STANDING DESK

Construction and Connection to the Classroom

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WHERE DID THIS PROJECT STEM FROM?

- The project came about from a desire to create something that would help teach students real-world work skills in a school environment.
- The goal was to have a "product" that had tangible use, rather than building something just for the sake of building it.
- Finally, it was decided that it would be great if the "product" met an authentic need and if it could be sold, so the project could be self supporting.

WHY A STANDING DESK?

It provides students with the opportunity to learn important, practical skills.

- Basic carpentry, math, shopping, and problem solving skills are transferable to daily real-life tasks.
  - E.g. measurement, angles, cost, profit, where to purchase materials, how to use a home center, sales, communication

WHY A STANDING DESK?

It fits an authentic need in our schools.

- With many schools and school boards embracing *Universal Design for Learning*, flexible workspaces are in demand.
- A compact, low-footprint design that can be adjusted to different heights can benefit learners of all sizes and profiles.

WHY A STANDING DESK?

A standing desk will see use.

- Many teachers would love to have these in their classrooms but current options are cost prohibitive.
- They provide students a way of giving back to the school community
- A solid wood desk can be made to last.

WHY A STANDING DESK?

The project can be customized

- *Based on skill level of the builders, this desk can be customized for:*
  - *Aesthetics (shape, tapers, different top, etc.)*
  - *Size: This model is deigned for high school but a shorter elementary version is easily built from the same design*
  - *Material selection (construction lumber, hardwood, softwood)*
  - *Hardware selection (screws & bolts vs. wood joinery vs. glue)*
  - *Finishing (paint, stain, sealant)*

WHY A STANDING DESK?

The project can be batched and sold

- *Imagine a entrepreneurial exercise where Prework students fulfill orders from teachers to build standing desks in their classrooms*

OUR STANDING DESK VS STORE BOUGHT

$165

$120 or less

SO WE HAVE THIS IDEA… NOW WHAT?

- A standing desk is wonderful, it teaches real life skills, it has a real use and it fits into a newer way of thinking about teaching…now we need to build it.

  - We set out to try to create a product that could be made in schools, by students.

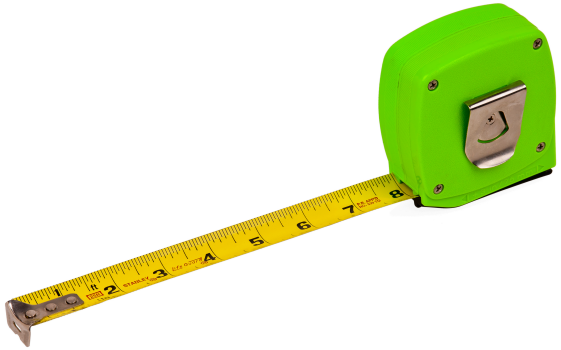
CONSTRUCTION OVERVIEW – TOOLS USED

Drill

Drill press

Mitre Saw

Orbital Sander



Measuring tape

Back saw w/ mitre box

CONSTRUCTION OVERVIEW – HARDWARE USED

Wood glue

Wood screws

Wood stain

Lag bolts

Eye bolts + nuts

CONSTRUCTION OVERVIEW – WORKSPACE

- We were fortunate to have access to a fully stocked carpentry classroom to build our prototypes
- While this setup is ideal - all of the tools used run off of a normal 120V plug and are more or less transportable
- With some planning this project could be done in a regular classroom
- Safety, air quality (sanding and staining) and proper clean up would be important factors to keep in mind

Mitre saw *– cutting components*

Drill *– Screwing components*

Drill press *– Adjustable post hole drilling*

CONSTRUCTION – PROTOTYPE 2 (TOOLS IN USE)

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CONSTRUCTION OVERVIEW

Part 1: Sawhorse Frame

A. Cut all components
B. Glue and screw vertical members to create doubled pieces
C. Drill holes into the vertical members for adjustable heights
D. Assemble frame
E. Sand

Part 2: Sawhorse bracket

A. Cut all components
B. Assemble
C. Slide bracket over sawhorse
D. Install Eye-Bolt into lowest position. Inspect and make adjustments.

CONSTRUCTION OVERVIEW

Part 2: Sawhorse Frame (cont.)

E. Cut and assemble supports (tabletop and bracket guides)

Part 3: Tabletop

A. Cut plywood to size

B. Cut and assemble edge-banding with glue + screws

Part 4: Finishing

A. Sand all components up to 180-220 grit.

B. Stain or paint

C. If staining, seal using polyurethane or equivalent for durability.

DESK CONSTRUCTION – PROTOTYPE 1

Component	Design	Strengths	Limitations
Top	Solid wood	• Long-lasting • Easy to repair & refinish	• Difficult to laminate (glue together) for novice woodworkers • A lot of sanding was needed
Base	Pipe and flange system	• Stylish • Durable	• Pipe added extra weight • Made the desk top heavy • Wobbly

DESK CONSTRUCTION – PROTOTYPE 2

Component	Design	Strengths	Limitations
Top	Plywood + solid wood trim	• Quicker to assemble • Less expensive	• More difficult to repair and refinish
Base	Construction lumber	• Lighter weight • Less expensive	• More sanding and finishing • More cuts + tool use

DESK CONSTRUCTION – PROTOTYPE 1

Ultimately this was…

- … healthy "failure"
- … problem solving in action
- … experimentation
- … a learning process

PROTOTYPE 1

THE FINISHED PRODUCT

FINISHED DETAILS

- Eye-Bolt can be pulled out.
- Table can be lifted and slipped into different heights.

FINISHED DETAILS

- Tight fitting bracket structure ensures that the desktop won't wobble

SO WHERE DOES A STANDING DESK FIT?

- No we are not talking about where it physically fits in a classroom…that is up to you.
- Where does this kind of project fit into the Prework curriculum? We see two fairly easy fits.
  - Math
  - Introduction to the World of Work (IWW)

MATH

- As previously mentioned this project gives students a chance to practice many real life math skills that they might use in a job placement or later
  - Measurement
  - Angles
  - Creating shopping lists
  - Price comparison
  - Reading a blueprint
  - Budgeting
  - Book keeping
  - Profit/Loss

INTRODUCTION TO THE WORLD OF WORK

- A small aside (for full disclosure)
  - A few years ago I was involved in a project where we broke down the ministry requirements for IWW.
  - We put together a resource binder (available on the LEARN website) and we think that this project fits nicely into the workshop model that we developed.

IWW – …TELL ME MORE ABOUT THIS WORKSHOP MODEL

- Introduction to the World of Work is meant to be taught using the classroom as a workshop.
- The ideal workshop scenario may involve a complete, mock work environment with all tools, materials and space available and include a knowledgeable teacher able to lead and assess students in a specific trade.
- Our goal was to create a framework that could be followed when doing a project or activity. Year 1 students would experience mini "job scenarios" within the school in order to prepare them for the expectations on the job site in the future.

SOUNDS NEAT, HOW DOES IT WORK?

- We tried to create something that would follow a similar way that students are evaluated when on work placement.
- This meant evaluating two competencies
  1. General transferable "Attitudes and Behaviors"
  2. Job Specific Competencies

TRANSFERABLE ATTITUDES AND BEHAVIOURS

Expected in the workplace

Workshop Scenario Evaluation

Student Name: | **Evaluation Date:**

Scenario:

	A	B	C	D
Attitudes and Behaviours	Meets requirements very well	Meets requirements	Partially meets requirements	Does not meet requirements
Relations with supervisors and co-workers	Always shows respect and courtesy and establishes excellent working relationships	Relates well to supervisor and is friendly with some workers	Has difficulty with authority and has some difficulty with working relationships	Is disrespectful and tends to stay alone at breaks and does not relate to workers
Relations with customers	Deals with customers with ease	Accommodates customer needs,	Has some difficulty dealing with customers	Has difficulty relating with customers
Following Directions	Listens carefully and follows directions accurately	Follows directions but sometimes needs corrections	Has some difficulty understanding and following directions	Instructions must be repeated frequently
Productivity	Very energetic, exceptional amount of work done	Completes work within expected time limits	Often seems tired and completes minimal work expected	Completes little work
Initiative and Motivation	Shows initiative regularly, very motivated and finds work to do	Shows initiative sometimes and motivated to follow the expectations of the job	Has not shown initiative yet and needs encouragement to stay motivated	Shows no interest in taking initiative and does not seem motivated
Communication	Communicates fluently in the workplace	Communicates adequately in the workplace	Sometimes has difficulty with communication in the workplace	Has difficulty with communication in the workplace

JOB SPECIFIC COMPETENCIES

Workshop Scenario	Standing Desk Construction

Teacher Introduction: (Overview / Purpose)

This workshop is designed to allow students to experience the construction of a wood product from a plan. This desk could be made to order and so the plans may need to be altered to satisfy the customer. Tasks may include: communicating the design with the customer, making changes to the plan and material list, buying the material, setting up the work station, building, and delivery. Students could advertise the desk and find customers. They could offer different designs and discuss with customers details about design and cost. Things to consider in this series of activities: customers should pre-order the desk and possibly give specifics for type of design (height, table top, etc.). Students could brainstorm slight changes to the design to offer and discuss and determine the specific types of clients for this product. Note that selling items in school needs to be passed through the Governing Board and the Principal. Also ensure that you have done specific safety lessons on each of the tools used and specific work shop safety.
This workshop scenario provides an opportunity to address many different specific tasks and performance criteria.

Materials

- Wood for construction (2x4, 2x8, 1x3, plywood)
- Fasteners (screws, eye bolts/nuts, lag bolts)
- Consumables (wood glue, stain/verathane, sand paper)
- Power tools (Mitre saw, drill press, Portable drills, sander(orbital))
- Carpentry tools (drill bits, driver bits, hex bit(lag bolts), measuring tape, clamps, rag/brush for stain)
- Safety equipment (safety glasses, gloves for staining,)

Performance Criteria		Specific Competencies
Health and Safety	- Observance of rules of hygiene and sanitation /occupational health and safety rules, Order and cleanliness.	• *Clean and tidy up the work area* • *Maintain the equipment and work areas* • *Prepare the workstation*
Following Procedures	- Compliance with work instructions, Proper application of work techniques and Proper use of equipment, Accurate interpretation of assembly plan and steps	• *Prepare to cut solid wood or wood-based panels* • *Cut solid pieces of wood into sections*
Customer Service	- Courteous service, Concern for customer satisfaction, Relevant, accurate and clear information provided, Attentive listening	• *Receive payment from customers*

Procedure

Pre-production:
Who would be potential customers for a standing desk?
Determine pricing: look into costs of materials and available tools, work space, etc.
Production:
Teach mini lessons about workshop safety and procedures for tools, maintain work area (neat working environment, clean as you go), handling the material, working with others in a workshop (safety and etiquette).
Review the material list and plans
Purchase all materials and begin assigning the tasks (cutting material, sanding, assembly, etc.)
Build the desk
Deliver the desk
Teacher acts as employer overseeing the operation
Post-Production –
- possible mini lessons as a follow up for areas of improvement (teamwork, communication, etc.)
-Reflection questions for students about process and project, WWI and EBI,
-Notes for future projects: