



Referee Guide and Quiz

Thank you!

Thank you for volunteering and thank you for being awesome. Tournament day will be one of those days that is life-affirming – a day that will make you realize how amazing and talented our *FIRST*® LEGO® League Challenge teams are. Refereeing is an important job. You will be different things to the teams – the friendly face that greets them at the Robot Game table; the supportive, but fair and knowledgeable referee who will take scoring their robot match very seriously; and the role model they will remember long after the day is over. If you bring your sense of humor and maybe a silly hat, we're sure you'll enjoy the day.

The Goal of the Teams

Teams will try to have their robot score as many points as possible by solving the missions of the SUBMERGEDSM game. Only the highest robot game match score of all a team's separate 2.5-minute matches counts. The Robot Game allows teams to demonstrate how well their robot design and programs worked. The Robot Game will also showcase how the teams embody the *FIRST*® Core Values and express *Gracious Professionalism*® -- the spirit of friendly competition unique to all *FIRST* programs.

Referee Role

There are two main parts to your role as referee. One is to regulate the action and fairness of the Robot Game during the tournament - you'll need to do some preparation to ensure you are equipped to do this well. The second part of your job is to be a role model and ensure the teams have an amazing experience, regardless of how many points they score in the match.

Before the Tournament

Your tournament organizer and/or head referee should help you prepare for your role.

Study the *Robot Game Rulebook*

By knowing the Robot Game, your actions and judgment calls will be consistent with the expectations of the teams and other referees. If you have questions during the event, your head referee is there to support you.

The [Robot Game Rulebook](#) contains:

Field Setup - Each field needs to be prepared before the first match. After that, only “resets” are needed between matches. You will be responsible for resetting and inspecting the field before every match.

Missions - The missions describe the specific match results required for points to be scored, and they put

some constraints on how those points can be scored. The missions are carefully worded to allow a variety of solutions. The SUBMERGEDSM Robot Game Missions video is a helpful tool to demonstrate the points scored for each mission. There is a referee version of this video which provides excellent training. Make sure you watch it.

Rules - It's important to read and know the rules, but the head referee is there to help you if you have any questions. The rules are there to back up your decisions.

Challenge Updates

[Challenge Updates](#) are posted as the season progresses, so be sure to review them for any rule changes prior to your tournament. Your head referee should also tell you about any changes on tournament day.

Referee Quiz

On or before tournament day, the Referee Quiz is a useful way to practice your referee decision-making. If a few answers are not clear to you, don't worry - some situations require a thoughtful “best” answer, or a “benefit-of-the-doubt” call. Remember, the ultimate goal is always to inspire and motivate the teams, as well as score their matches consistently and fairly.

During the Tournament

You will referee one team at a time at a Robot Game competition table, while another team competes on the opposite side with their own referee.

Before the match, reset and inspect the field.

Put the team at ease.

Perform the team equipment inspection.

Check the team is in position. Team members must divide into two groups and position one group at each side of the field (left and right). These members cannot switch sides during the match. If possible, the team should position two technicians at each home area. All other team members must stand back. Teams may never have more than two technicians at a single home area, but team members may swap places with technician(s) on their side at any time.

Check the team is ready for the start of the match.

Get into position. Stand in position along the bottom edge of the field, in the center, where the technicians and field are visible. Remember to leave room for the technicians to interrupt the robot if needed.

The match begins when the emcee signals, “3, 2, 1, LEGO®!”

During the match, watch the interaction between the team, the robot and the field.

Allow or do not allow action.

Example 1: If the team tries to reset a model outside home for “another try,” you would stop them. (See Rule #14)

Example 2: If there are three team members at one home area, you would have one step away. (See Rule #11)

Determine where things go after they are moved.

Example 1: If a robot is interrupted and it is in contact with a mission model or equipment that was obtained after it was launched, this object should be given to the referee for the remainder of the match. (Rule #17)

Example 2: If the robot drops a mission model or equipment outside of home, it stays as is. (Rule #18)

Make judgment calls.

Every tournament presents referees with situations which might seem difficult to rule on, but don't worry. Follow the rules as they are written. If a detail isn't mentioned, it doesn't matter. Don't forget, when calls are close, teams should be given the benefit of the doubt. Remember again, the goal is to be fair and motivating. Be consistent with details and facilitate the children to have a wonderful time on their big day.

Ensure the team stops the robot from completing additional missions after the end-of-match buzzer sounds.

Work together with the team to score the match.

Most of your scoring will be based on what is visible at the end of the match. Use a Robot Game scoresheet to record the match results. Do this before anyone touches or resets the field.

Consult a head referee if you are stuck or need help.

After you complete scoring for each match, evaluate how the team displayed *Gracious Professionalism*® during their time with you at the table.

Assume that all teams start with accomplished *Gracious Professionalism* scoring 3 points. If team members treat each other, another team or the referees disrespectfully, this may indicate they still need to develop their Core Values and could score a 2. In contrast, teams who demonstrate extra special kindness and support for each other or work especially well together, may qualify for an Exceeds, scoring 4 points. It is left to the referee's discretion as to whether to fill in *Gracious Professionalism* before or after the team's signature.

Consider a quick check using the practice matches as examples to ensure the *Gracious Professionalism* scores are consistent across the tables.

Teams have three separate *Gracious Professionalism* scores applied to their Core Values rank – one for each match, so teams can recover from a poor mark. Some teams may need to learn how to appropriately manage the stress of competition day.

Once the scoresheet is complete, send it to the score keeper.

Reset the field for the next match.

Head Referee Responsibilities

As your referee knowledge and skills advance, you may be asked to become a head referee in your region. Here are the high-level responsibilities of that role.

Before the Tournament

Recruit, communicate with, and train your referees. Send them the relevant items from the Referee Toolkit – the *Robot Game Rulebook*, the Referee Guide and Quiz, and the SUBMERGEDSM Robot Game Missions video (including the referee training version).

Be sure to review any game-related Challenge Updates with your referees before the first matches of the day begin.

Perform quality assurance on all tournament Challenge Sets.

Ensure all mission models are built and setup correctly according to the Field Setup in the *Robot Game Rulebook*. Make sure no pieces are missing prior to the event. Check all competition and practice fields again the night or morning before the event.

Work with your tournament director to prepare referee schedules, shirts, clipboards, score sheets and pens or if using the Event Hub a suitable device for scoring digitally.

Game-related questions and local decision-making.

Decisions should be made at the local level. If the referee and team disagree on the interpretation of a mission or rule, the local Head Referee makes the final call. Remember that teams should not be provided individual strategic advice. Any misprints, material contradictions or reoccurring questions/concerns should be shared with your Tournament Director and Program Delivery Partner. If an update is required, it will be issued.

During Tournaments

Work with your tournament director, referees, emcee, scorekeeper and other event staff to keep the robot game matches on schedule.

Report any [Participation Rules](#) concerns that your referees might have, to your tournament director.

Support your referees in difficult decision-making situations.

Make final decisions when robot performance action or scoring is in dispute. Observe the team reaction and consider this when their *Gracious Professionalism*[®] is evaluated. If teams are tied for Robot Performance Awards, look at second or third-highest scores to determine the winners.

Referee Quiz

This “quiz” is **not** to test your knowledge. Use it to practice your decision-making in realistic tournament situations. We suggest that you complete all the questions before moving over to check the answers.

1. Can the robot be launched by the technician putting a finger in front of a color sensor?
2. A team comes to you in match 3 and says the team thinks their match 2 score is inaccurate. What do you do?
3. The technician is all ready to launch, but a wire is clearly extending past the left edge of the mat. What do you do?
4. A team launches their robot. Right after it is launched, they notice it is slightly off-course. To correct this, the team nudges the robot in the direction it was intended to go before it leaves the launch area. Is this allowed? What do you do?
5. The robot accidentally knocks down a reef segment. Before the match has ended, they autonomously lift the reef segment so that it is upright, outside of home, and touching the mat. Does this score?
6. The technicians say the robot failed a mission due to debris under the mat. There is indeed debris there. What do you do?
7. An aiming jig is pushed against the border wall and clearly extends into the launch area, where the robot is pressed against it, and the technician is holding the jig in place. Should you allow this launch?
8. Let's say that a team shows up to the match with 6 motors, but they do not plan to use two of them. Is this allowed?
9. A team member away from the table is holding equipment. What do you do?
10. The match started at least 10 seconds ago, when you noticed a model hasn't been reset. What do you do?
11. You notice the team members standing back are giggling. They think they cannot be heard, but you happen to overhear them making fun of the opposing team and being disrespectful. What do you do?
12. The coral tree is hanging on its support, but it is not by the black loop. Instead, the coral tree is hanging by one of its branches. Does it score?
13. The robot is still in the launch area when it autonomously lifts the coral tree onto its support. Is this allowed?
14. You learn that a certain team used a different robot in match 2 than in match 1. Is this allowed?
15. Is it ever a good idea to mark scores before the match is over?
16. The robot is moving very slowly, pushing the unknown creature out to the cold seep. Just as the robot pushes the unknown creature into the cold seep, the team interrupts the robot by hand to prevent it from going too far and pushing it past the cold seep. Is this allowed?
17. Building on question 16, the team then says that their robot will not do any other missions and so they should not lose a precision token. Is this true?
18. While the robot is operating out on the field, the technician is preparing a separate attachment in home. Is this allowed?
19. There are two color sensors present in each of three separate attachments, making a total of six sensors. Is this allowed?
20. The team has just successfully achieved Mission 10 – Send Over The Submersible and the submersible is clearly closer to the opposing team. To keep it this way, the team places a piece of equipment holding their side up so that the other team cannot send it back. Is this allowed?

Answer Key

Remember, this quiz is a training tool. Refer to the official *Robot Game Rulebook*, which includes the rules, field setup and missions, and also check the Challenge Updates.

1. Yes (Glossary, Launch).
2. Direct the team to the head referee, not the score keeper. The score keeper should not be distracted. The head referee should review the posted score against the answers marked on the scoresheet.
3. Wires are equipment and all equipment must fit completely in the launch area to launch (Rule #15). Have the technicians tuck the wire into the robot so that it is inside the launch area before letting them launch their robot.
4. No, this would not be allowed. Since the robot was interacted with, it would require a relaunch (Rule #17). That said, since the robot was in the launch area when they did this, they would not lose a precision token (Rule #13). However, to continue, the team must stop the robot, realign, and launch again.
5. Yes. It was accomplished autonomously and the mission requirements were visible at the end of the match (Rule #23).
6. This is an example of a field preparation issue. If in your judgment there is a reasonable chance the robot would have otherwise completed the mission, score the mission a success (Rules, Important Section). If possible, after the match, clean the debris out during the next break in the schedule. In some instances, a re-run of the match may be the best option. It is up to the head referee or event organizers to decide whether to offer the team a re-run of the match.
7. Yes. This rule (Rule #15) applies to things "about to move." The jig in this case is not intended to move. Also, as home includes the launch area (Rule #12) it is completely in home.
8. No. The rules state that you are only allowed 4 motors in any particular match. This means that even though the robot will not use these extra 2 motors, they still may not be brought to the match (Rule #3).
9. Remind the team member that the equipment needs to be stored in home. (Rule #9).
10. If you can reach it, quickly but carefully, reset it. If you don't get to it in time, apply the 'benefit of the doubt' rule if there is a reasonable chance the robot would have completed the mission (Rules, Important Section). In some instances, a re-run of the match may be the best option. It is up to the head referee or event organizers to decide whether to offer the team a re-run.
11. We never like to see this, but unfortunately, on rare occasions, it does occur. Remember that the Robot Game will showcase how teams embody the FIRST® Core Values and express Gracious Professionalism® the spirit of friendly competition unique to all FIRST programs. If you notice a team is not displaying Gracious Professionalism, then you should consider this when filling out the Gracious Professionalism section found on each score sheet. Assume that all teams start with accomplished Gracious Professionalism scoring 3 points. If team members treat each other, another team, or the referees disrespectfully, they may still need to develop their Core Values and could score a 2, as in this case. In contrast, teams who demonstrate extra special kindness and support for each other, or work especially well together, may qualify for an "Exceeds" score of 4 points, which we absolutely love to see! Teams have three separate Gracious Professionalism scores applied to their Core Values rank – one for each match, so teams can recover from a poor score. Some teams may need to learn how to appropriately manage the stress of competition day. Head referees: Consider using the practice matches as a calibration opportunity to ensure the Gracious Professionalism scores are consistent across the tables.
12. Yes. The mission does not require that the coral tree be hanging by the black loop.
13. Yes. The robot is allowed to touch things beyond home if done autonomously (Rule #14).
14. No problem. Equipment limits are assessed at each match, independent of other matches (Rule #3).

Answer Key

15. Sometimes. Scoring conditions must be visible at the end of the match; because of this, you should record the scores at the end of the match together with the team, as things may change during the 2:30 match time. That said, on rare occasions, a mission requires an action or a method be observed during the match. We do recommend that you record successful actions or methods as soon as you see them, so memory doesn't fail you. Equipment Inspection is another exception. Equipment Inspection should always be recorded before the match begins.
16. No. They cannot stop the robot by hand to strategically cause a scoring condition (Rule #19 and use Rule #17 to determine what happens to the unknown creature).
17. Yes. The team may stop the robot by hand if they are not attempting any other missions and they will not lose a precision token (Rule #17). As in question 13, they cannot stop the robot by hand to strategically cause a scoring condition (Rule #19). Although the team will not lose a precision token, they will not earn the points for delivering the unknown creature.
18. No problem. The technicians are encouraged to prepare for the next robot launch while the robot is out in the field. Note that since the equipment and/or mission model is separate from the robot and in home, touching it does not qualify as an interruption (Rule #13).
19. No problem. There are no quantity limits on sensors (Rule #3).
20. No, this is not allowed. This mission includes an added requirement in the blue italicized text which states that "teams may not block the opposing team."