

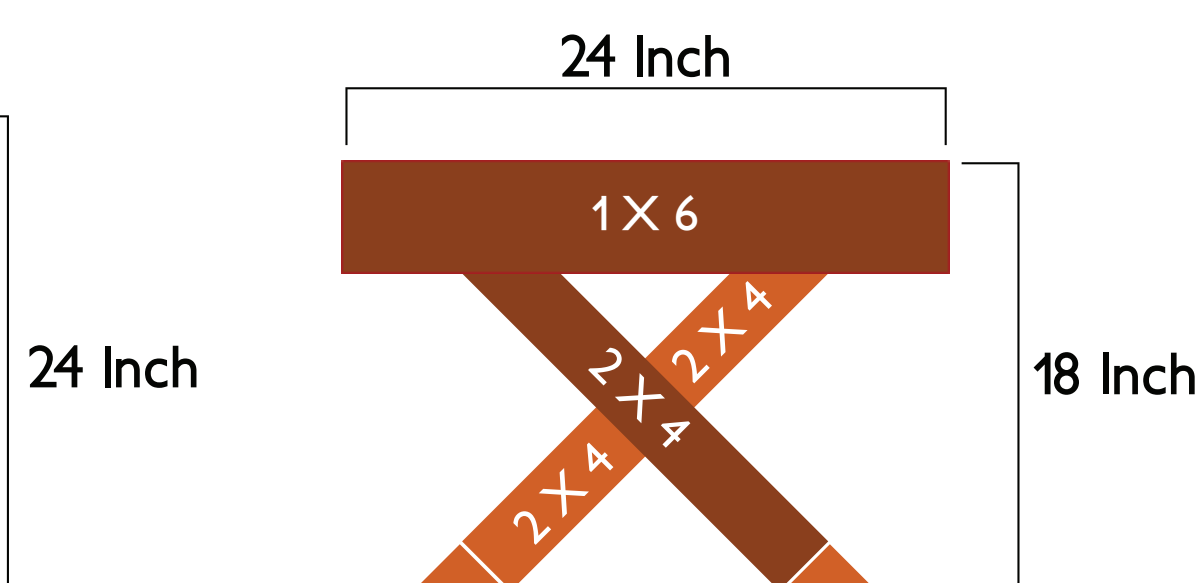
# 2015

## ENGINEERING TECHNOLOGY STUDENT PROJECT EXHIBITION

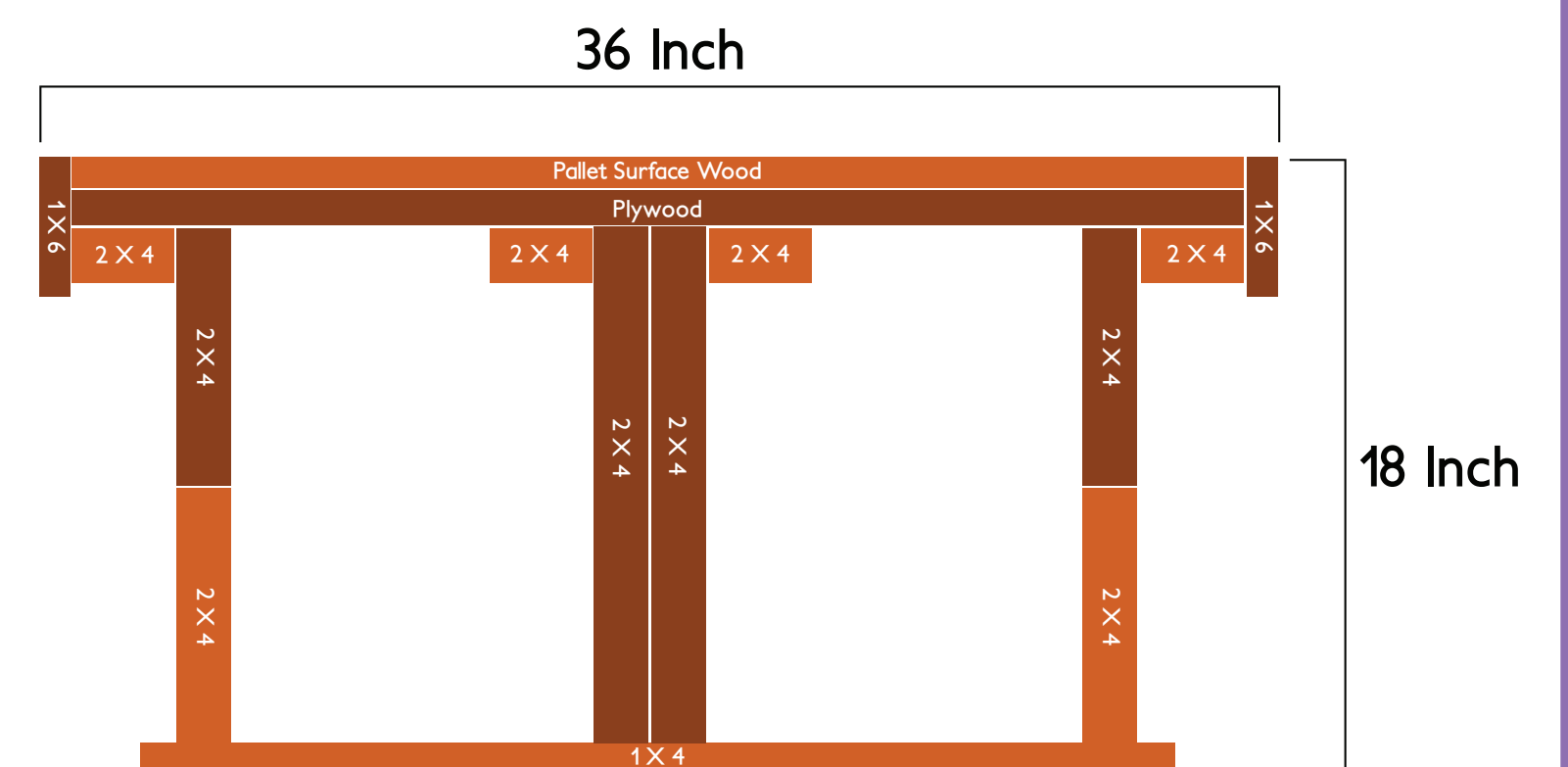
**BENCH PROJECT BY:**  
**ODELL WITCHER**  
**GARY RAY**  
**DAVID BROWN**



Top View



Side View



Front Cutaway View



### INITIAL DESIGN

We came up with a picnic table style bench. Simple and strong, and you could reinforce it enough ways to hold enough weight. As the design was coming along ideas were coming left and right, cup holders, sliding drawers that could hold items under the bench. There were a lot of extras that we came up with that didn't make the cut. We decided that since it would be on a tile floor to put two boards on the bottom of the legs to keep the legs from moving independent from each other. Also to put a one by six.

### FINAL DESIGN

The final design was a solid, sturdy and strong bench. We kept all the same designs as the initial design but added a few more supports and strengths as we went. We decided not to incorporate the cup holder design because we did not want the design of the "ATC" to be disturbed. So for that one idea we choose looks over function. The stain was a dark walnut was chosen to make the bench beautiful.

### SPECIFICATIONS

The Height is to be within 17 and 19 inches  
The length is to be able to seat 2 to 3 people  
The depth is to be no more than 24 inches  
Must be able to withhold a 6'5" 320 pound man  
Even if he tried his hardest, I feel that he would have a difficult time destructing our bench.

### REINFORCEMENTS

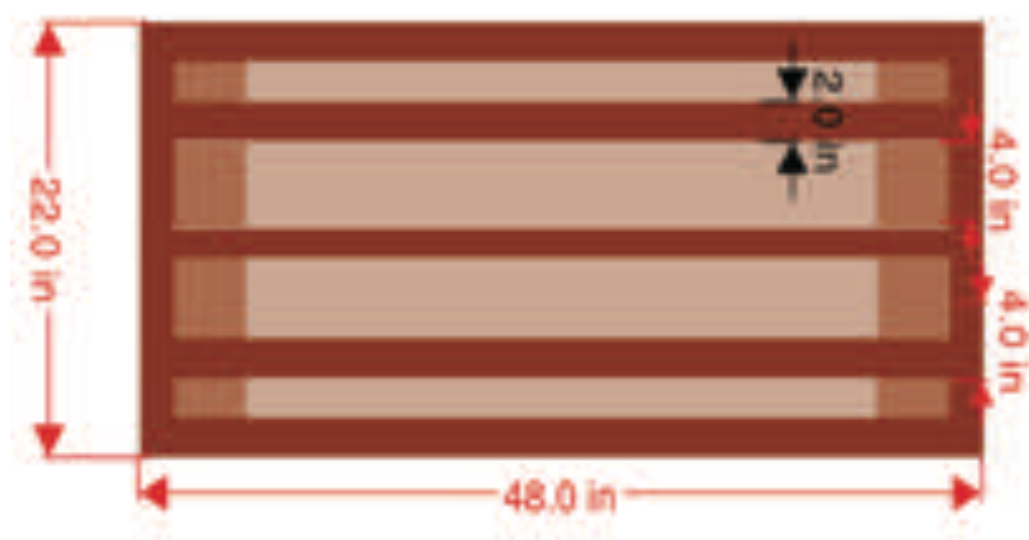
For reinforcements we used a lot of crossing and "x" patterns for strength. We used Three vertical "x" pattern braces to ensure strength. We also used and two Cross members on the feet of the bench to ensure stability and stop any wobble there may be. Six 2x4's were used to screw to plywood and used to connect to the "x" supports, also used for support of the surface of the bench, and increase the rigidity.



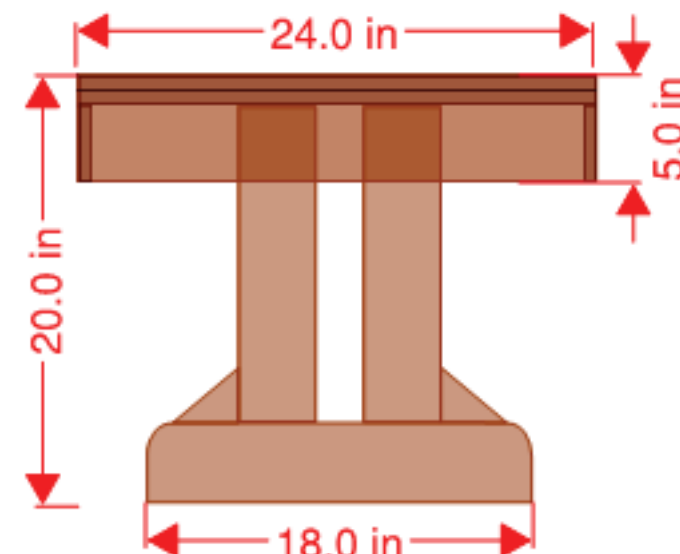
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## ENGINEERING TECHNOLOGY STUDENT PROJECT EXHIBITION

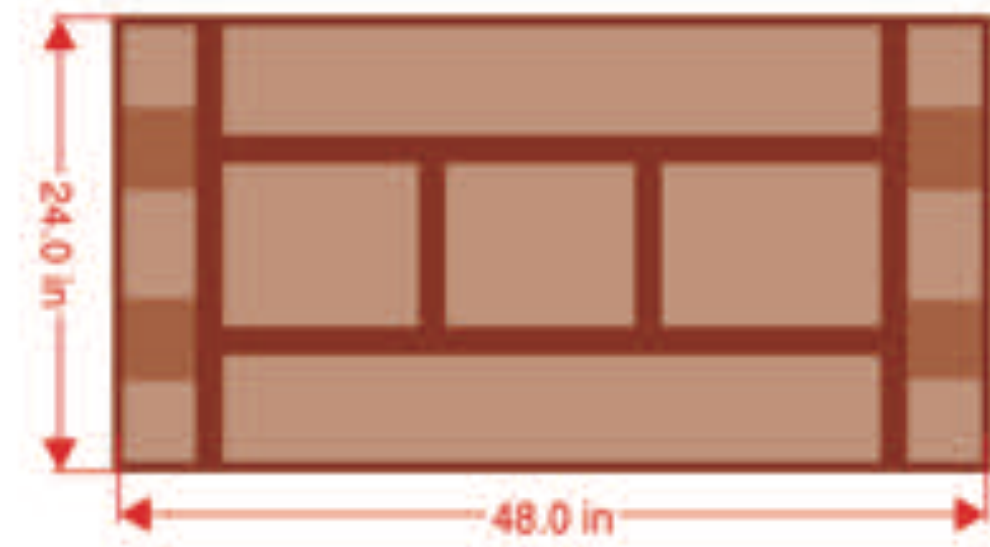
**BENCH PROJECT BY:**  
**JASON BELL**  
**TERRANCE HARDEN**  
**LANE PEMBERTON**



Top View



Side View

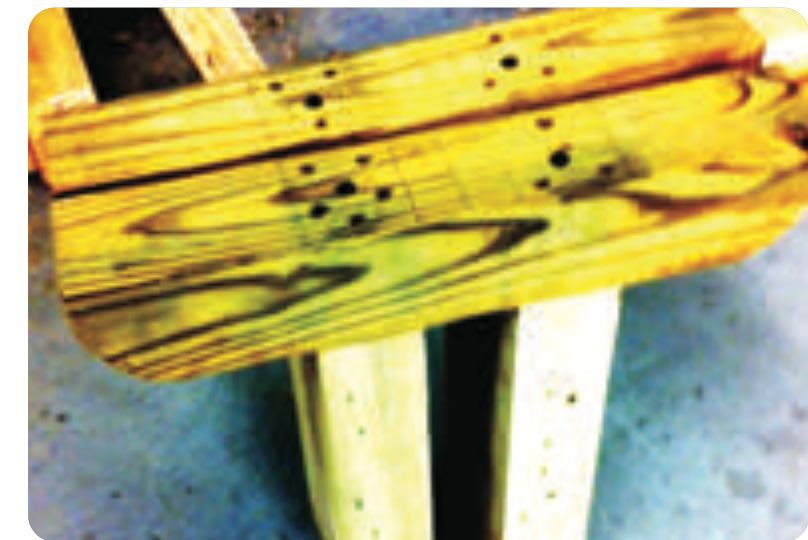


Bottom View



### INITIAL DESIGN

We boldly went where men fear to tread, Pinterest. Our Bench's measurements were based off of a traditional bench from [allenventures.com](http://allenventures.com). The Herring bone pattern heavily influenced our final design. Barn bench legs from "shanty 2 chic" were adopted.



### CONSTRUCTION

Throughout the building process we used a plethora of tools. We also used a variety of building materials. We started the construction of the bench with the framework and the top. The top was glued, stapled and trimmed to fit. Then the skirt board was added. Next, we built the legs and installed them to the framework. Finally, the bench was complete.



### SUMMARY

During the course of the project, we encountered some minor setbacks. These included: malfunctioning tools, splitting wood and limited resources. If we could do it over again, we would use more poly and add additional bracing to the legs. Overall, the bench exceeded our expectations. It is amazingly crafted and should be sold in stores worldwide.

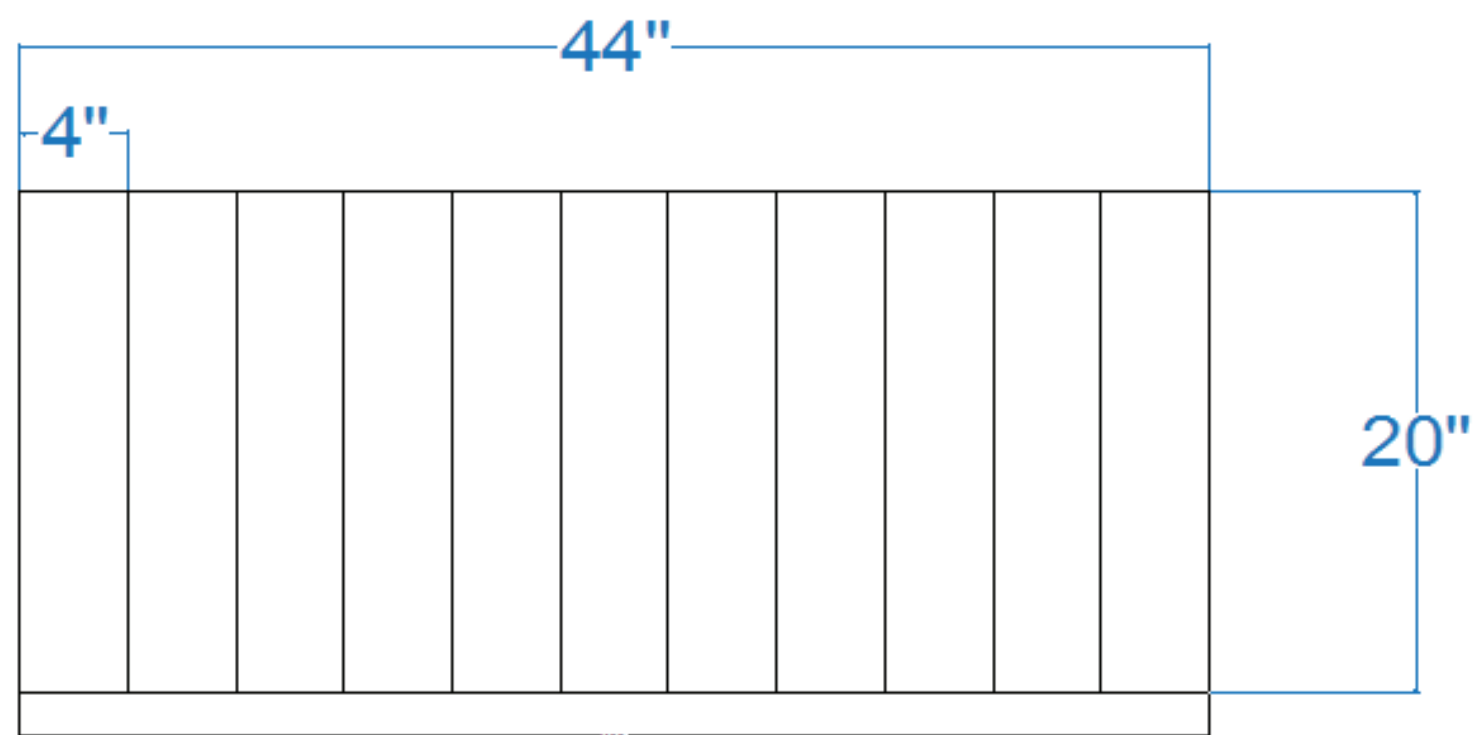


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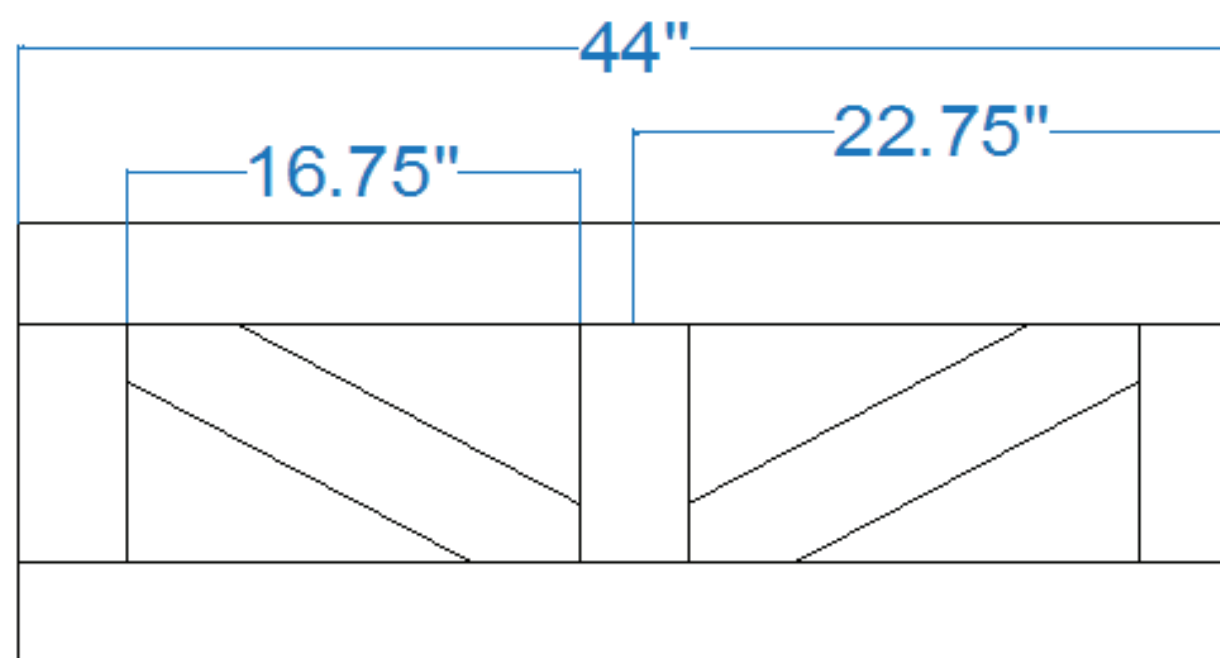
## ENGINEERING TECHNOLOGY STUDENT PROJECT EXHIBITION

### BENCH PROJECT BY:

JOE HOOD  
JACKSON ORR  
JOSE CUELLAR GUILLEN



Top View



Side View

### INITIAL DESIGN

After groups were assigned, our group began immediately coming up with ideas for creative and unique benches that would be very comfortable to sit on and aesthetically pleasing to look at.

Early on we focused on using angles to bring a pleasing contrast to how the bench looked and how it actually functioned.

While brainstorming, our group found that it would be easier to not use so many angles so that building the bench would go a lot smoother.

When our group was coming up with ideas, we drew those ideas using a computer program called AutoCAD.

This program is a powerful tool that allows the user to draw out any object he or she wishes to create.

### CONSTRUCTION

When a person breaks down a pallet, they must first realize that the wood that is used in the pallet is old and full of rusty nails, while the types of wood that are used in the pallet can differ in size, density, shape, structure, and age.

These factors make the deconstruction of a pallet very taxing due to wood constantly splitting or breaking. Life is made easier when the use of a saw of some kind is brought in to cut sections out of the pallet for use on the bench.

After the pallets were broken down, our group then measured out the boards required to construct our bench.

Many of these boards had to be cut at precise angles so that they fit together.

While separating the wood into piles of different sized boards we then collaborated on what tools we needed to build the bench and make our idea come to life.

We needed saws (chop, jig, circular, table just to name a few), hammer, nails, drills, drill bits of varying sizes, wood screws, crowbars, speed square, and the most important tool of all a tape measure.

### LESSONS LEARNED

First off, since the age of the wood we used was both old and new it sometimes was warped, split, or cracked due to the intense stress pallets are put under during transportation.

Secondly, the bits that we used often broke due to human error or extreme stress put on the bit due to the density of the wood. (Again, we are extremely sorry to those in the class that fell victim to our use of your bits.)

Thirdly, when we were building our group had to make many changes to our design.

We wanted to try and give the student a place to put their backpacks near them after they sat down. This design called for two boxes connected by a low, flat table. This proved to be unsteady and a waste of precious resources.

After deliberation, our group came up with a simple and effective design that would last for many butts.



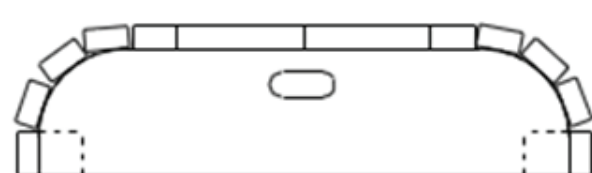


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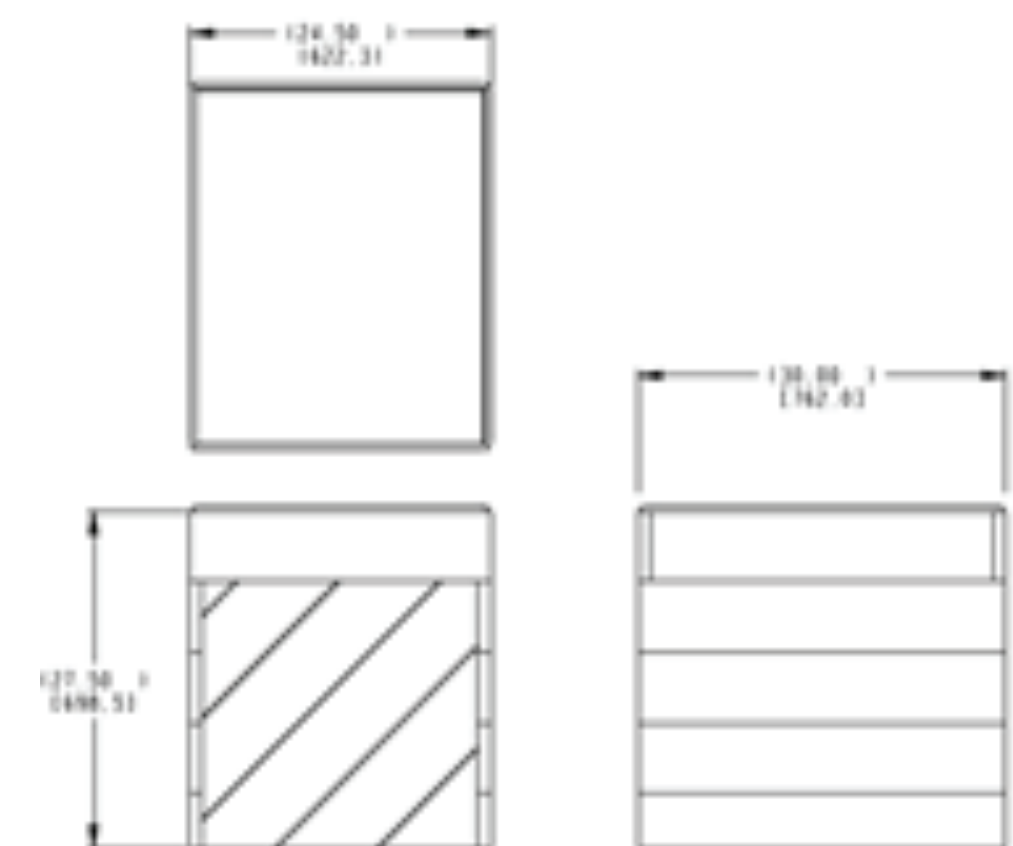
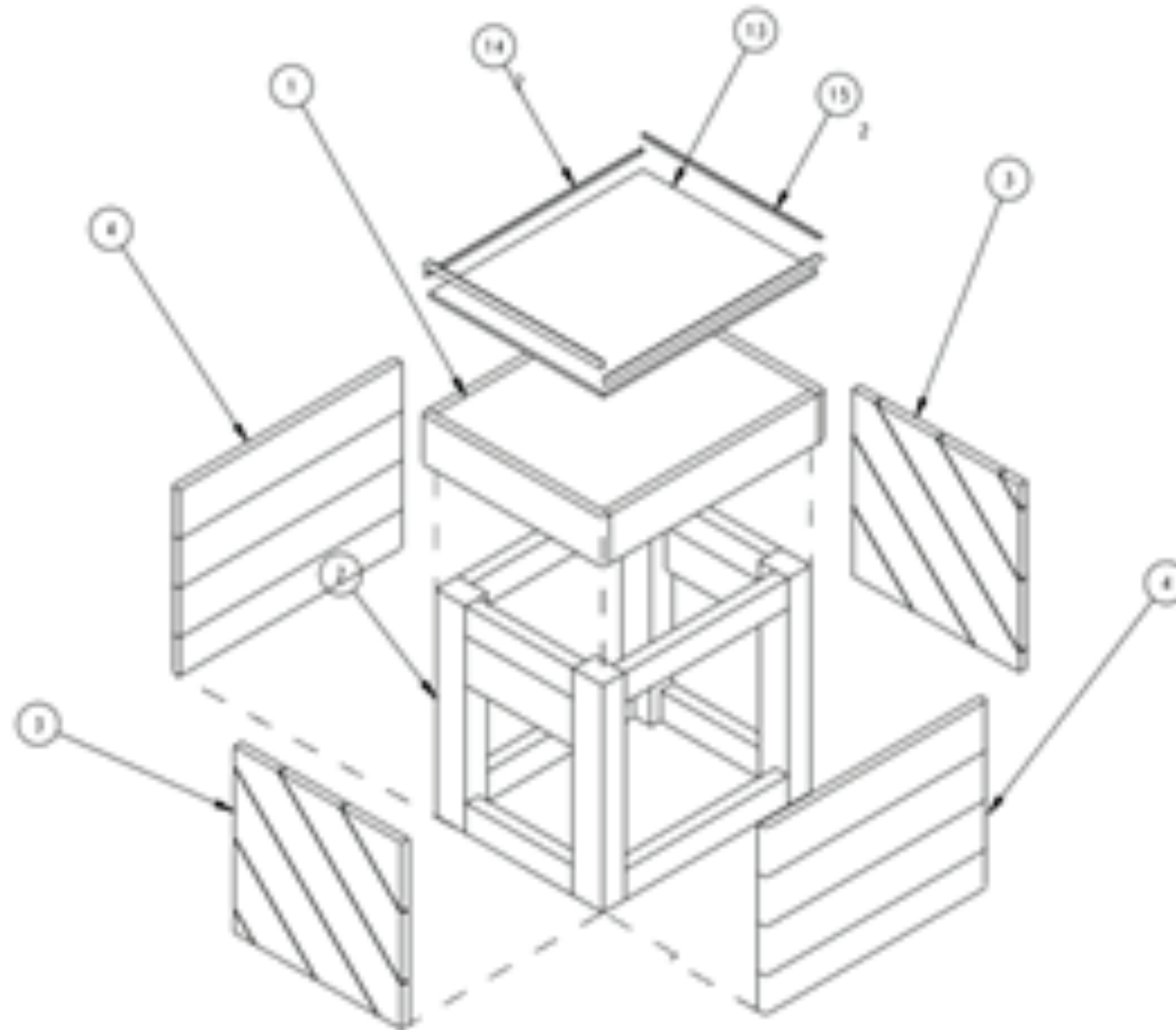
## ENGINEERING TECHNOLOGY STUDENT PROJECT EXHIBITION

### BENCH PROJECT BY:

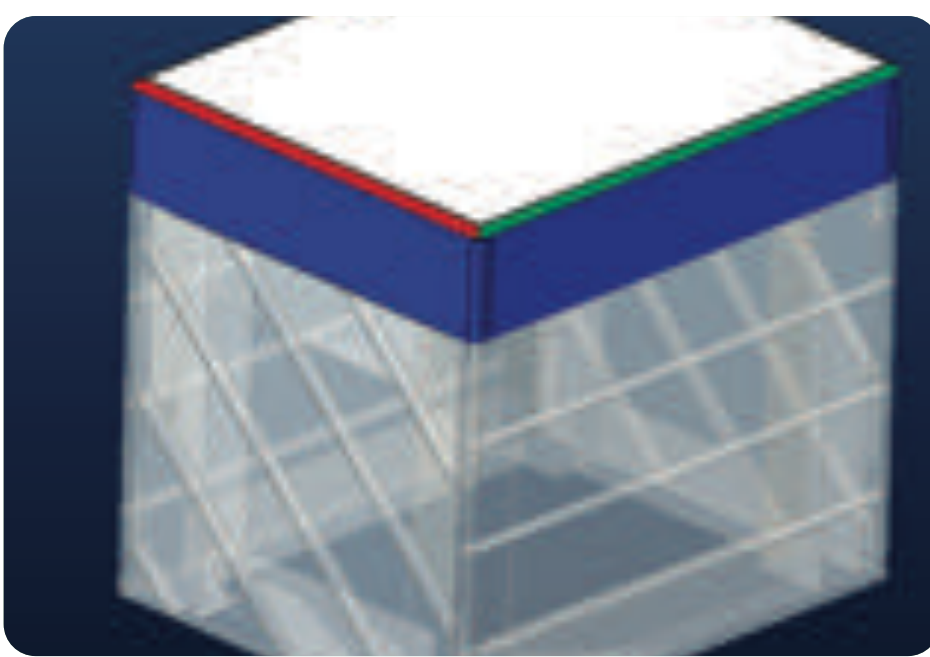
JAMIE HARRIS  
ALEX BRADFORD  
KAREN JENNINGS  
LUKAS DALTON



Top View



Detailed View



### INITIAL DESIGN

Initially we wanted to make a one piece bench with a table in between the two seats. The table top would have either a decorative geometric design built into it or a sliding tile puzzle to make it interactive. As we exchanged ideas and opinions we decided to strive for simplicity in design to make sure we didn't run out of time or materials to build it. We revised our design to be 3 individual pieces instead of one large piece, with each piece being simplistic in construction.

### SPECIFICATIONS

ADA standards  
Requires 36 inches of clearance  
Hallway 109"  
Bench- widest measurement 36"  
 $109'' - 36'' = 73$   
 $109'' - 72'' (2 \text{ sections}) = 37''$



### BUILDING PROCESS



Phase 1: Deconstruction of pallets  
Phase 2: Frame work construction of pieces, Broke down an additional pallet, simplified stringer contour for more appropriate curvature.  
Phase 3: Paneling and seating, Trimmed front and back of seats with skill saw so seating would be flush. Devised new support method for center stringers. Changed panel directions to avoid monotonous pattern. Added support structure for paneling and paneled all table sides.  
Phase 4: Details, Added hand holds to benches. Revised table top to be less bland. Decided on poly/sanding finish.

### SUMMARY

Most design changes were based on simplification, e. g. seat contour, table top design, 3 pieces instead of one piece.  
Some changes had to be made for structural integrity or convenience. Such as the hand holds on the seats and interior panel supports.

