

**DEAR ENERGY EXPERT**

NAME \_\_\_\_\_

**Dear energy expert,  
What is solar energy? How does it work?***Brightly, San Diego***Dear Brightly,**

Solar energy is radiation from the sun that hits the Earth. The sun produces huge amounts of energy. Scientists estimate that the sun delivers as much energy to Earth in 20 days as there is stored in all the fossil fuels on the planet! With the right tools, that energy can be captured and converted into heat and electricity.

You are probably noticed how hot it gets inside a parked car on a sunny day. That heat is a form of energy. To harness the sun's energy for use, many people use solar panels in their homes or businesses. The panels contain (units of sunlight) that convert the sun's energy into electricity. When Many photovoltaic cells are arranged together on a solar panel, they can gather enough sunlight—and create enough electrical current—to power things like the lights and appliances inside a home. Some engineers have even designed solar-powered cars.

What are the benefits of solar energy? The sun's energy is completely clean; no pollution is released when photons are converted to electricity. And, as long as the sun is shining, solar power is totally limitless!

**Dear energy expert,  
What makes hydrogen an energy source?***Sincerely, Wondering About Hydrogen in Honolulu***Dear Wondering,**

Hydrogen is an element, found virtually everywhere, that can be extracted to be used as a form of energy. It's embedded in water, fossil fuels, and all living things. It is the most plentiful gas in the universe, and the source of energy received from the sun. It is not found on Earth as a gas, but in a compound form, such as water (H<sub>2</sub>O). When hydrogen is combined with carbon, it forms organic compounds like methane, coal, and petroleum. Like electricity, hydrogen can be stored until it is needed. That makes it a great choice for powering cars and portable devices. Someday, for instance, you may have a hydrogen-powered MP3 player!

Hydrogen is converted into electricity inside hydrogen fuel cells. Those cells split molecules of hydrogen open, freeing electrons and creating an electric current. The electricity provided by the fuel cells can be used to power an electric motor. Fuel cell vehicles are more energy-efficient and emit less greenhouse gases and pollutants than vehicles powered with conventional fuel.

Scientists are currently working on ways to make it easier and cheaper to produce. Today, nearly half of all hydrogen fuel is derived from natural gas. But someday, more hydrogen may come from wind and solar power—making it a perfectly clean, completely renewable resource; another plus is that there is so much hydrogen.

*(cont.)*

It's Your Turn! In the space below write your own energy question. Then trade your question with a classmate. Research the question you are given and answer it on a separate piece of paper.

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**Challenge:** Create, design, and explain a renewable or alternative energy resource using a model or diagram.

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