

Newspaper in Education Presents

inquizi kidz

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Can You Build A Bridge?

Discover the Future

Interested in building roads or bridges? Consider these careers:

- Construction Engineer
- Civil Engineer
- Structural Engineer
- Surveyor
- Construction Estimator
- Construction Inspector
- Project Manager
- Supervisor or Foreman
- Equipment Operator
- Construction Laborer

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>

Technology and Bridges

A Bit About Bridges

By Leslie Rowe

Civil or structural engineers design and build bridges over obstacles—rivers, lakes, ravines, canyons, railroads, and highways. With over half a million bridges in the U.S., chances are you've crossed over one today.

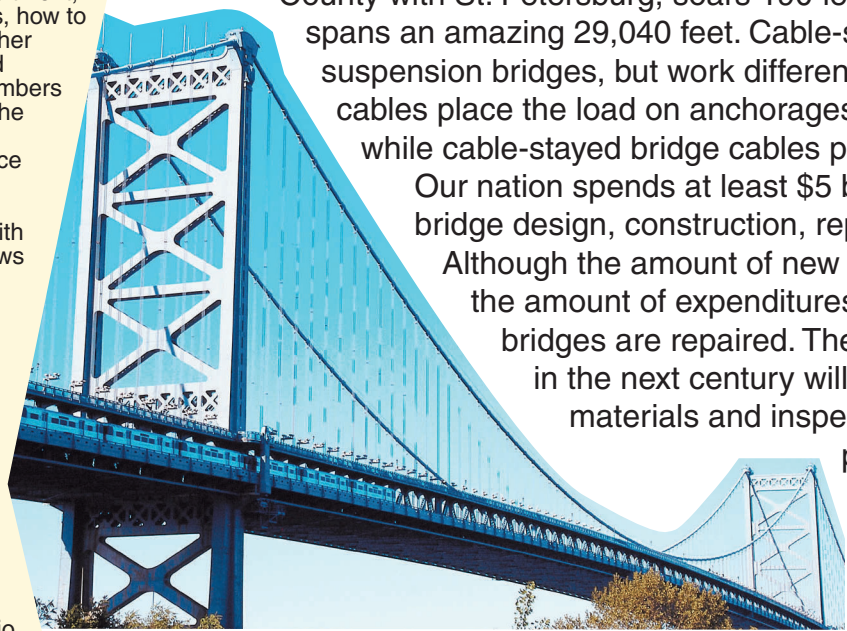
Bridges must be strong. Think about it! They must not only hold their own weight and the weight of vehicles that cross over them, they must also stand up to forces of nature such as hurricanes or earthquakes. Engineers have designed several types of bridges to withstand weight and nature's forces. The main feature that controls the bridge type is the size of the obstacle. How far is it from one side to the other?

The **beam bridge** is built with horizontal beams supported at each end by piers. The **truss bridge** is made from triangles assembled from a series of straight steel bars. **Cantilever bridges** are a complex form of girder in which only one end is supported; this type of bridge is constructed of two cantilevers that meet in the middle. An **arch bridge** is usually made of steel or concrete, with semicircular arches and abutments on each end of the arches which support the weight. A **suspension bridge** is hung from cables strung across the river, which are supported by tall towers. One of the most famous suspension bridges is the Golden Gate Bridge connecting San Francisco and Sausalito, California. The Sunshine Skyway Bridge, a **cable-stayed bridge** connecting Manatee County with St. Petersburg, soars 190 feet above the water and spans an amazing 29,040 feet. Cable-stayed bridges look like suspension bridges, but work differently. Suspension bridge cables place the load on anchorages at either end of the bridge, while cable-stayed bridge cables place the load on the towers.

Our nation spends at least \$5 billion per year for highway bridge design, construction, replacement, and repair.

Although the amount of new construction has declined, the amount of expenditures continues to rise as aging bridges are repaired. The key to improving bridges in the next century will be the use of advanced materials and inspection technology that

permits rapid repair and return to service with minimal disruptions to safety and traffic.



explore it

Build A Bridge From Toothpicks

Each year during February's National Engineer's Week, area students can participate in a toothpick bridge building contest sponsored by local chapters of the Society for Manufacturing Engineers (SME), American Society of Civil Engineers (ASCE), Florida Engineering Society (FES), and the American Public Works Association (APWA). Students compete for the strongest bridge. How do they know which bridge is strongest? Unfortunately, the only way to find out is to destroy them. Judges weigh the bridge then add weight to the bridge, noting the ultimate weight that destroys it. Winning bridges have the highest ratio of weight held to weight of the bridge. Former winning bridges held over 100 pounds! Technology students at Manatee High School have performed quite well at this event.

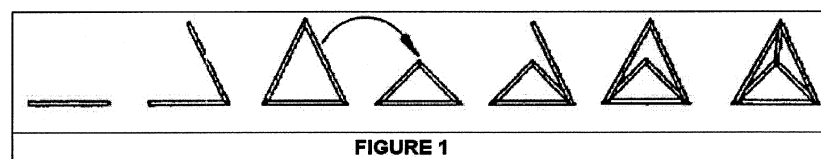
Here's your chance to get a little practice before this year's event by experimenting with bridge building. You will need:

- 2 (250 count) boxes of standard wood toothpicks
- 1 small bottle of carpenter's wood glue

Using only these materials, build a bridge entirely from toothpicks. Have fun trying out different shapes, and then putting weight on your bridge to see how strong it is.

For students desiring to compete in the next contest, your bridge has a few strict rules. Bridges must stand alone, and not be a flexible structure. Do not cut or alter the toothpicks. Only glue where toothpicks touch or where one crosses another. Competition bridges must be built to the following specs:

- Maximum weight = 125 grams (4.4 ounces).
- Minimum Length = Must exceed 20.00 inches
- Maximum Length = 25.5 inches
- Maximum Height = 18.00 inches
- Maximum Width = 7.00 inches



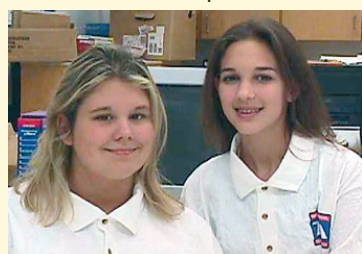
One of the methods you can use to make a stronger bridge is to construct triangles, as shown in Figure 1. Figure 1 shows the construction of a tetrahedron (a polyhedron with four sides). Begin by gluing three toothpicks together to form a triangle. Then build a pyramid of toothpicks from each of the triangle's corners. This is a very rigid and strong structure. If you continue to use this method, you will get the maximum strength from the toothpicks.

kidzbiz

Young Women Succeed In Technology

By Leslie Rowe

Sophomore Monica Carrington and junior Melissa Pickelsimer excel in three areas: technology, leadership, and service. Actively involved in **Manatee High School's** Technology Student Association (TSA), Melissa and Monica have achieved honors in the program and are aiming even higher. Using a laser engraver and a planer, Melissa created a manufacturing prototype for an educational toy and placed second at the national TSA competition. Currently serving as chapter president, she hopes to run for State vice president.



Technology students Melissa Pickelsimer (left) and Monica Carrington

As an eighth grader, Monica achieved second place in TSA's Cyberspace Pursuit by creating an environmental website. Currently TSA reporter, Monica hopes to eventually

become chapter president and a State officer.

Both students participate in TSA's many community service activities, including hurricane cleanup in Arcadia. They'll attend the TSA Leadership Conference in Altamont Springs this month. "We'll learn about teamwork, leadership, recruitment, tips on the competitive challenges, how to hold meetings—and we'll meet other leaders from around Florida," said Melissa. Next April around 20 members of MHS's TSA will compete in at the state competition in Orlando.

Melissa belongs to several service clubs, is a photographer for the yearbook, and works at Learning Express Toys. Monica performs with the Sarasota Players, and is a news editor for the Macohi, the school paper. Through their technology classes and TSA, they're busy preparing for a successful future.

School biz

Top Tech Trio at MHS

By Leslie Rowe

Manatee High School's trio of technology teachers creates a tremendous program. Each teacher focuses on different aspects of the subject, supporting one another to prepare savvy students for a technological world.

Jeff Sharp's classes feature a high-tech computer lab where students learn the basics of communications, electricity, construction, film, fluid systems, hydraulics, space, the web, aerodynamics, computer aided design (CAD), and more. Students complete modules at their own pace, studying both technology and



From left, Technology teachers Jeff Sharp, Dewayne Fintel, and Joe Orr

careers. Joe Orr teaches CAD; the use of a computer in industrial design applications such as architecture, engineering and

manufacturing. Students often design projects in Joe's class that they later build in Dewayne Fintel's Materials and Processes class. Joe also leads the school's Technology Student Association. It is Dewayne's classroom that evokes the most surprise—a huge workspace with an amazing selection tools and work areas. New students have remarked, "We never had anything like this at our school!" Students in Materials & Processing classes learn how to apply design to building prototypes, working with metal and wood.

Together these courses can dovetail into MCC and MCTI's technology programs. Qualifying students may receive the Florida Gold Seal Vocational Scholars Award, earning 75% of college or technical school tuition. These three hands-on programs focus on preparing students for life in an increasingly technical world.

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Manatee High School

- Ballard Elementary Magnet
- Daughtrey Preparatory Magnet
- Harllee 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

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- www.tryscience.org
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