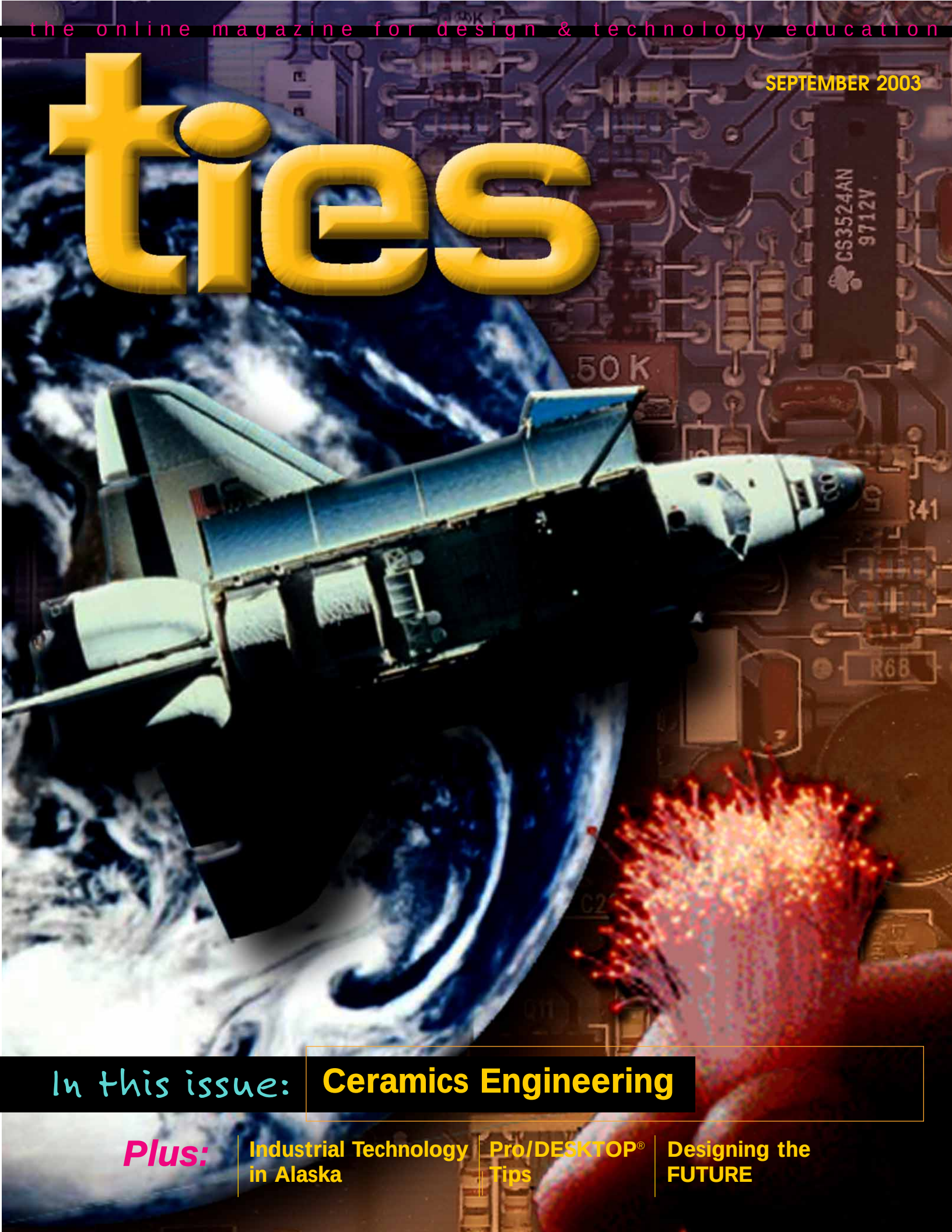
the online magazine for design & technology education

ties

SEPTEMBER 2003



In this issue: **Ceramics Engineering**

Plus:

- Industrial Technology in Alaska
- Pro/DESKTOP® Tips
- Designing the FUTURE

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preview

The Technology Student Association celebrated its Silver Anniversary at their national convention this past summer. The turnout was exceptional, the competitions intense and the feeling of family was everywhere. Jill Landsman gives us the details in "Ties to a Broader Network".

There is at least one person who would like to talk the majority of the TSA membership into pursuing engineering as a profession. Celeste Baine is an advocate for students to explore careers in engineering. In her "Ceramic Engineering" article, she gives us insight into that expanding field.

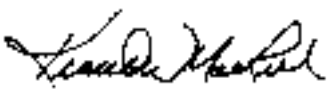
David Scheier has expanded his middle school program to fit his community's needs. In this case the community is a town of 7,100 located on Alaska's Kenai peninsula. It boasts outstanding salmon fishing, and thriving oil and fertilizer industries. Kenai needs craftspersons who can maintain and repair a wide variety of technologies. Kenai Middle School prepares their students to meet those needs.

This month, Stephen Yaffe expanded "Pro/DESKTOP Tips" into a full-length article showing how to use Sweep. There are five primary features in Pro/DESKTOP to generate 3D models from 2D sketches—according to Steve, Sweep is one of the coolest. If you are a Pro/DESKTOP user, you may be familiar with Steve's work, one of his jobs is maintaining the Pro/DESKTOP.net web site.

If you are looking for curriculum to go with Pro/DESKTOP software, we have some exciting news for you. John Hutchinson is completing a classroom text on the contextual use of Pro/DESKTOP. The text will be available this winter.

This text is one of the products of the High Tech Work Force Grant funded by the New Jersey Commission on Higher Education. Nicole Tracey-Healy explains the grant activities in more detail in "Designing the Future in a Technological World: A New Way of Learning by Exploring Design and Engineering."

We would like to hear what is going on in your classroom. Write an article for Ties and share your experiences with our readers.



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a publication of

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***ties* is produced using QuarkXpress, Adobe Photoshop, Illustrator, InDesign and Acrobat programs.**

september 03

on the cover

Cover design: Lori Lozinski

***ties* Magazine** (ISSN 1041-6587) is published by The College of New Jersey four times a year with the following cover dates: Sept., Dec., Mar., June. Executive, editorial and national advertising management offices are located at: The College of New Jersey, 103 Armstrong Hall, P.O. Box 7718, Ewing, NJ 08628-0718. Phone: (609) 771-3332; FAX: (609) 771-3330.

Published in U.S.A. September, 2003 issue, Vol. 16, No. 1.

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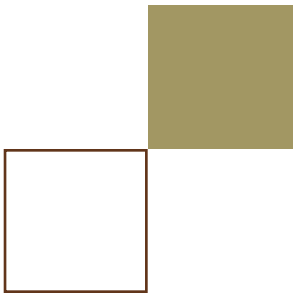

for this **issue**

departments

- Preview
- Ties to a Broader Network
- Pro/Desktop Tips
- TSA Corner

- Literature Showcase
- Resource Center
- Mail Order Marketplace

We all wonder what the future will bring. How will the world in which we live change? What new ideas, inventions and technologies will shape this change?

Who will lead the way?

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THE COLLEGE OF NEW JERSEY IS PLEASED

TO INTRODUCE THE MATH, SCIENCE, AND TECHNOLOGY (M/S/T)

PROGRAM FOR EARLY CHILDHOOD AND ELEMENTARY EDUCATION MAJORS

At the college of New Jersey we know that a new paradigm consisting of mathematics, science, and technology literacy is necessary to meet the challenges of the 21st century. While most people understand the importance of mathematics and science in the general education curriculum, technology, as a critical force within our society, has only recently been recognized. The new integrated major in M/S/T will create teachers who know how to tap and develop the potential of generations of innovators to come.

ADVISING YOUNG PEOPLE ON FUTURE CITY COMPETITION, ENGINEERS GAIN NEW PERSPECTIVES ON THEIR OWN CAREERS

by Donald Lehr

THE NATIONAL ENGINEERS WEEK COMMITTEE NEEDS VOLUNTEER ENGINEERS FROM EVERY FIELD TO GIVE SOME OF THEIR TIME THIS FALL AND WINTER TO INTRODUCE LOCAL YOUNG PEOPLE AT MIDDLE SCHOOLS ACROSS THE NATION TO A CAREER IN ENGINEERING THROUGH THE NATIONAL ENGINEERS WEEK FUTURE CITY COMPETITION™. SINCE ITS FOUNDING IN 1992, THIS EDUCATIONAL PROGRAM HAS MADE ENGINEERING COME ALIVE FOR TENS OF THOUSANDS OF STUDENTS.

Across America, thousands of engineers annually volunteer to serve as mentors for students in the National Engineers Week Future City Competition™. Many volunteers say they join in to help students get a better view of the world of engineering, to give something back to the community, or for the gratitude they receive from teachers, students and parents.

Consistently, however, the engineers who guide the students from conception to design to construction of their future cities also say that one of the finest rewards is how the students give them a better perspective of their own lives as engineers.

"It's helped me not be so narrowly focused," says Tony Arikol, P.E., an engineering consultant in Baton Rouge, Louisiana, who helped his team of middle school students from St. Thomas More School to win the state's regional competition and then go on to earn

St. Thomas More School, Baton Rouge, Louisiana, 2nd place in the 2003 National Engineers Week Competition, with their city "Nereid." (L-R): Julie Love, engineer mentor Tony Arikol, P.E., Stephen Demouy, teacher Shirley Newman, Colette Burke.

second place in the 2003 Future City national finals in Washington, D.C. As an engineer, Arikol says, "sometimes you get tunnel vision. Young people are a lot more creative as thinkers. They help you look outside for novel solutions. And when you look for novel solutions, you find them."

"Kids always have an idea," agrees John Medler, a project manager for Schlumberger in Houston and a mechanical and environmental engineer by training. In 2003, Medler advised a student team from Atascocita Middle School in nearby Humble all the way to first place in the Texas-Houston regional and third place at nationals. "What's that term – thinking outside the box? Well, that's what these students do naturally."

In the competition, seventh- and eighth-graders design, first on computer and then in three-dimensional scale models, cities of tomorrow. Now entering its twelfth year, the program has become one of the most successful educational outreach programs of its kind, having already reached more than 100,000 young people. The students, usually working in teams of three and with the help of a teacher, must devise a city that functions (using the popular SimCity 3000 software donated to each participating school by Maxis), write an essay and abstract, and defend their city model before a panel of judges. In 2002-03, more than 30,000 students from more than 1,000 schools

Atascocita Middle School, Humble, Texas, 3rd place in the 2003 National Engineers Week Future City Competition, with their city "Rhiannon." (L-R): Christina Tamayo, Mark Thompson, teacher John Baron (rear), Matthew Clifford.

in 31 regions around the United States participated. Thirty-six regions are expected in the 2003-04 competition.

Students begin their cities at the beginning of the school year, working during and after school and through holidays breaks. While Future City was once primarily an extracurricular activity, increasingly schools use it as part of math, science and technology courses. Regional competitions are held in January. First-place teams (including the engineer mentor) win all-expense-paid trips to Washington, D.C., for national finals during National Engineers Week, February 22-28, 2004. National Engineers Week 2004 is co-chaired by the Institute of Electrical and Electronics Engineers (IEEE) and Fluor.

Advising, cajoling, or simply serving as sounding boards along the way are engineer mentors from every walk of the profession. That participation, though, sometimes means just sitting back and letting the students work it out for themselves. "I try to motivate through inaction," says Medler. "They come up with some wild ideas, but I don't say anything because – who knows – it may work."

As for his own sense of engineering, Medler says Future City offers a pleasantly different take. "Engineers have a tendency to go straight to the answers. This program brings you back to opening up you own mind to solve a problem."

He adds, "Kids aren't scared to try. They're open to alternatives and they give it a shot. You can learn by the

Mission Middle School, Bellevue, Nebraska, winners of the 2003 National Engineers Week Future City Competition, with their city "Candeo Glacia." (L-R): Mitchell Laski, teacher Susan Hester, Megan Horton, Casey Laski.

naiveté of kids who don't know the difference."

The new perspective is just one of the rewards of volunteering, says Freddie Bazen, a lieutenant commander in the U.S. Navy who helped Mission Middle School in Omaha go from Nebraska to Washington in 2003 to win first place, though because of the war in Iraq, he wasn't able to leave his base to travel with the team. For Bazen, a mechanical engineer, the real payback for volunteering is assisting young people. "The Navy is big on mentoring," he says, "and it was through mentoring that I was helped along. Younger folks need the same thing. I get gratification knowing that I helped them see engineering in a new way."

Those new insights into engineering come at a critical time in a child's life, says Bazen. "It's super important to expose them to something that may become part of their lives and to do it before they're into their teen years."

Not only are the students directly involved in the competition influenced, he says, but also their friends and the community at large. "There's a tremendous amount of support from the community."

For engineers who may balk at volunteering because of the possibility of having to spend too much time with the project, Tony Arikol has a solution. "Take the baby step and put down the minimum amount of time to volunteer," he recommends. "It doesn't require a humongous commitment. I was dragged kicking and screaming, but I guarantee they won't be able to hold themselves back once they get involved. I was vice president of my company when I first volunteered and now I'm president. It must not have been that bad."

Engineers interested in more information can contact Carol Rieg, National Director, at (877) 636-9578, via e-mail at *CRieg@futurecity.org* or visit *www.futurecity.org*. All interested engineers will be put in touch with their area's regional coordinator.

Donald Lehr
is president of The Nolan/Lehr Group in New York City, public relations consultant for the National Engineers Week Future City Competition.

The **knock-out** field that does it all

Ceramic Engineering

Computer chips, fiber optics, joint replacements, CDs, DVDs, VCRs, video games, watches, snow skis, phone lines, space shuttle tiles, safety glass windshields, dental restoration, bone implants, medical electronic equipment, airbag sensors, spark plugs, piston rings, bricks, cement, missiles, capacitors, resistors, electronic components, TV components, magnets, laser communications, lab equipment, bathroom sinks, kitchen appliances...

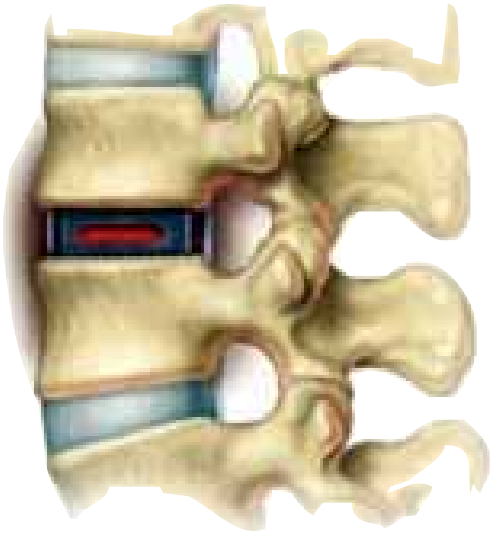
by **Celeste Baine**

...all these and more depend on ceramics and the advances of the ceramic engineer.

Ceramic engineering could be called the smooth operator of the engineering world. It is almost impossible to avoid the advance of ceramics in your daily life. We rarely hear about the work of ceramic engineers or think about the everyday household items and electronic components that are possible only because of highly complex ceramic materials and processes designed by them.

Typically, as we grow up, we see ceramics in pottery class or think of ceramics as cereal bowls or plates. We might see ceramic tiles lining the interior of tunnels we drive through, reflecting any available light and making the tunnel easy to clean. Or we might think of ceramic tile as something to walk on in the bathroom or kitchen. There are many more applications for ceramics and opportunities for ceramic engineers. Ceramic is a cutting-edge, low-cost material with unique properties that make it a dream come true for scientists and engineers.

The space shuttle is a wonderful example of a cutting-edge, high-temperature ceramic application. The entire shuttle is covered with ceramic tiles that protect the aluminum shell. The tiles can withstand temperatures of



1400° Celsius (C) that are prevalent at the nose of the shuttle as it exits or enters the atmosphere. If the tiles were not present, the aluminum shell would melt at 660° C. There could be no moon landing, no space study without ceramic materials.

Ceramic engineers look for different uses for ceramics, create new ceramic products, and design processes for making ceramics. They take raw materials such as clay and sand and convert them into usable, useful products. They use the periodic table to combine different elements that create new materials for specific applications such as increasing or decreasing the electrical, magnetic, or thermal properties.

Ceramic is a cutting-edge, low-cost material with unique properties that make it a dream come true for scientists and engineers.

...ceramic engineering ranks in the top 5 engineering disciplines for women

Ceramic engineering combines physics, chemistry, and materials.

The Ceramic Engineering Department at the University of Missouri-Rolla explains that ceramic engineers may:

- Develop improved heat tiles to protect the space shuttle and the future supersonic space plane from the searing heat of reentry into the earth's atmosphere.
- Produce ceramic teeth, bones, and joints to replace parts of the human body or improve advanced medical equipment to continue research in the war against disease.

- Help make innovative, ultra-fast computer systems using ceramic superconductors, lasers, and glass optical fibers.
- Develop materials to enclose and support aircraft engines that run at high temperatures.
- Improve fiber optic cables that allow doctors to see inside the human body and permit the human voice to travel thousands of miles under the ocean without distortion.
- Discover new ways to use ceramics to build highways and bridges, or to carry water and waste to treatment plants.

If ceramic engineering sounds like the career for you, visit the Web sites of all of the colleges that offer ceramic engineering, and take a tour of materials engineering departments in your area. There are currently only seven accredited programs in ceramic engineering. The American Ceramic Society/The National Institute of Ceramic Engineers have a great Web site with helpful information such as links to all of the accredited ceramic engineering programs, co-op opportunities, internships, and ceramic news. Student competitions involve contests such as the ceramic putting competition in which students design putters and golf balls made of ceramic; mug contests in which ceramic mugs are judged on strength, insulation, and artistic merit; and a speaking competition. Visit http://www.acers.org/ for more information about the opportunities and challenges of a career in ceramic engineering.

Ceramic Engineering and Women

According to the American Society for Engineering Education (ASEE) 2002 statistics, ceramic engineering programs boast that almost 1 out of 3 students are women and ceramic engineering ranks in the top 5 engineering disciplines for women. Biomedical, Environmental, Industrial and Chemical are slightly ahead of ceramic/materials engineering. In the Fall of 2002, The University of Washington enrolled 25 percent women in their Bachelor of Science program, 29 percent in their Master of Science program, and 33 percent in their PhD program.

Women in all engineering disciplines are certainly on the rise. "Engineering is a matter of intellect, not of brawn," Judith McDonald, Director of the College of Engineering's Women in Engineering Program at Ohio State University said. "There is no doubt that women are as intelligent as men. People have been saying for years that the math and science ability of females lessens as they enter high school. Recent studies suggest that may not be true. We certainly don't see evidence of inferiority among our women engineering students."

Unfortunately, statistics indicate that women engineers do not yet receive equal pay for work equal to that of their male counterparts. According to the NSF report "How large is the gap in salaries of male and female engineers," the median earning for women is 13 percent lower than the median earning for men. However, in the Income and Salary Survey 2001 conducted by the National Society for Professional Engineers, the median salary for women was $56,235; 29 percent less

than the median salary for men. But in terms of experience, women with 15–19 and 20+ to 24 years of experience earned more than men.

As more women gain positions of leadership within the engineering community, pay scales will become commensurate with the genius of women engineers every where. With the help of organizations such as The Society of Women Engineers (SWE), Women in Engineering Programs and Advocates Network (WEPAN), Women in Engineering programs, camps, competitions and events and The Women In Engineering Organization (WIEO) this year will prove to be the best ever for new and seasoned women engineers.

Celeste Baine
is a biomedical engineer, the Director of the Engineering Education Service Center, editor of the Pre-Engineering Times newsletter, and author of Is There an Engineer Inside You? and The Fantastical Engineer. She regularly provides presentations and workshops on engineering careers. Contact her at celbaine@engineeringedu.com or visit http://www.engineeringedu.com/

Ceramic Engineering Resources

Ceramic Engineering Classroom Activities

Ceramics in the Classroom
http://www.ceramics.org/membership/classroom.pdf

Science on Wheels
http://www.ceramics.org/membership/wheels.pdf

A Fiber Optics Experiment
http://nyscc.alfred.edu/cems/cm/fun_activities/flashlightfiberoptics.html

A Musical Glass Experiment
(you should be familiar with this one)
http://nyscc.alfred.edu/cems/cm/fun_activities/musicalglass.html

Ceramic Engineering Resources

California Occupational Guide
http://www.calmis.ca.gov/file/occguide/ENGCERAM.HTM

The American Ceramic Society/The National Institute of Ceramic Engineers
http://www.acers.org/

Alfred University
http://www.alfred.edu/

Clemson University
http://www.clemson.edu/

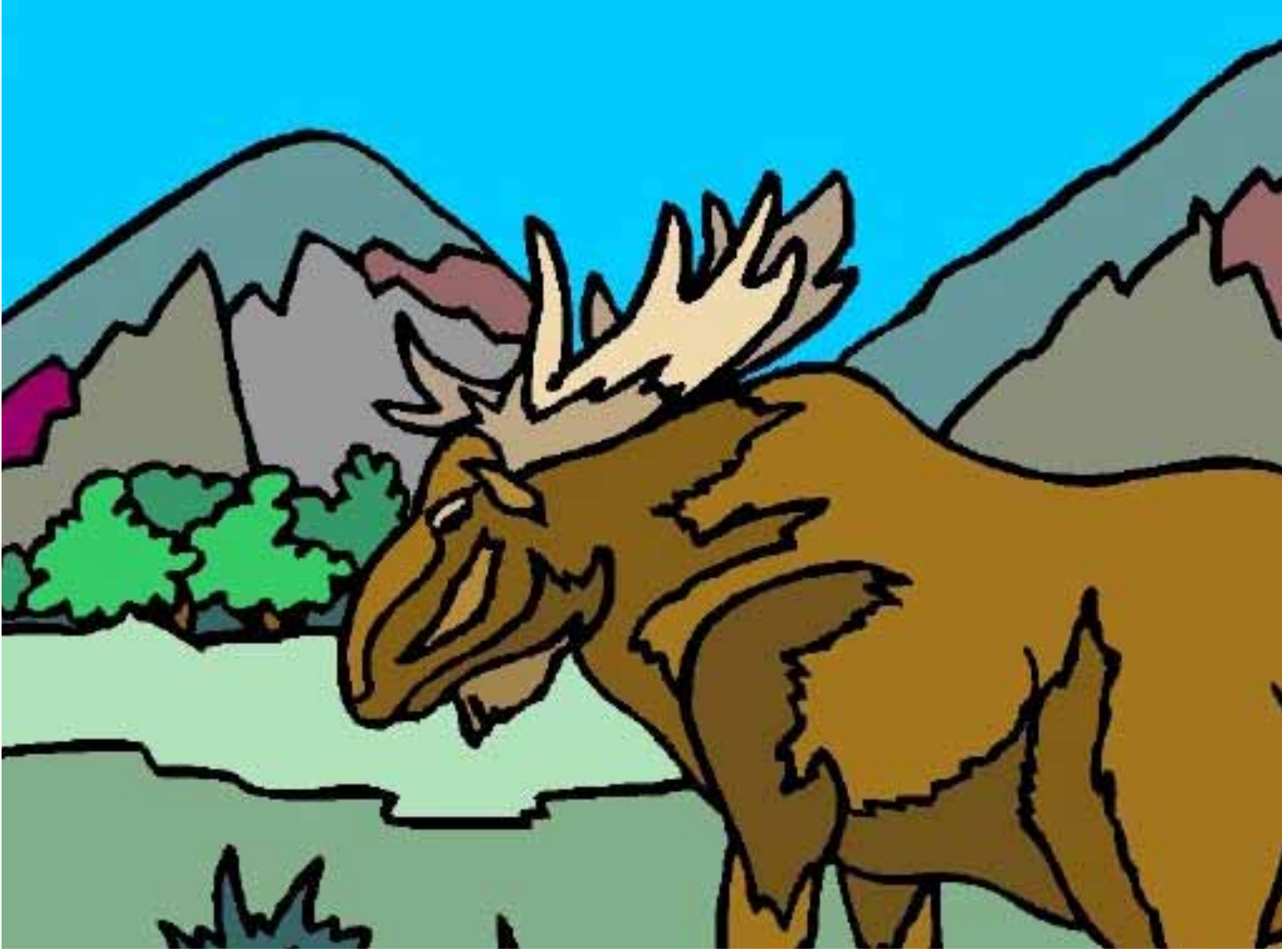
University if Missouri-Rolla
http://www.umr.edu/

Ohio State University
http://www.osu.edu/

Pennsylvania State University
http://www.psu.edu

Rutgers, The State University of New Jersey
http://www.rutgers.edu/

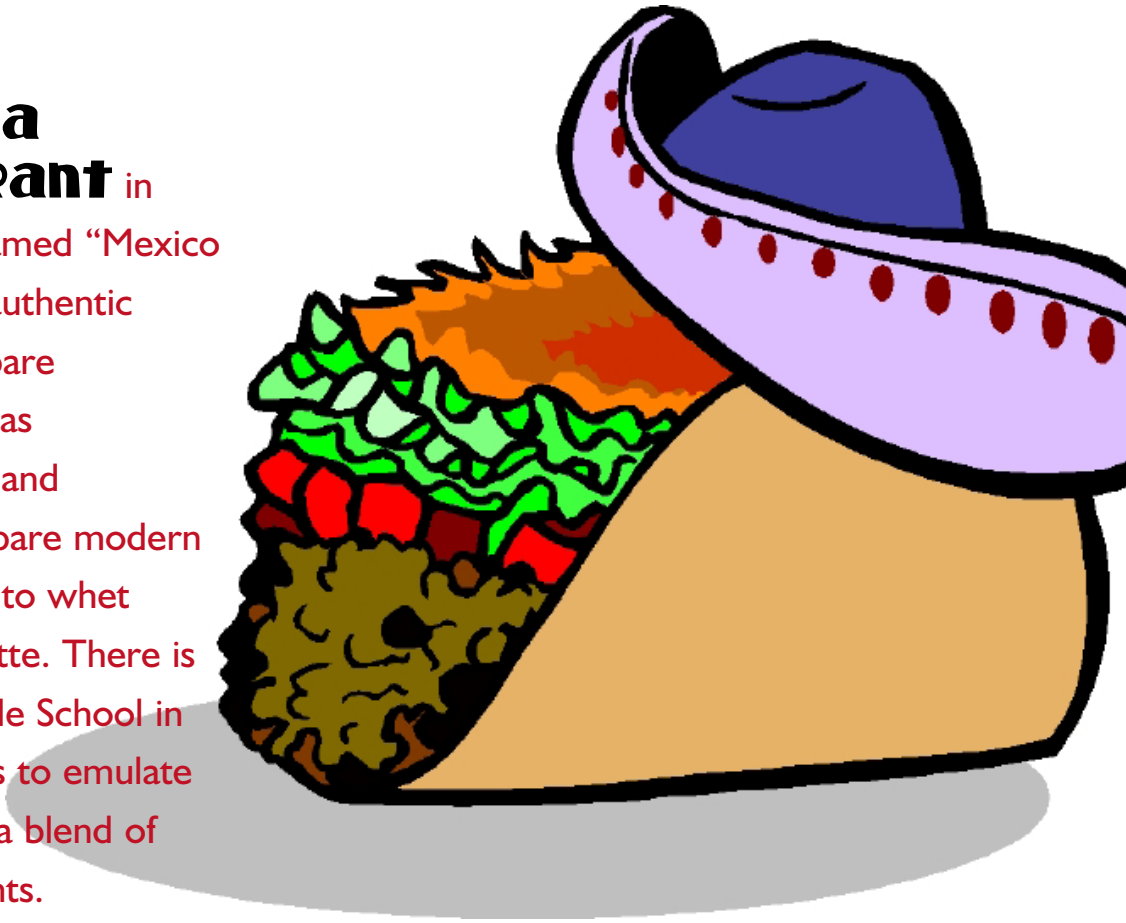
University of Washington
http://www.washington.edu



Industrial Technology in Alaska

by David C. Schrier

There is a restaurant in Anchorage named "Mexico in Alaska" which serves authentic Mexican food. They prepare traditional favorites such as chimichangas, enchiladas and sopapillas. They also prepare modern Mexican dishes designed to whet today's adventurous palette. There is a program at Kenai Middle School in Kenai, Alaska, that strives to emulate this same concept: offer a blend of old and new to its students.



Philosophy

The city of Kenai is located 150 miles south of Anchorage and is home to several industries. Agrium, Inc. produces urea fertilizer for agricultural purposes. Tesoro has a plant north of town, that refines oil into various products. Phillips sends a ship to Tokyo every nine days laden with liquefied natural gas (LNG). Welders are needed to weld the miles of pipe running around the plants. Mechanics keep compressors and generators functional. Engineers design new plant additions and improve old ideas. Drafters draw up blueprints so that engineers and operators have a visual reference of the plant. Conversely, silicon chips and computers are appearing in all facets of industry. From GPS navigational aids on fishing boats to digital switches on pipe valves to digitally controlled printing presses, technology is permeating today's industry in Alaska. Our philosophy at Kenai Middle School is to prepare our students to meet the challenges of competing in today's technological/industrial workplace by offering a classroom experience that blends old and new together.

"Bridge building" station (l-r) 8th graders: Lauren Baldwin, Andrea Focht, Sandi Steele

Format

A very structured and systematic format was selected for the sometimes chaotic and confusing life of the middle school student. In keeping with our philosophy of blending old and new, sixteen centers or workstations were developed for one semester. Students spend a week at each station reading about the subject and completing a project. The last week of class is devoted to finishing any incomplete work, cleaning out laboratory lockers and testing designs. Projects are graduated so that sixth grade projects are easier and require less sophisticated tools, techniques and processes to complete

"Oxy-Acetylene gas cutting" station (l-r) 8th graders: Jake Malanaphy, Sam Van Hatten, Stuart Stretch.

than eighth grade projects. For example, sixth graders do a project using the plastics injection molder, seventh graders use the thermoforming machine and eighth graders employ the strip heater. If a middle school student chooses to take industrial technology all three years he/she is in our school, he/she will have completed 40 projects (eight in sixth grade, 16 in seventh grade and 16 in eight grade) that require a

"Robotics" station (l-r) 8th graders: Eric Price and Kyle McMillan.

unique set of tools, techniques, materials and processes. To give students some choice in the matter, I ask that they have a project of their choice to work on in the event that they complete their particular project before the end of the week. A technical design project is assigned the first day of class so students can get their hands on something straight away. They must work with someone else on this project and have until the quarter ends to fulfill the minimum criteria. As an example, the technical design project is to build a catapult (which will fling a ping-pong ball at least ten feet) with 50 craft sticks or less, a rubber band, steel rod and Dixie cup (to hold the ball). A "leader board" is written on the chalkboard and students have until the quarter end to improve their distance. The team with the greatest distance by the end of the quarter wins a prize.

Evaluation

Observing "Best Practices" of education, students are asked to evaluate their work on a weekly basis by filling out a self-evaluation sheet and submitting it to the teacher. The learning vehicle is the station project and, therefore, makes up most of the grade (80%). The reading and associated worksheet are worth 20% of the grade. If the student completes the project to the best of his/her ability, he/she receives full credit. Ten points are deducted from the student's overall point tally every time the teacher reminds him/her that he/she must wear eye protection in the lab at all times (always a challenging issue). I am not so concerned with how the project looks as I am the journey and the experience.

Workstation (or centers) Sample projects

Station	6th Grade	7th Grade	8th Grade
Metal	wrought metal	sheet metal	machining
Electronics	solar exploration	Mr. Circuit	soldering kit
Welding	wire	stick	gas
Plastics	injection molding	thermoform	strip heater
Power	Cox .049 engine	Briggs	4 Cylinder
Transport	rocketry	dragster	boat
Woods	hand tools	portable	machine
Drafting	sketching	board	computer

Maintenance

The biggest challenges that I have experienced implementing such a diverse program is maintaining the equipment, assembling kits, procuring materials and keeping the lab a

"Plumbing" station (l-r) 8th graders: Whitney Brown, Jordan Curren, Cameron Percical, Brad Fusaro.

clean and safe area to work. Scroll saw blades get changed each week, dust is blown out of the computers, and feed rolls on the wire welder get cleaned – to name a few. Students help out with assembling the kits for the various projects (the boat kit, for example, has an electric motor, wire battery, and propeller) and also cutting materials such as plastic and sheet metal. There are no alternatives to procuring supplies and replacing damaged tools short of driving over to Radio Shack and purchasing a new soldering iron (for example). Students take turns sweeping the floor, workbenches, and machines each day.

Safety

As with any tools program, the safety of our students is a paramount priority. Before using a machine, students must first take a written test specific to that machine. Next is the performance test, where the student must demonstrate competence and safe use of that particular machine. Finally, students are required to ask permission before using a certain machine so that the instructor knows who is using the machine and what he/she is cutting/drilling/grinding.
As mentioned earlier, students are required to wear eye protection in the classroom at all times, wear gloves when working with sheet metal, wear leather coats when welding (and appropriate helmet or goggles), and face shields when operating the lathe. Radial and table saws are off limits to students (as one colleagues says, "they are too short").
The instructor precuts materials for various projects to reduce costs and waste.

"House wiring" station (l-r) 7th graders: Billy bushnell and Andi Knowles.

The Future?

One of my goals for the future is to team up with local industry to develop an industrial/technical project that is related to their field. For example, Agrium engineers could develop a process technology model that demonstrates the process natural gas goes through before it comes down the conveyor as urea fertilizer. As money becomes available, we plan to acquire more technology to blend with traditional crafts such as bench metals (my first choice is a mini-CNC machine). We also need to be responsive to our government's mandate that "no child be left behind" and ensure that ALL students are proficient readers, writers and mathematicians. Our technology courses promote those goals because students apply them throughout the curriculum.

Start Up

Here are some factors to consider if you want to develop a program like mine:

1. What hand and machine tools are currently available?

Wood? Metal? Engine?

2. How much money do you have for kicking off such a program?

Is it a new school or is there windfall money?

3. The instructor's background – strengths and weaknesses.

Computer skills? Craftsperson turned teacher?

4. Current school curriculum

Traditional or high-tech? Time for revision?

5. School's schedule

45 minute periods or 1-1/2 hour block?

Rome was not built in a day – nor will your new program be built in a day. I encourage you to start slowly, and adjust stations as your needs change and as you acquire new equipment and new insights.

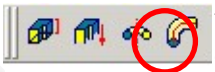
David (Chris) Schrier
is the technology coordinator
at Kenai Middle School,
Kenai, Alaska

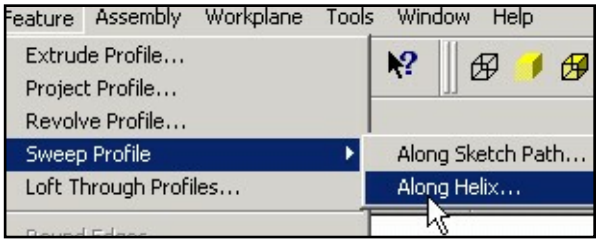
Pro/DESKTOP Tips

Pro/DESKTOP uses five primary features to generate 3D models from 2D sketches: Extrude, Project, Revolve, Loft and Sweep. One of the coolest is Sweep.

By Stephen Yaffe

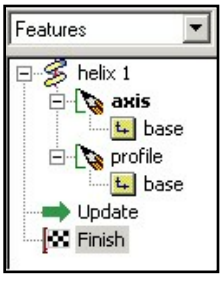
Clean Sweeps

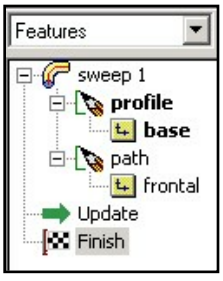
There are two ways to accomplish a **Sweep**, but  three ways to access the feature, and three sets of nomenclature! If, on the one hand, you access **Sweep** from the feature icon toolbar at the top of the screen, you



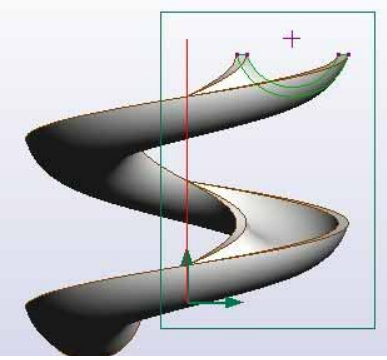
will be presented with a single option to **Sweep Profile Along Profile**. That's perfectly straightforward. On the other hand, if you opt to access the **Sweep** command from the Feature menu at the top of the screen, you will be presented with what appear to be two additional options: **Sweep Profile Along Helix**, and **Sweep Along Sketch Path**. So, here's the first tip: Despite the different terminology, **Sweep Along Profile** and **Sweep Along Sketch Path** are the same thing.

The two approaches have different sentence structures in the object browser.





Sweep Along Path = Feature > applied to two sketches > applied to two perpendicular workplanes	**Sweep Along Helix** = Feature > applied to two sketches > applied to one workplane

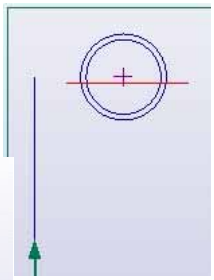


SWEEPING ALONG A HELIX

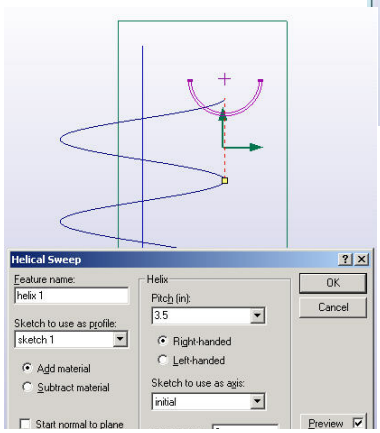
Sweeping along a helix is much like revolving a profile.

Here are the steps for making a helical sweep (like the one shown here) using an abbreviated, short cut notation system.

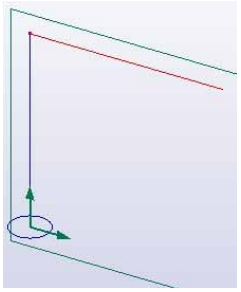
1. Open a new design file: **[Ctrl + N] > Enter**.
2. Drag a straight line starting at (0,0): **[S]** > Drag straight line, 5 inches long.
3. Rename this sketch: In the **Workplane browser**, click on the plus sign by the base workplane > Double click on the word Initial to open properties box > Rename sketch "Axis."



4. Create a new sketch: In the **Workplane browser**, right click on the **Base** workplane > select **New Sketch** > Name it "Profile."
5. In this new sketch, drag two concentric circles originating at (2,5) > Drag a line cutting off the top three fifths of these circles > **[D]** Delete the upper line segments > Leave the segments that connect the two arcing segments to complete a valid profile.
6. Create the sweep. Once you have completed these two sketches, from the **File** menu choose **Feature** > Select **Sweep** and then **Along Helix**. The **Helical Sweep** dialogue box will appear.
7. Select **Profile** as the sketch to use as the profile and make sure that the axis is selected (it will turn red).
8. Then, drag the handle down to set the **Pitch**. > Click on **OK** when you have a pitch that suits your purposes.



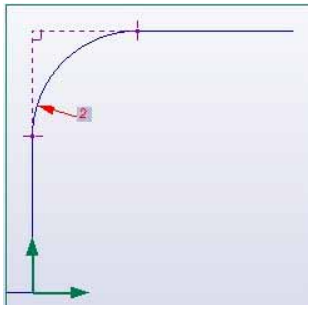
SWEEPING ALONG A PATH



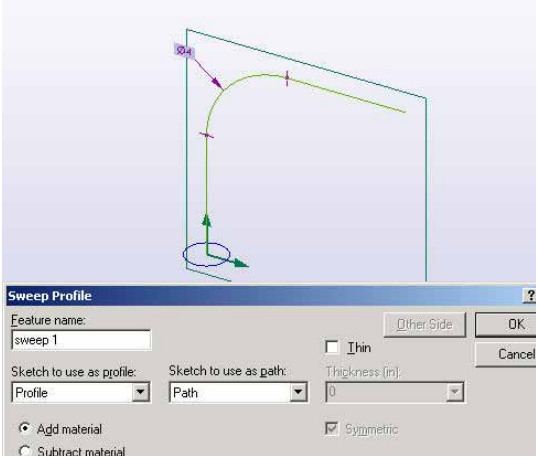
Now comes **Sweep Profile Along Path** (or profile). First we will cover the correct way to do this, and then we will discuss common pitfalls and how to resolve them. Please note that these instructions are abbreviated, assuming that readers have had at least a passing experience with **Pro/DESKTOP**.

To set up, you will need two sketches in two perpendicular workplanes.

1. Open a new design **[Ctrl + N]** > Enter.
2. Rename the initial sketch "Profile:" In the **Workplane browser**, click on the plus sign by the **Base** workplane to access the sketch. > Click once on the word "Initial", then click on it a second time to rename > Change the name to "Profile."
3. **[C]** Sketch a circle: Snap to grid (0,0), diameter 1 inch.

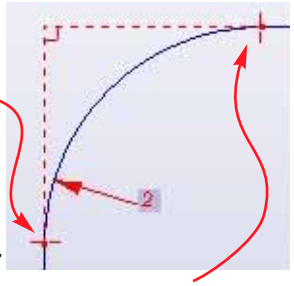


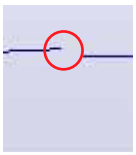
4. Select a perpendicular workplane (there are two to choose from): **[W]** > Click on one of the two workplanes perpendicular to the base turning it red > Right click > Select New Sketch > Name it “Path.”
5. Drag a vertical straight line 5 inches long (holding the shift key constrains lines to be vertical or horizontal) > Starting at the end point of the first line, drag a horizontal straight-line, length 5 inches.
6. Apply a 2-inch radius to the corner. Click on the Sweep icon at the top of the screen > In the dialogue box that opens, make sure that each sketch is in its proper field, “Profile” in Profile, “Path” in Path> Click OK.



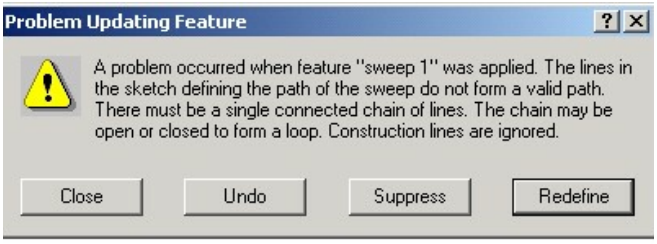
Now the pitfalls.

COINCIDENCE. It is important to remember that for a profile to be valid, it must form a single, connected chain of lines. Pro/DESKTOP provides visual clues to indicate that your lines are connected.



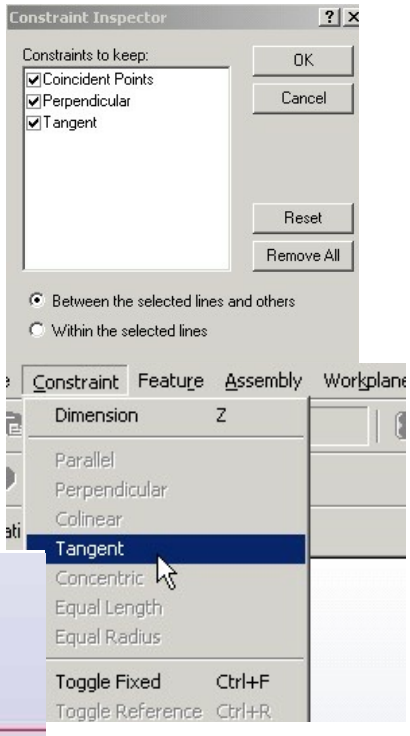


In this image you see tiny red squares at the intersection of the radius and the straight lines. These squares are called coincident points, and they indicate that the lines have been successfully connected. If you don’t see them – as in the image to the right – you are likely to get this **Problem Updating Feature** error message.



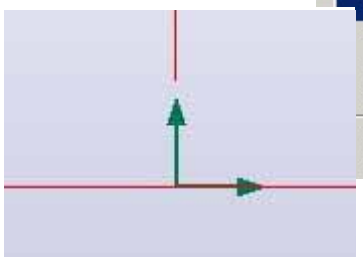
Another visual clue is the dashed line right at the coincident points. This dashed line indicates that the radius is *tangent* to the straight line.

If you have made a complex sketch to use as your **Path** profile and your **Sweep** isn’t working, you can look to see if these dashes and squares are present. You can also click on any two lines in the sketch (shift functions as the word “and”) and from the **Constraint** menu select **Inspector**.



If your sketch doesn’t have these constraints, you can apply them yourself. Just click on any two adjacent lines > From the **Constraint** menu select **Tangent**. The two lines should move together and the dashed line should appear indicating that the lines are tangent. It is a good practice to **Fix** a line in place before using constraint commands or the lines might move in unpredictable ways. With a line selected (red), go to the **Constraint** menu at the top of the screen > Select **Toggle Fixed**.

PERPENDICULARITY. What if all your lines are connected and tangent to radii and your sweep still doesn’t work? Bear in mind that for a sweep to work, you need two sketches in two perpendicular workplanes. It is vital that the first line of the path meet the profile *absolutely perpendicularly*. The most effective way to ensure that the path is perpendicular to the profile is to hold the shift key while dragging the line; this ensures that a line is vertical or horizontal.



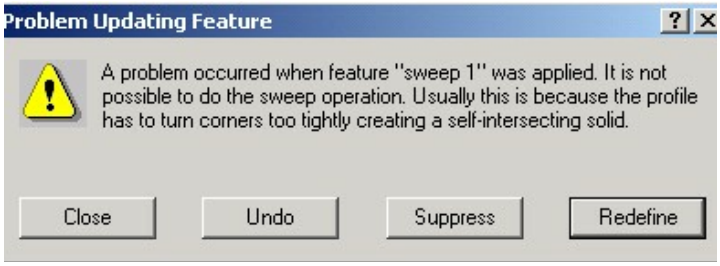
Ok, but what if the sweep still isn't working? After banging the desk you might want to check one other possibility. When we say that sketches have to meet perpendicularly, we mean the have to meet perpendicularly. The easiest way to ensure that the sketches meet is to start them both at (0,0) on the perpendicular workplanes. You can also zoom in **[Shift + Z]** really close to see if they are missing, like here.

If they are missing, click on the end of the path line and move it around, dragging it right to coordinate (0,0).

SELF-INTERSECTING SOLIDS. This problem occurs under the following conditions:

➢ An angle is too acute

➢ Your profile is too wide for you path



➢ One line is much shorter than adjacent lines at a right angle to it

A FINAL TIP

If you are working on a very complex sweep project, set up the profile, set up the path sketch, and begin building the path by adding one line at a time. *Good luck and have fun!*

To learn how you can receive training in teaching with Pro/DESKTOP, go to *www.ptc.com/for/education/schools/index.htm*.

Stephen Yaffe

training manager for PTC's Design & Technology in Schools Program, has trained teachers all over the United States how to teach with Pro/DESKTOP 3D design software. A former small business owner, he holds a bachelor of fine arts degree from Massachusetts College of Art and a master's degree in business administration from Northeastern University.

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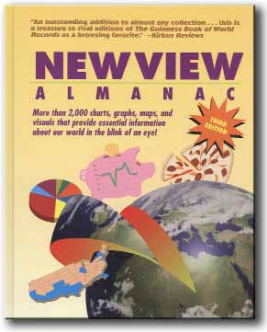
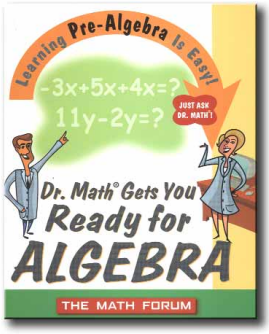


NEW VIEW ALMANAC

Bruce Glassman, Editor
Thomson Gal, 2003 by Blackbirch Press
ISBN 1-56711-674-4
www.gale.com/blackbirch

This almanac was updated for the millennium. It uses an all-visual collection of computer graphics to convey essential statistical information. More than 2,000 charts, graphs, and maps covering 85 topics make this almanac one of the most exciting references available today. Thousands of facts and hundreds of essays on: health, nutrition, politics, pastimes, population, environment, geography, transportation, energy, science, technology, education and natural resources.



READY FOR ALGEBRA

By The Math Forum
John Wiley & Sons, Inc. 2003
ISBN 0471225568
www.wiley.com

Getting ready for your first algebra class? Don't panic. Making the leap from the concrete world of numbers and real objects to the abstract world of letters and symbols doesn't have to be as scary as it sounds. Dr. Math®—the popular online math resource for students, parents, and teachers—is here to help. You'll learn about basic algebraic operations and their connections to the real world. Pretty soon, everything from integers to single-variable equations will make sense.

A calendar of professional meetings, conferences, & conventions

scan

To help you organize your travel for the coming year:

December 11-14, 2003
The Association for Career and Technical Education (ACTE) Annual Convention will be held in the New Orange County Convention Center, Orlando, Florida ***www.acteonline.org***

November 5-8, 2003
Frontiers in Education Conference "Engineering as a Human Endeavor: Partnering Community, Academia, Government and Industry," Boulder, CO
www.fie-conference.org/03/

February 2-6, 2004
American Society for Engineering Education (ASEE) Conference for Industry and Education Collaboration, Biloxi, MS
www.asee.org/conferences/ciec20

March 18-20, 2004
The International Technology Education Association's 66th Annual Convention will be held in Albuquerque, New Mexico. See their ad in this issue.
www.iteawww.org

July 25-29, 2004
NATIONAL CONFERENCE ON EDUCATIONAL ROBOTICS and the Botball 2004 National Tournament are tentatively scheduled to coincide with the American Association for Artificial Intelligence Conference in San Jose, CA, ***www.botball.org***

TCNJ student Jenn Eaton is working on the **Exploring Design & Engineering**™ project.

- Jenn is helping to coordinate standards with instructional units for the **Exploring Design & Engineering**™ project. **ED&E**™ is part of a $2.5 million project funded by the New Jersey Commission on Higher Education under a "high-tech" workforce readiness grant. *(Nice for the resumé and first job interview!)*
- Introductory classes in *Pro/DESKTOP*® (TSNG111), *Creative Design* (STEC161) and *Introduction to Technology* (TSNG171) are open to any students for the spring semester.
- Jenn recently completed her Student Teaching Experience at a local area high school, where she taught CAD and graphic design. All students graduating with a teaching certificate receive multiple job offers with starting salaries as high as $43,500 and top well over $90,000. Two months of summer vacation are typical.

The College of New Jersey

exploring design & engineering

Department of technological studies

For further information, contact Dr. John Karsnitz, Chairperson, Department of Technological Studies, Armstrong Hall 181 (x2543), email karsnitz@tcnj.edu.

The Technology Student Association's National Conference Boasts Best Quality Technology Education Competitions, Presenters, Attendance In 25-Year History

ORLANDO, FLORIDA — For nearly 4,000 Technology Student Association members nationwide, the Technology Student Association's 25th National Conference was the place to showcase their technological savvy by competing in more than 60 national technology education events. With the theme, "TSA, Unveiling the Potential in You," the TSA national conference unveiled student winners of the new Jaguar F1 Team in Schools, cyberspace pursuit, imaging technology, engineering design, architectural model and dozens of others technology challenges. Taking place from June 25-29, 2003, the conference was hosted at the Rosen Centre in Orlando, Florida.

Explaining how the quality of life in the modern world is driven by technology, noted historian and expert in spacecraft design Dr. Jack Bacon delivered the DuPont-sponsored keynote speech. He works at the NASA Johnson Space Center, where his duties include assignments in the integrated architecture, design, and operations of the Shuttle and of all systems in the US, Russian, Japanese, European and Canadian elements of the International Space Station.

Identifying the best qualities that technology companies seek in their employees and "A" leaders, Joy Sabol, Vice President of Communications for Lockheed Martin, captivated technology education teachers at the conference. Excerpts from the Lockheed Martin presentation can be found at http://www.tsaweb.org.

Another presenter lauded the important work of TSA's technology education teachers. "We all know of the potential shortage of talented technical young people who will enter the technology field," said Raytheon Company's Executive Michael Teeley at the advisor meeting. "Raytheon, as one of the largest employers of engineers in the US, is grateful to technology teachers across America who are helping young people develop an interest in science and technology. The work [TSA is] doing makes a big difference."

Meant to encourage boys and girls to consider engineering as a career, the Jaguar F1 Team in Schools was a popular competition whereby 12 TSA Chapter teams designed and raced model Formula One model racecars. Innovatively, students used CAD/CAM (computer aided design and computer aided manufacturing) software and manufacturing techniques to create the racecar while fulfilling specific competition guidelines.

"What a suitable way to celebrate our 25th anniversary by hosting our best TSA member participation in both numbers and quality," said Alta McDaniel, new president and chairman of TSA, Inc. "And In fact our 25th anniversary fund recently doubled as a result of the generous donation of Harvey Dean, CEO of Pitsco, Inc. This fund was created to assist financially challenged schools throughout the nation who want to charter a TSA chapter. Pitsco is an industry leader in quality technical education equipment and curricula.

Said Rosanne T. White, Ed.D., National TSA's executive director, "Preparing today's students to be qualified for tomorrow's global, technologically advanced workforce is our 12-month commitment every year, and our efforts were clearly reflected in the success of this anniversary conference."

The Technology Student Association (TSA) is a 170,000-member organization. Nearly 2,500 TSA technology teachers conduct TSA chapter programs in 47 states. TSA's goal is to promote technological literacy and leadership. Students learn problem-solving, decision-making, and critical thinking skills as they relate to communications, power, energy, transportation, engineering, manufacturing, construction and biotechnology. TSA is a non-profit education association with its national office at 1914 Association Drive, Reston, VA 20191. Call 703 860-9000. Reach TSA on the web @ www.tsaweb.org

PRESS RELEASE

FOR IMMEDIATE USE

Contact: Matt Frankenbery, 800-828-5787
mfrankenbery@pitsco.com

TSA-Pitsco CO2 Racing Web Site Spotlights the Best

Specifications, animated launch, and details of national finalists among features

What does it take to win a state or national Technology Student Association Dragster Design Challenge? A lot of planning, attention to detail, and hard work.

To see for yourself exactly what it takes, visit the new TSA-Pitsco CO_2 Racing Web site developed by Pitsco, Inc. From an explanation of the various competitive events to design and construction tips to an animated launch to full specs and pictures of the nearly 60 U.S. and Australian championship qualifiers, this site offers a comprehensive view of competitive CO2 racing in both dragster design and transportation modeling categories.

"The information on the site really educates readers about the racing events and cars, as well as ignites enthusiasm for participating in the national conference competitions," said TSA Communications Manager Lynda Haitz. "The explanations and visual effects capture the excitement of past events and inspire interested students for future CO2 car design and racing."

Pitsco, the leading producer of CO2 dragster supplies and materials for more than a quarter century, sponsors and stages the national dragster design and transportation modeling competitions.

"For more than 20 years, TSA has enjoyed a productive partnership with Pitsco," Haitz said. "Pitsco's dedication to CO2 racing and its involvement in sponsoring the racing events at TSAís national conferences help to make dragster design and transportation modeling some of the most sought after and successful competitive events each year."

Students enjoy seeing the fruits of their labor on display via the Web for all to see. "Photographs and detailed specs make the information much more interesting," Haitz said. "It spotlights the amount of hard work and preparation that competitors put forth to make it to the top ten."

For more information, visit the TSA-Pitsco CO2 Racing Web site at *www.pitsco.com/-TSA2002/TSA02main.asp*. To learn about standards-based dragster design curriculum and activities, see the Science of Speed at *www.science-of-speed.com*.

To learn more about TSA, visit *www.tsaweb.org*.

NOTE TO MEDIA:
To learn more about Pitsco, Inc., visit *www.pitsco.com* and *www.pitsco.com/newsroom.asp* or contact Public Relations Coordinator Matt Frankenbery at *mfrankenbery@pitsco.com*.

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Gradebook, circa 2004

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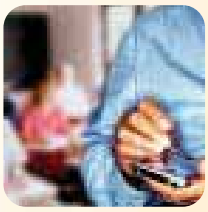

ADMIN uses a Palm OS® handheld and hundreds of rubrics to help teachers integrate with Paxton/Patterson Technology Education and Family and Consumer Sciences learning systems.

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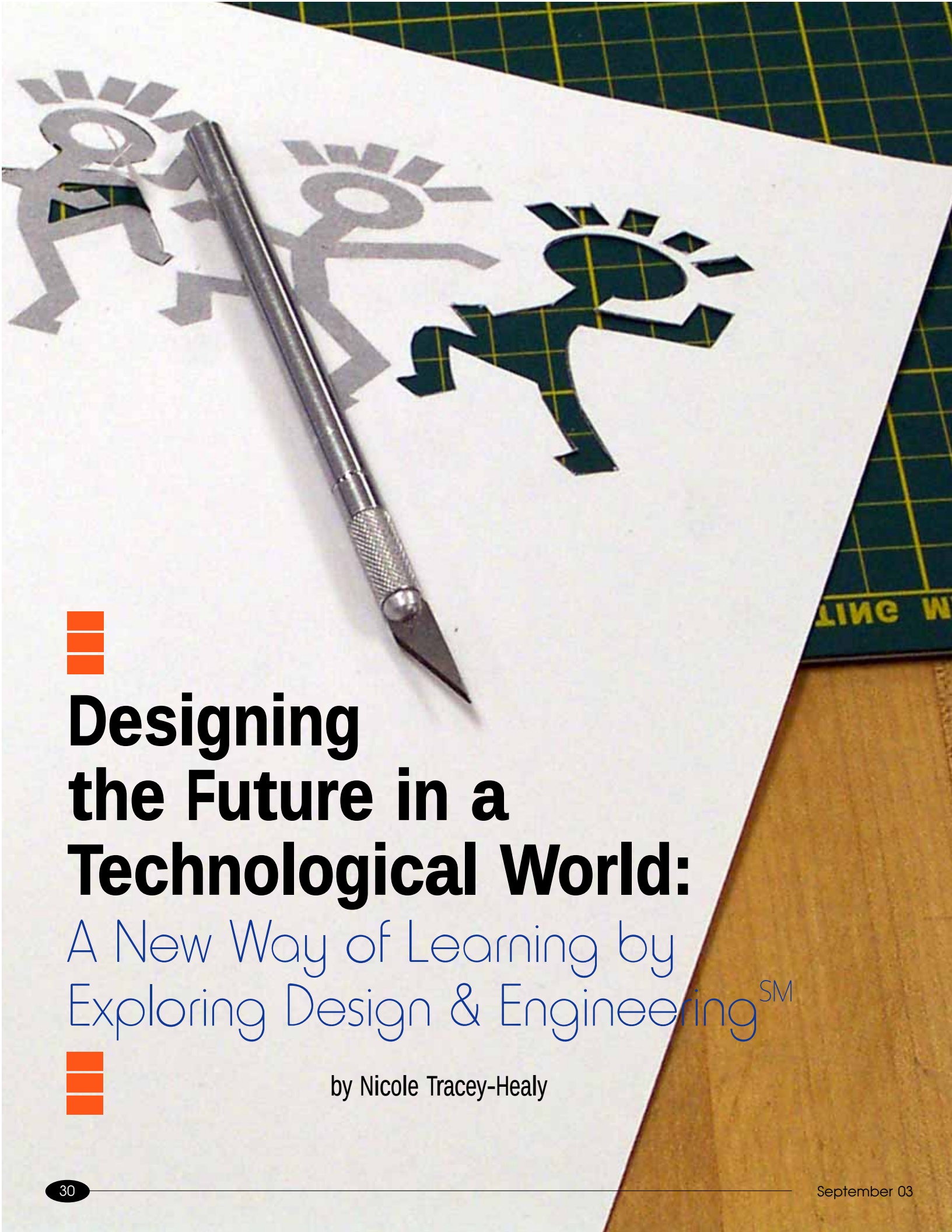


Designing the Future in a Technological World:

A New Way of Learning by Exploring Design & Engineering℠

by Nicole Tracey-Healy

...the proverbial question most students ask while in school, especially when it comes to math and science.

"Why do I need to know this?"

Adults are not the only ones who want to know their activities and time spent are meaningful. Students also want to know the importance of what they are learning and how it will apply to them now and in the future. A way to motivate and interest students is to engage them in real-world, hands-on activities that are not only fun, but are also relevant to society and the future workforce they will one day be entering. These were the ideas that the developers of the *Exploring Design & Engineering*℠ (*ED&E*℠) Project had in mind when they set out to create contextual learning units for middle school and high school students. The ED&E team saw the need to improve technology education in schools and to design activities that students enjoy, ultimately creating a life long desire in students to continue learning about technology.

Through funding under the High Tech Work Force Excellence grant from the New Jersey Commission on Higher Education, the *ED&E* Project developed eight contextual learning units in Design & Technology and one classroom text on *Pro/DESKTOP*® software. The Project also conducted professional development workshops to train teachers to use these units. The workshops were held at The College of New Jersey, *ED&E*'s home office in Ewing, New Jersey, and at different school sites throughout New Jersey. A total of 514 New Jersey teachers were trained between 2002 and 2003 – those teachers ultimately reached 8, 491 students in the 2002-2003 school year and will reach 13, 243 students in the upcoming 2003-2004 school year.

The Learning Context

The contextual learning units use real-world settings from business and industry to present design challenges that help students discover the design and development of the "human made world" and its importance to society and the workforce. The units pose a real-world design problem called the Big Challenge that has to be solved in the final week of the unit. All of the activities in the unit, called Task Sessions, provide information and skills that will be necessary to complete this Big Challenge. The students use a similar design process to that used in business and industry throughout the unit to

solve each of the challenges that lead up to the Big Challenge, as well as to solve the Big Challenge itself. The Task Sessions also connect the learning experience to the national standards for math, science and technology. Finally, research on the different careers available in technology related fields is incorporated into the units, giving students insight into the work world.

All of the units incorporate both Technology Education and Information Technology. Students must combine design and engineering techniques with the use of software and hardware in order to complete the activities. For instance, students may use Pro/DESKTOP® software, a 3-D CAD program, to draw a model of a boat or use the Control Station, a hardware and software package that allows computer control of devices, to control lights and motors. By connecting the two, students learn how to use Information Technology and then how to apply it to solve problems and design solutions. The students are empowered and motivated by these hands-on, real-world applications that show them the significance of the concepts they are learning.

> "This effort has helped introduce Technology Education teachers across NJ to skills & knowledge that are essential for helping students become technologically literate."
>
> Ronald Todd
> ED&E Project Director &
> longtime advocate for design,
> engineering and technology
> for all students
> The College of New Jersey
> Ewing, NJ

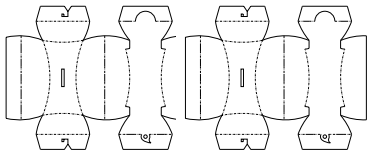
The *ED&E* Project builds on the *Children Designing and Engineering Project*™ (*CD&E*™), originally funded by the National Science Foundation, that developed twelve contextual learning units for children in grades K-2 and grades 3-5. *CD&E* and *ED&E* allow for a continuum of this type of learning from kindergarten all the way through high school. Students will learn these designing and engineering skills early in their education and then be able to carry the knowledge and skills they develop into their later years of education. Both projects believe that children have the potential and capacity for a high level of learning and creativity and want to provide

Engage your students in the world of technology...

...the world of mechanical toys, roller coasters, audio systems and 3D computer modeling... with contextual learning units that let them explore designs and implement solutions of their own. The Exploring Design & Engineering℠ (ED&E℠) Project's eight contextual learning units and one classroom text in Design & Technology provide middle school and high school students with real-world design problems through hands-on activities.

- Students investigate, design ideas, model solutions and test their designs using the engineering design process.
- The units provide realistic, enjoyable activities that are relevant to society and the work world.
- The activities allow students to see and understand the meaning of the concepts they are learning.

By designing activities from the context of life, the ED&E Project strives to create life-long learners, ones with the desire to continue learning about technology throughout their lives. For more information on these units and professional development workshops, please contact **Henry Harms, ED&E Project Coordinator, at 609-771-3339 or harms@tcnj.edu.**



The College of New Jersey

A layout of a package design developed in *Pack It Up... Ship It Out!* using Microsoft Word.

them with the opportunity to accomplish these goals. For additional information on the *CD&E* Project, please visit their website at http://childrendesigning.org.

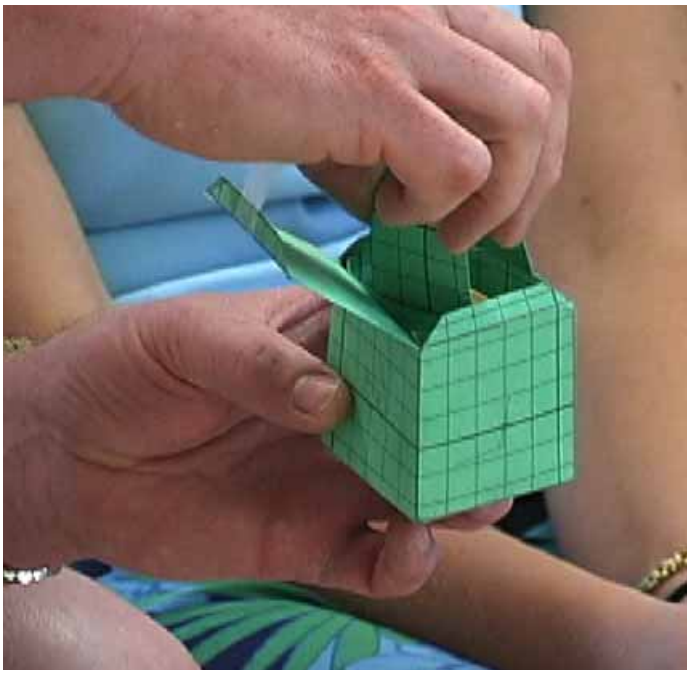
The Units

The *ED&E* Project developed four units for the middle school level, four units for the high school level and one classroom text for Pro/DESKTOP.

MIDDLE SCHOOL

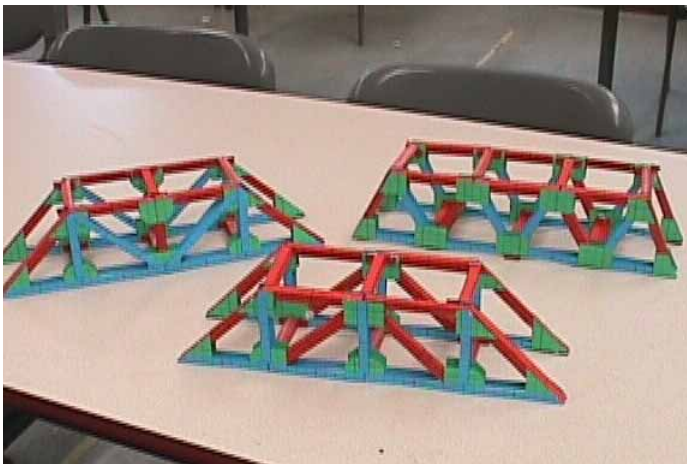
Pack it up… Ship it Out!

This unit explores the purpose and role of packaging and packaging engineering, the manufacturing process and the packaging industry. The students take on the roles of different types of engineers and must solve a specialized engineering problem. They also learn about the surface area and volume of packages, the materials used for packaging, the strength of packages and the safety and environmental issues involved in packaging. Once the criteria for packages are investigated, the students make paper and glue and test their strength, durability and ease of use. Marketing tactics, such as the layout and design of the package, as well as the important safety information printed on the package are also researched. The final stage of the unit challenges the students to design, model



A completed package ready for artwork.

Light bars for the DJ unit are being created in proportion to the manikins.



A completed model of a Truss bridge made out of Checkcard©, a heavy cardboard like paper with grid lines for drawing and cutting.

and test a complex package of their own. The students create packaging patterns through the use of computers and Microsoft Office software, construct the package (including marketing designs and health and safety information) and then test and model their package for the class.

Community by Design

Three major activities are explored in this unit: traffic control, sound barriers and bridges. During the traffic control activity, students learn the history and function of traffic lights, the wiring information and the different types of intersection control. They then study a problematic intersection in their own community and design a solution. Once they have redesigned the intersection, they build a model of that intersection and simulate traffic signals using computer control. The students also learn about the effect of highway noise on communities, research the policies for building sound barriers and conduct tests using a decibel meter in the sound barrier activity. They then build their own model sound barrier and calculate costs. Finally, the students study the forces that act on a bridge and use the West Point Bridge Designer software to analyze bridge designs, followed by constructing

“...the workshops have been informative and useful...Keep the great programs coming!”

their own bridge out of Checkcard©. The unit culminates in a Big Challenge of the teacher’s and students’ choice, such as redesigning a bridge in the community, improving a local intersection, designing a community park or recreation center or reviewing and redesigning the lighting design of a school parking lot.

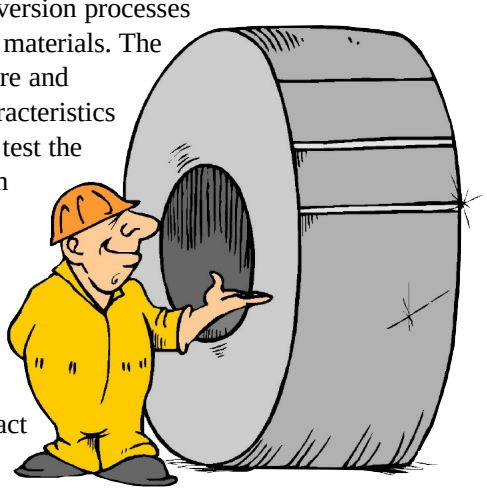
Bill Schlupp
Technology Education Teacher
Orchard Middle School
Sewell, NJ

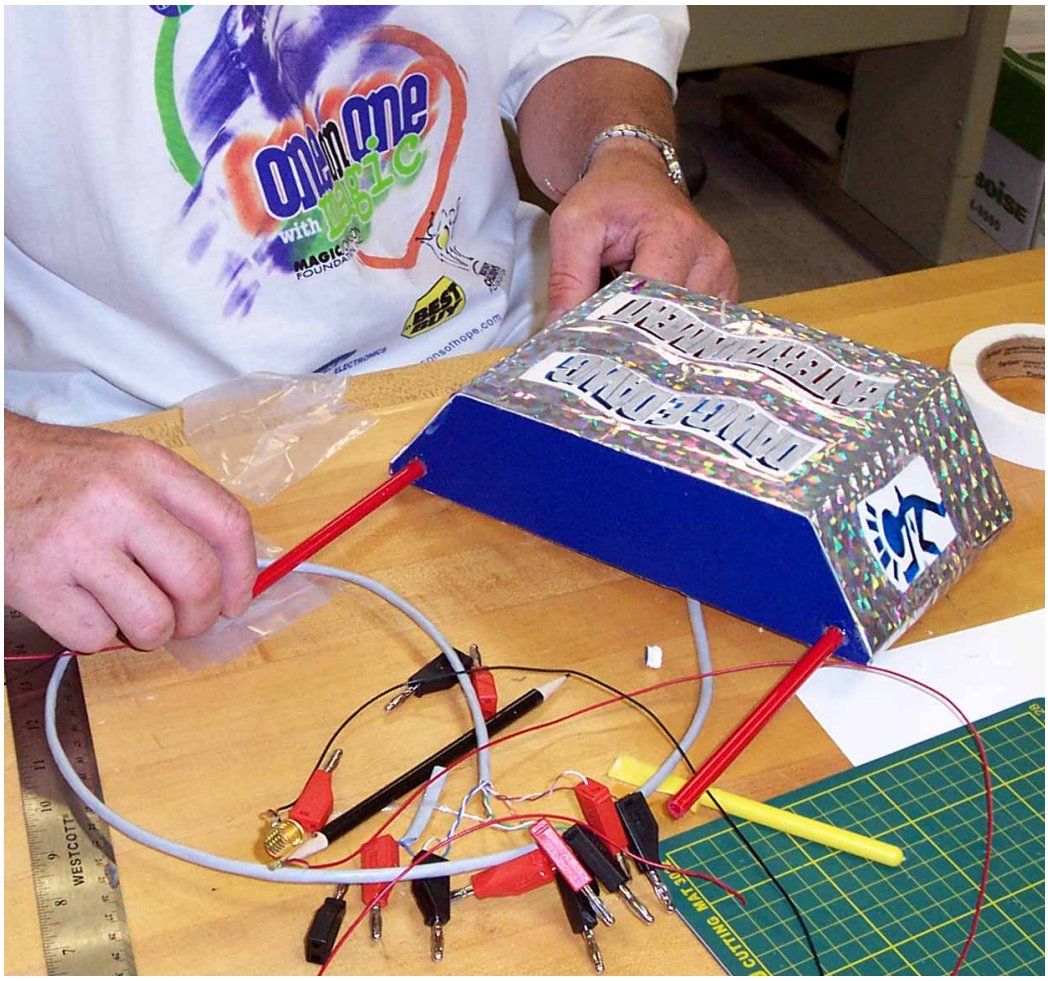
The Big Thrill! Dream it, Plan it, Build it

Students design and build a model of a new theme park. First, they explore the different roles of engineers, the development of land, the planning process and how to create scale drawings. Then the architectural aspect of theme parks is investigated by testing the strength of structural members, building structures and working with engineered textiles. The students also learn about mechanisms and motion in order to build their own animated devices. Once they have an understanding of mechanisms, they investigate pneumatics and hydraulics used to create motion and use the Control Station software to control rides. The students complete the unit by designing and building a model of their own theme park, including model rides, fountains, eating areas, as well as the circuitry and programs that control them.

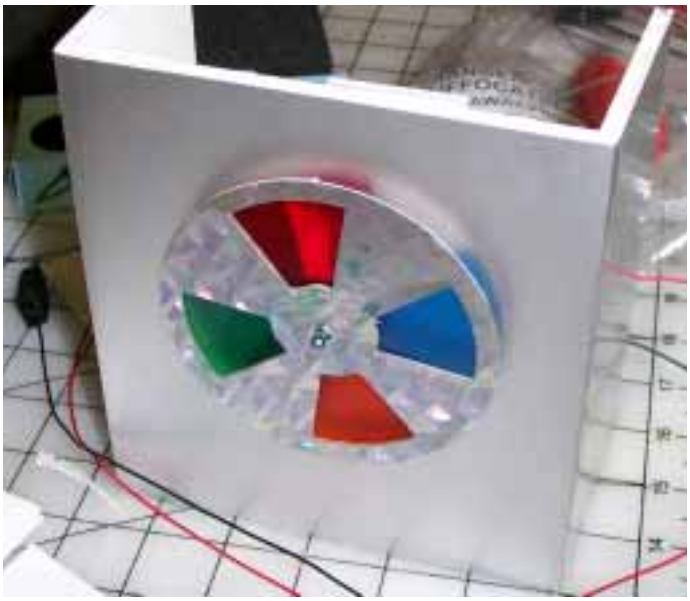
Materials & Processes

This unit investigates concepts, conversion processes and structures and classifications of materials. The students research the types, the nature and structure and the properties and characteristics of engineering materials. They then test the materials and consider the impact on people and the environment, the disposal and storing and the safety considerations associated with the materials. After testing, the students explore other concepts and principles, such as assembling polymers, separating metallics, impact forming and chemical conditioning.





Light poles are being added to the unit as it nears completion.



The front of a DJ unit in the initial construction stages – made out of foam core board and reflective paper.

The students complete their activities by importing data into spreadsheets in order to analyze, organize and compare the differences of the properties of the materials being tested and used in their design work.

HIGH SCHOOL

Digital DJ

This unit explores sound, lighting, electronics and computer control technologies used in the music entertainment world. Students design, build and control a small DJ system suitable for an individual operating in the mobile entertainment business. They begin by researching information on the Internet available from manufacturers on research laboratories, sound studios and high technology manufacturing facilities. Students also gain experience in importing, editing and exporting various types of digital audio files. Once the students learn how to use the software, calculate the current requirements for the circuits and determine sensors for sound and lighting, they create the console for their system using 2-D

"...it's something students can relate to ...DJs at school dances, packaging in stores ...they make the connection right away."

Dave Niemierowski
Technology Education Teacher
Toms River Intermediate East
Toms River, NJ

Computer Aided Drafting (CAD) software. Next, the design is cut out of the material using a vinyl cutter. The students then control this DJ system by using a Programmable Logic Controller (PLC).

Ready…Set…Sail!
Students dive into the world of marine activity in the design of yachts and marinas. They learn about the marine industry and about the work of yacht and marina engineers. The learning experiences engage students in the investigation of fluid mechanics, buoyancy, center of gravity and other principles of boating. Boat propulsion, safety issues, principles of navigation and related careers are also researched and explored. Once these concepts are covered, the students gain an understanding of The Global Positioning System (GPS) and learn how to use Three Dimensional (3D) design software to design a boat hull and simulate its performance in water. Finally, the students complete the Big Challenge by designing, modeling and testing a yacht and a marina, all within a specified budget.

Ready, Set, Sail... a completed yacht!

Xtreme Automata
Students investigate mechanisms and electrical circuits to build automata, devices that have a history dating back hundreds of years. Automata are mechanical toys that are usually made out of wood and metal and are commonly based on a humorous theme. The design of the toy can also include electronic devices and circuits in addition to its mechanical aspects. The first activity is to learn about automata, how they work, how they are made and what makes them appealing to people. Next, the students learn about electronic control, electronic circuit design and construction, how to troubleshoot a circuit and how to create a program using PIC-Logicator software. The students then design and build a platform for their automata. Once the platform is built, they design their

Some examples of automata students can create using traditional resources such as wood, wire and gears, as well as materials from home such as soda bottles, jar lids and tin cans.

automata and choose the best mechanism for the desired motion. In the final stage, the students manufacture and construct the mechanical parts, build their toy and use PIC-Logicator software to control it.

Capstone Course

This unit is an Independent Study that allows students to work individually and/or in teams to design, develop and construct a solution to a design problem. The unit provides the students with the opportunity to work with a mentor from industry and business and engages them in a variety of activities that require them to communicate and think their way through the design of a product, system or service. The students take on many roles to see a design from concept to end product. They also utilize design concepts, problem solving, technical writing, mathematics, science, computer applications and material processing skills. The students prepare electronic portfolios for oral presentations and write press releases and then post their work on the school website. Throughout the process, their solutions will be tested, evaluated and redesigned for optimal design. Finally, the students present their design solution to the class.

Classroom Text

Design & Engineering with Pro/DESKTOP®

Design & Engineering with Pro/DESKTOP® is a classroom text that includes instructions on how to use the Pro/DESKTOP® software. It teaches the program, as well as design and engineering principles. The main focus of the text is the 3D aspects of Pro/DESKTOP®; however, it also includes sections on engineerigng drawing and using the photo album. The lessons include beginner, intermediate and advanced designed-based activities. The advanced activities include open-ended design problems that are more challenging to solve. Some of the activities in the text include designing all kinds of consumer products, from cases for cosmetics and MP3 Players to lamps.

Professional Development Workshops

Since the contextual learning units cover a range of concepts in math, science and technology, it is essential that the teachers be comfortable and confident when teaching them. If the teachers feel they do not have extensive knowledge of some of the material, they may eliminate those parts from their lesson plans. *ED&E* provides training in the units to ensure that the teachers can confidently integrate the units into their curriculum. The professional development workshops instruct the teachers in all facets of the units, including the concepts and theories, executing hands-on activities and the management of the unit.

Between 2002 and 2003, the *ED&E* team conducted 31 professional development workshops for teachers in New

Jersey. The units included ***Pack it Up…Ship it Out***, ***Digital DJ***, ***Ready…Set…Sail!***, as well as ***Pro/DESKTOP***, ***Rapid Prototyping***, ***CAD/CAM 1*** and ***CAD/CAM 2***. *ED&E* continues its support of the teachers after the workshops are complete by offering refresher courses and being available to answer questions and concerns.

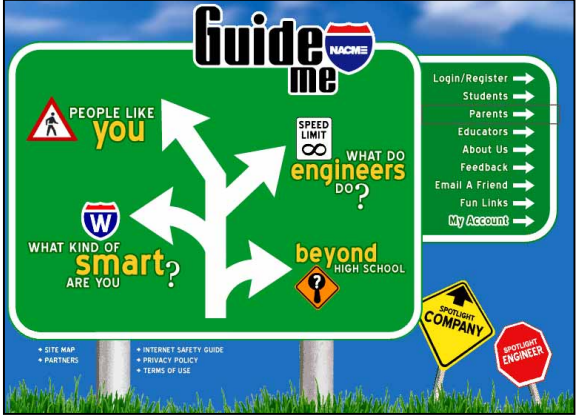
How to Contact ED&E

To learn more about the *ED&E* Project, the units and the professional development, please contact Henry Harms, the Project Coordinator, at 609-771-3339 or harms@tcnj.edu. Before he joined the *ED&E* management team, Henry was a middle school technology teacher for 32 years. He uses the experiences and skills he gained to manage the development of all the *ED&E* units, organize and conduct the professional development workshops, and oversee the production and marketing of the units.

The Future of Technology Education

ED&E strives to be a significant contributor to the changing Technology Education field. They will continue their effort to develop additional learning units and to train teachers through professional development workshops. Their goal through the use of these units is to implement good learning techniques and the desire in students to learn more about technology. Ultimately, *ED&E* hopes their units will allow students to become critical thinkers, motivated learners and possibly future engineers.

Nicole Tracey-Healy
is the Exploring Design & Engineering Project Administrator at The College of New Jersey and an English Instructor at Bucks County Community College in Newtown, Pennsylvania.



NACME (National Action Council for Minorities in Engineering) Launches Web site for Middle School Students

NACME has launched a new web-site designed to excite middle-school students of diverse backgrounds about studying and working in the field of engineering. The site targets girls and underserved minorities, offering aptitude diagnostics, role models for them already in the field, an introduction to what engineers do in their jobs, and advice about how to plan their studies to enter the field of engineering. Go to: *http://www.GuidemeNACME.org* .

Bright Ideas

ITEA

Bright Ideas Volume 2

Bright Ideas is a service provided by the International Technology Education Association four times per year, at no cost to subscribers, with the intent of promoting technological literacy in our school systems. *Bright Ideas Volume 2, #1* is sponsored by NASA Explorer Schools.

We hope you enjoy *Bright Ideas Volume 2, #1*. If you have any questions, please contact Katie de la Paz at *iteacomm@iris.org*.