

White Lake Cardboard Boat Races For Cancer



What Floats Your Boat Cardboard Boat Basics

Ideas for boats

Police car

Fire truck

Rubber Ducky

Viking

Star wars

Pirate

Bus

Tractor

Plane

Tank

Tiki Bar

Patriotic

Outhouse

Challenger space

Rocket

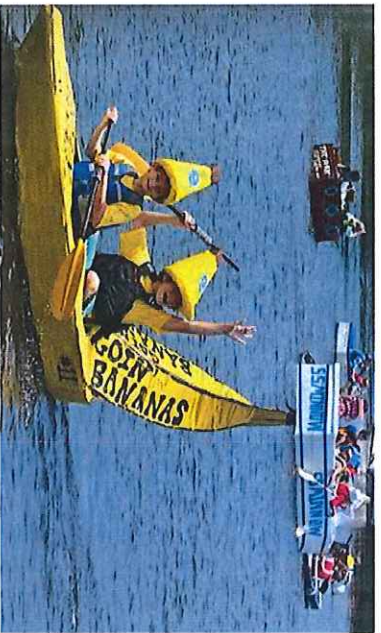
Dragon

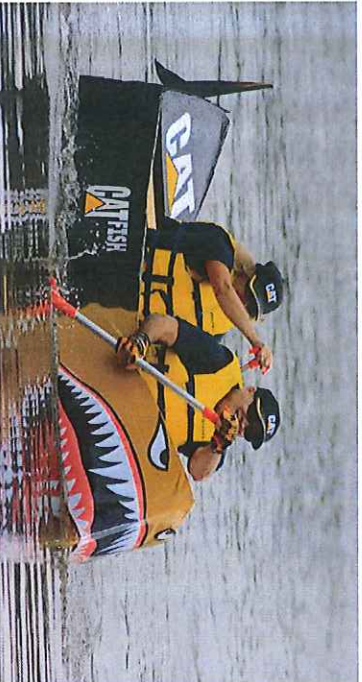
Alligator

Titantic

Tropical

Fruit





Construction Rules (Equal Opportunity)

- The ENTIRE BOAT must be built of CARDBOARD
 - Only exceptions are the paddles & decorations
 - Use Cardboard boxes, “blocks”, carpet tubes
 - NO pre-treated cardboard allowed
 - No SONA-TUBES, or waxed or ‘treated’ cardboard
 - NO wood, plastic or fiberglass
 - NO caulking compounds or two-part/mixed adhesives.
 - NO wrapping in duct tape, plastic or fiberglass

Construction Rules (continued)

- Waterproof the boat with Varnish, Paint or Polyurethane (1-part, paint-like substance)
- Decorations are allowed - as long as they don't effect structural strength or buoyancy
- The crew compartment can NOT be ENCLOSED so as to interfere with escape
- Every crew member must wear a life jacket

Construction Materials

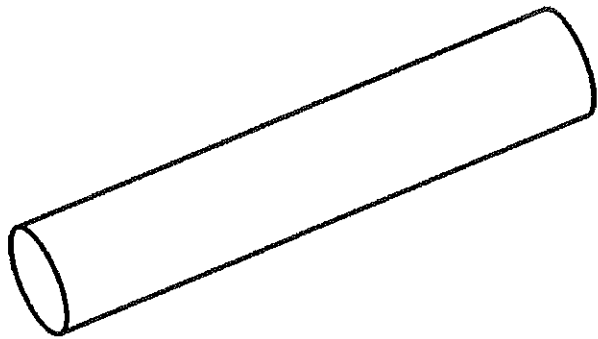
Permissible Materials

- Corrugated Cardboard
 - Appliance or Grocery Stores
- Cardboard “blocks”
 - Furniture stores
- Cardboard Tubes
 - Carpet/Linoleum stores
- Fastening material
 - Duct or masking tape
 - Liquid nails adhesive
 - Latex Paint, Varnish

Materials NOT Allowed

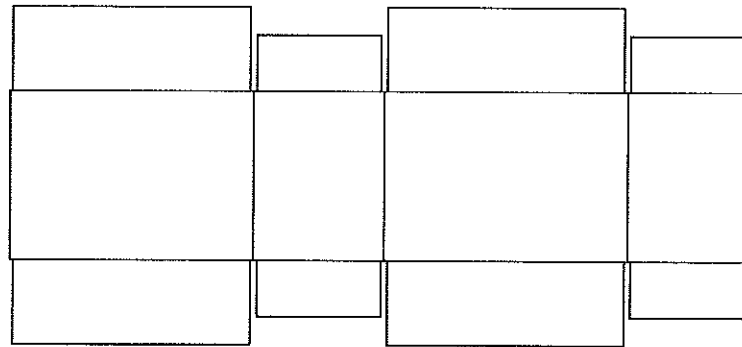
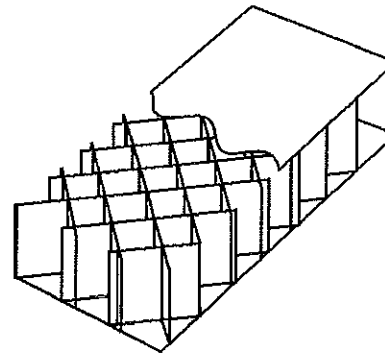
- Wood, Styrofoam
- Plastic sheathing
- Fiberglass
- Sona-Tubes, coated cardboard
- Silicon, Wax, Tar
- Caulking compounds
- Metal
- Staples, clamps, screws
 - * Judges decide on the interpretation of the rules

Construction Materials (continued)



Carpet Tube
(about 4 1/2" dia.)

Cardboard
Block
(2-3" thick)



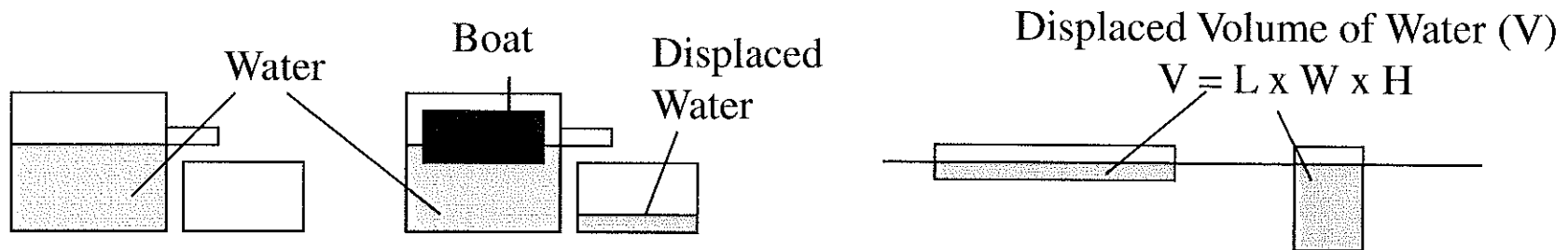
Cardboard Box - cut open

Cardboard Boat Design

- Consider its Size - building & transporting
 - Big enough to hold crew, small enough to carry
 - Wider is better, but still be able to paddle
 - no surfboard style designs are allowed
 - Rafts ARE allowed
 - Consider total weight of all materials when wet
 - EVERYTHING must be removed from the lake
- Boat decorations & crew costumes are encouraged
 - use your imagination

Cardboard Boat 'Physics'

- “How much will you sink? - Displacement



Weight of Water =
62.4 pounds/cubic-foot

$$\text{Water Displaced(ft}^3\text{)} = \frac{\text{Weight-of-boat-\&-people-lbs}}{62.4 \text{ lbs/ft}^3\text{-H}_2\text{O}}$$

$$\text{Depth(ft) boat sinks} = \frac{\text{Water Displaced(ft}^3\text{)}}{\text{Length X Width of boat (ft}^2\text{)}}$$

Example:

Box boat, 3 ft X 6 ft, 1ft tall (high)

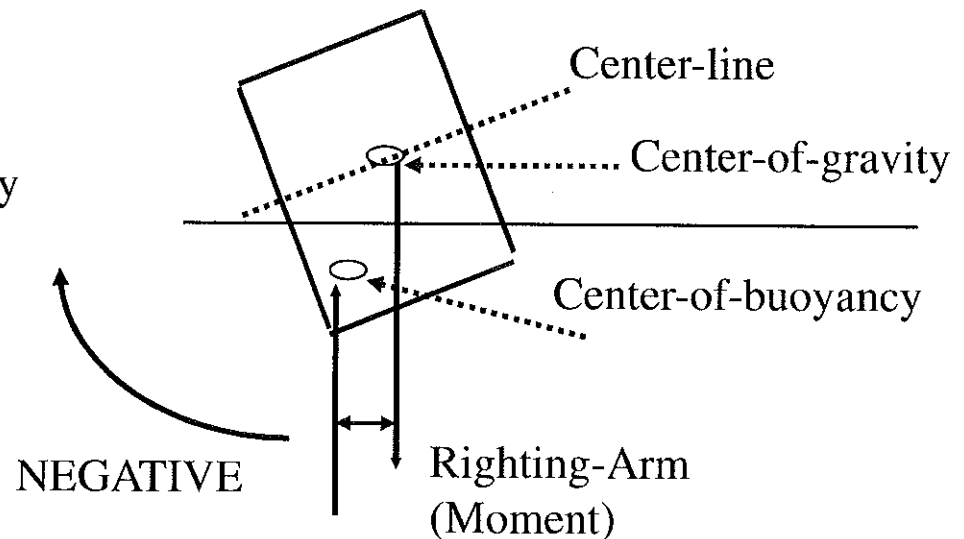
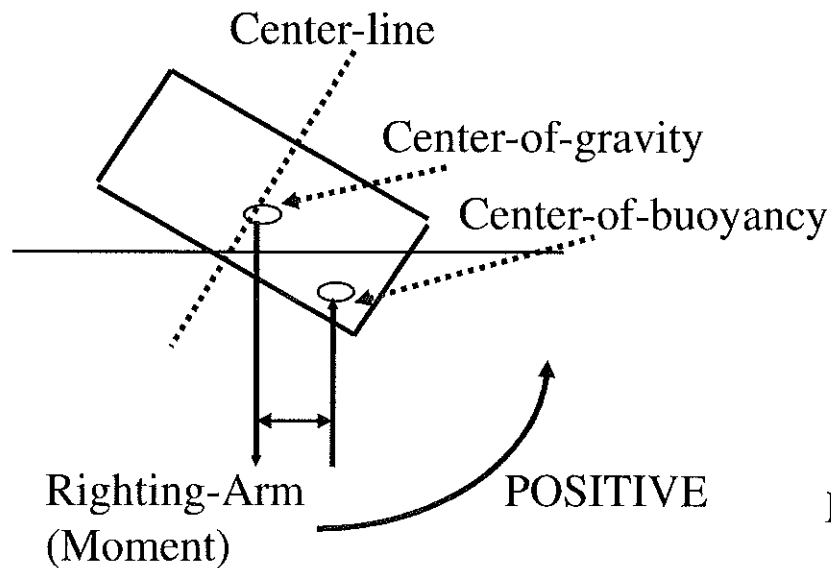
Boat volume = 3' X 6' X 1' = 18 ft³

Boat displacement = 18 ft³ X 62.4 lbs/ft³ = 1123.2 lbs

Which equates to 93.6 lbs per inch of boat height

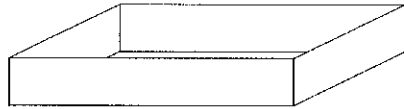
Cardboard Boat 'Physics'

- “Wider is Better” - Center of Buoyancy

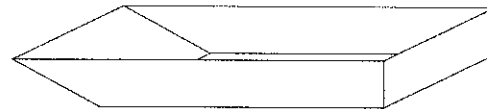


Cardboard Boat 'Physics'

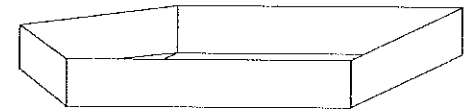
- Movement Through the Water



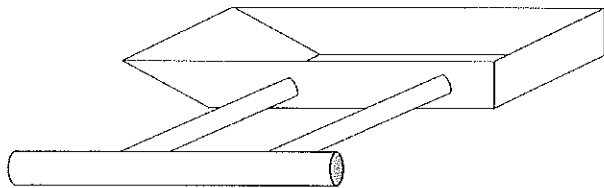
Simple
Box



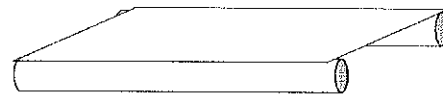
Slanted
Box



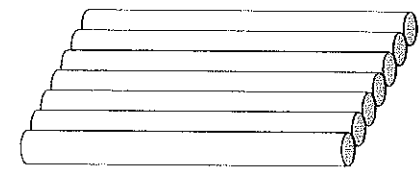
V-Shaped
Bow



Outrigger
Design



Pontoon
Design



Raft
Design

Cardboard Boat Design Suggestions

- Set the Design Goal: FUN, Speed or looks
- Sketch out your design
 - build a scale model from manila paper:
 - estimate materials or plan how to use what you have
 - plan out what construction techniques will be used
- 1'x1'x3' box: will float 187 lbs.
 - if it'll hold you, it's big enough to float
- Flat bottoms, sit-to-paddle - are the best/easiest
- Rudders help keep you straight but make turning difficult and adds complexity to your design.

Cardboard Boat

Suggestions (cont'd)

- Long boats go fast - but are harder to turn
- Short boats (<10') - are difficult to keep straight
- Best Length: 8-12 feet
- Best Height: 18 inches
 - allows room to sit/kneel & still paddle over the edge
- Best Width:
 - 18"-30"(max) for 1 person
 - 48" wide for 2 people side by side
- Kneeling is a “power” position but sitting is more comfortable

Construction Tips & Techniques

- Cover edges of cardboard - acts like siphon
- Cardboard Tubes make great frames
 - Cutting for joining & bending
 - Fastening tubes together
- Cardboard Hull
 - 1-2 layers, fasten & cover the seams
 - With 2 layers, overlap the seams
 - Decorate, paint & varnish
- Reinforce the area where you sit, kneel or stand

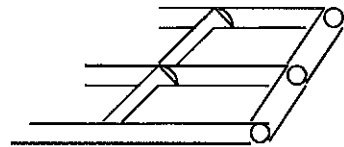
Construction Tips & Techniques

- Carpenter's glue works well, liquid nails
 - hot-melt glues melts in the sun
- Duct tape only non-painted surfaces (tubes or frame that will be covered)
 - Duct tape shrinks when painted
 - Duct tape can be covered with masking tape if you need to paint it.
 - No Clear tape - it melts when painted
 - Masking tape for glued edges & seams
 - Kraft paper with spray adhesive also

Construction Tips & Techniques



Solid Tube
Frame

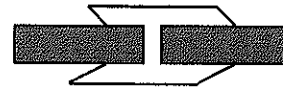


Center/Cross
Beam
Frame

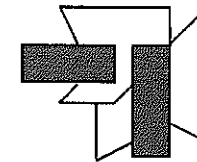
FRAMES

CONNECTING TUBES

Cardboard
Wrapper for Tubes
End-to-End

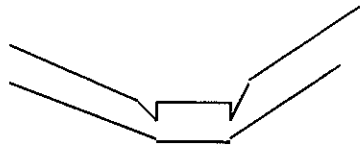


Cardboard
Wrapper for Tubes
At Right-Angles

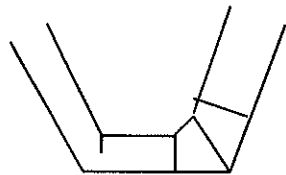


Construction Tips & Techniques

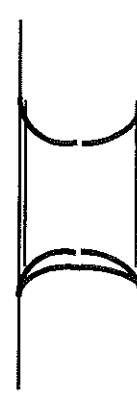
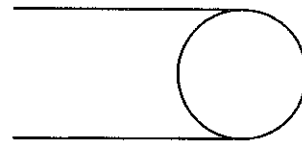
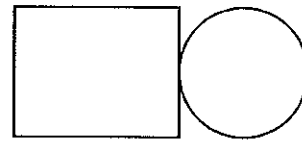
FRAME ANGLES



V-Shaped Cuts

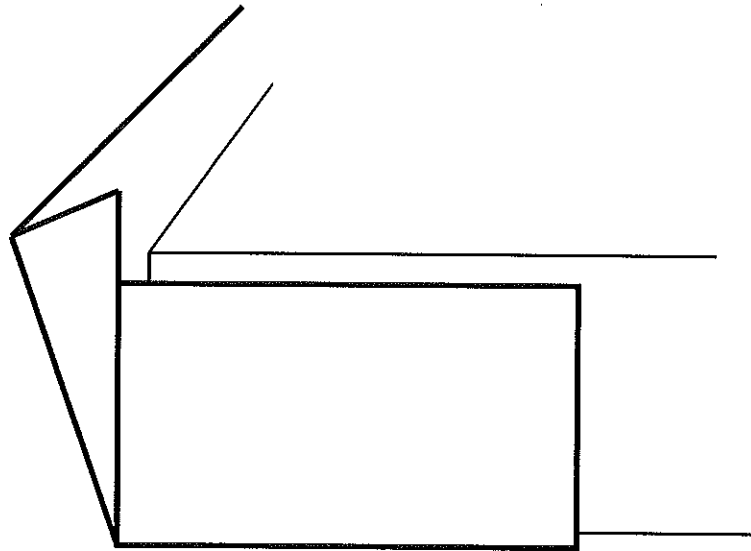


Multiple Cuts
for Sharper Angles



TUBE CUTTING TEMPLATE

Construction Tips & Techniques

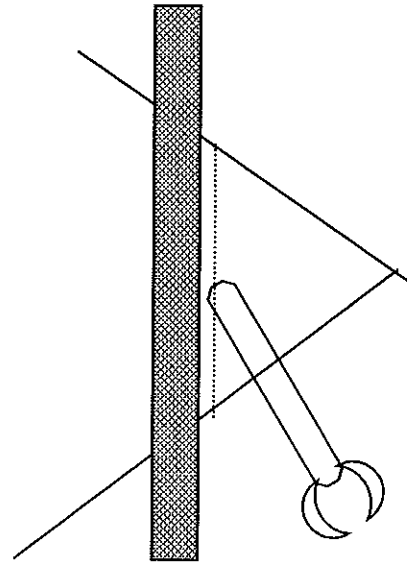


**FOLD & OVERLAP
CARDBOARD
AROUND CORNERS**

Construction Tips & Techniques

**Crease/Score a line
for a nice**

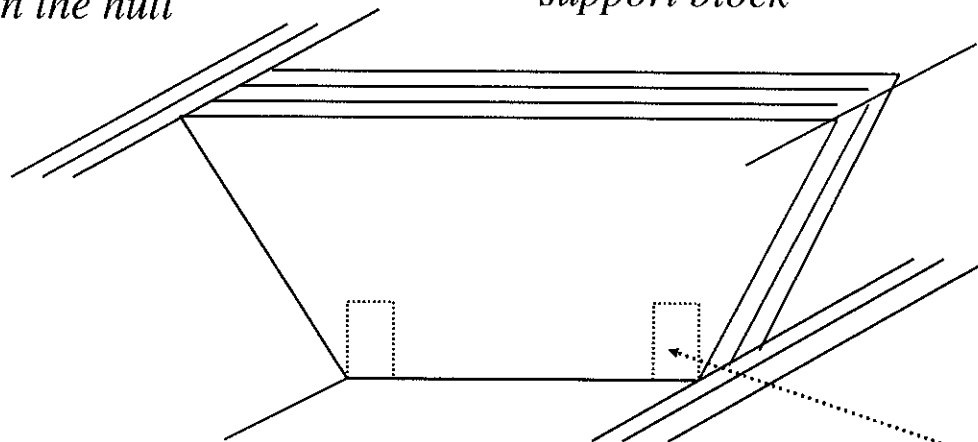
**STRAIGHT
FOLD**



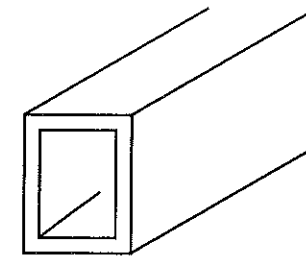
Construction Tips & Techniques

Multiple cardboard layers
“glued” together on the sides
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*



For Any Questions Please Call

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