Judge Guide

New This Year

Major changes to the Judge Guide:

- Modified Excellence Award candidate identification process
- Updated the Design Award process
- Added Bonus in rubric for bound notebooks, further defined notebook content
- Remove pre-submission requirement for Design at the VEX Robotics World Championship
- Remove pre-submission requirement for STEM Research at VEX Worlds
- Changed eligibility requirements for STEM Research and Design Awards at VEX Worlds
- Added Inspire Award (typically only used for VEX Worlds)

Overview

This guide is for Event Partners, Judge Advisors, and Judges. **Official events may not change award criteria from those listed below. Events not following the award criteria in this document will not qualify to higher level events.**

Thank you for sharing your time and talents as a Judge at a VEX IQ Challenge event. In the VEX IQ Challenge program, teams of elementary and middle school students showcase their knowledge and skills in designing, building, and programming a robot, documenting their learning in an Engineering Notebook, and producing a STEM Research Project presentation, with minimal adult assistance.

It is important for Judges to **recognize student accomplishments** in the VEX IQ Challenge. Students must make the decisions, complete the work, and demonstrate their learning in the VEX IQ Challenge, in order for their team to qualify for official award recognition at events.

The students who participate in VEX IQ Challenge events represent diverse levels of maturity, skills, and experience. Your warmth, patience, and enthusiastic support of their learning and sharing will make a positive impact on these students on event day and beyond.

In addition to this Guide, judging resources and training information are available to support your efforts at: roboticseducation.org/event-partners/event-partner-resources-documents/.

Adults are preferred to fill the role of Judges. In some cases, high school students may be paired with adults as Judges. Younger students should not be used as Judges. Judges at state or regional championship events should be adults; college students are a good source for Judge support.

Key Concepts

Student-Centered Teams: The Robotics Education & Competition Foundation seeks to increase student interest and involvement in science, technology, engineering, and mathematics (STEM) by engaging students in hands-on sustainable and affordable curriculum-based robotics engineering programs across the U.S. and internationally. Judges play an important role in our efforts to ensure that our program remains student-centered. Teachers/Mentors/Parents providing guidance and helping students design, fix or program robots is accepted. Adults doing the majority of the work on a robot, or working on a robot alone without students, is not acceptable, as there is obviously limited student learning and ownership taking place in such a situation.

Judges have the opportunity through observation and interviews to identify teams, schools and clubs that strive to keep their program student centered and that understand the purpose of the program is to enhance the learning process, not to win at all costs. Judges, with input from event staff, should identify teams that are not student-centered.

Examples of this may include:

- Robots built entirely by adults or, in the case of younger student, mentors (i.e., high school students building robots for elementary or middle school teams).
- Identical robots on two or more teams (so called clone-bots).
- Adults who criticize students from alliance teams for poor performance, failure to perform optimally or who blame other teams for low scores rather than offering positive suggestions.

Judges should not reward teams that Judges have clearly identified as not student-centered with any Judged awards.

Team Conduct: The REC Foundation considers the positive, respectful, and ethical conduct of all students and adults associated with a team to be an important and essential component of the VEX IQ Challenge program. For this reason, Judges will consider all team conduct by students and/or adults when determining award recognition at VEX IQ Challenge events.

Judges should use the "VRC and VEX IQ note to Judges from the competition fields" form to receive feedback on team conduct at events.

Pit Area: The area that teams use as their home base during the day is called the Pit Area. Teams are usually provided with a table for their robot, laptop, batteries, and other VEX parts. The Pit is also the work area for the teams. This is a great place to meet with teams in an informal setting and see them in a more relaxed environment. Judges at VEX Worlds visit teams in their pit areas to conduct student interviews for most Judged awards. Judges at local events should help prepare teams for regional championship events and VEX Worlds by interviewing them in the pit area.

It may be difficult to catch teams in their pit area due to tight competition schedules. Additionally, larger teams may only have some of their team in the pit area, with the rest of the members congregating in the stands. If at first you are unable to locate a team in their pit area, feel free to leave them a note to inform them that the Judges are hoping to speak with them and/or check their pit area later. A standard Judges note to missed teams is available at: roboticseducation.org/event-partners/event-partner-resources-documents/

Robot Game: Teams play the robot game in collaborative Teamwork Challenge matches and have the option to also demonstrate their own team's skills in Programming and Driving Skills challenges. All three robot challenges are played on the same 4' x 8' game field. The game field is a great place to see teams in action and to evaluate how well their robots perform. You can also get a good idea of the sportsmanship, energy, and enthusiasm of teams while observing them on the game field. For robot game details, please visit: roboticseducation.org/competition-teams/vex-iq-challenge/.

Event Partner (EP): Adult volunteer who organizes and coordinates the event.

Judge Advisor: Adult volunteer who coordinates the event judging process.

Judge Responsibilities

Judges are in a position of trust at VEX IQ Challenge events. To ensure that the judging process is an effective, equitable, and positive experience for all participants, it is important that Judges maintain:

- **Confidentiality**: The judging process often includes frank discussions about teams. These discussions must remain confidential and your judging team should take precautions to ensure that these discussions are not shared with or overheard by teams or other event participants.
- **Impartiality**: Advise the Judge Advisor or Event Partner of any possible conflict(s) of interest and remove yourself from all discussions and decisions in which you may have a personal interest.
- **Engagement**: Demonstrate your full interest and involvement in discussions with students and your judging team by refraining from distractions such as phone usage or side conversations. Your active participation in the judging process is invaluable and much appreciated.
- Plan to not be alone with students. Work with at least one other Judge if you meet with teams in separate spaces.

To prepare for the event, Judges should:

- Review this Judges Guide, including the attached STEM Research Project and Design rubrics.
- Review the VEX IQ Challenge at roboticseducation.org/competition-teams/vex-iq-challenge/:
    - Game Video, Game Description, and/or the Game Manual.
    - STEM Research Project document to understand the project challenge.
- Review the event location, schedule, team list, and awards to be offered on the event posting at robotevents.com.
- Plan to wear comfortable closed-toed shoes and business casual clothing that is team-neutral.
- Inform the Judge Advisor of any potential conflict of interest. Judges who are associated with a team at the event are not disqualified from judging. However, they should not wear team shirts or other items associated with their teams, they should avoid interviewing their own teams, and they should recuse themselves from deliberations involving their teams. Judge advisors should use the Judge sign in sheet to identify potential conflict of interest.

During the event, Judges should:

- Review the Engineering Notebooks that were submitted by the teams. Use the attached Design Award rubric to evaluate the Engineering Notebooks and your discussions with teams.
- Use the attached STEM Research Project rubric to evaluate presentations and discussions.
    - Use a clock or a timer for the STEM Research Project session (4-minute presentation and up to 4 minutes for discussion) and to stay on schedule throughout the event day.
- For large events that offer one or more Technical Awards or Other Judged Awards, use the VEX IQ Challenge Awards Scoring Sheet to evaluate your discussions with teams.
- Design and Technical Judges meet with teams in their pit areas and observe how they perform on the field. If, after several visits to the team's pit area, you are unable to locate the team, leave a "Sorry we missed you" note on their pit table. Your Judge Advisor should have these forms.
- Ask questions that encourage the students to explain their answers using a conversation that shows that you are interested in what they have to say. "How" and "why" questions work well as leading questions. Use the sample questions listed at the end of this document.
- Take notes to support your team evaluations and Judge deliberations. Ensure that your rubric forms and are returned to the Judge Advisor after deliberations.
- Rank each team you have met with for awards consideration after meeting each team. Simply keep your completed rubrics or notes in order of the teams' rankings. Typically, rankings for the top 25% of the teams that you visited are needed during the deliberation process, but rankings for more teams are sometimes needed for Design and STEM Research Project.
- Attend and participate in the Opening and Awards Ceremonies, if possible.
- Share all questions or concerns with your Judge Advisor.

During judging deliberations, Judges should:

- Post or share your top-ranked teams for each award, as instructed by the Judge Advisor. Typically, each Judge team will initially post the top five teams for each award or one quarter of the Judged teams, whichever is greater. A white board, flip charts or Post-It notes may be used to post the top-ranked team numbers on a wall so that they are visible to all Judges.
- Work collaboratively with other Judges to reach consensus on the award recipients.
- Remember that the deliberation process often includes frank discussions about teams. Therefore, the deliberation process is a confidential process. Judges' discussions should not leave the Judges room. Only Judges are allowed in the Judges' room.
- Remove yourself from discussions involving teams that present a conflict of interest.
- Share all questions or concerns with your Judge Advisor.
- Return **all rubrics, judging notes, and materials** to the Judge Advisor at the end of deliberations. The Judge advisor should destroy these materials. **They are not to be returned to teams.**

Judge Training

Your Judge Advisor or Event Partner (EP) will arrange for some form of Judge training. This training should include a review of this guide, the current game, the STEM Research Project, and the judging rubrics. This training may take place prior to the event and/or on the morning of the event. Check with your Judge Advisor or Event Partner for details.

Online REC Foundation Judge training materials are available for all Judges, Judge Advisors, and Event Partners. Please visit: roboticseducation.org/volunteers/volunteer-resources/ to find these materials.

If you have specific questions regarding the judging process please send an email to: tarek@roboticseducation.org.

Judging Schedule

The entire judging process will take place during the event, with each team of Judges planning to meet with one team every 10-15 minutes. Judges should meet with a wide enough selection of teams to get a good basis for comparison. The Judge Advisor will provide a list of teams that each team of Judges is responsible for visiting, and the match schedules when these become available.

The following is a sample schedule for an event with 24-36 teams. The Event Partner and Judge Advisor consider the number of participating teams when recruiting Judges and setting the schedule.

Sample Schedule	
7:30 – 8:00 a.m.	Judge Advisor reviews training materials with Judges, makes assignments.
8:00 – 9:15 a.m.	Judges review team notebooks, Judge STEM presentations, meet with teams.
9:30 – 11:30 a.m.	Judges continue to meet with assigned teams.
11:30 – 12:15 p.m.	Working lunch. Post top candidates for each award. Identify teams that require visits after lunch.
12:15 – 1:15 p.m.	Observe teams in the pit area and on the field. Complete follow up meetings and observations to complete the rank ordering of teams for each award. If possible, other Judges should visit with the top contenders for each award.
1:15 – 2:00 p.m.	Conduct final deliberations and determine award recipients.
2:00 – 2:30 p.m.	Input all award recipients into the Tournament software and print scripts for delivery at the awards ceremony.
2:30 – 3:00 p.m.	Attend Finals matches and the awards ceremony. Celebrate the day!

Judge Advisor Responsibilities

The Judge Advisor is an adult, who works with the Event Partner (EP) to plan and coordinate an efficient, effective, and equitable event judging process. Judge Advisor responsibilities may include the recruitment and training of the Judges for the event.

The Judge Advisor manages time and resources, potential conflicts of interest, and a deliberative decision-making process that determines the event award recipients. The Judge Advisor is responsible for ensuring that award winners are entered into Tournament Manager and that award scripts are printed from Tournament Manager for presentation at the awards ceremony. This will also assure that the award winners are ready for posting to the event listing on robotevents.com. The Judge Advisor is responsible for ensuring that the trophies or other awards are ready for the awards ceremony.

The Judge Advisor and/or the Event Partner should not share the completed STEM Research Project and Design Award rubrics with teams after the event. The rubrics are intended to be used by Judges to narrow down the field of contenders for each award. Multiple teams often score "perfect" 3's on a rubric. While the rubric is quantitative in nature, Judges are expected to apply their qualitative Judgement when making a final decision on all awards. Teams with a perfect rubric score often do not understand why they were not selected for an award. Judges should also be aware that they must be very careful in discussing these awards with teams after an event. A Judge's best intentions are often misinterpreted by teams resulting in students with hurt feelings. The Judge Advisor and/or the Event Partner must properly dispose of these and all other judging materials at the conclusion of the event.

Judging Materials

The following are suggested materials for the Judge Advisor and other Judges to use on event day. Judging documents are available at: roboticseducation.org/event-partners/event-partner-resources-documents/.

- Judge Guide (this document)
- Awards Appendix
- The list of awards to be offered at the event
- Student Interview and Discussion Tips – one copy per Judge (attached)
- STEM Research Project document and one Project rubric per team (attached)
- Design Award rubric – one rubric per team (attached)
- Awards Scoring Sheet, if Technical or Other Judged Team awards are offered – one per team
- List of Judges (provided by the Event Partner or Judge Advisor)
- List of teams (provided by the Event Partner)
- Map of the event/pit area and event program, if available (provided by the Event Partner)
- Match schedule (provided by the Event Partner)
- Standard Award Descriptions for the Judges Room for posting to facilitate Judge deliberations
- Award Ceremony Scripts (these can be printed from Tournament Manger)
- Post it notes, marking pens and highlighters
- Clip boards and pens
- Transparent tape and/or painter's masking tape
- Tables for Judge Advisor, Project presentations, judging materials, and Judge deliberations

The following trophy packs may be purchased by the Event Partner for use at events:

VEX IQ Challenge Trophy Packs		
Qualifying Event Trophy Pack	**Additional Trophy Pack**	**Championship Event Trophy Pack**
Trophies Included: (7) small trophies Award plates Included: (2) Excellence (2) Teamwork Champion (1) Design Award (1) STEM Research Project (1) Robot Skills Champion (1) Judges (1) Volunteer of the Year (9) Date Plate	Trophies Included: (4) small trophies Award plates Included: (2) Teamwork Challenge 2nd Place (1) Amaze (1) Think (4) Date Plate	Trophies Included: (7) large trophies Award plates Included: (2) Excellence (2) Teamwork Champion (1) Design Award (1) STEM Research Project (1) Robot Skills Champion (1) Judges' Award (1) Volunteer of the Year (9) Date Plate
Event Partners receive this trophy pack free as part of the **VEX IQ Challenge Event Support Bundle.**		receive this trophy pack free. Event Partners hosting a state/provincial/regional/national championship

Additional trophies may be purchased by the event partner if they choose to give additional awards.

Awards Overview

Awards are to be spread as equitably as possible among the teams, with no team winning more than one Judged award. A team should only win additional awards if they are for robot performance (Teamwork and/or Robot Skills awards) or if there are no other qualified teams. Individual awards given to coaches and mentors do not affect a team's eligibility for a Judged award.

A complete listing of all awards and their descriptions is included in the Awards Appendix on: roboticseducation.org/event-partners/event-partner-resources-documents/.

Not all awards are available at all events. Check with your Event Partner or Judge Advisor to confirm the awards to be offered at your event.

Please Note: Events may not change the awards criteria outlined in this Guide and in the Awards Appendix. Events not following the award criteria in this document will not qualify to higher level events.

Standard Awards. Following are the awards commonly offered at local events:

Standard Awards	
Award Name	**Award Description**
Excellence Award	Top All Around Team (Robot Performance and Judged)
Teamwork Champion Award (2 teams)	1st Place Teamwork Alliance (Robot Performance)
Design Award	Most effective and efficient robot design process (Judged)
STEM Research Project Award	Best overall STEM research project presentation (Judged)
Robot Skills Champion Award	Top Robot Skills Team (Robot Performance)
Judges Award	Team deserving special recognition (Judged)

The Tournament Manager software supports the creation of both Individual and Team Service Award certificates. These certificates provide great recognition for outstanding teams and volunteers.

Excellence Award

The Excellence Award is the highest award presented in the VEX IQ Challenge Program. The recipient of this award is a team that demonstrates overall excellence in all components of the VEX IQ Challenge.

In determining the Excellence Award Judges will consider:

- Teamwork Challenge qualification rounds
- Robot Skills Challenge performance
- STEM Research Project presentation and discussion with Judges
- Engineering Notebook and robot design discussion with Judges
- All other Judged awards offered at the event

Events may offer two Excellence Awards in a blended event, which includes both Elementary and Middle School teams. Both teams must meet the criteria established for the Excellence Award.

Excellence Award at Small Events

Many small events may not have skills challenges or may only offer a couple of Judged awards to teams. In this case, the Judges should consider each team's Engineering Notebook, field performance, and team dynamics in determining the Excellence Award winner. The top 5 teams identified for the Design and STEM Research Project Awards should be considered candidates for the Excellence Award at small events.

Excellence Award at Large Events

The Judge Advisor is to use the following method at larger events:

Teams are given points towards the Excellence Award in the following categories:

- Design Award (up to 1 point possible)
- STEM Research Project (up to 1 point possible)
- Tournament Qualification Matches Ranking (up to 1 point possible)
- Robot Skills Challenge Ranking (up to 1 point possible)
- Judged performance in all other award categories (up to 4 points possible)

Using this wide range of criteria, the Excellence Award will be presented to the team who excels in all areas of VEX IQ Program. With many tournaments offering a state or regional championship qualifying spot to the Excellence Award winner during the current season, we recommend the following calculations be used to **narrow down the field** of Excellence Award contenders at larger local events:

Team #	Design Award Ranking (1) ONE point possible	STEM Project Presentation (2) ONE point possible	QR Ranking (3) ONE point possible	RS Ranking (4) ONE point possible	Judge Ranking (5) UP TO FOUR points possible	Total Points

How to Use the Calculator

Team numbers of the top 5 candidates for the Design Award (or top 25% of teams with Engineering Notebooks, if greater than 5) are entered in the first column. Teams are then assigned points using the categories below based upon their performance. The total points for each team are then added to determine the top 2-3 teams.

1. A **Design Award Ranking** point is earned for finishing in top 5 Design Award finalists. (one point available)
2. A **STEM Project Ranking** point is earned for finishing in top 5 STEM Research Project Award finalists. (one point available)
3. A **QR Ranking** point is earned for finishing in top 8 of qualifying matches (one point available)
4. A **RS Ranking** point is earned for finishing in the top 10 of the Robot Skills challenge. Each team's top score from the Programming Skills and Driving Skills challenges will be added together to determine Robot Skills Score. Events with less than 15 teams participating in the robot skills challenge should only award a RS Ranking point to teams finishing in the top 5 of the robot skills contest (one point available)
5. **Judge Ranking** points awarded for every Judged award for which team is finalist (up to 4 points available, one point given for each Judged award for which a team is considered finalist)

An Excel-based Excellence calculator is located at:
roboticseducation.org/event-partners/event-partner-resources-documents/.

Top contenders for Excellence will be found using the Excellence calculator. Once this calculation is completed, **Judges will use their best judgment to choose the team they feel best exemplifies the best overall robotics *program***. The Judges' final decision on the Excellence Award should include a team's behavior, sportsmanship, and professionalism at the event. A team is composed of students, mentors, and adults at the competition. Judges may wish to use the "Field Note to Judges" form to help collect information on team sportsmanship. Teams must have an Engineering Notebook and STEM Project Presentation to be eligible for the Excellence Award.

At VEX Worlds, Excellence Awards will be offered at the Middle School and Elementary School levels. Only teams that have won an Excellence Award at an official event during the current competition year and have submitted their Engineering Notebook will be considered for the Excellence Award at VEX IQ worlds. Please note that if an individual team receives the Excellence Award at VEX Worlds, then the award is given to that team's school or organization, not just the single team. Schools or organizations that won the Excellence Award in the previous three years will not be eligible for the Excellence Award at VEX Worlds.

Design Award

The Design Award recipient demonstrates the ability to implement an effective and efficient robot design process. Their Engineering Notebook and discussion with the Judges will demonstrate the team's ability to produce a quality robot with minimal adult assistance. Only teams that submit Engineering Notebooks are eligible for the Design Award.

Key criteria:

- Engineering Notebook is clear, complete, and organized document of the robot design process.
- Team demonstrates effective management of skills, time, and material resources.
- Students understand and explain how they developed an effective game strategy and robot design.
- Students demonstrate teamwork and effective communication skills.

Design Award Rubric

Judges will use the Design Award Rubric to evaluate the teams' performance on the award criteria. Judging should be broken down to a two-step process. The first step identifies top contenders for the award and the second step determines the award winner. Using this process, it is not necessary for Judges to interview every team that submits an Engineering notebook.

The first step is to collect all team notebooks during team check in. Judges should then use the first page of the Design Award Rubric to evaluate the quality of a team's Engineering Notebook. Notebooks should be separated into several categories based on this evaluation. The categories may include beginning, intermediate and outstanding. This process allows Judges to identify teams that should be considered for follow up pit interviews using the second page of the rubric. The intent of this process is to allow Judges to identify top contenders for the Design Award efficiently. It allows Judges to identify the top 3-5 contenders for the design award based on their notebook.

The second step of the Design Award judging process is to use the second page of the rubric to evaluate the students' understanding and application of an effective robot design process, as demonstrated in a team pit interview with Judges. The Design Award Rubric is found below. Rubrics are confidential judging documents and should not be returned to the team, coach, or Event Partner. Rubrics should be destroyed immediately after the Judge Advisor has recorded the winning team.

Design Award – Engineering Notebook

One of the primary missions of the VEX IQ Challenge is to help students acquire real world life skills that will benefit them in their academic and professional future. The Engineering Notebook is a way for teams to document how the VEX IQ Challenge experience has helped them to better understand the engineering design process while also practicing a variety of critical life skills including project management, time management, brainstorming, and teamwork. Bound notebooks are preferred by Judges. Teams receive a bound Engineering Notebook when they register. Instructions and examples are included in the front of the notebook.

The Engineering Notebook is created through a concerted effort by a team to document their design decisions. Large events may send a Design Award winner to a state or regional championship, so teams should start their notebooks early and update them often.

Engineering is an iterative process whereby students recognize and define a problem, brainstorm and work through various stages of the design process, test their designs, continue to improve their designs, and continue the process until a solution has been identified. During this process, students will come across obstacles, encounter instances of success and failure, and learn many lessons. It is this iterative process that students should document in their Engineering Notebook.

The Engineering Notebook is an opportunity to document everything a team does throughout the design process. Students should include a number of items in their Engineering Notebook including: team meeting notes as they relate to the design process, design concepts and sketches, pictures, notes from competitions regarding observations that should be considered in the next iteration of their design, team members' observations and thoughts on their design, team organization practices as they relate to their design process, and any other documentation that a team finds useful as related to their robots design. The team should also document their project management practices including their use of personnel, financial, and time resources.

A bound quad-ruled notebook is the preferred format. Teams are provided a notebook by the REC Foundation or may purchase their own bound notebook from any one of many other sources. The notebook should never be edited. The team number should be on the cover. The notebook should be written in ink with errors crossed out using a single line. Pages should be numbered and entries should be dated in chronological order with each page signed or initialed by the students. Additional materials such as computer code or CAD drawings should be glued or taped into the notebook. Pages should never be removed from the Notebook even if they contain errors.

Judges will not accept Electronic notebooks on lap tops, thumb drives, or cloud based servers.

Design Award at VEX Worlds

Teams must have been awarded the Design, STEM Research or Excellence Award at a state/regional/provincial/national event to be eligible to be considered for Design at VEX Worlds. Eligible teams will be asked to submit their Engineering Notebooks at check in. Teams with high quality Engineering Notebooks will be selected for Design Award interviews in the Team Pit Areas. Teams are not given scheduled sit down interviews for the Design Award at VEX Worlds. Note: Restrictions on Design notebook submission at VEX Worlds may be changed to include all teams that have been awarded the Design, STEM Research or Excellence Award during the current season if teams provide a sufficient number of Judges to allow additional entries.

STEM Research Project Award

The **STEM (Science, Technology, Engineering, and Mathematics) Research Project Award** is presented to the team that shares the most effective STEM Research Project presentation. This presentation, as well as the follow-up discussion with the Judges, effectively demonstrates the students' significant depth of understanding of their topic and research findings. The presentation will also highlight the students' work in sharing what they learned in an effective format.

Teams research a topic of their choice that is related to the STEM theme for the season and share their findings with Judges in a four (4) minute presentation. Teams may deliver their project findings in any format that effectively demonstrates their understanding of the research topic. Following the presentation, Judges have up to four (4) minutes of discussion time with the teams to learn more about their project research and discoveries. Teams typically sign up for presentation times in 15-minute time slots, so that Judges have seven (7) minutes to use the attached rubric to evaluate the team's presentation and get ready for their next team presentation. Delivery of a project presentation is required for teams to be eligible for the STEM Research Project Award and the Excellence Award. For more details on the STEM Research Project, please visit: roboticseducation.org/competition-teams/vex-iq-challenge/.

Key criteria:

- Identifies a challenge topic of interest that relates to the STEM theme for the season
- Completes research and collects evidence using reliable sources
- Demonstrates a well-organized and documented process to study and explain research findings
- Describes how the research findings were applied to develop and test the solution
- Shares the solution in an effective and creative presentation
- Students demonstrate an understanding of the entire research process
- Students demonstrate teamwork and effective communication skills

Judges should use the attached STEM Research Project rubric as a tool to evaluate teams' project presentations. Rubrics are confidential judging documents and should not be returned to the team, coach, or Event Partner. Rubrics should be destroyed immediately after the Judge Advisor has recorded the winning team.

Only students are allowed in the judging room with the Judges unless:

- An adult is requested as a chaperone when only one Judge is present.
- An adult is needed to support student(s) with special needs.

STEM Research Project Award at VEX Worlds

To be eligible to present a STEM Research Project at VEX Worlds, teams must have won the Excellence Award or STEM Research Project Award at an official event this season. Teams must have been awarded the Design, STEM, or Excellence Award at a state/regional/provincial/national qualifying event to be eligible to present a STEM Research project at VEX Worlds. Team interview schedules will be forwarded to eligible teams the week of Worlds. Teams should be sure that they have listed a contact email that they may access at the event. Note: Restrictions on STEM Project presentations at VEX Worlds may be changed to include all teams that have been awarded the Design, STEM Research or Excellence Award during the current season if teams provide a sufficient number of Judges to allow additional entries.

Judges Award

The **Judges Award** is presented to a team that the Judges determine is deserving of special recognition. Judges consider a number of possible criteria for this award, such as team displays of special attributes, exemplary effort and perseverance at the event, or team accomplishments or endeavors throughout the season that may not fit under existing awards, but are nonetheless deserving of special recognition.

Technical Awards

Detailed descriptions and criteria for other awards such as performance awards are available in the Awards Appendix at: roboticseducation.org/competition-teams/vex-iq-challenge/.

For large events that offer one or more Technical Awards (the Amaze, Build, Create, and Think Awards), use the VEX IQ Challenge Awards Scoring Sheet to evaluate your discussions with teams. After each team discussion, fill in the team number on a blank row, record scores for each of the award criteria columns, and use the ranking columns to keep track of the rank of the top 25% of teams for each award by adding tick marks to the new team and lower-ranked teams as directed.

The **Amaze Award** is presented to a team that has built an amazing high-scoring robot demonstrating overall quality. A solid mechanical design along with demonstrated robot programming, robustness, strong performance and consistency are key attributes assessed for this award.

Key Criteria:

- Robot design is consistently high scoring
- Robot demonstrates a solid mechanical design, is robustly constructed to fulfill its designed task
- Robot programming is consistently effective and successful
- Students understand and explain how they worked together to develop their robot

The **Build Award** is presented to a team that has built a well-crafted and constructed robot.

Key criteria:

- Robot construction is of high quality; robust, clean, and effective use of materials
- Robot efficiently uses mechanical and electronic components
- Robot is designed with a clear dedication to safety and attention to detail
- Robot demonstrates reliability on the field and holds up under competition conditions
- Students understand and explain how they worked together to develop their robot

The **Create Award** is presented to the team whose robot design incorporates a creative engineering solution to the design challenges of the season's game.

Key criteria:

- Robot has a well-crafted, unique design solution, which demonstrates creative thinking
- Team has demonstrated a highly creative design process and methodology
- Team has committed to ambitious and creative approaches to solving the game challenge
- Students understand and explain how they worked together to develop their robot

The **Think Award** is presented to a team that has successfully utilized high quality programming during competition.

Key Criteria:

- All programming is cleanly written, well documented, and easy to understand
- Team has explained a clear programming strategy to solve the game challenge
- Team demonstrates their programming management process, including version history
- Students understand and explain how they worked together to develop their robot programming

Other Judged Awards

Detailed descriptions and criteria for other Judged awards are available in the Awards Appendix at: roboticseducation.org/competition-teams/vex-iq-challenge/.

Use the VEX IQ Challenge Awards Scoring Sheet to evaluate your discussions with teams.

The **Energy Award** is presented to a team that displays a high level of enthusiasm and passion at the event. VEX Worlds uses ballots for this award.

Key Criteria:

- Team maintains a high level of excitement and energy throughout the event
- Team's passion for robotics enriches the event experience for others
- Students demonstrate teamwork and effective communication skills

The **Innovate Award** the ability to implement an effective and efficient robot design process. Their Engineering Notebook and discussion with the Judges will demonstrate the team's ability to produce a quality robot with minimal adult assistance. Only teams that submit Engineering Notebooks are eligible for the Innovate Award. This award will be given by Judges to a top contender for the Design Award. Note to Judges: the VEX IQ innovate is intended to be given to a Design Award finalist to recognize their work.

Key criteria:

- Engineering Notebook is a clear, complete, and organized document of the robot design process.
- Team demonstrates effective management of skills, time, and material resources.
- Students understand and explain how they developed an effective game strategy and robot design.
- Students demonstrate teamwork and effective communication skills.

The **Inspire Award** is presented to a team that has inspired Judges with their STEM Research Project presentation. This team will effectively communicate their passion for STEM and maintain a positive attitude throughout the presentation. The teams stem presentation will have impressed the Judges. This award will most likely only be offered at VEX Worlds.

The **Sportsmanship Award** is presented to a team that earns the respect and admiration of the volunteers and other teams at the event. VEX Worlds uses ballots for this award.

Key Criteria:

- Team is courteous, helpful, and respectful to everyone at the event, on and off the field
- Team interacts with others on the game field in the spirit of friendly collaboration
- Team demonstrates respect and willingness to help event staff, other teams, and spectators
- Team demonstrates excitement and enthusiasm throughout the event

Individual Awards

The **Mentor of the Year** award is given to a mentor or engineer that is not a teacher and that has helped students achieve goals that were seemingly out of reach. This individual is a role model, a leader and an extraordinary mentor who helps show students new ways to expand their knowledge and solve problems in the worlds of STEM. The recipient of this award will be nominated by the students on their team with a written submission detailing how the mentor inspires, motivates and educates students in a positive, enthusiastic and challenging atmosphere. To be considered for this award at VEX Worlds, teams must pre-submit a 500-word essay through the VEX World Championship Awards page at robotevents.com/vexawards/, which will be available from **February 1, 2018 until March 20, 2018**.

The **Teacher of the Year Award** is presented to a teacher who shows true leadership and dedication to his or her group of students. The winner of this award continually exceeds expectations to ensure a safe, enjoyable and educational experience for all students. The recipient of this award will be nominated by the students on their team with a written submission detailing how the teacher inspires, motivates and educates students in a positive, enthusiastic and challenging atmosphere. To be considered for this award at VEX Worlds, teams must pre-submit a 500-word essay through the VEX World Championship Awards page at robotevents.com/vexawards/, which will be available from **February 1, 2018 until March 20, 2018**.

The **Volunteer of the Year Award** is presented to an individual who demonstrates commitment and devotion to their community, putting in many hours of hard work and passion to help make events happen. Usually, the event organizing committee or Event Partner will choose the winner of this award.

Judge Sign in Sheet

Note to Judge Advisor:

Please use this sheet to check in your Judges. Record each Judge's name, email (in the event you want a follow up contact), cell phone number (to reach Judges during the event), and team affiliation (to avoid potential conflict of interest issues).

Name	Please provide your email	Please give a cell phone number that you may be contacted at during the event	Please list Team Numbers you are affiliated with

Student Interview and Discussion Tips and Sample Questions

Student Interview and Discussion Tips

Judges need to talk to students, not adults. Occasionally enthusiastic adults may want to answer the Judge's questions. If this is encountered, politely remind the adult(s) that the Judges are there to meet with and learn from the students.

- Collect Engineering Notebooks from the team check in table and complete the appropriate section of the Design Award Rubric before meeting with teams.
- Be flexible in setting a discussion time with teams that coordinates with match schedules.
- Help put the students at ease for your discussions by asking them questions about their robot. This often helps students feel more comfortable in sharing their learning experiences.
- Try not to ask questions that allow the students to answer with a yes or no, and encourage the teams to elaborate on their answers.
- Be prepared to re-word your questions if the team is struggling to understand or answer.
- When talking to young children, take a knee and smile. This will get you on the students' level and help make them comfortable.
- Include as many student team members in your discussion as possible.
- Being a Judge gives you a unique opportunity to impact students. They will be looking to you for positive reinforcement. Just a few words of encouragement can make their day.
- Demonstrate your full interest and involvement in discussions with students by refraining from distractions such as phone usage or side conversations.
- Taking a digital photo of each team with their robot oriented so that the license plate is visible will help you identify teams and robots during deliberations.
- Use the "sorry we missed you" note in the pit area for teams that you are having trouble locating.
- For large events, placing a colored adhesive dot on the team sign each time you meet with a team in the pit area will help you identify teams that have been spoken to by Judges.

Robot Challenge Sample Questions

These are some leading questions that are typically effective in helping students to express themselves:

- What does your robot do and how? Which team members built the robot?
- How does your robot score points? How did you choose this robot design?
- What part of your robot are you most proud of? Why?
- Were there any other robots that inspired your robot design? How?
- What changes did you make to improve your design during the season?
- Did you use any sensors? What are they used for?
- What did you program your robot to do? How did you program it? Who did the programming?
- What problems did you have in working on your robot and how did your team solve them?
- If you had one more week to work on your robot, how would you improve it?

STEM Research Project Sample Questions

- How did your team choose the topic for your research?
- What sources did you use for your research and why?
- What was the most interesting thing you learned from your research?
- How could you use what you learned in your research to make people's lives better?

STEM Research Project Rubric

Teams will share the results of their STEM Research Project with VEX IQ Challenge event Judges in a creative and effective four (4) minute presentation, including setup. Judges will then have up to four (4) minutes to ask questions of the team to learn more about their project.

Team Name: _____ **Team Number:** _____ ☐ Elementary ☐ Middle **Judges:** _____

For details, review the STEM Research Project and Awards Appendix on www.roboticseducation.org/vex-iq-challeng/viq-current-game/

Directions: Mark the descriptor that best describes the team's performance for each criterion.

Criteria	Expert (3 points)	Proficient (2 points)	Emerging (1 point)	Points
Identifies a challenge topic of interest that relates to the STEM theme for the season	Challenge topic clearly identified, with a strong connection to the STEM theme for the season	Challenge topic identified, with some connection to the STEM theme for the season	Topic not identified and/or limited connection to the STEM theme for the season	
Completes research and collect evidence using reliable sources	Provides evidence of thorough research using 3-5 reliable and credible sources	Provides evidence of research using 1-3 reliable sources	Provides evidence from no reliable sources	
Demonstrates a well-organized and documented process to study/explain research findings	Demonstrates highly organized and well documented process to study and explain the research data	Demonstrates some organization and documentation of the project	Demonstrates little to no documentation of the project	
Describes how the research findings were applied to develop and test the solution	Demonstrates an in-depth understanding of the application of the research to develop and test the solution	Demonstrates some under-standing of the application of the research to develop and test the solution	Demonstrates little to no application of research to develop and test the solution	
Shares the solution in an effective and creative presentation	Presentation and visual aids provide clear, effective, and creative explanation of how solution was developed and how it works	Presentation provides adequate explanation of how the solution was developed and how it works	Presentation lacks detail needed to understand the team's solution	
Students demonstrate an understanding of the research process	All students demonstrate mastery of the research process	Most students demonstrate some understanding of the research process	Students demonstrate little or no understanding of the research process	
Students demonstrate teamwork and effective communication skills	All Students demonstrate high levels of cooperation, courtesy, enthusiasm, confidence, accuracy and clarity	Students demonstrate some cooperation, courtesy, enthusiasm, confidence, accuracy and clarity	Students demonstrate limited cooperation, courtesy, enthusiasm, confidence, accuracy and clarity	
Describe the best features of this presentation and discussion with the Judges (continue on back of sheet): _____ _____				Total Points

Rubrics are confidential judging documents and should not be returned to the team, coach, or Event Partner. Rubrics should be destroyed immediately after the Judge Advisor has recorded the winning team.

Design Award Rubric

Team Name: _____ Team **Number:** _____ ☐ Elementary ☐ Middle **Judges:** _____

For Design Award details, review the Awards Appendix on www.roboticseducation.org/vex-iq-challeng/viq-current-game/

Directions: Mark the descriptor that best describes the team's performance for each criterion.

The Engineering Notebook …

Criteria		Expert (3 points)	Proficient (2 points)	Emerging (1 point)	Points
Clear document of Robot Design Process	Identify the challenge(s)	Describes the challenge at the start of each design process iteration with words and pictures, and states the teams' goals for accomplishing that challenge	Identifies the challenge at the start of each design cycle	Does not identify the challenge at the start each design cycle	
	Brainstorm solutions	Lists 3 or more possible approaches to the challenge with labeled diagrams	Lists 1-2 possible approaches to the challenge.	Does not list the results of the brainstorming sessions.	
	Select the best approach and plan	Explains why the selected approach was chosen and why the other alternatives were not chosen. Fully describes the plan	Explains why the selected approach was chosen. Mentions the plan	Does not explain why the selected approach was chosen	
	Build, Program and Test	Records the building, programming and test processes and the test results in such detail that someone outside the team could recreate the robot by following the steps in the notebook	Documents the key steps to build, program and test the robot and the key test results	Leaves out important information about building, programming and testing the robot	
	Repeat process steps, if needed	Contains a complete history of the design process iterations for the season that resulted in the current robot design, repeating the steps above for each iteration	Describes most of the design process iterations, including most of the steps for each iteration	Leaves out most of the design process iterations	
Complete and organized document of Robot Design Process		Contains Project and Team Assignments, Entries from team meetings, with goals, decisions and accomplishments, and recorders' names or initials and dates. Indexed so that anyone can easily locate any needed information	Contains most of the information listed at left. Organized so that team members can locate most needed information	Leaves out important information and/or is poorly organized	
Team demonstrates effective management of skills, time, and material resources		Includes an overall project timeline against which progress is checked regularly as well as daily goals and accomplishments. Documents the assignments of each team member based on skills and availability.	Documents most daily goals and accomplishments and most team member assignments	Does not document the team's management of key resources	

Describe the best features of this **Engineering Notebook**:

_____

Total the number of points earned from Notebook (Add 3 points for a bound notebook & enter the number on page 2 of this rubric):

Total Points

Rubrics are confidential judging documents and should not be returned to the team, coach, or Event Partner. Rubrics should be destroyed immediately after the Judge Advisor has recorded the winning team.

Design Award Rubric

Robot Design Interview				
Criteria	**Expert (3 points)**	**Proficient (2 points)**	**Emerging (1 point)**	**Points**
Engineering Notebook is a clear, complete, and organized document of the robot design process	Students can explain clearly the robot design process and how they documented their use of the process in their Engineering Notebook	Students can explain most aspects of the design process and how they documented their use of the process	Students can explain only limited aspects of the design process and/or how they documented their use of the process	
Team demonstrates effective management of skills, time, and material resources	Students can explain how team progress was tracked against an overall project timeline and how students were assigned to tasks based on their skills and availability	Students can explain how team progress was monitored and how students were assigned to tasks	Students cannot explain how team progress was monitored and/or how students were assigned to tasks	
Students understand and explain how they developed an effective game strategy and robot design	Students can describe multiple game strategies and robot designs that were considered, and they can fully explain how and why the current game strategy and robot design were selected	Students can describe at least two strategies and designs that were considered, and can explain how or why the current strategy or design were selected	Students can only describe the current strategy and design, or they cannot explain how and why the current strategy or design were selected	
Students demonstrate teamwork and effective communication skills	Students demonstrate high level of teamwork, fluency, and courtesy	Students demonstrate some teamwork, fluency, and courtesy	Students demonstrate limited teamwork, fluency, and courtesy	
Describe the best features of this **Robot Design Interview**:		**Total the number of points earned from Student Interview and Discussion:**		
		Total the number of points earned from Notebook: (including bonus for bound notebook)		
		Total the number of points combined:		

Rubrics are confidential judging documents and should not be returned to the team, coach, or Event Partner. Rubrics should be destroyed immediately after the Judge Advisor has recorded the winning team.