

Crate it Away!

Construction of a Wooden Crate in a Power Tool Skill Development Course

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The Challenge:

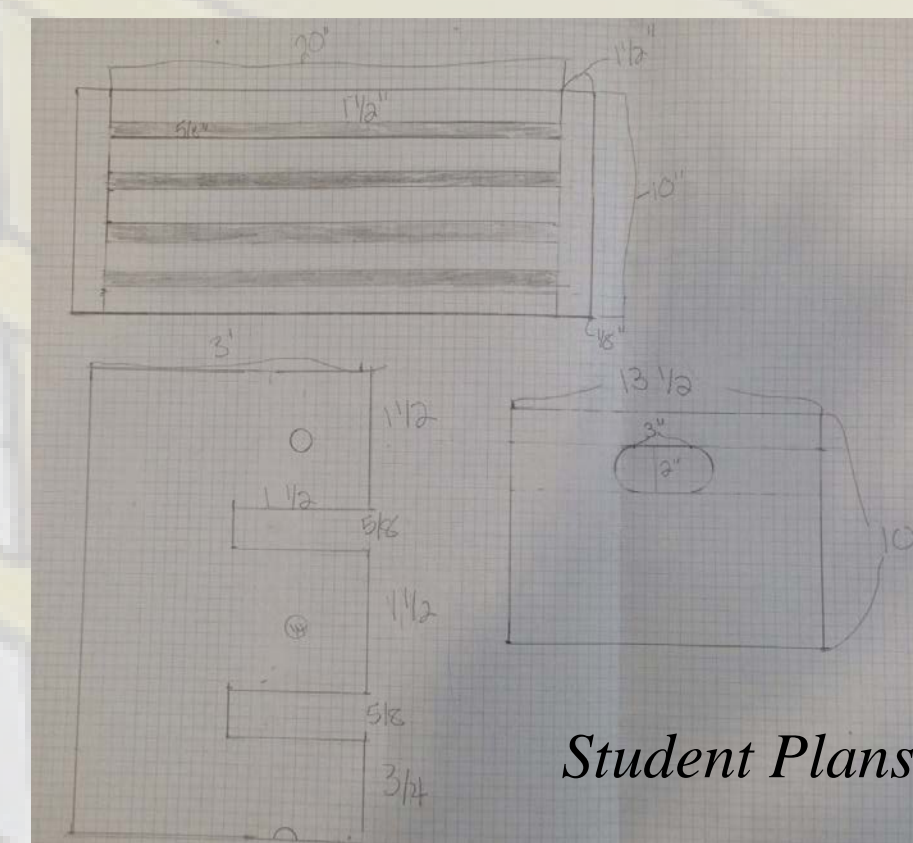
Tool safety, skill, and application course is offered for Ag Ed majors. Students are expected to construct a final project in the course. The project must:

- Show student cumulative learning and application of skills taught through out the semester
- Incorporate the application of multiple power tools in the PSTS lab
- Have multiple starting points to eliminate “bottle necking” at tools
- Be cost effective
- Be a project students will take pride in building and want to take home

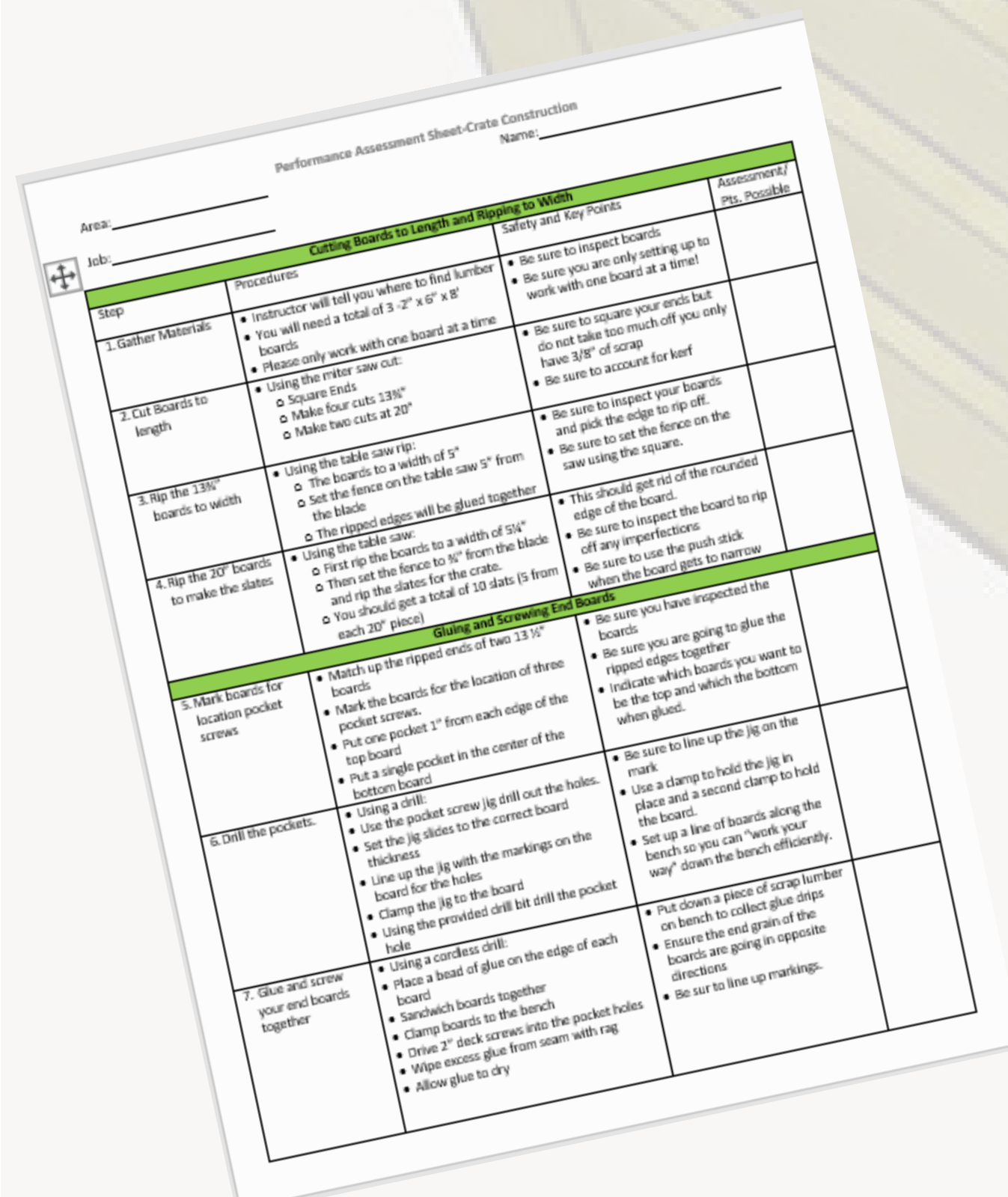
The Solution:

Instructor designed a Wooden Crate Project for students to construct. Students construct 3 total crates one at a time. The crate project:

- Is presented to students in class, they draw it to scale, identify the steps in the procedure, and identify tools needed for construction
- Requires the use of 15 different power tools to construct
- Has three different starting points to break the class into groups
- Uses minimal resources to construct: 1-8’ 2x6; a piece of 1/8” hardboard, and 14-gauge steel
- Students use final project as bookshelf, nightstand, etc.



Student Plans



Tools Used During Construction of Crate	
Tool	Task(s) tool used to complete
Miter Saw	Cut 2x6 to length
Circular Saw	Cut HDF bottom from sheet
Table Saw	Rip 2 x6 cuts for end piece and slats
Jig Saw	Cut the handle openings in the ends
Router	Round over edges of handle cut outs; Cut overhang from bottom
Corded Drill	Drill holes for handle cut outs
Cordless Drill	Drill pocket screw holes with jig/drill pilot holes for screws
Impact Driver	Drive screws in pocket screw holes
Drill Press	Drill holes in the fabricated metal brackets
Metal Band Saw	Cut metal brackets in half so they fit in the brake
Angle Grinder	Flap discs to sand/polish metal brackets
Bench Grinder	Round corners on metal brackets
Iron Worker	Use brake attachment to bend bracket cut outs to 90°
Pneumatic Nailer	Fastens HDF to bottom of crate
Sander	Sand glued ends/sand to smooth finish

How it Works:

- Students are taught how to safely operate each tool
- Students design plans for the wood furniture crate final project.
- Students use 15 different power tools during construction
- The ends and sides of the crate are cut from one 8’ 2x6” piece of lumber
- The bottom is cut from an 1/8” thick sheet of HDF
- Students design and fabricate metal bracket hardware
- Students are divided into three starting groups (cutting 2x6; cutting HDF; designing brackets)
- Students build 3 total crates, one at a time enhancing skill level with each build



Completed Project



Costs/Resources:

- One 8’ 2x6” piece of stud lumber
- HDF (hardboard) cut from a 4’x8’ sheet
- Hardware brackets cut from a 4’x8’ sheet of 14-ga steel
- Screws, wood glue, and brad nails needed for assembly
- **Total cost per crate: \$9.00 OR \$27.00 for all 3**



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