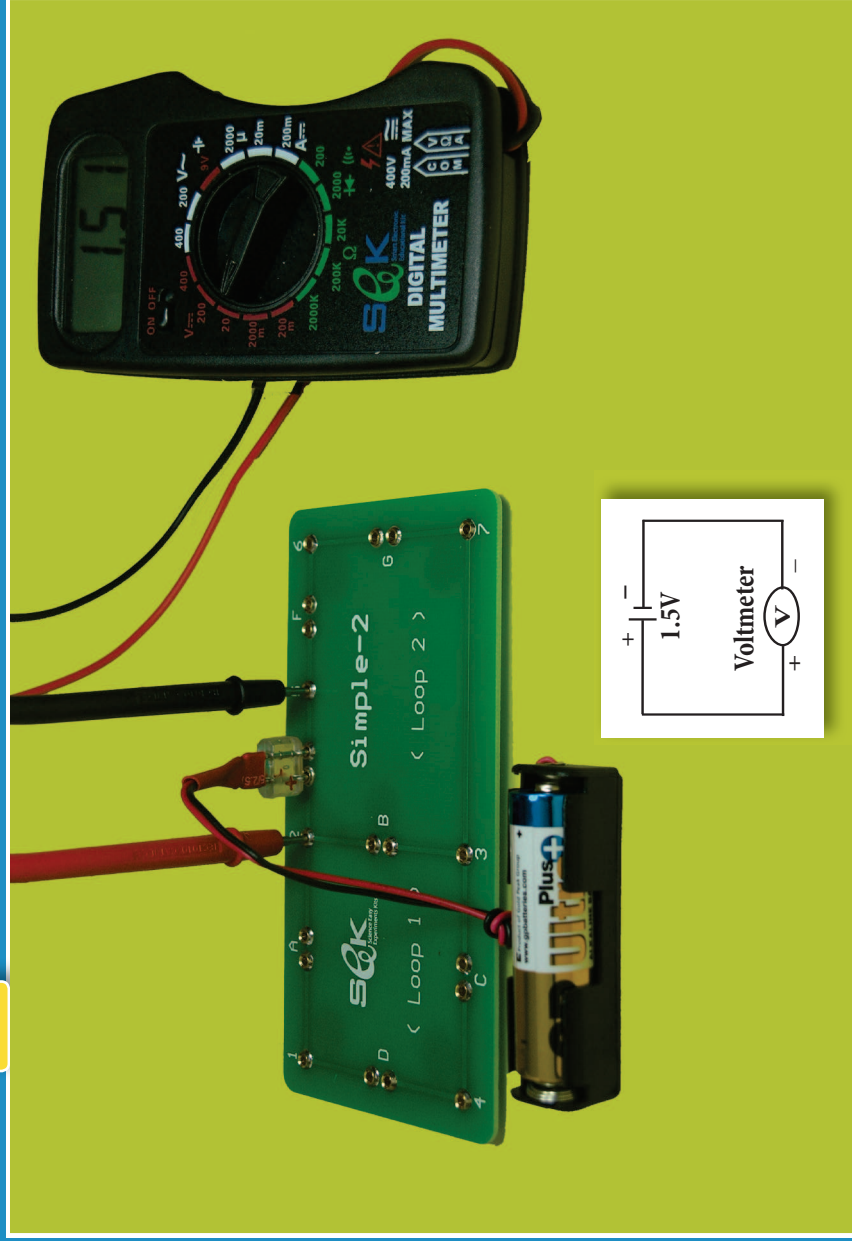


Experiment

7

Connecting Batteries in Series



Objectives

1. The student will identify the “positive” and “negative” terminals of a battery.
2. The student will be able to connect Batteries in Series.
3. The student will investigate the advantages of connecting Batteries in Series.
4. The student will be able to measure the output voltage of connecting Batteries in Series.

Apparatus

- Experiments Board (Simple-2)
- 1xAA Battery Holder w/AA battery
- 2xAA Battery Holder w/AA batteries
- DMM

Procedure & Conclusions

1. Build a simple circuit as shown in the photo, in a way that the positive terminal (red wire) of the battery will be towards point (2)
2. Set the mode of the DMM to (DVC) (range 20)
3. Use the DMM probes to measure the voltage difference (V1) of this battery by inserting the red probe of the DMM in the point (2) & black probe in the point (5)

- Voltage difference of the first battery (voltage difference between points 2 & 5),

$(V_1) = \dots\dots\dots$ volt.

4. Connect another 1xAA Battery Holder at the pair (F) in a way that the positive terminal (red wire) of the battery will be towards point (5) as shown in the photo.
5. Insert the red probe of the DMM in the point (5) & black probe in the point (6) and notice the DMM reading.

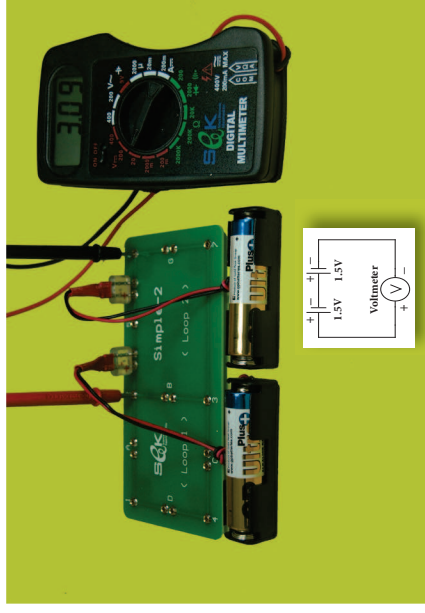
- Voltage difference of the second battery (voltage difference between points 5 & 6) $(V_2) = \dots\dots\dots$ volt.

6. Notice: Batteries in series need to be connected with the positive end of one battery to the negative end of the next battery.

7. To measure the voltage difference of the two batteries (V), Insert the red probe of the DMM in the point (2) & black probe in the point (6).

- Voltage difference between points (2 & 6), (V_{out}) of the two batteries connected in series), $V_{out} = \dots\dots\dots$ volt.

- We conclude that batteries in series produce a voltage equal to $\dots\dots\dots$ multiplied



- by the voltage of each individual battery.
- Connecting batteries in Series will double the ... voltage / current ...
8. Invert the connection wire of the second battery holder at the pair (F) in a way that the positive terminal (red wire) of the battery will be towards point (6), watch the DMM reading.
 - Voltage difference that we get in the last step equals volt.
 9. Connect 2xAA Battery Holder at the pair (F) instead of the 1xAA Battery Holder in a way that the positive terminal (red wire) of the battery will be towards point (5), watch the DMM reading.
 - The total voltage difference for the three batteries connected in series in the last step (V_{out}) = volt.

Note: The two batteries in 2xAA Battery Holder are connected in series.

Discussion

1. What is the advantage of connecting batteries in Series?