



TEXAS TECH UNIVERSITY™



# Cardboard Boat Races

2014 TTU - LISD Middle School  
STEM Challenge

*A One Week Challenge Guide*  
*Kristin Yearkey, MS*

*Please note: All photos used by permission from Texas Tech University and Lubbock ISD unless otherwise referenced.*  
<http://www.stem.ttu.edu/challenge/>



## Cardboard boat races- What are they?

Quite simple:

- Design and build boats out of cardboard and duct tape.
- Race them for the fastest times.





## Construction rules:

- The ENTIRE BOAT must be built of cardboard and duct tape
  - *Only exceptions are the paddles & decorations*
- NO outside materials – you can only use what is provided for you.
- Only adults can handle the knives.
- Follow all shop safety rules.
- If you have any questions, ask us!



## Participant rules:

- During competition, the crew must be IN the boat.
  - *This means no towing, holding, swimming, or allowing the life jacket to provide floatation of the vessel.*
- Throwing water on another boat is reason for disqualification, unless it is from the normal incidental splash of paddles.



## Rules of the Race

### Participant rules:

- Participants are expected to maintain the dignity of a yachtsman.
  - *(But without the language of a sailor.)*





## Safety rules:

- EVERY participant in a boat must be wearing a Personal Floatation Device (PVD).
- The crew compartment of a boat CANNOT be enclosed so as to interfere with escape.
- Follow all posted and stated safety rules.



## Things to consider:

- Size
- Stability
- Mobility
- Strength
- Weight of materials when wet
  
- Note:
  - *Everything must be removed from the pool.*





## Boat Design Suggestions

# Set the design goal: Fun, Speed, Looks

- Sketch the design







## Boat Design Suggestions

# Set the design goal: Fun, Speed, Looks

- Estimate time and materials





## Boat Design Suggestions

# Set the design goal: Fun, Speed, Looks

- Decide construction techniques





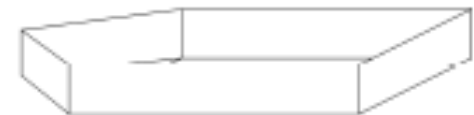
## Sample construction designs:



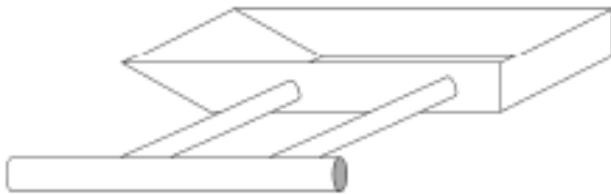
Simple  
Box



Slanted  
Box



V-Shaped  
Bow



Outrigger  
Design



Pontoon  
Design



Raft  
Design





## Boat Design Examples

### Simple Box:





## Boat Design Examples

### Slanted Box:







## Boat Design Examples



Copyright © 2010  
[www.westportmarina.com](http://www.westportmarina.com)



## Boat Design Examples

### V-Shaped Bow:





# Boat Design Examples



<http://www.capecoralregatta.com/Index/BoatBuilding>

# Boat Design Examples



<http://www.blue-room.com/onetruth/archive/000591.html>



# Boat Design Examples



## Pontoon/ Raft:





## Boat Design Suggestions

- Flat bottoms/ sit to paddles are the best/ easiest



<http://fredericksburg.com/News/FLS/2005/082005/08212005/123782>





## Boat Design Suggestions

- Long boats go fast but are harder to turn



<http://fredericksburg.com/News/FLS/2005/082005/08212005/123782>



## Boat Design Suggestions

- Short boats (<10 feet) are harder to keep straight



<http://ualr.edu/forum/index.php/2011/02/24/sink-or-swim-cardboard-boat-regatta-yields-mostly-sinkers/>



## Boat Design Suggestions

- Kneeling is a “power” position, but sitting is more comfortable



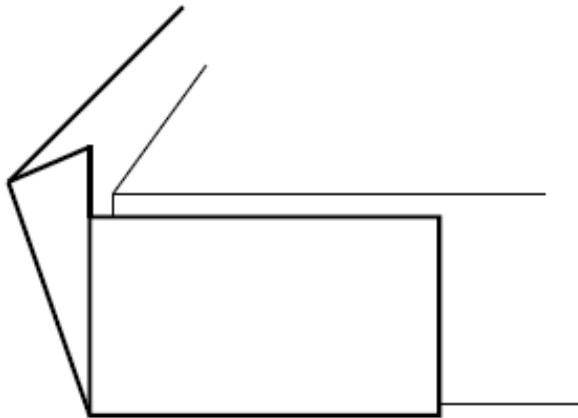
<http://www.amusingplanet.com/2010/06/oxford-cardboard-boat-race-2010.html>





## Tips and Techniques

- Have strong corner and supporting edges



**FOLD & OVERLAP  
CARDBOARD  
AROUND CORNERS**



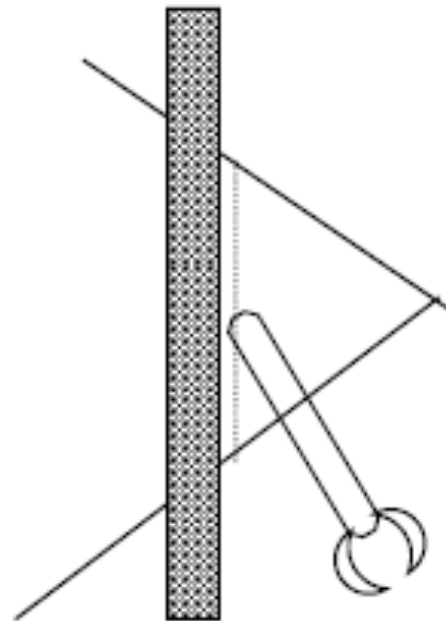


## Tips and Techniques

- Have clean crease for a straight fold

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

**STRAIGHT  
FOLD**





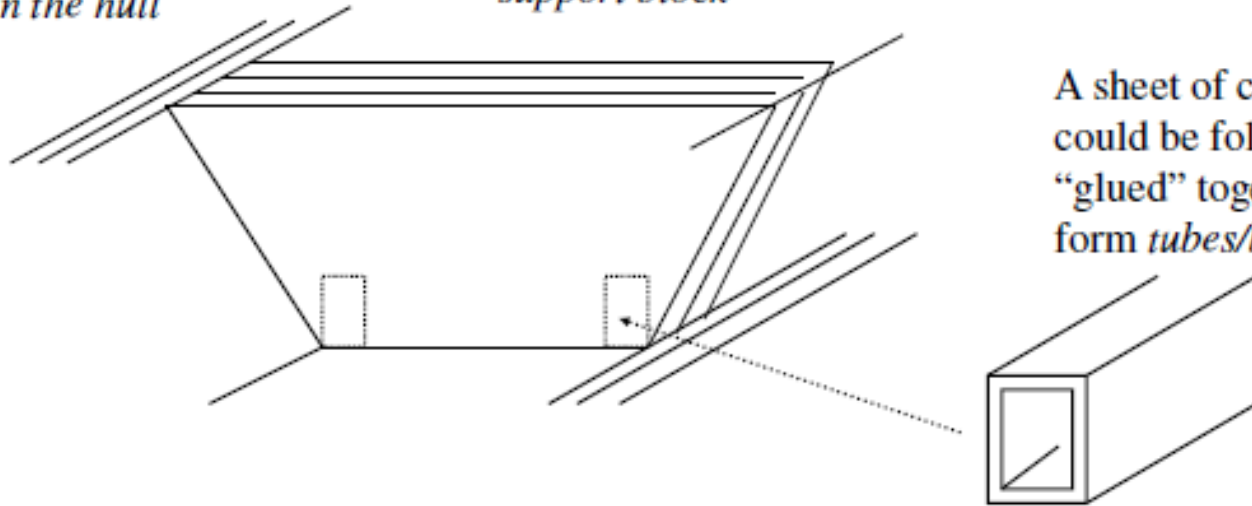
## Tips and Techniques

- Strengthen the boat with what you can!

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*



# Boat Construction





And remember, have fun with it...



Really...



<http://imgur.com/YfXUI>



Or else...



[http://www2.ljworld.com/photos/galleries/2005/aug/21/cardboard\\_boat\\_race/](http://www2.ljworld.com/photos/galleries/2005/aug/21/cardboard_boat_race/)





TEXAS TECH UNIVERSITY™

[\*\*www.stem.ttu.edu/challenge\*\*](http://www.stem.ttu.edu/challenge)