MECHANISMS

The process for designing and iterating upon a mechanism can be separated into five different stages: Planning, Prototyping, Design, Manufacturing/ Assembly, and Iteration.
Use this workbook to start developing your robot's mechanisms.

Check out the prototype worksheet before starting this one on the Technical Resources webpage.

MECHANISMS

- ❑ Go through this workbook and its questions with your team
- ❑ Includes **following elements:**

01. Planning
02. Prototyping
03. Design
04. Manufacturing/Assembly
05. Iteration

01 PLANNING

DISCUSSION

Think about the initial ideas and concepts your team has developed for your robot.

1. What are some limiting factors to your robot's design?

   Consider drivetrain dimensions, robot height, weight and extension limits, etc.

2. List out what your team wants, needs, and wishes your robot could do.

01 PLANNING

DISCUSSION

Think about the initial ideas and concepts your team has developed for your robot.

3. How will your mechanisms interact with each other on the robot?

   Draw a system diagram for these interactions on a seperate sheet of paper.

4. How would you need to adapt mechanisms to meet the goals stated in the previous question?

01 PLANNING

ACTIVITY

Create an outline for how your mechanism(s) will fit on the robot.

02 PROTOTYPING

DISCUSSION

Reflect on your team's testing process and ideas for the robot. Check out the worksheet on prototyping and [Prototyping 101 Resource]

1. What process and materials does your team need to use to prototype mechanisms on the robot? Consider for example creating wooden structures.

2. What needs to be tested on your robot? Consider game piece interaction, different wheel sizes and types, possible mechanism options, hardware etc.

3. After testing, which ideas can or should be narrowed down for the next robot design?

03 DESIGN

DISCUSSION

Think about the mechanisms your team wants to include on the robot and the best ways your team can go about designing them. Consider the drawing under the planning category and your answer to the questions below to layout a design plan and schedule.

1. Does the design follow the KISS (Keep It Simple, Silly) principle? Consider what iterations you should do to arrive at such a design.

2. How can your team design to ensure manufacturing, assembly, and serviceability during competition? Consider which fasteners and wiring your team has readily available.

04 MANUFACTURING/ASSEMBLY

DISCUSSION

Think about what parts are needed to construct the robot's mechanisms. Reference the manufacturing worksheet on the Technical Resource webpage.

1. How can your team effectively manufacture the robot's mechanisms? Consider your methods of manufacturing in house and your team's skills.

2. How can your team effectively assemble the robot's mechanisms? Consider organizing non-assembled parts by the mechanisms they belong to.

05 ITERATION

DISCUSSION

After testing, use these questions to reflect about the robot's design and what can be improved on the mechanisms.

1. What aspects on the robot worked well?

2. What could be improved on the robot? Some mechanisms will require constant changes while others only require two or three iterations.

3. How can your team improve the robot? Consider the elements in question 2.

Rapid Iteration makes problems apparent early on so that a mechanism can be improved upon.