



## **Engineering Design & Development: Projects with Purpose!**

*A sampling of Engineering Design & Development (EDD) capstone projects from around the nation, tackled by Project Lead The Way students just like you.*

**Indiana PLTW students designed and developed a unique emergency shelter** for use in disaster-stricken areas. The shelter is extremely lightweight yet durable and folds down into a compact kit that can be air dropped into the affected areas and assembled on the ground. The waterproof shelter includes a water purification system that uses carbon to kill bacteria. The students were among 100 PLTW students participating in the 2012 White House Science Fair.

The students were inspired by the earthquakes in Haiti. After initial research, they realized how many people could use this type of shelter. Within six months of the Haiti earthquake, the students had developed the first prototype. They are hoping a company will take on their design.

Their invention is under review by various national and international relief agencies which are considering the invention as part of their relief efforts. The cost of the shelter is approximately \$600, comparable to the tents currently used in relief efforts.

**Six PLTW seniors tackled a real-life transportation problem** in Woodstock, Illinois. The students spent several weeks studying a problematic intersection and proposed three solutions to improve safety and traffic flow. They presented their solutions to the McHenry County Transportation Board.

During their research, students learned about the "complete street" concept: a space where public transportation, cars, pedestrians and bicyclists can co-exist, with enough room, safety, and curb appeal.

The students studied pedestrian and vehicle safety, examined accident records, participated in a field trip to meet with officials from the Chicago Metropolitan Agency for Planning, the University of Illinois-Chicago College of Urban Planning, and the Center for Neighborhood Technology. They also toured Chicago and learned more about the complete street concept.

**Indiana students designed a more efficient "ER of the future" for a local hospital.** After touring several area emergency rooms, the students went to work researching ways make improvements while staying within health, safety, security, and building code regulations. They also developed a device to convert medical waste to safer general waste. They presented their design recommendations to the hospital board and a panel of healthcare professionals.

**Patent applicants:** Five New Hampshire PLTW students designed and developed an innovative electric ring cutter, and are now named on a patent application for the device. This new design changes a two-handed concept to a single-handed device making use by emergency room personnel or EMTs significantly easier.

**PLTW students developed an HHO generator** that uses water to replace gas in a car's engine, increasing one car's miles per gallon 50%.

**Alternative energy:** PLTW students designed and built solar panels for the school greenhouse. The total plan for the greenhouse project included having an electronic monitoring system to read how much energy the solar panels are putting out at any given time, LED lighting for plants, and a solar thermal water heating system.