

CARDBOARD BOAT

Objectives



- Understand the concept of displacement
- Model and design a boat that has stability
- Explore the use of cardboard as a construction material
- Have fun!!!!

Introduction

- You and a partner will construct a cardboard boat that will be big enough to hold at least **ONE** person. A race will be held on Comox Lake in June to see who built the best boat.

Parameters

- You can only use standard non-waxed cardboard
- Duct tape is the **ONLY** bonding material allowed – NO GLUES
- Paints and lacquers **WILL** be used to seal the boat when done
- **ONE** person must sit **inside** the boat (Below the gunwale)
- The side walls of the boat **MUST** be at least 30cm high
- The boat **CANNOT** be longer than 2.5m (8ft)
- You will be supplied 2 rolls of duct tape per boat.
- You **CANNOT** tape the entire boat. The tape is for the seams **ONLY**!
- Mr. Claassen will supply a limited amount of cardboard.

Procedure:

- On a piece of paper sketch the design of your boat and add dimensions.
- On the computer you will draw a final model of your boat using **FUSION** and then produce a plan for it.
- Using file folder material and clear tape, you will build a 1:10 scale model of the boat. You will use the same construction techniques for the model and the final cardboard boat!
- Test the model in the sink for stability (With Boater Steve in it!).
- Hand in the sketch, computer drawing and model to the teacher for marking and security. The drawing and model will be used to mark your final product against.
- Begin building your boat. Use the cardboard supplied and begin cutting out the pieces that you need (xacto knife, bandsaw, tablesaw).
- When using the duct tape, make sure you have good joints before taping. Overlap taped joints 2 or 3 times.
- When the boat is complete, paint it with a marine paint or a waterproof sealer, if possible.

Timeline:



- For this project you have until the last week of June.
- Throughout the course you will complete the project
- Make sure you divide your time evenly between you and your partner as you don't need to **ALWAYS** work on the same thing.

Cardboard Boat Assessment

IF PARTNERS DO NOT SHOW EQUAL AMOUNTS OF WORK ON THE PROJECT, THE PERSON DOING LESS WORK WILL BE GIVEN ONLY A PERCENTAGE OF THE FINAL MARK!!!

Self - assessment	<i>Emerging (1)</i>	<i>Developing (2)</i>	<i>Proficient (3)</i>	<i>Extending (4)</i>
	Initial Understanding/Ability	Partial Understanding/Ability	Complete Understanding/Ability	Exceptional Understanding/Ability
Sketch of Boat (5 marks)	Did not complete or do it.	Did a sketch, no detail, quickly done	Sketch resembles a boat that can be made, has detail, measurements, etc	Very detailed and nice drawing, clearly has sizes, notes on what is needed, etc.
Fusion Drawing of Boat (20 marks)	Did not complete or do it.	Did the FUSION model and printed out the plans, but they were incomplete. Missing dimensions, missing views, etc.	FUSION Model and plans are complete and can build the model/boat from it.	FUSION Model and Plans are 100% accurate. Layout, dimensions, notes, everything is there in detail to build the boat.
Cardstock Model (10 marks)	Did not do the cardstock model or gave up.	Did the cardstock model but had issues or rushed putting it together so it looks a bit ratty and is definitely not perfect (gaps in taped joints, bent in places it should not be, bad cutting/fitting together)	Cardstock model worked out well and reflects the design of the boat. Slight gaps in joints, a bit weak taping, doesn't line up 100%,	Cardstock model was perfect and not sure it could be any better.
Final Cardboard Boat compared to Model and Fusion Drawings (10 Marks)	Did not finish Does not resemble the drawing/plans.	Looks like the original drawing/model but... things were added/deleted from the original drawings	Looks really close to the original drawings/model. Slight discrepancies (size, location of pieces)	Looks exactly like the drawings/Model and when measured, is within 1/2in (12mm).
Quality Of Construction (20 marks)	Poorly built/not complete, falling apart, gaps in joints	Built OK, flexes/bends when picked up, seems already coming apart, small gaps where water can get in (not 100% sealed).	Well built, but it bends/flexes when picked up. 100% sealed from water penetration	Extremely well built, everything is rock solid
Finishing/Painting (15 marks)	No effort put in or ran out of time. Left the project as bare cardboard	Did bare minimum and painted the boat a single colour with no other detail	Painted the boat well (nice brush lines), added some detail AND an appropriate name.	Great paint job and lots of detail added to make it look professional.
Overall Completion/Did it make it through the first race? (10 Marks)	Did not complete it. Boat never made it to the lake.	Finished the boat, made it to the lake and it FLOATS!	The boat is in the water and we paddled it from Point A to Point B and back, but... we have issues already	Boat is rock solid, seems, paint, structure is rock solid!
Race Day Results (10 Marks)	Never raced	Had issues and it never made it through a race. But, we tried.	The boat made it to the finish in all the races I was in.	I won a prize!

Student Score/Mark _____/100