



2011 CHANCES Great American Cardboard Boat Races & Demolition Derby

Saturday, August 6, 2011

BOAT BUILDING TIPS

HOW TO BUILD A "PERSON-POWERED" CARDBOARD BOAT CAPABLE OF COMPLETING THE COURSE.

Building a cardboard boat is all about trying to meet "The Challenge"

Along the way, you will enjoy encountering and dealing with many small details. But look ahead to the satisfaction of knowing you accomplished something that most people won't even try -- building a boat made of corrugated cardboard.

First things first . . . start with some objective in mind. Maybe you want to build the fastest boat at the race. Perhaps you are more interested in one of the Judges Awards for design or eye appeal. Maybe you want to win the Team Spirit Award. Perhaps you want to get on television or be the featured photo in the newspaper. Or, just maybe you want to take home the Titanic Award for the most spectacular sinking.

Next . . . start with a design idea, a vision of what you want your cardboard creation to look like. But, consider this first -- it doesn't have to be a boat at all! It can be any design you like or want to try out. You can have jeeps, exotic cars, full-scale pickup trucks, school busses, fire trucks, and other vehicles. There can be space shuttles, Elvis on his guitar, beds, soft drink cans, personal computers (with a mouse that trails in the water), a raft with a trailing shark fin, a floating outhouse, a taco, a bratwurst, a giant Tootsie Roll, Tessie the Loch Ness Monster, Deidra the Dragonfly, the Statue of Liberty hand (from "Planet of the Apes"), and so much more. Oh sure, there can be lots of boats too: submarines, aircraft carriers, PT boats, lake freighters, pirate ships, the Exxon Valdez and so on.

Try this to save time . . . build a model using a manila folder or other heavy paper or lightweight cardboard. That way, you can fold, re-fold, and fold again to your heart's content. You can cut it up, glue it together, and try out your design idea in small scale before working on a full-sized creation. Or, you can throw out an idea that sounded great, but just won't work, then try something else before you have wasted any cardboard.

How about a little science? If you want, you can toss in a little physics or other science. Maybe you will choose to calculate the displacement of your design idea so that you will have some certainty about the buoyancy of your design. Here's the basic number: a cubic foot of water weighs about 62 pounds. That means that a 180 pound man will float in a boat that is 1 foot by 1 foot by 3 feet -- of course, that could be a bit uncomfortable! But at least you would know just how much boat you will need for you (and your crew) so you don't overdesign it and add unnecessary weight.

Then again, how about some art? Perhaps you have a really creative idea, maybe something that nobody has done before. Unless you get your kicks from putting in lots of hours and making discoveries along the way -- hey, sometimes that can be great fun -- you may want to at least try out that unique or innovative idea in model form. If you want to put a palm tree in the middle of your "desert island," be sure you won't make the whole thing top-heavy -- unless, of course, you are trying for the Titanic Award.

Now, go full-scale . . . but first, think about this, make sure your creation will be able to get out the door of wherever you choose to build it. We have many tales of woe about boats that had to be dismantled -- or even trashed and rebuilt -- just because no one thought about the size of the boat and the size of the door.

Hmmm, where to get cardboard? You might get cardboard from appliance stores. The shipping boxes for refrigerators and big freezers can be good possibilities. Maybe you can get boxes from TVs, bedding, bookcases, or other furniture. Of course, you can also use smaller sheets and glue or fasten them together.

Creative problem-solving is the name of the game. Whether you get your creative insights from methodical effort or from wide-ranging trial-and-error, building a cardboard boat can be -- no, make that, will be -- both fun and challenging!

FYI -- there are no plans, no pre-set designs, no step-by-step instructions here . . . no recipe cards, no fill-in-the-blank formats. The first ingredient in cardboard boat-building is creativity. The second important ingredient is problem-solving. Then there is cardboard, of course -- and it has to be corrugated. Next, search the internet for "cardboard boat building".

Hey, maybe you are more the "wing it" type -- okay, get some cardboard, fold it a little, cut out any excess here and there, add a little glue or duct tape, maybe some paint or water sealant, and presto-chango, you have a boat for the Race.

Let's see, other materials . . . you can use glue and tape. You can use paint and water sealant and other stuff. But first, take a look at "The Rules" to find a short list of substances that are NOT to be used. We're not trying to make it tough on you, but we are steering you away from stuff that is toxic, either for you or for the environment and our lake that we will race in.

Handling cardboard -- you will find it easier and more fun if you keep in mind a few tips. You can have strength and still keep your boat light if you laminate layers of cardboard. In fact, try placing one layer so that the corrugations run in one direction, then placing the second layer so that the corrugations run at a 90-degree angle to the first layer. To fold cardboard across the corrugations, consider scoring the line of the fold with the butt end of your utility knife or other rounded edge of a tool. Don't step on your cardboard! If you break the corrugations -- well, think about it. To keep your cardboard dry, don't forget to seal the edges with caulk or silicone. If water gets into your corrugations, you can have great fun watching it get drawn through the corrugation just like in a drinking straw. That may be okay when you have time to do something about it, but if you see this happen in the middle of a race . . . !!

Here are a bunch of other items to think about . . .

- A flat bottom is recommended.
- A V-shaped bottom is likely to tip over unless the V is very gentle.
- The lowest center of gravity is the most stable; kneeling or standing will cause you to tip over.
- Longer boats go faster, but they are harder to turn.
- Boats shorter than 10 feet are difficult to steer.
- For height, allow about 18 inches for you to sit and paddle effectively without the edge of your boat blocking your arms.
- For width, figure about 18 inches for a kayak, about 23–24 inches for a canoe.
- Figure about 30 inches maximum for 1 person, 48 inches for two people.
- Paint all surfaces before gluing.
- Caulk the edges, then glue (carpenter's glue works great).
- Avoid oil-based stains, caulk, and glue because the oil soaks into the cardboard, may never dry, and this weakens the cardboard.
- Duct tape shrinks when it is painted.
- Clear tape melts when it is painted.
- Reinforced paper tape works well over caulked edges and seams.
- Forget about "glue guns" because that type of glue melts on hot days.

Hey, some of the fun is in the discovery. So, that's it for tips. Now go for it! Keep in mind the other lessons you learn along the way. That will make building your next boat just that much easier. Have fun! Be creative! If you can dream it, you can do it!