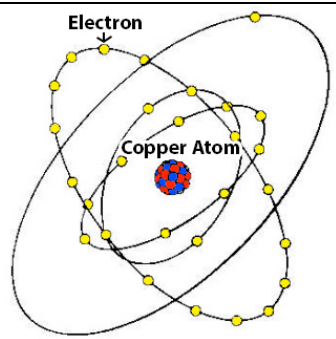
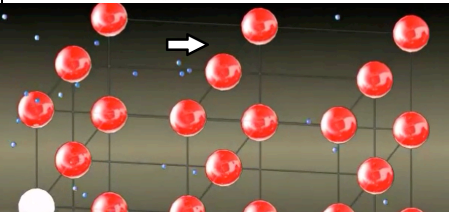
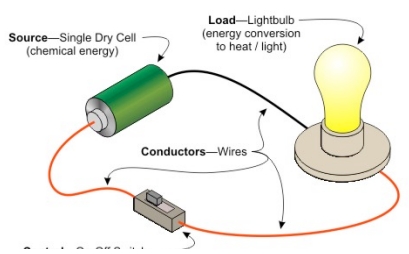
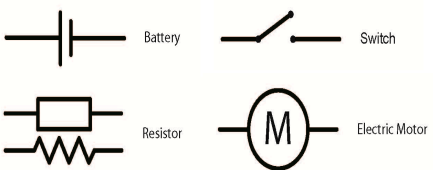


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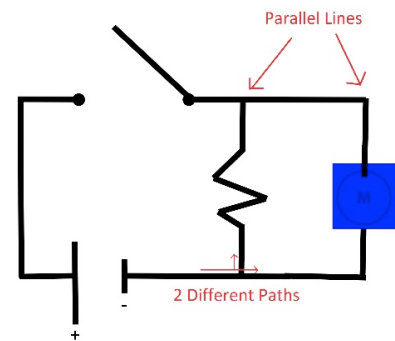
Activity Sheet	
Gr 6 - Lesson #7	Switch – Complete the Circuit
Date:	Name(s):

<b>Check That I'm Done</b> <input checked="" type="checkbox"/>		
<input type="checkbox"/> Commented on my code	<input type="checkbox"/> Modify it task	<input type="checkbox"/> Coding Challenge

Learn	
<p>All materials are made of <u>atoms</u>, including metals like copper. The structure of the atom goes like this. There is a nucleus in the center, and a cloud of tiny electrons which orbit around this center. In metals, these electrons can be 'convinced' to leave their home atom and travel within the material. If there is enough of a push and pull, they can flow through a path very quickly, and be used to power other devices such as light bulbs, motors and heaters. Electricity!</p> <p>An <u>electric circuit</u> is a closed path that allows electrons to flow from a negative charge to a positive one. Circuits are used in any device requiring electricity, and being able to carefully control that electricity is what allows electrical devices to have so many important uses.</p> <p>We uses diagrams to show how a circuit is laid out, so we can reconstruct them and analyze them. Here are some symbols we use to signify the various circuit control components.</p>	   

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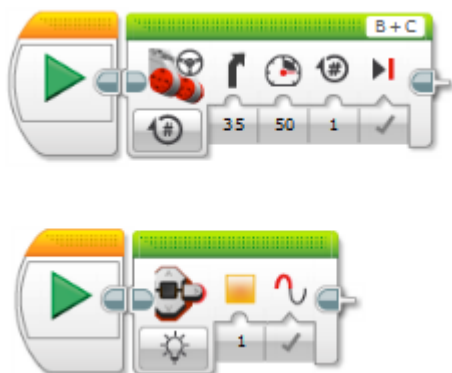
Parallel circuits are circuits with more than one path for the electrons to travel. They have this name because when you draw them, they make parallel lines.



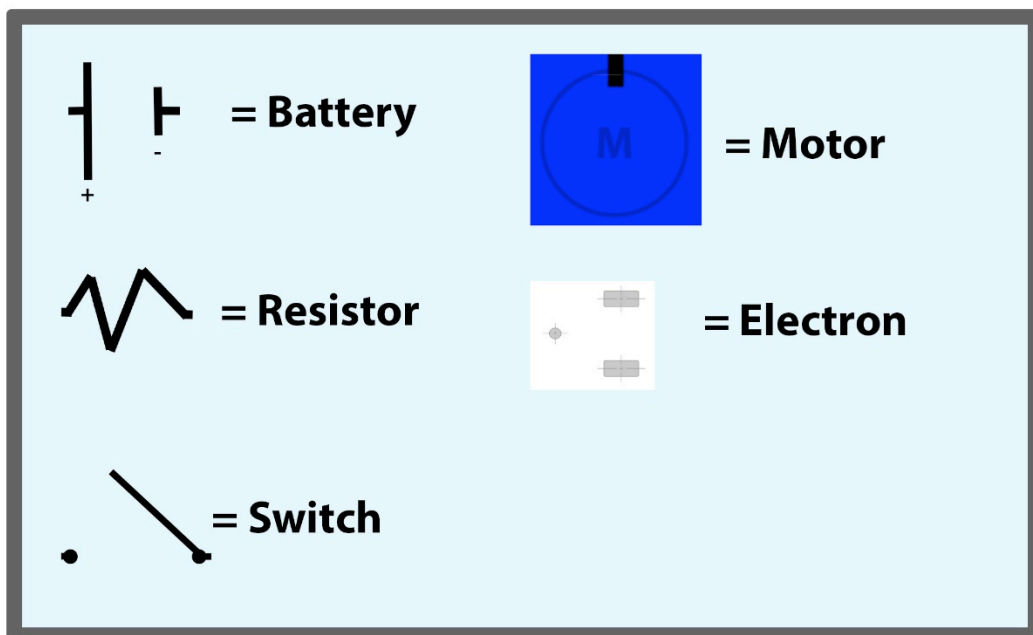
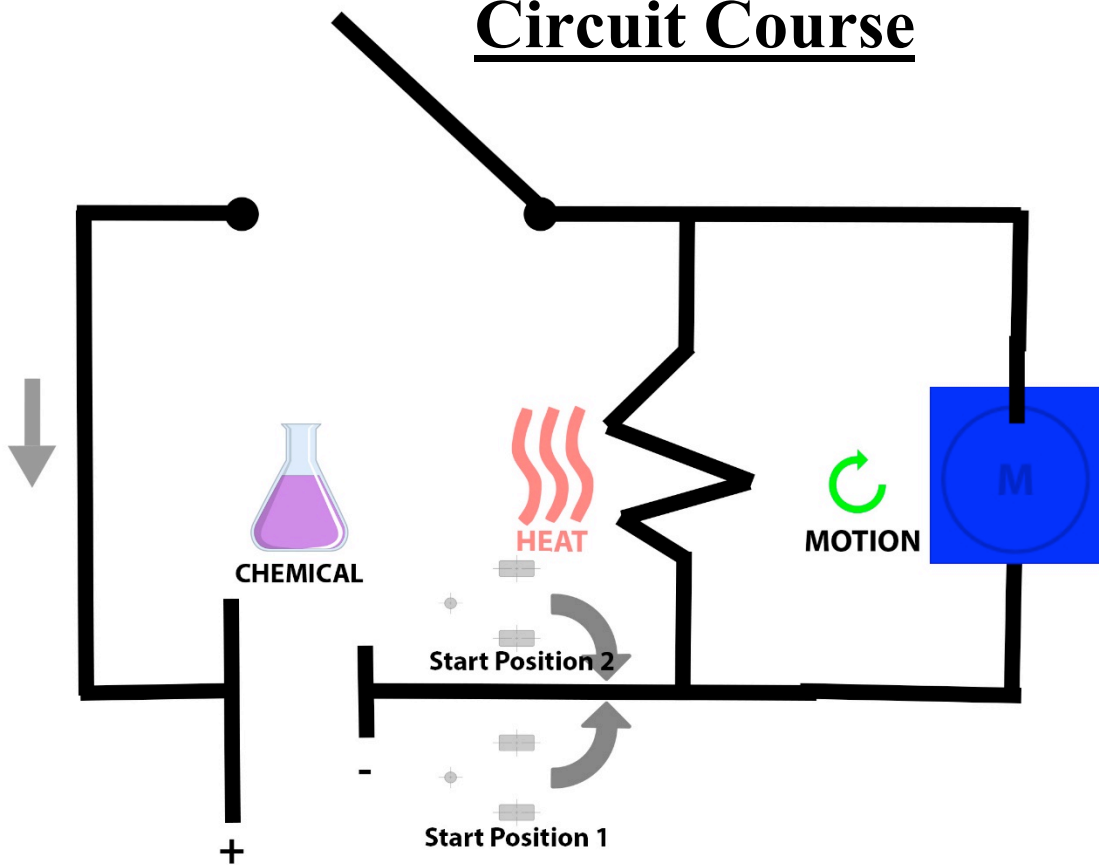
### Predict and Plan

If the circuit 'tape course' has not already been constructed, use black tape to make one as similar as you can to the picture provided. Make sure it's large enough (>1m wide) so the robot has a good chance of being able to follow it.

With the EV3 software you can run two programs at the same time. This is called parallel programming. For example, you can run one program which controls the motors, and another which controls the lights. Do this by grabbing a second start button in the control tab. Test this out to make sure it's working.



## Circuit Course




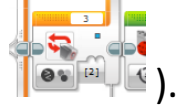
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**Demonstrate/Design/Discover**

- ✓ Demonstrate your knowledge of a circuit by having your robot turn into an electron! Below is a list of scenarios your robot must be able to demonstrate. Each one shows an important concept about electrical circuits.
- ✓ Edit your program along the way to accomplish these demonstrations. You may wish to save them separately.

#	Show	Science Concept
1	As the robot begins to follow the line from one of the start positions the robot branches off at the junction and follows one of the paths. Then, in the other start position, it follows the other path. (You will need to modify your program by switching the motor ports or direction).	Electrons split up at junctions.
2	When the robot hits the resistor part of the course, the light turns red showing heat. (This can be done by creating a second program that waits for a certain amount of time).	Resistors cause heat and electrons to slow down.
3	When the robot hits the blue motor, it stops, spins 3 times, moves forward, and then resumes line following. (Change the loop exit	Motors use the electrons' energy to do

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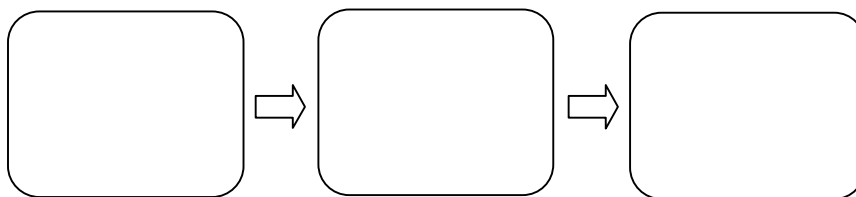
	<p>from unlimited  to a colour sensor .</p>	tasks.
4	<p>Show the electron (robot) getting stuck at the switch in the open position, but being able to continue in the closed position.</p>	<p>Switches stop and allow the flow of electrons.</p>

Tips: Using a steering block (instead of two motor blocks) can make tweaking your line following a lot simpler.

**Record**

Fill out energy transformations that happen going from the battery, to the wire, and then to each load.

Path 1:



Path Two:

