

Intro to Strategic Design

Virtual Learning Activity

Created by FRC 6328 & FRC 8604

6328

**MECHANICAL
ADVANTAGE**

LITTLETON, MA

8604



ALPHA CENTAURI

Strategic Design Activity



Write your answer here.....

When you think of the phrase “strategic design” what comes to mind? Write your initial thoughts in the text box.

Strategic Design

Watch the FRC (FIRST Robotics Competition) 2020 game animation video linked on this slide.

<https://www.youtube.com/watch?v=gmiYWTmFRVE>



Strategic Design: RANKING PRIORITIES

Based on the assigned point values for teleoperated game tasks, rank the game tasks by strategic priority in the provided table and provide justification. Note: this is subjective, so rank based on what you think!

Task	Point Values	Your Ranking (1-7)	Justification
Inner Port Power Cell	3 points		
Outer Port Power Cell	2 points		
Lower Port Power Cell	1 point		
1 st Color Wheel spin	10 points		
2 nd Color Wheel spin	20 points		
Climbing at end of match	25 points		
Balanced climb at end of match	15 points		

Strategic Design: Little Black Box

Now that you have ranked the game tasks strategically, picture your robot as a “little black box.” Your task now is to design your robot as if it were a magical black box. Don’t think about mechanisms yet or how the game tasks will be accomplished. Simply think about the ideal machine you would create based on your strategic priorities.

Key constraints to think about when designing your ideal machine:

- Resources Available: What tools & machines do we have in shop?
- Technical Skills: How hard will each of the tasks be for all the sub-teams? (CAD, manufacturing, assembly electrical wiring, programming) For example, a goal-tracking Power Cell shooter may be very effective, but the code to make that happen is complicated. Is the trade off worth it?
- Time: How much time do we have? When does the machine need to be completed by?



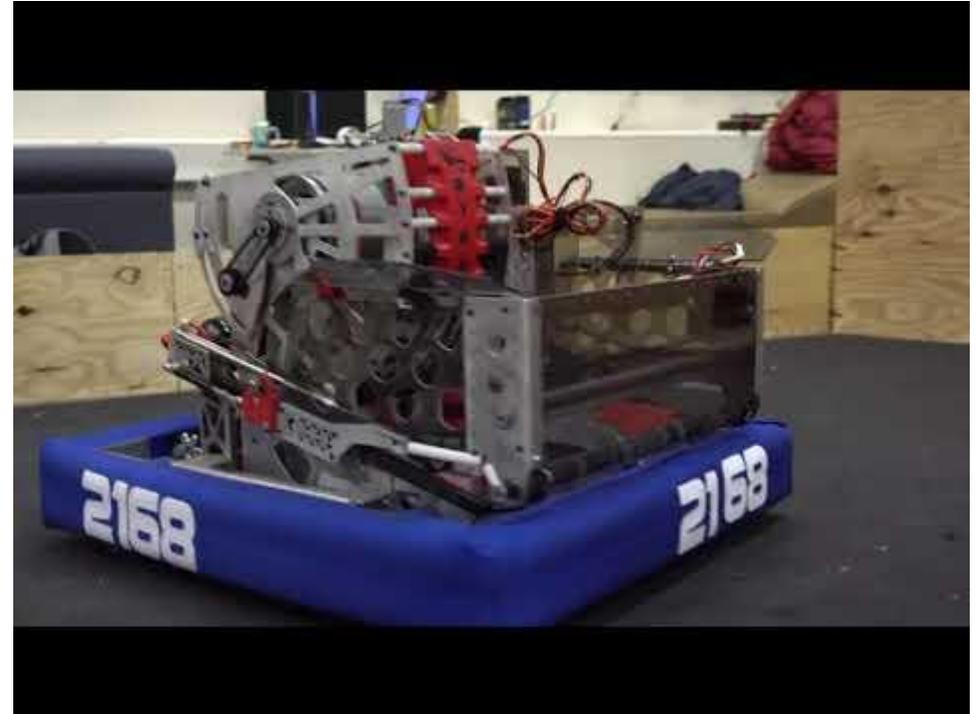
Strategic Design: CONCEPT SKETCH

Based on your Little Black Box design, create a pencil & paper concept sketch for your ideal robot! Annotate your sketch by jotting notes about how the mechanisms will work and how the machine is laid out.

Paste image of concept sketch here.....

Strategic Design Activity Part 2

To continue this activity, you will be watching a video of a team's completed robot for the 2020 FRC game. After watching the video, answer the questions on slides 8-13



***FRC Team 2168
Aluminum Falcon
Robotics
Groton, CT***

Question 1

Describe how the team's
Power cell intake works.

Write your answer here...

Question 2

Describe how the team's
Power cell shooter
works.

Write your answer here...

Question 3

Describe how the team's climber/balancer works.

Write your answer here...

Question 4

Based on the team's design, what do you think their strategic priorities were?

Write your answer here...

Question 5

Identify one strategic compromise you think this team made in their design.

Write your answer here...

Question 6

How did this team's design compare to your concept sketch? What are the similarities and differences?

Write your answer here...