

M3OA/Medford Recreation 2023 Cardboard Canoe Race - Rules

The Cardboard Canoe challenge is a chance to mix creativity, construction, and engineering skills with pure athleticism. All proceeds from the race will go to funding M3 Outdoor Adventures programming. Teams must contain at least 2 paddlers who will compete in races across Wright's pond. The race will be 75-100 meters with one turn. Winners will be required to run multiple heats, so durability matters! Awards and honor will be earned for both speed, style, and survival. *The race manager reserves the right to disqualify any boat that does not meet the following criteria.* REMEMBER: This event is for charity and fun. We would like all teams to compete with that spirit in mind!

Please check out the "Build Your Boat Tutorial" found on the M3 Outdoor Adventures Youtube channel for more advice & support in boat construction.

Race Rules

- All boats need to be built **before the event**. All polyurethane/paint must fully dry on race day. They will be inspected prior to the race.
- It will be a bracket style tournament with three canoes at a time racing to and around a buoy, and the winner will advance to the next round.
- Duct tape, masking tape, or adhesives such as 'liquid nails' and 3M general purpose spray adhesive CAN be used to connect cardboard to cardboard and CAN be used to reinforce all seams and stress points. It CANNOT be used to waterproof boats. Your whole boat can not be covered in layers of duct tape.
- Waterproof the boat with Varnish, Paint, or Polyurethane (one-part, paint-like substance). (If you don't want your boat to sink, waterproof the entire boat with any paint-able, one-part substance like Varnish or Polyurethane inside and out.)
- Decorations are encouraged -as long as they don't affect structural strength or buoyancy. Boats CANNOT tow anything behind them for the safety of other boats.
- The crew compartment CANNOT be enclosed so as to interfere with escape. Every crewmember must wear a PERSONAL FLOATATION DEVICE (PFD) & proper footwear. PFDs will be provided at the event.
- All crew members MUST sign a Participant Waiver on race day. Boats will not be allowed to race without a signed agreement from each race participant
- There is a minimum of TWO crewmembers (each over the age over 10) in the boat for the race. All boats are human powered (paddles be provided).
- To qualify as a finisher in any heat, you must be IN your boat, not towing it in your teeth or between your legs.
- All participants must be human. No pets are allowed on the canoes.

SEE THE NEXT PAGES FOR MORE DETAILED INSTRUCTIONS!



Approved Construction Materials

Approved materials	Not allowed materials
<ul style="list-style-type: none">○ The ENTIRE boat must be built of cardboard, duct tape, and one-part polyurethane. (Any part of your boat that touches the water must be cardboard. This includes the hull, decking, keel, cowling, superstructure, oar locks, seating and rudder. Nuts, bolts, washers and staples are NOT allowed in hull construction. The cardboard may be as thick as you want, but may not be attached to wood, plastic, fiberglass, etc.)○ Only exceptions are the paddles & decorations○ Use cardboard boxes, “blocks”, carpet tubes○ Duct tape may be used to reinforce seams○ 1 part polyurethane to waterproof the canoe.○ Paper spray adhesive.	<ul style="list-style-type: none">○ No pre-treated cardboard allowed○ No Sona-Tubes, waxed or ‘treated’ cardboard○ No wood, plastic, styrofoam or fiberglass○ No caulking compounds or two-part/mixed adhesives○ No wrapping in duct tape, plastic or fiberglass or similar product○ No caulking, wax, or tar○ No Staples, clamps, or screws○ No metal

How the Race Will Go

- Bracket style tournament, with seeds drawn randomly
- Canoes will go head to head racing around a buoy, and the winner will advance to the next round.

Building tips and tricks

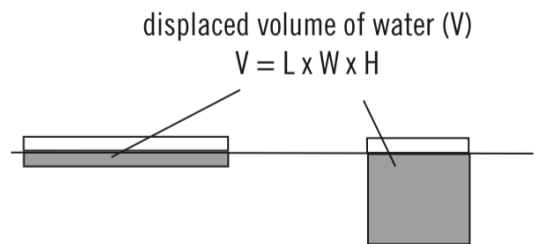
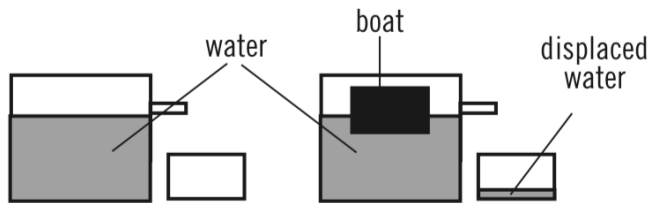
Boat design

- Start with a model. It is much easier to build and redesign small scale models.
- Use a flat bottom boat. Flat bottom boats are much easier to build and are much more stable in the water
- Boat design styles: most boats fall into three design styles
 - Raft design: Think Huckleberry Finn. This is an open design where participants sit on top of a floating pile of cardboard.
 - simple canoe: This is the most common and the fastest at turning. Participants sit inside a canoe. Make sure your boat is wide enough to be stable.
 - Outrigger canoe: An outrigger can be added to the canoe to make it more stable. This allows the canoe to be made narrower without becoming tippy. These tend to be the fastest in a straight line.

- Length: long boats tend to be faster but hard to turn. Short boats tend to be slow but turn on a dime. Your boat needs to be somewhere in the middle. The best boats tend to be 8-12 feet long and have a wall height of around 18 inches.
- Wider boats tend to be more stable, but if they are too wide it becomes hard to paddle. Recommended widths are 18-30 inches.
- Reinforce the area you will be sitting or kneeling on.
- Some helpful math. Make sure your boat displaces enough water to float your team. a cubic foot of water weighs roughly 60 pounds. You want to make sure only about half your boat is underwater. Therefore if you have a team weight at 400 pound you will need a minimum of 14 cubic feet of water displacement. Always plan on extra buoyancy your canoes will rock side to side as you paddle you do not want water getting in your boat and sinking it.

Some Physics!

“How much will you sink?” - Displacement



Weight of Water =
62.4 pounds/cubic-foot

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

Depth (ft) boat sinks _____

EXAMPLE:

Box boat, 3ft x 6ft, 1 ft 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

Hope this helps, See you race Day!