

SUGGESTIONS & CONSIDERATIONS

- Set design goal: Fun, Speed & Appearance
- 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 technique will be used
- A box measuring 1' x 1' x 3' will float 187 lbs
- In theory: If it's big enough to hold you, it will float you
- Flat bottom, sit-to-paddle & canoe styles have been the most popular and successful designs in the past
- Long boats go fast, but are harder to turn
- Short boats (<8') are difficult to paddle straight
- Best Length: 8-12'
- Best Height: 18" (allows room to sit/kneel & still paddle over the edge)
- Best Width: 18"- 30" (max) for 2 or more people in a row
Minimum 48" wide for 2 people side by side
- Kneeling is a "power" position but sitting is more comfortable

Basic boat styles



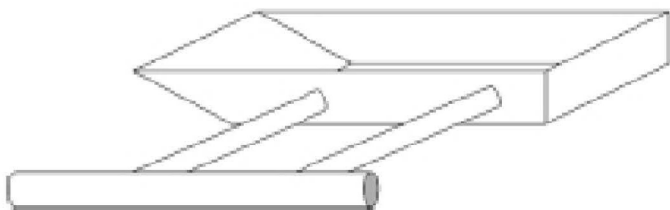
Simple
Box



Slanted
Box



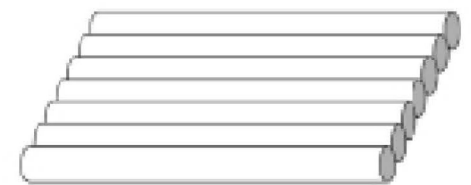
V-Shaped
Bow



Outrigger
Design



Pontoon
Design

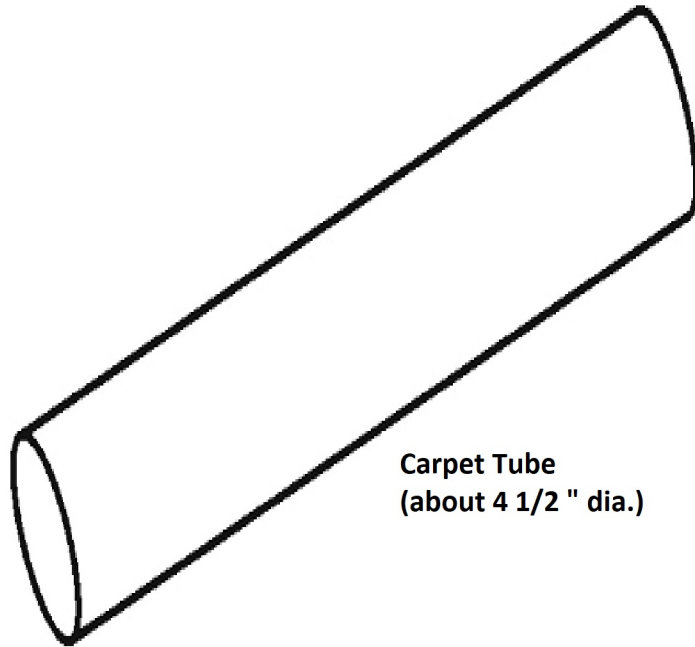


Raft
Design

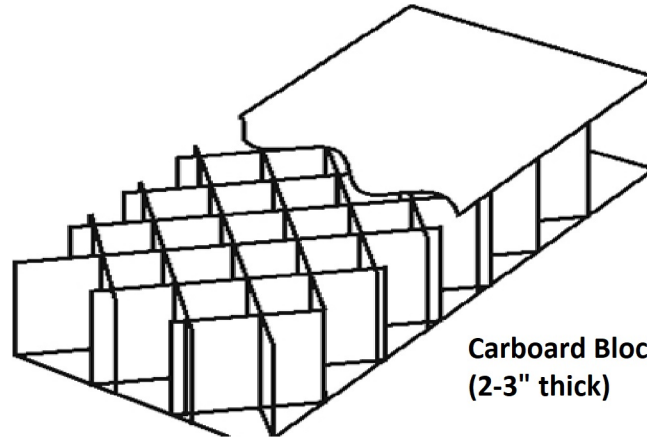
CONSTRUCTION

FUN DUNE + RAISER.ORG
duct tape boat races

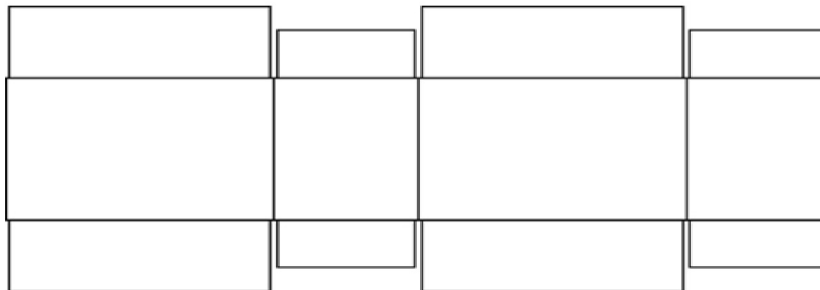
CONSTRUCTION



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



Carboard Block
(2-3" thick)



Cardboard Box - cut
open

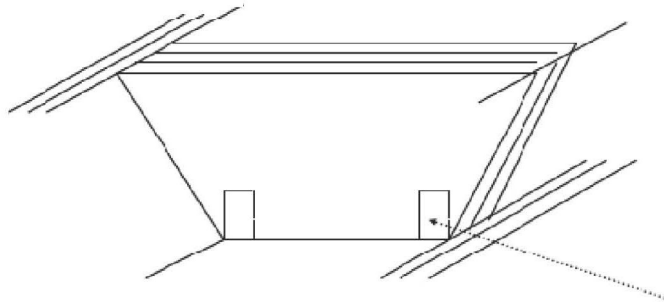
SUGGESTIONS

- Cover all edges and joints. Cardboard acts like a siphon
- Cardboard tubes make great frames. (Cut for joining & bending)
- Cardboard Hull: 1 or more layers, fasten & cover the seams. With 2 layers, overlap the seams & duct tape like crazy. Decorate with Latex paint (if desired).
- Reinforce the area where the crew will sit, kneel or stand
- Duct tape only non-painted surfaces (duct tape shrinks with painted)

CONSTRUCTION

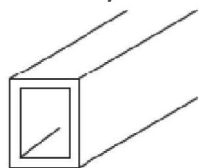
FUN DUCT + RAISER .ORG
duct tape boat races

Multiple cardboard layers
"adhered" together with duct tape
on the sides strengthen *the hull*



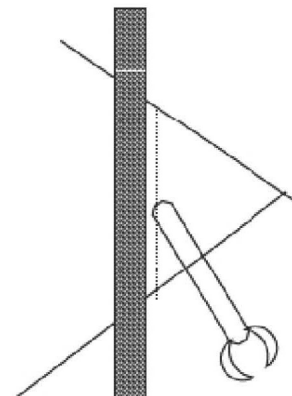
Multiple trapezoid-shaped pieces
"adhered" together with duct tape
to form a "support block"

A sheet of cardboard
could be folded &
"adhered" together
with duct tape to form
tubes/beams



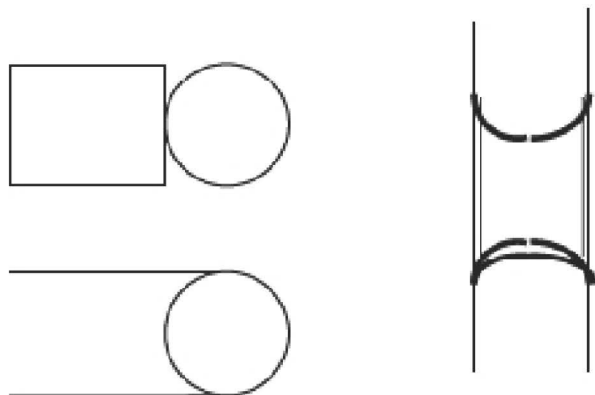
Crease/Score a line
for a nice

STRAIGHT
FOLD

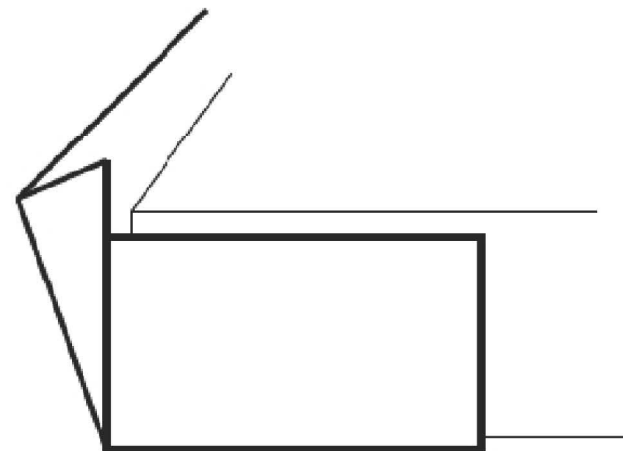


CONSTRUCTION

FUN DUCT + RAISER.ORG
duct tape boat races



**TUBE CUTTING
TEMPLATE**

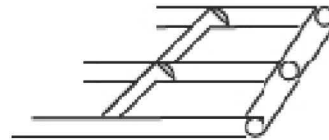


**FOLD & OVERLAP
CARDBOARD
AROUND CORNERS**

FRAMES

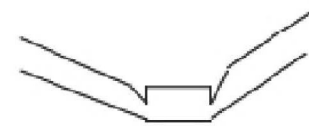


Solid Tube
Frame

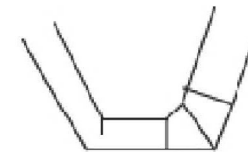


Center/Cross
Beam
Frame

FRAME ANGLES



V-Shaped Cuts



Multiple Cuts
for Sharper Angles

CONNECTING TUBES

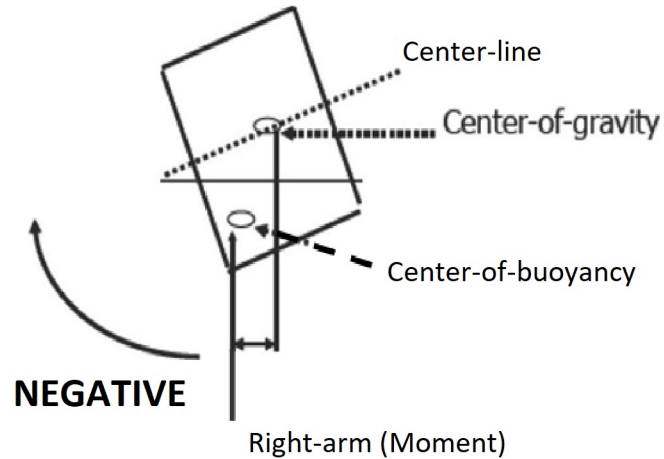
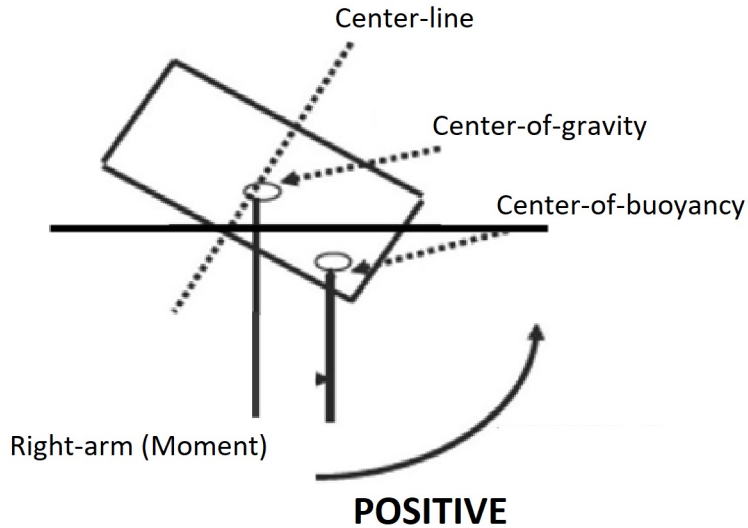
Cardboard
Wrapper for Tubes
End-to-End



Cardboard
Wrapper for Tubes
At Right-Angles

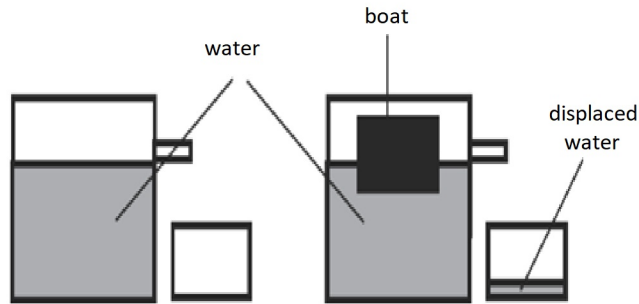


WIDER IS STEADIER

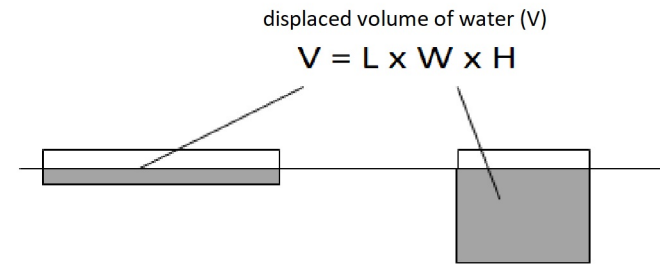


DISPLACEMENT

HOW MUCH WILL YOU SINK?



Weight of Water =
62.4 pounds/cubic-foot



Water displaced (ft³) = $\frac{\text{weight-of-boat \& people (lbs)}}{62.4 \text{ lbs/ft}^3\text{-H}_2\text{O}}$

Depth (ft) boat sinks _____

Example: Box boat, 3 ft x 6 ft tall (high)
Boat volume = 3' x 6' x 1' = 18ft³
Boat displacement = 18 ft³ x 62.4 lbs/ft³ = 1123.2 lbs
Which equates to 93.6 lbs per inch of boat height