

### Overview

Thank you for your willingness to help make the VEX Robotics Competition a success. This document will serve as a guide to assist you during your time as a VRC Judge. Methods outlined in this guide are consistent with the judging process used at VEX Worlds. This resource exists to serve as a guide to 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.**

In this document, you will find:

- Common Judge responsibilities
- Judge Advisor position description
- A detailed description of common awards

### 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 that 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 (ie. High school students building robots for 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 such 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 Robotics Competition program. For this reason, Judges will consider all team conduct by students and/or adults when determining award recognition at VEX Robotics Competitions.

**The 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 the process at 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/](http://roboticseducation.org/event-partners/event-partner-resources-documents/)

**The Competition:** Robot matches take place on the competition floor in a 12' x 12' competition field. Rounds last 2 minutes, including a 15-second autonomous period, and are scored by referees. Teams typically have one practice round, and then qualification rounds, followed by the elimination rounds. The competition floor is a great place to see the teams in action and to evaluate how well their robots perform. Judges who spend time viewing the competition have the opportunity to validate statements made by teams during student interviews and discussions. Be certain to ask your Judge Advisor if there is time allocated for this activity. In addition, you can get a great idea of a team's sportsmanship, energy, and enthusiasm while observing teams on the competition field. For robot game details, please visit:

[roboticseducation.org/competition-teams/vex-robotics-competition/](http://roboticseducation.org/competition-teams/vex-robotics-competition/)

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

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

## Judge Responsibilities

Judges are in a position of trust at VRC 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 Design Award rubric.
- Review the Game Video, Game Description and/or the Game Manual at:  
[roboticseducation.org/competition-teams/vex-robotics-competition/](http://roboticseducation.org/competition-teams/vex-robotics-competition/)
  - Knowing the tasks that teams will be trying to complete is essential to evaluating their robots on a technical level.
- Review the event location, schedule, team list, and awards to be offered on the event posting at: [robotevents.com](http://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 if possible, and they should recuse themselves from deliberations involving their teams.

### **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.
- For large events that offer one or more Technical Awards or Other Judged Awards, use the VEX Awards Scoring Sheet to evaluate your discussions with teams.
- Conduct student interviews and discussions with teams in the appropriate area. This is usually done in the Team Pit Area. Please ask your Judge Advisor for additional information.
- If, after several visits to the team's pit area, you are unable to locate the team, leave a "Sorry we missed you" form 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 notes are not included on the 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 determine 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.

Judges should plan on attending and participating in the Opening and Awards Ceremonies. Remember to wear comfortable attire and shoes. Business casual is appropriate attire. Any Judge who is associated with a team at the event must ensure that the Judge Advisor is aware of the potential conflict of interest. Judges with conflicts are not disqualified from judging. However, they should avoid interviewing their own teams if possible, and they should recuse themselves from deliberations involving their teams and should not wear team shirts or other items associated with their teams.

## **Judge Training**

The Judge Advisor or Event Partner (EP) will arrange for some form of Judge training. Typically, this training will involve reviewing this guide, the current game, 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 EP for details.

Regular REC Foundation Judge training calls are open to all event partners, Judge Advisor, Judges, and Awards Coordinators. On each conference call, we will focus on lessons learned from previous events, preparing for upcoming events, share “best practices”, and answer any questions. These conference calls can serve as a resource to train and prepare, please feel free to join us!

Schedule Of Judge Training Calls			
Date	Time	Date	Time
Sept. 8, 2016	6:00 PM Eastern	Dec. 8, 2016	6:00 PM Eastern
Sept. 8, 2016	9:00 PM Eastern	Dec. 8, 2016	9:00 PM Eastern
Oct. 13, 2016	6:00 PM Eastern	Jan. 12, 2017	6:00 PM Eastern
Oct. 13, 2016	9:00 PM Eastern	Jan. 12, 2017	9:00 PM Eastern
Nov. 10, 2016	6:00 PM Eastern	Feb. 9, 2017	6:00 PM Eastern
Nov. 10, 2016	9:00 PM Eastern	Feb. 9, 2017	9:00 PM Eastern

Please reference VEX Robotics Competition email blasts for additional call-in information. To access these calls, please dial **(855) 212-0212** and use access code **878-304-944**. Additionally, specific call-in information may be found by visiting: [roboticseducation.org/volunteers/volunteer-resources/](http://roboticseducation.org/volunteers/volunteer-resources/).

If you have specific topics or questions that you want addressed, please send an email to [tarek@roboticseducation.org](mailto:tarek@roboticseducation.org) ahead of the call.

## Judging Schedule

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

The sample schedule to the right is for a tournament with 24-36 teams. The Event Partner and Judge Advisor consider the number of participating teams when recruiting judges and setting the schedule.

**Please note:** Scripts are now generated by Tournament Manager. Judges simply need to fill in the team number on the awards tab in Tournament Manager and use the program to print out completed scripts for the awards ceremony.

## 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 Judges for the event.

Sample Schedule	
7:30 – 8:00	Judge Advisor reviews training materials, makes assignments
8:00 – 9:45	Judges arrive, receive training, review Engineering Notebooks, and begin interviews for assigned teams
9:45 – 10:00	Attend Opening Ceremonies
10:00 – 11:30	Teams of Judges complete initial interview of assigned
11:30 – 12:00	Return to judging room and each panel of Judges identifies their top candidates for each award. (Use post-it notes to list teams)
12:00 – 1:00	Lunch Break -Initial deliberation on top candidates for awards
1:00 – 2:00	Judges observe teams in pit area and on field, and return to competition field to do follow up interviews and observation as necessary to complete rank ordering for each award category. If possible, all Judges should have an opportunity to visit with top contenders for each award
2:00 – 3:00	Judges return to Judge room to conduct final deliberations and determine award winners.
3:00 – 3:30	Enter team numbers for all award winners into Tournament Manager. This should be completed no later than quarter-finals.
3:30 – 6:00	Attend finals and award ceremony (speak to your Judge Advisor if you have other obligations that require you to leave).

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](http://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 have the option of sharing the completed Design Award rubrics with teams after the event. If the rubrics will be shared with teams, the Judge Advisor must ensure that all feedback included on the completed rubrics is positive and encouraging to teams. If the rubrics will not be shared, 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 is a list of suggested materials for the Judge Advisor and Judges to use on event day. Judging documents are available at:

[roboticseducation.org/event-partners/event-partner-resources-documents/](http://roboticseducation.org/event-partners/event-partner-resources-documents/)

- Judge Guide (this document)
- Awards Appendix D
- Design Award Rubrics (one per team)
- VEX Awards Scoring Sheet (one per team if Other Judged Awards are offered)
- Student Interview and Discussion Tips – one copy per judge (attached)
- List of Judges
- List of awards to be offered at the event
- List of teams (provided by EP)
- Match schedule (provided by EP)
- Map of the event/pit area(if available)
- Event Program (if available)
- Awards Ceremony Scripts (these can be printed from Tournament Manager).
- Standard Award Descriptions for the Judges Room to be posted
- Clipboards and pens
- Post-it notes, marking pens & highlighters
- Transparent tape and/or painter’s tape
- Tables for Judge Advisor, judging materials, and judge deliberation

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

VRC Trophy Packs		
Qualifying Event Trophy Pack	Additional Trophy Pack	Championship Event Trophy Pack
Trophies Included: (7) 10" Trophies	Trophies Included: (5) 10" Trophies	Trophies Included: (7) 12" Trophies
Award Plates Included: (1) Excellence (3) Tournament Champion (1) Design (1) Judges (1) Robot Skills Champion (1) Volunteer of the Year (8) Date Plate  <b>Note:</b> Event Partners receive this trophy pack free as part of the <b>VRC Event Support Bundle</b> .	Award Plates Included: (3) Tournament Finalist (1) Amaze (1) Think (5) Date Plate	Award Plates Included: (1) Excellence (3) Tournament Champion (1) Design (1) Judges (1) Robot Skills Champion (1) Volunteer of the Year (8) Date Plate  <b>Note:</b> This pack is available for state/provincial/regional/national championship events.

Trophies may also be ordered individually at [vexrobotics.com/iq-trophies.html](http://vexrobotics.com/iq-trophies.html).

## Awards Overview

Awards are to be spread as equitably as possible among the teams, with no team winning more than one judged award, if possible. A team should only win additional awards if they are for robot performance (Tournament 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/](http://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 that 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:

Award Name	Award Description
Excellence Award	Top All Around Team (Robot Performance & Judged)
Tournament Champion Award	Each Team on Winning Alliance (2 or 3 teams) (Robot Performance)
Design Award	Team with a professional design approach
Robot Skills Champion Award	Top Combined Programming & Driving Skills Challenge Team (Robot Performance)
Judges Award	Recognition from Judges for special accomplishments

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 Robotics Competition. This award is presented to a team that exemplifies overall excellence in building a high quality VEX robotics **program**. This team is a strong contender in numerous award categories. Excellence winners must have an engineering notebook. Key criteria:

- Design Award ranking
- Tournament Qualification Matches ranking
- Robot Skills Challenge ranking
- Other Judged Award rankings
- High quality VEX robotics program

Some events may offer two Excellence Awards, one for the top overall Middle School team and one for the top overall High School team, if they have at least ten (10) teams in each group.

A team does not have to win the competition to receive the Excellence Award, but must at least be competitive in the Judge's rankings.

### 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 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)
- 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 Robotics. 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	QR Ranking (2) ONE point possible	RS Ranking (3) ONE point possible	Judge Ranking (4) 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 **QR Ranking** point is earned for finishing in top 8 of qualifying matches (one point available)
3. 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)
4. **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/](http://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 may include a team's behavior, sportsmanship, and professionalism at the event. A team is composed of students, mentors, and adults at the competition.

## Excellence Award at VEX Worlds

At VEX Worlds, only teams that have submitted at least two different VEX Online Challenges, have won an Excellence Award at an official event during the current competition year, have signed up for an Excellence Award interview, and have submitted their Engineering Notebook will be considered for the Excellence Award.

Please note that at VEX Worlds if an individual team from a school or organization receives the Excellence Award, then the award is given to the entire organization, not just the single team. Each qualified team will be given a single Excellence Award Interview slot. Schools or organizations with more than one eligible team will be given one Excellence Interview slot. Teams may sign up for Excellence Award interviews at: [robotevents.com/vexawards/](http://robotevents.com/vexawards/) from **February 1, 2017 until March 20, 2017**. Failure to meet this deadline will make the team ineligible for Excellence at VEX Worlds 2017.

## Design Award

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. Only teams that submit Engineering Notebooks are eligible for the Design Award. Key criteria:

- Engineering Notebook is a clear, complete document of the team's design process
- Team is able to explain their design and strategy throughout the season
- Team demonstrates personnel, time and resource management throughout the season
- Teamwork, interview quality, and team professionalism

## VRC Design Award Rubric

Judges will use the attached Design Award Rubric to evaluate the teams' performance on the award criteria. The first page of the Design Award Rubric is used to evaluate the quality of a team's Engineering Notebook. The second page of the rubric is then used to evaluate the students' understanding and application of an effective robot design process, as demonstrated in their team pit interview and discussion with Judges. The Design Award Rubric is also available as a separate file at: [roboticseducation.org/event-partners/event-partner-resources-documents/](http://roboticseducation.org/event-partners/event-partner-resources-documents/)

## Engineering Notebooks

One of the primary missions of the VEX Robotics Competition 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 Robotics Competition 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.

Each notebook is created through a concerted effort by a team to document their design decisions. Large events may send a Design Award winner as well as the Excellence 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 so that it can serve as a historical guide of lessons learned and best practices. Students should include a number of items in their Engineering Notebook including: a table of contents, team meeting notes, design concepts and sketches, pictures, notes from competitions, team members' observations and thoughts, team organization practices, and any other documentation that a team finds useful. The team should also document their project management practices including their use of personnel, financial, and time resources.

## Judging Engineering Notebooks

The Robotics Engineering Notebook provided by the REC Foundation with team registrations includes hints on good notebook practices and gives examples of good practices. A bound quad-ruled notebook is best. 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.

## Design Award at VEX Worlds

At VEX Worlds, only teams that have previously won an Excellence or Design Award at an official qualifying event will be eligible to submit an Engineering Notebook for review by the Judges. Teams will submit their Engineering Notebooks at check in. The notebooks will be reviewed using the first page of the Design Award Rubric. Teams with high quality Engineering Notebooks will be selected for follow up student interviews and discussions in the Team Pit Areas. Judges will complete the second page of the Design Award Rubric following each interview. Judges will use the completed Rubrics to help determine the design Award winners. Teams are not given scheduled sit down interviews for the Design Award at VEX Worlds. Teams may sign up to submit their Engineering notebooks at Worlds at: [robotevents.com/vexawards/](http://robotevents.com/vexawards/) from **February 1, 2017 until March 20, 2017**. Failure to meet this deadline will make the team ineligible to submit a notebook at VEX Worlds 2017.

## Other Judged Awards

For descriptions and criteria on all awards, please see **VRC Awards Appendix D** at: [roboticseducation.org/competition-teams/vex-robotics-competition/](http://roboticseducation.org/competition-teams/vex-robotics-competition/)

For an understanding of judging at Worlds, please reference the **VEX Worlds Judge Handbook** at: [roboticseducation.org/event-partners/event-partner-resources-documents/](http://roboticseducation.org/event-partners/event-partner-resources-documents/)

Not all awards will be offered at all events. Please check the event listing on [robotevents.com](http://robotevents.com) or consult your tournament organizer or Judge Advisor to confirm which awards will be offered at your event. The following is a list of awards commonly offered at local qualifying events.

Quick Reference Guide for Other Judged Awards	
<b>Amaze</b>	Team with an amazing, well rounded and top performing robot
<b>Build</b>	Team with a well-crafted robot
<b>Create</b>	Robot with a creative engineering solution
<b>Energy</b>	Team with extraordinary enthusiasm
<b>Innovate</b>	Team that exemplifies thinking outside of the box and innovative engineering design
<b>Judges</b>	Team that deserves special recognition for efforts leading up to, and during, the event
<b>Sportsmanship</b>	Team that is extremely courteous and most enthusiastic throughout the event
<b>Think</b>	Team with an impressive and effective autonomous programming

Most of these awards are Judged using the VEX Awards Scoring Sheet, which is available at [roboticseducation.org/competition-teams/vex-robotics-competition/](http://roboticseducation.org/competition-teams/vex-robotics-competition/).

## Award Description and Criteria for Other Judged Awards

The **Amaze Award** is presented to a team that has built an amazing, high-scoring and competitive robot that clearly demonstrates overall quality.

Key criteria:

- Robot design is consistently high-scoring and competitive
- Robot demonstrates a solid mechanical design and is robustly constructed to fulfill designed task
- Robot programming and autonomous mode are consistently effective and successful
  - Integration of sensors for use in both autonomous and tele-operated mode
- Teamwork, interview quality, and team professionalism

The **Build Award** is given to a team that has built a well-crafted and constructed robot that also shows a clear dedication to safety and attention to detail.

Key criteria:

- Robot construction is of professional quality; robust, clean and elegant use of materials
  - Solid construction (robot doesn't "wobble")
  - Robust drive train and mechanisms
  - Subsystems cleanly integrated, thought out and purposeful
- Robot efficiently uses mechanical and electrical 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
- Teamwork, interview quality, and team professionalism

The **Create Award** is earned by a team that has a robot design that incorporates a creative engineering solution to the design challenges of this season's game.

Key criteria:

- Robot is a well-crafted, unique design solution, demonstrating creative thinking
- Team has demonstrated a highly creative engineering design process and methodology
- Team has committed to ambitious and creative approaches to playing the game
- Teamwork, interview quality, and team professionalism.

The **Energy Award** is based on team enthusiasm displayed at the event. The winning team will demonstrate boundless passion and energy throughout the competition – in the pit area, on the field, and in the audience, even when their robot is not playing.

Key criteria:

- Team maintains a high level of excitement and energy throughout the event
- Team's passion for competition and robotics enriches the event experience for others
- Teamwork, interview quality, and team professionalism

The **Innovate Award** is presented to a team that has demonstrated a strong combination of ingenuity and innovation in designing their VEX robot. This award will typically recognize a specific, unique piece of engineering that exemplifies thinking outside of the box and innovative engineering design. This robot feature should also be a part of the engineering design solution that solves the complex problems presented by the VRC game.

Key criteria:

- Robot design demonstrates an ingenious and innovative piece of engineering
- Innovative feature is soundly crafted and is an effective solution to a design problem
- Innovative solution is integrated as a part of an overall well-crafted robot
- Students understand and explain why the innovative feature was necessary
  - The award is not meant to recognize innovation for the sake of innovation, rather innovation for the sake of excellence
- Teamwork, interview quality, and team professionalism

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.

The **Sportsmanship Award** is presented to a team that has earned 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 treats others on the playing field in the spirit of friendly competition and cooperation
- Team demonstrates respect and willingness to help to event staff and spectators
- Team demonstrates excitement and enthusiasm throughout the event

The **Think Award** is presented to a team that has successfully utilized autonomous programming modes 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
- Team's autonomous code is consistent and reliable
  - Use of advanced programming techniques and/or sensors to control motion
  - Multiple autonomous modes
  - A simple mode which works consistently is preferred over a jaw dropping mode which only works occasionally
- Teamwork, interview quality, and team professionalism

The **Volunteer of the Year Award** is presented to an individual who demonstrates a commitment and devotion to their community, putting in many hours of hard work with persistence and passion to help make the event happen. In most cases, the local organizing committee or the event partner will choose the winner of this award.

### Student Interview and Discussion Tips

- Review the Engineering Notebooks and complete the appropriate section of the Design Award Rubric before meeting with teams.
- Be prepared to re-word your questions if you find that the team is struggling to understand or answer.
- Try not to ask questions that allow the teams to answer with a yes or no, and encourage the teams to elaborate on their answers.
- The students may be nervous. A tournament can be a stressful experience. Asking them questions about their robot can help to put them at ease.
- Judges need to talk to students, not adults. Occasionally enthusiastic adults will want to answer a Judge's questions. In this case, the Judge should politely remind the adult that Judges are there to talk with the students and that input from adults is not considered.
- When talking to young children, take a knee and smile. This will get you on the students' level and help make them comfortable.
- Try to include as many student team members in your interview 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. Try to leave each team with a positive feeling about their performance at the event.
- 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 provided "sorry we missed you" note in the pit area for teams that you have trouble locating.
- 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.

### Sample Questions

Getting the students talking is sometimes a harder task than it may seem. Here are some standard questions that are typically effective in helping to get students to express themselves:

- Tell me about what your robot does and how?
- What part of your robot are you most proud of? Why?
- 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?
- Has your approach to the game been effective? Why do you think your approach to the game has been effective?
- What does your robot do in autonomous mode? Who programmed it?
- What makes your robot effective at playing this year's game?
- Did you use any sensors? What are they used for? How do they operate in your autonomous mode? How do they operate in your teleoperated mode?
- Based on your robot's performance so far, what would you like to improve?
- Were there any other robots that inspired your robot design?
- How many subsystems does your robot have? Who was responsible for integrating them?



# Design Award Rubric

Team # _____
Judges _____



For Design Award details, review the Awards Appendix on [roboticseducation.org/competition-teams/vex-robotics-competition/](http://roboticseducation.org/competition-teams/vex-robotics-competition/)

**Directions:** Mark the descriptor that best describes the team’s performance for each criterion. Write the best features of the team’s Engineering Notebook and Student Interview and Discussion on the back of this page.

Engineering Notebook: The notebook...		See Student Interview and Discussion Criteria on Next Page		
Criteria	Expert (3 points)	Proficient (2 points)	Emerging (1 point)	Points
<b>Design Process: Challenge</b>	Describes the challenge at the beginning of the notebook with words and pictures and states the teams’ goals toward accomplishing that challenge.	Identifies the challenge at the beginning of the notebook.	Neglects to clearly identify the challenge.	
<b>Design Process: Brainstorming</b>	Generates an extensive list of possible approaches to the challenge with labeled diagrams.	Provides an extensive list of possible approaches to the challenge.	Contains a very short list or does not list the results of the brainstorming sessions.	
<b>Design Process: Select Approach</b>	Explains why the selected approach was chosen and why the other alternatives were not chosen.	Explains why the selected approach was chosen.	Does not document why the team selected the approach they did.	
<b>Design Process: Build &amp; Program</b>	Records the building and programming process in such detail that someone outside the team could recreate the robot by following the steps in the notebook.	Documents the key steps in the process of building and programming.	Seems to skip some important steps in the process of building and programming the robot.	
<b>Test &amp; Redesign</b>	Describes in great detail the process of troubleshooting, testing, and redesigning through all iterations (cycles) of the process.	Captures the key results of the troubleshooting, testing, and redesign cycle.	Leaves out important information about the troubleshooting, testing and redesign cycle.	
<b>Usefulness</b>	Is such a detailed account of the team’s design process that the reader could recreate the project’s history. It is a useful engineering tool. It contains evidence that team made decisions about design process based on previous entries. The team can explain why the notebook is organized the way it is.	Is a complete record of the process, documenting the key events of each work session. It is organized in a way that any team member can locate needed information.	Is missing, or lacks the detail needed for the reader to understand the team’s history, and/or is not organized in a way that an outsider can make sense of it.	
<b>Resources</b>	Shows the team’s efficient use of time with an overall project timeline. The team uses checkpoints to help them know how well they are staying on schedule and readjusts their schedule as needed. The notebook illustrates the good use of human resources by assigning members roles based on their strengths.	Documents the team’s efficient use of time with planning and goal-setting for each day’s session. It shows that the team used its human resources wisely by assigning members specific tasks.	Does not provide evidence of the team’s wise use of the team’s time or talents.	
<b>Teamwork</b>	Provides evidence that all team members were consistently involved in the process, that individual team members were self-directed enough to finish what needed to be done, and that all team members consistently shared ideas and respectfully considered each other’s input.	Shows that all team members’ were involved in the process, that members could be counted on because they did what they were supposed to, and that the whole team shared ideas and supported ideas of others.	Suggests that perhaps some team members did most or all the work, that one or more individuals had to be nagged or reminded to do their work, and/or that some team members did not contribute ideas or that their ideas were not considered.	



# Design Award Rubric

Team # _____
Judges _____



Student Interview and Discussion: During the interview...		See Engineering Notebook Criteria on Previous Page		
Criteria	Expert (3 points)	Proficient (2 points)	Emerging (1 point)	Points
<b>Design Process</b>	Students describe the goals of the design process and how the team accomplished the challenge.	Students provide possible goals of the design process but do not clearly identify how team accomplished the challenge.	Students neglect to identify any goals of the design process and cannot describe how the team accomplishes the challenge.	
<b>Design: Methods &amp; Strategies</b>	Students describe multiple design methods and strategies considered; explaining both how and why the current design strategy was selected	Students only describe their current design methods and strategy; explaining only one of either how or why the current design strategy was selected	Students do not describe any of the design methods or strategies considered; do not explain why or how the current design strategy was selected	
<b>Team Work: Contributions</b>	Students explain how each team member contributed to the design and strategy.	Students explain how some team members contributed to the design and strategy.	Students only explain how 1-2 members contributed to the design and strategy.	
<b>Interview: Individual Contributions</b>	All students independently answer the Judges' questions.	Students support each other as needed to answer the Judges' questions.	Students rely on one or two members to answer all the questions.	
<b>Interview: Professionalism</b>	Students present their answers in a respectful and courteous manner to the Judges and other team members, making sure each team member has a chance to contribute and waiting to speak until the other person has finished.	Students present their answers in a respectful and courteous manner to either the team members or the Judges.	Students do not present themselves in a respectful and courteous manner.	
		<b>Total the number of points earned from Student Interview and Discussion:</b>		
		<b>Total the number of points earned from Notebook:</b>		
		<b>Total the number of points combined:</b>		

The REC Foundation thanks Northeastern State University, Oklahoma teacher training program for developing this rubric.

**Comments:** \_\_\_\_\_

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