

Robot Design Executive Summary (RDES)

To help the Robot Design judges quickly and consistently learn about your robot and the design process used, we are requiring a short presentation. An “executive summary” is often used by engineers to briefly outline the key elements of a product or project. In other words, the purpose of the RDES is to give the Robot Design judges an outline of your robot and all that it can do. The RDES is intended to help your team consider in advance the most important information to share with the judges. What you chose to share will enable the judges to effectively evaluate your team and provide more helpful feedback.

Your team is free to determine how much time you invest, but realistically it should only take a few hours to develop and practice the RDES. The RDES is NOT intended to be as extensive or time consuming as your Project.

Your team will present your RDES at the beginning of your Robot Design judging session. The entire presentation, including the trial run, should not take any longer than **four (4) minutes**. Following your Robot Design presentation the judges will pose questions for your team to answer. You are not required to provide a written version of the RDES to leave with the judges.

Basic Outline: The RDES should include the following elements: *Robot Facts*, *Design Details*, and a short *Trial Run*.

Robot Facts: Share with the judges a little bit about your robot, such as the number and type of sensors, drivetrain details, number of parts, and the number of attachments. The judges would also like to know what programming language you used, the number of programs and the amount of memory used by each program, and your most consistently completed mission.

Design Details:

1. **Fun:** Describe the most fun or interesting part of robot design as well as the most challenging parts. If your robot has a name, who chose the name and why. If your team has a fun story about your robot please feel free to share.
2. **Strategy:** Explain your team’s strategy and reasoning for choosing and accomplishing missions. Talk a little bit about how successful your robot was in completing the missions that you chose. Judges may like to hear about your favorite mission and why it is your favorite.
3. **Design Process:** Describe how your team designed your robot and what process you used to make improvements to your design over time. Briefly share how different team members contributed to the design and how you incorporated all the ideas.
4. **Mechanical Design:** Explain to the judges your robot’s basic structure, how you make sure your robot is durable and how you made it easy to repair or add/remove attachments. Explain to the judges how the robot moves (drivetrain), and what attachments and mechanisms it uses to operate or complete missions.
5. **Programming:** Describe how you programmed your robot to ensure consistent results. Explain how you organized and documented your programs, as well as, mention if your programs use sensors to know (and ensure) the location of the robot on the field.
6. **Innovation:** Describe any features of your robot design that you feel are special, different or especially clever.

Trial Run: Demonstrate the operation of your robot for the judges performing the mission(s) of your choice. Please do not do an entire robot round; time will be needed for judges to ask questions of your team.



Robot Design Summary

Team Number

Team Name

Robot's Name					
Favorite Mission		Maximum Score		Typical Score	
Favorite Robot Feature		Most Innovative Robot Feature			
How often does your robot or its attachments break? <i>(Circle One)</i>		Frequently	Fairly Often	Occasionally	Almost Never
How often does your robot get stuck on the field and you have to retrieve it by hand? <i>(Circle One)</i>		Frequently	Fairly Often	Occasionally	Almost Never
Strategy <i>How did you choose the missions you worked on?</i>					

How many Motors and Sensors are on your robot? <i>(See the Robot Game Rules for allowable types)</i>					
Large Motors		Medium Motors		Color / Light Sensor	
					
Ultrasonic Sensor		Touch Sensor		Gyro / Angle Sensor	
					

Design Process

What processes did you use to design your robot? Did you follow the Engineering Design Process (Explore -> Imagine -> Create -> Test -> Improve)? (Attach additional pages or use the back if needed. Show the Judges your Engineering Design Notebook and any photos, drawings or diagrams of your robot throughout the season, if you have them.)



Robot Design Summary

Team Number

Team Name

Program Summary

What can your robot do? List every program you plan to run during the tournament. Attach additional pages if needed.

Programming Language Used: LEGO MINDSTORMS EV3 OTHER _____

Program Name	Mission(s) Accomplished	Robot Actions	Attachments Used	Program Structure (Architecture)	Mechanical and/or Sensor Feedback Used	Mission Success Rate
<p><i>What is this program called in your robot?</i></p>	<p><i>List the missions your robot will accomplish when you run this program.</i></p>	<p><i>List the types of actions performed during this mission (Forward / Turn / Lower attachment / etc.) You may include a more detailed outline and/or path diagram on a separate sheet.</i></p>	<p><i>Do you add anything to your robot while running this program?</i></p>	<p><i>List the types of programming commands used [actions (start motor, read sensor, etc.), loops, do until, switches (if-then), subroutines (MyBlocks), parallel programs, etc.]</i></p>	<p><i>Does your robot make decisions based on input from a sensor or mechanical feature? If yes, explain how the input is used.</i></p>	<p><i>How often does your robot accomplish the mission(s)? Show the Judges any data you collected from your trial runs!</i></p>
<p>EXAMPLE From HYDRO DYNAMICSSM</p>	<p>Fountain</p>	<p>Drive forward. Lower arm to release Big Water. Reverse back to base.</p>	<p>Arm</p>	<p>Forward in Rotations</p>	<p>None</p>	<p>Fairly Often (85% from data)</p>



Robot Design Summary

Team Number _____

Team Name _____

Program Name _____

Robot Path Diagram

Create one Robot Path Diagram for each program you're planning to run. Sketch the path the robot takes as it executes the program. Each time the robot stops or takes an action, use the diagram to show what the robot is doing. Show the path diagram for your team's best program to the Judges during your Robot Design judging session.



Program Description

Explain each Path Diagram by showing your code, pseudocode (written outline), flow chart, or some other way. Assume the Judges have never seen the language you're using to code. How can you help them understand how your program works? (Use the back or additional pages if needed)