



HOW TO BUILD A CARDBOARD BOAT

Adapted from www.hctn.org/tourism/

Supplies (beyond cardboard):

1. A sharp cutting tool
2. 1 quart (or more) of contact cement - (Gallon size shown)
3. 2 tubes (or more) of construction adhesive (like Liquid Nails) and a caulking gun
4. A roll of 1" masking tape
5. A roll of duct tape (Optional)
6. Measuring tape
7. A long straight edge
8. A marking pen or pencil
9. Screen installing roller
10. An old table or saw horses to place card board on while working.
11. Kilz - quart of exterior oil base primer (Gallon size Kilz shown)
12. You may use any latex enamel or spray paint for final coats (no multi-part paints allowed)
13. Paint brushes and rollers
14. Building square (optional)
15. Patching plaster (optional - Not shown)
16. Wallboard screws for holding cardboard together while glue dries. These must be removed when glue dries.
(Optional - Not Shown)
17. Electric drill or electric screwdriver for installing the screws (Optional - Not Shown)



To build this boat you need to find a piece of cardboard similar to the one shown on the left. These used to be used by Lowes as dividers when products are shipped into stores that receive pallets of product. Lowes has quit offering them, according to our local manager.

Thus, you may need to search for large sheets. Corrugated cardboard comes in single-wall (most common), double-wall, and triple-wall thicknesses. You may want to double up single-wall sheets for the boat's bottom and the bulkheads by using contact cement to glue two sheets together. You will need additional corrugated material to add decorations.

Double ~~1/8"~~ thickness sheet from Lowes 102" x 86". Comes folded at 102" x 43". Need 1 1/2 sheets.

The diagram provides detailed measurements and fold lines for constructing a boat from a 102 inch by 86 inch piece of cardboard. Key dimensions include:

- Bow:** Center Fold, 2" height, 29" width.
- Sides:** Top height 102", Side height 29", Side width 43".
- Bottom:** Total width 86", Front Bulkhead width 29", Center Bulkhead width 29", Stern Bulkhead width 29".
- Deck Insert:** Top height 29", Side height 29", Side width 43".
- Bulkheads:** Front Bulkhead (2 pieces), Center Bulkhead (2 pieces), Stern Bulkhead (2 pieces).
- Other:** Lips on bow to support deck filler, Top of center bulkhead, Top of stern bulkhead.

Instructions:

- Dashed lines are right angle (90 degree) folds.
- Cut a piece 74" x 29" and glue to bottom after you have folded up the sides. Use contact cement.
- Use a screen roller to crush through one layer of cardboard to create the seam where you will fold the cardboard.

Stem view: Stem height 10", Stem width 29".

Here are the plans for building the boat from the 102 inch by 86 inch piece of cardboard described above. The measurements we use make the optimal use of the cardboard and create a very stable and easy to paddle boat.

You will need to adjust the measurements for smaller sheets (48" x 96", for example)



The fold (center) of the cardboard will be the bottom edge for one side of the boat. Now you must decide how wide you want the boat to be. It should be a minimum of 24" wide up to a max of 31" wide. The sides can be anywhere from 8" to 10" high, but we have found from experience that 10" works very well.

We will use the 29" bottom, 10" side and 4" lip to build this boat.

On the first side, measure in 4" and 14" from the edge and use a straight edge to mark the lines. These are for the 4" lip and the 10" side. The remainder is the 29" bottom.

NOT SHOWN: Using the same straight edge, use the rounded screen roller and roll along the line pressing hard to crush through 1 layer of the cardboard. This will create a crease where you can fold the cardboard.

Repeat this process on the 14" line.



Lay a board along the crushed line and start folding the cardboard a little at a time.



Fold the cardboard down on itself as shown. This will allow it to spring back and remain at about a 90 degree angle.

You can also turn the cardboard over and bend it along the edge of a table. This may be a little easier than folding it up against a board.



Repeat this process on the next crushed line and fold it as shown.



(No picture) Fold the other half upright from the center fold and measure up 10" and 14" and draw lines. These will be the other side and top lip.

Cut a V groove on the 10" line and fold it as before. Or you may use the screen roller and roll along the line pressing hard to crush through at least 2 layers of the cardboard. This will create a crease where you can fold the cardboard.

Cut the cardboard on the 14" line. You now have both sides done.

NOT SHOWN: Measure the width of the boat bottom and cut a piece that wide by 74". Use contact cement to glue this piece to the bottom. (This will have to be cut from an additional piece of cardboard)

	<p>Measure the inside width and height of the boat and cut three (6) bulkheads from the extra piece you just cut off. Use contact cement to double up each bulkhead.</p> <p>NOTE: You may want to use 3 pieces for the rear bulkhead.</p>
	<p>Check the bulkheads to make sure they fit before you glue them in. Modify the bulkhead pieces to fit as necessary.</p> <p>The front bulkhead should be installed 28" from the front of the boat, and the middle bulkhead installed halfway between the front and rear bulkhead (approximately 37").</p> <p>Use a marking pen to mark along the center and forward bulkheads so you know where to brush on the contact cement.</p>
	
	<p>Use an inexpensive paint brush to apply the contact cement. You also need to apply contact cement to the bottom and side edges of each piece and to the bottom and sides of the boat where the braces will be installed. In the picture above you can see where we marked along the edge of the center bulkhead so we know where to brush on the contact cement.</p> <p>Hint: Place the contact cement brush in a container of water. It will remain pliable as long as you keep it underwater. Just use a paper towel to wipe off the water when you want to use the brush. We've kept brushes</p>

	<p>pliable for over a month. Follow the instructions on the contact cement can. After applying the cement, you must wait for the pieces to dry to the touch before joining them together. Hint: I like wearing rubber gloves when using contact cement and work in a well ventilated area.</p>
	<p>Once the contact cement has dried to where it will not stick to your finger, carefully install the bulkheads. Start by placing the bulkhead on the bottom, followed by the sides and then the top.</p>
	
	<p>We have found the easiest way to temporarily hold the bulkheads in place is to insert wallboard screws through the outside walls into the bulkheads.</p>



Once the braces are in, you can apply a bead of construction adhesive along the sides, top and bottom of each piece. This provides additional strength and it seals the pieces from water. You should also apply a bead along the inside edge of the boat that you bent. Remember you cut into the first layer, so the bead of construction adhesive will seal that as well.



After you have installed the front, middle and rear bulkheads, you are ready to complete the front of the boat.

You need to cut the sides of the boat from the front bulkhead to the end of the cardboard, which should be approximately 28".



This is the outside view. Lay your cutting blade on the top of the bottom cardboard and cut through the wall to the front of the boat. Do this on both sides.



Pull the sides to the center so they join together.



Using a straight edge ruler, measure down 2" from the front and lay the straight edge from there to the bottom rear edge of the bow and draw a line. Do this on both sides.

You will now cut along this line.



While holding the bow together, cut through the two 4" top rails so you have a clean cut and they will fit together. Cut a scrap piece of cardboard to fit underneath them. Use contact cement to glue the front and the scrap under the cut you just made. You can use screws to **temporarily** hold them together.



Apply contact cement to the bottom of the boat where it will meet the bow pieces and apply it to the bottom edge of the bow pieces.



Once the contact cement has dried, hold the pieces together.



Cut off the extra bottom piece by angling your blade about 4 degrees and make a smooth cut all the way to the top.



Cut the rear edges of the 4" top piece on both sides so it fits nicely. Use Contact cement glue the pieces together.

(No Picture)



Use construction adhesive to seal all the seams inside the bow and to seal the outside where you cut off the bottom.



Now to complete the deck. Cut two pieces of cardboard that are 2" wide and long enough to run the length of each side of the deck. These will be installed underneath the overhanging pieces so a deck insert can be glued on to them.

The pieces are sitting on top of the deck in the picture. Apply contact cement to one side of the pieces you just cut, and to the underneath of the 4" overhang.



Once those are glued into place as shown. Cut a triangular piece to fit into the deck and glue it into place.



Cut two more piece of cardboard 2" wide to glue to the tops of the middle and rear bulkheads. These may also be held in place temporarily with wallboard screws.

REMEMBER TO REMOVE ALL SCREWS BEFORE PAINTING.

Fill in all the holes left by the screws with construction adhesive. After you fill each hole with adhesive, immediately smooth it out using a scrap piece of cardboard. This will mean less sanding after it dries.

You may use masking tape to cover the edges and then paint over it. We find it works better to paint the edges with contact cement, let it dry and then put the masking tape over it. The tape sticks much better this way.

As you can see in the picture, we used construction adhesive to fill in all the openings in the deck and the bottom of the bow.

Once you have sealed all the openings and seams, you need to apply a coat of oil based primer. We have found that the KILZ brand is an excellent choice. It covers well and it dries quickly. It is best to apply this with a roller to get an even coverage. One coat is all you need.

After the first coat is dry, you may now fill in any imperfections with wall board spackle. Let it dry and sand it smooth. You may have to do this more than once to get the desired smoothness.

You may now complete painting it using any latex enamel. We always try to find stores that has paint that was mixed and returned because of a color mismatch. Usually two to three coats will be adequate.



If you want a longer boat, pick up two sheets of cardboard. Bend the second sheet to match the first sheet. Butt them together and splice them as show using contact cement.

Use construction adhesive to seal the edges of the splice where it meets the bottom and sides. Also use the adhesive to seal the seam on the outside.

With care in your construction, your boat should be able to compete in multiple races!