Cardboard Boat Design

• Consider its size - building & transporting to the water
  – 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 water

Construction Materials
(examples)

Cardboard Block
(2-3” thick)

Cardboard Box - cut open

Carpet Tube
(about 4 1/2” dia.)

Cardboard Boat ‘Physics’

• “How much will you sink?” - Displacement

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 Design Suggestions

• Set the Design Goal: Fun, Speed and Appearance
• Sketch out your design
• 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 bottom, sit-to-paddle & canoe styles - are the best/easiest
• Rudders help keep you straight but make turning difficult and adds complexity to your design.
• Long boats go fast - but are harder to turn
• Short boats (<8’) - 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
• Cover all edges of cardboard - acts like siphon
• Cardboard Tubes make great frames
  – Cut for joining & bending
  – Fasten tubes together
• Cardboard Hull
  – 1-2 layers, fasten & cover the seams
• Reinforce the area where you sit, kneel or stand