Kentucky

Anchor Set

Reading Grade 7

RE925656243

Dagdeviren Work is Significant

Date	Comments	Version
4/20/20	Origination	1

Directions: Read the excerpt from "Cool Jobs: Making Electronics to Wear." Then answer the questions.

from "Cool Jobs: Making Electronics to Wear"

by Stephen Ornes

Originally published on www.sciencenewsforstudents.org, January 29, 2016

Meet the researchers who are pushing the boundaries of electronic devices

1 Could keeping track of your health be as easy as wearing a temporary tattoo? Materials scientist John Rogers thinks so.

2 In his lab at the University of Illinois at Champaign-Urbana, Rogers and his team design electronic devices unlike anything in an Apple store. Their inventions hardly look like electronics at all. Most electronics are boxy, fragile things that have to be handled with care. For a tablet or a cell phone, a minor accident, like spilling water, can quickly turn catastrophic.

3 But the inventions from Rogers' lab are more like high-tech stickers. These adhesive patches, crisscrossed with miniature wires, stick to the skin for weeks at a time. They can survive the wear and tear of life. Already, the scientists have programmed the devices to take a wide variety of measurements. These include temperature, blood pressure and skin moisture levels (or hydration). Rogers says he wants his sensors to look more like parts of living organisms and less like traditional computers.

4 "We're driving the technology by thinking outside the box," he says.

5 Stretchy, wearable electronics interest researchers from a variety of fields. Rogers is a materials scientist, which means he looks for smart ways to use, understand and even create the materials used to build things.

6 Developing these devices is appealing, says Rogers, because it has the potential to improve health care. Instead of trudging to the clinic or hospital for every checkup, a patient might be able to download data from a stick-on device and send it to the hospital. This technology offers the potential for more measurements and fewer trips to the doctor.

7 Here, Rogers and two other researchers who work on stretchy electronics describe these skin-like devices—as well as what their future may hold.

How to harvest energy from the body

8 As a young girl growing up in Turkey, Canan Dagdeviren received a book about the scientist Marie Curie from her father. Curie was the first woman to win a Nobel prize, one of the highest honors given to a scientist. (Curie actually won two.)

9 "I think my dad was thinking I would get inspiration from her," recalls Dagdeviren, who does research on wearable electronics at Harvard University and MIT, both in Cambridge, Mass. "But when I read the book, I fell in love with her husband because he discovered the piezoelectric effect."

10 In the late 19th century, French scientist Pierre Curie and his brother Jacques showed that some crystals generate sparks when they're under pressure. Sparks mean electricity. So piezoelectric crystals turn mechanical energy, which comes from motion, into electricity. Scientists have looked to piezoelectric materials in recent years as a potential power source for wearable electronics.

11 Dagdeviren suspects piezoelectric materials could capture energy from movement in the human body. Even at rest, the body is constantly in motion. Lungs expand and contract as you breathe. The heart beats. Blood streams through your veins and arteries. All of these are examples of mechanical energy, or the energy associated with motion, location or both.

12 As a graduate student, Dagdeviren studied with John Rogers in Illinois. She designed devices that could be used inside the body. Her inventions converted the movements of the lungs, heart and diaphragm into electricity. This technology might one day provide power to devices like pacemakers, which help the heart keep up a steady rhythm. Right now, pacemakers need batteries that have to be replaced every five to 10 years. Dagdeviren's system wouldn't need batteries.

13 "You can generate power, and use this power to run your personal electronics," she says. . . .

14 Wearable, flexible electronics could make it possible to constantly monitor the body. Usually, we take measurements like temperature or blood pressure at a single moment in time. But that snapshot may not tell the whole story. If a person is wearing a sensor, a doctor can study a stream of data and look for patterns.

15 "Our organs and our bodies speak to us," Dagdeviren says. "I use my devices to understand what they're saying."

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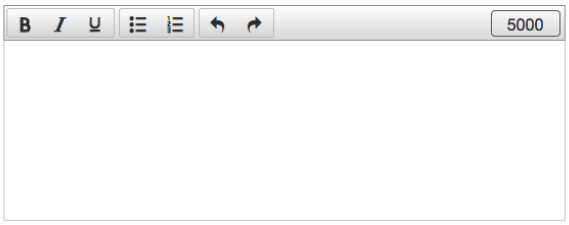
Short Answer Directions: Read the question carefully. Then enter your answer in the space provided.

How does the author convey his belief that the work of Canan Dagdeviren is significant? Support your answer with evidence from the text.



A1

Uin:AAAYIP13820000559487 Form:20RD07SPONEN00000009 Clip:RE925656243 p.671

The author conveys that he believes Dagdevirens' work was significant through paragraphs 12-15. In one way of the author explaining how amazing Dagdevirens' work is in paragraph 12 when he wrote "She designed devices that could be used inside the body. Her inventions convereted the movements of the lungs,heart and diaphragm into electricity. This technology might one day provide power to devices like pacemakers, which help the heart keep up a steady rythm. Right now, pacemakers need batteries that have to be replaced every five to 10 years. Dagdeviren's system wouldn't need batteries" this evedince shows that she can help people with heart problems and lessen the carbon footprint with battery waste which both are quiet significant. More evidence can be seen in paragraph 14 when the author writes "Wearable, flexible electronics could make it possible to consttantly monitor the body. Usually, we take measurments like temperature or blood pressure at a single moment in time. But that snapshot may not tell the whole story. If a person is wearing a sensor, a doctor cna study a stream of data and look for patterns." this piece of evedince shows that Dagdeviren's system could help catch medical problems sooner and help the doctors study more in depth data of our vitals. All of his evedince goes to show that the author believes that the system Dagdeviren has created in quiet signifacant.

2

A2

Uin:AAAYIP13820000290435 Form:20RD07SPONEN00000009 Clip:RE925656243 p.440

Pierre Curie was a man that found a use of crystals. Dagdeviren is somebody that used that oddity to make a possible recharging battery that is charged 24/7 on your skin! In paragraph 12, it talks about how pacemakers have to be replaced every 5 to 10 years. With this battery, they will never have to be charged, unless the crystal goes bad, which I assume they are testing. If the crystal can last 80 years before the crystal in the thin sticker dies, the person won't have to go through surgery every 5 years that weakens the immune system and increases the chance of death. Also, they dont have to take autoimmune pills. It's outside their skin, so the body can't fight it. Nobody wants to take a pill for the rest of their life. They want to live a happy life. Not a intruding, scary life. When a pacemaker is due, the person thinks that any second their heart could stop because the pacemaker battery will run out. Do you want to live with that fear for the rest of your live? I don't. It would be a constant nightmare.

2

A3

Uin:AAAYIP13820000182316 Form:20RD07SPONEN00000009 Clip:RE925656243 p.1195

The author believes Canan's work is significant because of the things that Canan did such as find out that the body can make electricity by the movement of organs like the lungs and the heart. She id trying to make wearable electronics so that they will be charged by body movement instead of batteries, and can monitor the body right at home instead of going to the doctor. She says in the passage that "instead of trudguing to the clinic or hospital for every checkup, a patient might be able to download data from a stick on device". By the way that the author talks about this in the passage I can infer he he conveys Dagdevirens work significant.

2

A4

Uin:AAAYIP13820000326715 Form:20RD07SPONEN00000009 Clip:RE925656243 p.464

The authour conveyed his belife that the work of Canan Dagdeviren is significant by stating some of her ideas to improve healthcare,and what they do in the text.Evidence from the text to prove this is " she designed devices that could be used inside the human body". This supports the claim because this states what her divice is used for and does.

1

A5

Uin:AAAYIP13820000373550 Form:20RD07SPONEN00000009 Clip:RE925656243 p.680

She invented a device that keeps track of your personal data and that will help us not have to go to the doctor as often.

1

A6

Uin:AAAYIP13820000154202 Form:20RD07SPONEN00000009 Clip:RE925656243 p.426

The work of Canen Dagdeviren is significant because it has the potential to improve healthcare rather than trudging to the hospital for every check-up

1

A7

Uin:AAAYIP13820000497131 Form:20RD07SPONEN00000009 Clip:RE925656243 p.2678

The passage says that "Curie was the first woman to win a Nobel prize and its one of the highest honors given to scientist" She was a inspration to him

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A8

Uin:AAAYIP13820000601021 Form:20RD07SPONEN00000009 Clip:RE925656243 p.2652

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The author conveys his belief that the work of Canan Dagdevieran is signifigant because he uses her exaples and quotes from the text. He also says multiple times what she done and how she was inspired.

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A9

Uin:AAAYIP13820000667597 Form:20RD07SPONEN00000009 Clip:RE925656243 p.2663

he thinks one day he can be a scientsit but one day. he was going to the univerty of llinois.

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