



2006

Rules

-
- 1. READ THIS FIRST** To maximize performance and eliminate surprises, you must take the time to read and understand FOUR documents: the Field Setup Instructions, the Missions, the Rules, and the CURRENT Questions & Answers (Q&A) page on the web.
 - 2. MATCH** At a tournament, two Challenge fields are joined back to back, and each team is paired opposite another to compete in a match. For 2-1/2 minutes, the robot tries to get the most points it can by completing missions. The timer never pauses during a match. Each match is a fresh chance for the team to get its best score, and no match has anything to do with another.
 - 3. MISSION** A mission is a job the robot can complete for points. The robot starts from Base and goes out on one or more trips to try to complete one or more missions per trip. Missions may be tried in any order, alone or in groups, re-tried when possible and allowable, or skipped. Points are given if the required results are still visible on the field at the END of the match.
 - 4. ROUND** The process of cycling all teams through one match each is called a round. Most tournaments run at least 3 rounds, and teams have time between their matches to go to the pit area and work on the robot and its programs as needed.
 - 5. PARTICIPATION** The maximum allowable team size is 10 members, not including coaches and mentors. See the Coaches' Handbook for allowable ages. At the tournament, only two team members at a time are allowed right up at the competition table except during repair emergencies. The rest of the team may stay nearby, but away from the table. To share in participation, members may rotate in/out at any time.
 - 6. AUTONOMY** Robot performance must be autonomous (hands off, Bluetooth off). After preparation by the team, the robot is required to leave Base completely and accomplish missions BY ITSELF, and return (if needed) to Base BY ITSELF. Most robots require multiple trips, with some rescue and/or preparation between trips. If the team does rescue (touch/handle) the robot, depending on where the robot is and what it's doing, there could be negative consequences such as mandatory restarts, loss of control of objects, and reversal of changes to the field.

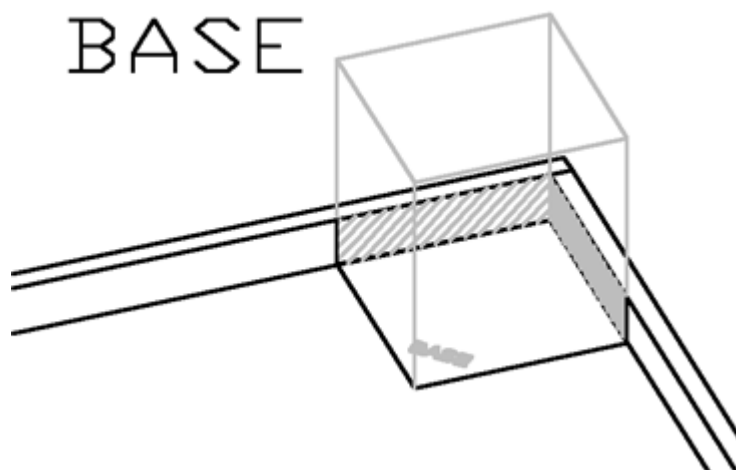
7. ROBOT The robot is defined as the RCX OR NXT brick and anything currently connected or attached to it. Mission models, strategic objects, separate pieces, and separate mechanisms are not part of the robot.

8. MATERIALS At the competition table, the robot, its attachments, and all strategic objects must be made entirely of LEGO elements in original factory condition (except LEGO string and tubing may be cut to length). At the competition table, the total package of robot, attachments, and strategic objects when viewed all at once must conform to the following quantity limits on electrical parts, no matter what the team intends to use at any one time: For RCX users: For NXT users: RCX controller (1) NXT controller (1) motors (3) motors (3) touch sensors (2) touch sensors (2) light sensors (2) light sensors (2) lamp (1) lamp (1) rotation sensors (3) rotation sensors (3 minus the number of NXT motors present) 3rd touch OR light sensor (1) ultrasonic sensor (1) LEGO wires and converter cables are allowed as needed. Spare/alternate electrical parts are allowed in the pit area. Objects functioning as remote controls are not allowed anywhere. There are no restrictions on the quantity or source of non-electric LEGO pieces. Stickers, paint, tape, glue, oil, etc. are not allowed, except marker may be used for owner identification in hidden areas only. To participate in a match, a team must follow this rule.

9. SOFTWARE The robot must be programmed using LEGO MindStorms or RoboLab software (any version).

10. DOWNLOADING One team's download can erase another team's programs and ruin their performance. Therefore, downloading is only allowed in the pit area, download settings must be kept on short range, the process must be shielded from surrounding teams, Bluetooth must be switched off, and the robot should be kept OFF when not in use.

11. BASE Base is an imaginary hollow shape formed by vertical walls that rise from the perimeter of the Base's footprint (including the inside surfaces of the border walls), and by an invisible ceiling 16 in (40 cm) high. NOTE: Base is a VOLUME—not an area.



12. OPERATIONAL DEFINITIONS Though the Challenge is fun, it is robotics after all, and like all technical work it depends on specifics and exact descriptions of physical conditions. So to limit language-induced confusion, the following operational definitions are provided for the location of objects (including the robot) with respect to the missions, rules, and Q&A:

To/At/Reach: When an object must get TO, be AT, or REACH a target, it is sufficient for any portion of the object to barely cross over the outer edge of the target.

On/Onto: When an object must be ON or get ONTO a target, the target should be able to support all the weight of the object when any/all other supports are removed, as proven or estimated by the referee (ref).

In/Into: When an object must be IN or get INTO a (container-type) target, the object must be trapped from being dislodged in at least 5 directions.

Touching: When and ONLY when an object must be TOUCHING a target, the object itself must be making direct contact with the target.

Completely: When an object must meet a condition COMPLETELY, every bit of the object must meet the condition.

13. STRATEGIC OBJECTS Strategic objects are allowed and defined as any team-designed/supplied objects other than the robot and its attachments, handled by the team during preparation only, or used by the robot with three constraints: 1) they must be used/released by the robot, 2) they must be completely out of Base when used/released, and 3) the robot must be completely out of Base when it uses/releases them. This rule includes strategic objects containing wind-up or pull-back "motors."

14. STRAY OBJECTS Any object caused by a robot to be in the way of either team's robot performance may be moved by the referee upon team request if that can be done without a direct effect on scoring. Objects in scoring position may be shifted to equivalent scoring positions if possible, and worthless objects may be removed from the table.

15. DELIVERABLES A deliverable object originates in Base, and could be worth points outside of Base. If the robot is touched while delivering a deliverable, that object is given to the team back in Base for another try. Each deliverable object must itself meet the mission requirements for points, whether or not it is packaged, or joined with other deliverables, and no matter where the robot is.

16. RETRIEVABLES A retrievable object originates outside of Base, and is worth points at Base. If the robot is touched while retrieving a retrievable and before that object has reached Base, that object is simply released in whatever place and position it was in at the time of the touch, and may be considered stray. Each retrievable object must itself reach Base for points, no matter where the robot is, with leniency in close situations. As soon as a retrievable in contact with the robot reaches Base, both the robot and the object may be touched by the team without causing a Bonus Loss.

17. TRANSFERABLES A transferable object originates outside of Base, and could be worth points outside of Base. If the robot is touched while transferring a transferable, that object is simply released in whatever place and position it was in at the time of the touch, and may be considered stray. A transferable object must itself meet the mission requirements for points, whether or not it is packaged, or joined with other transferables, and no matter where the robot is.

18. PREPARATION Before the match and between trips into the field, the robot may be repaired, reconfigured with attachments, loaded/unloaded, and aimed. Its mechanisms may be set/reset, its buttons may be pressed, and its sensors may be signaled. This handling of the robot must take place at Base. Objects apart from the robot may be handled at Base or off the table at any time.

19. HOUSEKEEPING : Any objects at Base which could get in the way of the robot's preparation or motion may be kept "near" Base as long as they do not cause any changes in the field.

20. STARTING POSITION : For all starts, all portions of the robot (not just where it contacts the mat) and its currently used attachments, strategic objects, and deliverables must start from completely in Base, with leniency for slight overextensions.

21. STARTING TECHNIQUE : For all starts, all portions of the robot (not just where it contacts the mat) and its currently used attachments, strategic objects, and deliverables must start from completely in Base, with leniency for slight overextensions.

22. ROBOT MUST LEAVE BASE Directly after every start, the robot must leave Base completely before it is allowed to make contact with any objects outside of Base and before it loses contact with any deliverable or strategic object. The robot is not allowed to cause objects to cross out of Base unless they are being taken along in contact with it through pushing, carrying, or pulling.

23. RESTARTS Any time a performing robot is touched, no matter where the robot is, it is considered STOPPED and must immediately be returned to Base if it's not already there. The team may then make preparations, and follow the STARTING TECHNIQUE again when ready. NOTE: The robot does not have to return to Base unless the team touches it, or unless a mission specifically requires it.

24. BONUS OBJECTS/LOSS Bonus objects are worth points anywhere on the table. Each time the robot is touched while completely out of Base, the ref removes one bonus object from the table if there are any available at that time. If the robot is touched while crossing into or out of Base, or while in contact with a retrievable which is crossing into base, there is no bonus loss.

25. REVERSALS There are three situations that could cause the ref to reverse (undo) changes in the field: 1) when a change happens through unallowable action, 2) when field damage occurs, and 3) when a result worth points is achieved through a method other than the one required.

26. MUSCLE ACTION The team is not allowed to cause anything but the robot to leave or extend out of Base except as described in the ROBOT MUST LEAVE BASE rule.

27. INTERFERENCE Your team's robot is not allowed to have any effect on the other team's robot, field, or strategy except by directly meeting the scoring requirements of missions in areas that are shared between the two sides by design of the Challenge.

28. LOSS OF CONTACT When the robot is completely out of Base and loses contact with a deliverable, retrievable, transferable, or strategic object, that object stays where it is and may be considered stray.

29. ROBOT DAMAGE At any time during the match, the team may recover robot parts that come off as result of obviously unintentional damage. The team may do this by hand or request help from the ref.

30. FIELD DAMAGE The team is not allowed to handle mission models outside of Base. The team must use the mission models supplied by the tournament and must not bring duplicates to the competition area. Changes in the field are never restored by hand for the sake of giving the team "more tries." However, if a mission model accidentally breaks, malfunctions, moves, or is activated by anything other than allowable robot action, the ref reverses the change as soon as possible (if possible), and gives the benefit of the doubt if points are in question. Intentional field damage is also reversed, but draws a warning, and could result in denial of points. Field damage too severe to reverse is left as is and could fall under the STRAY OBJECTS rule.

31. SCORE DETERMINATION To minimize controversy about what happened during a Match, THE SCORE IS DETERMINED AT THE END OF THE MATCH, BY THE CONDITION OF THE FIELD AT THAT TIME ONLY. This means that points are not given for accomplishments that the robot accidentally trashes before the match ends.

32. BENEFIT OF THE DOUBT In situations that are too close to call, like when a split-second or the thickness of a line is a factor, the team gets the benefit of the doubt. In general where the team disagrees with the ref and the team can respectfully raise sufficient doubt in the ref's mind, the ref meets with the head ref, and the resultant decision is final. Here, the team should NOT necessarily expect the benefit of the doubt.

33. AFTER THE MATCH At the end of each match, the ref and the team look at the field together and come to agreement about what points were given or missed and why, and to be sure that the team is not walking away with any mission models.

34. VARIABILITY Every effort is made by our suppliers, donors, and volunteers to ensure that all fields are correct and identical, but some variability is to be expected, such as texture/bumps under the mat, flaws in the border walls, and variety in lighting conditions and rigging. Although the robot is allowed to extend over the tops of the border walls after proper starting technique, interference may vary at the ends of the field.

35. PRECEDENCE When there is conflict between a mission and a rule, the mission takes precedence, but the current Q&A page on the web (MAKE SURE TO CHECK BACK THERE OFTEN) takes overall precedence.

36. CHALLENGE QUESTIONS/SUPPORT For official answers to questions about the Robot Game part of the Challenge, including rulings on special strategies or situations, e-mail flitech@usfirst.org (most efficient) or call 1-800-871-8326, x118 (less efficient). For best results, be sure you've read the four documents listed above, under the rule READ THIS FIRST. When e-mailing, be sure to put "Challenge" in the subject line, and please state your role on the team (member, coach, parent, mentor). When calling, please leave your contact information slowly, your role on the team, and YOUR QUESTION on voicemail. NOTE: flitech can not support LEGO product, and does not answer questions about building or programming the robot. NOTE: The FLL International Forum is great for sharing ideas, but it is NOT A RELIABLE SOURCE OF ANSWERS about the Challenge.

37. FULL DISCLOSURE/TRANSPARENCY Since individual victory need not come at the expense of collective excellence, all official answers given to teams through Challenge support are subject to public posting in the Q&A, including answers about ALLOWABLE strategies. Also, the only documents given to the refs for reference to conduct matches and make calls are the same 4 documents you and every other team have access to all season. So if a strategy is questionable for you, chances are it will be questionable for the ref too, and guarding it until the tournament is risky.

38. COACHES' MEETING If a question does come up right before the tournament, your last chance to ask it is at the "Coaches' Meeting" the morning of the tournament. There, the head ref and the coaches meet to identify and settle any differences BEFORE the matches start. For the rest of the day, the ref's calls are final when the team leaves the table. No Q&A entries will be posted after 3 pm ET on Fridays.