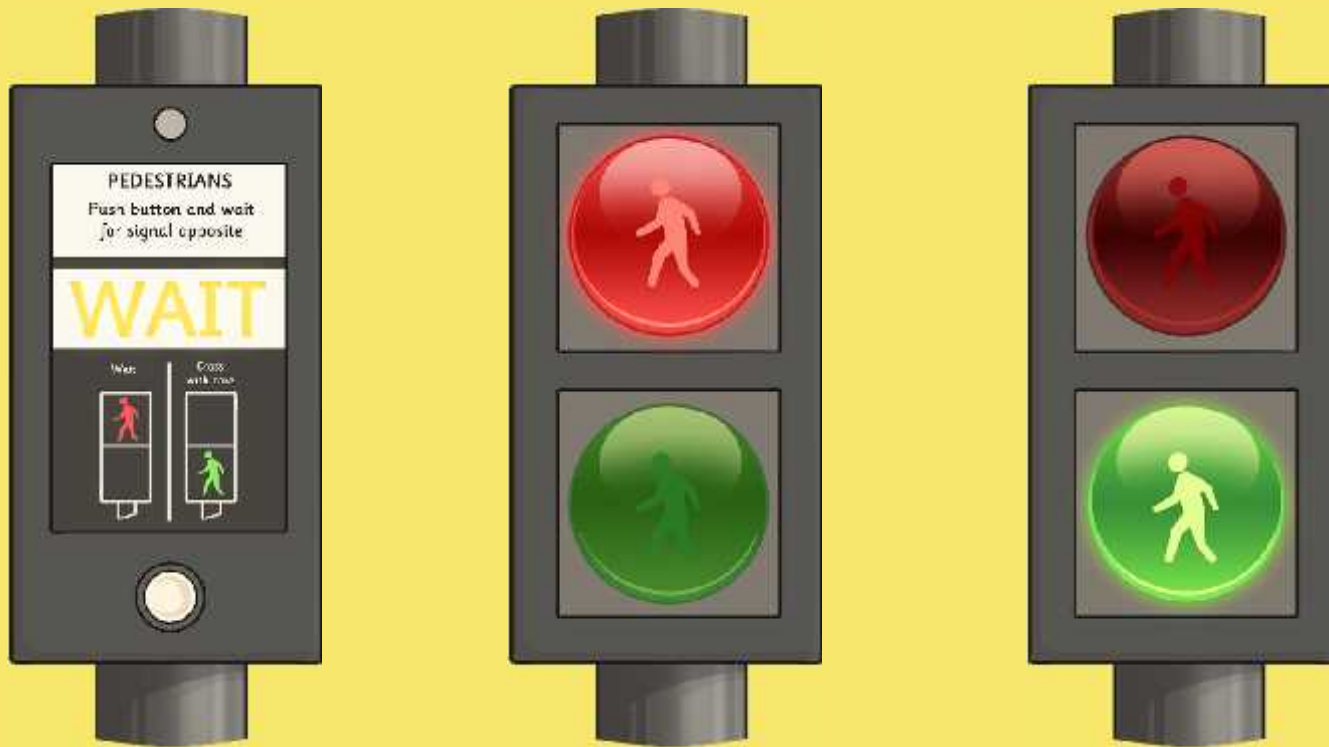
Checkit: Look out for a set of traffic lights near to your home or school. Check the sequence matches the lesson! Think about the flowchart sequence for a pelican crossing. What happens when you push the button to wait for the green man?



Computing

Controlling Devices: Flowol

Multiple Outputs



Aim

- I can control multiple outputs at the same time.

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Traffic Light Sequence



Using the activity sheet, colour the lights to show the correct sequence of lights.

Traffic Light Sequencing

Colour the traffic lights to show the correct sequence.

What will the opposite set of traffic lights look like while this set is going through its sequence?

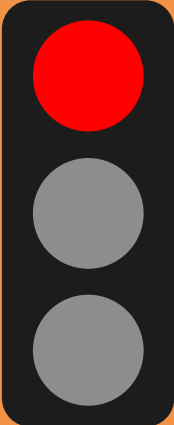
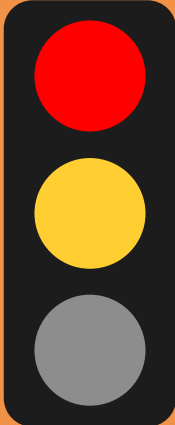
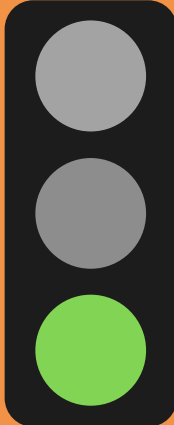
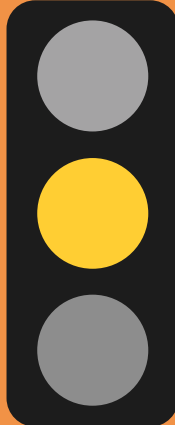
Think about which lights follow in what order.

What will the opposite set of lights show during this time?

Traffic Light Sequence



What is the correct sequence for a set of traffic lights changing?
Click on the slide to reveal the correct sequence below.

1	2	3	4
			
Red	Red & Amber	Green	Amber

Note that while this set of traffic lights is going through its sequence 2 to 4, the opposite set will remain at red.

Flowol: Bridge Lights



Open the Flowol software.

Select the mimic 'Bridge Lights'.

Save as a new file with a suitable filename.



Show and Test Outputs



What are the outputs in the sets of traffic lights?

You can show (or hide) the output labels on a mimic by clicking in the top left corner.

To test an output, just click on it. This makes it appear 'on'.



Creating Your Flowcharts



Create the flowchart for the first set of lights (Set 1 in the main window).

Use a loop to make the program repeat continuously.

After you have tested and checked your flowchart, can you edit the symbols to simultaneously control the second set of lights?

Use the activity sheet to help you.

The screenshot shows a Scratch project titled "Bridge Lights". It contains two scripts for the "Bridge Lights" sprite. The first script, "When green flag clicked", includes a "say" block, a "loop" block with a "say" block inside, and a "say" block. The second script, "When green flag clicked", includes a "say" block and a "say" block. There are also two images of traffic lights and a small image of a bridge.

Correcting Mistakes



How do you correct a mistake on a flowchart?

How can you edit a symbol?

How do you remove a symbol?

Check and Edit



We will choose one or more flowcharts to open and view on the interactive whiteboard.

When we run the program, check that the sequence is correct.

If not, can it be debugged and edited to make it work correctly?

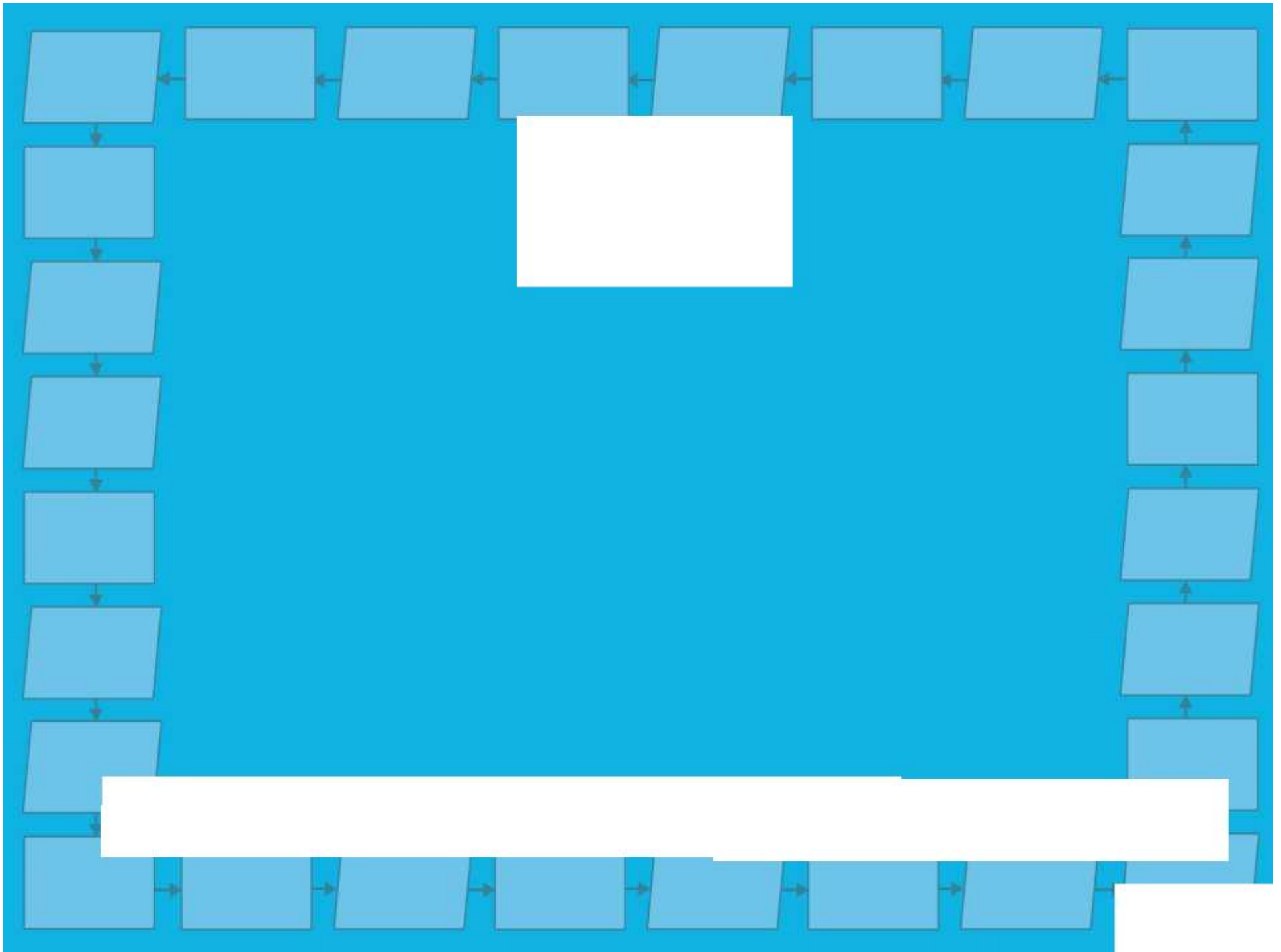
Aim



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Bridge Lights

1. One Set of Lights

Open the Flowol software and select the mimic 'Bridge Lights'. Save your file using an appropriate name and remember to keep saving regularly.

Create a flowchart to control one set of lights (Set 1 in the main picture). The program should turn the lights on and off in the correct sequence with a delay in between each change.

Use a loop to make the sequence repeat continuously.

Run and test your program.



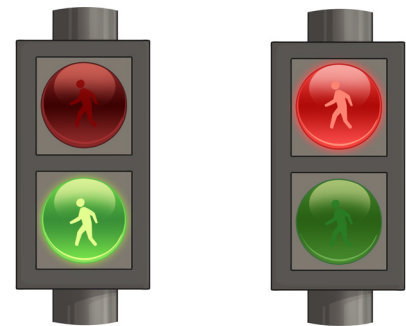
2. Two Sets of Lights

Save your file again with a different filename.

Now try to edit your flowchart to control the second set of lights at the same time (Set 2 in the inset picture, top right).

Hint:

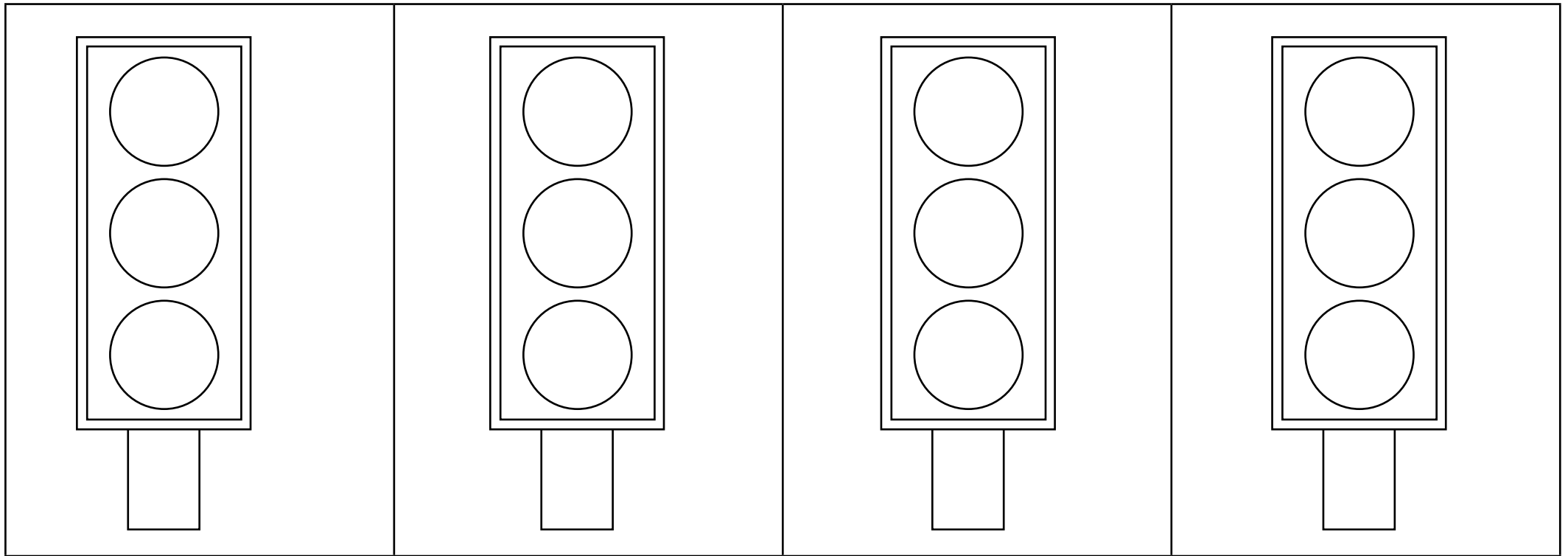
- You can use the same output symbol to turn one light on and another light off.
- You will need to insert extra output and delay symbols.
- Make sure that the two sets of lights are not showing amber or red/amber at the same time or you could cause a crash!
- When testing your flowchart, click on an output symbol and simulate what will happen by clicking on the lights in the picture. This might help you think through the sequence of both sets of lights and what will need to happen next!



Traffic Light Sequencing



Colour the traffic lights to show the correct sequence.

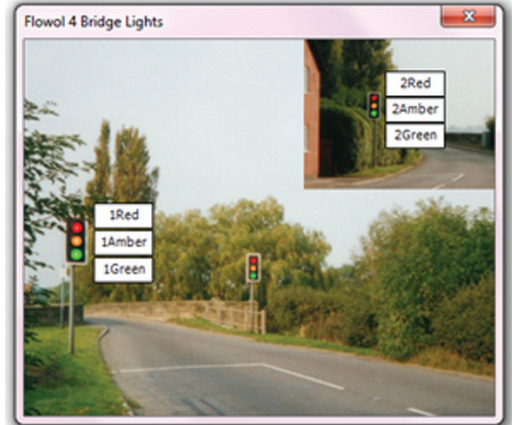
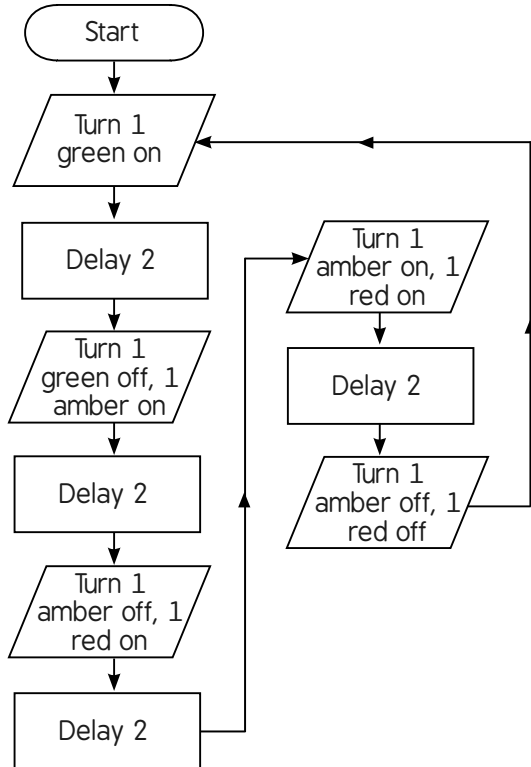


What will the opposite set of traffic lights look like while this set is going through its sequence? _____

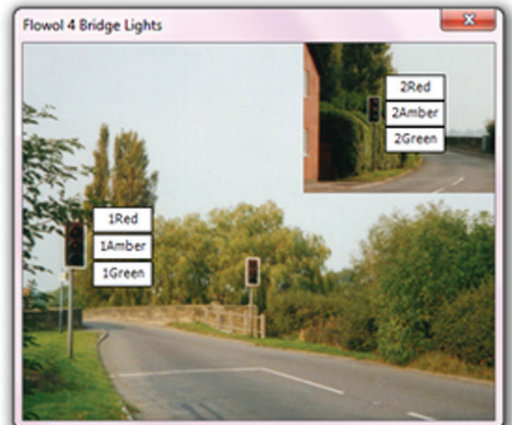
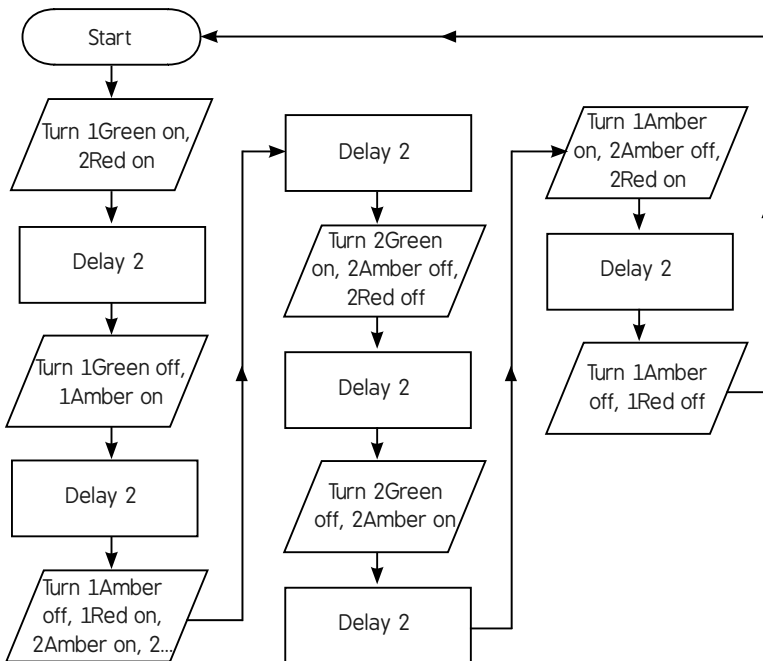
Adult Guidance

Solutions to Bridge Lights Mimic

Possible flowchart for one set of lights:



Possible flowchart for two sets of lights:



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