

Newspaper in Education Presents

# inquizi kidz

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So, You  
Want To  
Be An  
Engineer?

## Kidz biz Brains and Brawn

By Leslie Rowe

Ask a typical high school student, "Where do you see yourself in five years?" and you often get an "Ummm, I'm not sure." Ask Justin Terry, a fifteen-year-old tenth grader at Bayshore High School, and he's a little more specific. "I see myself as an engineer—probably computer engineering—doing parallel processing and computer architecture, designing chip sets..." He sounded so casual—like he'd just described eating a Big Mac—and the words were as familiar to him as adding a side of fries.



Justin Terry

That's because Justin has been practicing engineering skills in his Project Lead the Way Engineering classes. Recently Justin and his classmates constructed 3D robotic modeling systems using Fischertechnik® parts powered by Lucky Logic computer software. The system used a light sensor to detect whether marbles were dark or clear, and then sorted the marbles in a manufacturing process simulation. "I like the idea of designing your own projects and coming up with your own ideas to make it work," Justin said. "It's a good course—it gives you an idea of what engineering is like. It helps you develop problem-solving skills that you can use in any job."

When Justin is not using his brains, he puts his muscles to work with hobbies in weightlifting and freestyle wrestling. A Bradenton native, Justin plans on attending college after high school and possibly joining the Army Reserves. One thing is certain—he's sure to be successful!

## school biz Leading the way

By Leslie Rowe

After 30 years of teaching at Bayshore High, Timothy Estep has experienced tremendous technological change. He started out teaching shop, mechanics, and mechanical drafting. Eleven years ago he added Computer Aided Drafting (CAD), and now teaches both CAD and engineering classes in the nationally-recognized pre-engineering program, Project Lead the Way (PLTW). A U.S Navy Vietnam veteran, Tim maintains a friendly leadership style. Spend a little time in the classroom and it's obvious that he enjoys his students.



Tim Estep

Tim assists with the Technology Students Association (TSA), an organization teaching leadership and problem-solving. TSA students recently participated in the state TSA competition in Orlando in web page design, graphic arts, and technology problem solving. If there is one message Tim would like to broadcast, it's that his pre-engineering program wants to attract more students to the field of engineering. His hands-on, project oriented PLTW classes stimulate creativity and ingenuity as students team together to learn about engineering. "Many of these students will become engineers," he said. "They're motivated; they're all going to college; and they're really prepared for college. I act less like an instructor. I'm a facilitator. These students are inquiring. That's the nucleus of engineering—problem solving." Student Josh Wright agreed. "It's kind of like a job. We come in here; we have work to do, so we do it."

This week's InquiziKidz explores Project Lead The Way and careers in engineering. The KidzBiz and School Biz sections feature Bayshore High School.

## What Kind of Work Do Engineers Do?

By Julie Gillies

What kind of work do engineers do? It varies greatly, depending on which field of engineering you're talking about. Engineering has a wide range of career possibilities. But essentially engineers do two things: create things and solve problems. From building road systems, skyscrapers and bridges to creating software which operates huge factories or runs the space shuttle, engineering is a vital part of any project's success. Engineers strive to understand what needs to be done, when it needs to be done and how to smoothly implement the technologies to cause it all to happen. You may be surprised to learn the variety of careers available in the engineering field. Here are just a few:

**Civil Engineer:** Civil engineers have one of the most easily visible careers. These engineers literally build the infrastructure of our cities and our country. They build dams, bridges, buildings, skyscrapers and roads using all the most advanced materials and technologies available.

**Electrical Engineer:** Electrical engineers work with all forms of electricity. The field is wide open and can involve working with cell phones, television or radio, computer software, medical imaging, fiber optics and manufacturing.

**Agricultural Engineer:** Agricultural engineers not only work with farmers, but they also help conservation organizations find solutions for forest and land preservation. They can also create processing equipment for the food and timber industries.

**Industrial Engineer:** Industrial engineers work in various types of manufacturing, making anything from foods and juices to medicines and plastics. These engineers are real problem solvers who oversee projects and help things work more smoothly, with an aim to stay on budget. Industrial engineers often evaluate how things currently run and may bring about change to improve the manufacturing process.

**Chemical Engineer:** Chemical engineers create hundreds of things from plastics and paints to cosmetics, medicines and even building materials. A chemical engineer combines science and engineering in attempts to produce many new materials. Their jobs can vary from research in a laboratory to making spaghetti sauce in a factory.



There are several vital skills that all engineers use regularly. Good communication skills combined with teamwork are essential. Engineers often work in teams, and the ability to communicate effectively can greatly enhance the speed and smoothness of any project. Good math and science skills are also required, especially as technology and information continually changes and advances. So, do you want to be an engineer? Project Lead The Way at Bayshore High School offers plenty of training and hands on experience for high school kids like you who might like to be an engineer. It could be the beginning of a very successful career!

## explore it

Here's your chance to think like an engineer. In the activity below, you'll be focusing on the two main purposes of engineering: creating and problem solving. The design which you will create must be twofold; it should function well enough that two raw eggs will survive a two-story drop, and should also be visually appealing and attractive. You may want to assemble your own engineering "team" for this project. And remember, communication, testing and trouble-shooting are essential for success.

### THE EGG DROP BOX

**Purpose:** To design a container which will safeguard two (2) raw eggs as they free-fall from a second floor window to a sidewalk or hard surface below.

- Design Rules:**
1. The container must be re-usable without modification to its design. Therefore, it must be able to be opened to place the eggs inside and closed in order to drop the package.
  2. It must not exceed a total volume of 125 cubic inches.
  3. The container must be a single unit without extensions. There can be no parachutes, sails, "fly-outs," wings, or attached cords of any type.
  4. This package must be made entirely from recycled materials. NO STYROFORM. Do not purchase any materials.
  5. The eggs cannot be altered in any way, nor can they be wrapped in tape, paper, foam, etc.
  6. The package must be aesthetically pleasing in form and in function. Color and "looks" are important.

What an engineering challenge! Good luck and happy engineering!  
Source: PLTW® Design Resource Guide, Project Lead The Way, Inc.

## Discover the Future

Engineers manufacture and design things all around you. Here is just a partial list of careers available in the field of engineering.

- Chemical Engineer
- Civil Engineer
- Electrical Engineer
- Computer Engineer
- Mechanical Engineer
- Aeronautical Engineer
- Aerospace Engineer
- Agricultural Engineer
- Biomedical Engineer
- Environmental Engineer
- Engineering Technician

For more career information see your school counselor and get information on-line at:  
<http://jobstar.org/tools/career/spec-car.cfm>  
OR  
<http://www.acinet.org/acinet/default.asp>



## An Overview of Project Lead the Way

Project Lead the Way Inc. (PLTW) is a national program forming partnerships among public schools, higher education institutions, and the private sector to increase the quantity and quality of engineering and engineering technologists graduating from our educational system. PLTW has developed a sequence of courses which, when combined with college preparation math and science courses, introduces students to the scope, rigor, and discipline of engineering prior to entering college. Originating in New York in 1997, the 2003-2004 PLTW program included 680 schools, 71,000 students, and 1,600 teachers. Sixteen Florida high schools participate in the program. Bayshore is the only high school in Manatee County offering PLTW's curriculum, while Harlee Middle School provides a strong introduction to the high school program. The standards-based classes are modeled after introductory level engineering courses taught at the university level. Participants gain first-hand experience in different facets of engineering and discover their own strengths and interests. Teachers are rigorously trained to act as facilitators that help students define problems, set timelines, and become leaders, team members, and problem solvers. Bayshore High School currently offers or is planning to offer the following PLTW-designated courses:

- Introduction to Engineering Design (currently offered)
- Principles of Engineering (currently offered)
- Civil Engineering and Architecture (coming Aug 2004)
- Computer Integrated Manufacturing (coming 2005)
- Digital Electronics (coming 2005)
- Engineering Design and Development (coming 2005)

PLTW students are better prepared for college engineering programs and are more likely to be successful—thus reducing the engineering student attrition rate, which exceeds 50% nationally. Any Manatee County high school student may apply to Bayshore to participate in the PLTW program through the school choice process. Contact Tim Estep at (941)751-7004 for more information about PLTW, or the Manatee School District office at (941)708-8770 for information about school choice.

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### Bayshore High School

- Ballard Elementary Magnet
- Daughtrey Preparatory Magnet
- Harlee Middle Magnet
- Johnson Middle Magnet
- Lee Middle Magnet



- Lincoln Middle Magnet
- Manatee Elementary Magnet
- Rowlett Elementary Magnet
- Tillman Elementary Magnet
- Wakeland Elementary Magnet

Schools listed in red offer instruction in the subject area featured in today's InquiziKIDz

Next weeks question: What are the real life skills?

- <http://www.florida-tsa.net/>
- <http://www.pltw.org/aindex.htm>
- <http://www.bls.gov/oco/ocos027.htm>
- <http://www.bls.gov/oco/ocos030.htm>
- <http://www.bls.gov/oco/ocos261.htm>
- <http://www.bls.gov/oco/ocos107.htm>
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- <http://www.discoverengineering.org/home.asp>
- [http://www.intel.com/education/design/resources/what\\_engineers\\_do.htm](http://www.intel.com/education/design/resources/what_engineers_do.htm)

