Robot Design Rubric

	Needs Improvement	Fair	Good	Excellent
Strategy, Process, Problem Solving	Uses standard design. No design process, concept to refinement, communicated. Strategy based only on ease of task - did not maximize time, combine mission tasks or consider points.	Little forethought in initial design. Refinement of robot and programs not communicated. Strategy often based on ease of task - few risks taken. Little consideration of time, mission combinations or maximizing points.	Basic understanding of design process, evidence of conceptual planning, building, testing, refining of robot, manipulators, programs. Effective strategic planning, combining mission tasks, plotting routes, using manipulators and/or program slots.	Communicates complete design process, from initial concept through build, test and refinement. Excellent/innovative strategy, combining mission tasks, plotting routes, maximizing points.
Locomotion and Navigation	Difficulty going same distance on repeated missions. Too fast for accuracy, or too slow to accomplish mission. Turns inaccurate or inconsistent. Moves between two points inconsistently. No effort to know position on table beyond distance and accurate turns	Goes defined distances sometimes. Turns sometimes accurate. Sometimes moves between two points consistently. Little or no effort to know position on table beyond distance and accurate turns.	Goes defined distances most of time. Not too fast for accuracy or too slow to accomplish mission. Turns reasonably accurate and consistent. Allows for variables. Moves between two points with reasonable accuracy and consistency. May use various sensors	Goes defined distances efficiently. Adjusts speed, position sensing for optimum speed and accuracy. Turns accurately and consistently. Allows for variables (battery wear, obstacles). Moves between two points with very good accuracy and consistency. May use various sensors.
Kids Did the Work	Little knowledge of why some parts are where on the robot or who put them there. Little or no understanding of what pieces did. Building/programming appears primarily done by coach.	Knowledge of robot structure and programming show minimal understanding of design, science and technology behind (age specific expectations). Building and programming seems primarily directed by coach.	Knowledge of robot structure and programming show moderate understanding of design, science and technology behind (age specific expectations). Building/programming mostly directed by team members, with help from coach.	Knowledge of robot structure and programming show thorough understanding of design, science and technology behind (age specific expectations). Building/programming was done by team members.
	Okay for team members to have different roles, as long as work is done by kids.			
Structural	Difficulty with robot assembly during demo. Base weak, falls apart when handled or run. Attachments, if used, weak and fall apart often. Attachments, if used, difficulty completing task or overly complex. Robot design from book, little modification by tea	Robot assembly done with few errors. Robot base structure has some stability Attachments, if used, difficult to apply and/or not modular. Attachments, if used, not precise or not repeatable. Robot shows signs of team's design ideas	Robot assembled with no errors, but slowly. Robot base stable, but not robust. Attachments, if used, modular, function most of the time and/or take some time to assemble Attachments, if used, somewhat precise and/or repeatable. Robot designed by team	Robot assembles easily. Robot base stable and robust. Attachments, if used, modular, function as expected and easily added/removed from robot. Robot displays wide range of capabilities. Attachments, if used, perform tasks extremely well and are repeatable. Robot designed by team, design is unique and creative.

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Overall Design	Robot lacks most critical design components: works, stays together, efficient parts use, attachments easy to add/remove, simpler than comparable robots Few components work together Few components look like they belong together	Robot lacks many critical design components: works, stays together, efficient parts use, attachments easy to add/remove, simpler than comparable robots Some components work together Some components look like they belong together	Robot lacks some critical design components: works, stays together, efficient parts use, attachments easy to add/remove, simpler than comparable robots Most components work together Most components look like they belong together	Robot is elegant, complete system All components work well together All components look like they belong together
	*(Optional *) Completes one or two missions*	*(Optional *) Completes 40% of the missions*	*(Optional *) Completes 70% of the missions*	*(Optional *) Completes 90-100% of the missions*

*Optional * - Some tournaments will provide performance scores to the judges*
others will have judges ask the teams how many missions their robot completes