

GEARLOOSE

INTRODUCTION

An essential aspect of creativity is not being afraid to fail
Edwin Land

Have you ever as a child had an urge to make simple machines. Awaken that engineer from slumber and race your neurons to come up with that ingenious idea to astonish all. Put your thinking caps on and come up with creative ideas for this year's problem statement of designing an "Amphibious War Vehicle" that not only can move on land but also on water.



Mission Objective

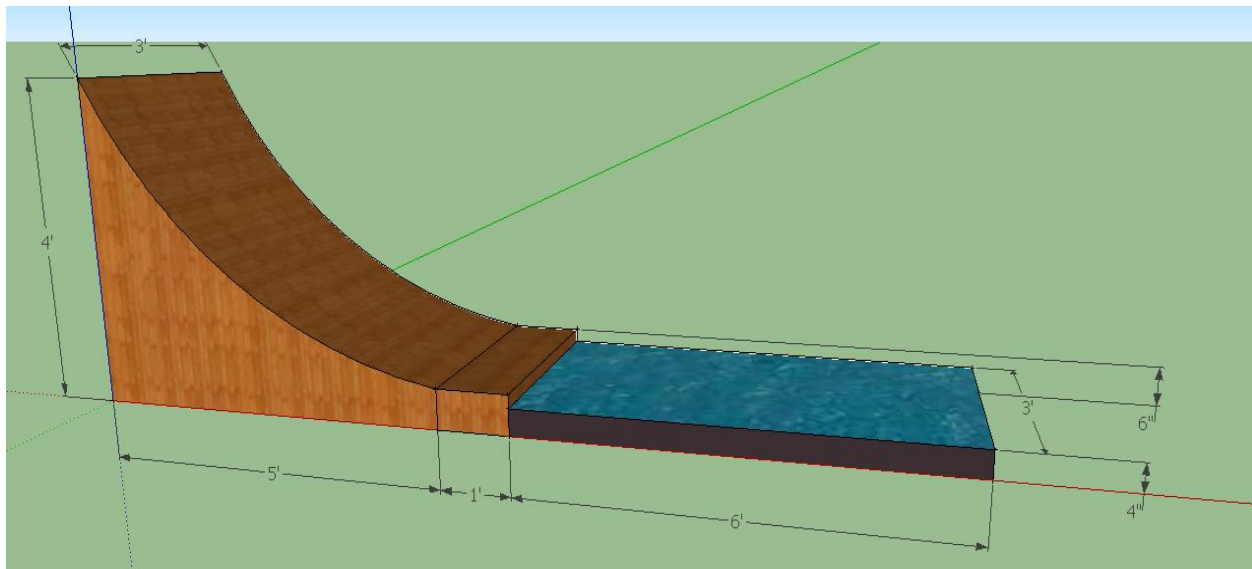
To design a vehicle/mechanical system which can descend a ramp and reach the end of pool (as shown in the arena). The bot must complete this series of tasks in the shortest possible time.

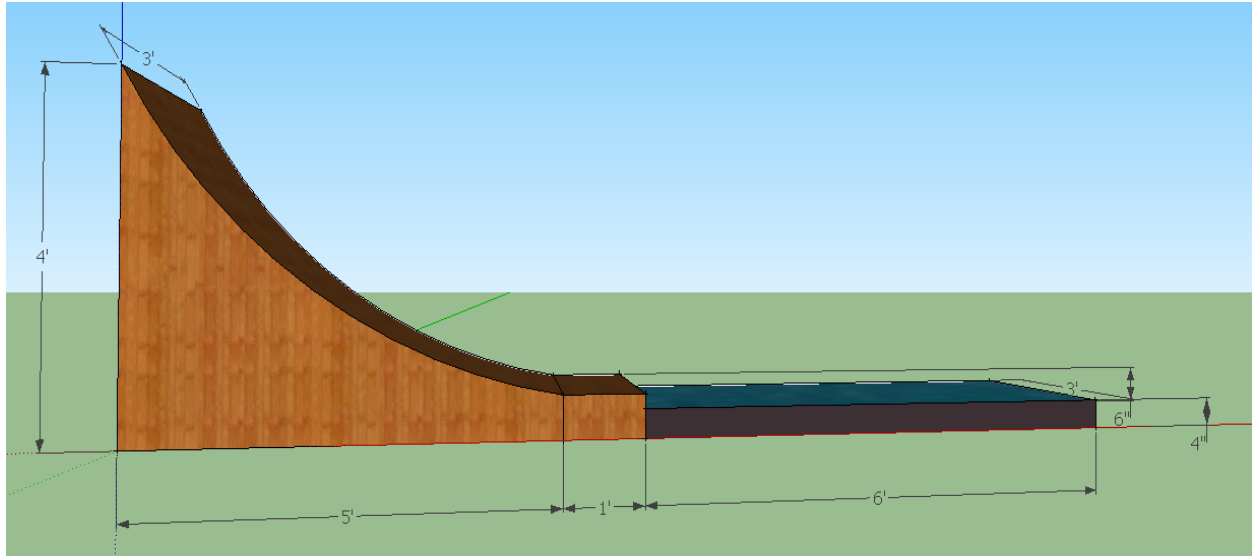
PROBLEM STATEMENT

The arena consists of an incline and a small water pool lying at its base. The bot/mechanism has to move down the incline and land on water. Next, it must propel itself by means of some potential energy or acquired kinetic energy and reach the end of pool.

Design and fabricate a vehicle which is capable of moving on incline as well as floating on water. It must be capable of performing two tasks-

- Firstly it must smoothly descend the incline.
- Secondly it must self-propel itself on water to travel up to the end of water pool whose total length is 6'.
- All the tasks must be done in minimum possible time.





RULES AND REGULATIONS

- A team may consist of a maximum of 3 members from the same pool.
- Maximum dimension of the vehicle must not exceed 25x25x25 (cm³).
- The vehicle must have at least 2 wheels.
- Each team has a chance to intervene his vehicle once during the entire task for which the points would be deducted as follows -
 - More points will be deducted for intervening on incline itself (intervention is allowed only if the vehicle stops on the incline)
 - Lesser point will be deducted for intervening while on water. (intervention on water is allowed if and only if vehicle sinks or stops completely)
- If the vehicle falls off the incline, no marks are awarded for that trial.
- Vehicle should not damage the arena in anyway otherwise it might lead to disqualification of the team.
- No part of vehicle must be left behind while landing on water.
- Vehicle's energy sources should be purely mechanical in nature. No electrical sources (motors, batteries, explosives etc.) can be used.
- Teams may use spring, pulley systems, rubber bands, plastic paddles, balloons or any other such things.
- The chassis of the vehicle can be made from cardboard, plastic boxes, thermocol, etc.

JUDGING CRITERIA

1. There are 2 main tasks as mentioned in the problem statement. Point breakup is as given in scoring criteria.
2. All the teams shall be given only three trials to score maximum number of points.
3. The best trial will be considered.
4. In case of any discrepancy, the judges and coordinators have the sole rights to take the final verdict.

SCORING CRITERIA

1. A team can score a maximum of 100 points.
2. 40 points will be awarded if the vehicle moves stably on the incline. If the vehicle falls off the incline, no marks are awarded for that trial.
3. 20 points will be deducted for intervention on the incline.
4. 10 points are awarded if the vehicle lands stably on water.
5. 10 points will be awarded if your bot floats on water.
6. 40 points will be awarded if bot reaches the end of the pool in 60 seconds (time is measured from the starting point on the incline).
7. 4 points will be deducted for every 10 seconds delay. Intervention will be considered as a time out.
8. 10 points will be deducted for intervening on water pool. Intervention on water is allowed only when the bot sinks or stops completely.
9. In case, none of the bots are able to reach the end of the pool in 160 seconds (60 sec + 100 sec), then points will be given on the basis of distance of the front most point of the bot (even if it is tilted) from the starting point of the water pool. The bot will be stopped at the end of 160 seconds (before taking the measurement).
The scoring in this case will be as such
 - $\frac{1}{2}$ point will be awarded for every inch from starting point of water pool.
10. If only one of the bots reach the end within 160 seconds, then it is the clear winner. Rest of the bots will be judged according to the previous point.
Note: **Only 1 intervention** is allowed during a trial.