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***Building a Just and Sustainable World***

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**EDUCATION CONNECTION | VISUAL LEARNING**

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Images, photos, and pictures stimulate the mind. For the viewer, they offer a chance to connect and question. They also offer potential for play and imagination, and pulling the observer into purposeful messages.

Most often, newspaper and magazine readers quickly glance at photos and their captions. With this YES! lesson plan, you and your students can pause to truly understand an image, its message, and why it's interesting (or not).

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### Keep It Light

#### Step 1: What do you notice?

Ask your students to make sense of the photograph by trusting their instincts of observation and inference. In doing so, the image offers possibilities and interpretations beyond a typical reading where the reader glances at a photograph to reinforce its title or caption. Do not introduce any facts, captions, or other written words.

In response to the question, “What do you notice?” you may hear: *a human hand, blue and white woven patch, white fringe, burgandy and navy sweater.*

#### Step 2: What are you wondering?

After you’ve heard your students’ first observations, you may hear a peppering of questions: “*What’s the patch for—decoration or a specific use? How was it made? What’s underneath the fibers? Is it wood?*”

This is a good time to reveal the photo’s caption and other information about the photo (below). Watch how the conversation shifts from what they believe to be true to discerning the facts about the photo.

#### Photo caption

Imagine charging your phone by plugging it into your shirt. Dr. Jayan Thomas, a professor of Nanoscience Technology at the University of Central Florida, has invented a tiny, ribbon-shaped photovoltaic (solar) cell that can be woven into fabric. The cells are intended to make it easier to charge portable electronics.

photo courtesy of the University of Central Florida

#### Photo facts

- Weaving was one of humanity’s earliest inventions—before the domestication of the horse or the invention of the wheel. Besides cloth, early weavers wove baskets, string, rope, and nets to trap small animals.
- Solar cells are made of thin wafers of silicon, the same element that microchips are made of. First, the silicon has to be purified by heating it in a vacuum furnace for more than 300 hours at between 1,500 and 2,000°C. That’s hotter than molten lava!

- Solar power is the fastest growing source of electricity in the U.S. People used 41 percent more solar electricity in 2015 than they did in 2014. In comparison, from 2014 to 2015 coal-generated electricity use dropped by 15 percent.
- If the average U.S. household used only solar electricity for a month, it would keep 1,162 lbs of CO<sub>2</sub> out of the atmosphere.
- The world’s largest solar plant is in Kamuthi, Tamil Nadu, in southern India. It covers 10 square kilometers (about the area of Washington, D.C.) and is designed to produce enough electricity to power about 150,000 homes.
- An iPhone uses very little power. It can be powered for more than one month with the electricity it would take to power a 100-watt incandescent light bulb for an hour.

#### Step 3: What next?

1. Does your home, or the home of someone you know, use solar power? What inspired this decision? Why might (or not) solar power be a better choice than other energy sources?
2. Energy-saving, sustainable items like solar panels, electric cars, and organic food tend to be expensive. Is it fair that many people can’t afford them? What can be done to make these products accessible to everyone?
3. The United States government gives far more subsidies (financial assistance) to fossil fuel companies than to renewable energy companies. Why do you think the government supports fossil fuels? What would change if the government supported renewable energy instead?
4. Professor Thomas got the idea for electricity-generating fabric from *Back to the Future II*, a 1985 movie about a teenager named Marty McFly who has self-lacing electric sneakers. Have you seen a futuristic device in a movie that you wish you could actually invent?
5. Before mechanized looms were invented, people wove all their cloth by hand. Do you know how to make anything by hand? What’s different (maybe even better) about an object you make versus one that you buy?