2016 Shocker MINDSTORMS

Let the WUkiee Win

Build Instructions

Base:

1. The underlayment was cut down to dimension using a table saw.
2. The underlayment was reinforced by the fur strips cut to the outside dimensions using a chop saw.

3. The fur strips and the underlayment were connected by pre drilling holes and then drilling in screws.

4. The center of the board was also reinforced using excess fur strips. The middle of the width was measured and then the length of the needed fur strip was measured.
where the fur strip was placed. Tape was placed over it to hold it in place to drill on the other side.

5. Six measured fur strips were used to reinforce the remaining open spaces by placing three on each side equally apart, and then taped and drilled in the before mentioned way.

Lines:
1. The general areas of the lines were painted yellow and white. (ignore other colors, our design changed).
2. We then let it dry and measured and taped off the lines using 1.5 in painters tape, a ruler, and a protractor for the lengths and angles.

3. Then, the whole board was spray painted black and let dry.
4. Once dry we pulled the tape up and made fixed any imperfections by spraying the paint into cups and using small brushes to go over the areas that needed fixed.
5. We then remeasured all of the lines and angles to make sure they were correct.

Wooden Box:
1. The excess underlayment was used to create the wooden structure for the foam ball to sit on.

2. The open box was created by cutting two 4X4 pieces and two 3.5X4 pieces to make sure the measurements of the cube were kept to 4X4 all of the way around using a table saw.

3. A hole saw radius of 3 inches was used to cut the half circle out of both of the 4X4 pieces.
4. Then all four pieces were glued together with wood glue and reinforced by clamping the structure together to let the wood set.
1. A compass was used starting the in the center of the placement for the wooden box. Radii of two, three, four, and five inches were used to create the half circles going out away from the box. To paint it we spray painted the paint in cups and used small brushes to paint the smaller areas alternating red and white.

Foam ball:
1. Foam ball was covered in plastic wrap and spray painted black and let dry.

Path B - Bathmat
1. Below is a picture of the bath mat used with the shell pattern
2. First, to create a straight line for reference and to get rid of the curved edge, a line was drawn connecting the top of the first row of shells as shown below.

3. Next, all measurements of Path B were marked on scraps and then placed to create the correct shape while keeping one finished edge, the edge that measures 7.62 inches. Note: In the picture below, Path B only has 5 sides. When fitting the component to the board, the 6th side was created so as to fit correctly on the board.

4. After all sides were marked, the path was cut.
5. To attach Path B to the course base, screws were placed in the corners of the path as shown below.

Walls
1. There are two walls on the course, a straight red wall, and a blue U-shaped wall. Both were built in the same manner.
2. All walls are 5 in. tall, and 1 in. wide. To create the correct dimensions of the wall, leftover 5.0 mm underlayment was used for the outer portions of the wall. The underlayment was cut to size using a table saw.
3. After all the underlayment was cut to size, to create the correct thickness, leftover 1” X 2” was used as spacers in between the outer layers of underlayment. A chop saw was used to cut the 1” X 2” boards.

4. Then, all boards were screwed into place.
5. When making the U-shaped wall, three separate walls were initially built and then screwed together using four of the 1.5 in screws. All walls were then painted their corresponding color and secured to the board.

Halfpipe
1. For the halfpipe, the 2 gal. bucket was cut in half and the bottom cut out.
2. First, the metal handle was taken out and a line was drawn on the bucket, dividing it in half.
3. A dot was placed on the bucket and a straight edge was used to connect that dot and the plastic indentation on the middle of the bottom of the bucket.
4. To create the lines on the sides of the bucket, a straight edge was used, keeping one edge flat on the table.
5. To cut the bucket in half, a vibrating saw was used.
To cut the bottom of the bucket out, the vibrating saw was used to cut the largest portion out, and a vibrating sander was used to finish the bucket.
Split Ramp

1. 2, 2"X4" boards were used for the split ramp.
2. First, the total length for the split ramp was cut, then the sides were marked for the lengths and angles of the ramps on either side. The ramp portion was cut using a table saw cutting along the marked edge.

3. The board was then flipped and the same cut was made on the opposite side. Then the ramp was cut to width, as the 2" X 4" board is too wide. 0.25" was taken off either side so as to not leave one curved edge. The ramp was sanded to smooth out the cuts from the blade of the saw, and painted.
Ramp Leading to Halfpipe

1. The ramp leading to the halfpipe was cut in the same fashion as the split ramp, but only one side has a ramp.

2. First, the 1” X 10” board was cut to the overall length using a tablesaw. After that, the one ramp was marked out and cut using the tablesaw.

3. Because the board is so tall, one side was cut, then flipped over and cut on the opposite side.
4. After that, it was finished up with a handsaw, cut to width, sanded down to create a smooth surface, and painted.

Dowel Rods
1. The red wall, blue wall, split ramp, the ramp leading into the halfpipe, and the wedges securing the halfpipe all have dowel rods securing them to the board.
2. The components were placed on the correct place on the board, then using a 0.25” drill bit, were drilled from the bottom of the base into the component.
3. Then a dowel rod was dry fitted into the wall. Then marked roughly 0.75 in. above the surface of the component. The dowel rod was then cut to length and glued into place using wood glue.
Hook & Loop

1. The halfpipe and the 4 in box that the Deathstar sits in were secured to the board using hook & loop. Because the hook & loop adhesive doesn’t stick to the wood, superglue was used to secure the hook & loop to the board and the component.