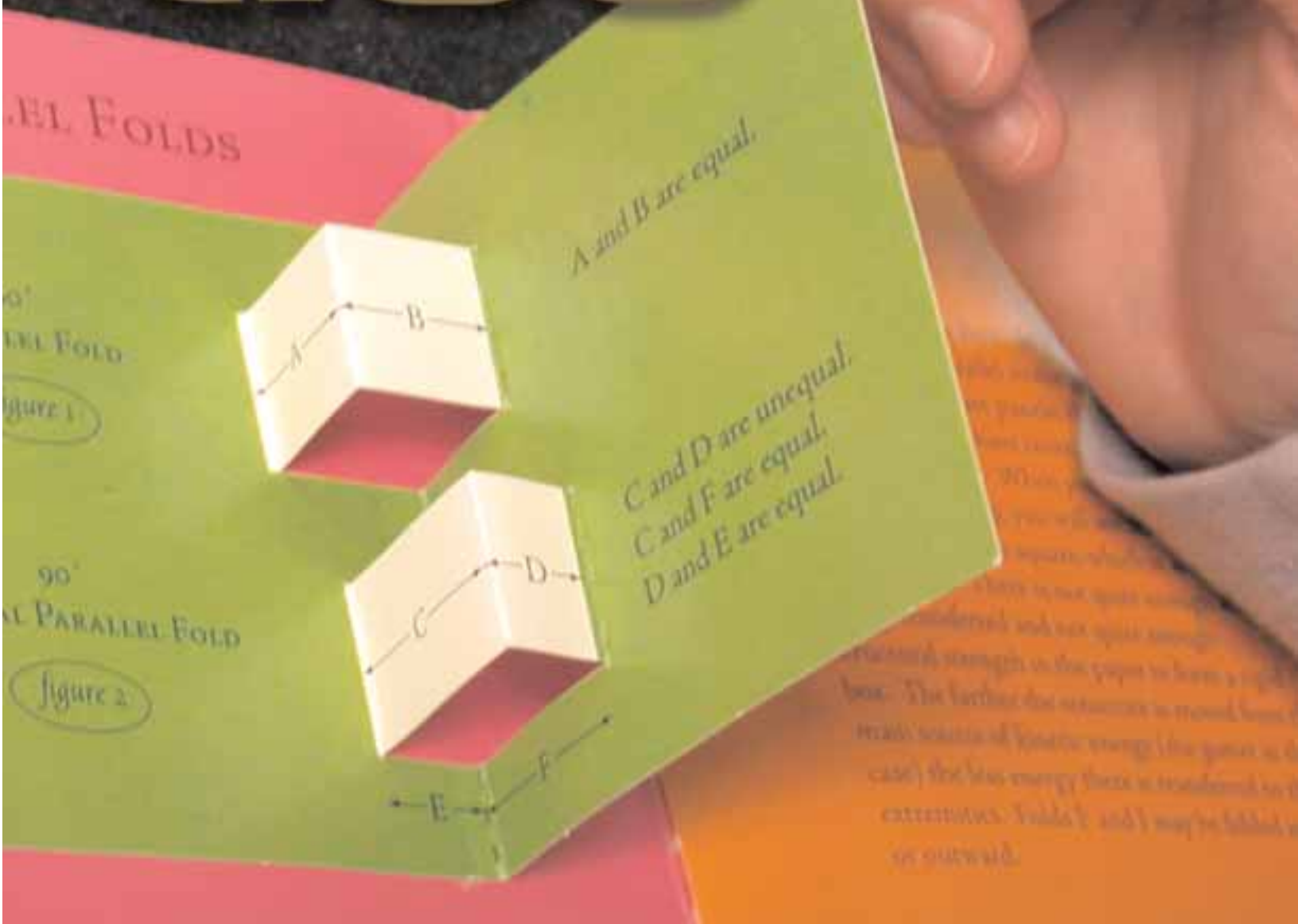


# ties



In this issue: **Pop-Up Book Technology**

**Plus:**

Virginia Tech  
Technology  
Education  
Program

Shiloh High  
School:  
A Phoenix Has  
Risen from  
It's Ashes

Pro/DESKTOP  
**8**

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I want to enroll in one of Ed Goldman's classes at Brooklyn Technical High School in Brooklyn, NY.



This is the second article about courses he offers and this is the second time I've felt this way. He sent us digital movie clips of the pop-up books his students designed and made. We've included them with the article. Our video expert, Rich Albe, used Media Cleaner EZ 4 to reduce the size of the clips Mr. Goldman sent us from 5 MB to around 400 Kb – a lot easier for you to download. One of the resource books Ed uses with his students is *The Elements of Pop-Up* by David Carter and James Diaz, Simon & Schuster Children's Publishing Division. Available at Amazon.com for \$24.50 – this book is an outstanding resource. Several of the illustrations in our article are taken from their book.

Change has come to the Technology Education program at Virginia Tech. Mark Sanders tells us exactly what is going on in Blacksburg, Virginia. Change has also come to Shiloh High School in Hume, Illinois. They have revamped their wood technology program. David Millson and Shiloh teacher Mark Smith show us what professional cabinetry high school students can produce given the time, equipment and teaching expertise. Their designs and finished products are extraordinary.

The Technology Student Association (TSA) produced comprehensive recommendations for their members to protect their privacy while using the Internet, email and instant messaging. Thanks to Jill Landsman for putting that together for us. The advice is applicable to students and adults.

Stephen Yaffe put together a synopsis of the new version of PTC's design software, *Pro/DESKTOP 8* for us. He highlights the new features and shows some practical uses for them.

Finally, our *Ties to a Broader Network* this month focuses on National Engineers Week and their "Introduce a Girl to Engineering Day." The philosophy of inclusion and gender equity transcends the one-day program and is applicable to any profession.

Hope you have a relaxing and refreshing holiday.

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on the cover



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## c o n t e n t s

### SHILOH HIGH SCHOOL

Teacher Mark Smith helped his advanced woodworking classes at Shiloh High School, Hume, Illinois combined design, entrepreneurship and professional-level manufacturing skills to turn-out exceptional products.



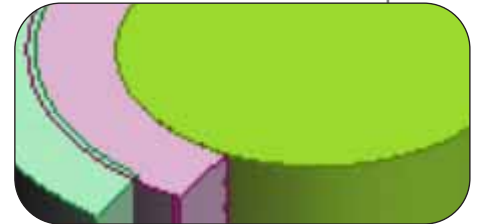
### POP-UP BOOK

Ed Goldman talks about his Pop-up Book design course. His Brooklyn Technical High School students produced engaging materials.



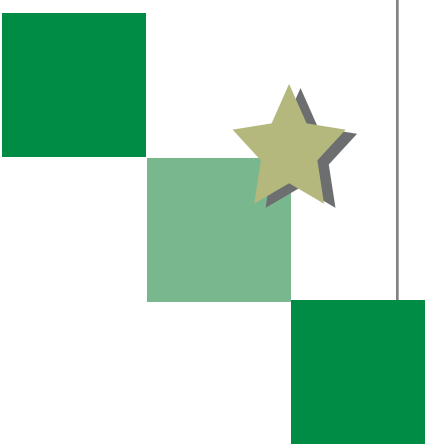
### PRO/DESKTOP

This article highlights the features that make the new PTC design software, Pro/DESKTOP 8.0, so easy to use.



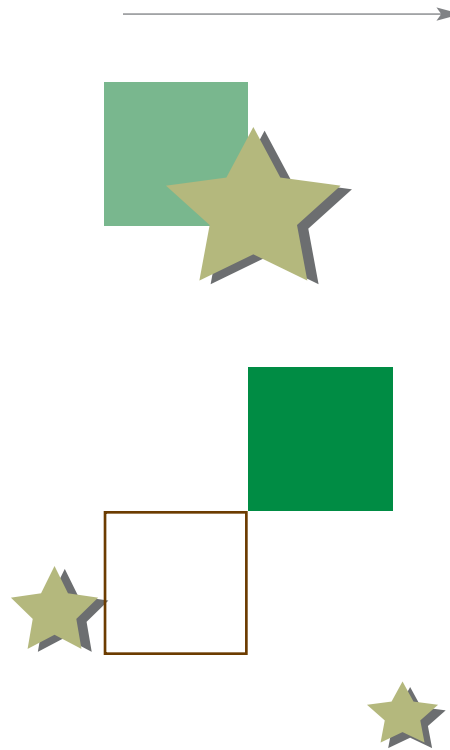
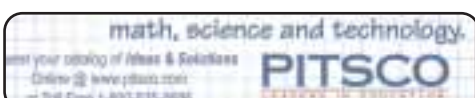
### VIRGINIA TECH

There were rumors floating around the Technology Education community concerning the Virginia Tech program. We went to the source for the definitive word.



# s p O n s o r s

for this issue:



d e c e m b e r

## 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?**



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



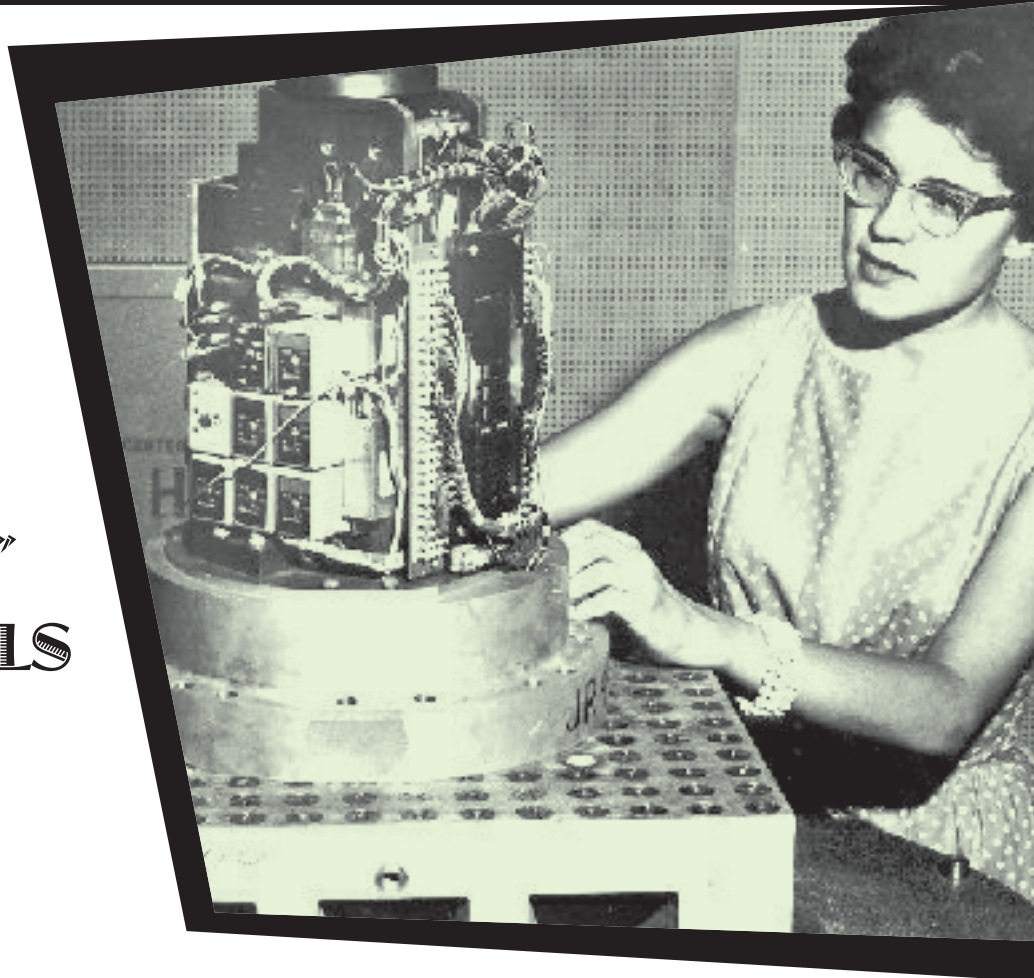
At the college of New Jersey we know that a new paradigm consisting of mathematics, science, and technology literacy is necessary to meet the challenges of the 21st century. While most people understand the importance of mathematics and science in the general education curriculum, technology, as a critical 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.

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**“THE REAL BENEFIT OF INTRODUCING GIRLS TO ENGINEERING,” PROFESSIONALS SAY, “IS TO ENGINEERING ITSELF.”**



Teresa Helmlinger, the 68th president of the National Society of Professional Engineers, remembers well her early days as an industrial engineer.

“I was a distinct minority,” says Helmlinger. “I can still see the look on some men’s faces when I claimed to be an engineer. I’d go to construction sites and have to walk a mile to find the women’s bathroom, which they called the ‘kitty litter.’”

But, as Helmlinger and other leaders in engineering will tell you, there has been a sea change in attitudes toward women in the profession, thanks in large measure to increased access and an ever-expanding network of support, encouragement and mentoring.

For Helmlinger, an accomplished, 50-year-old engineer, however, there’s still much work to be done, so now she’s focused on the future: “My goal is that I leave a legacy so the next person doesn’t have to go through what I went through.”

For her and thousands of other women engineers – with a good deal of support from their male counterparts – establishing that legacy means an all-out mentoring effort on Introduce a Girl to Engineering Day, a centerpiece of National Engineers Week’s annual outreach to encourage underrepresented groups to consider a career in engineering.

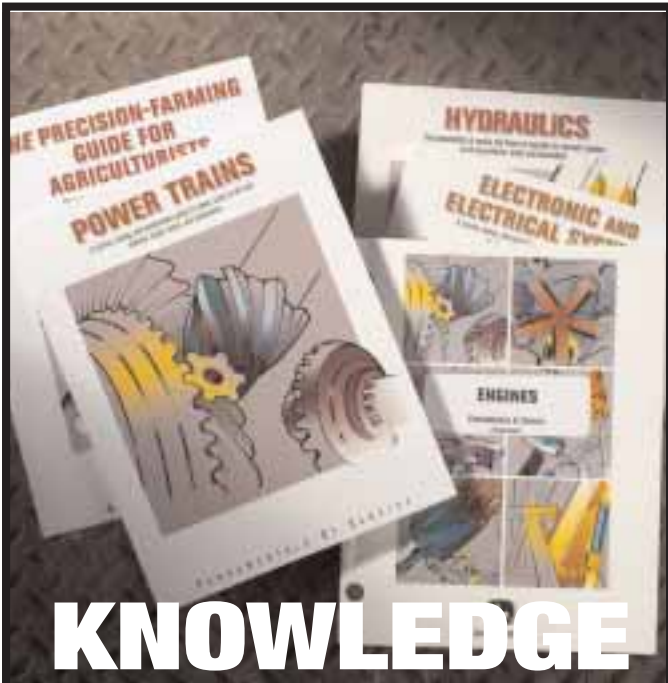
Now in its fourth year, Introduce a Girl to Engineering Day 2004 – Thursday, February 26 – will feature more than 125 organizations mobilizing 11,000 women engineers to

actively reach out to an estimated one million girls that day and throughout the year. The program, often dubbed “Girl Day” in engineering circles, is led by 2004 National Engineers Week co-chair, The Institute of Electrical and Electronics Engineers (IEEE/IEEE-USA), with major sponsors Agilent Technologies, Inc., and the Elizabeth and Stephen Bechtel, Jr. Foundation.

In order to get as many people as possible to participate, Girl Day organizers have posted information, along with resources for volunteers, at the National Engineers Week web site at [www.eweek.org](http://www.eweek.org). At the site, organizations and engineers can list their activities on the 2004 Pledge Roster, which will help make educational and career opportunities and mentoring programs available for girls and prospective women engineers nationwide.

“The heart and soul of Introduce a Girl to Engineering Day are the young women we inspire,” says Joey Duvall, an electrical engineer at Lockheed Martin, IEEE member, and chair of this year’s campaign. “I’ve had a great deal of support





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from key role models throughout my journey. I never doubted I could become an engineer, and that's the message I hope to give to my younger, future colleagues.”

Duvall and others involved in the program stress that Girl Day is much more than an attempt to diversify the profession, which is about 90 percent male. Instead, it's considered a critical linchpin in a nationwide effort to broaden and increase the ranks of engineers in America. Nor is it simply a need to fill numbers. The very essence of engineering, they say, is at stake.

“What do engineers do, really?” asks Sherra Kerns, slated to become president of the 12,000-member American Society for Engineering Education in June 2004. “We design. Design is a fundamental, a creative endeavor. Engineering is creation and implementation. If you have the best social mix and the most perspectives, then more likely you'll have the best design.”

Speaking to what she considers the core of engineering, Kerns, who also serves as vice president for Innovation & Research at Franklin W. Olin College of Engineering in Needham, Mass., says, “There's more to it than a single solution.”

In a similar message, Sherry Woods, director of special projects at the College of Engineering at the University of Texas at Austin and president of WEPAN, Women in Engineering Programs & Advocates Network, agrees. “If it's coming from one perspective, it's limiting,” says Woods. “We're committed to ensuring that every girl has an opportunity to pursue whatever career path she wants with no blatant or covert barriers. We don't need those barriers.”

Carol Muller, president of MentorNet, points out, “If you have differences of experiences, products are designed better.” Muller's nationwide mentoring program headquartered at San Jose State University matches professional women and men engineers with engineering students, mostly women, via email. MentorNet has successfully paired more than 20,000 students and professionals since it began in 1997.

“Women are half the population, half the talent. They should be half the results,” she says. “You want more women in engineering and as much talent as possible for the very best designs.”

For Nancy Berg, executive director and general manager of the 40,000-member Society of Manufacturing Engineers (SME), diversifying engineering not only brings better design, but is essential to the future of America. “We need to look at all our communities,” she says. “If we don't strengthen our competitive talent, our leadership in engineering is going to go to other countries.”

That means exposing more people early on to the opportunities of engineering. “We seek gender parity to engage as many young people as possible until we have enough brains to make this country successful. Some 500 SME chapters are involved in mentoring programs and summer camps,” she says. “We have student chapters, we go to shopping malls. We go where kids go.”

And like many of her colleagues, Berg insists it's everyone's responsibility to pitch in as mentors. “We have more role models than we realize,” she says. ●

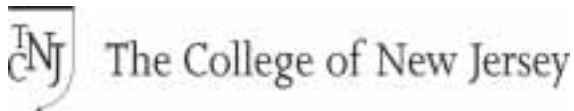
# Looking?

## Nearly half of all college students will change their majors!

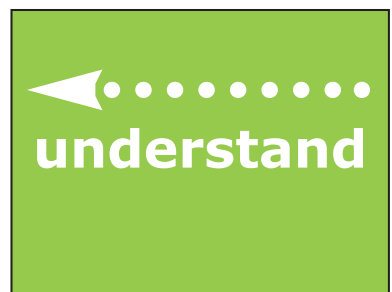
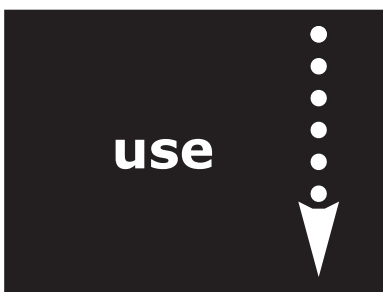
- Alex graduated from TCNJ with a Bachelor of Science degree in Technology Education, Spring '00.
- Alex enjoyed the design aspect of our world and wanted to be a part of it, so he chose Technology Education
- Alex *“received a top quality education in an area that I really enjoyed.”*
- Alex continues to have wonderful employment opportunities. He is...
  - being called for interviews and was offered jobs even before graduation;
  - continually receiving job offers after two years of teaching;
  - currently teaching 6th-8th grade technology in Washington Township School District.



Alex Chis-Luca is happy he changed his Major.



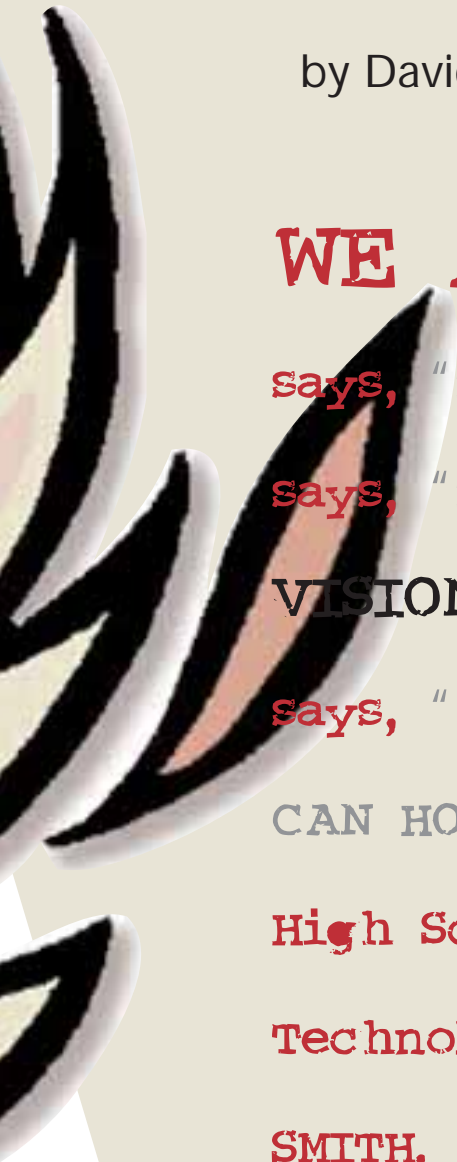
## TECHNOLOGICAL LITERACY:





# A Phoenix Risen from Its Ashes

by David Millson with Mark Smith



**WE ALL KNOW** that the pessimist says, "MY GLASS IS HALF EMPTY" and the optimist says, "MY GLASS IS HALF FULL." But the **VISIONARY**, beholding an empty glass says, "WHAT WONDERFUL THINGS THAT GLASS CAN HOLD!" One of the visionaries at Shiloh High School in Hume, Illinois, is Industrial Technology/WoodLINKS USA Teacher, **MARK SMITH.**



Shiloh Industrial Technology students represent their program at the 2002-2003 AWFS Student Competition in Anaheim Convention Center in California. From left to right, the students are: Paul Wilson, Emory Luth, Katie Weber, Heidi Kibbler, Brandon Draper and Adam Carrington. At right is their teacher, Mark Smith. Paul and Emory received their AWFS Finalist awards that year.

When Mr. Smith was interviewed for his current position in the last month of the '94-'95 school year, Shiloh's half-time metal/wood shop program was barely limping along. He was told frankly, "We have a program that is in decline. We want it to be better because our students need to succeed in an effective program in order to be employable."

This scenario has beset hundreds of schools across the nation as they confront the changes wrought by the expansion of trade – and jobs – to global proportions. Shiloh's story, however, takes on mythic proportions. From out of a rusty, dusty relic, Mr. Smith and his students, with the proactive support of school, administration and industry partners, created a first-rate wood-based Industrial Technology facility.

Today, Shiloh sends students out as interns in industry; places some graduates into production-grade jobs; and sends others into post-secondary and college study in fields ranging from design engineering to computer-animated graphics.

## THE VISIONARY

Though the old shop had been spiraling downward as a metal/wood shop, "My thing was woodworking," Mr. Smith

proclaimed, "and I prefer to concentrate on one thing and do it the best I can."

I knew I could teach problem solving, material handling, accurate measurement, product flow, floor management, and more, with any material. By using wood, we could capitalize on what woodworking tools were already there, add to them, and our students soon would be able to build complex projects that they'd be proud of."



Brock Duke, Chasidy Galloway, Dustin Watson and Ryan Nichols pose before a three-unit entertainment center built by the Production class for "paying customers," a couple in Sullivan, Illinois. All side components, shelf holes and the center section arch were toolpathed and machined with Mastercam. Once opened, the center section doors retract back into the cabinet for clear TV viewing.

What Mr. Smith *doesn't* say is that his own enthusiasm for the material and belief in the acuity of young minds would add an intrinsic factor of huge proportions in the growth of the curriculum. From the beginning, Mr. Smith felt that, "over time, the school would be proud of our students and they would serve as examples to the community of what our young people could do when given across-the-board support. I believe that if we can help adolescent students – kids at a very vulnerable stage in their lifetime development – gain confidence and feelings of self-worth from patently obvious results, we will have given them a gift for life."

Mr. Smith's goals for his students are nowhere more evident than in his influence on the school's present-day Industrial Technology Department Mission Statement:



*The new millennium is bringing about swift and dramatic changes in the industry and economy of the United States of America. Because of these changes, the education and career opportunities of the population are also changing. Due to the complexity of society and the advancement of technology, the individual's security in the workforce is best achieved by providing a foundation of practical education based on the knowledge and skills needed by businesses, industries, and communities in our society.*



Paul machined the tabletop contours, pockets and underside parts-locating pocket with Mastercam. Paul's first-ever entry in the 2002-2003 AWFS Student Competition, his table was selected for exhibit by an 8-person professional committee as one of the top 50 entries from all educational levels.

## THE EMPTY GLASS

Mr. Smith arrived at Shiloh High School in September of 1995 to a classroom that had nothing but drafting tables: no computers; a shop meagerly supplied with equipment, mostly moldering in a storage area; and what little they *did* have was in bad condition. Though aware that the shop was in total disrepair, School Board members and others who interviewed him shared Mr. Smith's high hopes for breathing new life into the program.

"When school started," Mr. Smith recalls, "I was going to build our shop literally from the ground up in partnership with the students." These students, who in years past had been treated like characters in "*National Lampoon's Wood Shop*," would now have "sweat equity" in a modernized and industry-respected program.

"We cleaned the shop first," chronicles Mr. Smith, "and we rebuilt machines that weren't performing properly: an 8" joiner and the table saw. We adapted a maple lab tabletop into a double-sided 5' x 5' router table and ordered some small hand tools. That first year we also purchased a 37" surfacing sander. Together, we got our shop up and running to the point where we could do more than just build a bird house; we wanted to build things like coffee tables and living room furniture!"



A year after completing his glass-topped coffee table, now-junior Paul Williams inspects the routed top for one of two end tables he's making to complement the original.



## FILLING THE GLASS WITH PERFORMANCE

“In the first few years,” Mr. Smith relates, “our students did superior work on fix-it projects around the school because we didn’t have all the equipment to do the elaborate projects we were aiming toward. The very first year, they accomplished the equivalent of \$10,000 in repairs for the school.” Their investment of time and talent, backed by Mr. Smith’s ingenuity, gained them the reputation among their fellow students as helping to make school better. They worked at keeping it in good shape despite the damage done by others and soon that, too, was stopped when the perpetrators realized they could be part of the positive school image Smith & Co. were establishing.

“We started making a yearly report to the school board outlining the accomplishments of the program,” Mr. Smith continues. “The students also began making items such as mantle clocks to give to people who had helped the program. This generated good will in the school district and community.”



IT student-made cabinets create the workspace for a fifth Family and Consumer Science classroom. This project was the beginning of Industrial Technology’s trust relationship with the school administration, built on timely and professional completion of school improvement projects like this.



Considering space constraints against the equipment necessary for efficient, up-to-date library operation, Industrial Technology students created this functional yet attractive multipurpose unit over the summer of 1998. This was a year before Thermwood and Mastercam.



Cole Grafton, John Myers and Taylor Craig, all currently Parkland College <http://www.parkland.edu/est.html> students, show off Shiloh IT pride with a new school sign they made in CAD/CAM class in the 2002-2003 school year. Cole is the first First Semester Parkland College IT student ever to be given an internship at Frasca International (<http://www.frasca.com>), designers and manufacturers of simulators for all types of aircraft and training tasks.



## MAKING THE DEAL

The 1998-1999 school year was the first for the district's new superintendent, Dr. Mary Bourne Cerra who, Mr. Smith reports, was also quite the visionary. Dr. Cerra allowed Mr. Smith's students to begin working on projects other schools might have considered overly complex.

At the time, Shiloh had four Family and Consumer Science kitchens in operation but the school had been built with room for six. Making the cabinetry for the fifth, which the administration hoped would help the FCS curriculum flow more smoothly, would require – for starters – a shaper. In addition, Mr. Smith proposed a fine unit for the school's librarian: a cube-shaped desk with paneled construction, baseboard, and crown molding. Armed with these school improvement projects, Mr. Smith struck a deal with Dr. Cerra: If the school would buy the shaper, Mr. Smith guaranteed that his students would earn money to pay back the cost. It must have been an offer the administration couldn't refuse because Shiloh got its shaper, its new kitchen cabinets, and the students paid back their half from the profits of their first job.

### Job?

Oh. We didn't mention the hidden agenda here: With the shaper at the ready, Mr. Smith could teach his students how to build the cabinets. But he had sold the cart before the horse and now he had about a month to research how kitchen cabinets are to bring the whole "deal" together.

## A QUICK STUDY

"In 1998 I went to cabinet manufacturers and other craftspeople for information and help with learning to design and build professional quality cabinetry," recalls Mr. Smith. "After building kitchen cabinets for two school years, in 1999 our program moved toward the next phase: purchasing our Thermwood CNC Router and acquiring Mastercam®. I spent two days at the Thermwood facility learning to use Mastercam with their router."

"We now cut all upper and lower *corner* cabinet side, tops, shelves and decks, and all upper and lower *along-the-wall* cabinet sides on the Thermwood. I still like to reserve the remaining straight-wall cabinet pieces for beginning students to cut on hand-fed power tools – partly so they can

begin to participate in major projects and also so that we are using all of our tools during the school year." Mastercam-toolpathed operations included cutting contours, dados, moveable shelf-pin holes, and rabbet joints. "Today," Mr. Smith says, "if we have a customer who wants a unique cabinet, we just design and toolpath in Mastercam. Routing a distinctive cabinet shape couldn't be simpler."

Over the summer of the previous year Mr. Smith and a small student crew installed a dust collector in the shop. Before then, production volume was nonexistent; now, students were tracking sawdust all over the school. The following summer, Mr. Smith recalls, "We cut over 200 sheets of plywood and raised LOTS of dust – so the dust collector improved relations with the school's custodial staff as well as improving our working environment."



This section of the cabinetry built for a couple in Naperville, Illinois, is graphic proof of Mr. Smith's drive toward professional-quality production.

"After we built the school's first cabinets, we created a set for Carol and John Edstrom, my sister-in-law and brother-in-law, in Libertyville, Illinois. We charged them cost plus enough to pay back our half of the shaper. We also were able to add a new table saw and additional hand tools. We were well on our way to assembling a fairly nice manufacturing facility."



## WOOD GETS AROUND

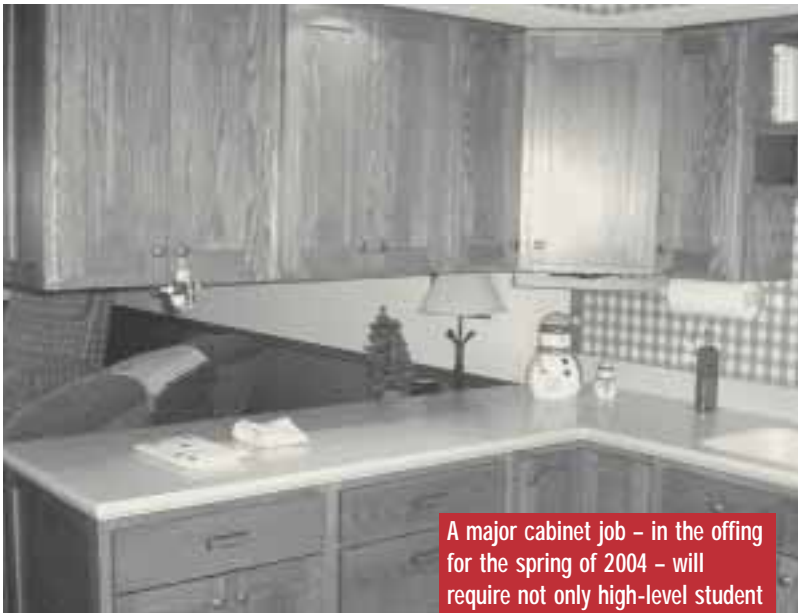
Word of mouth spread the message that individuals could get new, high-quality kitchen cabinets for cost plus a \$2,000 donation to the Shiloh build-a-shop project. All cabinets were built with top-of-the-line materials: Blum hardware (Blum specializes in concealed hinges and drawer systems), plywood construction, dovetailed drawer boxes, five-piece raised-panel doors, and *real wood* interiors and shelves – *no* particleboard. For Mr. Smith, “This is manufacturing technology at its best. It has to be, first, because we’re teaching; secondly, it would be a community relations

disaster to ask a homeowner for \$6,000 for cabinets built by high school students unless the results were top-of-the-line.”

Students custom-measured each job, built the units in Production class, and then installed the cabinets in their customers’ homes. “We soon developed a backlog of work,” Mr. Smith recollects, “and over the past six years, we have had at least two to three people on our waiting list. We have installed jobs as far away as 200 miles but, typically, we work within a 50-mile radius.

“When it’s time to install, we set up a firm date. The students know the job has to be done as scheduled: the customers have already yanked their old cabinets out!” The student/teacher crew shows up on a Friday morning and they drive back home or stay over in a hotel, then meet back at the job site on Saturday to finish the job.”

On more complicated installations, professional installers are hired for additional help, since the student crew does not work on Sundays and must be back in school on Monday. One such job will feature 35 cabinets: complete kitchen, laundry room, three baths, and a built-in buffet in the living room. “Hired hands” will install all but the kitchen, which the students have reserved for themselves.



A major cabinet job – in the offing for the spring of 2004 – will require not only high-level student performance but also professional help to complete the installation of 30+ units in a timely fashion so that the job doesn’t interfere with the students’ study/class time.



## MAKING IT WORK

Soon after installing the first cabinet job, Mr. Smith contacted Simington Windows, of Paris, Illinois. A very education-minded company, Simington frequently donates materials and funds to technical education. They also have had good experience hiring high school Tech Ed students so they know their investments result in a better worker pool.

In 1999, Simington allocated \$3,500 to Shiloh for the purchase of two seats of Mastercam. This was also the year that Mr. Smith began to work with the District Board and Superintendent to purchase a Thermwood CNC Router Model 40. The students committed to generating half of the cost of the router, for which the school has already paid with the help of a deep discount from the manufacturer. Three students went with Mr. Smith to Thermwood’s Dale, Indiana, headquarters for a week of intensive, on-site industrial CNC training on the Model 40 that summer.



Student-built elementary classroom shelving.



Emory Luth prepared this extendable headboard (shown in its double-bed position) as his first-ever entry at the AWFS show in 2003. It was among only 50 from secondary through college levels selected for exhibition.



Paul Wilson, whose French provincial table achieved for him first-time-out recognition at AWFS, displays a Rococo mirror frame he Mastercam/Thermwood-routed from four pieces of African vermilion (padouk) cut and fixtured so that the grain is vertical throughout the assembled piece.



Industrial Technology/WoodLINKS USA Teacher Mark Smith stands proudly as Mark Luth and Paul Wilson display the WoodLINKS USA certificates they received at the 2003 AWFS show. Shiloh High School was the first in Illinois to become a WoodLINKS USA center.

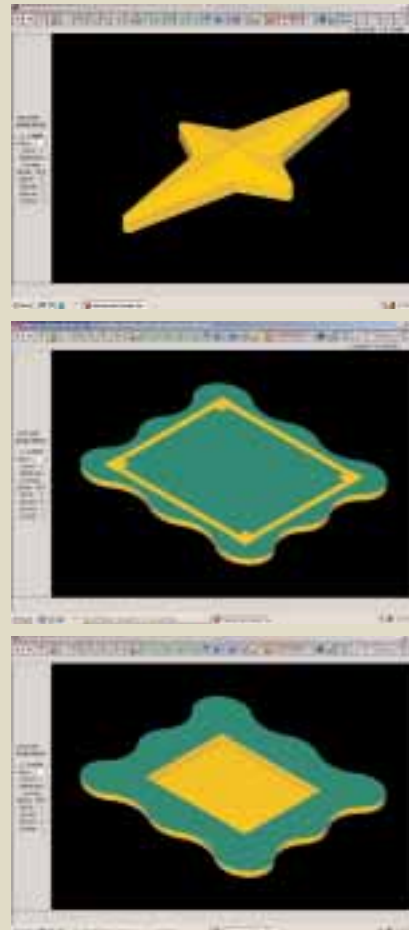


Mr. Smith reports that, as of this printing, the students' balance from their original \$20,000 commitment is \$6,000; the next three cabinet jobs will pay off the bill. "We use the router, programmed by Mastercam, in all of our manufacturing, production, and CAD/CAM classes," says Mr. Smith.

## RAMPING UP THE PROGRAM

By the fall of 1999, in addition to the Thermwood and Mastercam, the shop had most of the basic wood

manufacturing tools including a pocket hole machine, saws, and sanders, and Mr. Smith began teaching AutoCAD. The Shiloh administration was very excited about the technical and professional advances Mr. Smith and his students were making. So were many community people and, of course, the parents of the "industrial arts" students. Dr. Cerra suggested the feasibility of a summer program to add greater scope to the program while filling school-related needs. Thus was born the Industrial Technology Department.





As with the building of most new schools, some items on the wish list for this K-12 school were cut for budgetary reasons. Though every classroom was built with a 2' recess in one wall to receive 20" x 8' shelving units, no shelves were installed. Mr. Smith met with the faculty and worked out a uniform design for all the rooms. Mr. Smith prepared a bill of materials and presented it to Dr. Cerra, who met with District Board and authorized hiring four of Mr. Smith's best students.

The Classroom Cabinet Cadre worked from the first day school was out for the summer until just before classes in the fall. They built shelving units in 4 elementary school rooms; a full set of cabinetry and shelving for the art room; a new school podium; and new service desks for three reception areas. They also built a spray room within the shop area.

"Then, during the 2000-2001 school year," Mr. Smith reports, "we formed an Industrial Technology Advisory Committee composed of local business and community leaders, school administrators, parents and students. We are hoping to generate ownership, direction and support through this committee."

## THAT WAS THEN...

Today, Shiloh High School's Industrial Technology program offers eight different CAD/CAM programs but our major focus is on Mastercam and AutoCAD. The eight are included in three levels of AutoCAD; three levels of Manufacturing Technology; two levels of Production; and one level of CAD/CAM. Our CAD/CAM class teaches machine code and Mastercam toolpathing, as well as the basics of CNC machine operations.

Students who advance to the upper level of AutoCAD spend their class time learning and working for the school district, local businesses and contractors producing architectural drawings and shop drawings. And students learn many additional marketable skills in the manufacturing classes. By the end of each year, students have a project they can take home as an example for their families of the quality of their work.

The CAD/CAM and Manufacturing classes prepare students who have had both the computer side of study and

the hands-on shop classes for our two Production classes. We have expanded and solidified the program so that we continue to build custom kitchen cabinets for homeowners locally and around the state each year, *raising thousands of dollars for our program*. The students face many of the real-world challenges and pressures any company would face, among them material handling, safety issues, quality control, time management, precise measurement, preparation processes, combination processes, materials selection, coating technology, and customer service.

## UP AND OUT

Now that the Industrial Technology program had the means, backing and experience to give students a comprehensive secondary technical education, Mr. Smith felt it was incumbent on him to go one step further. He wanted to begin to place graduating students in construction or wood manufacturing work so, as he put it, "they could get paid for the skills they had learned – earning a living doing the kind of work they enjoy." He also encouraged those who showed aptitude and interest in further education to apply for post-secondary and/or degree programs.

Mr. Smith remembers, "It took some time to show results because I had made no further industry contacts than the people from whom we bought cabinet materials, software and equipment. I started spending lots of time e-mailing, phoning, and sending letters to every manufacturer, every educational entity – anyone I could think of – in order to develop relationships that could lead to placement of our IT graduates. I was also looking for industry partners in current-use areas: field trips, technical support on machine set-up, software, additional materials, technical know-how, etc."

## JUMP-START!

Student job placement began slowly as a result of Mr. Smith's contact base but the limited range of his personal resources frustrated him. Hoping for a boost, he decided to go to woodworking industry trade shows. During school year 1999, Mr. and Mrs. Smith attended their first, what Mark called "Industrial Strength Woodworking Show," in Wisconsin.

"I was walking around the show trying to develop relationships one-on-one, when I saw a booth for



WoodLINKS – a national organization that started in Canada and was migrating into the US. According to its Web site [www.woodlinks.com/USA/home.html](http://www.woodlinks.com/USA/home.html),

*“WoodLINKS is a non-profit society created to respond to the wood industry's need for better-qualified, entry-level employees. Its mandate is to ensure that students, teachers and parents are knowledgeable about the value-added wood industry and the career opportunities it provides. WoodLINKS works with high schools, post-secondary institutions and industry to develop wood manufacturing programs in schools, and provide practical training opportunities, career counseling and information for students and teachers”*

Mr. Smith was VERY excited thinking about having their clout behind him. Representatives there introduced him to what was then “Wood-in-the-Box,” a CD-ROM-based woodworking curriculum (now at [WoodLINKS Curriculum](#)), plus other materials highlighting the woodworking industry and its opportunities for students. In the summer of the 2000 school year, Mr. Smith received a call from Larry Hilchie of WoodLINKS in the US. Mr. Hilchie volunteered as the organization’s leader on top of his full time job. This kind of personal commitment gives some indication of the seriousness of purpose of the organization; woodworking manufacturers desperately need people with manufacturing skills, among them CAD/CAM-trained people, if they are to regain their competitive position in the world market against cheap offshore labor.

Mr. Hilchie invited Mr. and Mrs. Smith to the Association of Woodworkers and Furnishings Suppliers (AWFS) show in Atlanta. There he stood amid, as he put it, “monster floor space.” We walked around for three days, all day, and saw only three-quarters of the show. It was a real eye-opener; I saw processes there that were completely new to me.”

“We attended WoodLINKS USA meetings and met some of the organization’s movers and shakers. We listened to them and heard the industry leaders serving as guest speakers. We also learned what practical steps were needed for Shiloh High School to become a WoodLINKS USA site. We were

excited because of the potential WoodLINKS could offer our program and, once we began to use their resources and curriculum, what that would do for our students.”

## LINKING UP

Shiloh High School’s Industrial Technology Program became the first WoodLINKS USA high school site in Illinois. Mr. Smith is certain that the information and leverage gained from the organization will help him reach the Industrial Technology Department’s goal of linking education with industry. He says, “Our students will be exposed to exciting careers, receive national certification recognized by industry, and obtain jobs right from school, or a preferred standing in post-secondary programs. WoodLINKS USA donations of equipment and supplies will assist students to connect with post-secondary wood programs.”

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- Dick Wilson, Instructor  
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Four of Mr. Smith's students received their WoodLINKS USA certificates during the 2002-2003 school year. Two of them, Emory Luth and Paul Wilson were selected to exhibit their work in the AWFS Student Design Contest and received their WoodLINKS USA certificates at the banquet honoring all the AWFS award winners on August 1, 2003.

### ...AND MORE TO COME

Indeed, it has already begun. Mr. Smith pursued the WoodLINKS USA opportunities and made contacts with woodworking industry leaders; he was like a politician on the campaign trail. His energy seems boundless... and there is yet more of his odyssey to be revealed in Ties Online in June. Some highlights:

- Students caught Trade Show Fever from Mr. Smith and began raising funds to attend and participate at the student level in shows around the country.
- Shiloh has been offered a CNC Point-to-Point Router *free* and can't find a place to put it. James M. Aklin, the District's current superintendent, has encouraged Mr. Smith to find support for building an addition onto the shop in which to put the Point-to-Point and other future items. "If we can fit this new piece of technology," says Mr. Smith, "we will be able to start teaching the manufacture of 32mm cabinets." Mr. Smith promises to highlight the importance of teaching to the 32mm standard in our June report
- Emory Luth continues at Shiloh during this 2003-2004 year and has embarked on an ambitious project: his original design for a *moderne* table [Photo #18] with compound-curve drawers and top. His project requires independent study of the shaping, jig making, materials selection, complex toolpathing, and adhesive techniques necessary to create a piece of professional quality furniture.

Mark Smith has become a man with a mission, one he wants to share with as many other Technical Education professionals as possible. In June, we'll flesh out helpful details of Shiloh's IT evolution and follow Emory Luth's Louis XVI project which he began in preparation for the 2004 AWFS Student Design Contest. Despite the organization's recent decision to exclude students at the

secondary level, Emory continues his research and practical experimentation... in pursuit of his Personal Best.

And, perhaps through some timely feedback, in June we can learn of more teachers who have been handed a decrepit shop – a pile of ashes – and watched it take flight like a Phoenix: a new, viable Technical Education curriculum dedicated to student success. Please let me hear from you.

*David Millson, copyman@gmavt.net.*

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# INTRODUCING:

## Pro/DESKTOP Version 8

PTC has created a powerful new version of Pro/DESKTOP, the 3D design software that is being used by more and more design and technology teachers around the world to help young people achieve technological literacy.

by **Stephen Yaffe**

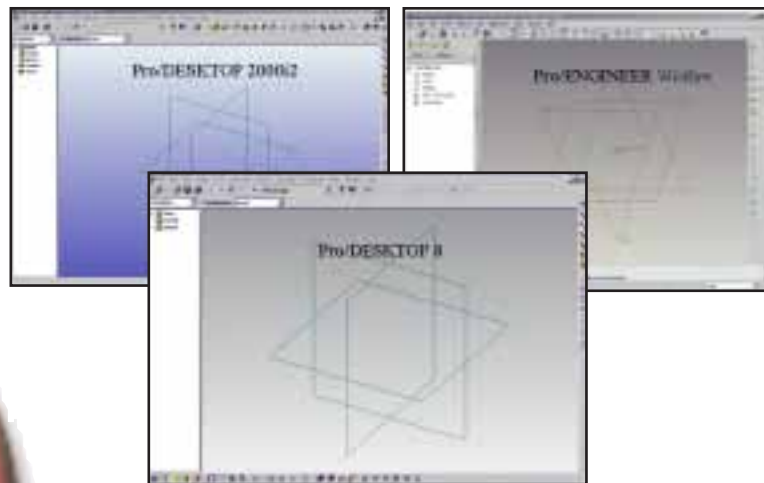
Pro/DESKTOP trainers have already begun providing their classes with the new version. Teachers who are currently using Pro/DESKTOPi<sup>2</sup> will receive Pro/DESKTOP 8.0 discs in the New Year.

### Getting started.

This article highlights the new features that make the new Pro/DESKTOP 8.0 so easy to use. First, it is important to note that **before you install Pro/DESKTOP 8.0, you must delete any previous version that is on your computer.**

### 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.



Pro/DESKTOP 8.0 integrates many of the qualities of PTC's Pro/ENGINEER Wildfire. The first thing you will notice when comparing Pro/DESKTOP 8.0 with the previous version is the new default colors of the screen. Gone is the familiar blue fade we are all so used to. The gray scale of the design field now more closely resembles Pro/ENGINEER Wildfire.

An exciting innovation is that parts designed in Pro/DESKTOP 8.0 can now be opened and fully manipulated in Pro/ENGINEER Wildfire. You can even combine parts from Pro/DESKTOP 8.0 and Pro/ENGINEER Wildfire into an assembly maintaining all meta-data like part color and density. Pro/DESKTOP 8.0 can also build an assembly containing both Pro/DESKTOP and Pro/ENGINEER

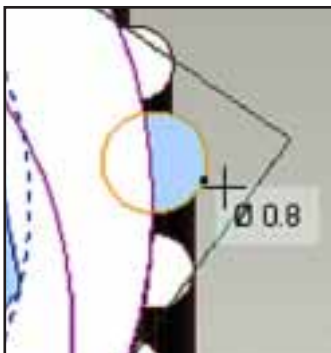
Wildfire components, and the latter will remain Pro/ENGINEER Wildfire parts. This is called a heterogeneous assembly.

## Same part, different programs!

Pro/DESKTOP 8.0 also boasts a greatly improved **palette**,

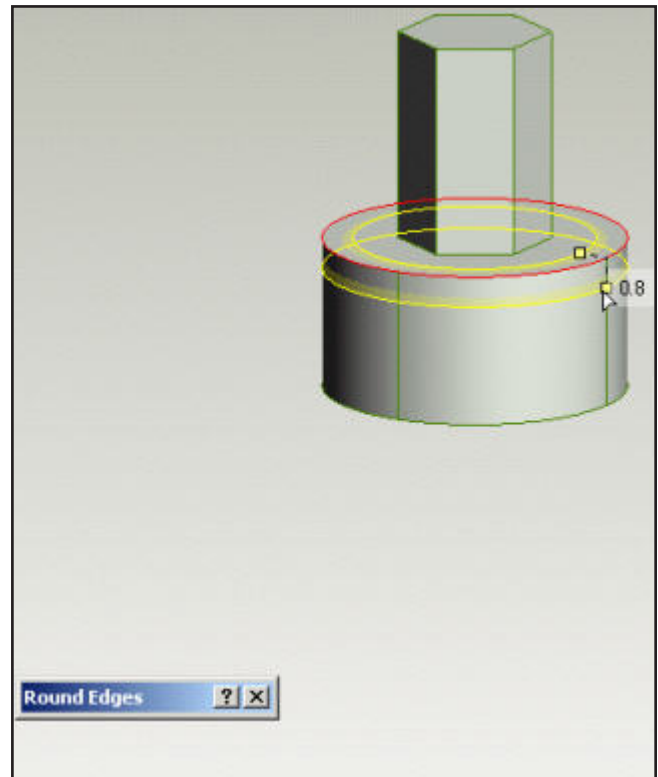


employing extensive use of drag- and-drop elements. Now entire assemblies can be quickly and easily created by choosing items from these menus and putting them together. Pro/DESKTOP 8's new **palette** represents a major step forward in conceptual design.



Another advance that greatly improves the user experience is the arrival of **real time numeric feedback** right at your cursor – making it possible to sketch simple profiles without adding sketch dimensions. This 'cursor text' allows the user to capture his or her design concept quickly and accurately.

*In this example, you can see that the diameter is .8".*



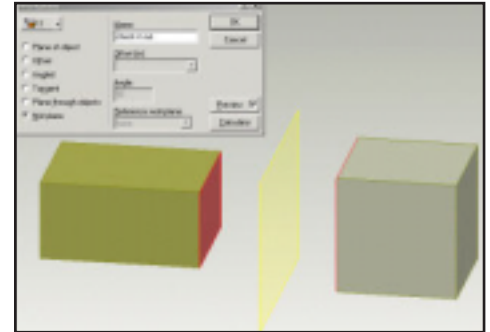
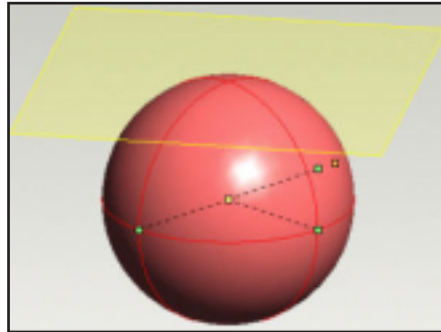
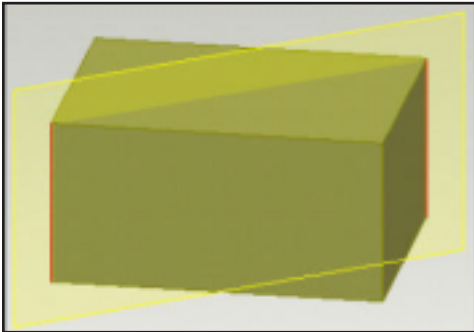
**Auto-shrink dialogue boxes.** These simplify commonly repeated steps like extrusions while increasing your design field real estate. Now you can either enter the values you desire or drag the handles and simply press **enter** to accept the modification. You can also use the middle mouse button to accept the changes.

**Thumbnails.** You can view files before selecting them for opening or assembly. Thumbnails provide a visual and instant confirmation of Pro/DESKTOP design file contents and are available in File>Open, Add Component. The thumbnails are also visible in Windows Explorer.





## Improved workplane creation.



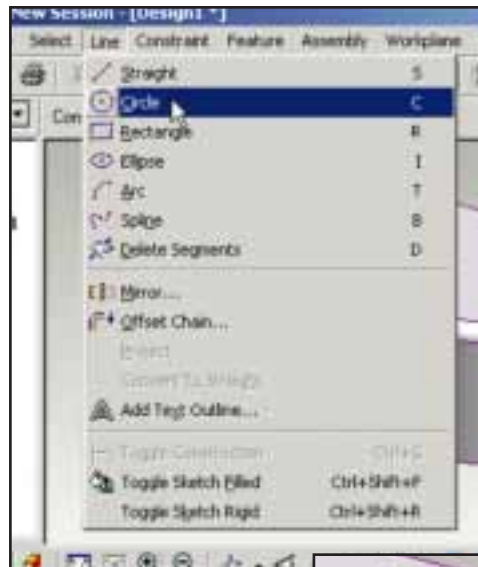
This applies even to workplanes tangent to cylindrical and spherical objects. With the default setting showing workplanes filled, it is much easier to visualize workplanes as you create them, visualizing distances and angles in relation to selected objects. You can also delete workplanes if you want to.

**Improved View Manipulation.** All view manipulation is now controlled by the middle mouse button (for 2-button mice, hold down both buttons simultaneously).

- Hold down middle mouse button (MMB) for rotate
- **Ctrl+MMB** for zoom. The zoom is centered under the cursor. The wheel of a wheeled mouse can also perform the zoom
- **Shift + MMB** for pan
- **Ctrl + Shift + MMB** for turn (rotate in plane of the screen)

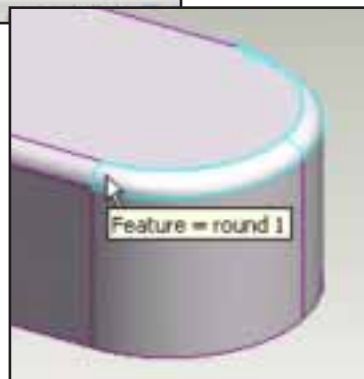
If you have geometry selected with this manipulation option, the following happens:

- Select a straight line the rotate axis is the straight
- Select a Circle or Arc the rotate is around the axis of the circle/arc
- Select a plane the view rotates about the center of the plane
- Select a Cylinder, Cone or Torus. The rotate is about the axis of the face/surface
- **Ctrl + MMB click** zooms in by a factor of 2
- **Shift + MMB click** drags the point under the cursor to the center of the window



**Icon images in dropdown menus.** These make it easier to learn shortcuts for sketching tools and other menu items. New icons have been added for various menu options, including **Toggle Sketch Filled**, **Mirror...** and **Offset Chain**. These icons

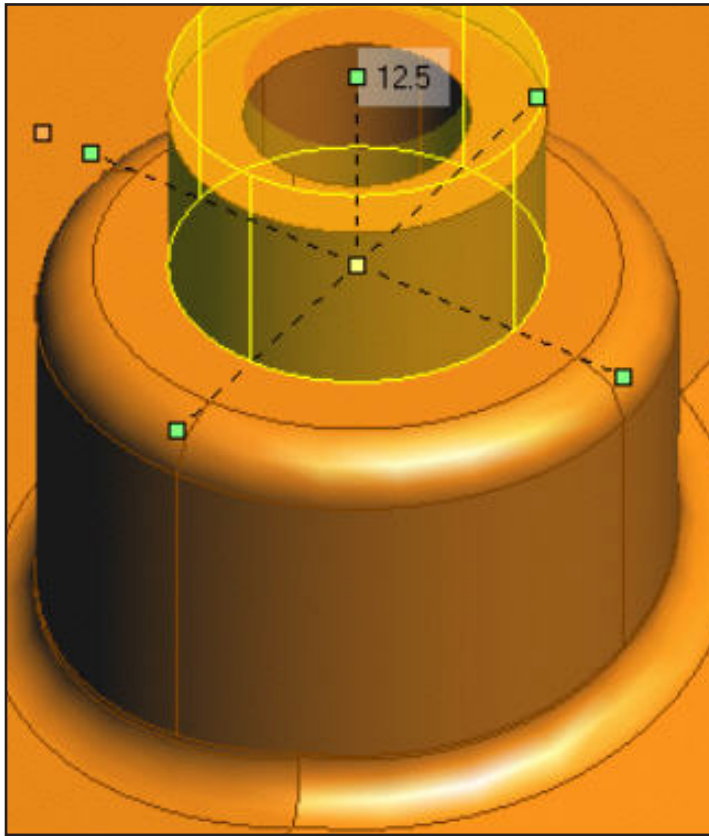
represent a significant advancement in ease of use, especially for students new to Pro/DESKTOP.



**Double-click activation.** It has always been the case that double clicking on objects in browser activates objects in design field. Now double clicking on lines in the design field also activates that sketch, saving you mouse movement and time.

## Cursor based object identification.

In the event that you neglect to name features during the design process, Pro/DESKTOP 8.0 presents a sanity-saving innovation. Now you can simply allow your cursor to hover

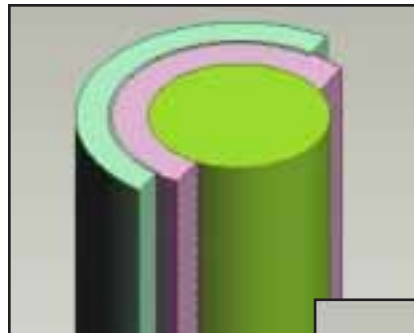


over any object and a small text box will indicate the name of the indicated object. It is important to remember that you will still need to stipulate what kind of object you are looking for, i.e., **part**, **feature**, **face**, etc.

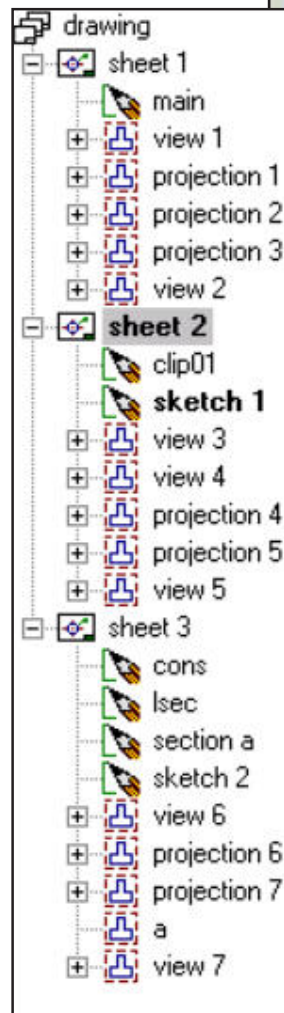
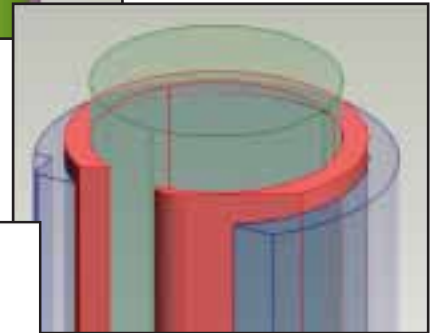
**Extended use of feature handles.** Once you select a feature, you will access all variable dimensions. These will be governed by a series of “handles” that allow for lateral and vertical adjustment in addition to a new rotation parameter.

**Material List.** Pro/DESKTOP 8 has a pull down list of materials, and automatically sets material properties like density, thermal coefficient and conductivity.

## Drag and Drop Sectioning.



You can take a slice out of individual components used in an assembly so that you can look right through it when fully assembled.



## View Transparent.

Pro/DESKTOP 8.0 has a greatly improved transparent view option that enhances viewing pleasure.

There are several improvements in the **Engineering Drawing** file type of Pro/DESKTOP 8.0.

**Dimensioning.** Now you can point-to-point dimension directly to a corner. Additionally, you can dimension to side-on cones. And you can redefine dimensions on drawings if they become invalid.



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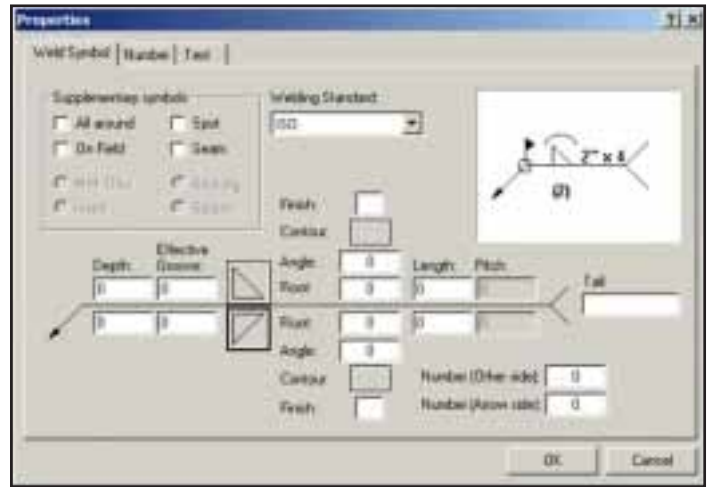
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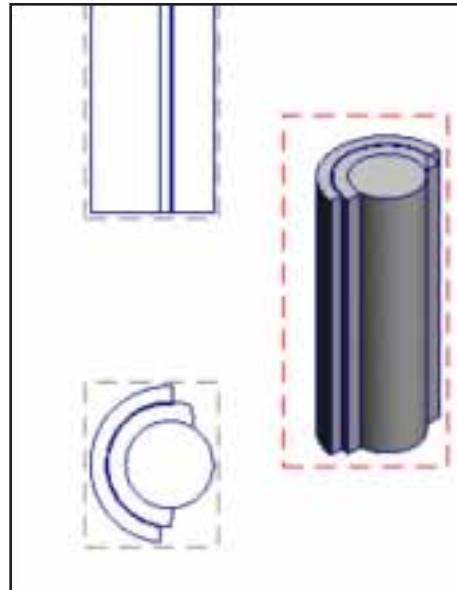
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## New symbols for Welds!



You can now add shading to drawings to improve visual understanding.



## Multi-sheet capabilities.

These have been added so you can coordinate orthographic of complex assemblies.

As you can see, Pro/DESKTOP 8.0 represents an advance that both teachers and students will enjoy. Good luck and have fun!



To learn more about securing a FREE Pro/DESKTOP license for your school, go to [www.ptc.com/go/schools](http://www.ptc.com/go/schools).

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# PAPER ENO

## A Tech Unit That's Challenging and *FUN!*

*Ties Magazine* has had the privilege to have staff members observe Ed Goldman's classes at Brooklyn Tech. His courses really are challenging, fun and engaging. To help you understand what this unit looks like we have incorporated movie clips of student work. It is the first time we've tried this technique, so please give us feedback on how well the clips worked at your end and how helpful they are in illustrating the article. We have also included some pictures from an excellent resource book *The Elements of Pop-Up: A Pop-Up Book for Aspiring Paper Engineers* by David A. Carter and James Diaz. Ed Goldman has it as a reference for his students. It certainly helped the editors at *Ties* to understand the various folds. We purchased it through [amazon.com](http://amazon.com).

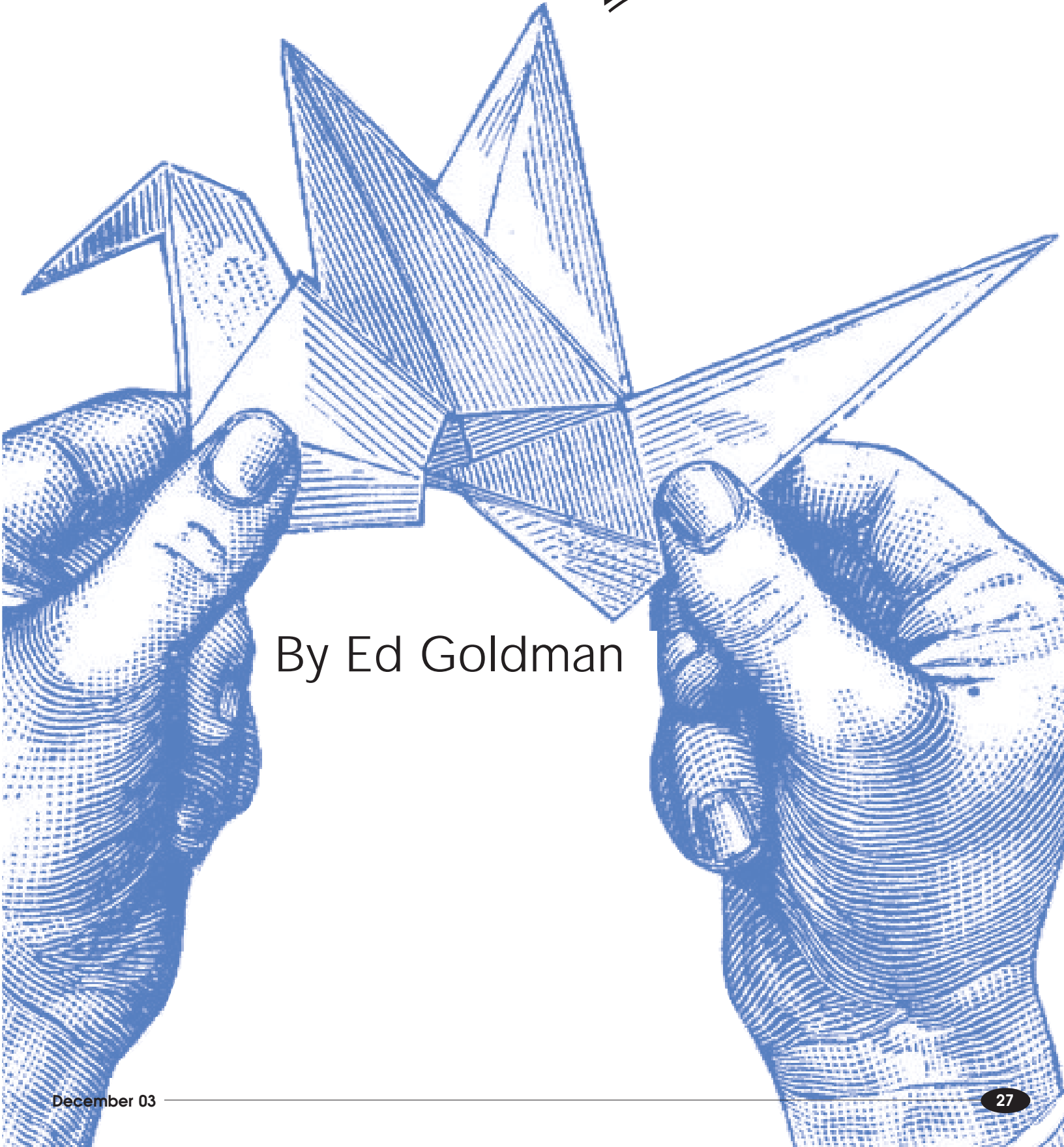
Pop-up books have been around for a long time. Though historically they were made for young and old, for most of the twentieth century the audience was almost exclusively children. That changed as a new community of "paper engineers" emerged. Their work combines complex mechanical systems with vivid color made possible by modern printing technology. On occasion, as for example with *The Pop-Up Book Of Phobias*, even the intended audience has changed from children to adults.

### THE PAPER ENGINEERING UNIT AT BROOKLYN TECHNICAL HIGH SCHOOL

The paper engineering unit at Brooklyn Tech is incorporated in our 9th grade "Introduction to Technology and Engineering Design" course. With its emphasis on developing observational and design skills, the unit is a perfect fit. It builds upon units introducing freehand drawing, graphic



# ENGINEERING:



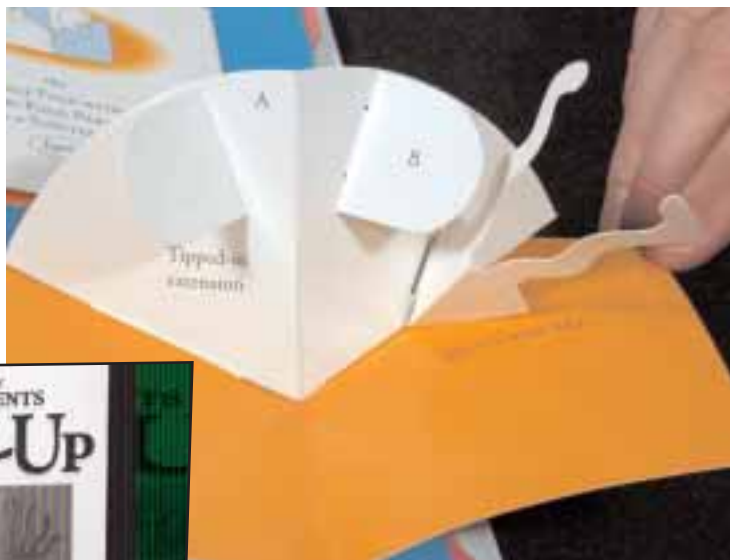
By Ed Goldman



# PAPER ENGINEERING:

design (School Club Poster Design Challenge) and structural design (Cardboard Chair Design Challenge). It combines an introduction to color with an extended investigation of mechanisms including levers and linkages, pivots and slides.

The unit runs approximately nine weeks with daily classes of 43 minutes. More than a few people have asked why I devote so much time to a single topic. In fact, a few years ago I would have asked the same question. The answer is that without a substantial amount of time to develop skills and understanding, the students always found their final work less than satisfying. The trick then was to keep the work interesting.



Over the nine weeks, students have the opportunity to work at varying degrees of difficulty and sophistication. The content is varied, including an investigation of color and activities about “looking and seeing more.” The most important activities involve learning about and working with the pop-ups and paper mechanisms. These are introduced gradually, with each becoming more complex and requiring greater expertise to construct. Medial deadlines with “mini” design challenges are set as we progress. The culminating task is to create a small pop-up book that demonstrates what the students have practiced and learned.

We introduce this challenge during the last two or three weeks of the unit. Click here for the page: [Engineering Design’s Challenge](#).

## AN OVERVIEW OF THE UNIT

In the fall semester, we spend a lot of time exploring and experimenting with two-dimensional design in the form of posters and static mechanisms through designing a cardboard chair (see Ties, September 2002, “Chair Design” article). In the spring, we begin with freehand drawing (focused perspective, shading and drawing from life). We continue to work with the students on developing their observational skills. (This is, obviously, a major theme of the course.) We follow this with a brief introduction to color theory (the color wheel, analogous color, warm and cool and how color affects our understanding of depth). Both of these topics lead directly into our paper engineering, and students are expected to incorporate these concepts into their pop-up compositions.

## THE PEDAGOGY

We take a constructivist approach to learning, giving students a lot of time and materials to explore, experiment with, and make their own sense of how each system functions. Students work in design teams, questioning, sharing, and explaining to each other. But each student does his/her own work and keeps a record of it. The students use words, schematics and mathematics wherever possible to describe the input and output motions and the links and movement connecting them.

The class comes together regularly to sum up and critique work, to pose questions and to get clarification. During strategically planned lessons the teacher introduces new forms and mechanisms, tools and materials, and technical explanations. The teacher also uses these occasions to review concepts and principles underpinning the designs that the students are exploring such as explanations of the geometry and algebra behind the mechanical principles and rules relating to the use of color.



## THE PROCESS

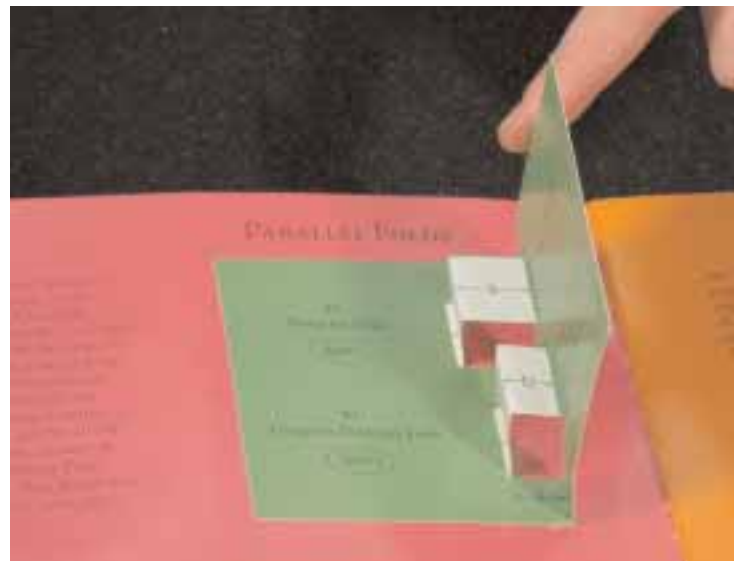
The paper engineering unit begins with a brief (3-4 day) exploration of the 90° pop-up form, most commonly found in greeting cards. Students gain some familiarity with the basic technical terms (tab, link, linkage, pivot, input, output, gutter, etc.), start making schematic drawings of their linkages, and begin to investigate the geometry of their pop-ups. They also gain important experience working with the tools and materials and the relatively small scale of the work. Each student produces several experiments, each accompanied by a schematic drawing and explanation of the pop-up as a system (input, process and output.). A culminating mini-challenge requires students to produce a “busy” 90° pop-up using warm and cool colors, value changes and other graphic tools to enhance the visual depth. (A variation of this requires that only analogous colors be used.) The linkages must also be compounded so that link motion is actuated through a linkage rather than having every folded linkage directly connected to the non-fixed (moving) base page.

The students are required to make a schematic drawing and write an explanation on the back of every experiment type they complete. The teacher may also require the students to complete a summary sheet, similar in format to a test, to record their understanding. All are encouraged to experiment with as many different forms as possible. It is understood that most students will not have time to try every form. Thus, a lot of sharing takes place within each design team.

The learning (and the fun and frustration) comes with the experimentation. The students set their own pace. Each new form presents a new challenge and the level of difficulty increases as the work moves forward. The creating becomes its own reward.

Samples of each pop-up form and mechanism are available for the students to study. The students, in turn, are encouraged to copy as many samples as possible. They may make

an exact copy, or they may alter things as simple as the shapes and colors. Most quickly begin to make the samples their own by experimenting with different folds, lengths and angles, and methods of assembly. Using forms in original combinations is a common way that students reinvent the experiments and make them their own.



The “pop-up” books that are out everyday provide a second source of information and inspiration. Students are encouraged to work at analyzing the linkages and to copy as many experiments as possible. In this way they



# PAPER ENGINEERING:

build a technical vocabulary that they will use in subsequent experiments and in the final challenge.

We spend about three weeks experimenting with the more versatile 180° pop-up form. With these, the base pages open flat. This allows for greater output motion or the seeming growth of structures that can be made to look like animal faces or story scenes. Each pop-up form has a name such as “double angle fold”, “parallel plane”, “tent”, and “tipped in extension”.

We spend another ten or more days working with black box systems made from heavy card stock (or tag board). Students create slides, levers, linkages and wheels. They learn about the connections necessary to transfer and transform motion from input to output. They are challenged to create complex linkages that, for example, can convert a horizontal reciprocating input to a vertical oscillating output. Many find the explorations in this part of the unit the most interesting, challenging and satisfying.

## ASSESSMENT

We employ a variety of tools in our assessment of the students and their work. We look for quantity, variety and quality in the student work. The depth of each student’s understanding is also considered. Evidence of each of these is found in the student’s collection of experiments and companion explanations. A culminating three page book project and a “Learning Portfolio” presented with it provides each student with an opportunity to sum up his/her work and his/her thinking and understanding about it.

Some teachers make use of written quizzes and other more traditional assessment tools. In every case the emphasis is on explanation and sense making rather than memorization and the production of the perfect product.

## THE LARGER PICTURE

The official title for this introductory class in design is “Introduction to Technology, Engineering and Design.” A full-year class, it replaced two single-semester classes in art and technology. In this new program we have helped students see technology as including everything in the human built environment. Among our objectives we seek to make the idea of studying technology attractive to more students and help to remove the gender bias often inherent in tech programs. We also hope the course redesign will help resituate technology at the center of learning in the school, a position that it had historically, but which has been diminished in recent years.

The classes are block and parallel programmed with English. The curricula of both classes emphasizes observation and seeing more, sense making, design, and the critiquing of design. We have worked to define a common vocabulary of language and process. Creating (with objects and with words) individually and in groups, and presenting these designed works are central features of both classes. The development and implementation of these changes has been supported by the Brooklyn Tech Alumni Association through its CARETECH Initiative.

Click to view 





## Paper Engineering Design Challenge

### The Challenge

Make a paper engineered book in which the pages are tied together thematically.

### The Specifications

1. **Structure:** The book must have a minimum of three pages. You may make as many pages as you like. If you choose to work with others you may combine pages. But each individual is responsible for creating his/her own three pages as defined in these specifications.
  - At least one page must be engineered to create a 3-D structure when opened.
  - At least one page must be engineered using folds to create the appearance of motion upon opening.
  - At least one page must be engineered using pull-tabs and/or wheels as input devices to create output motion not tied to the movement of the opening of pages.
  - There must be a cover with a title (which communicates the book's theme) and the author's name.
  - The engineer/artist's name, period and date of completion must appear on the back cover of the finished book. This information must be neatly printed at the top.
2. **Integrity:** All pages must be assembled as a book and must have a common theme.
3. **Aesthetics:** All pages must demonstrate good composition. You will be expected to justify your composition decisions based, at least in part, on our class discussions and experiments. (Refer to notes on composition.)
  - At least one page must use composition to enhance and/or exaggerate the sense of depth.
  - All pages must demonstrate an understanding of color. You will be expected to justify your choice of color based, at least in part, on our class discussions and experiments. (Refer to notes on color.)
  - At least one page must use colors in “analogous color harmony.”

### Assessment:

1. The books which will be critiqued based on:
  - The specifications listed above
  - The complexity of the engineering
  - The thoughtful use of color and composition
  - The successful development of the theme with pop-ups, images and/or words
2. The presentations, which will take place on \_\_\_\_\_.
3. The **Design Portfolio**, which will further demonstrate each student's understanding of concepts and design decisions.

## The Paper Engineering Learning “Portfolio”

This work will be considered your final reflection on what you have come to understand about the design of the pop-ups you worked on. Each person must complete this assignment.

This written presentation will be considered the report for this project. In its totality it should make clear what you learned, how you learned it, and how you came to understand what you needed to know to make a successful final paper engineering project. This work must be brought to the presentation along with your “book”

### Step 1 Work Selection

Look over all the work you have done since you began working with color and then pop-ups. Select the work you think represents the learning steps most important to you in developing the understanding and skills about mechanisms and appearance. You must use a minimum of three and no more than six pieces (experiments or other assignments).

### Step 2 Discussion/Written Presentation

For each piece of work you selected:

- a. Explain what you practiced &/or came to understand from this type of experiment or work.
- b. Explain how this understanding or skill influenced your final work.
- c. Identify where in the final work examples of this understanding can be seen.

### Step 3 Your Introduction

Your introduction may not exceed 250 words or one page. It should review the activities we did and the process you followed in learning about pop-ups and color. It may include your thoughts about whether you worked well and/or why this was a good or poor experience for you.

## The Presentation Format

- Your work must be assembled with a cover. The cover must include the information and follow the format shown on the back of this page. You may use color or add images. But the information must be complete and in the locations shown. The due date is \_\_\_m/ d/ yr\_\_\_\_\_.
- Discussion of work samples must be about the samples you include. They may be on the same page or on pages before the sample. Do not put all the “discussion” or written parts in one section and the work samples separated into another section.
- All writing must be typed and double-spaced.
- All pages must be the standard 8 1/2" x 11" size. All work smaller than the standard size (including any experiments) must be mounted on a standard sheet so that all pages will be the same size. There must be a 3/4 inch margin (or larger) all around the page. Margins must be the same size on every page.
- Every page of the portfolio must be numbered.
- There must be a blank page at the end of your portfolio.
- Your work may be presented in a folder or report binder.



## 180 Degree Pop-Up Rules Homework

Sketch Here



1. Why can or can't a tent pop-up be added to the side of a 180° tent pop-up?

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2. If you construct a tent with a “tipped in extension” (see diagram below) can the extension be tipped in so that the point at which links c & d come together is not in line with the gutter and the point formed by links a & b? Explain why or why not.

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3. In making a 180° angle fold pop-up, how does the angle formed by the 2 links above the base page (-a) affect the angle formed by the gutter and the fold between the 2 top links (-b)?

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## 90 Degree Pop-Up Rules Summary

Sketch Here



1. What can you now say about the length of links in all 90° pop-ups?

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2. What can you now say about the shape formed by links of 90° pop-ups (when observed from the end)? \_\_\_\_\_

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3. What can you now say about the angles formed by pop-up links attaching to base pages and/or links? \_\_\_\_\_

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4. What else can you now say about how to make 90° pop-ups? \_\_\_\_\_

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5. List other rules about 90° or other pop-ups that you have discovered.

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## Rules/Specifications For Moving & Structure Pop-Ups

Sketch Here



1. Vertical Motion From A  $90^\circ$  Double Angle Fold

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2. Vertical Motion From A  $180^\circ$  Double Angle Fold

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3. Horizontal Oscillating Motion Directly Transferred From The Base Page Through An Angle fold

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4. Horizontal Oscillating Motion Transferred Through A Link To An Angle Fold

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5. Two Horizontal Oscillating Motions In Opposite Directions

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# PAPER ENGINEERING:

Sketch Here



4. A Vertical Oscillating And A Horizontal Oscillating Motion  
In The Same Pop-Up

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5. A Structure Including An Angle Fold Built On Top Of Another Angle Fold

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6. A Structure Where An Angle Fold Moves Over Another Angle Fold

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9. A Structure That Forms The Shape Of An Animal (Real Or Fictional)

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10. Other Forms

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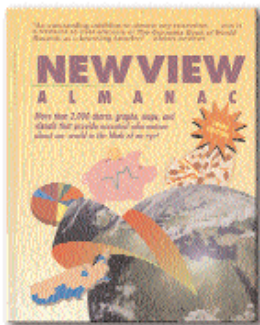


---

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Brooklyn, NY. His  
first *Ties* article,  
"Chair Design",  
appeared in the  
September 2002  
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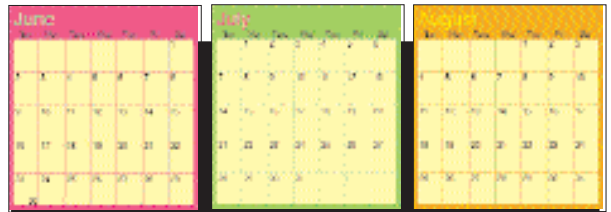


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ISBN 0471225568

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**February 2-6, 2004**

American Society for Engineering Education (ASEE) Conference for Industry and Education Collaboration, Biloxi, MS [www.asee.org/conferences/ciec20](http://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](http://www.iteawww.org)



**April 1-4, 2004**

National Science Teachers

Association National Convention, Atlanta, Georgia. [www.nsta.org](http://www.nsta.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](http://www.botball.org)



## NATIONAL RESOURCE CENTER CREATES VIRTUAL CLEARINGHOUSE

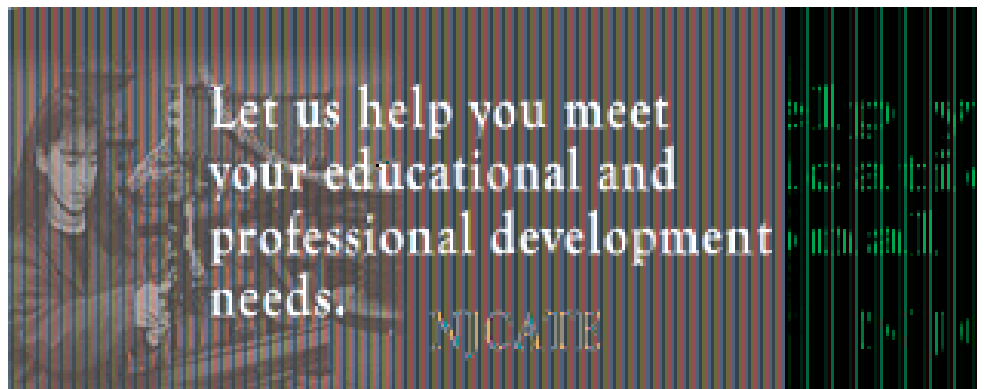
**NJCATE, A NATIONAL CENTER FOR** Advanced Technological Education at Middlesex County College in Edison, NJ has announced its latest endeavor, the National Engineering Technology Education Clearinghouse or NETEC, which will be operational in spring 2004. Funded by the National Science Foundation, NETEC is an electronic clearinghouse that will serve as a resource center for broad dissemination of exemplary engineering technology education program models, materials and pedagogical strategies, and will be available with 24-7 access to students, faculty and industry professionals. This four-year, \$1.5 million grant will provide the engineering technology community with the resources it needs to stay current and connected with the latest innovations and happenings in the Engineering Technology field throughout the country.

NETEC's reach and influence will be extensive. Through the clearinghouse, NJCATE will be in a position to continue its mission of advancing the state of engineering technology education. It is anticipated that the involvement of the engineering technology education community in this reform and improvement will be broadened considerably with ease of access to information, increased resources, and a common framework for faculty nationwide.

NETEC will help to foster the comprehensive, system-wide improvement of engineering technology that is needed to create broad and sweeping change. The clearinghouse will create a path of reform to follow where best practices can more effectively be replicated. Individuals and their institutions will be able to rely upon risk-free, electronic on-demand information, and personal assistance through linking institutions. Innovations that in the past, might have been confined to a single institution, will now be available to all.

program models and structures, and instructional strategies. Additionally, career and employment information to business and industry, engineering technology students and potential students, secondary and postsecondary educators, government and professional associations will be available.

The purpose and impact of all these efforts will be to increase the number of technological workers. The questions of why and how to choose Engineering Technology as a career will be answered. Novel approaches to technician education



By linking faculty with appropriate consultants and/or mentors, NETEC will create a technical assistance communication network of engineering technology educators nationwide, and serve as a national resource on educational programs. Faculty will find on the website-clearinghouse, engineering technology education curricula, instructional materials,

that can inspire students to become highly trained, resourceful workers able to meet the demands of a technology-centered global economy will be available. Traditionally underrepresented populations such as female and minority students will also find through the clearinghouse, a segue into technical programs. While the United States scrambles to find a trained technical



workforce, NETEC will be committed to the principle of leaving no one behind.

This may seem like a huge undertaking. As a National Center for Advanced Technological Education for the past eight years, NJCATE has been a leader in the field of engineering technology, creating innovative curriculum models, designing inventive programs for K-12 reform such as robotics competitions, and professional development for high school teachers. The Center has built professional development partnerships with two and four-year colleges and universities, and corporate and industrial partners with local industry. Already a resource center in its own right, NJCATE has answered the call to community colleges to provide industry with technicians who can be problem solvers and meet their needs, and is well equipped to be the driving force behind such a task.

NJCATE's professional development institutes have linked engineering technology professionals, high school teachers and administrators and industry representatives concerned with workforce development at conferences all over the nation. Through its workshops, conferences, seminars, educational materials and other services, NJCATE promotes and supports educational programs that address the engineering technology needs of the global workforce. With the establishment of NETEC, NJCATE will continue to serve as a resource and mechanism for the reform and revitalization of engineering technology throughout the nation with the goal of broad and sweeping change always on the horizon.

For more information about NETEC, please visit: [www.njcate.org/NETEC.htm](http://www.njcate.org/NETEC.htm).

# MATH SCIENCE TECHNOLOGY

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LEADERS IN EDUCATION

# Communication Is Key To Educating, Protecting Youth About Internet Use

## Technology Student Association Recognizes The Need To Provide Guidance, Cautions To Students

By Jill Landsman

While using the Internet daily, children play in a virtual playground, sometimes unaware of real-world dangers that exist in cyberspace.

“Before the Internet, young people monopolized the family’s phone, but today teens are often online and quite expert at using the Internet,” said Alta McDaniel, Technology Student Association, Inc. President and Supervisor of Technology Education in West Virginia. “Whether they are completing schoolwork, Instant Messaging, visiting chat rooms, sending e-mails or using other Web-based tools, young people are not always 100 percent safe online. We, as technology educators, want to impress upon young people those safeguards that will help reduce their vulnerability to the Internet’s dark side. As educators, we are concerned about young people’s relatively trusting, uncritical approach to the Internet.”

TSA surveyed nearly 600 middle and high school TSA students about their views on Internet use as well as their Internet practices at its national conference this past summer. TSA students learn advanced technology skills that will help qualify them for careers in a technologically competitive world. The students were among 4,000 attendees at the TSA national conference in Orlando, Florida. TSA, which boasts 170,000 members, is a non-profit national student organization

devoted exclusively to the needs of young people in technology education.

Protecting today’s teens is not a matter of limiting computer use but rather teaching responsible habits, according to Rosanne T. White, Ed.D., National TSA’s executive director. “While we, at TSA, strive to give our students a technological edge for a competitive workplace,” White said, “we want them to be armed with related technological skills and common-sense practices to avoid risk, danger and misfortune. The Internet can be a place where unscrupulous people can corrupt unsuspecting young people.”

According to the survey, the majority of TSA students know that anonymity on the Internet cannot be ensured; 7 out of 10 students realize that their online communications are traceable. The TSA surveyed revealed that 9 in 10 teens have never provided personal data to chat room buddies and 6 out of 10 understand that chatting with strangers online can be risky.

Amy Groner, TSA National Student President, of Powell High School, Powell, Tennessee, cautions all young people to be highly protective about their personal data. “With all of the cases we hear about on the news,” she said, “where people pretend to be something other than who they are on the Internet, I think it is important to only give out personal information to those that you are 100 percent sure of,

like school friends and family.”

To help students avoid copying work from the Internet, TSA advisors stress that when students obtain material electronically, they must identify the electronic sources used including author, publisher and website. Brandon H. Walters, a TSA National Student Officer from South Jones High School in Ellisville, Mississippi, noted that such practices are “indeed a growing moral dilemma in modern society. I find it morally wrong to plagiarize anything. I do believe, however, that one may use the Internet as sources for one’s own writing and ideas as long as credit is given.”

“While parents, teachers and others should continue to value young people’s growing expertise on the Internet, we must recognize the importance of our continued guidance in their use of it,” McDaniel said. “Being able to make informed evaluations of online sites and opportunities is critical if today’s youth are to benefit from their online experiences while avoiding the pitfalls.”

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*Jill Landsman*

is the Public Relations Manager for TSA.



# Here are the 2003 TSA Internet Usage And Safety Survey findings:

<p>1. How I use the Internet cannot be traced and I can stay anonymous.</p> <p><b>Agree</b> 33% <b>Disagree</b> 67%</p>	<p>6. I have forwarded e-mail from someone I know is typically safe, even if it has an attachment.</p> <p><b>Agree</b> 68% <b>Disagree</b> 32%</p>
<p>2. I see nothing wrong with chatting with a stranger online.</p> <p><b>Agree</b> 57% <b>Disagree</b> 43%</p>	<p>7. I go into a "chat room":</p> <p><b>Every Night</b> 7% <b>3 times/week</b> 10% <b>1 time/week</b> 24% <b>Never</b> 59%</p>
<p>3. I have given or I am willing to give out my personal information (name, telephone, etc.) to someone I have met in a chat room or other places on the Internet.</p> <p><b>Agree</b> 13% <b>Disagree</b> 87%</p>	<p>8. How much time do you spend on the Internet on a weekly basis (select closest answer):</p> <p><b>12+ hours</b> 30% <b>6+ hours</b> 26% <b>2-3 hours</b> 23% <b>less than 2 hours</b> 19%</p>
<p>4. There is nothing wrong with meeting someone from a chat room "face to face" as long as I take precautions (i.e. meet in a public place, take a friend with me, etc.).</p> <p><b>Agree</b> 42% <b>Disagree</b> 58%</p>	<p>9. Once I send an e-mail or post my picture on the Internet, I have control over how it is used.</p> <p><b>Control/Some Control</b> 37% <b>Little/No Control</b> 63%</p>
<p>5. I download music from the Internet.</p> <p><b>Often/Once in a While</b> 73% <b>Seldom/Never</b> 27%</p>	<p>10. It's okay to copy "stuff" from the Internet as long as I don't give it to anyone.</p> <p><b>Agree</b> 59% <b>Disagree</b> 41%</p>



## Netiquette

Navigating the information highway safely is a valid concern for parents, teachers and organizations that teach technology literacy such as the Technology Student Association. TSA supports these **Netiquette Do's and Don'ts For Young People** online, adapted from those offered by the Federal Trade Commission:

1. I will never give out personal information to anyone online, including but not limited to:
  - my full name, or anyone else's.
  - my address, or anyone else's.
  - my passwords, or anyone else's.
  - my phone number, or anyone else's.
2. I will never personally meet anyone I have meet online without the permission of my parents. If this opportunity should arise, I fully expect my parents to come to the meeting.
3. I will not go surfing in areas that are not appropriate including, but not limited to websites:
  - that are unsuitable for young people.
  - that promote hate.
  - that are offensive in language.
  - that are of a violent nature.



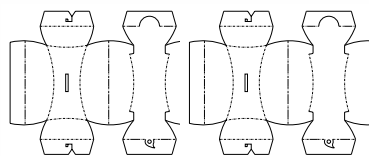
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- Students investigate, design ideas, model solutions and test their designs using the engineering design process.
- The units provide realistic, enjoyable activities that are relevant to society and the work world.
- The activities allow students 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](mailto:harms@tcnj.edu).



The College of New Jersey



by Mark Sanders

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## **technology education and engineering join forces at virginia tech**

To paraphrase Mark Twain, the rumors of the death of Technology Education at Virginia Tech are greatly exaggerated. The Technology Education Program at Virginia Tech not only isn't dead...



***It's shakin' & movin'!!!***

---

# It's shakin' & movin'!!!!

...this "new breed"  
of Technology  
Education  
graduates  
from Virginia Tech  
should be  
well suited  
for tomorrow's  
Technology  
Education  
classrooms...

It's true that because of a \$2 billion state revenue shortfall, Virginia Tech now receives \$72 million (26%) less state support than it did two years ago. It's true that this remarkable shortfall led to a university-level decision to phase out all undergraduate teacher education programs at VT. And yes... it's true that decision has impacted the Technology Education Program in profound ways. But please make note... the Technology Education Program at Virginia Tech fully expects to graduate a steady stream of licensed Technology teachers in the coming years without interruption.

There are currently 27 undergraduates in the program, most of whom will graduate in Spring 2004 and Spring 2005. A few of them (currently sophomores) are scheduled to graduate in 2006. Over the next few years, Virginia Tech will be phasing out its undergraduate Technology teacher education program.

In keeping with Virginia Tech's stated goal of becoming a "top 30 research institution," the emphasis is shifting to our graduate program. The Virginia Tech graduate program in Technology Education has long enjoyed a reputation for excellence. Currently, our graduate program is larger than it has ever

been, including a crowd of masters students and 11 active doctoral students.

Technology Education at Virginia Tech is beginning a new era of collaboration with the College of Engineering. The new Dean of Engineering has proclaimed, "my vision for the college is to become a leader in the field of engineering education." His new goal provides us with an outstanding new opportunity.

Amidst this strong support for "engineering education," several of my new Engineering colleagues and I have just received NSF funding for our "Bridges for Engineering Education: Virginia Tech (BEEVT) Project proposal. One of the three primary objectives of the project is to: "Develop a new Masters / Technology Education Teacher Licensure Option for engineering graduates."

In accordance with that objective, we have begun to conceptualize a new 5th year Masters / Technology Education Licensure program for engineering graduates. This provides us with a new pathway for preparing Technology teachers. It builds on the strong traditions of Engineering and Technology Education at Virginia Tech. Given that there are about 1,500 engineering freshman each

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## It's shakin' & movin'!!!!

year, this new option has the potential for us to graduate as many or more Technology teachers than we have in the past.

There's no question these new Technology teachers will be different from our previous graduates. Given the direction our field has been going for the past two decades, and the emphasis in the Standards for Technological Literacy on engineering design, this "new breed" of Technology Education graduates from Virginia Tech should be well suited for tomorrow's Technology Education classrooms/laboratories. With courses such as "Introduction to Engineering," "Advanced Engineering," "Computer Aided Design," and "Principles of Technology" among those we teach in Virginia, these upcoming classes of Technology teachers with bachelors degrees in Engineering will bring backgrounds to our classrooms that will benefit our field in new and unforeseen ways.

In addition to giving rise to an innovative new masters/licensure program, this new collaboration between Technology Education and Engineering faculty at Virginia Tech, and the emphasis on graduate education, positions us to compete effectively for external research support. That, in turn, will help to "grow" our graduate program in the years to come, both in numbers and in the richness of what we have to offer our doctoral students.

**So...** the rumors were correct in one sense.... It will not be business-as-usual at Virginia Tech from here on out. We're working hard to graduate the last few classes of undergraduate Technology Education majors over the next few years, while building a new pathway for the education of a "new breed" of Technology teachers who will bring a rich set of engineering principles to their teaching. In doing so, we will continue the rich tradition of Technology Education that Virginia Tech has enjoyed over the past half-century. ●

### MATH SCIENCE TECHNOLOGY

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## Precision Glue System

Midwest Products Co., Inc. has a Precision Glue System – an all-in-one glue system – with both CA and accelerator in one convenient package. The Precision Glue System features CA glue – which is lighter than typical tacky glues, and accelerator – with a squeeze bottle and needle tip applicator, for precision applications with less glue and less mistakes. This new system bonds within 3 - 5 seconds.



The Precision Glue System can be used with any fine creative project that requires precise adhesion without excess glue, such as Balsa or Basswood bridge kits, Balsa gliders, crafted miniatures and model railroads, etc. For additional information, visit our web site at [www.midwestproducts.com](http://www.midwestproducts.com) or e-mail [education@midwestproducts.com](mailto:education@midwestproducts.com).

### Precision Glue System

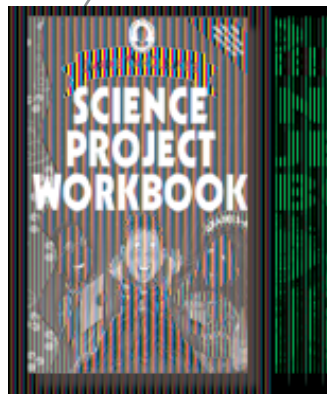
Contents:

1 - .35 oz. Bottle of CA glue

1 - .33 fl. oz. Bottle of accelerator

Stock #365

Retail: \$6.99 ea.

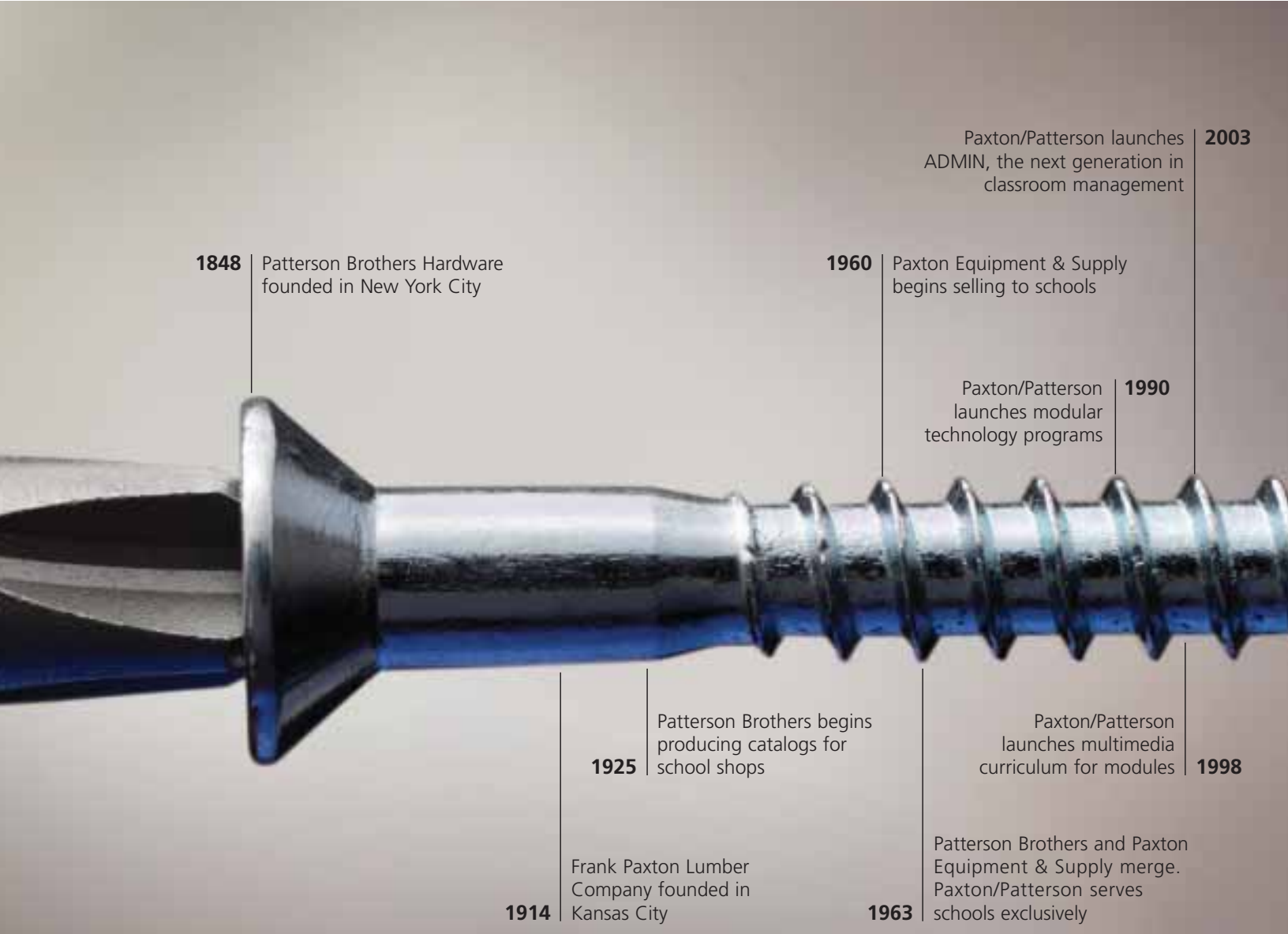


## Science Project Workbook

Science is a way of solving problems and discovering why things happen the way they do. Why do stars twinkle? Why do you blink? What is stereophonic sound? Students ages 8 to 12 can answer these and 223 other questions by doing the

experiments in this book. They cover five fields of science: astronomy, biology, chemistry, earth science and physics.

John Wiley & Sons Publishers, September 2003, \$19.95 Paperback, [www.wiley.com](http://www.wiley.com)



**1848** | Patterson Brothers Hardware founded in New York City

**1960** | Paxton Equipment & Supply begins selling to schools

Paxton/Patterson launches ADMIN, the next generation in classroom management **2003**

Paxton/Patterson launches modular technology programs **1990**

**1925** | Patterson Brothers begins producing catalogs for school shops

Paxton/Patterson launches multimedia curriculum for modules **1998**

**1914** | Frank Paxton Lumber Company founded in Kansas City

**1963** | Patterson Brothers and Paxton Equipment & Supply merge. Paxton/Patterson serves schools exclusively

# A history of learning inside every tool.

**Paxton/Patterson** has been helping America develop better students since before Lincoln was President. Today, we offer the full range of learning tools for educators. It might be a screwdriver for an industrial arts class. Or, a complete family of interactive learning modules and the technology lab and equipment that supports them. In all the ways you work with us, you'll discover our timeless commitment to helping students transition from school to life. And a dedication to those who point the way. **Paxton/Patterson. An American institution dedicated to helping yours.**

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