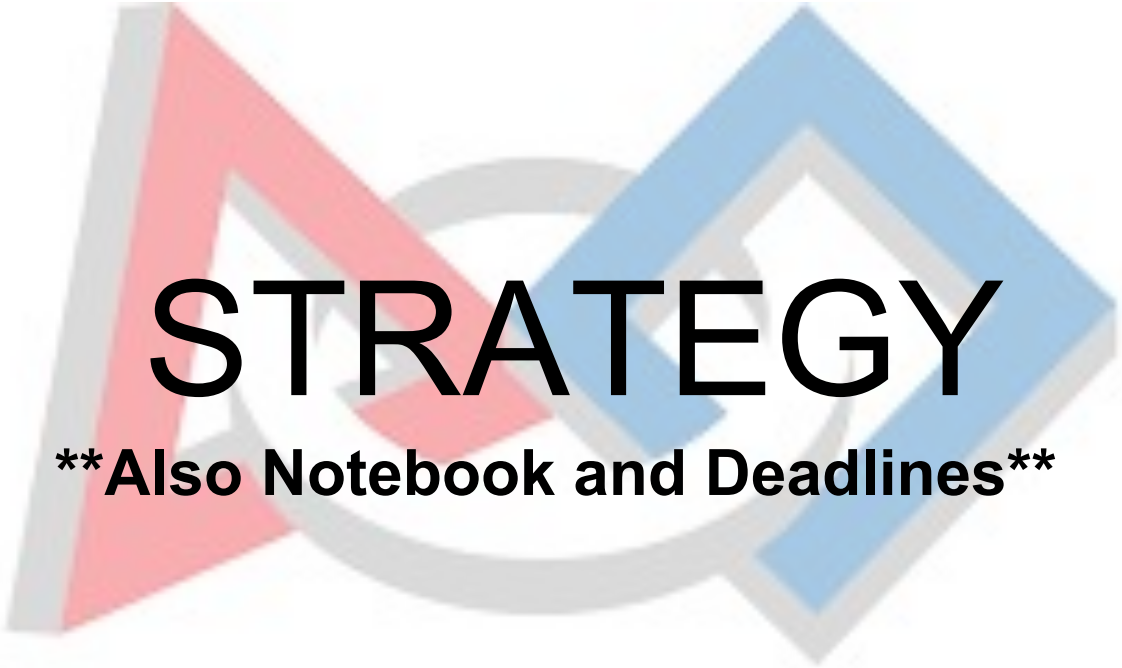
Design Process

****Also Notebook and Deadlines****

By Jennifer Guevara

Before Design Process

- Understand the game!
  - GAME MANUAL AVAILABLE
  - WRONG UNDERSTANDING = WRONG ROBOT
- Game Manual
  - READ IT
  - KNOW ALLOWED MATERIALS
- Know you have a playing field. Remember to take advantage

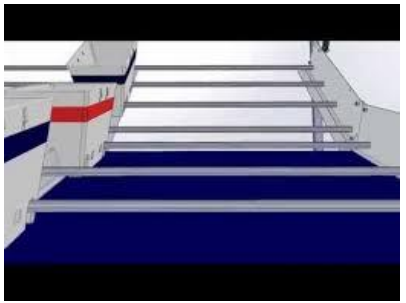


STRATEGY

****Also Notebook and Deadlines****

Basics

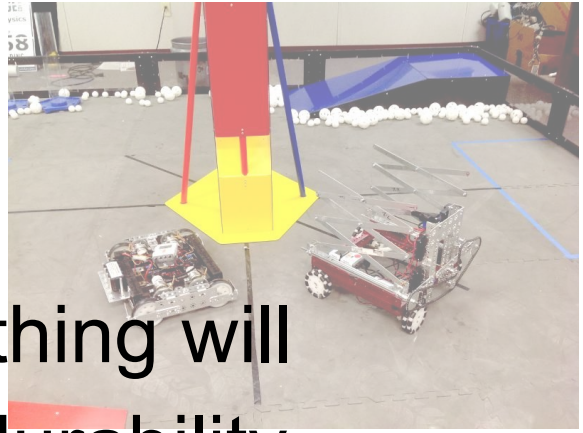
- Before designing, what do you want your robot to actually do? STRATEGY → ROBOT DESIGN
- Analyze ALL scoring options (ranking system)
  - Can also find possible ways to prevent scoring from opposing teams but DANGEROUS
- Analyze likely scenarios
- Research past games/bots



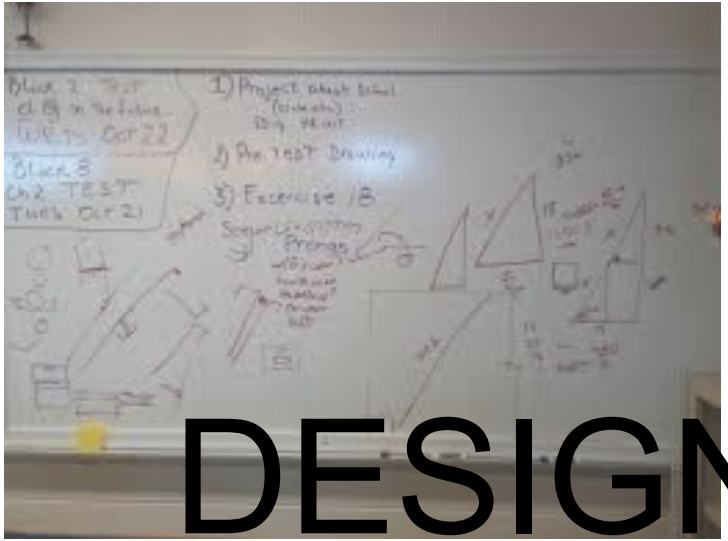
K.I.S.S

- Keep It Simple, Stupid
- Golden Rule #1: Build within your team’s limits.
- #2: 3 functions ranking 10/10 are better than
- 5 functions at 6/10
- Don’t refuse all complex ideas, but be realistic

Trade-offs

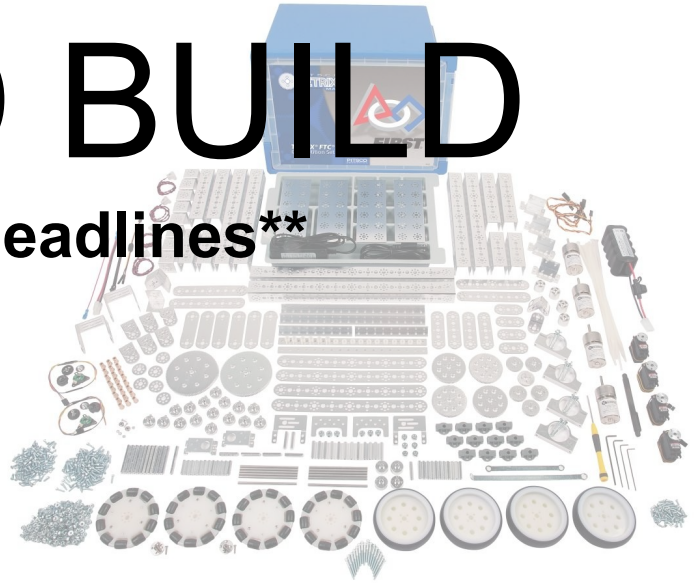


- Choosing a function means something will have to be given up. (Ex. speed, durability, height, size)
- You have partners. You can rely on them for stuff, but don’t be too relying.



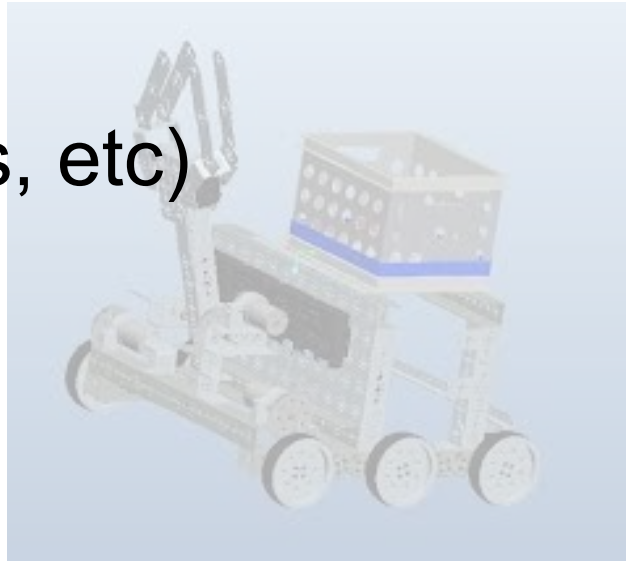
DESIGN AND BUILD

****Also Notebook and Deadlines****



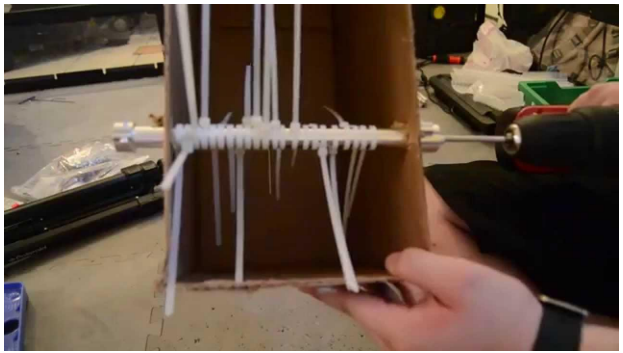
Ideas/Design

- All ideas are welcome
- Think of specific mechanisms as well as overall bot.
- Use game manual (restrictions, etc)
- Prototype



Prototyping

- Test ideas/concepts before final decisions
- Multiple prototypes
  - More iterations = BETTER ROBOT
- Does not have to use competition material (can use wood, plastic, etc)
- Prototype in unknown areas



Building

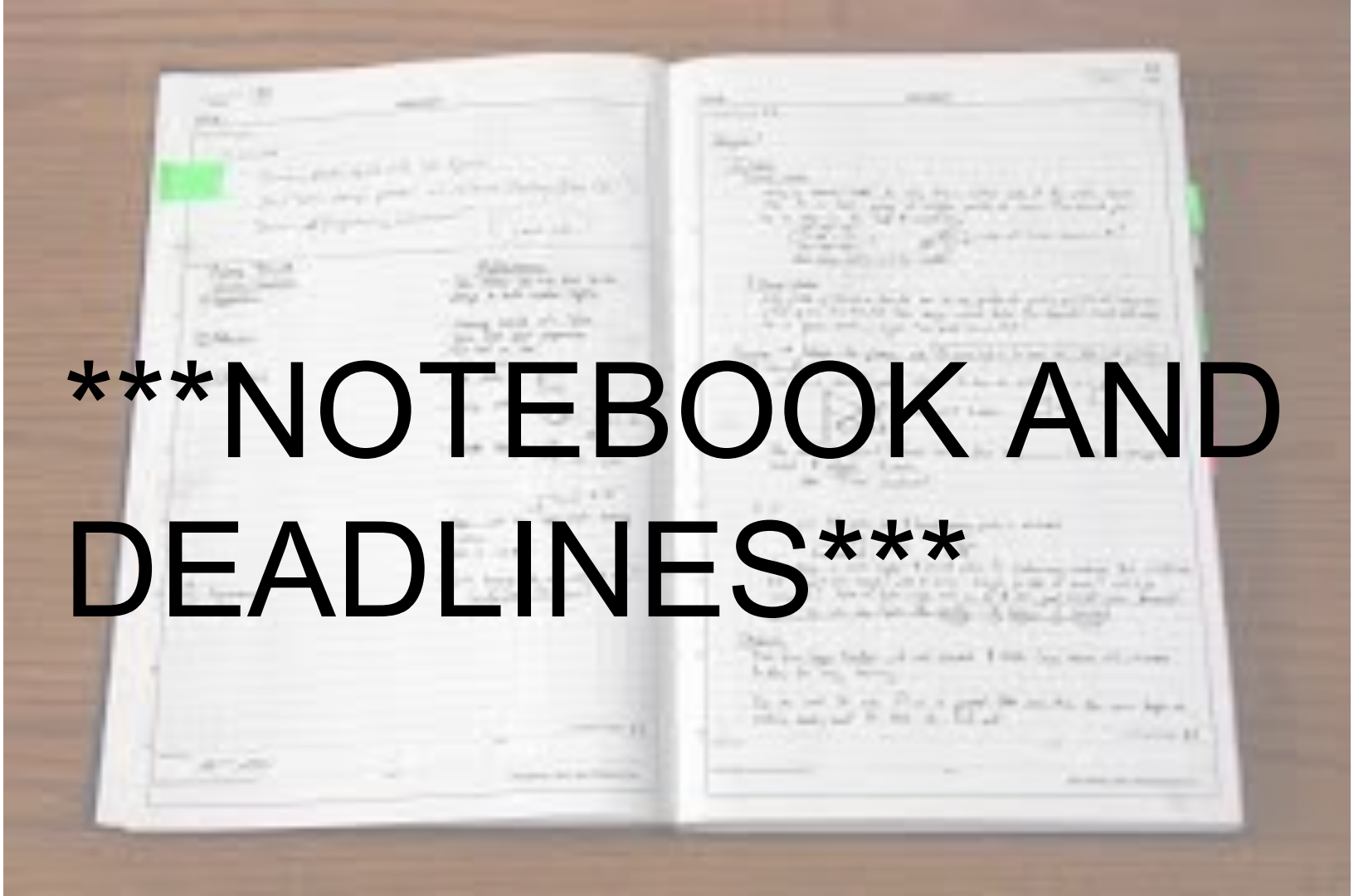
- Build final designs/mechanisms
- Make sure everyone has a job
- Monitor robot size, weight, space
- Order needed parts on time
- Build and test. Fix.
- Make sure all subgroups complete work (Electrical, Mechanical, Programming)

TESTING

****Also Notebook and Deadlines****

Test/Practice

- You have a field. Test your robot and its functions. Fix stuff. Practice driving and playing the game
- Practice with different circumstances
- Crimson vs Gold mini competitions


NOTEBOOK AND DEADLINES

Notebook (Mandatory for FTC)

- Always keep a notebook
- Write all strategies, ideas, final decisions and changes, failures, mechanisms, and materials
- Will help remember HOW you did things
- Will help figure out problems on robot
- There’s a prize for the best
- IMPORTANT. NOTEBOOK → GOOD TEAM → GOOD ROBOTS

Deadlines

- Create deadlines for everything.
  - Strategic Decisions
  - Design
  - Build
    - Mechanical, Electrical, and Programming
- Will leave time for fixing and practice

Resources

- Karthik and 1114: FIRST Strategies Video: https://www.youtube.com/watch?v=sJOfH-IomEQ
- http://www.theonerobot.com/ftc-resources/our-robot-design-process ← THIS IS GREAT.
- Own experience on team
- Past RoboLancers design classes