

ACTIVITY 6 - OPEN BUILD SESSION

LEARNING OUTCOMES

Students will,

1. Work together in groups to make a circuit of their choice
2. Draw the circuit diagram of their circuit
3. Present what they built to the group

This activity should take **~1 hour** to complete. It assumes free access to a black-and-white printer, a classroom with a whiteboard, blackboard, or chart-paper.

- 5m explanation of the open building session
- 5m introduction to LSR and RG LED
- 5m group formation and ideation
- 25m parts distribution and build time
- 20m team presentations

This activity does not require regular access to electricity.

MATERIALS AND COSTS PER STUDENT

Item	Qty.	Cost per Student ¹	Expendable ²	Supplier
Push Button	2	0.04	y	AliExpress
Potentiometer 10k	1	0.38	y	AliExpress
LED RGB Common Cathode	1	0.04	y	AliExpress
LED Assorted 3mm 5mm	1	0.02	y	AliExpress
Piezo Buzzer 5V 12mm	1	0.19		AliExpress
Resistors Assorted 2100pcs	3	0.02	y	AliExpress
9V Battery Snap	1	0.16		AliExpress
Jumper cables MM 10cm	4	0.08	y	AliExpress
Breadboard 400 point	1	1.49		AliExpress
Breadboard Power Supply	1	0.75		AliExpress
9V Ni-Mh 450mAh	1	5.17		AliExpress
DC Motor 6V	1	0.87		AliExpress
Total Cost per Student		9.22 CAD		

Note: resistor values of 100 ohms (for use in series with buzzer), 220 ohms (for single use with LEDs), and 680 ohms (for use in parallel for LEDs).

1. Currency is CAD, 2017-06-10. Assuming one set of parts per student. ↵
2. Likely to be broken or lost during the activity. ↵

LESSON

Before class: connect each of the power supplies to a breadboard; snap the battery snaps onto the 9V batteries; print student handouts.

Outline:

1. Open Building Session Format
2. LSR and RG LED
3. Group Formation and Ideation
4. Build Time
5. Presentation

1. OPEN BUILDING SESSION FORMAT

- Form a group of 4-5 and think of a circuit you'd like to build, then try to build it!
 - You can try to build circuits from previous activities that you weren't able to get working
- You can make modifications to circuits we've built before
- You can build something completely new!
- At the end of the 25m build session, you and your group will present to the class
 - What is your circuit is designed to do (e.g. turn on a light when a button is pressed)?
 - Draw the circuit diagram.
 - Explain how the circuit works.
- If you want a part, ask one of the instructors to give it to you

2. LSR AND RG LED

- The RG LED is much like the RGB LED we saw before. It combines two LEDs in one component, and the LEDs share the same (+) pin. Remember to use one resistor with each colour's (-) pin.
- LSR stands for Light Sensitive Resistor. It is a resistor that changes depending on how much light is shining on it. When there is more light, it has a lower resistance.

3. GROUP FORMATION AND IDEATION

- Have the students form groups of 2-5 students, depending on the size of the group. There should be 4 groups or less in total to allow for sufficient presentation time.
- Ask the students to discuss in their groups about what they want to build and what parts they will need. If they have extra time before the 5m discussion time is over, they can start sketching the circuit diagram of what they want to build.

4. BUILD TIME

- Have each of the groups come forward and explain to the instructor what they plan to build, and what parts they will need. Give them the parts to build the circuit.
- Set a timer for 25m, give the students regular reminders.
- When only 5m is left, ask the students to stop working on their circuits and draw out their circuit diagram in preparation for their presentation.

5. PRESENTATION

- The presentation should be addressed to the whole class (not just the teacher) and answer the following:
 - What is your circuit is designed to do (e.g. turn on a light when a button is pressed)?
 - Draw the circuit diagram
 - Explain how the circuit works
- Give an example presentation using a simple circuit(e.g. one demonstrating the LSR or RG LED)