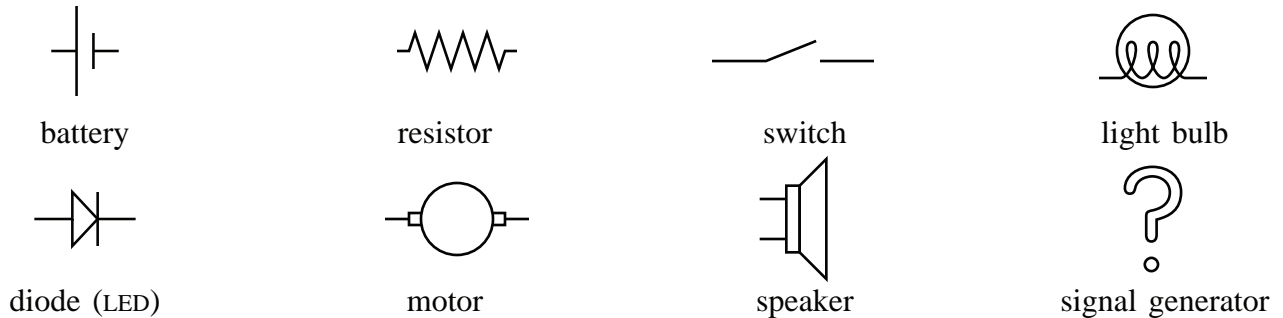


ELECTRIC CIRCUITS

- ☞ The purpose of this lab is to test your practical knowledge of the behavior of series, parallel, and other simple electric circuits.
 - ☞ Credit will be awarded to the entire group for circuits that have been verified as operational by the supervising lab teacher, but each student will complete their own lab sheet.
1. Write your name followed by the names of your partners in the spaces provided below [+2%].

☞ Use the following standard symbols when drawing circuit diagrams:



2. Construct a series circuit using the battery pack, two resistors, and a light bulb. Draw the circuit in the space provided below [+12%]. Measure the voltage across each element with a multimeter and complete the table [+12%].

	V (V)	I (A)	R (Ω)
resistor 1			
resistor 2			
light bulb			
battery (total)			

3. Construct a parallel circuit using the battery pack, two resistors, and a light bulb. Draw the circuit in the space provided below [+12%]. Measure the voltage across each element with a multimeter and complete the table [+12%].

	V (V)	I (A)	R (Ω)
resistor 1			
resistor 2			
light bulb			
battery (total)			

☞ Six circuit challenges are presented below. Each one correctly constructed, verified, and diagramed is worth +10%.

4. Household Wiring: An LED and a light bulb that can be switched on and off independently—like the lights in your home. (Use two switches.)
5. Reading Light / Safety Light: When the light bulb is on, the LED is off. When the light bulb is off, the LED is on. (Use one switch.)

6. Two Speed Motor: Flip the slide switch one way and the motor runs fast. Flip the slide switch the other way and the motor runs slow. Use the press switch to turn the entire circuit on and off. (Hint: Use a light bulb or LED.)
7. Fan Cooled Light Bulb: Flipping the switch turns on the light bulb and the fan. The fan should be positioned to cool the light bulb. The fan blade must not fly into the air.

8. Three-Way Light: The light bulb has different brightnesses when either or both switches are pressed. (“OFF” is not a level of brightness.)
9. Secure Flying Saucer with Indicator LED: Two switches must be pressed to launch the flying saucer. At the same time, the LED lights up.

10. Return all the equipment. [-5% if anything is damaged or missing.].

☞ Five additional circuit challenges are presented below. Each one correctly constructed, verified, and diagrammed will add +10% to your grade from yesterday.

11. Light Activated LED 1: When light is directed into the photoresistor, the LED gets brighter. (Do not use the transistor.)

12. Light Activated LED 2: When light is directed into the photoresistor, the LED turns on. (Use the transistor.)

13. Slow Off Switch: When the switch is opened, the LED turns off slowly. (Use the capacitor to store charge.)

14. Camera Flash: Close the flip switch to charge the capacitor. Open the flip switch to disconnect it. Then press the press switch to discharge the capacitor and flash the LED.

15. Signal Generators: Points will be awarded to whichever group is the first to get U1, U2, or U3 to make a programmed sound. (That's three different groups.) Use only the signal generator, speaker, and switch in your circuit.

16. Return all the equipment. [-5% if anything is damaged or missing.].