

## Back to School: Industrial Arts with Mark Smith at Shiloh High

### “High-tech High School”

Mark Smith’s new job teaching industrial arts at Shiloh High School came with an ultimatum. Make the program work, they said, or we’re shutting it down. At that point in 1996, Mark’s classroom and workshop looked, sadly, like many others do now: no computers, very little equipment, unenthusiastic students hammering nails into uninspiring projects.

Ten years later, Mark’s classes are brimming with honors students, new tools, a CNC router and computers equipped with the latest modeling and cabinetry software. A large percentage of Shiloh’s 130 students take at least one of his classes, and some stick with him through four years. With the help of the wood industry, the humble but P.R.-savvy shop teacher has indeed turned this Illinois high school’s industrial technology program around.

### Working class

In March, one of Mark’s classes installed 43 cabinets at a local church. His students complete at least one major cabinet job per year, charging only the cost of materials and a \$2,000 donation to help equip the woodshop. They have an ongoing arrangement to produce wooden sunglasses frames for a company called iWood Ecodesign, for which they are paid \$10 each (the high-fashion glasses retail for about \$350-425). And they recently contracted with Wedge Woodworking, which manufactures high-end gun display cases, to carve personalized panels using the school’s software and CNC equipment. (The panel is a \$50 option on the gun cases, base prices of which range from \$4,000 to \$5,300.)

Mark’s aim is to expose his students to real-life working situations – deadlines, budgets and profits, client service – such as those they will face when they finish school and go on to post-secondary education or take jobs. As a team, they consult with their cabinetry clients before planning the job, estimating the materials, cutting as many as 800 individual pieces, and building and installing the cabinets. “Mr. Smith expects a certain standard out of all his students,” junior Lyle Gordon said. “I’ve never learned quite as much in any other class.”

Students must take three classes to qualify for the production class (which handles cabinet jobs, wooden sunglasses for iWood Ecodesign, and carvings for Wedge woodworking). One is an intro to drafting in AutoCAD, and another is a manufacturing class which includes traditional woodworking concepts and tools, as well as an introduction to the CNC router.

Manufacturing students each choose and build a furniture project, some of which are surprisingly large and/or complex. This year, Lyle built a “puzzle table.” Its puzzle-piece-shaped top was cut out on the CNC router and its legs were built with traditional woodworking methods. Tony Dickson, also a junior, built a queen-size bed in the Mission style. Sophomores Will Young and Brad Krenitzki built a 14-shelf media cabinet and a desk, respectively. Brad is also in the production class, and hopes to continue taking classes with Mark through his senior year. “He’s a good teacher,” Will said of

Mark. “He makes sure you’re safe, and he knows just about everything there is to know about woodworking.”

#### A man on a mission

Mark might just have a genetic predisposition toward teaching. His father is a university professor, while his mother teaches fourth grade. He also has aunts, uncles and siblings who teach.

In high school, he was particularly influenced and inspired by his shop teacher, Jonathan Hart, and his English teacher, Mic Eiben. But before he became a high school teacher himself, he gained other work experience that would later benefit his students by (in an unplanned way-take this out), taking jobs at a furniture factory and a glass company, and for a time running his own commercial painting company.

Unlike some of his students, Mark doesn’t give himself enough credit for the success of his program at Shiloh. He was determined to make it work from the start, digging into small building and repair projects around Shiloh’s classrooms despite the lack of good tools. “We did little projects that were relevant to the school and the community, like repairing desks and chairs. It was good experience for the kids, and it kept us busy.” But undeniably, his dogged pursuit of industry resources and technology has made the program flourish. Wood industry companies now donate and discount equipment and supplies, to the tune of about \$20,000 each year, Mark said. “I never imagined we would get this kind of support. People said, ‘They won’t help you. They won’t even talk to you.’”

Au contraire! Not only have they helped (see a list of supporters on page XX) but they also frequently talk to Mark and his students. A phone in the shop/classroom is constantly in use, with students calling companies for help with software and equipment (a good way to develop problem-solving skills) and companies, in turn, contacting students about internships and their plans for the future.

#### Discovering a link

These active relationships first began to form during a 1999 trip to Milwaukee, where Mark and his wife attended a trade show and came across a booth for WoodLINKS – a non-profit that seeks to link skilled wood industry employees with companies who need them. Of course, this includes improving industrial technology programs at secondary schools and helping make the transition from student to employee. “WoodLINKS was doing exactly what I wanted to do: get industry involved and bring shops up to date. I knew I’d found a perfect match,” Mark said.

The next year, WoodLINKS’s Larry Hilchie invited Mark to the IWF (International Woodworking Machinery & Furniture Supply Fair) in Atlanta. “Our doors were just blown off,” Mark said. “The show was gigantic. The tools were high-tech. That’s when I saw my first CNC router.”

Returning with many new industry contacts, Mark arrived at home certain of two things: getting involved with WoodLINKS was a great decision, and Shiloh High School must obtain a CNC router. Mark researched about 10 different companies before buying the massive machine, which he calls “the heart of our operations,” from Thermwood. The company offered a significant educational discount, training Mark and three of his students for a week. The production class immediately started using it to cut parts for

cabinet jobs. The first job was to outfit Shiloh High's home economics department, including five kitchens, with new cabinets. Later, Mark's students learned to use Thermwood's free eCabinet Systems software, which renders a demonstration of what the finished cabinets will look like in a client's room and generates cut lists, materials estimates, and CNC code. "We've been using it four or five years, and the number of 'wrong' parts has gone down dramatically," he said.

Thermwood became one of the first of a long list of companies to enthusiastically support Mark's program. In addition to the initial training, they have offered tireless assistance by phone to Mark's students, and are sponsoring them on a trip to a major trade show this year. Other companies have donated so many tools, Shiloh has had to turn some of them away for lack of space. What's Mark's secret, anyway?

"It's really WoodLINKS that makes all this possible," Mark said. It's true the organization has introduced Mark to many of his benefactors, but his own commando public relations strategy might be an even bigger factor. Mark consistently snaps digital photos of his students while they build their projects, install their cabinets, travel to trade shows or tour industry sites. He then sends them, with updates and notes of thanks, to a list of supporters. "People see we're really using the donation they gave us," he said. Mark is not shy about using his industry contacts to help out his students, said Stephen Gilbert, who graduated from Shiloh in 2005 and continued studying industrial arts in college. Stephen accepted a summer internship with Burger Boat in Manitowoc, Wis., a manufacturer of yachts up to 200' long. He will be using CAD and CNC machines in the woodworking department at Burger. "Mark is very unselfish when it comes to helping his students. I wouldn't have gotten this internship without him," he said.

Stephen is one of many success stories Mark has helped write in his years teaching at Shiloh. The school is in a rural area without much industry to rely on for employment. Stephen would like to be able to continue working on his family farm, and hopes his industrial training will eventually provide additional income and flexible hours, perhaps through a business of his own.

#### The wider world

Mark's documentation and promotion of his students' progress is not lost on the media. His classes have been featured in many publications including *Wood Digest*, *Modern Woodworking*, and *Wood & Wood Products*. In fact, one student was the subject of a short article in the first issue of *Woodcraft Magazine*. Emory Luth had built a challenging elliptical desk during his senior year, then had entered a mechanical engineering program at the University of Illinois.

Two years later, Emory has just purchased a Thermwood CNC machine and started his own construction company. He interned for two summers with Andersen Windows, testing how wood composite materials interacted with other materials (and the weather). He redesigned an entire floor of a corporate office building, reorganizing the floor pattern and adding architectural millwork. He is also developing manufacturing processes for a line of furniture. "All the knowledge I have in that area is a direct result of projects I did with Mr. Smith," Emory said.

This job had a precursor in the 18-month development of processes for making iWood's sunglasses frames, which included working with designers to get the 3D modeling right, obtaining the proper tooling for the CNC router, creating a clamping device and

developing a steam-bending process. Shiloh High was basically the R&D center for that product, he said.

“[Mark taught] not just woodworking, but manufacturing and commercialization. Any project I did back then I could mass-produce now,” Emory said.

Mark has shown his students that woodworking is not only a hobby; it’s also a serious industry with great potential for employment. Mark’s contribution to his students is (at least) twofold: training and contacts in a thriving industry, and the confidence that comes from successfully planning and building a challenging project.

Tony, who built the Mission bed, met many of Shiloh’s industry supporters when he traveled with Mark and other students to the IWF. “They said if we were ever looking for a job, we should let them know,” he said. “I decided once I started taking this class, this is what I want to do. I never thought I’d be good at anything, and I found something I’m good at.”

-- Sarah Brady is a contributing editor to Woodcraft Magazine.



Junior Tony Dickson adjusts the headboard assembly of his queen-size Mission bed.



Junior Lyle Gordon displays a prototype of the top of his puzzle table, fresh off the CNC router.



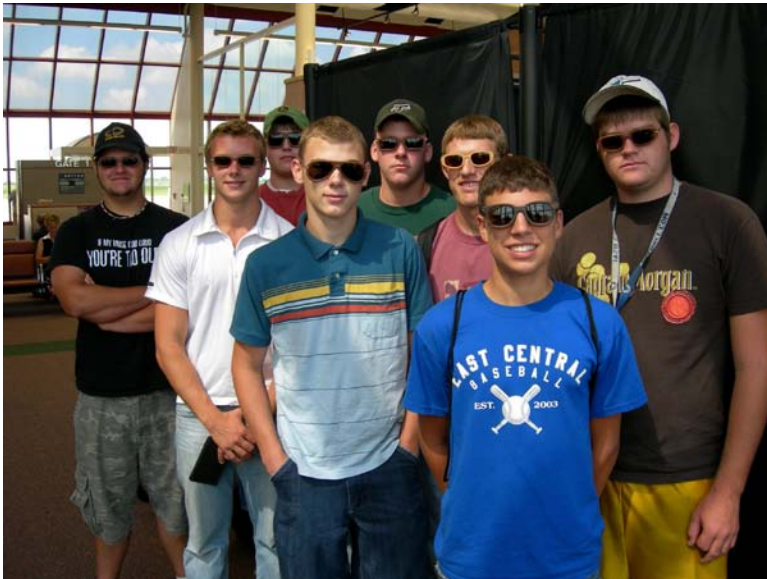
Members of Mark Smith's 2007 production class stand in front of cabinets they built and installed for a local church. From left to right, they are: Jacob Hixson, John White, Tony Dickson, Craig Wilson, Matt Sheppard and Joern Rosendahl-German foreign exchange student.



Jacob Hixson and John White . In March, Smith and his students built 43 cabinets and installed them at a local church.

### **White.jpg**

John White works on wooden sunglasses frames. The Shiloh High School industrial arts program earns money producing frames for the environmentally friendly line of eyewear, which has been featured in *Vogue*, *House & Garden*, *Yoga Journal* and *O the Oprah Magazine*. Each pair retails for about \$300.



Sporting wooden sunglasses, a group of Mark Smith's industrial art students prepare to board a plane to the AWFS (American Woodworking and Furnishings Suppliers) Fair.