



ROBOTICS EDUCATION & COMPETITION FOUNDATION

Judge Guide

2020-2021

*For the Judges, the Judge Advisor,
the Event Partner, and Teams*

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New This Year

- This document includes revised information for Judging at VEX IQ Challenge, VRC, and VEX U events and is focused on the roles of Judge Advisors and Judges.
- Additional Technical and Other Awards for VIQC, VRC, and VEX U awards have revised criteria.
- The two-page Design Award Rubric has been split into a one-page [Engineering Notebook Rubric](#) and a one-page [Team Interview Rubric](#).
- The Awards Score Sheet used for Judged Awards has been revised to one page and is now a universal document for judging additional Judged Awards at VEX IQ, VRC and VEX U events.
- The Qualifying Criteria has been updated to revise the order of several Judged Awards from Amaze, Think, Innovate, Build, Create to Innovate, Think, Amaze, Build, Create. Please consult the respective Qualifying Criteria chart for more details on the order of award priority per spot level.
- This revised Judge Guide will provide the most recent judging information as of **June 2020**; please note where there is any difference between the Judge Guide and the online Judge Certification course, the Judge Guide will take precedence.
- For VIQC, the STEM Research Project is now an Online Challenge. Only a small number of events offered the STEM Research Project last season. Now all VIQC teams that wish to participate in the STEM Research Project will have that opportunity.

Judging Overview

This Judge Guide is for VIQC, VRC, and VEX U competitions sanctioned by the REC Foundation, including VEX Worlds.

The Judge Guide describes the judged award criteria and informs the Judges, Judge Advisor, and Event Partner on their roles and responsibilities in the judging process. Additionally, this guide helps coaches and teams understand the judged award criteria and processes so they may improve their performance on judged awards.

Local qualifying events, and events that qualify teams directly to the VEX Robotics World Championship must follow the criteria and processes in the Judge Guide, or those events will not qualify teams to higher level events. Should anything in the Judge Guide contradict the Game Manuals or Qualifying Criteria Documents, the Game Manuals and/or Qualifying Criteria Documents will take precedence.

In the VEX Robotics Competitions, teams of students showcase their knowledge and skills in designing, building, and programming a robot. Students demonstrate their knowledge of the engineering design process by documenting their design process in an Engineering Notebook.

Student drive teams exhibit their driving skills and game strategy during match play and skills challenges. All these activities are to be completed by the students with minimal adult assistance. Students must make the decisions, complete the work, and demonstrate their learning and knowledge for their team to qualify for judged awards.

Judge Advisor Role:

- The Judge Advisor must be an adult.
- Organize and oversee the judging process at an event.
- Solicit, assign and train the Judges to prepare them for an event.
- Use the Judge Guide for reference and to help train the Judges.
- Ensure judging is done in compliance with the Judge Guide.
- Ensure correct award winners are uploaded to Tournament Manager and manage presentation of awards.
- Protect the confidentiality of judging process.

Judge Role: Judges can play multiple roles depending on the assignment, including:

- Review Engineering Notebooks.
- Judge presentations (online or in person).
- Observe teams on the competition floor.
- Interview teams in the pit areas (the primary Judge role).
- Deliberate over awards selection as outlined in the Judge Guide.
- Present awards as needed (the Event Partner will decide who presents awards).

Event Partner Role:

- The Event Partner oversees the operation of the entire event and provides support for the Judges and Judge Advisor.
- The Event Partner picks the Judge Advisor.
- The Event Partner must know and understand the role of the Judges and the Judge Advisor.
- Decisions on all judged awards are made by the Judges in consultation with the Judge Advisor.

Event Partners may not recommend or assign judged awards to any team.

Judging: Recruiting and Preparation

Overview

The Event Partner recruits the Judge Advisor and Judges 1-2 months before the event. Good sources include local professional or technical workers, employees of any event sponsors, teachers, school or district administrators, college students, and local service organizations. The two main skills required for a Judge is an interest in STEM and the ability to converse in a comfortable way with students.

Note: Judge Advisors must always be an adult.

For local VIQC qualifying events, adults are preferred as Judges, but high school students may be paired with Judges who are adults. Elementary and Middle School students may not be Judges at VIQC events. At events that qualify teams directly to VEX Worlds, all Judges must be adults; anyone age 18 or older and not a high school student is considered an adult for VIQC judging.

For all VRC events, Judges must be adults. No students, except adult college students, are to be Judges. Anyone age 18 or older and not a high school student is considered an adult for VRC judging.

For all VEX U events, Judges must be adults over the age of 21.

Pre-event Training

The Event Partner and Judge Advisor should agree on the process of recruitment and selection of the Judges well in advance of the event. The Event Partner and Judge Advisor should both have the contact information for the Judges.

The Judge Advisor should ensure that the following is sent to the Judges at least one to two weeks prior to the event to prepare for the volunteer role:

- The Judge Guide.
- Relevant Game Manual (i.e., [VIQC](#) or [VRC](#)), game introduction video ([VIQC](#); [VRC](#)), and one-page game description ([VIQC](#); [VRC](#)).
- A list of the judged awards for the event and/or the event page on RobotEvents.com.
- The REC Foundation [Code of Conduct](#) and [Student-Centered Policy](#).
- An agenda for the event including expected arrival time and estimated departure time for Judges on the day of the event.
- Ask Judges to wear comfortable closed-toed shoes and comfortable business casual clothing that is team-neutral (i.e., does not show any team numbers or team branding).

All of the materials needed for Judges and the judging process should be provided by the Event Partner or Judge Advisor, but is also available online at:

➔ <https://www.roboticseducation.org/volunteer-downloads/>

Pre-event Preparations

The Judge Advisor guides, and is responsible for, the judging process at the event. Therefore, it is necessary that the Judge Advisor know and understand the role of Judges and all aspects of the Judge Guide.

Two to three weeks prior to an event the Judge Advisor should:

- Review with the Event Partner the awards to be offered at the event and that the Event Partner has ordered the trophies for the event.
- Ensure adequate Judges are recruited and confirm their attendance.
- Prepare a judging schedule based on the number of teams registered and the agenda for the event. The Judge Guide provides a sample judging agenda.
- Consult with the Event Partner on the process for Engineering Notebook submission at team check-in.
- Confirm the location of the separate Judges Room and that food/refreshments are provided.
- Ensure that you will have judging materials, including clipboards, pens, highlighters, Post-It notes, copies of the Judge Guide, [Engineering Notebook Rubric](#), [Team Interview Rubric](#), [Awards Scoring and Ranking Sheet](#), [Team Interview Tips and Sample Questions](#), and other needed items.

The Judge Advisor should do the following on the day of the event:

- Prepare the Judges Room.
- Train and orient the Judges prior to the start of the event.
- Keep a record of which teams have submitted Engineering Notebooks at check-in.
- Ensure Judges sign in on the Judge Sign-In sheet provided in the Judge Guide; also, monitor and manage any team affiliations or potential conflicts of interest noted by the Judges.
- Pair up Judges in teams (may be done prior to event).
- Print a team list and team schedule for each judging team; match schedules will be ready once check-in is complete.
- Assign Judges to teams to interview and ensure all teams are interviewed.
- Manage time and ensure judging teams are keeping pace to interview all teams on schedule.
- Lead deliberations for judged awards.
- Record the results of all judged awards and transmit the list of award winners to the Event Partner and Tournament Manager operator; also, have the Tournament Manager operator print the award scripts to be used at the award ceremony.
- Collect and destroy all judging materials to ensure confidentiality.
- Ensure the process for returning all Engineering Notebooks to teams.

Judging: Orientation, Training and Scheduling the Day

Judges should check-in to the event as a volunteer and be directed to the Judges Room by the volunteer coordinator. Once in the Judges Room, the Judges will sign-in on the Judge Sign-in Sheet provided in this Guide and disclose any potential conflicts on that document. Once the Judges are gathered, the Judge Advisor should welcome the Judges, have them introduce themselves, and let them know where the refreshments and restrooms are located.

The Judges will engage in the following activities during the course of the event. The Judge Advisor will give the Judges a short outline for the day with specific times:

- Judges Orientation Meeting.
- Interview Teams and Sort Engineering Notebooks.
- (Approximately) Short Meeting to regroup.
- Working lunch to nominate teams for awards.
- Skills Challenges end time/Qualification Matches end time: Collect Rankings report.
- End Deliberations.

The Judge Advisor will cover the following at Judge orientation:

- The fundamentals of the judging process, including key sections of the Judge Guide.
- Review this season's game challenge.
- Review and explain the [Team Interview Rubric](#) (formerly page 2 of the Design Award Rubric) and the [Awards Scoring and Ranking Sheet](#).
- Read through the different sections of the Rubric so they have an understanding of how to record their observations; the team interviews and the Rubric will be covered more in depth in another unit.
- Explain how to interview teams at their pit table.
- Judges are paired in teams of 2 to go out to the pits and interview teams at their pit table.
- Use the [Team Interview Tips and Sample Questions](#) page to guide the pit interview process.
- List the judged awards for the event, then read the descriptions for each of those awards.
- Review how to sort Engineering Notebooks; this is covered more in depth in a later unit.
- Review the day's schedule and explain when the meetings (i.e., check in and deliberations) are and what will be discussed at the meetings.

Make sure the Judges have a copy of the event agenda for the day and a pit map of where teams are located.

Sample Judging Schedule for an event:

| Sample Judging Schedule | |
|-------------------------|---|
| 7:30 – 8:00 a.m. | Judge Advisor arrives, reviews awards offered, and gathers judging materials. |
| 8:00 – 9:30 a.m. | Judges arrive and receive training. Judge Advisor assigns Judge Teams and assigns teams to be interviewed. Engineering Notebooks are reviewed, and Judge Teams begin team interviews. |
| 9:30 – 9:45 a.m. | Judges attend Opening Ceremony. |
| 9:45 – 11:30 a.m. | Judge Teams complete initial interview of assigned teams. Engineering Notebook Judges complete the Engineering Notebook Rubric (formerly the first page of the Design Award Rubric for the select notebooks that qualify). |
| 11:30 – 12:30 p.m. | Working lunch – initial deliberations – each Judge Team identifies their top candidates for each award and use Post-it® notes to list teams under the award categories. Judge Advisor identifies teams that require follow-up interviews, especially for Design and Excellence awards, and assigns Judge Teams for follow-up interviews. |
| 12:30 – 1:30 p.m. | Judges observe teams in pit area and competition area for follow up interviews and observation as necessary to complete rankings for each award category. If possible, several Judge Teams should visit with the top contenders for each award. |
| 1:30 – 2:30 p.m. | Judges return to Judges Room to conduct final deliberations and determine judged award winners. Judged award winners should be determined between the last round of qualifying matches and before the first round of VRC Finals matches or before VIQC Finals matches. This allows qualifying rankings to be considered for the Excellence Award and allows awards to be announced during finals matches. |
| 2:30 – 2:45 p.m. | Judge Advisor oversees entry of judged award winners into Tournament Manager software. |
| 2:45 – 4:30 p.m. | If possible, Judges attend finals matches and award ceremony. Judges may be asked to read an award script and announce a judged award winner if comfortable doing so. |

Student-Centered Teams

The REC 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. We believe that the student-centered model of learning is aligned with the REC Foundation’s mission and provides effective educational benefits to students.

Teams must be student-centered. There are a variety of definitions for the term “student-centered” in the educational community, and the REC Foundation would like to communicate a definition for student-centered that will apply for teams that participate in the VIQC, VRC, and VEX U competitions to increase the transparency of the expectations and increase the student learning opportunities. The term student-centered is encompassed in both the learning and application settings for REC Foundation events and activities:

Student-Centered Learning: Students are actively involved in learning opportunities to increase their knowledge and skills in the engineering design process, mechanical design, programming, and teamwork under the guidance of adult mentorship.

Student-Centered Application: Students have ownership on how their robot is designed, built, programmed, and utilized in match play with other teams and Robot Skills matches.

Through observation and interviews with teams, Judges identify teams that are student-centered. These teams understand that the purpose of the program is to enhance the learning process, not to win at any cost. Judges shall give higher consideration to teams that favor the enhancement of student learning over teams that favor winning at any cost.

Judges, with input from event staff, should identify teams that are not student-centered. Teams that are not student-centered should not receive judged awards.

Additional information and guidance on student-centered teams is found in the REC Foundation's Student-Centered Policy:

➔ <https://www.roboticseducation.org/studentcenteredpolicy/>

Judging Concepts and Guidelines

Judges are in a position of trust. To ensure the judging process is an effective, equitable, and positive experience, it is important for Judges to understand these concepts and follow these guidelines:

- **Confidentiality:** The judging process includes frank discussions about teams. These discussions must remain confidential and Judges should take precautions to ensure that these discussions are not shared with or overheard by teams or other event participants.
- **Impartiality:** Proactively advise the Judge Advisor and Event Partner of any possible conflicts of interest and remove yourself from discussions and decisions in which you may have a personal interest. Event Partners may not recommend, advise, or assign judged awards to any team.
- **Engagement:** Demonstrate your full interest and involvement in discussions with students and your Judge Team by refraining from distractions such as phone usage or side conversations.
- **Youth Protection:** Do not be alone with students. Always work with at least one other Judge and two or more students. Do not meet with teams in a private space.
- **Discretion:** All written judging materials, including Judges notes, Rubrics, awards worksheets, and so on are to be given to the Judge Advisor for disposal after the event. None of these materials are to be given back to teams or given to the Event Partner. Judges should not discuss deliberations, awards, or judging with teams after an event. These discussions are easily misinterpreted or misunderstood by students, coaches, mentors, and parents. Please refer any inquiries about the judging process to the Judge Advisor.

- **Judgement:** Judges are expected to apply qualitative judgement when making final decisions on all judged awards. For example, the [Engineering Notebook Rubric](#) is quantitative in nature, but Judges must deliberate and apply qualitative judgement when making a final decision on the Design Award winner.
- **Inclusion:** Only a limited number of teams at an event will earn a judged award. However, every team at an event should be interviewed by Judges regardless of their status for a Judged award.
- **Equitability:** No team shall be awarded more than one judged award at an event. Top teams often win robot performance awards in addition to judged awards. Individual awards presented to adults, such as Volunteer of the Year Award, do not affect a team's eligibility for a judged award.
- **Common Sense:** When reading and applying the rules, criteria, and processes in this document, please remember that common sense always applies.
- **Team Ethics and Conduct:** Ethics is an important part of every engineer's professional training and practice. The REC Foundation considers the positive, respectful, and ethical conduct of teams to be an essential component of the VEX competition. A team includes the students, teachers, coaches, mentors, and parents associated with a team. Judges will consider all team conduct when determining judged awards.

Overview of the Event Competition

The competition area is where matches and skills challenges take place. Judges should spend time observing teams in the competition area. Judges can validate statements made by teams during their interview and can evaluate their robot performance and game strategy. Additionally, Judges can assess a team's sportsmanship, energy, and enthusiasm while observing them in the competition area.

| VIQC | VRC | VEX U |
|--|--|---|
| <p>Matches take place on a 6'x8' competition field. A match lasts 1 minute and is scored by Referees. Teams play 6-8 qualification matches, randomly paired in each match in an alliance with another team. Teams work together to score as many points as possible, and both teams are awarded the same points. After qualification matches are played, teams are paired by ranking in an alliance. Each alliance plays one finals match. The alliance with the highest score in the finals matches becomes the Teamwork Champion.</p> <p>Teams may also demonstrate their own team's abilities by participating in Programming and Driving Skills Matches. Each type of skills match lasts 1 minute. Teams may run a maximum of 3 of each at an event.</p> | <p>Matches take place on a 12' x 12' competition field. A match lasts 2 minutes, including a 15-second programming-only period, and is scored by Referees. Teams play 6-8 qualification matches, randomly paired with other teams. Matches are played with 4 robots on the field; two paired as the Red Alliance and two paired as the Blue Alliance. The two alliance teams work together to score more points than the other alliance, and both teams in the alliance receive a win, loss, or tie for the match. Qualification matches are followed by Alliance Selection and Elimination Rounds, played in a sports bracket format. The alliance that completes Elimination Rounds undefeated becomes the Tournament Champion.</p> <p>Teams may also demonstrate their own team's abilities by participating in Programming and Driving Skills Matches. Each type of skills match lasts 1 minute. Teams may run a maximum of 3 of each at an event.</p> | <p>Matches take place on a 12' x 12' competition field. A match lasts 2 minutes, including a 45-second programming-only period, and is scored by Referees. Teams play 6-8 qualification matches. Matches are played with one team as the Red Alliance and one team as the Blue Alliance. Each alliance works to score more points than the other alliance, and each alliance receives a win, loss, or tie for the match. After qualification matches are complete, teams are ranked and play Elimination Rounds in a sports bracket format. The alliance that completes Elimination Rounds undefeated becomes the Tournament Champion.</p> <p>Teams may also demonstrate their own team's abilities by participating in Programming and Driving Skills Matches. Each type of skills match lasts 1 minute. Teams may run a maximum of 3 of each at an event.</p> |
| Game Details | | |
| VIQC: roboticseducation.org/competition-teams/vex-iq-challenge/ | VRC: roboticseducation.org/competition-teams/vex-robotics-competition/ | VEX U: roboticseducation.org/competition-teams/vex-u |

The Awards

Awards Overview

There are three types of awards at REC Foundation-sanctioned competitions:

- **Performance Awards:** Based on robot performance on the competition field in match play (Tournament Champion for VRC and Teamwork Champion for VEX IQ) and skills challenges (Robot Skills Champion). Judges do not determine performance awards. Team rankings on robot performance is considered by Judges when deliberating on the Excellence Award (more details on the specifics of this process is covered in later sections).
- **Judged Awards:** Based on the award criteria in the Judge Guide. Judges, in coordination with the Judge Advisor, determine judged awards using the process outlined in the Judge Guide. The number of judged awards may vary between events, but typically include the Excellence Award and Design Award.
- **Individual Awards:** Recognize the contribution of a volunteer or sponsor, and are determined by the Event Partner. Judges do not determine individual awards. Individual awards do not affect a team's eligibility for other judged awards.

The Design Award

The Design Award criteria is the foundation for the Excellence Award and helps rank teams for other awards. Therefore, the Design Award judging process is fundamental to judged award rankings and deliberations. The Design Award judging process, including the use of [Engineering Notebook Rubric](#) and the [Team Interview Rubric](#), is outlined in later sections of this Judge Guide.

The Design Award is presented to a team that demonstrates an organized and professional approach to the design process, project and time management, and team organization. The team's Engineering Notebook and Judges interview will demonstrate the team's ability to produce a quality robot with minimal adult assistance. Key criteria:

- Engineering Notebook must be submitted (usually at team check-in).
- Engineering Notebook demonstrates clear, complete, organized record of robot design process.
- Team demonstrates effective management of time, talent, and resources.
- Team interview demonstrates their ability to explain their robot design and game strategy.
- Team interview demonstrates effective communication skills, teamwork, and professionalism.

The Excellence Award

The Excellence Award is the highest award presented in the VEX Robotics competition. This award is presented to a team that exemplifies overall excellence in building a high-quality robotics program. This team is a strong contender in numerous award categories. Key criteria:

- Engineering Notebook must be submitted (usually at team check-in).
- Ranking for the Design Award.
- Ranking for Qualification Matches.
- Ranking for Robot Skills (does not apply to VAIC-HS or VAIC-U).
- Ranking for other judged awards.
- Quality of the team's interview with the Judges.
- High-quality robotics program.
- Team conduct.

Specifics on the use of the [Engineering Notebook Rubric](#) and the [Team Interview Rubric](#) in relation to judging the Excellence and Design Awards is discussed in detail in later sections.

Blended Events

VEX Robotics competitions can be grade-level restricted as follows:

- **VIQC:** Elementary School Only or Middle School Only
- **VRC:** Middle School Only or High School Only

Any event that is grade-level restricted will only offer one Excellence Award.

Events that are open to all grade levels within a platform (i.e., VIQC or VRC) are called Blended Events. Events having at least ten (10) teams at each level registered two weeks prior to the event must offer two (2) Excellence Awards, one for each grade level. For example, a blended VRC event that has 12 middle school teams and 12 high school teams registered two weeks prior to the event, will offer two Excellence Awards: one for middle school and one for high school. Each recipient must meet all the Excellence Award criteria. The Event Partner shall inform the Judge Advisor and Judges if two (2) Excellence Awards are offered at the event.

If two Excellence Awards are offered, it is critical that the Judge Advisor inform the Judges and ensure that the candidates for the Excellence Awards are judged separately by their respective grade levels. For example, at a blended IQ tournament with 20 elementary teams and 15 middle school teams, the judges must judge the elementary teams against elementary teams for the elementary school Excellence Award and middle school teams with other middle school teams for the middle school Excellence Award.

Additional Judged Awards – Technical Awards

The **Innovate Award** is presented to a team with the most effective and efficient design process; a top contender for the Design Award. Key criteria:

- Engineering Notebook is required
- Engineering Notebook is a clear, complete, and organized document of the design process
- Team demonstrates effective management of time, talent, and materials
- Students understand and explain how they developed an effective game strategy and robot design
- Students understand and explain the engineering design process
- Students understand and explain how they worked together to develop their robot

The **Think Award** is presented to a team with the most effective and consistent programming strategies and solutions to solve the game challenge. Key criteria:

- Participation in the Programming Skills Challenge is required (does not apply to VAIC-HS or VAIC-U)
- Autonomous programming is consistent and reliable
- Programs are cleanly written, well documented, and easy to understand
- Team clearly explains the programming strategy used to solve the game challenge
- Team clearly explains their programming management process, including version history
- Students understand and explain how they worked together to develop their robot programming

The **Amaze Award** is presented to a team that has built the most consistently high scoring and competitive robot. Key criteria:

- Robot design is consistently high scoring and competitive
- Robot construction is high quality
- Robot programming is effective, successful, and consistent
- Students understand and explain how they worked together to develop their robot

The **Build Award** is presented to a team that has built the most durable robot. Key criteria:

- Robot construction is durable and robust
- Robot is reliable on the field and holds up under competition conditions
- Robot is designed attention to safety and detail
- Students understand and explain how they worked together to develop their robot

The **Create Award** is presented to a team who has built a robot that incorporates the most creative engineering design solution to the challenges of this season's game. Key criteria:

- Robot design incorporates a creative design solution
- 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

Other Judged Awards

The following judged awards may be offered at events:

The **Judges Award** is presented to a team that is most deserving of special recognition. Key criteria:

- Team displays special attributes, exemplary effort and perseverance at the event
- Team overcomes an obstacle or challenge and achieves a goal or special accomplishment at the event or at some time throughout the season
- Team distinguishes itself in some way that does not fit under other award criteria but nonetheless deserves special recognition
- Students demonstrate teamwork and effective communication skills

The **Energy Award** is presented to a team that shows the most enthusiasm and excitement at the event. Key criteria:

- Team maintains a high level of enthusiasm and excitement throughout the event
- Team exhibits a passion for robotics competition that enriches the event experience for all
- Students demonstrate teamwork and effective communication skills

The **Inspire Award** is presented to the most passionate and positive team at the event. Key criteria:

- Team exhibits passion and positive attitude at the event
- Team exhibits integrity, and goodwill toward other teams, coaches, and spectators
- Students demonstrate teamwork and effective communication skills

The **Sportsmanship Award** is presented to a team that has earned the respect and admiration of the volunteers and other teams at the event. Key criteria:

- Team is courteous, helpful, and respectful to everyone at the event, on and off the field
- Team interacts with others in the spirit of friendly competition and cooperation
- Students demonstrate teamwork and effective communication skills

Judging: The Engineering Notebooks

Using the Engineering Notebook for Judged Awards

One of the primary missions of the REC Foundation is to help students acquire real world life skills that will benefit them in their academic and professional future. Following the engineering design process and creating an Engineering Notebook helps students practice and develop a variety of real-world life skills including project management, time management, brainstorming, communication, and teamwork. The engineering design process and the Engineering Notebook are used by engineering and design professionals in many different fields.

When teams register with the REC Foundation, they receive a bound Engineering Notebook in the Welcome Kit. It has instructions and examples of sample pages in the front. Teams may use the notebook provided or purchase their own from VEX Robotics or most office supply stores.

The engineering design process is iterative. Students identify and define a problem, brainstorm design ideas to solve the problem, test their design ideas, and continue to improve their design ideas until a solution is reached. During the engineering design process, students will encounter obstacles, successes and failures, and learn many lessons. Everything a team does throughout the engineering design process should be documented by the students in their Engineering Notebook.

All Engineering Notebooks should contain these elements:

- Team number on the cover.
- Errors crossed out using a single line (so errors can be seen).
- Notebook has not been edited.
- All pages intact; no pages or parts of pages removed even if they contained errors.
- Each page numbered and dated in chronological order.
- Each page signed or initialed by student author.
- Team meeting notes as they relate to the design process.
- Pictures, CAD drawings, documents, examples of code, or other material relevant to the design process are glued into the notebook (tape is acceptable, but glue is preferred).

Outstanding Engineering Notebooks should contain these additional elements:

- Table of contents.
- Each page signed by a student witness as well as student author.
- First entry is the first team meeting, and each team meeting has an entry.
- Descriptions of brainstorming sessions.
- Descriptions, sketches, and pictures of design concepts and the design process.
- Observations and thoughts of team members about their design and the design process.
- Records of tests, test results, and evaluations of specific designs or design concepts.
- Team organization practices as they relate to the design process.
- Project management practices including their use of personnel, financial, and time resources.
- Notes and observations from competitions to consider in the next design iteration.
- Descriptions of programming concepts, programming improvements, or significant programming modifications.
- A person unfamiliar with the team's work would be able to recreate the robot design based only on information in the Engineering Notebook.

Judging the Design Award – Sorting the Notebooks

Follow steps 1-2 below to evaluate the Engineering Notebooks and identify the outstanding Engineering Notebooks. These teams will be contenders for the Design Award and by extension, the Excellence Award. A separate Judge Team may interview the top contenders for the Design Award, which is outlined in [the next section](#) of this Guide.

Note: The Judge Advisor may assign one Judge Team as the Design Award Judge Team, with the primary responsibility of determining contenders for the Design Award.

1. Perform a quick scan of all the Engineering Notebooks and divide them into two categories: *Developing* and *Fully Developed*.
 - Developing Engineering Notebooks contain little detail, will have few drawings, and will not be a complete record of the design process. These are usually turned in by new teams without a fully developed robotics program. These teams will not be contenders for the Design Award. To save the Judge's time, the [Engineering Notebook Rubric](#) will not be completed for these teams. However, the Engineering Notebooks should be retained for consideration of other awards.
 - Fully Developed Engineering Notebooks will contain much detail, will include detailed drawings, will include tests and test results, will include solutions to problems the team encountered, and will be a complete record of the design process. These are usually turned in by teams with a developed robotics program and a strong emphasis on the design process. These teams may be contenders for the Design Award. These may be roughly the top 10 teams or top 30% of teams (whichever is larger).

2. Complete the first page of the [Engineering Notebook Rubric](#) for the Fully Developed Engineering Notebooks and divide them into two categories: *Intermediate* and *Outstanding*. The [Engineering Notebook Rubric](#) MUST be used for this evaluation:
 - Intermediate Engineering Notebooks will lack some details and will not be as complete as Outstanding notebooks. These teams will not be contenders for the Design Award.
 - Outstanding Engineering Notebooks will be a complete record of the team's engineering design process. Outstanding notebooks may be the top 5 teams or top 20% of teams (whichever is larger). A Judge Team shall interview the teams with Outstanding Engineering Notebooks. The Judge Team shall complete the [Team Interview Rubric](#) immediately after the interview.

Judging: Team Interview Rubric and Award Scoring Sheet

Overview

The [Team Interview Rubric](#) (formerly page 2 of the Design Award Rubric) is used for all team interviews. The Rubric has a 5-point scale to help you score the teams. Write the points in each row for the criterion that best describes the performance of the interview on each topic, then total the points.

Use the [Team Interview Tips and Sample Questions](#) in the Judge Guide to assist your team interviews.

Interview teams as assigned by the Judge Advisor. Interviews should be conducted at the team's pit area. All teams will be interviewed, but contenders for the Design and Excellence Awards will have more in depth interviews and may be cross interviewed by different Judge Teams. The Judge Advisor will assign additional interviews as needed during the event.

Conducting Team Interviews:

- Complete the [Team Interview Rubric](#) and [Awards Scoring and Ranking Sheet](#) away from the teams you interview and not during the interview.
- Plan to interview one team every 10-15 minutes. Staying on schedule is important to ensure all teams are interviewed and there is sufficient time to conduct deliberations.
- If you are unable to locate an assigned team for interview after several visits to the team's pit area, leave a "Judge's Note to Missed Teams" on their pit table. Indicate that the team should try to find you in the competition or pit area during a break in their match schedule or leave a time you will return.
- Observe teams in the competition area during match play and skills play, with a focus on the teams you have been assigned to interview by the Judge Advisor.
- Identify student-centered teams with positive, respectful, and ethical conduct during the team interviews and team observations.
- Take notes during interviews and observations to support your evaluations and assist with deliberations.

- Immediately after interviewing a team rank them using the Awards Scoring and Ranking Sheets, complete the [Team Interview Rubric](#). Again, please complete the worksheets in private and not in front of the teams or during the interview.
- The Judges will deliberate after team interviews are complete to determine judged awards.

Judging the Design Award – Team Interviews

A Judge Team(s) shall interview the teams with Outstanding Engineering Notebooks. The Judge Team shall complete the [Team Interview Rubric](#) immediately after the interview.

The [Team Interview Rubric](#) (formerly page 2 of the Design Award Rubric) MUST be used for this evaluation:

- Design Award interviews shall be conducted in the team pit area. The Judge Team shall compare the Rubrics and discuss the quality of the team interviews. Through this deliberation, the Judge Team shall rank all teams with Outstanding Engineering Notebooks. If two Excellence Awards are offered, the Judge Team shall rank all teams at each level with Outstanding Engineering Notebooks. Refer to the heading titled “Blended Events” for more information on blended events.
- Judges should recognize that Engineering Notebooks will improve during the season, and that early season Engineering Notebooks will include less of the iterative design process. However, even early in the season, notebooks should include documentation of the robot up to its current state in the design process.
- Judges should remember that younger students communicate their ideas differently than older students, and that judging of notebooks should consider an age-appropriate level of review.

Judging Additional Judged Awards – Team Interviews

Where additional Judged Awards are offered at an event (beyond the Excellence and Design Awards), the Judge Advisor will provide the [Awards Scoring and Ranking Sheet](#) to Judge Teams assigned to interview all teams. The Judge Teams will use both [Team Interview Rubric](#) and the [Awards Scoring and Ranking Sheet](#) in interviewing teams.

Judges will write down the team numbers of the teams they are assigned to interview on the [Awards Scoring and Ranking Sheet](#) and highlight the additional Judged Awards being offered at the event. The Judge Teams will then use the spaces provided to rank top contenders for each of the additional Judged Awards being offered at the event.

Teamwork, professionalism, interview quality, and team conduct shall be considered in scoring of all judged awards. Each time you meet a team, fill in a row of scores on the provided [Awards Scoring and Ranking Sheet](#), then rank each team for each award. Compare new teams to the teams you ranked previously and make notes for later use in deliberations.

The Code of Conduct

Team Ethics and Conduct

Ethics is an important part of every engineer's professional training and practice. The REC Foundation considers the positive, respectful, and ethical conduct of teams to be an essential component of any REC Foundation-sanctioned event. A team includes the students, teachers, coaches, mentors, and parents associated with a team. Judges will consider all team conduct when determining judged awards.

The REC Foundation Code of Conduct can be found here:

➔ roboticseducation.org/codeofconduct/

Feedback to Judges

Any conduct that may be a violation of the REC Foundation Code of Conduct shall be reported immediately to the Event Partner. The Event Partner will contact their Regional Support Manager to discuss the possible violation.

Any event volunteer may provide feedback to the Judges, Judge Advisor, or Event Partner about the conduct of teams, coaches, mentors, or parents using the "Field Note to Judges" form. Volunteers may report conduct such as a team that helps another by loaning a motor or assisting in some other way. Volunteers may report conduct such as a team that is impolite or consistently late arriving to matches. Judges may also report issues, including circumstances where a team is not student-centered or there are behavior issues with adults.

Removal of Teams from Consideration of Judged Awards

The Event Partner should share any Field Notes to Judges by providing them to the Judge Advisor. The Judge Advisor may speak with the Event Partner, volunteer who reported the issue or other individuals at the event in considering negative reports on teams. When possible, the Event Partner will contact their Regional Support Manager to discuss the possible violation.

The Judge Advisor, in consultation with the Event Partner, may decide to remove a team from consideration for judged awards where: (1) the behavior is repeated or egregious; and (2) there is sufficient reasonable evidence to support the decision. The decision to remove a team from consideration for judged awards should be done with caution and with a reasonable benefit of the doubt given to the team.

Where a team has been removed from consideration of judged awards at an event, the Event Partner must inform the REC Foundation Regional Support Manager as soon as possible. The Event Partner must also follow up in writing (i.e., via email) with a summary of the issue and include the name(s) and contact information of the Judge Advisor, team information, and any relevant information for the REC Foundation to review the matter.

The Do's and Don'ts of Judging

Judging is an exciting and rewarding process for both the Judges and the student competitors. While the process may initially feel overwhelming, focusing on making it a student-centered experience is key to the success of the program.

The Do's of Judging

Make sure teams receiving judged awards are student-centered. Students must do the majority of the work designing, programming, and repairing their robot. Coaches, mentors, and parents may provide minimal assistance but may not do any of this work without students present and involved. Through observation and interviews with teams, Judges identify teams that are student-centered. These teams understand that the purpose of the program is to enhance the learning process, not to win at any cost. Judges shall give higher consideration to teams that favor the enhancement of student learning over teams that favor winning at any cost. Judges, with input from event staff, should identify teams that are not student-centered.

Positively engage with the student competitors. Smile and be warm and friendly towards the students. Demonstrate your full interest and involvement in discussions with students and your Judge Team by refraining from distractions such as phone usage or side conversations. Also, encourage parents and coaches to allow the students to answer all questions during the pit interviews.

Focus on qualitative assessments over quantitative assessments. While Judges will consider objective factors as a part of the judging process, the decisions on judged awards ultimately must be based on qualitative deliberations. Judges, under the guidance of the Judge Advisor, should focus on qualitative judgements when reaching consensus on judged awards.

The Don'ts of Judging

Don't have a real or perceived conflict of interest. Judges should not judge or interview teams that they have any affiliation with. Judges can judge at an event where they have teams, but they must disclose this proactively to the Judge Advisor and provide this information on the Judge Sign-in Sheet. The Judge Advisor will ensure that any Judge with a potential conflict is screened off of judging any teams they should not interview, and the Judge with the conflict should refrain from any participation in deliberations of that team or teams for which they have a potential conflict.

Don't ask the students personal questions during pit interviews. Do not be alone with students. Always work with at least one other Judge and two or more students. Do not meet with teams in a private space.

Don't look back at other events to see what teams have already qualified to higher levels. Judged awards given at each event are to be given based on the judging at that event. The Judge Advisor and Judges must refrain from looking at which teams may have won awards at previous events or which teams have already qualified to a state/regional/provincial/national championship or VEX Worlds in deciding judged awards.

Don't take the rubrics or judging materials with you or give them back to the team or coaches. The judging process includes frank discussions about teams and the documentation relating to the judging process must be protected from disclosure. These documents and discussions must remain confidential and Judges should take precautions to ensure that these documents and discussions are not shared with or overheard by teams or other event participants.

Don't "share the wealth" by re-allocating judged awards based on performance awards. Judged awards must be decided based on the Judge Guide. Deliberations should be conducted during the last round of qualifying matches and concluded before the first round of VRC Finals matches or before VIQC Finals matches. Therefore, Judges should not know or look at which teams have won the Teamwork Champions Award (IQ), Tournament Champions Award (VRC) or Robot Skills Champion Award when deciding on judged awards. For example, Judges should not change which team is given the Excellence Award because a team won the Tournament Champions Award or Robot Skills Award. Judged awards and performance awards must be done independently. A team is allowed to win performance awards and one judged award at an event.

Don't give more than one judged award to a team at an event. No team shall be awarded more than one judged award at an event. Top teams often win robot performance awards (e.g., Robot Skills Champion) in addition to judged awards. Individual awards presented to adults, such as Volunteer of the Year Award, do not affect a team's eligibility for a judged award.

Don't let the Event Partner give input or be part of deliberations for judged awards. This does not apply to individual awards, like Volunteer of the Year or Sponsor of the Year, or to instances where there is a reported Code of Conduct issue.

Judging: Deliberations

Overview

Deliberations should begin during the last round of qualifying matches and conclude before the first round of VRC Finals matches or before VIQC Finals matches. Deliberate for the award recipients under the guidance of the Judge Advisor. It is important to get a copy of the match and skills rankings. Just before the last qualifying rounds begin, the Event Partner or Judge Advisor should print a copy of the Qualification Match Rankings and Skills Rankings for consideration during judging deliberations.

- Post or share your top ranked teams for each award as advised by the Judge Advisor. Typically, each Judge Team will post the top five teams for each award or 25% of the judged teams, whichever is greater. A white board, flip charts, or Post-it® notes may be used to post the top ranked teams underneath the award descriptions so they are visible to all Judges. Standard award descriptions are included at the end of the Judge Guide.
- Work cooperatively with other Judges to reach consensus on the award recipients. If the judges can't agree on which team should receive an award, then review and read the description of the award out loud, then look at the criteria for that award to help them make the decision. The Judge Advisor, time permitting, may send additional Judge teams out to cross-interview teams that are leading contenders for awards, especially the Excellence Award or Design Award.
- All deliberations should take place in the Judges Room. Deliberations include frank discussions about teams and are confidential. What is discussed in the Judges Room stays in the Judges Room. Only Judges are allowed in the Judges Room.
- Remove yourself from discussions involving affiliated teams or any teams that may present a conflict of interest.
- Share all questions or concerns with the Judge Advisor.
- Leave notes, rubrics, and all other judging materials with the Judge Advisor after deliberations. The Judge Advisor will destroy these materials as they are not to be returned to teams, the Event Partner, or anyone else.
- Do not discuss any judging or deliberations with any teams, the Event Partner, or anyone else. The judging process is confidential.

Judging Process for the Excellence Award

Step One

Judges complete the rankings for the Design Award following the Design Award Judging Process. The top contenders for the Design Award should be considered candidates for the Excellence Award.

Excellence Award candidates *should*:

- be at or near the top of the Design Award rankings;
- be ranked in the top 10 or top 30% of teams (whichever is larger) in qualifying rounds during the last round of qualification matches played;
- be ranked in the top 5 or top 20% of teams (whichever is larger) in Robot Skills (does not apply to VAIC-HS or VAIC-U);
- rank among the top teams in other judged awards;
- exhibit a high-quality team interview with the Judges;
- exhibit a high-quality robotics program;
- be student-centered, show positive team conduct and dynamics, sportsmanship, and professionalism.

Note: A team does not have to be among the Teamwork or Tournament Champions or Finalists to receive the Excellence Award but must be competitive in the qualification and skills rankings (skills rankings does not apply to VAIC-HS or VAIC-U).

Step Two

Judges use their best *qualitative* judgment based on observations and interactions with the teams to choose the team they believe best exemplifies the best overall robotics program at the event. Judges should ask themselves the following questions:

- Has the team met the criteria to be considered excellent?
- Does the team exemplify overall excellence?
- Would the Judges want the team to be emulated by other teams?
- Do the [Field Note to Judges](#) forms returned by event volunteers reflect the candidate's overall excellence?

Excellence Award at VEX Worlds

Key Criteria and Judging Process: The key criteria and judging process for the Excellence Award at VEX Worlds are the same as for local events and events that qualify teams directly to VEX Worlds. Online Challenges are not required to be eligible for the Excellence Award at VEX Worlds. However, Judges will consider Online Challenges as part of the overall team evaluation if they are submitted.

Prequalification: To be eligible for the Excellence Award at VEX Worlds, a team must have been awarded the Excellence Award at an event that qualifies teams directly to VEX Worlds during the current competition season. Eligible teams must submit their Engineering Notebook at VEX Worlds during the first day of check-in. Teams that have won the Excellence Award at VEX Worlds in the previous three years are not eligible for the Excellence Award at VEX Worlds. Eligible teams will be notified by email after the second weekend in March.

VEX U, VAIC-HS, VAIC-U: There are no prequalification requirements for the Excellence Award at VEX Worlds. Teams must submit their Engineering Notebook during the first day of check-in. Teams that have won the Excellence Award at VEX Worlds in the previous three years are not eligible for the Excellence Award at VEX Worlds.

Design Award at VEX Worlds

Key Criteria and Judging Process: The key criteria and judging process for the Design Award at VEX Worlds are the same as for local events and events that qualify teams directly to VEX Worlds.

Prequalification: To be eligible for the Design Award at VEX Worlds, a team must have been awarded the Excellence Award or Design Award at an event that qualifies teams directly to VEX Worlds. Eligible teams must submit their Engineering Notebook at VEX Worlds during the first day of check-in. Eligible teams will be notified by email after the second weekend in March.

VEX U, VAIC HS, VAIC-U: There are no prequalification requirements for the Design Award at VEX Worlds. Teams must submit their Engineering Notebook during the first day of check-in (Wednesday).

If No Teams Meet the Minimum Criteria for Design or Excellence Award

There may be circumstances where the Judges should not award the Design Award and by extension the Excellence Award to any team at an event. This may happen when either no teams submit an Engineering Notebook, or no Engineering Notebooks include the first three criteria of the [Engineering Notebook Rubric](#) (formerly page 1 of the Design Award Rubric). In either case, the minimum requirements for the Design Award and by extension the Excellence Award have not been met and therefore neither should be awarded to any team at the event.

The Event Partner must be notified as soon as possible if the Design Award or the Excellence Award will not be awarded at the event. The results of the event cannot be published until the Event Partner adjusts the award configurations for the event.

The objective in not awarding Design or Excellence under these circumstances is:

1. To avoid situations where only one or two teams turn in notebooks that consist of a title page and little more being recognized as Design or Excellence winners.
2. To avoid recognizing a team as excellent and worthy of emulation by other teams when no team has yet achieved at least the minimum level of excellence.

This is not meant to punish teams but rather to encourage them to improve. It is expected that these circumstances will be rare and only arise early in the season before teams have had time to organize themselves. If Judges decide not to award Design or Excellence, the Judge Advisor should make an event-wide announcement and remind teams that the Engineering Notebook Rubric and the instructions in the front of the supplied notebook may be used as guides to help teams develop their notebooks.

Finalizing the Judged Awards at an Event

After deliberations for judged awards have concluded, the Judge Advisor will record the results of all judged award winners. The Judge Advisor should be careful to accurately record the team number and letter (e.g., Team 123A) for each judged award. The Judge Advisor should promptly inform the Event Partner when judging has concluded.

The Judge Advisor will bring the judged award results to the Tournament Manager operator and oversee the entering of the judged awards into the competition software. Some events may provide a tablet or computer for the Judge Advisor to personally enter the results of the judged awards. If this is the case, ensure another Judge reviews the entries for accuracy.

Awards Presentation: Once the award winners are entered into Tournament Manager, the Judge Advisor should obtain award scripts from the Tournament Manager operator or Event Partner for each judged award. The Event Partner will decide when the judged awards are announced and will typically ask the Judge Advisor to make some general comments on the judging. Judges and the Judge Advisor may be asked to present awards at closing ceremonies.

Return the Engineering Notebooks to the teams: This is usually done by placing the notebooks on a table in the competition area before the finals matches begin and making announcements in the competition area and the pits for teams to pick up their notebooks. The Judge Advisor should ensure the emcee announces where and when the notebooks can be picked up.

Confidentiality: Collect all written judging materials, including Judges notes, Rubrics, awards worksheets, and so on. After the event, the Judge Advisor should shred or destroy all of these materials. Under no circumstances are any of these materials to be returned to teams, coaches or the Event Partner.

Feedback to Teams: We celebrate the student-centered experience of competitive robotics, for which judges serve a key role. However, Judges should be cautious in giving individual feedback to teams as the judging process must maintain confidentiality. Judges should not discuss deliberations, awards, or judging with teams during or after an event. These discussions are easily misinterpreted or misunderstood by students, coaches, mentors, and parents. Please refer any inquiries about the judging process to the Judge Advisor.



Standard Award Descriptions for Judges Room

Overview

The following pages contain VRC award descriptions for use by Judges in the judging room. They list key criteria for each award and are useful in guiding the Judges' deliberations.

Not all events will give out all awards. Each Judge Advisor should consult with their Event Partner to determine which awards will be given out at an event. The Judge Advisor may then print the award descriptions that will be used for a specific event.

Judge Advisors may wish to print these descriptions in color and then laminate them or place them in plastic sheet protectors for use at multiple events.

Excellence Award

is presented to a team that exemplifies overall excellence in building a high-quality robotics program. Team is a strong contender in numerous award categories.

Key criteria:

- Engineering Notebook must be submitted.
- Ranking for the Design Award.
- Ranking for Qualification Matches.
- Ranking for Robot Skills (does not apply to VAIC-HS or VAIC-U).
- Ranking for other judged awards.
- Quality of the team's interview.
- High-quality robotics program.
- Team conduct.



Design Award

is presented to a team that demonstrates an organized and professional approach to the design process, project and time management, and team organization.

Key criteria:

- Engineering Notebook must be submitted.
- Engineering Notebook demonstrates clear, complete, organized record of robot design process.
- Team demonstrates effective management of time, talent, and resources.
- Team interview demonstrates their ability to explain their robot design and game strategy.
- Team interview demonstrates effective communication skills, teamwork, and professionalism.



Judges Award

is presented to a team that is most deserving of special recognition.

Key criteria:

- Team displays special attributes, exemplary effort and perseverance at the event
- Team overcomes an obstacle or challenge and achieves a goal or special accomplishment at the event or at some time throughout the season
- Team distinguishes itself in some way that does not fit under other award criteria but nonetheless deserves special recognition
- Students demonstrate teamwork and effective communication skills



Innovate Award

is presented to a team with the most effective and efficient design process; a top contender for the Design Award.

Key criteria:

- Engineering Notebook is required
- Engineering Notebook is a clear, complete, and organized document of the design process
- Team demonstrates effective management of time, talent, and materials
- Students understand and explain how they developed an effective game strategy and robot design
- Students understand and explain the engineering design process
- Students understand and explain how they worked together to develop their robot



Think Award

is presented to a team with the most effective and consistent programming strategies and solutions to solve the game challenge.

Key criteria:

- Participation in the Programming Skills Challenge is required (does not apply to VAIC-HS or VAIC-U)
- Autonomous programming is consistent and reliable
- Programs are cleanly written, well documented, and easy to understand
- Team clearly explains the programming strategy used to solve the game challenge
- Team clearly explains their programming management process, including version history
- Students understand and explain how they worked together to develop their robot programming



Amaze Award

is presented to a team that has built the most consistently high scoring and competitive robot.

Key criteria:

- Robot design is consistently high scoring and competitive
- Robot construction is high quality
- Robot programming is effective, successful, and consistent
- Students understand and explain how they worked together to develop their robot



Build Award

is presented to a team that has built the most durable robot.

Key criteria:

- Robot construction is durable and robust
- Robot is reliable on the field and holds up under competition conditions
- Robot is designed attention to safety and detail
- Students understand and explain how they worked together to develop their robot



Create Award

is presented to a team who has built a robot that incorporates the most creative engineering design solution to the challenges of this season's game.

Key criteria:

- Robot design incorporates a creative design solution
- 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



Energy Award

is presented to a team that shows the most enthusiasm and excitement at the event.

Key criteria:

- Team maintains a high level of enthusiasm and excitement throughout the event
- Team exhibits a passion for robotics competition that enriches the event experience for all
- Students demonstrate teamwork and effective communication skills



Inspire Award

is presented to the most passionate and positive team at the event.

Key criteria:

- Team exhibits passion and positive attitude at the event
- Team exhibits integrity, and goodwill toward other teams, coaches, and spectators
- Students demonstrate teamwork and effective communication skills



Sportsmanship Award

is presented to a team that has earned the respect and admiration of the volunteers and other teams at the event.

Key criteria:

- Team is courteous, helpful, and respectful to everyone at the event, on and off the field
- Team interacts with others in the spirit of friendly competition and cooperation
- Students demonstrate teamwork and effective communication skills





Judges Note to Missed Teams

Dear Team Number _____,

We are sorry we missed you.

The Judges have come by to interview your team.

They will come back at _____

If you will NOT be available at this time please call _____

We were here at:

Date: _____ Time: _____



Judge's Note to Missed Teams

Dear Team number _____,

We are sorry we missed you.

The Judges have come by to interview your team.

They will come back at _____

If you will NOT be available at this time please call _____

We were here at:

Date: _____ Time: _____



Field Note to Judges

| | | | |
|--------------------|--|--------------|--|
| MATCH# | | DATE: | |
| TEAM Number | | | |
| TEAM Name | | | |
| School Name | | | |

| | | |
|--------------|--|------------|
| GREEN | Please tell the Judges what you have observed. This may be either positive feedback, which you want judges to know, or reporting a problem that you believe judges should be aware of during their confidential deliberations. | RED |
| | | |

| | | | |
|---|---|--------------|--|
| Referee Emcee Div. Manager | Print and sign full name: <hr style="border: 0; border-top: 1px solid black; width: 100%;"/> | TIME: | |
|---|---|--------------|--|



Engineering Notebook Rubric

Rubrics are strictly confidential; they are not shared beyond the Judges/Judge Advisor and shall be destroyed at the end of the event.

| |
|---|
| Team #: _____ |
| Program level: <input type="checkbox"/> Elementary <input type="checkbox"/> Middle <input type="checkbox"/> High or VEX U |
| Judges: _____ |

Directions: Write the points in each row for the criterion that best describes the performance of the Engineering Notebook on each topic. Total the points.

| | | Criteria | | | Points |
|--|---|--|--|---|--------|
| | | Expert <i>(4-5 points)</i> | Proficient <i>(2-3 points)</i> | Emerging <i>(0-1 points)</i> | |
| Topic | | | | | |
| Engineering Design Process | Identify game and robot design challenges and goals | Identifies the game challenge or robot design challenge <u>in detail at the start of each design process cycle</u> with words and pictures. States the goals for accomplishing the challenge. | Identifies the challenge at the start of each design cycle. <u>Lacking details in words, pictures, or goals.</u> | <u>Does not identify the challenge</u> at the start of each design cycle. | |
| | Brainstorm and diagram or prototype solutions | <u>Lists three or more possible solutions</u> to the challenge with labeled diagrams. Citations provided for ideas that came from outside sources such as online videos or other teams. | <u>Lists one or two possible solutions</u> to the challenge. No citations provided for ideas that came from outside sources. | <u>Does not list any solutions</u> to the challenge. | |
| | Select the best solution and plan | Explains why the solution was selected through testing and/or a decision matrix. <u>Fully describes the plan</u> to implement the solution. | Explains why the solution was selected. <u>Mentions the plan.</u> | <u>Does not explain why the solution was selected</u> or does not mention the plan. | |
| | Build and program the solution | Records the steps to build and program the solution. Includes enough detail that the reader <u>could recreate the solution following the steps in the Notebook.</u> | Records the key steps to build and program the solution. <u>Lacks sufficient detail to recreate the solution.</u> | <u>Does not record the key steps</u> to build and program the solution. | |
| | Test solution | <u>Records all the steps</u> to test the solution, including test results. | <u>Records the key steps</u> to test the solution. | <u>Does not record the steps</u> to test the solution. | |
| | Repeat design process | Shows that the <u>design process is repeated multiple times</u> to improve performance on an individual design goal or overall robot or game performance. | Shows that the <u>design process is not often repeated</u> for individual design goals or overall robot or game performance. | <u>Does not show that the design process is repeated.</u> | |
| | Usefulness and repeatability | <u>Records the entire design and development process</u> in such great clarity and detail that the reader could recreate the project's history and build the current robot from the notebook. | Records the design and development process completely but <u>lacks sufficient detail</u> to fully recreate the entire project or robot. | Does not record the design and development process or <u>lacks sufficient detail</u> to understand the design process. | |
| | Record of team and project management | Provides a <u>complete record of team and project assignments</u> ; a bound should be in ink; notes from team meetings including goals, decisions, and accomplishments; name or initials of author; each page numbered and dated. Design cycles are easily identified. Includes Table of Contents and/or Index so anyone can easily locate needed information. | Records <u>most of the information listed</u> at the left. Not written in ink. Organized so that team members can locate most of the needed information. | <u>Does not record most of the information</u> listed at the left. Not organized; needed information difficult to locate. | |
| | Notebook construction | Five (5) points if notebook is bound. If a Digital Engineering Notebook or a printed copy one, five (5) points if the entries contain a time stamp that can be confirmed. | Zero points for any other notebook. | Zero points for any other notebook. | |
| Describe a few of the best features of the Engineering Notebook: | | | | Total points for Engineering Notebook | |



Team Interview Rubric

Rubrics are strictly confidential; they are not shared beyond the Judges/Judge Advisor and shall be destroyed at the end of the event.

| |
|---|
| Team #: _____ |
| Program level: <input type="checkbox"/> Elementary <input type="checkbox"/> Middle <input type="checkbox"/> HS or VEX U |
| Judges: _____ |

Directions: Write the points in each row for the criterion that best describes the quality of the interview. Total the points.

| Topic | Criteria | | | Points |
|--|--|--|---|--------|
| | Expert <i>(4-5 points)</i> | Proficient <i>(2-3 points)</i> | Emerging <i>(0-1 points)</i> | |
| Design process and Engineering Notebook | Students clearly explain all aspects of the design process and how they recorded their use of the design process in the Notebook. | Students can explain most aspects of the design process and how they recorded their use of the process. | Students can explain only limited aspects of the design process and how they recorded their use of the process. | |
| Game strategies and robot designs | Students can describe <u>three or more</u> game strategies and robot designs that were considered; students can fully explain how and why the current game strategy and robot design were chosen. | Students can describe <u>two</u> game strategies and robot designs that were considered; students can explain how and why the current game strategy or robot design were chosen. | Students can describe <u>only their current</u> game strategy and design, or they cannot explain how and why the current game strategy or robot design were chosen. | |
| Project and team management | Students can explain <u>how team progress was tracked against an overall project timeline</u> , and how students were assigned to tasks based on their skills and availability; students can explain management of material resources. | Students can explain <u>how team progress was monitored</u> , or how students were assigned to tasks, or management of material resources. | Students <u>cannot explain how team progress was monitored</u> or how students were assigned to tasks or how material resources were managed. | |
| Teamwork and communication | Students can explain how <u>multiple team members contributed</u> to the robot design and game strategy. All students answer questions independently. | Students can explain how <u>most team members contributed</u> to the robot design and game strategy. Students support each other as needed to answer questions. | Only <u>one team member</u> answered questions or contributed to the robot design process. | |
| Respect and courtesy | Students answer respectfully and courteously. Students <u>make sure each team member contributes</u> . Students wait to speak until others have finished. | Students answer respectfully and courteously. Some <u>students attempt to contribute</u> but are interrupted by other students. | Students <u>do not answer respectfully</u> and courteously. Students interrupt each other or the Judges. | |
| Describe a few of the best features of the team interview: | | | Total points for Team Interview: | |
| | | | Total points for Engineering Notebook: | |
| | | | Total points for both rubrics: | |



Team Interview Tips and Sample Questions

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 interview the students.

- Help put the students at ease by asking them questions about their robot.
- Try not to ask yes or no questions. Encourage teams to elaborate on their answers.
- Be prepared to rephrase your questions. It is important to be mindful of differences in communication style. Also be mindful of students who do not speak the language you are using as their first language.
- Be aware of different age levels and approach students in an age appropriate way, especially when talking to younger students.
- Be sure all team members are present and include all team members in the interview.
- 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.
- Be attentive to students and do not engage in other conversations during interviews.
- Take a picture of each team with their robot so the license plate is visible. This will help you identify teams and robots during later during deliberations.
- Leave the [Judge's Note to Missed Teams](#) at the pit table for teams that you cannot locate.
- After interviewing the team, mark the pit sign or the team list to indicate the team has been interviewed.
- Did your team turn in an Engineering Notebook? When did you start making entries?
- What does your robot do and how does it score points?
- How did you develop this robot design?
- Which team members built the robot?
- 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? How do they operate in your autonomous mode? How do they operate in your driver-controlled mode?
- What problems did you have in working on your robot? How did your team solve them?
- If you had one more week to work on your robot, how would you improve it?
- Has your game strategy been effective? How and why?
- Tell us about your robot's programming. Autonomous mode? Driver control mode? Who did the programming?
- What were the challenges of this year's game that you considered before designing your robot? How did you design your robot to meet those challenges?
- How many subsystems does your robot have? Who was responsible for integrating them? (May be difficult question for VIQC students to answer.)