

# Energy Baton

## Series & Parallel Circuits

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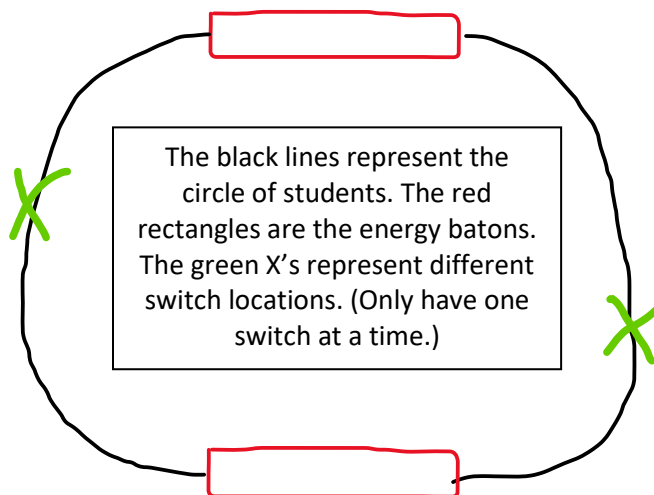


Your class can experience series and parallel circuits with two energy batons. Each circuit is described below. Please note a couple details applied to both circuits:

- Each student in the circle acts as a resistor. Depending on the size of your class and the battery strength in your batons, you may or may not be able to do these activities with your entire class. OEP has done both circuits with 25 students and new batons.
- If you instructed your students in the insulator/conductor activity to “touch fingers” with their partners, this might not work for these two circuits. OEP has found holding hands works more effectively.
- The batons are like a battery with a positive and negative end. If you find your circuit is not working, switch the direction of one baton and try again.

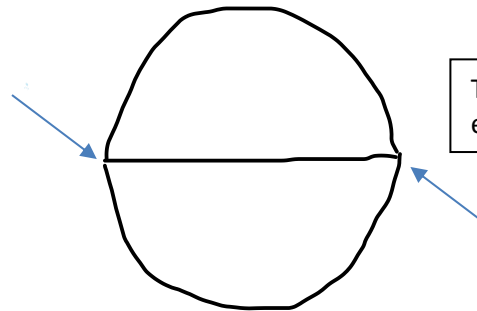
### Series Circuit Directions

1. Materials Needed-two energy batons
2. Gather your students in one large circle. Have students hold hands. Place each baton in opposite spaces in the circle. Note what happens. *Both batons are “on.”*
3. Designate the location of a switch. The two students acting as the switch should let go of their hands. Note what happens. *Both batons go “off.”* The students in your group are like a light switch, turning the batons “off.”
4. Change the location of the switch. Regardless of where the switch is placed, note what happens. *Both batons are “off” when the switch is open.*



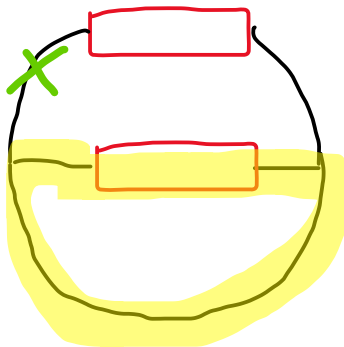
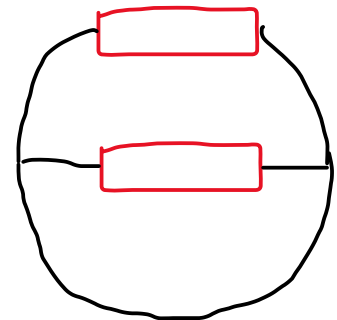
### Parallel Circuit Directions

1. Materials Needed-two energy batons
2. If you just completed the series circuit, have your students remain in a circle. Depending on the size of your group, remove 3-5 students from the large circle and move them to form a line across the middle of the large circle.



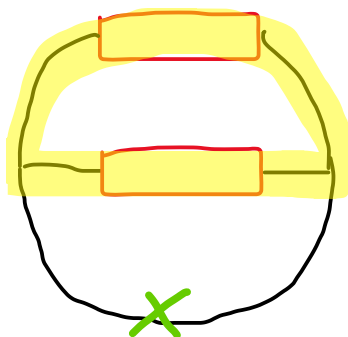
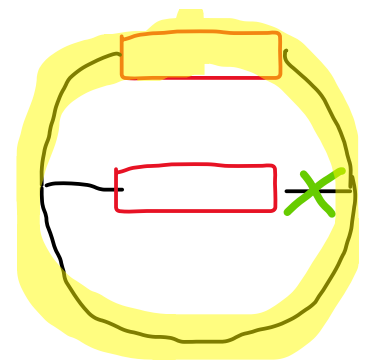
Three students will form a junction on each side at the blue arrows.

3. Add the two energy batons into the circuit. Have students hold hands. Note what happens: *Both batons are "on."*



4. Begin adding switches in different locations. Note what happens as the switch location changes. The closed circuit is highlighted in yellow. *The top baton is "off" and the bottom baton is "on."*

5. Move the switch. Note what happens. *The top baton is "on" and the bottom baton is "off."*



6. Change the location of the switch one more time. Note what happens. *Both batons are "on." The parallel circuit became a series circuit. If a second switch is added anywhere in the highlighted area, both batons would go "off."*