Voltage in Series & Parallel Circuits

Purpose: to compare the voltage of batteries (cells) in series and parallel circuits

Materials: 4 batteries, voltmeter, wire with alligator clips

Procedure and Data:

Part I – Measuring Voltage

1. Obtain and record the voltage of 4 different cells (batteries a, b, c, d)

Battery	A	B	C	D
Voltage				

Part II – Voltage in Circuits

1. Draw the circuit diagrams for:

a) Series circuits

1 Battery 2 Batteries 3 Batteries 4 Batteries

b) Parallel circuits

1 Battery 2 Batteries 3 Batteries 4 Batteries

2. Measure the voltage of each circuit described below

Circuit Type	# of Batteries	Voltage (V)
--------	1	
Series	2	
Series	3	
Series	4	
Parallel	2	
Parallel	3	
Parallel	4	

Conclusion:

1. Why did your batteries not have the same voltage when you measured them in part I?

2. What happens to the total voltage of a circuit when you add batteries in series?

3. What happens to the total voltage of a circuit when you add batteries in parallel?

Circle the best term in the parentheses to correctly complete each statement.

- A series circuit has (more than one, only one) path for current to travel.
- A parallel circuit has (only one, more than one) path for current to travel.

Fruit Battery Experiment

Purpose: to compare the electrochemical potential energy of fruit (cells)

Materials: apple, banana, grapefruit, guava, lemon, lime, orange, voltmeter, alligator clips, screws

Procedure and Data:

1. Obtain and record the voltage of the 7 different fruits.

Fruit	Apple	Banana	Grapefruit	Guava	Lemon	Lime	Orange
Voltage							

Results

Order of fruit starting with the most voltage fruit measured on the voltmeter (MVF "most voltage fruit")

1.
2.
3.
4.
5.
6.
7.

Conclusion

1. What did you already know before doing this experiment?

2. Did this experiment make you wonder about anything?

3. What did you learn from this experiment?

Lighting It Up Activity

Purpose: to light a bulb

Materials: D cell, wire with alligator clips, light bulb

Procedure and Data:

1. Using the flashlight bulb, wire and battery, try to make the bulb light up. Once you are successful, disconnect the battery. Make a sketch of these three materials were connected.

2. Rearrange the three materials and find a different way to make the bulb light up. Make a sketch of this second circuit.

3. Make a sketch that includes the three objects in such a way that the bulb will not light up. Then, using the materials, check if your sketch is correct.

Conclusion

1. Explain the difference between the sketches in steps 1 and 2 and the sketch in step 3.

2. Which of your sketches show a complete circuit

3. Give an example of something in your home or community that represents a complete circuit.