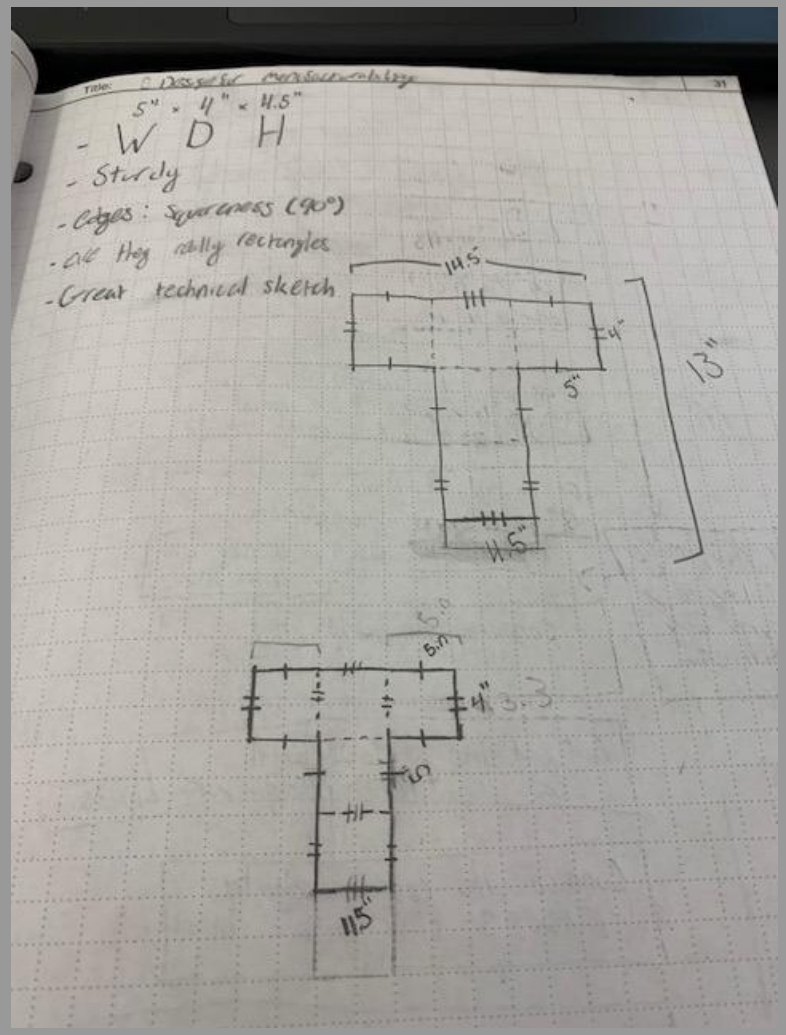
Manufacturing a Box

Billerica Memorial High School

January 8th, 2020

Original Team Sketches



Our Manufacturing Flow

Start

1. Get a large piece of cardboard

2. Draw one line that is 14.5” long on the cardboard

3. on each side of the 14.5” line, draw a 4” line perpendicular to the long line

4. at the end of those lines, draw a 5” line perpendicular to the 4” line going back along the long line

5. at the end of those lines, draw 5” lines going perpendicular away from the long line. Connect these with a dotted line.

6. after this, make a 4.5”line going the same way as the 5” line on each end

7. connect the ends, they should be 4.5” apart

8. cut out the outline with a box cutter, scissors, or a bandsaw

9. connect the corners made by the two 5” sides with a dotted line

10. at the same corners, make perpendicular, dotted lines going towards the long line

11. fold along all of the dotted lines

12. tape or glue along all of the seams where the sides connect

Finish

Our Assembled Materials

Time it took to make each box

X- 23min 36sec

X- 13min 42sec

X- 24min 47sec

Average- 21min

Your Assembled Boxes

- It took 24 minutes and 35 seconds to make all three boxes

Our Box Metrics – Cost

Cost		Quantity	Unit Cost	Total Cost
Labor	Time required per box (Box/Minute) 21min/box	Number of Boxes per hour * 60 Min/Hr 21min/box= 2box/hour	Hourly Wage (MA Minimum Wage?) $12.75	= $6.39
Materials	Mass of Cardboard (gm) per box Density of Cardboard Volume of Cardboard Thickness of Cardboard Area of the Cardboard (Volume/thick) price per sheet (if you buy 1)	2361.97g _0.689 gram per cubic centimeter___ ___3428.12 cm3__ __cm 0.41cm __ 8361.27cm2_____ ___$0.99__	Cost per gram of Cardboard: $_0.99_/_2381_g	= $0.0004/g X 30 g av. box = $0.012 per box

Our Box Metrics – Quality

Cost	Tested How Close To Desired Measurement	Box 1	Box 2	Box 3
Accuracy	Measured the length, width and height with a ruler to see how close to the desired measurement they are	8/10	7/10	6/10
Precision	If the measurements are off, test to see how much each one is off by, if they are all off by the same amount then they are precise	9/10	7/10	7/10
Squareness	Measure across the opening diagonally, if each measurement is the same then the squareness is good	10/10	10/10	7/10
Sturdiness	Look to see how much each box buckled under the 500g weight, if it did not buckle then it got a 10	10/10	9/10	9/10