Alternative energy science fair projects

High school students from more than 40 countries qualify for Intel ISEF bywinning at affiliated regional fairs like the USEF. The chance to win ashare of $3 million in prizes adds to the excitement at the event, but manystudents describe even bigger motivations--curing cancer, designing fuel-efficient vehicles, being the first to solve a mathematical problem, orhelping the blind have greater access to information. To read about moreentries visit Intel ISEF. Here is a just a small sampling of student projectson varying themes.

Student scientists who investigate issues in health and medicine aremotivated by the chance to offer new solutions to health problems. Theirresearch could improve and possibly even save lives.

Margaret Pere Jumonville, 15, a freshman at Saint Joseph"s Academy in BatonRouge, Louisiana, focused her research on something that affects her own life."I"m a singer, so I"ve always been concerned about abusing your voice. Singersmake a habit of drinking water, but I wanted to find out if hydration reallymakes a difference." Her medicine and health project, "Got Abuse? Get Water!Vocal Abuses and Effects on Fundamental Frequency and Vocal Quality," includedresearch in a computerized speech laboratory at Louisiana StateUniversity.

Blake Price, 17, a junior at Happy High School in Happy, Texas, becameinterested in the health risks that falling poses to older people after hisscience teacher"s grandparent suffered a broken hip as a result of a fall. Hisengineering project, "The Lift Assist: Second Edition," uses mechanicalengineering and electronics to provide a solution.

Using Price"s prototype, a person grabs onto two levers, pushes a button tostart the battery-powered motor, and is slowly pulled to an upright position.The device can be used with any type of seat, including a soft couch. Unlikeexisting lift-chair devices, which propel users out of their seats, Blake"sproduct continues to offer support once the user is standing. "If an olderperson is medicated, he or she might have trouble with balance. This givesthem time to get steady." The motorized levers also offer assistance to userswho lack upper-body strength.

Price did user testing with his target audience and continued modifying hisdesign to make improvements. "I was concerned about ergonomics and wanted tobe sure my product would be safe." The best part of the process, he said, "isthe chance to make something new that solves real problems."

Many students turn their attention to a wide range of environmentaltopics--from the reforestation of a landfill to alternative energy sources tothe dangers posed by road salt.

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For Arthur J. Petron, 18, a senior at Dallastown Area High School in York,Pennsylvania, risk-taking is part of the process of invention. "If you"re nottaking a risk, you"re not going anywhere," he said. For his engineeringproject, "Hydrocarbon Production Through Electrical Ionization," he designed achamber filled with hydrogen gas to produce synthetic hydrocarbons--an ideathat could generate an alternative energy source.

Petron initially considered working on the design of hydrogen fuel cells,"but then I decided to approach the problem more directly. Creating analternative source like this would decrease our dependency on other countriesfor petroleum-based fuels, and could have environmental and economicbenefits."

One of his biggest challenges was finding a lab willing to let him runtests. "My experiment is kind of volatile," he admits, given that it involveshydrogen gas and electric sparks. A researcher at York College finally agreedto give him lab time. "His only condition was that whenever I did a combustiontrial, I had to tell him in advance." Petron"s most satisfying researchmoment? "Putting the chamber in the hood, turning it on, and not having itblow up."

Energy can be made, or generated, using solids, gas or liquids as its source of power. So how do you use energy? Energy can be generated to produce light, heat or the movement of objects. In this experiment, we explore how to get power from water, or hydropower, which can be used to pick up household objects.

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