

# **Center for Technical Excellence**



Hutchinson High School Hutchinson, Minnesota A central strategy in Hutchinson's Skilled Workforce Development Plan was to establish the *"Center for Technical Excellence"* at Hutchinson High School.

In many schools across America, Career & Technical Education (or "the shop" as its often referred to) comes at the tail end of the school district budget. After everything else is paid for, if there's any money left over in the high school budget, it goes to the shop. Typically it's not very much. As a result, many schools have shop areas that are filled with inadequate and obsolete equipment.

On a tour of our shop area a few years back our school district superintendent commented, "this doesn't change the stereotype, it reinforces the stereotype!"...the stereotype being that manufacturing is dirty and undesirable as a career.

Truth be told, he was right. Our Career & Technical Education area – the shop – looked like a dungeon: unpainted cinderblock walls, run-down, filled with old and obsolete equipment. One of our CTE instructors noted that some of the equipment was so old it could no longer be calibrated correctly. It simply would not hold tolerance.



This is the type of thing that gets parents telling their children, *"Tommy, you go to college because I don't want you to end up in a place like this!"* 

Whether we realized it or not, we were sending a message: Career & Technical Education is not important.

Outdated tech-ed facilities reinforce old (and erroneous) stereotypes of manufacturing, discourages exploration of technical education and "turns off" students and parents.

It's no wonder we have a skilled workforce shortage!

Here in Hutchinson, we resolved to <u>dramatically</u> change the situation.

Our goals:

1. Change the stereotype students <u>and parents</u> have of manufacturing.



Well over 50 years old, this thing belongs in a museum, not in a high-school tech-ed classroom.

- 2. *Get students inspired and excited* about Career & Technical education and employment.
- 3. *Provide world-class equipment* for students to train on.

We started by remodeling our tech-ed facility. Old equipment was disposed of, walls painted white and floors received a coat of epoxy. Brand new, <u>real-world equipment</u> was added to create a first-class training environment.



Hutchinson High School's tech-ed wing was remodeled to give is a more inviting, contemporary look.



Windowed overhead doors were installed so students (and parents!) can see all the amazing activity in these high-tech classrooms. The big doors also make it easy to move equipment, materials & projects in and out.



**Computer Aided Drafting & Design (CADD) Lab** 

Our new CADD Lab is situated right in the middle of the "Center for Technical Excellence." The two overhead doors to the left lead straight into our Machine Tool Lab. Note the windows on the far side of the room, so students, parents & teachers can see what's happening.



We have signage in all of our tech-ed labs recognizing the partners that made it all possible. The overhead door leads into the Machine Tool Lab.

# **Machine Tool Lab**



State-of-the-art equipment like this HAAS CNC Vertical Machining Center match what is being used by precision, high-tech manufacturers in the 21<sup>st</sup> Century. We also coordinated with Ridgewater College (our local technical college) so that in many cases our equipment matches theirs.



### (Left) CNC Tool-Room Lathe.

(Below) While these mills are equipped with CNC capability, students start by learning manual mill & lathe techniques.

Our goal is to match as closely as possible what's being used both at our technical college and in industry.

Our goal is that students will have <u>years of experience</u> on these machines by the time they start their manufacturing career.





New lathes – same as you'd find on the shop floor of any well-equipped manufacturer.

# **Building Trades Lab**

Hutchinson's Building Trades Lab has been completely reequipped with state-of-the-art manual & CNC woodworking equipment.

In the background you can see the Tiny House under construction by Tiger Manufacturing (our student run business).

Note the clean, welllit environment.



# Welding & Metal Working Lab

The Welding & Metal Working Lab possesses 17 welding booths, each equipped with its own MIG & TIG welders.



If we had to do it all over again, we would have made both the Building Trades Lab and the Welding & Metal Working Lab <u>bigger</u>. We discovered that while we had room enough for all the equipment, we didn't leave enough space for students to store whatever projects they were working on.

# Engines & Automotive Lab





New work benches are on wheels, allowing the space to be reconfigured as needed.



The foreground shows part of the Engines & Automotive Lab.

In the background is the Welding & Metal Working Lab before the welding booths were completed. You can see the welding fume extraction system.

# **Coming Attraction:** Applied Engineering & Physics Lab

In the summer of 2018 we'll be adding the Applied Engineering & Physics Lab. Here students will learn hands-on physics through the use of various automation / mechatronics trainers developed by Festo Didactic.



#### Some of the trainers that will equip our Applied Engineering & Physics Lab:





Distributing/Conveyor, Joining, Sorting

# Stacking Magazine station



#### Technical learning objectives

Solar / Wind Energy Training System

- Fundamentals of pneumatics
- Single-acting cylinders
- Double-acting cylinders
- Solenoid valves
- Sensor technology magnetic limit switches
- Connecting tubing and wiring
- Relay control systems

# Conveyor station



#### **Technical learning objectives**

- Activation of direct current motors
- Inductive sensors
- Opto sensors
- Relay circuits
- Polarity reversal circuits
- PLC programming
- Control using logic operations
- Construction and wiring

# Handling station



#### Technical learning objectives

- Fundamentals of pneumatics
- Double-acting cylinders
- Gripper
- Solenoid valves
- Sensor technology magnetic limit switches
- Connecting tubing and wiring
- Relay control systems
- Control with logic
- PLC controllers
- Sequencing

As part of our effort to change stereotypes, we branded our Tech-ed area as the **"Center for Technical Excellence."** We believe it is the best-equipped, most advanced high school technical education facility in Minnesota.

This is the type of facility that will inspire students, show what manufacturing really looks like in the 21<sup>st</sup> century and get Mom & Dad saying, *"Tommy, Suzie, <u>get in there</u> and do that because it looks super cool!"*