



Lesson 3: Making a Parallel Fuel Cell Stack

Voltage sources arranged in parallel produce different voltages than the same source placed in a series. Can you determine how arranging fuel cell stacks in parallel impact their voltage and current produced?

Doing the Science

1. Start the Fuel Cells Simulation by clicking on the “Sim” tab.
2. Use the materials on the top shelf to build one fuel cell.
3. Once your fuel cell is correctly built, click on the 100% H₂ Gas Flow button.
4. Next, click on the 100% O₂ Gas Flow button.
5. Click the “Make Stack” button at the bottom of the screen and then click the “Parallel” button.
6. Drag two or more fuel cells into the slots on the right side of the screen. (Remember that a stack is two or more fuel cells.) Dragging a fuel cell to the top left of the screen causes the H₂ and O₂ tank positions to switch. Record your stack construction, the stack voltage, and the stack current in Table 1.
7. Create different stack combinations to produce a variety of voltages and current. Make sure to record your stack construction and results in Table 1.

Table 1. Parallel Fuel Cell Voltage and Current

Parallel Stack Construction	Voltage (volts)	Current (amps)

Do You Understand?

1. Which stack construction produced the greatest voltage? Which stack construction produced the largest current?

2. Describe a water and bucket analogy for your fuel cells arranged in parallel.