

It's easy
to set-up,
easy to use,
and robust!



Hydrogen Fuel Cell Model Car

For grades 5 – 10 science classes

The Hydrogen Fuel Cell Model Car demonstrates a "Solar hydrogen system", a method of harnessing renewable energy to power the cars of tomorrow.

How it works:

The electrolyzer, using electricity from the solar panel breaks water into its basic components, hydrogen and oxygen gases. The gases are stored in graduated cylinders, which are attached to the sides of the electrolyzer. When power to the car is required the fuel cell is connected to the onboard electric motor. The fuel cell then converts the hydrogen and oxygen gases back into water releasing electricity in the process. This electricity powers the electric motor, which drives the car forward.

Hydrogen Fuel Cell Model Car-Demo

- **Solar module**
- **Reversible PEM fuel cell (operates as both an electrolyzer and a fuel cell)**
- **Car chassis with electric motor**
- **New for 2005!**

Course lesson book:

"A Middle School Introduction to Hydrogen Technology"

Contains 8 experiments for grades 5 – 10 students using the kit.

Item no. 352E

Hydrogen Fuel Cell Model Car-Basic

- **All items as Fuel Cell Model Car-Demo EXCEPT the solar module**

Item no. 349E

Hydrogen Fuel Cell Model Car-Complete

- **All items as Fuel Cell Model Car-Demo PLUS load measurement box**

Item no. 354E



Energizing Education

Hydrogen Fuel Cell Model Car

Technical data

4_2005

Course book

"A Middle School Introduction to Hydrogen Technology"

Summary of learning objectives from the 8 experiments:

- In electrolysis twice as much gas is produced at the cathode than produced at the anode.
- History surrounding discovery and identification of the two gases hydrogen and oxygen, and the classic tests for identifying each gas.
- Explore how the orientation of solar cells affects electrical energy output.
- That hydrogen fuel can produce an electric current when used in a fuel cell.
- That more hydrogen is consumed when the electric motor does more work.
- To understand the basic scientific principles behind the fuel cell.
- To consider the future implications of changing to a hydrogen-powered economy.

Solar module

Dimensions (LxWxH)	2¾" x 4¾" x 2" (70 x 120 x 52 mm)
Open circuit voltage	3.0 V DC
Short circuit current	245 mA
Voltage (at maximum power point)	2.4 V DC
Current (at maximum power point)	200 mA
Power output	0.48 W

Note: Solar module output data based on standard conditions (1000 W/m², 25 °C)

Reversible PEM fuel cell

Dimensions (length x width x height)	3" x 3¼" x 3¼" (72 x 80 x 80 mm)
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Electrolyzer operation:

Required voltage	1.4 – 1.8 V DC
Storage volume of hydrogen and oxygen	15 ml each

Fuel cell operation:

Power output	0.4 W
Voltage output	0.4 – 0.9 V

Car chassis with electric motor

Dimensions (length x width x height)	8½" x 4½" x 1¾" (210 x 110 x 45 mm)
Voltage requirement for motor operation	0.5 – 3.0 V
Rate of hydrogen consumption in drive mode	3 – 5 ml/min.
Running time of car	3 – 5 min.

Climatic conditions

Required ambient temperature for operation	10 – 35° C
Required storage temperature	10 – 35° C

*We reserve the right to make changes