



Investigation: Series or Parallel Wiring for Solar Panels

Single Panel

Record the distance (m) between the light source and the solar panel: _____

1. Measure the voltage (V) and current (mA) across the terminals of a single solar panel.
 - a. Voltage:
 - b. Current:
2. Use this measured current in the table below. Use this as the baseline for Expected Value for No Shading. Calculate the rest of the Expected Values according to how much sunlight they receive (25%, 50%, 75% total)

	Measured Value (mA)	Expected Value (mA)
No shading		
Cell 25% shaded		
Cell 50% shaded		
Cell 75% shaded		

Two Panels: Series

Keep the distance between the panels and the light source the same as above: _____

3. Measure the voltage (V) and current (mA) of the panels connected in series.
 - a. Voltage:
 - b. Current:
4. Use this measured current in the table below. Use this as the baseline for Expected Value for No Shading. Calculate the rest of the Expected Values according to how much sunlight they receive (i.e. Cell A 50% shaded is 25% shaded for the total)



Name: _____ Period: _____ Date: _____

Physics – Series and Parallel Shading Lab Sheet

	Measured Value	Expected Value
No shading		
Cell A 50% shaded		
Cell A 100% shaded		
Cell A 100% shaded and Cell B 50% shaded		
Cell B 50% shaded		
Cell B 100% shaded		
Cell B 100% shaded and Cell A 50% shaded		

Two Panels: Parallel

Keep the distance between the panels and the light source the same as above: _____

5. Measure the voltage (V) and current (mA) of the panels connected in series.
 - a. Voltage:
 - b. Current:

6. Use this measured current in the table below. Use this as the baseline for Expected Value for No Shading. Calculate the rest of the Expected Values according to how much sunlight they receive (i.e. Cell A 50% shaded is 25% shaded for the total)

	Measured Value	Expected Value
No shading		
Cell A 50% shaded		
Cell A 100% shaded		
Cell A 100% shaded and Cell B 50% shaded		
Cell B 50% shaded		
Cell B 100% shaded		
Cell B 100% shaded and Cell A 50% shaded		

Critical Thinking Questions:

1. With no shading, what wiring method produces maximum current? Max voltage?



Name: _____ Period: _____ Date: _____
Physics – Series and Parallel Shading Lab Sheet

2. Describe the relationship between current and shading for a solar panel wired in series.
3. Describe the relationship between current and shading for a solar panel wired in parallel.
4. Do the measured values align with the expected values? If not, offer a few reasons why they are out of alignment.