



Awards and Judging Policies

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Section 1 BEST Award Guidelines

The BEST Award is presented to the team that best embodies the concept of *Boosting Engineering, Science, and Technology*. This concept recognizes that inclusiveness, diversity of participation, exposure to and use of the engineering process, sportsmanship, teamwork, creativity, positive attitude and enthusiasm, and school and community involvement play significant roles in a team's competitive experience and contribute to student success in the competition beyond winning an award.

In accordance with the BEST philosophy, **materials submitted by teams must be the work of students**. The involvement of student peers in auxiliary roles to support a school's official BEST team with the documentation – i.e., journalists, photographers, artists, musicians – is encouraged.

Space constraints at each regional championship site will determine the number of teams that can compete for the BEST Award at the championship (check with the specific guidelines published by each regional championship). In order for a team to be eligible to compete for the BEST Award at any of the regional championships, the team: (1) must have placed in the top 3 teams in the BEST Award judging at their local hub competition, and (2) must agree to compete in all five of the BEST Award categories at the regional championship.

1.1 Judging Evaluation and Criteria

Evaluation of competitors will be based on the criteria outlined in these guidelines. An evaluation score of a total possible 100 points will be composed of the following:

Category I - Engineering Notebook (mandatory for ALL teams)

Category II - Marketing Presentation (at hub's discretion for BEST Award inclusion)

Category III – Team Exhibit and Interviews (at hub's discretion for BEST Award inclusion)

Category IV - Spirit and Sportsmanship (mandatory for BEST Award)

Category V - Robot Performance (mandatory for BEST Award)

Hubs are required to judge at least four of the above five categories using one of the following scenarios:

Scenario 1: (preferred)

Judging Category	Point Value
Engineering Notebook	30 points
Marketing Presentation	25 points
Team Exhibit and Interviews	20 points
Spirit and Sportsmanship	10 points
Robot Performance	15 points

Total 100 points

Scenario 2:

Judging Category	Point Value
Engineering Notebook	30 points
Marketing Presentation	25 points
Spirit and Sportsmanship	10 points
Robot Performance	15 points

Scenario 3:

Judging Category	Point Value
Engineering Notebook	30 points
Team Exhibit and Interviews	20 points
Spirit and Sportsmanship	10 points
Robot Performance	15 points

Total 75 points

1.2 Judging Procedure

- A distinguished team of judges from private and public sectors with technical and non-technical expertise will evaluate teams. Judges will serve on a rotation schedule.
- As each team completes a category, it will be assigned a category score that is the average of individual scores of the judges reviewing it.
- Teams should know in advance that scores among many teams frequently differ by only fractions of a point.

1.3 Judging Results

- Each team advancing to the regional championship will be provided with a copy of its score sheets following their local competition. Score sheets of non-advancing teams will be provided upon request.
- Teams advancing to the regional championship can use judges' comments to make improvements as they wish subject to the schedule restrictions of the regional championship (e.g., Engineering notebook due dates).

1.4 BEST Award Recognition

The teams ranked first, second, and third in the BEST Award judging will receive trophies superior to the teams finishing first through third in the Head to Head robot competition.

1.5 Category I: Engineering Notebook (30 Points)

1.5.1 Notebook Requirements

- ALL participating teams are required to submit an Engineering Notebook at both the local competition and the regional championship following the requirements stated herein. All notebooks will be evaluated on a 30-point scale.

- For competitions having 32 or fewer total teams, the notebook scores of all teams will be used to determine which 4 teams earn a chance to participate in the single “wildcard” match. The winning wildcard team will be one of eight total teams that advance to the semifinals phase.
- For competitions having greater than 32 total teams, the notebook scores of all teams will be used to determine which 8 teams earn a chance a chance to participate in one of the two “wildcard” matches. The two winning wildcard teams will be two of sixteen total teams that advance to the semifinals phase.
- The purpose of the notebook is to document the process the team used to design, build, and test their robot.
- The notebook may be delivered in electronic format (PDF only) or in physical format as determined by the local hub and regional championship.

NOTE: The preferred delivery format is electronic (PDF). Please see the ***Awards and Judging – Hub Logistics*** document for the specified format and information on when and how the notebook is to be submitted.

- The notebook must meet the following specifications:
 - All physical notebooks must be submitted in a *standard* 3-ring binder with a maximum 2” ring size
 - A cover sheet / title page must identify the school, team name, teacher contact, and team number
 - 32 typed **single-sided** pages or less (note that title/cover page and Table of Contents page(s) will not be counted as part of the 32 pages)
 - Standard, 8 ½” x 11” paper, double-spaced, 1” margins, and Times New Roman (preferred) or similar business-style font no smaller than 12 pt. Single-spacing is acceptable in tables and outlines.
 - Teams may include a supplemental appendix of no more than 20 double-sided sheets (40 total pages) of information. The appendix may include support documentation such as drawings, photos, organization charts, minutes of team meetings, test results, etc. *This material should directly support the process described in the primary document and NOT reflect activities related to community or promotional efforts, spirit development, or team-building.*

1.5.2 Notebook Evaluation

- The notebook will be judged on the documentation of the team’s:
 - ***Implementation of the Engineering Design Process***
 - Evidence that the engineering process was effectively used.
 - ***Research Paper***

- Correlation between the current year’s game theme and how related technological practices or scientific research is being used at a company/industry/research lab in the team’s state or region; Any information related to the game theme, such as history, famous inventor(s), or major milestones; Creativity in linking the game theme to appropriately related science/technology content; Proper use of grammar and composition throughout the paper; citations of sources used to gather information for the paper
- The research paper must be a minimum of 2 pages and maximum of 5 pages (of the allotted 32 pages)
- **Brainstorming Approaches**
 - How well organized and productive was the brainstorming approach used? How well was the brainstorming approach documented?
- **Analytical Evaluation of Design Alternatives**
 - Use of analytical and mathematical skills in deciding upon and implementing design alternatives
- **Offensive and Defensive Evaluation**
 - Analysis of the gaming strategies and design elements used to achieve specific team goals
- **Software Design & Simulation**
 - Evidence of custom software design versus using the default robot program
 - Evidence that a software design process was followed
 - Demonstration of design of functionality applicable to the defined task
 - Evidence of use of software simulation (e.g., Simulink, virtual worlds, etc.) to verify the correct operation of the robot program
 - Evidence that good software design practices, testing/debugging techniques and efficiency and portability were all considered
 - **Award Given for this Component (see Section 2 for more information).**
- **Safety**
 - Evidence that safety training occurred and safe practices were followed to prevent students’ misuse of tools and other devices/equipment that may result in personal injury or damage to property
- **Support Documentation**
 - CAD /other drawings, photos, organization, team minutes, test results, etc. that support the main document
- **Overall Quality and Completeness of Notebook**
 - Organization, appearance, adherence to specifications, quality of content

1.6 Category II: Marketing Presentation (25 Points)

For the marketing presentation, the team should view themselves as employees of a “company” that is marketing their “product” (robot) to potential buyers/investors (judges). This marketing team is an integral part of the engineering team that has designed a specialized robot. The marketing presentation

should provide information about their company, the engineering team involved in the design and construction of the product, and why their product is the best one on the market that can complete the assigned task. The potential buyers/investors will be assessing the following:

- The company's demographics, budget, and operations (e.g., company structure and operations, evidence of diversity of employees, evidence of budget that includes sponsorship and expenditures, etc.)
- The company's design and manufacturing process (engineering process of "design to market", including a discussion on the advantages of your company's robot design)
- Marketing strategies to promote the product (e.g., school and community involvement, promotional efforts, etc.)
- The company's use of technological resources to accomplish the task (e.g., CAD, programming tools, computer simulations, diagnostic tools, web page development, presentation software, etc.)
- Overall quality of presentation, including adherence to guidelines for this category

Each BEST Award team will sign up for a presentation time to occur at a time designated by the local hub or regional championship.

1.6.1 Marketing Presentation Guidelines

- A minimum of 4 and maximum of 8 students should actively participate in the presentation.
- At the discretion of the hub or regional championship, an audience may be allowed to quietly observe the presentations. The size of the allowed audience is space-dependent and up to each hub to determine.
 - If a hub does choose to allow an audience during the presentations, it is recommended that each presentation room have an official room monitor (not a judge) to ensure that the presentation team is not being disturbed or coached by audience members.
 - Audience members are not allowed to speak or ask questions during the Q & A period.
- Adults are not allowed to participate, including setting up or taking down equipment for the presentation.
- Representation by student presenters from more than one grade level is encouraged and will be considered in the evaluation as part of the team's recruitment efforts.
- Videotaping/photographing by team representatives will be allowed during the presentation, however, the person(s) handling videotaping will be counted in the 8 maximum students allowed.
- The presentation format is the prerogative of the team.
- The team must provide any equipment it wishes to use, or check with the local hub for information about what equipment can be provided.

1.6.2 Marketing Presentation Logistics

- There will be a check-in station in the general area of the presentation rooms.
- Teams should check in prior to their time slot.
- The order and breakdown for the 25-minute presentation time period is as follows:
 - *5 minutes*: Set-up
 - *12 minutes*: Presentation
 - *5 minutes*: Q&A with judges
 - *3 minutes*: Break-down and clear room

Note: Teams not requiring set-up or break-down time may utilize that time for their presentation (for a total presentation time of up to 20 minutes).

- At least five minutes will be scheduled between presentation sessions to allow judges time to confer without the team present.
- The local hub or championship will provide event-specific information (times, locations, etc.). Refer to the **2016 Awards and Judging – Hub Logistics** document for these additional details.

1.6.3 Marketing Presentation Evaluation

- Presentations will be evaluated with consideration of:
 - **Company Demographics, Budget & Operations**
 - Well-defined roles as company employees/owners/managers; methods of company decision-making; organization of company departments for product development; company demographics; evidence of budget including sponsorship and expenditures
 - **Design and Manufacturing Process (Engineering Design Process)**
 - Brainstorming approaches; game strategy evaluation; analytical evaluation of design alternatives; effective implementation of the engineering process
 - **Marketing Strategies**
 - Publicity efforts to inform school and community of company's product (e.g. school newsletters, presentations to community and/or school groups, fliers/brochures, posters, press releases, commercials, etc.)
 - **Use of Available Technology**
 - CAD or other drawings; software programming and simulation; Web page development, computer simulations, use of presentation software
 - **Quality of Presentation**
 - Well organized and prepared; met required specifications; communication skills and professionalism; achieved goal of marketing company's robot; creativity of format; quality of question and answer session with judges

1.7 Category III: Team Exhibit and Judges Interview (20 Points)

- The purpose of the exhibit and interviews category is to creatively:
 - a. Communicate an understanding of the game theme
 - b. Demonstrate how the team has promoted community awareness about BEST in the school and their community

1.7.1 Exhibit and Interview Guidelines

- Refer to the **2015 Awards and Judging – Hub Logistics** document for standard table size at your local hub competition and availability. At regional championships, each team will be provided with a standard six-foot long table (approximately 29 inches wide) upon request.
- An 8' X 8' X 8' exhibit space will be allocated per team at your local hub and the regional championships. All exhibit content must remain within the defined exhibit area.
- Skirting for the table will not be provided.
- Each team should bring one extension cord and one power strip for any electrical needs. Refer to the **2016 Awards and Judging – Hub Logistics** document for possible electricity and electrical limitations at your local hub competition.
- Teams are encouraged to avoid using expensive store-bought display boards and structures and opt for more creative and hand-made exhibit props.
- Any audio-visual equipment needs and extra extension cords will be the responsibility of the team.
- Each team is responsible for the security of its own material.
- Each team is also responsible for breakdown of its team materials and clean-up of its exhibit area following the awards ceremony on Game Day.
- All material should be clearly marked with the appropriate identification and contact information.
- Refer to the **2016 Awards and Judging – Hub Logistics** document concerning when and where team exhibits can be set up at your local hub competition.
- As a general rule, candy and other food and drink items are not permitted at exhibits as complimentary handouts. Refer to the **2016 Awards and Judging – Hub Logistics** document concerning specific rules for your local hub competition.
- During the designated interview time, at least one student representative from the team must be present who is able to respond to informal questions asked about the exhibit. In addition, student representatives should be aware that judges may ask questions concerning robot design and construction. These questions will be part of the interview evaluation of the team.
- Teams should expect to be visited by three to four different judges during this period.

- Judges may also interview team members in the pit area and in the seating area.

1.7.2 Exhibit and Interview Evaluation

- **Exhibits** (13 points) will be evaluated on:
 - Sharing information and/or technology resources, and mentoring other schools, including other BEST teams
 - Presentations and robot demonstrations to other schools and community groups
 - Publicity (print materials, media/press) generated within the school and within the community about BEST
 - Fundraising and/or sponsorship efforts (strategies used to recruit sponsors, team fund raisers, description of how funds were allocated to support team, team budget information available for review)
 - Use of technology, display models or boards, or multi-media at exhibit in promotion of BEST
 - Creativity in incorporating game theme into design and presentation of this exhibit
 - Compliance with specifications (e.g., did not exceed space allocation)
- **Interviews** (7 points) will be evaluated on:
 - Evidence of students' enthusiasm, learning experience, and understanding of the game theme
 - Evidence that recruitment efforts for the team included multiple grade levels and students from a cross-section of the school population
 - Evidence that students were the primary designers and builders of the robot

1.8 Category IV: Spirit and Sportsmanship (10 Points)

1.8.1 Spirit and Sportsmanship Guidelines

- Judges will evaluate this category on Game Day
- Judges will observe the spirit promoted by the team during their head-to-head competition matches as well as the team's conduct throughout the day in the seating area, team exhibit area, game floor, and pit area

1.8.2 Spirit and Sportsmanship Evaluation

- Spirit includes the vigor and enthusiasm displayed by team representatives

- Teams can use posters, props, t-shirts, cheerleaders, musicians, mascots, costumes, and lower-frequency noise-makers to increase the level of spirit (Check the **2016 Awards and Judging – Hub Logistics** document to determine noise-maker restrictions for your local hub competition)
- Community involvement: number of team supporters present at competition (other than students)
- Sportsmanship includes outward displays of sportsmanship (e.g., helping other teams in need), grace in winning and losing, and conduct and attitude considered befitting participation in sports
- Overall team sportsmanship is also demonstrated by students (not mentors) making the majority of robot adjustments and repairs during the competition

1.9 Category V: Robot Performance (15 Points)

- The fifth category, *Robot Performance*, will determine the final 15% of possible BEST Award points. These 15 points will be based on the total game points earned throughout the seeding phase of the head-to-head competition (prior to the semi-final phase) according to the following scale:
 - Team finishes in top 20% of all teams competing at hub 15 Points
 - Team finishes in top 40% of all teams competing at hub 12 Points
 - Team finishes in top 60% of all teams competing at hub 9 Points
 - Team finishes in top 80% of all teams competing at hub 6 Points
 - Team finishes in top 100% of all teams competing at hub 3 Points
 - Team is unable to score any points during the competition 0 Points
- Up to 15 Robot Performance points will be added to the total BEST Award points

1.10 Advancement to Regional Championship Competition

- The total number of teams a hub will be allowed to send to a regional championship is determined by the regional championship. Traditionally this number is related to the number of teams competing at the hub, the total number of teams in the region, and the maximum number of teams that the regional championship venue can accommodate.
- The sequence of advancing teams will be as follows:
 1. BEST Award 1st Place
 2. Game 1st Place
 3. BEST Award 2nd Place
 4. Game 2nd Place
 5. BEST Award 3rd Place
 6. Game 3rd Place
 7. BEST Award 4th Place
 8. BEST Award 5th Place

9. BEST Award 6th Place
10. etc.....

- The list above is intended to illustrate the qualification order, not necessarily the exact number of teams advancing from each hub.
- Exception to above qualification order:

A hub has the option to advance a Game winner OR a BEST Award winner at their discretion IF the hub is limited in the number of advancing teams that can participate in the BEST Award at the regional championship, and IF a BEST winner also places as a Game winner.

For example, if a regional championship allows four advancing teams per hub, BUT only two advancing teams can participate in the BEST Award, AND a Game winner is also a BEST Award winner at the hub level, a hub could be forced to advance a 3rd place BEST Award team that cannot actually compete in the BEST Award at the Regional level. In such a case, the hub can opt to send the 3rd place Game winner instead of the 3rd place BEST Award winner.

Section 2 Software Design and Simulation Award

The Software Design and Simulation Award is presented to the team that is able to best describe and articulate their software design process, techniques and experiences in their Engineering Notebook. It is intended to recognize teams who understand that “programming” is an essential part of their overall robot design and requires just as much thought as the mechanical/electrical design.

The team scoring the highest in the Software Design and Simulation portion of the Engineering Notebook evaluation at each hub will receive this award and be entered into a nationwide drawing for one of (3) three \$1000 cash awards, to be announced at the conclusion of all local hub competitions. A separate score sheet is provided for evaluating the Software Design and Simulation portion of the Engineering Notebook.

Refer to paragraph 1.5.2 for the evaluation criteria for this award.

Section 3 Simulink Design Award

The “BEST Simulink Design Award” is open to all teams participating in the competition. The award will be presented to one team in each of the 4 BEST regions (Northern Plains, Frontier Trails, South’s, Texas) that best applies the ‘Simulink Support Package for VEX’ based on the judging criteria below and their robot’s performance in the competition. Any team using MathWorks MATLAB/Simulink to design their software (i.e., robot program) is eligible.

3.1.1 Applying for the Award

To apply for the award, teams are required to submit their best Simulink model and an optional link to a short video describing their program design using Simulink. The entries must be submitted before 11

PM (local time) two weeks before their respective regional championship. See the **2016 Awards and Judging – Hub Logistics** document and the BEST Robotics website for more information on deadlines.

3.1.2 Simulink Design Award Guidelines

- One entry per team is allowed.
- All teams can participate for the award within their region. There will 1 winner per region.
- Every entry should include the following items:
 - 1 Simulink model file (*.slx)
 - 1 video link (use YouTube only)
- The Robot program must be created using Simulink. Submissions of programs designed using other software will not be accepted. The submitted Simulink file should not be a pre-built example model or the default program. It should be your own program or a modification of the existing examples or default program.
- The video should be no more than 3 minutes in length and include at least a 1.5 minute overview about the program design (e.g. a screencast of the Simulink model with voice over).
- Multiple entries may be made prior to the submission deadline always using the same email address during submission. Only the last submitted entry will be scored.
- Final submissions for this award must be uploaded at http://www.bestinc.org/simulink_award/form.php before the stated deadlines.

3.1.3 Simulink Design Award Evaluation

The award will be given to one team from each region and be based on the judging criteria and robot performance in the competition. The following criteria will be used for judging each entry using a maximum 60pt scale. The video is worth up to 10 points.

Simulink Model	
Creativity- Innovative, creative and original work	5 pts.
Functionality – Error-free and designed to achieve the game tasks	10 pts.
Software Design Practices – Best practices like commenting, block naming etc.	5 pts.
Difficulty and Mastery – Level of Simulink knowledge demonstrated in executing the tasks	15 pts.
Readability - Clean, organized and easy to comprehend	15 pts.
	50 pts.
Short Video (YouTube)	
Creativity - Interesting, innovative and informative	2 pts.
Quality of the video – Video making process and technical execution	1 pts.
Concept – Engaging, coherent and appropriate	3 pts.
Clarity – Message is clear and well-communicated	3 pts.
Adherence to Guidelines - Video length and content on Simulink usage	1 pts.
	10 pts.
Total Possible Points	60 pts.

3.1.4 Simulink Design Award Recognition

The winning teams will be awarded all of the following:

- \$1500 cash award
- Trophy with inscription 'BEST Simulink Design Award – by MathWorks
- Student Version DVD of the latest release of MATLAB software to all team members (\$99 value) and
- a MathWorks hat for each team member

The winning teams from the 4 regions will be recognized on the BEST website (www.bestinc.org) and their regional championship website.

Section 4 Hub-Level Awards

The following awards will be given at all BEST hub competitions:

BEST Award

Awarded to the team that best embodies the concept of ***Boosting Engineering, Science and Technology***. Winning the BEST Award is considered the highest achievement any team in the competition can accomplish. First, second, and third place finishes will be awarded.

Head-to-Head Competition Award

Awarded to the teams whose machines finish first, second, and third in the head-to-head robotics competition. In addition, fourth place “finalist” will also be awarded.

Founders Award for Creative Design

Awarded to the team that makes best use of the engineering process in consideration of offensive and defensive capabilities in machine design. Awarded in recognition of BEST founders Steve Marum and Ted Mahler.

Most Robust Machine

Awarded to the team whose machine requires the least maintenance during and between matches and is generally the sturdiest machine in the competition.

Software Design and Simulation Award

Awarded to the team who developed the most efficient software program for their machine and utilized software simulation for verifying its operation.

Section 5 Regional Championship Awards

The following awards will be given at all BEST regional championships:

BEST Award

Awarded to the team that best embodies the concept of ***Boosting Engineering, Science and Technology***. Winning the BEST Award is considered the highest achievement any team in the competition can accomplish. First, second, and third place finishes will be awarded.

Head-to-Head Robotics Competition Award

Awarded to the teams whose machines finish first, second, and third in the head-to-head robotics competition. In addition, fourth place “finalist” will also be awarded.

Founders Award for Creative Design

Awarded to the team that makes best use of the engineering process in consideration of offensive and defensive capabilities in machine design; awarded in recognition of BEST founders Steve Marum and Ted Mahler.

Most Robust Machine

Awarded to the team whose machine requires the least maintenance during and between matches and is generally the sturdiest machine in the competition.

BEST Simulink Design Award

Awarded to one team in each of the 4 BEST regions (Northern Plains, Frontier Trails, Souths, Texas) that best applies the ‘Simulink Support Package for VEX’ based on the specified judging criteria and their robot’s performance in the competition.