Purdue Energy Center
Fuel Cell Project
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Item Descriptions
I1-I7
What is Power?

Power is something that is created using a power source.

The wind is a power source; when the wind blows, leaves move.

The sun is a power source in the form of heat. On cloudy days, the sun's rays are blocked and so people on earth feel less heat.
One way to make Hydrogen is to separate it from Water

Lightning can naturally split water into hydrogen and oxygen.

Electrolyzers use electricity to split water into hydrogen gas and oxygen gas.

Hydrogen is produced on the cathode and oxygen is produced on the anode. The hydrogen is then stored in a fuel tank and the oxygen is released back into the atmosphere.
Hydrogen Cycle

Renewable Energy provides electricity.

Electrolyzers use the electricity to split water into hydrogen and oxygen.

The Fuel Cell splits hydrogen to produce electricity.

Image Courtesy Schatz Energy Research Center Humboldt State University
Here we use sunlight to make, Clean, Renewable Electricity

Solar panels use silicon wafers to generate electricity directly from sunlight.

The electricity then travels down the wires to power the light bulb.
Fuel Cell Learning Module

Use the track ball to navigate through the fuel cell module to learn about how hydrogen is produced, how a fuel cell operates, and some of the current and future applications for fuel cells.
Fuel Cell Operation

As hydrogen molecules enter the anode, the catalyst causes them to split into electrons (e\(^-\)) and ions (H\(^+\)). The electrons flow can through the wire as electricity which causes the light to come on. Meanwhile the (H\(^+\)) ions flow through the membrane. When the electrons (e\(^-\)) and ions (H\(^+\)) meet oxygen at the cathode, water (H\(_2\)O) is produced along with heat.

Adding stacks together provides more power.

Images Courtesy Los Alamos National Labs
Fuel Cell Applications

Fuel cells have been tested in all the items on this display, but they are more practical for some uses because of space and weight concerns.

Hydrogen as a fuel takes up more space than an equal amount of gasoline and the tank that holds hydrogen fuel is often heavier than a gasoline tank.