Technology Forecast

Fuel Cells

The internal combustion engine has been the heart of the car for more than 100 years. But an electric motor could soon replace it.

Automakers want to make the change because electric motors produce fewer emissions than gasoline-powered piston engines. Electric motors are also quieter. They might even require less maintenance.

Cars with electric motors are now being built. These motors need many improvements before they can replace the combustion engine. The driving range is too short. The batteries that power the electric motors are heavy and slow to recharge. There is another major drawback for consumers: they are expensive.

To provide the electric current these motors need, engineers are designing fuel cells. First used by NASA in the US space program, fuel cells could easily power cars and trucks. A fuel cell creates electricity from hydrogen stored in the vehicle as either a gas or a liquid. Hydrogen also can be extracted from gasoline or methanol stored in the vehicle.

Once the hydrogen enters the fuel cell, it is split into protons and electrons. The electrons are used to run the electric motors. The protons pass through a thin membrane to combine with electrons and oxygen in the air. The result is water—a safe vehicle emission.

Action Activity

Prepare a graphic display that shows how a fuel cell works. Label the major parts. Explain the steps for creating electric current. What are the advantages and drawbacks of fuel cells? What are some obstacles to manufacturing fuel cells?