

ID1050 Concepts in Engineering Design

# Floating Bicycle

Team 12

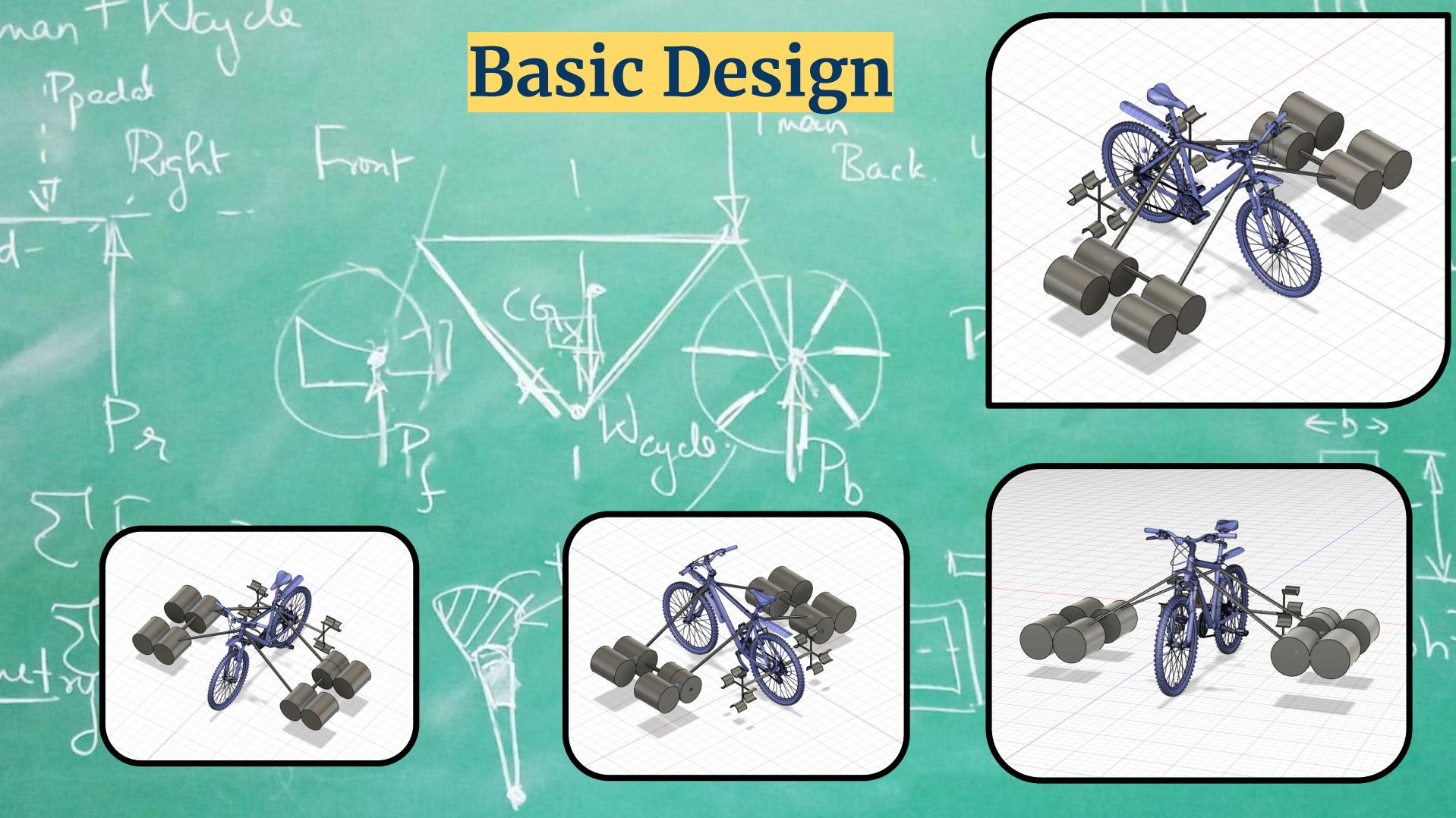
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# Basic Design

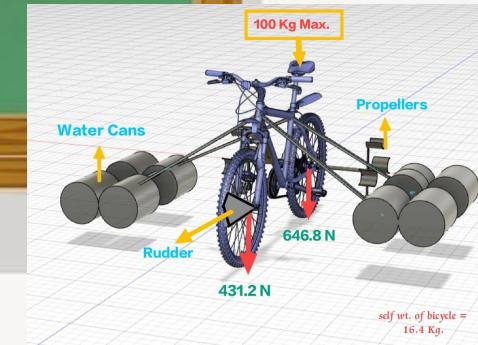


Let's roll for a quick  
3-Dimensional Tour



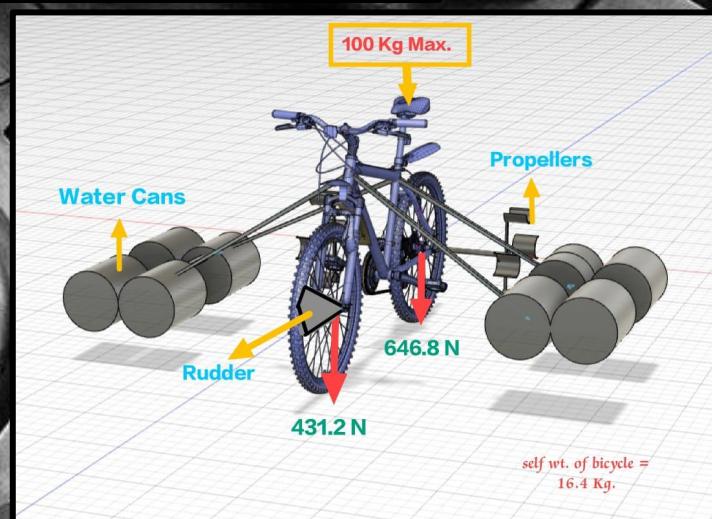
# Physics behind our project

- To make the cycle float on water, we need to balance the total mass acting on the centre of gravity of the cycle, equal to the buoyant force experienced by the water cans.
- In order to ride the floating cycle, we need to balance the force applied at meta centre.
- The cycle will topple if the load on front wheel and back wheel won't be same, to tackle this problem we should individually balance the normal acting on both the wheels by the buoyant force acting on the back and front water cans.
- When all the above conditions are satisfied, the cycle will float.



## About our design

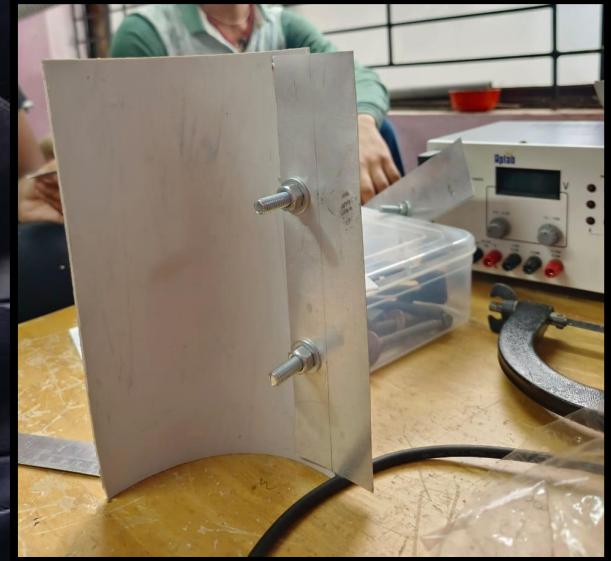
The idea behind our design is that, we will be fixing 8 water cans with the cycle in a frame so that the cycle can float. The direction control for the cycle is managed by the rudder fixed using the front wheel. When the person will paddle the cycle, the propellers will move with the backwheel resulting in forward movement.



# Our design in detail, with work progress

- **Propellers**

*We started our project by preparing propeller. For propeller we need fins. We used PVC pipes to create fins.*



*To cut the water with more ease and to help the propeller in smooth rotation for the forward direction, we added some extra portion to the fins, this portion is made of Galvanized Iron (GI) sheet.*

- Attaching the back wheel with the propellers

For the movement of propellers with the back wheel, when paddled, we need to attach the propeller with the rotating part of the back wheel. For this we used a rod to pass from the axis of rotation of the back wheel having propellers on both sides.



We used lathe to make the rod pass from the hole at the center of the wheel and used welding to connect the propellers. We also added ball bearings to the rod for the rotation.

- Attaching the back wheel back to the cycle

After we were done attaching the propellers to the back wheel with the help of a rod. Now we have to attach the wheel back to cycle. For this we first needed to make some minor changes with the cycle frame. For welding the ball bearings to the cycle frame, we used a metal belt over the ball bearing to protect it from direct welding.



- Making rudder



For the directional movement of the cycle, we planned to attach a rudder. For making rudder, we partially covered the front wheel with the hard GI sheet. This will help in moving the cycle right or left.



- Making the frame

For making the frame, we took flat steel hollow rods, we welded the rods on the cycle as shown in the picture.



We connected the water cans with the frame using metallic wires. The height of the drums are decided keeping the propellers in mind.

*Special Thanks to*

**Ms. Anuradha S**

**Dr. Anoop A M**

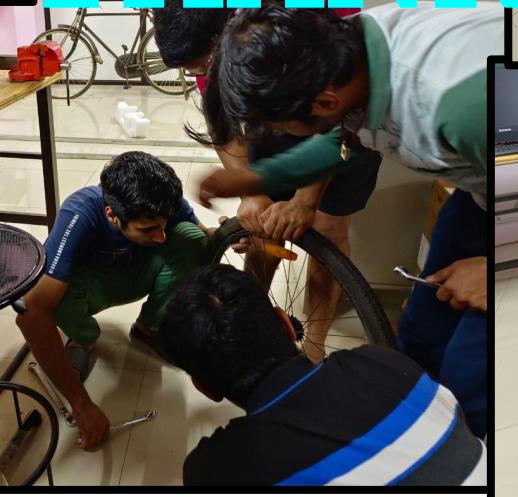
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THANK YOU