CARDBOARD BOAT BUILDING 101

The Caton’s Island Sunken Ship Boat Race 2013
Construction Rules

1. The entire boat must be built of cardboard, duct tape and one-part polyurethane. Only exceptions are the paddles and decorations.
2. Use cardboard boxes, blocks, carpet tubes
3. No pre-treated cardboard allowed
4. No Sona-Tubes, waxed or treated cardboard
5. No wood, plastic or fiberglass
6. No caulking compounds or two-part/mixed adhesives
7. No wrapping in duct tape, plastic or fiberglass
8. Duct tape may be used to reinforce seams
9. Waterproof the boat with varnish, paint or polyurethane
10. Decorations are encouraged as long as they don’t affect structural strength or buoyancy
11. The crew compartment cannot be enclosed for safety reasons
Participation Rules

1. Crewmembers must be 13 years of age or older
2. Every crewmember is required to wear a personal flotation device and water shoes or protective foot wear
3. Each crew member must be able to swim and sign the participant waiver in advance of the race
4. No intentional boat crashing, pushing or paddling inside of the competitor’s boat
### Construction Materials

<table>
<thead>
<tr>
<th>Permissible Materials</th>
<th>Material Not Allowed</th>
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</thead>
<tbody>
<tr>
<td>● Corrugated Cardboard</td>
<td>● Wood, styrofoam</td>
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<tr>
<td></td>
<td>● Plastic sheeting</td>
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<tr>
<td>Acquired from Appliance or Grocery stores</td>
<td>● Sona-tubes, coated cardboard</td>
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<tr>
<td>● Cardboard “blocks”</td>
<td>● Silicon, wax, tar</td>
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<tr>
<td>Acquired from furniture stores</td>
<td>● Caulking compounds</td>
</tr>
<tr>
<td>● Cardboard Tubes</td>
<td>● Metal, staples, clamps, screws, washers</td>
</tr>
<tr>
<td>Acquired from carpet/linoleum stores</td>
<td></td>
</tr>
<tr>
<td>● Fastening material</td>
<td></td>
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</table>
Duct or masking tape
Liquid nails adhesive
Twine, rope, string

Please note: Judges decide on the interpretation of the rules.

Cardboard Boat Design

Consider size in terms of building and transporting:
- Big enough to hold crew, small enough to carry
- Less than six foot wide
- No surfboard style designs are allowed
- Raft designs are allowed
- Consider total weight of all material when wet
Everything must be removed from the water following the race.

Boat decorations and crew costumes are encouraged!
Most of all........"HAVE FUN"!!
"How much will you sink?"  Displacement

**Example:**

Box boat, 3ft x 6ft, 1 ft tall (high)  
Boat volume = 3’ x 6’ x 1’ = 18 ft$^3$  
Boat displacement = 18 ft$^3$ x 62.4 lbs/ft$^3$ = 1123.2 lbs  
Which equates to 93.6 lbs per inch of boat height
Cardboard Boat Design Suggestions

Set the Design Goals:
- Fun, speed and appearance
Sketch out your design:

- Build a scale model from poster board
- Estimate materials or plan how to use the materials you have
- 1’ X 1’ X 3’ box will float 187 lbs
- If it’ll hold you, it’s big enough to float

Flat bottom, sit-to-paddle & canoe styles are the best/easiest
A rudder helps keep you straight but makes turning difficult and adds complexity.

Long boats go fast, but these boats are harder to turn
Short boats less than 8 feet are difficult to steer straight

**Best Width:**
- 18” to 30” for one person
- 48” for two people side by side

**Best Length:**
- 8’-12’

**Best Height:**
- 18”
- Allows room to sit/kneel & still paddle over the edge
- Kneeling is a power position but sitting is more comfortable

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**Construction Tips**
And Techniques

Cover all edges of cardboard – Openings act like a siphon

Cardboard tubes make great frames:
- Cut for joining & bending
- Fasten tubes together

Cardboard Hull:
- 1-2 layers, fasten & cover the seams
- Width 2 layers, overlap the seams & polyurethane in between
- Decorate, paint & varnish

Reinforce the area where you sit, kneel or stand

Carpenter’s glue and liquid nails work well:
- Hot glue melts in the heat and sun

Duct tape only non-painted surfaces (tubes or frame that will be covered)
- Duct tape shrinks when painted
- Duct tape should be covered with masking tape if you need to paint it
- Clear tape melts when painted
- Masking tape works well on glued edges & seams
- Craft paper with spray adhesive may also be used
Multiple cardboard layers “glued” together on the sides to strengthen the hull

Multiple trapezoid-shaped pieces “glued” together to form a “support block”

A sheet of cardboard could be folded & “glued” together to form tubes/beams
Go Build Your Boat!

WE’LL SEE YOU AT CATON’S ISLAND!!

Saturday, July 13, 2013

RACE DAY SCHEDULE:

12 noon - Boat drop-off for judging and inspection.

2:30 p.m. Captain’s meeting

3:00 p.m. RACE BEGINS!!!! Boats will be randomly assigned to a heat. The winner of each heat will move on to the final race.

Awards Ceremony will begin after clean-up.

For more information please email: Ben Canney canneyb@cationsisland.com

Many thanks to Beth Shafer for much of the info contained in this packet
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