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Appleton Area School District

A-Tech Prepares High School Students for the World of Work

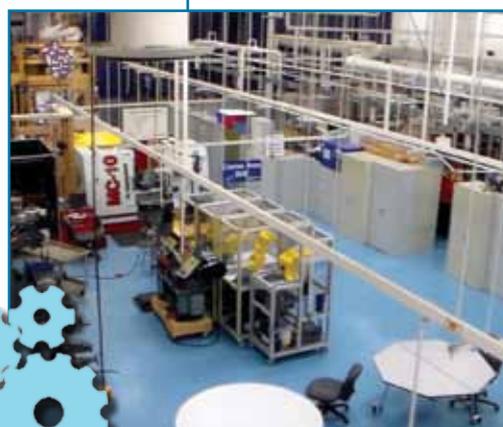
Page 5 — A-Tech was created in response to a need for workers to fill the growing demand for skilled manufacturing positions in Northeast Wisconsin. Using a project-based, hands-on learning approach, the school day features a mix of manufacturing related courses (Welding, Machining, Mechanical Design, Automated Manufacturing) and a mix of traditional core classes (Math, Science, English, Social Studies).



Kenosha Unified School District

LakeView Technology Academy

Page 6 — LakeView Technology Academy is public high school by day and Gateway Technical College campus by night, with a little overlap in between. The partnership between LakeView Technology Academy and Gateway Technical College give students exposure to the best practices in industry, current equipment and machines, and the ability to jumpstart advanced training in the area of manufacturing.



School District of Eleva-Strum Cardinal Manufacturing

Page 8 — Cardinal Manufacturing has served hundreds of customers from private individuals to clients throughout the state of Wisconsin and other parts of the country. "Students in Cardinal Manufacturing are the cream of the crop." Cegielski states. "We only take the best. People wanting to get in need to go through an interview process, just like at a real business, and our admittance is limited."



New Richmond High School Making Students Work Ready

Page 9 — Utilizing a \$25,000 grant, the New Richmond High School metals/manufacturing shop was able to add another piece to its workshop that will allow students to push their education even farther during their high school careers. "The students that take New Richmond School District Technology Education classes are



serious about their future and with new equipment like the CNC lathe turning center they are able to hone their skill sets into skills that employer's desire."

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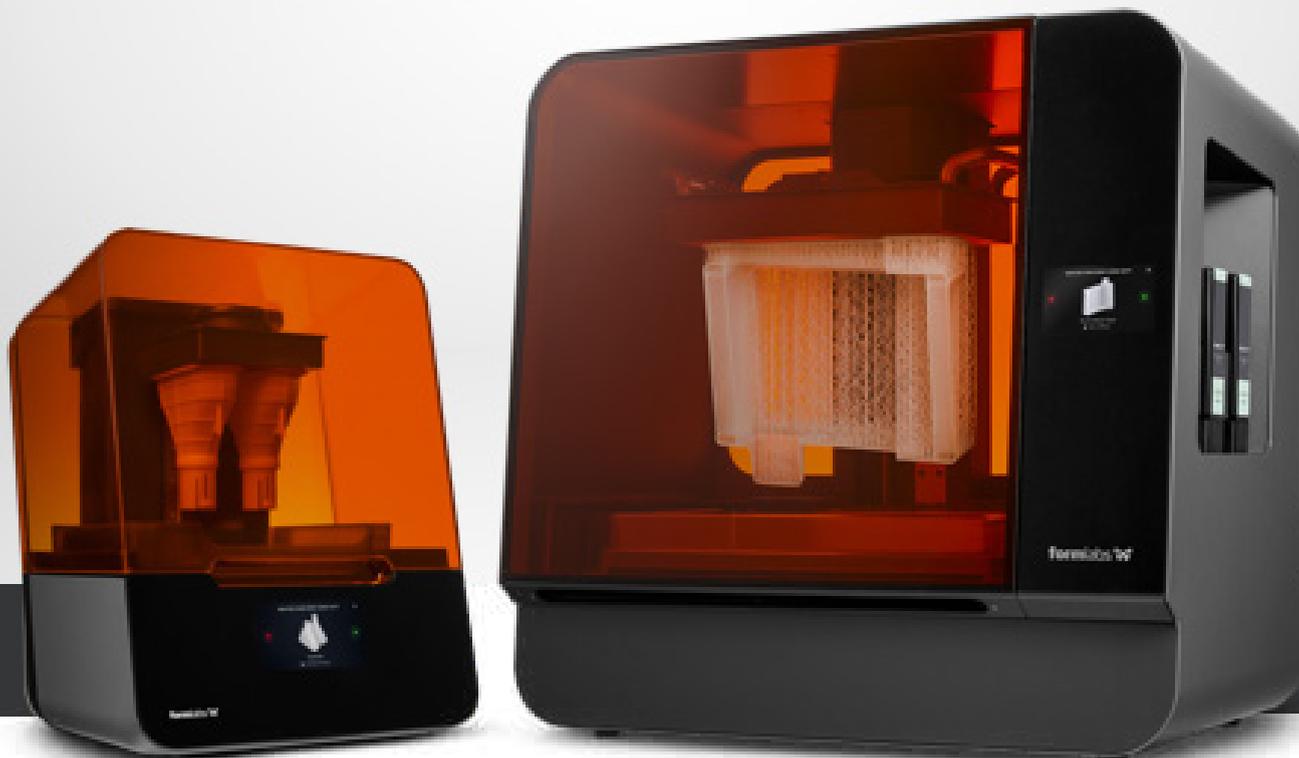
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**Green Bay Area Public School District
Bay Link Manufacturing Gives Students
'Real World' Experience in the
Manufacturing Industry**

Page 10 — Every year, juniors and seniors in the Green Bay Area Public School District are invited to apply for the Bay Link Manufacturing® program. This student-run manufacturing job shop provides students with opportunities to complete projects for local businesses in areas of welding, machine fabrication, and metals. Some of the equipment capabilities include; design/software, CNC machining, manual machining, cutting and welding.



**Kimberly Area School District
Kimberly High School Rube Goldberg
Machine Team Takes a Fourth Place
Finish to the Bank**

Page 17 — The purpose of a Rube Goldberg Machine is to overcomplicate a simple task in a humorous and creative manner. The contest required machines to have between 20 and 75 steps to accomplish the task of depositing money in a piggy bank. The students learned to work as an engineering team and go through the design process of brainstorming, sketching, computer-aided design (CAD) modeling, building and fabricating.



**Arrowhead High School
Arrowhead Engineering
Students Show Amazing
Promise at Versevo**

Page 18 — Anthony Christian, the technical education teacher at Arrowhead, devised a college-level capstone project to give aspiring engineers a sense for what's involved in engineering and problem-solving in an industrial environment. Last year, he worked with Versevo to arrange a plant tour for 30 engineering students. At the end of the tour, the Versevo team presented the group with a set of 10 real problems and issues it's trying to solve.



**Kaukauna Area School District
KHS Technology and Engi-
neering Program Earns
National Award**

Page 20 — The Kaukauna High School Technology and Engineering program recently earned Advance CTE's 2019 "Excellence in Action Award" for the Manufacturing Career Cluster. "We are thrilled to see the work of Mr. Lawrence, our Technology and Engineering program, our students, and our community partners honored with this award," said Matthew Smith, Director of Secondary Education for the Kaukauna Area School District.



**Mukwonago Area School District
MHS Robotics Team 930
Dominates on World Stage**

Page 22 — Mukwonago FIRST Robotics Team 930 returned home from the FIRST World Championship at Ford Field in Detroit this spring celebrating a 2nd-place finish. The robotics team, consisting of nearly 50 students and over a dozen mentors and coaches, competed against more than 400 teams from across the world. In taking 2nd place, Team 930 became only the second Wisconsin team ever to place as a world championship finalist.



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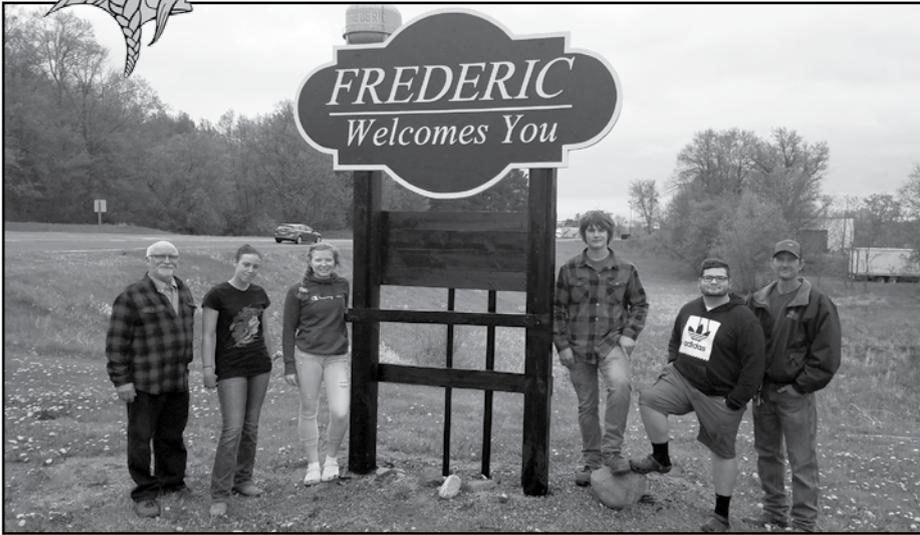
Make Connections to Talent

WIMTS is Wisconsin's Largest Manufacturing Event and our Workforce Labor Initiative aims to pair employers with potential employees—especially Wisconsin's highly skilled, technical students. In addition to 225+ exhibitors, there will be student competitions in Welding and Automation & Robotics and a "Resume Rendezvous" where students can put their resumes on file for exhibitors, industry leaders and attendees to review. Also, you won't want to miss the "Connection Reception" sponsored by **First Citizens Bank** as students, parents and teachers witness the manufacturing industry up close and enjoy free refreshments.

**For more information on attending or competing,
contact Jill Smart at 262-370-2073 or Jill@EpiShows.com**
[Sorry, no one under 16 years old can be allowed into the show]



Viking Industrial Products



*Duane Krueger
Technical Education Teacher
Frederic School District*

In a time where the demand for college and career readiness has become a growing focus in Wisconsin public schools, the Frederic School District began exploring creative options for exposing its students to a richer variety of technical skills and experiences. In reaching out to local business owners and relevant community members, a techni-

cal education team was developed to begin planning what is known today as "Viking Manufacturing Products" (VIP). Representatives from local businesses, the community, and a technical college played a vital role in the development of the VIP programming Frederic offers its students today. The collaborative team toured local manufacturing companies, developed business plans, and scheduled a tour visiting a similar program in the Eleva-Strum School District, known

as Cardinal Manufacturing. By the spring of 2016, the vision behind VIP started coming to fruition as local partnerships and funding avenues quickly developed. VIP coursework began in the fall of 2016 with thirteen VIP students designing and producing wood products with a brand new CNC Router.

Now, in 2019 local businesses, community members, and staff at Frederic School District have helped VIP continue to grow and create beautiful products. Our VIP team now consists of several dedicated students who are being productive and helping in a real-world, technical setting. They continue to gain knowledge and make quality products using VCarve Pro and our CNC Router. Viking Industrial Products has also gained popularity and business inside and outside of the Frederic community. Students are marketing, organizing meetings with customers, and making sure every buyer is getting exactly what they want. Not only do students meet with customers but they also use their creativity to create generic signs to sell to anyone. The students continue to develop stunning designs, clever ideas, and breathtaking results. Our program still receives support from our community in the form of donated materials, money, time, and buying our products.

VIP also went on a recent trip to White Bear Lake, MN to see a manufacturing business on a large scale. It was very educational, and the students enjoyed touring the building and seeing all the different machines and even robots that assisted the machinists. Students also talked to employees about different jobs within the company and possible job opportunities in manufacturing.

These past two years have been exciting for staff, customers, and VIP students. Students get to express their imagination and creativity while producing a product for their customers. Our goal is to have Viking Industrial Products continue to grow and give students the best educational experience possible. The Frederic School District takes pride in the VIP program because of the professionalism, educational experiences, and hands-on learning environment.

www.frederic.k12.wi.us
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Three Lakes Fab Lab Manufacturing



Al Votis, Three Lakes School District

There are some new manufacturing activities happening at the Three Lakes Fab Lab this year. The first new activity deals with a new piece of equipment that the school acquired last year, a Tormach 1100 PCNC. The Tormach 1100 PCNC is a personal CNC machining tool that allows our students to work with metal for machining instead of only wood, or other soft materials with a Roland

MDX-40A mini-mill. We've also gotten the 4th axis with the Tormach, which allows us to machine 3D parts. Students are working on not only learning the basics of machining in metal by designing and milling parts, but also using the machine to create artistic elements as well. "This is a great acquisition for our students, because now they really have the chance to learn a whole new set of skills, use new materials, and make things that are really functional," says Al Votis, one of the Fab Lab instructors. "We've opened up a number of different doors for our students by being able to machine in metal, as well as to start exploring careers in different manufacturing areas than we were able to before." Students in the How To Make Almost Anything (HTMAA) classes, as well as in metals classes in the tech ed area are utilizing the Tormach and are learning to put it through its paces.

Also this past year at Three Lakes, the CNC club has expanded beyond its production of Wisconsin Badgers licensed plasma cut signs to producing a number of items for Northern Michigan University. "We've produced over \$4000 of product for Northern Michigan this past year, mostly signs and display pieces made out of metal for the University. This has been a great partnership for our students to be able to work on deadlines, and work with another entity to meet criteria for orders" says

Mike Gorney, the tech. ed. Teacher and CNC Club advisor. "We still do make quite a bit of licensed Badger products, but this help us expand outwards to more clients, more ideas, and even has led to more custom orders pieces to be made."

Along with the production of metal products, the metals class has also been working on designing and producing fire pits, using software and the CNC plasma to cut the pieces out, and then weld them together. They have been working with individuals to customize each fire pit to meet their needs, and to be decorative and functional.

With all these new activities and new equipment at Three Lakes, manufacturing skills and expertise are on the rise with our students, and students are producing and learning great skills for the future!

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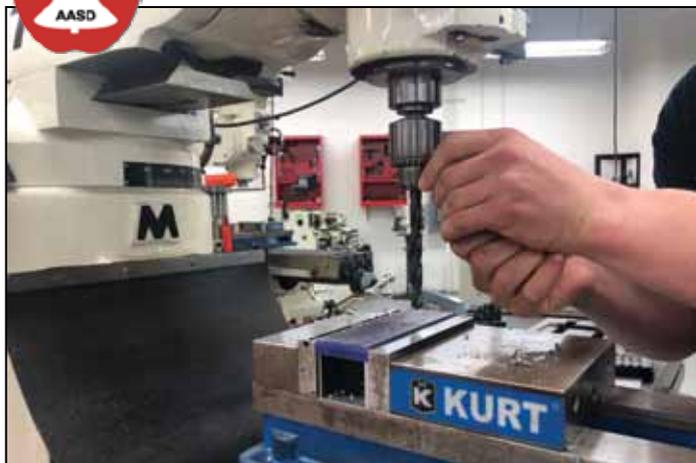
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A-Tech Prepares High School Students for the World of Work



Appleton Area School District

If you've ever heard a student ask "When will I ever use this in real life?" you already understand the need for Appleton Technical Academy (A-Tech). Students learn practical skills that get applied to real-world situations, such as math skills to determine the proper angle for a specific laser cut or weld, writing skills to prepare a standout cover letter and resume, and science skills to understand the chemistry behind the materials they're working with. Each student's education track is tailored to his or her interests, resulting in more individual attention.

A-Tech was created in response to a need for workers to fill the growing demand for skilled manufacturing positions in Northeast Wisconsin. The manufacturing environment in the region is strong and growing. Additionally, as more and more baby boomers retire, businesses are finding it increasingly difficult to find qualified workers to replace the retirees.

In cooperation with the local technical college and business leaders, this Appleton Area School District (AASD) charter school is focused on providing serious students with the skills needed for a successful career in advanced manufacturing and industrial technology.

Mark McQuade, A-Tech Principal says "What sets us apart from other schools is our ability to offer over 40 college credits that transfer into the program of study that the student has chosen. The close relationship

between the college instructors and A-Tech instructors allow for a smooth transition."

Using a project-based, hands-on learning approach, the school day features a mix of manufacturing related courses (Welding, Machining, Mechanical Design, Automated Manufacturing) and a mix of traditional core classes (Math, Science, English, Social Studies).

A-Tech labs are second-to-none with brand new equipment that mirrors what the students will see in industry. We have eight welding booths with 16 welders that will expose the students to MIG, TIG and stick welding. We have six manual lathes, 4 manual mills and a brand new Haas CNC machining center. Our fabrication equipment includes a CNC plasma cutter and numerous metal forming pieces of equipment that will allow students to create meaningful projects.

Students in A-Tech learn about the world of work in a variety of ways. In the classroom they are exposed to the basics of machining, welding, mechanical design, automation, math for the trades, reading blueprints, project-based learning, and other classroom experiences designed to reflect the world of work.

A-Tech appreciates the involvement of manufacturing professionals making classroom presentations and demonstrations and

businesses opening their doors to allow students to tour their production facilities and to do job shadows with experienced workers.

Our students benefit from attending A-Tech in a multitude of ways. They get to learn what a career in manufacturing is really like. It's like taking a test drive before buying. They could make money while learning. Seniors enrolled at A-Tech have the opportunity to complete a paid internship for school credit.

A-Tech graduates gain advantage over other applicants entering the workforce. They'll already have hands-on experience in a variety of trades and skilled labor, making you attractive to potential employers. Paul Lindberg, Lead Teacher says that "As an instructor what is extremely rewarding is having graduates return to us after graduation and expressing the benefits of what they learned while in A-Tech."

Learn more about A-Tech:

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LakeView Technology Academy



Bethany Ormseth, Ed.D.,
Principal LakeView Technology Academy
Kenosha Unified School District

LakeView Technology Academy is public high school by day and Gateway Technical College campus by night, with a little overlap in between. LakeView Technology Academy has 22 teachers total and three of these are Gateway Technical College instructors. LakeView Technology Academy is located in Pleasant Prairie and enrolls approximately 400 students annually.

The partnership between LakeView Technology Academy and Gateway Technical College give students exposure to the best practices in industry, current equipment and machines, and the ability to jumpstart advanced training in the area of manufacturing. Traditional high schools often have obstacles of: equipment costs, timelines for change and staffing to overcome to be able to offer the same experiences LakeView can offer students.

Splitting the cost of equipment with the

technical college allows the high school to have the most current technology and this affords students real life exposure to what the area workforce is using in industry. This is critical in the preparation of students for post high school training and in preparation for entering the workforce. The ability to split costs allows high school dollars to stretch further and this allows for more students to have this exposure to cutting edge technology. LakeView has produced high school graduates with almost 30 college credits and over 50% of all graduates have college credits at graduation.

The technical college teaching staff bring real life work experience to LakeView students. This is invaluable in assisting students in the connection of classroom learning to real application of skills. Students will report it is the ability of teaching to connect the lessons to application that makes the learning meaningful and engaging. The college staff always do a nice job of making those connections.

Finally, Gateway Technical College has fingers on the pulse of local industry. As course offerings need to change, technical colleges have the ability to make those changes at a far quicker rate than local high schools. This allows high school students

to have the newest approaches and exposure. The students bring this experience with them to post-secondary education or straight into the workforce. The ability to know the immediate needs of our industry partners bring another layer of engagement and meaning to LakeView students.

Most high school offers contracted or transcribed courses but it is the deep partnership of resources between LakeView Technology Academy and Gateway Technical College that make it unique and successful high school in the area. LakeView boasts close to a 100% graduation rate and some of the highest test scores in the area. LakeView was nominated next year for a National Blue Ribbon award and the foundation of the success is the partnership with the local technical college.

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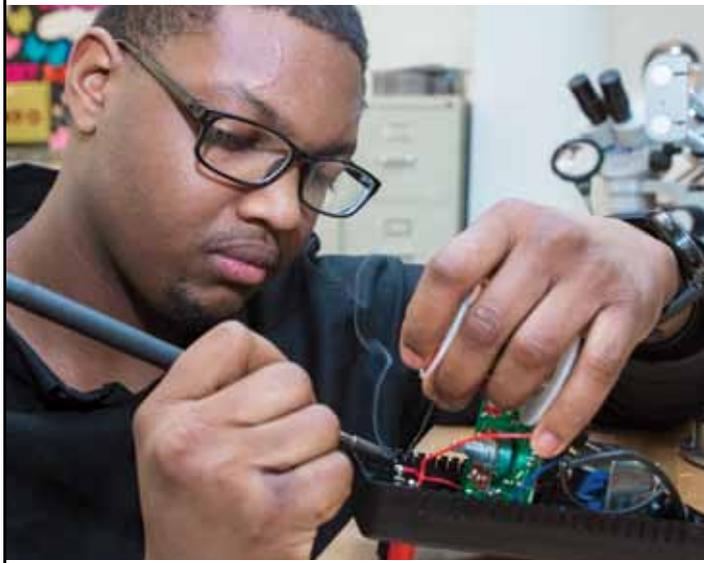
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Cardinal Manufacturing

Filling the Skills Gap One Student at a Time



School District of Eleva-Strum

Cardinal Manufacturing began in the Eleva-Strum School District during the 2007-2008 academic year when instructor, Craig Cegielski, approached the School Board about the potential of pursuing an in-school manufacturing business similar to one he started in his prior position in the school district of Antigo, WI.

The school board approved and since that time Cardinal Manufacturing has gone from its infant stages to a company with significant

annual sales and national notoriety. The growth of the program has attracted national and international attention and Cardinal Manufacturing has attended national tradeshows and hosted celebrity guests.

Cardinal Manufacturing has served hundreds of customers from private individuals to clients throughout the state of Wisconsin and other parts of the country. A number of students have gone directly to skilled employment positions after high school, but most choose to go on to post-secondary education through technical

college or the university system.

Cardinal Manufacturing has also built strong relationships with a number of private companies and professional organizations which have been supportive through donations, advice, publicity opportunities, and projects.

Cegielski's aim hasn't strayed from its mark. His mission is still the same as it was the day he first stepped through those garage doors. "(The intent was always) to run a higher-end manufacturing program, to close the skills gap, and to teach how a business works."

"Students in Cardinal Manufacturing are the cream of the crop," Cegielski states. "We only take the best. People wanting to get in need to go through an interview process, just like at a real business, and our admittance is limited." The application process includes creating and submitting a resume, project portfolio, and a letter of recommendation.

Besides the great experience gained, the students receive a profit sharing check at the end of the school year based upon number of hours worked and other measurement tools. Only a portion of Cardinal Manufacturing earnings are paid to students after expenses and upcoming needs are covered. Most of the money earned supports the purchase of materials, equipment

and facility needs to continually grow and improve Cardinal Manufacturing.

Working with industry leaders, Cardinal Manufacturing has added a great deal of CAD software and other equipment, including a CNC lathe and two brand new Haas CNC milling machines.

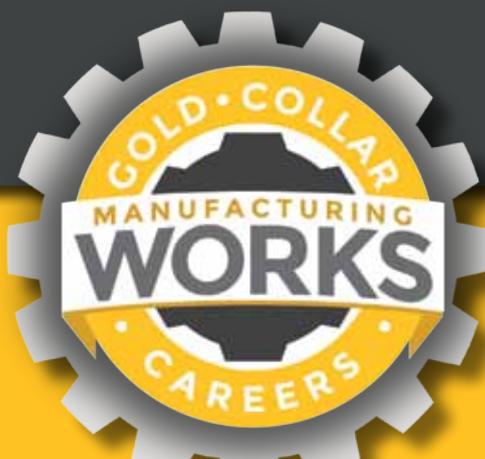
From the Cardinal Manufacturing Team:

"The Cardinal Manufacturing class has 21 students which we fully intend to grow each year. These talented students are welders, machinist, production manager, engineer, wood manufacturers, marketing manager, office manager, and new this year is the position of project manager! We are very excited to welcome a second tech ed teacher to Eleva-Strum, Mr. Rohrscheib! Tyson graduated from Eleva-strum and was a former Cardinal Manufacturing student. We really have increased our CAD/CAM engineering classes. We also have remodeled a new Cardinal Manufacturing Office. Keeping the real life business and filling the skills gap one student at a time!"

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- ⚙️ Create a pipeline of future employees for your business.
- ⚙️ Help sponsor events to promote manufacturing as a career choice with statewide exposure and recognition.

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Learn more about sponsorship levels and member benefits at: goldcollarcareers.com/manufacturers



Making Students Work Ready



By Jordan G. Willi

Utilizing a \$25,000 grant from Bosch Community Fund Grant, the New Richmond High School metals/manufacturing shop was able to add another piece to its workshop that will allow students to push their education even farther during their high school careers.

“My mission is to make students work ready, and post-secondary ready. The support

from Bosch Community Fund Grant gives our students the opportunity to use machines that they will see in life after high school,” said Technology Education teacher Tom LeQue. “Our facility is well equipped to give our students a great education. I will always push for the new equipment as it comes available. I am always looking for a new way to reach students and improve safety, quality and efficiency.

“The students that take New Richmond School District Technology Education classes are serious about their future and with new equipment like the CNC lathe turning center they are able to hone their skill sets into skills that employer’s desire.”

Associates from Bosch attended the official launching of the CNC Lathe Turning Center on Wednesday, May 8, to tour the shop and see what their grant offers students at NRHS, as well as allow students to demonstrate how they will use the new equipment in class.

“It is beneficial for students to showcase what they have learned. Networking with industry professionals can and has led to opportunities for students,” LeQue said. “The new CNC will be used to get students excited about manufacturing. There are so many great opportunities and a demand for skilled workers. As an educator, I get great satisfaction out of helping shape students into quality active citizens.”

The CNC Lathe Turning Center will also allow students who have completed their manual machine practices to continue their training.

“The CNC Lathe will give the students

the opportunity to use their prior knowledge of Computer Aided Design, Computer Aided Machining and Manual machine skills to automate the machining process,” LeQue said. “The lathe is also intended to gain student interest and provide the next step for our Machine Tool Students. The CNC lathe will allow our students to easily replicate parts while providing tight tolerances. The students are excited and are using the machine every day.”

New Richmond human resources company representative, Bill Burkart, said the tour of the high school’s metals/manufacturing shop revealed the measures taken by the community to build superior STEM capabilities in the New Richmond area.

“What we saw was more than just the CNC lathe that Bosch helped purchase. What we saw was an entire shop that was designed well, equipped well and perfectly maintained, filled with bright students who not only knew what they were doing, but also took pride in their shop and their participation in the program,” Burkart said. “The experience made it obvious that community leaders, businesses, school administrators and parents support STEM activities enough to make it worthwhile

Continued on Page 18

DWD Announces Recipients of the Advanced Manufacturing Technical Education Equipment Grant

Grants will provide equipment to help support Career and Technical Education programs in Wisconsin school districts

The Wisconsin Department of Workforce Development (DWD) has awarded 16 Advanced Manufacturing Technical Education Equipment grants to Wisconsin school districts to fund the acquisition of technical education equipment to prepare students for careers in advanced manufacturing.

DWD awarded a total of \$500,000, which will ultimately impact 57 school districts and at least 3,850 students across Wisconsin.

The grants are intended to address Wisconsin’s skilled worker shortage by increasing the number of high school students trained in advanced manufacturing fields, to accelerate student entry into the workforce and to prepare students for stable careers and success in a modern, global and competitive economy.

“At DWD, we strongly believe in a sound workforce investment strategy that includes advocating for careers in manufacturing, one of Wisconsin’s strongest economic sectors,” said the DWD Secretary. “The equipment purchased from these grants, and students’ interaction with it, will encourage consideration of and planning for careers in manufacturing.”

Grants will reimburse school districts for the purchase and installation of equipment for vocational training and technical education in advanced manufacturing, including costs for

equipment operational software, instructional materials and minor facility modifications to accommodate the equipment.

Grants were awarded to the following schools:

Waupaca High School — DWD issued a grant of \$19,871.77.

- Equipment includes: 3-Axis CNC mill, CNC lathe, three 2-axis mills, related collets, chucks, vises and inspection equipment, textbooks and installation

Luxemburg-Casco School District — DWD issued a grant of \$50,000.

- Equipment includes: CNC lathe, CNC vertical mill, ironworker and an air compressor

Stevens Point Area Public School District — DWD issued a grant of \$45,500.

- Equipment includes: 3-Axis CNC mill

Waterford Union High School — DWD issued a grant of \$50,000.

- Equipment includes: nine GMAW welders and a grinding table

Holmen School District — DWD issued a grant of \$36,345.16.

- Equipment includes: CNC mill, six CNC simulators, 6-axis robotic arm with 25 online training seats and a CNC wood router

Wisconsin Heights School District — DWD issued a grant of \$43,326.

- Equipment includes: four multi-function welders, CNC plasma cutting system, pneumatic plate marking tool and unlimited student software licenses

Kickapoo Area School District — DWD issued a grant of \$25,000.

- Equipment includes: CNC plasma cutting table, welding table and fixture kits

Coleman High School — DWD issued a grant of \$30,400.

- Equipment includes: laser engraver

Brown Deer School District — DWD issued a grant of \$19,200.50.

- Equipment includes: welding booth, MIG welder, two 6" verti-lock machine vises, two 3-axis precision tilting vises, two T-slot clamping kits and a variety of cutting, threading and precision measuring tools

Delavan-Darien School District — DWD issued a grant of \$15,644.56.

- Equipment includes: three metal precision CNC lathes with digital readout systems

Antigo Unified School District — DWD issued a grant of \$35,150.

• Equipment includes: 20 CNC simulators
Kenosha Unified School District — DWD issued a grant of \$33,000.

- Equipment includes: three sets of equipment (robotic arm, smart factory, barcode reader, PLC troubleshooter) for instruction of “Industry 4.0” four-course series

Elkhart Lake-Glenbeulah High School — DWD issued a grant of \$18,343.66.

- Equipment includes: plasma cutter table, 3D printer and 3D printer education package

Northern Ozaukee School District — DWD issued a grant of \$31,365.

- Equipment includes: CNC horizontal lathe, four CNC milling machines, two welders and a CNC plasma cutter/router

Stockbridge School District — DWD issued a grant of \$7,500.

- Equipment includes: CNC mill/lathe

Belmont School District — DWD issued a grant of \$39,353.35.

- Equipment includes: two mobile AC/DC training systems and two mobile automation training systems

Source - The Wisconsin Department of Workforce Development



Bay Link Manufacturing Gives Students 'Real World' Experience in the Manufacturing Industry



Green Bay Area Public School District

Every year, juniors and seniors in the Green Bay Area Public School District are invited to apply for the Bay Link Manufacturing® program. Bay Link Manufacturing® gives students the opportunity to gain real world experience in manufacturing, engineering, marketing, and business. Recognizing that the future depends on creating a highly skilled workforce to sustain our vibrant community, the Green Bay Area Public School District and its partners developed Bay Link Manufacturing® in 2014. Students receive high school credit as well as college credit upon completion of the program.

Bay Link Manufacturing® is a high-

precision manufacturing learning lab located at Green Bay West High School. The lab is equipped to complete projects for local companies in the areas of industrial welding, machine fabrication, and metals. Through sales, marketing, accounting, project planning, bidding, purchase orders, and customer service, students also learn the business side of manufacturing. After being a part of Bay Link Manufacturing®, students are prepared to attend a 2 or 4 year college in the fields of manufacturing and engineering. They may also be prepared to enter the workforce in an entry-level position.

This student-run manufacturing job shop provides students with opportunities to complete projects for local businesses in

areas of welding, machine fabrication, and metals. Some of the equipment capabilities include; design/software, CNC machining, manual machining, cutting and welding.

Each summer, students have the opportunity to work for Bay Link Manufacturing®. Andy Belongia, Bay Link Manufacturing® Coordinator, hires a few students each year to keep the shop running through the summer months.

“There is no formal instruction during the summer, the students just know what we need to do and how to do it,” said Belongia. “They punch in; punch out just like a regular job. It’s more laid back in the summer and for that reason we need to have the right students.”

Students get hands on experience in learning to produce materials and projects efficiently, effectively and accurately. There is also a business side to Bay Link Manufacturing® where students talk to customers and make sales calls. “We do charge for the work we do, so the money that we make goes back into the program and the students then receive a scholarship based off our profits,” said Belongia.

Belongia’s favorite part about the

program is the summer aspect of it. “We can tell our customers that we don’t close once the school year is done. We can continue to keep these relationships going all summer and continue to do the work for them,” said Belongia.

Bay Link Manufacturing®, both as a course and summer employment, is a great addition to a student’s resume. By maintaining this program during the summer, students continue to gain experience in the areas of machining and manufacturing, which is important for employers who are looking to hire individuals with prior work experience.

To learn more about Green Bay West’s manufacturing program, visit gbaps.org/baylinkmanufacturing and follow them on Facebook at [facebook.com/BayLinkManufacturing](https://www.facebook.com/BayLinkManufacturing).

www.gbaps.org
(920) 448-2000



This Girl Can



The Green Bay Area Public School’s “This Girl Can” workshops provide an opportunity for girls in grades 7th–9th to explore non-traditional career paths for women. This year, students again had the opportunity to explore the career area of manufacturing along with their mothers/significant female mentors.

Together they used basic welding to create and design a decorative lawn art project. They also learned about manufacturing and engineering industries and the many career opportunities available.

This workshop was held at Bay Link Manufacturing®, a high-precision manufacturing learning lab located at Green Bay West High School equipped to complete projects for local companies in the areas of industrial welding, machine fabrication, and metals.

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2. Appleton Area School District
3. Arrowhead Union High School District
4. Ashwaubenon High School
5. Badger High School
6. Baldwin-Woodville High School
7. Beloit Memorial High School
8. Brillion Public Schools
9. Chetek-Weyerhaeuser Area School District
10. Denmark High School
11. Eleva-Strum School District
12. Ellsworth Community School District
13. Franklin High School
14. Frederic School District
15. Fond du Lac School District
16. Grafton School District
17. Green Bay Area School District
18. Hortonville High School
19. Hurley High School
20. Hustisford School District
21. Kaukauna High School
22. Kenosha Unified School District
23. Kimberly Area School District
24. Mayville School District
25. School District of the Menomonie Area
26. School District of Michicot
27. Middleton-Cross Plains Area School District

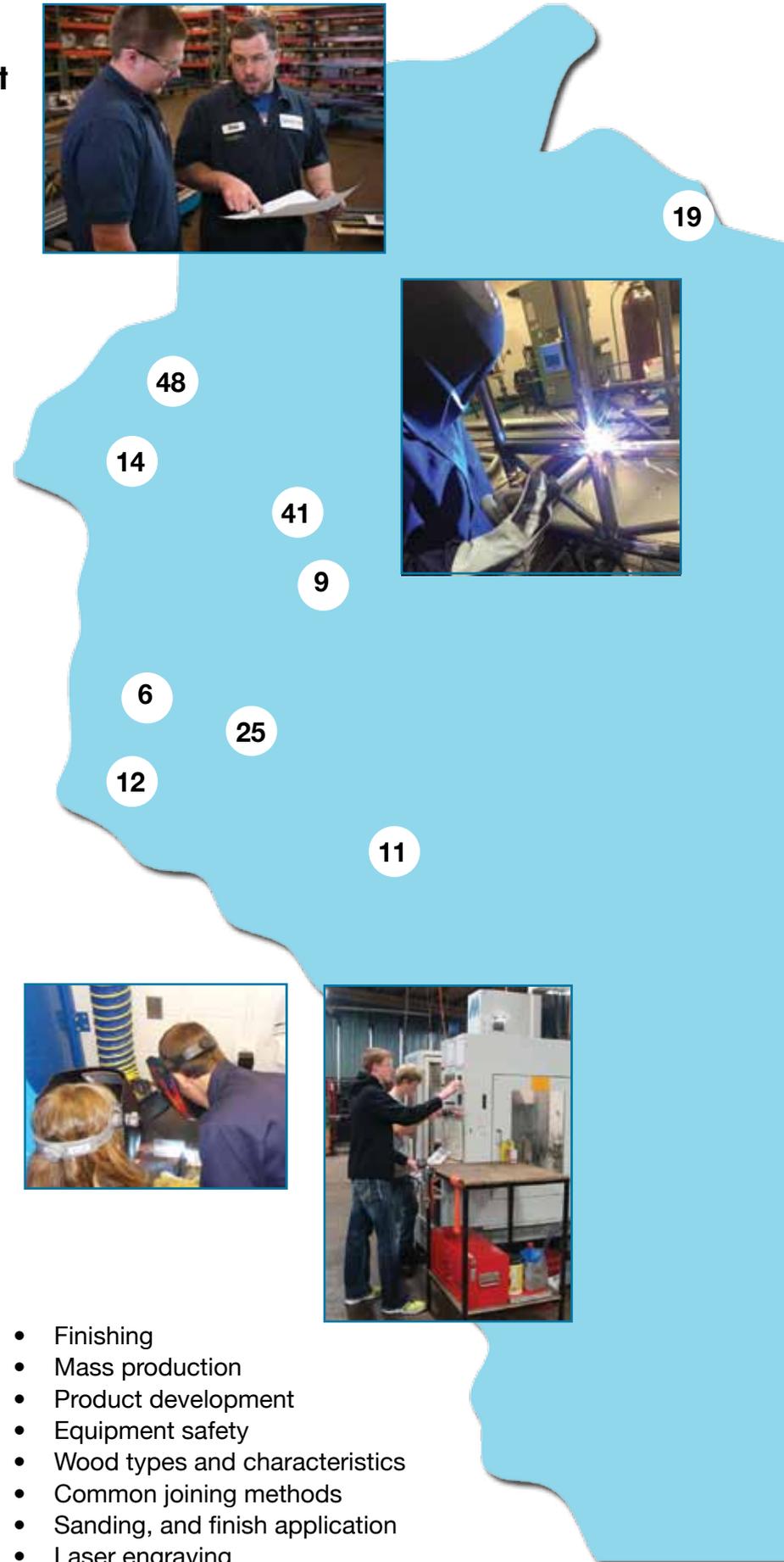


These are the skills that Wisconsin students are acquiring through their manufacturing programs/projects/student run businesses.

Hands on:

- Machining
- Engineering
- Welding — SMAW, GMAW, and TMAW in the flat, horizontal and vertical position
- Mechanical design
- Automation
- Math for the trades
- Project-based learning
- CNC programming
- CAD
- Machine maintenance
- CNC tool setup and changing
- CNC machine setup
- Material selection
- Machining tolerances
- Bookkeeping
- Reading and Creating Technical Drawings
- Product flow
- Production Routings
- Bill of Materials
- Finishing
- Mass production
- Product development
- Equipment safety
- Wood types and characteristics
- Common joining methods
- Sanding, and finish application
- Laser engraving

Celebrating Ma



Manufacturing in Wisconsin



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22

- 28. Milwaukee Public Schools
- 29. Monroe High School
- 30. Monticello School District
- 31. Mosinee School District
- 32. Neenah Joint School District
- 33. North Fond du Lac School District
- 34. Northland Pines School District
- 35. School District of New Berlin
- 36. Oakfield School District
- 37. Oshkosh North High School
- 38. Plymouth School District
- 39. Portage High School
- 40. Pulaski High School

- 41. Rice Lake High School
- 42. Sheboygan Area School District
- 43. School District of Sheboygan Falls
- 44. Slinger High School
- 45. Stoughton High School
- 46. Three Lakes School District
- 47. School District of Waukesha
- 48. Webster High School

Please contact us if your school has not been included!



Soft Skills:

- Project Management
- Communication
- Team work
- Problem Solving
- Leadership
- Attention to details
- Flexibility
- Problem solving
- Decision making
- Positive attitude
- Work ethic
- Interpersonal skills
- Time management
- Sales
- Marketing
- Accounting
- Project planning, bidding
- Purchase orders
- Customer service

Equipment Used:

- Welders that will expose the students to MIG, TIG and stick welding
- Manual lathes
- Manual mills
- Haas CNC machining center
- CNC plasma cutter
- CAD software
- CNC lathe
- Haas CNC milling machine
- CADD utilizes Google SketchUp, AutoCAD and AutoCAD Architecture
- 3D printers
- High-end graphics printing/cutting machines
- Photography and video production equipment
- The latest software used in industry, including 3D modeling and Adobe software products
- Hand tools



Tech Ed at Monticello High School



*Tyler Theden, Monticello School District
Technology Education Teacher*

Prior to my start at Monticello High School in 2016, there was no official Tech Ed program for about 6 years. The previous Tech Ed instructor had retired and the task of keeping Tech Ed curriculum in the school fell on to the shoulders of our Agriculture instructor, Mr. Indergand. The one major benefit of him taking on that role was the woodworking and welding labs remained in working order.

In my first two years at Monticello, most of the changes I made included purchasing small tools required for the classes we offered and fixing or removing broken equipment. We were able to add a smartboard and a 3D printer to my classroom by the end of my first year, as well as put 12 computers in the library for

my CADD class. In the second year, we really started to make some changes. We purchased a 4'x8' CNC router and started rearranging the woodworking lab, which was also serving as my classroom. Before school let out for the summer, one-half of the woods lab was cleared out to accommodate the construction of a classroom over the summer.

At the start of the 2018 school year our program had a brand new classroom that provides us with not only a conducive learning environment, but also a clean space for the two 3D printers and laser engraver/cutter. Another primary benefit of the new classroom was being able to move in the computers from the library. Before, any part file creation included students running back and forth between the woods lab and the library. Now we can work in a much more collaborative and efficient environment.

These changes would not have been possible without the support of my administration and school board. Each time that I've gone to them asking for approval and funding they have been as excited as I was. Thanks is also due to an anonymous donor who provided our department with funding to purchase our second 3D printer. Receiving such great support has been nothing short of amazing.

Currently I offer the following classes: Introduction to Technology Education, Woodworking, Computer Aided Drafting and Design (CADD), Welding, Manufacturing, and Construction. I also teach a period of Exploratory for middle school students. Exploratory classes are only three weeks long and include a variety of units. One of the units is co-taught with Mr. Indergand and covers Hunter Safety that allows students to earn their hunter safety certification.

Intro to Tech Ed focuses on introducing students to the core concepts of all of our offered courses to help students get an idea of what interests them. Woodworking's

primary learning objectives emphasize equipment safety, wood types and characteristics, common joining methods, sanding, and finish application. CADD utilizes Google SketchUp, AutoCAD and AutoCAD Architecture to teach students basic 3D modeling, technical drawing, blueprint design, and dimensioning. This course also intrudes students to 3D printing and laser engraving. Our welding class partners with a technical college for students to earn three transcribed credits. The welding processes we learn includes: SMAW, GMAW, and TMAW in the flat, horizontal and vertical position. Construction focuses on the building processes of constructing a house. We start with foundations and work our way up, covering floor, wall and roof construction as well as interior and exterior material application such as drywall, siding, and shingles. Manufacturing is a yearlong course treated like a capstone class for students who have taken most of the Tech classes. During the first semester, we learn to create part files for the 3D printer, laser engraver, and CNC router as well as job set up and machine operation. We also cover precision measurement instruments (PMI) which allow students to earn industry-recognized credentials. During the second semester, students are able to design and fabricate their own projects utilizing all of the welding, woodworking, and fab-lab equipment.

Projects certainly have not been hard to come by these past three years. So far, my construction classes have built two baseball dugouts for our baseball field, a concrete sidewalk and handicap ramp, and have started planning for a storage shed for our youth football program. Manufacturing class is currently taking on producing personalized engraved cutting boards for every staff member at our school for teacher appreciation week. Some examples of individual student projects include coffee tables, end tables, family farm signs, cutting boards, storage chests. There have been a few unique projects made as well; such as a boot rack made of horseshoes and a bench made out of an old Chevrolet tailgate. This year I also had a student make a new 4'x8' recycling center regulations sign for the Washington Township.

In the future, my goal is to continue improving the layout and efficiency of our woods and welding labs. I want our space to be more organized and user friendly as well as allow for the addition of more equipment so we can continue to better prepare students for their educational and/or career pathways.

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2019 MANUFACTURING DAY EVENTS

ABB

New Berlin, WI

October 2nd 9:00 am–1:00 pm

ABB is offer college students exposure to top tier manufacturing automation, upper level management and upcoming career opportunities.

Door County Economic Development Corporation

Sturgeon Bay, WI

October 4th, 8:30 am–4:00 pm

Door County's 2019 Manufacturing Days Event will include 12 area manufacturing companies.

Eaton-Watertown Manufacturing Facility

Watertown, WI

October 4th, 8:00 am–12:00 pm

There will be a welcome presentation that will include a safety brief, a company overview and tours.

Manitowoc Pattern and Machining Manitowoc, WI

October 4th, 9:00 am–12:00 pm

We will be hosting presentations and tours for students, teachers and the public.

Menomonee Falls and Germantown Chambers of Commerce

West Bend, WI

October 23rd, 2:00 pm

The MCE Manufacturing Career Expo is a free educational trade show spotlighting the career opportunities available in the manufacturing industry.

Nelson-Miller, Inc. Berlin, WI

October 4th, 10:00 am

In celebration of MFG Day, Nelson-Miller invites you to join them at their factory in Berlin, WI.

Pace Industries Grafton, WI

October 4th, 8:30 am–2:00 pm

During the day students will be taken on a tour of the plant and to learn about all of the career opportunities available to them.

PrecisionPlus Elkhorn, WI

October 5th, 9:00 am–1:00 pm

We invite you to explore and celebrate manufacturing and technology careers at this family friendly Open House event.

Wisconsin Aluminum Foundry Manitowoc, WI

October 4th, 9:30 am

Our team will be providing tours through our facility and have some product giveaways. We are excited to showcase the great manufacturing careers available to them.

Wisconsin Manufacturing & Technology Show

WI State Fair Park, Milwaukee, WI

October 8th–10th

In addition to the 255+ exhibitors, student competitions in Welding and Automation and Robotics and a "Resume Rendezvous" where students can put their resumes on file for exhibitors, industry leaders and attendees to review.

**TO LOCATE A MANUFACTURING DAY EVENT HAPPENING
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Kimberly High School Rube Goldberg Machine Team Takes a Fourth Place Finish to the Bank

Nicole Noonan
Marketing and Community Coordinator
Kimberly Area School District

The Kimberly High School (KHS) Mechanical Design/Rube Goldberg team finished a great season by taking fourth place at the national competition. This year, the Rube Goldberg Machine Contest's assigned task was to put money in a piggy bank. The KHS' Super Mario Brothers themed machine accomplished this task in 75 unique steps.

The Kimberly team members were: Mackenzie Beck, Noah Eichstaedt, Luke Endries, Trevor Lamers, Emma Langenhuizen, Chase Robinson, Jared Schmerth, Xander Shampo, Sean Twomey and Alex Vander Pas. These students advanced to compete at nationals in Lawrenceburg, Indiana, after taking second place at STEM Forward's Wisconsin Regional Rube Goldberg Machine Contest.

The purpose of a Rube Goldberg Machine is to overcomplicate a simple task in a humorous and creative manner. The contest required machines to have between 20 and 75 steps to accomplish the task of depositing money in a piggy bank.

In just over a minute, the KHS Rube Goldberg Machine puts coins into a piggy bank using a variety of scenes, scenarios and characters from

the Super Mario Brothers video game universe.

Picking a theme for the machine helped to get the design and creative process in motion. "We wanted to make a fun animated cartoon," said team member Mackenzie Beck. "We used characters from the game and all the different aspects of it."

The students learned to work as an engineering team and go through the design process of brainstorming, sketching, computer-aided design (CAD) modeling, building and fabricating. "When we first started, we separated it into three different parts: the right, middle and left part so then people could work on the different parts," said student Noah Eichstaedt.

Bringing all the parts together to function as one machine involves hours of team work and problem solving. "Each person designs and constructs their own part and then once they are all put together we work together to make one flow to the other," said team member Alex Vander Pas. Student Trevor Lamers added, "It starts off where everyone has their own part and as it progresses we all help each other to make it run perfectly." Several members of the team described their favorite parts of the machine in this video <http://bit.ly/khsrube>.

The team also had to create a presentation describing their machine's process. They had



fun with the Mario theme and created a skit-like presentation where each team member played a character from the video game. The students even handcrafted their character's costumes. Of course, there were hero roles like Mario and Luigi, played by Mackenzie Beck and Luke Endries. A video game isn't complete without villains and that is where characters such as Wario and Waluigi, represented by Trevor Lamers and Chase Robinson, came onto the scene.

As Mario and Luigi journey through each level of the world there were obstacles, more villains and prizes. The ultimate goal of a video game is to defeat the boss monster, which in the student's Rube Goldberg Machine was Bowser.

Played by student Jared Schmerth, Bowser aimed to stop Mario and Luigi from stealing the coins inside his castle. Schmerth was assigned the supervillain role by his teammates in his absence. "These guys just picked me and let me know," said Schmerth. "I guess I stuck with it." He embraced the character and constructed a creative costume featuring Bowser's signature spiked shell, horns and shock of bright hair.

The team members amassed many memories during every step of the process. "The experience was really the best part of it," added Schmerth. "Working with everyone and going

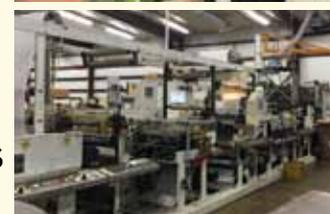
Continued on Page 18

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Arrowhead Engineering Students Show Amazing Promise at Versevo



Imagine being a high school student with a passion for engineering and getting to solve real-world manufacturing problems. For a group of Arrowhead High School juniors and seniors, this isn't just a dream. They were able to do so at Versevo, a Hartland, WI-based world-class design and build, die, mold, tooling, casting and machining company that is celebrating its 25th year of business in 2019.

Like many manufacturers, Versevo's leadership has found it challenging to find and hire talented people to work in its high-tech operation. Its partnership with Arrowhead is one of several initiatives it supports to educate young people about careers paths in manufacturing.

Anthony Christian, the technical education teacher at Arrowhead, devised a college-level capstone project to give aspiring engineers a sense for what's involved in engineering and

problem-solving in an industrial environment. Last year, he worked with Versevo to arrange a plant tour for 30 engineering students. At the end of the tour, the Versevo team presented the group with a set of 10 real problems and issues it's trying to solve.

"We covered everything from rotary degassing of aluminum and casting traceability to improving workflow and reclaiming aluminum from dross," explains Versevo VP of Engineering Tim Kaufung. The group picked two challenges and divided into two groups of four students each. The challenges they selected were:

Automated parts washing: After a part is cast, how can they automate the process of washing it to remove casting residue? Today, it's a time-consuming manual brush and washing task.

Autonomous casting conveyance: Cur-

rently, Versevo utilizes vertical lift storage systems in its operation. One forklift operator moves everything from raw materials for castings and fixtures to tools and kitted assemblies. How could this be replaced by an autonomous vehicle that could flexibly traverse the plant floor to deliver materials and parts where they're needed?

As part of their classroom work, the teams first needed to research existing solutions to these challenges and analyze their cost versus estimated return on investment. To Kaufung's surprise, both teams discovered many of the same vendors and solutions as Versevo's engineering team did.

During their research and solution development process, they had access to Christian and to Lucas Weyenberg, who started his professional career as a mechanical engineering intern with Versevo while he was attending UW-Stout. "Lucas helped them stay on the right path, work through cost issues and redirect them toward practical solutions that really could work," Kaufung explained.

Each team documented its findings and presented them to the Versevo senior management team. They were expected to share the story of how they worked through failures and redirections to arrive at their final solutions.

Each team then demonstrated a rough prototype of its proposed solution. "These were proofs of concept only. For example, you couldn't expect students to program an artificial intelligence-powered material handling system," Kaufung points out. "But the team did use an Erector set (metal pieces joined with nuts and bolts) to build a basic vehicle with sensors that

could move under a part, raise its lift table and then move the part."

"Both teams did a great job of not only presenting the thinking and engineering behind their solutions, but they also provided very thorough ROI analyses," he adds. He was quite pleased with the quality of thinking that went into their presentations and their prototypes.

"It's a testimony to the teacher, the faculty of Arrowhead High School and the incredible quality of the students themselves. There's no doubt in my mind that many of them will go on to do great things!"

What's in it for Versevo?

Kaufung says manufacturing is evolving rapidly, which means Versevo must seek out a higher level of candidate in the years ahead. At the same time, it's getting harder to find skilled people who want to choose manufacturing as a career.

"Under the circumstances, it makes sense to step up our efforts to present Versevo as an attractive place to work and to build goodwill in our industry and our community. This type of high school partnership is one way we can do that," he concludes.

Article submitted by: TDMAW Member Company, Versevo, Inc.

Reprinted from the spring, 2019 issue of Surgeons of Steel by TDMAW

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Making Students Work Ready

Continued from Page 9

and exciting to young people."

As a potential employer for students working in the NRHS metals/manufacturing shop, Burkart feels the money Bosch has given the high school over the last two years has been well invested.

"I could see these students successfully working at Bosch, or really any local employer, someday. As I commented to the shop instructor 'A welder is not just a welder anymore.' Our Bosch associates are expected to not only have a trade skill, but also to be able to identify issues and opportunities in their areas," Burkart said. "As such, schools need to prepare students to think beyond just what they are doing with their hands, or the jobs they have in front of them and consider how what they do can be improved."

According to Bosch Program Officer Haley Eve, the Bosch Community Fund - the corporate foundation for Bosch in North America - was established in 2011 to provide community engagement and philanthropic

support in Bosch site locations.

"The fund focuses on the enrichment of science, technology, engineering and math (STEM) education and advancing environmental sustainability initiatives. The fund operates on an invitation-only basis, and makes grants to 501(c)(3) organizations and educational institutions. Since 2012, the Fund has awarded over \$400,000 in grants to organizations in the New Richmond area," Eve said. "The 2018 Bosch Community Fund grant award to New Richmond High School (NRHS) represents a second year of support for this program."

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Rube Goldberg Machine Team

Continued from Page 17

through it together."

Technology education teacher and team advisor Kevin Janota believes the makeup of the Rube Goldberg team is part of what makes it successful and helps students prepare for their future. "The team continues to get a really good mix of students," said Janota. "About half the team is interested in engineering, otherwise they're looking at skilled trades and marketing. It gives everyone a place to work on a common project together. Learning to work together on something is huge."

When asked what aspect she's most proud of Mackenzie Beck stated without hesitation, "All of our perfect runs." But just like in real life, the imperfect runs also taught the team many lessons. One component that had their theme's namesake character, a part they called the "Mario Lever," was a challenge to get working in a reliable manner. Another component that kept the team on their toes was the flag at Bowser's castle. This piece was within the last few steps of the 75-step process, but proved a difficult aspect

because it would become unreliable at the most inopportune times - at the competitions.

Throughout the whole process, the team had to continually reflect on each part and make adjustments to get the machine working together. The imperfect runs taught the team to persevere, be creative problem solvers and to work together in order to accomplish something much bigger than their one part.

"This machine is amazing," said Janota. "We were disappointed that we finished fourth but proud of the work. I could not believe how many people came up to us afterwards and told the students how great their machine was."

That made us feel better right away." To watch a video of their Super Mario Brothers themed machine in action, go to <http://bit.ly/khsrubemach>.

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- TDMAW partners with **Wisconsin technical colleges**, **BotsIQ WI** and **SkillsUSA** to fully support and further the manufacturing industry.
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- Mechanical Engineer
- Plant Superintendent
- Production Scheduler
- Maintenance Machinist
- Special Machine Assembler
- Quality Control Inspector



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Kaukauna Wins for Manufacturing Program



The Kaukauna High School Technology and Engineering program recently earned Advance CTE's 2019 "Excellence in Action Award" for the Manufacturing Career Cluster. Mr. Nels Lawrence accepted the award for the District on Tuesday, April 9, 2019 at The Advance CTE 2019 Spring Meeting in Washington, D.C.

seven states, represent some of the best Career Technical Education (CTE) programs in the country. Learners in these award-winning programs take part in rigorous sequences of courses beginning with foundational skills to subject-matter mastery; real-world, hands-on

Continued on Page 22

Advance CTE's annual Excellence in Action award recognizes and honors superior Career Technical Education (CTE) programs of study from across the nation. Selected programs of study exemplify excellence in the implementation of the Career Clusters, show a progression from secondary to postsecondary education, provide meaningful work-based learning opportunities, and have a substantial and evidence-based impact on student achievement and success. This year's Excellence in Action award winners, spanning eight Career Clusters® from

How does Kaukauna do it, and how can you develop your own program? Here are some of the steps Lawrence and his staff have taken to get the program where it is today.

Line up the employers. Twenty years ago, Lawrence made calls to employers to find out which ones would be open to working with students. Today, CTE leaders and teachers can build capacity more quickly by tapping into the district's business education partners. Look to regional workforce development boards, economic development boards, chambers of commerce, or industry associations as possible sources of support. Once employers are identified, Lawrence suggests that you set up "interviews" to help them fill out state paperwork associated with the program.

Line up the students. Evaluate students' levels of performance and assess their skills and knowledge in order to match him or her to the most appropriate work setting.

Prepare the students. At Kaukauna, students must take a "Co-op Youth Apprenticeship" class prior to enrolling in work-based learning. The class trains students in professional skills and human resources priorities, such as appropriate dress and harassment in the workplace.

Follow up with employers. Get feedback from employers as soon as possible after

a student is placed so that if something is not working out, steps can be taken quickly to correct the situation. For students who need more support, this is a key step and requires more employer contact.

Work with the union. Lawrence said this is a relatively new development at Kaukauna. As recently as 5 years ago, some unions overlooked the opportunity to employ high school students, but now as the workforce is aging and retiring, the union has begun investing in and training students.

Continue promotion. Build trust in the community to build the trust in parents. Talk with community groups and the local newspaper to get the word out. Once the program gets traction, good student word-of-mouth will help expand the program.

Program success has come with positive changes over time. Employers now seek Lawrence out for trainees, for example. He's also seeing a cross section of students from mid-level performers to valedictorians graduating from the program. And increasingly, employers are willing to fund technical college degrees and provide flexible work schedules to accommodate school schedules.

Source – Wisconsin DPI. To read more CTE Success Stories go to dpi.wi.gov/cte/newsroom



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Aircraft Structure and Systems Assemblers

Assemble, fit, and install parts of aircraft.

Wages — \$26.11/hour

Biofuels Processing Technicians

Work on various parts of the production of biofuels, such as ethanol.

Wages — \$30.26/hour

Cabinetmakers and Bench Carpenters

Build wooden objects such as cabinets or furniture.

Wages — \$19.40/hour

Chemical Equipment Operators

Operate equipment to control chemical changes or reactions during a production process.

Wages — \$19.31/hour

Chemical Plant and System Operators

Control entire chemical processes through a system of machines.

Wages — \$22.73/hour

Chemical Technicians

Work in labs and assist with analyzing chemicals and other substances.

Wages — \$23.06/hour

Coating, Painting, and Spraying Machine Operators

Operate machines to coat or paint a variety of products.

Wages — \$19.26/hour

Computer Numerically Controlled (CNC) Machine Tool Programmers

Develop programs to control the processing of metal or plastic parts by machines.

Wages — \$28.90/hour

Crushing, Grinding, and Polishing Machine Operators

Operate machines that crush, grind, or polish materials like coal, glass, grain, stone, food, or rubber.

Wages — \$20.03/hour

Cutting, Punching, and Press Machine Operators

Operate machines to saw, punch, bend, or straighten metal or plastic material.

Wages — \$18.14/hour

Drilling and Boring Machine Operators

Operate machines to drill, bore, ream, mill, or countersink metal or plastic pieces.

Wages — \$16.47/hour

Electrical Engineering Technologists

Assist electrical engineers in a variety of activities.

Wages — \$27.47/hour

Electrical and Electronic Engineering Technicians

Apply electrical and electronic theory to design or build electrical equipment.

Wages — \$30.42/hour

Electrical and Electronics Drafters

Prepare diagrams that are used to create, install, or repair electrical equipment.

Wages — \$28.15/hour

Engine and Other Machine Assemblers

Construct, put together, or rebuild all types of machines.

Wages — \$17.77/hour

Extruding and Drawing Machine Operators

Operate machines to push thermoplastic or metal materials into tubes, rods, hoses, or structural shapes.

Wages — \$18.52/hour

Fabric and Apparel Patternmakers

Make precision fabric patterns.

Wages — \$26.77/hour

Forging Machine Operators

Operate forging machines to shape or form metal or plastic parts.

Wages — \$20.75/hour

Furnace, Kiln, Oven, Drier, and Kettle Operators

Operate specialized heating equipment.

Wages — \$19.53/hour

Gas Plant Operators

Distribute or process gas for utility companies.

Wages — \$32.27/hour

Geothermal Technicians

Install or maintain geothermal (ground source heat) systems.

Wages — \$22.18/hour

Hydroelectric Plant Technicians

Monitor activities involved in hydropower generation.

Wages — \$30.26/hour

Industrial Engineering Technicians

Help industrial engineers to design processes to make better use of resources at work sites.

Wages — \$24.71/hour

Industrial Machinery Mechanics

Repair, install, or adjust manufacturing equipment.

Wages — \$26.12/hour

Inspectors, Testers, Sorters, Samplers, and Weighers

Look for defects or problems in raw or manufactured materials.

Wages — \$19.06/hour

Jewelers and Precious Stone and Metal Workers

Design, create, or repair jewelry.

Wages — \$18.04/hour

Lathe and Turning Machine Operators

Operate lathe and turning machines in production processes.

Wages — \$19.35/hour

Machinists

Set up and operate a variety of machine tools to produce precision parts.

Wages — \$23.40/hour

Mechanical Drafters

Prepare diagrams of machinery and mechanical devices.

Wages — \$27.94/hour

Mechanical Engineering Technicians

Apply principles of mechanical engineering to help to develop machinery.

Wages — \$26.44/hour

Medical Appliance Technicians

Construct, fit, or repair medical devices such as braces or prosthetics.

Wages — \$16.59/hour

Metal and Plastic Layout Workers

Lay out reference points and dimensions on metal or plastic work pieces.

Wages — \$21.29/hour

Nanotechnology Engineering Technicians

Operate equipment to produce or test materials at the molecular level.

Wages — \$27.47/hour

Non-Destructive Testing Specialists

Test the safety of various types of structures using x-ray, ultrasound, or fiber optic equipment.

Wages — \$27.47/hour

Nuclear Power Reactor Operators

Operate or control nuclear reactors.

Wages — \$45.56/hour

Packaging and Filling Machine Operators

Operate machines to prepare products for shipment.

Wages — \$15.97/hour

Petroleum Pump System and Refinery Operators

Operate systems that refine petroleum.

Wages — \$29.08/hour

Photonics Technicians

Build, install, or maintain optical or fiber optic equipment.

Wages — \$27.47/hour

Power Plant Operators

Operate machinery to generate electric power.

Wages — \$39.85/hour

Production, Planning, and Expediting Clerks

Coordinate the flow of work and materials between departments, following a production schedule.

Wages — \$23.75/hour

Purchasing Agents

Purchase all the goods and services that are needed to run an operation.

Wages — \$29.87/hour

Radio, Cellular, and Tower Equipment Installers and Repairers

Repair, install, or maintain equipment used in radio transmission or other communications.

Wages — \$32.33/hour

Robotics Technicians

Build, install, test, or maintain robotic equipment or related automated production systems.

Wages — \$27.08/hour

Semiconductor Processors

Perform a variety of different duties during the production of electronic semiconductors.

Wages — \$18.17/hour

Supervisors of Production and Operating Workers

Directly supervise and coordinate the activities of production and operating workers.

Wages — \$29.47/hour

Welders, Cutters, Solderers, and Brazers

Weld or join metal pieces together using hand-welding, flame-cutting, or brazing tools.

Wages — \$20.94/hour

Welding, Soldering, and Brazing Machine Operators

Operate welding, soldering, or brazing machines or robots.

Wages — \$20.58/hour

Woodworking Machine Operators

Operate woodworking machines, such as drill presses, lathes, shapers, sanders, planers, or nailing machines.

Wages — \$16.07/hour

Source - <https://www.onetonline.org>



MHS Robotics Team 930 Dominates on World Stage



*Benjamin Kossow
Mukwonago Area School District
Coordinator of Assessment and Data*

Mukwonago FIRST Robotics Team 930 returned home from the FIRST World Championship at Ford Field in Detroit this spring celebrating a 2nd-place finish. The robotics team, consisting of nearly 50 students and over a dozen mentors and coaches, competed against more than 400 teams from across the world. In taking 2nd place, Team 930 became only the second Wisconsin team ever to place as a world championship finalist.

Team 930 overcame adversity on its path

to the finals. Starting in January, the team typically has six weeks to build and test a robot they design from the ground up within strict rules and a limited budget.

“We lost a lot of time due to snow days in January, but the whole team stepped up to work together and get things done, coming in to work overtime on Fridays and Sundays and putting in extra hours during the week,” said Samantha Murphy, Team 930 member and MHS senior. “Every day was spent constantly innovating and improving because we can always do better, and it really paid off.”

Internationally, over 3,700 teams competed in regional events to qualify for the

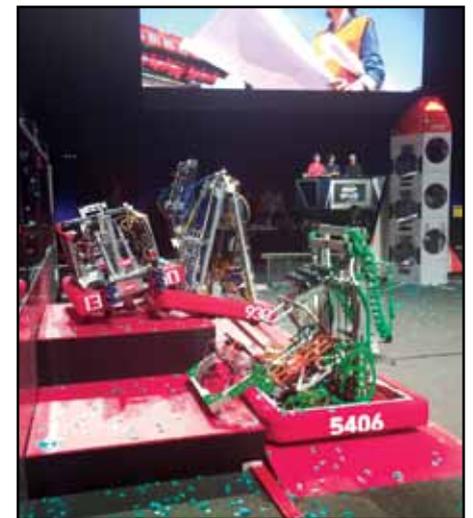
FIRST World Championship. Team 930 competed at events in Chicago, Iowa, and Milwaukee against dozens of other regional teams to earn a spot in the World Championships, where the team advanced to the elimination rounds and rose to the top.

“Going into the competition, I wasn’t very optimistic about how we would do, because the competition is pretty tough at the world championship,” Murphy said. “But as we kept advancing in the competition, everyone got more and more excited to be there, and it really motivated us to go further because we knew then that we could.”

“The big goal of this program is to give students opportunities for learning that they don’t get in a typical high school program,” said Greg Billetdeaux, a lead mentor for Team 930, MHS graduate, and former Team 930 member.

Billetdeaux, a software engineer for Milwaukee-based RokkinCat, an engineering company, explained that mentors encourage students to use design and build processes that mirror what one would find in real-world industries.

“I’ve learned so much about programming, the engineering process, teamwork, and leadership throughout the years and I am so grateful for it,” Murphy said. “Being



a part of Team 930 inspired me to keep pursuing [science, technology, engineering, and math] and study computer science at Purdue University next year, and I will take all of the valuable lessons I’ve learned with me.”

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Kaukauna Manufacturing Program

Continued from Page 20

experiences in the classroom led by dedicated educators; and meaningful work-based experiences facilitated by industry partners. Key to the programs’ successes are industry and educational partners that provide input on curriculum, mentorship, strong networks for learners and seamless pathways to successful careers.

“We are thrilled to see the work of Mr. Lawrence, our Technology and Engineering program, our students, and our community partners honored with this award,” said Matthew Smith, Director of Secondary Education for the Kaukauna Area School District. “The work that they do continues to be exemplary.”

Kaukauna High School’s Technology and Engineering department offers thirty courses for students in grades 9-12, covering topics like technology concepts, engineering, renewable energy, welding, automotive technology video media production and more; ten of these courses allow students to obtain college credit while enrolled in the high school course. Additionally, during the 2018-2019 school year, KHS placed 52 students in Youth Apprenticeship roles, and another 20 in co-op positions, utilizing 45 of approximately 150 existing community business partners.

About Advance CTE

Advance CTE: State Leaders Connecting Learning to Work is the longest-standing national non-profit that represents State Directors and state leaders responsible for secondary, postsecondary and adult Career Technical Education (CTE) across all 50 states and U.S. territories. Advance CTE was formerly known as the National Association of State Directors of Career Technical Education Consortium (NASDCTEc). Their mission is to support visionary state leadership, cultivate best practices and speak with a collective voice to advance high-quality CTE policies, programs and pathways that ensure career success for each learner. To learn more about the organization and what they do, please visit: <https://careertech.org>.

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Mayville Manufacturing — Not Just in it for the Projects



Dave Seiler
Mayville School District

As I look at many of the great articles in this publication, I notice how many schools have adopted the student led manufacturing plan. Well, add this to the list. This is the story of Mayville High school's student led business — Mayville Manufacturing. While what we do seems similar in many aspects of other schools, we do pride ourselves on a few other things that have not been mentioned. Each of them having a little story behind it,

which I think helps define what we are trying to do.

Mayville Manufacturing was started in Dec. 2015. At that time, students named our business Cardinal Industries (we really like the name Cardinal Manufacturing, but we didn't want to compete with another great student led business north of us). From early on, we really wanted to work with other departments. We really didn't care how, but wanted to involve as many people as possible in sharing this experience. We had a discussion with our

Marketing teacher and asked if they could help us create a company logo. Throughout the process, the Marketing students did research on our name and suggested that we change names as Cardinal Industries was already used by a business in Wisconsin. The end result was over 30 designs to choose from. Complete with a logo design and new name. The ironic ending to this story was that the design that was eventually chosen was created by a student who is currently in Mayville Manufacturing. We continue to focus on working together as much as possible.

Another aspect we pride ourselves on is giving back to the community. We really want the students to understand that a business is not just about making money, but also the giving back to others. We have done this in a number of ways. At the conception of now Mayville Manufacturing, we decided to start the business off by designing, building and then donating cribbage boards to our local American Legion. Showing this gratitude for the community, from the beginning was necessary. They in turn donated money to us and this started our business.

Our local Chamber of Commerce holds a fundraiser every year and for the past few years, we have donated to them. In the past, we have made an Adirondack chair with the back the shape of Wisconsin, as well as

raised planter boxes. This past year, as we were busy packing and moving into a new shop space, we donated money for the event. Another worthy cause that we need to be a part of. In addition to this, we have also given money to needy families during the Christmas season.

Our shop does not have equipment to mass produce a lot of things. Most of our projects are unique and one of only a few. We make things from wood, metal and plastics. Almost all of the projects have stories behind them. From the teamwork put into the design, to the pride in craftsmanship to complete it. Everyone that is a part of Mayville Manufacturing understands that they need to be on the top of their game, every day. Just like any other company would be. This sometimes is the hardest part as a new class starts each year.

Like others, our long term goal is to become self-sustainable, while teaching real world experiences and lessons to our students. Our hope is that they apply these experiences and lessons after graduation.

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