



# **RECF Robotics Competitions**

## **Judging Resources**

**2026-2027**

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The printable resources in this document are the official tools for judging at RECF robotics competitions. They include rubrics, award descriptions, and other printouts that can be used by judges and judge advisors. They should not be modified or replaced.

1. [Judged Award Descriptions & Criteria](#) - This document includes award descriptions and key criteria for each award, and is useful in guiding judges' nominations and deliberations. Event partners / judge advisors may wish to print this document and tape the appropriate pages to a wall or whiteboard to guide the judges at the event. Not all events will give out all awards. Each judge advisor should consult with their event partner to determine which awards will be presented at an event.
2. [Single-Page Outline of the Judging Process](#) - Condensed overview of the judging process and the steps of a simple engineering design process
3. [Judging Single-Page Reference Sheet](#) - Interview tips and condensed overview of award criteria
4. [Award Candidate Ranking Sheet](#) - Worksheet for judging pairs/groups to track potential award candidates during interviews
5. [Final Award Nominee Ranking Sheet](#) - Worksheet for the judge advisor to track award nominees during deliberations
6. [Engineering Notebook Rubric](#) - Worksheet used to assess fully developed notebooks
7. [Design & Innovate Awards Interview Rubric](#) - Worksheet used to assess teams during follow-up interviews for the Design and Innovate Awards
8. [Team Interview Notes](#) - Worksheet for judges to use during team interviews
9. [Excellence Award Criteria Checklist](#) - Checklist of the minimum requirements for the Excellence Award
10. [Script for Award Not Given Out](#) - Script to be used during the award ceremony in cases where no team meets the requirements for a specific award
11. [Innovate Award Submission Form](#) - Team submission form for the Innovate Award
12. [Judge Volunteer Check-in Sheet](#) - Check-in sheet for judging volunteers, including disclosure of team affiliations
13. [Volunteer Field Note to Judge Advisor](#) - Form used to inform the judge advisor about positive or negative team behaviors at the field
14. [Sportsmanship Award Nomination Form](#) - Nomination form if this award will not be judged
15. [Energy Award Nomination Form](#) - Nomination form if this award will not be judged
16. [Team Spirit Award Nomination Form](#) - Nomination form if this award will not be judged
17. [3D Printing and Fabrication Award Nomination Form](#) - Nomination form if this award will not be judged
18. [Team Interview Tips and Sample Questions](#) - A set of sample questions for optional use by judges
19. [Coach\Student Guide to the Engineering Notebook Rubric](#) - A descriptive overview of the rubric
20. [Coach\Student Guide to the Design & Innovate Award Interview Rubric](#) - A descriptive overview of the rubric



## Judged Award Descriptions & Criteria

The following pages contain award descriptions and key criteria for each award and are useful in guiding judges' nominations and deliberations. Event partners / judge advisors may wish to print these pages and tape them to a wall or whiteboard to assist the judges.

Not all events will give out all awards. Each judge advisor should consult with their event partner to determine which awards will be presented at an event.

# Design Award

Recognizes an organized and professional approach to the engineering design process, project and time management, and team organization.

## Key criteria:

- Be at or near the top of qualitative engineering notebook rankings with a fully developed notebook.
- Both the team interview and engineering notebook demonstrate independent inquiry from the beginning stages of the team's design process through execution.
- The engineering notebook is consistent with the qualities demonstrated in the team interview and robot design.
- Team demonstrates effective management of time, personnel, and resources.
- Team interview demonstrates the students' ability to explain their robot design and game strategy.
- Team interview demonstrates effective communication skills, teamwork, and professionalism.
- Engineering notebook, team interview, and conduct at the event demonstrate a student-centered ethos.

## Notes:

- Student demonstration of the engineering design process is fundamental to the educational value of RECF programs. The Design Award recognizes a team's ability to document and explain their engineering design process via an engineering notebook and team interview.
- Required award if judging occurs at an event.
- The submission of an engineering notebook is required. If no team meets the requirements for this award, it should not be given out.
- The quality of a team's engineering notebook and team interview may play a role in the consideration of that team for other awards.

# Excellence Award

Recognizes overall excellence in both the judged award and the performance award categories.

## Key criteria:

- ALL the criteria of Design Award
- The team is a candidate in consideration for other judged awards.
- The team exhibits positive team conduct, good sportsmanship, and professionalism.
- At the conclusion of alliance matches, the team is ranked in the top 50% of teams\* at the event in alliance match rankings.
- At the conclusion of the solo matches, the team is ranked in the top 50% of teams\* at the event.
- At the conclusion of the solo coding matches, the team is ranked in the top 50% of teams\* at the event with a score above zero.

\*For events with a single Excellence Award, percentages are based on the number of teams at the event. For blended grade level events with two grade specific Excellence Awards, percentages are based on the number of teams in each grade level award.

## Excellence Award Notes:

- Incorporates all the criteria of the Design Award, plus the added component of a team's on-field performance at the event.
- Required award if judging occurs at an event.
- Under certain conditions, at "blended" events which combine both grade levels (middle school and high school for RECF Achieve, or elementary school and middle school for RECF Engage), one Excellence Award per grade level may be awarded. This is determined by the [RECF Robotics Qualifying Criteria](#). In the instance of two grade level specific Excellence Awards being given out at an event, teams are only compared to teams of the same grade level. This includes quantitative event data, such as rankings. When only one Excellence Award is given out for an event with multiple grade levels, all teams are considered together without regard for their grade level.

For example, in a 25-team blended event with a single Excellence Award, 50% of 25 teams would be 12.5, which rounds up to 13 teams. Thus, to be eligible for Excellence, a team would need to be ranked in the top 13 in the event for the above performance metrics to be eligible for the Excellence Award. If the event had 10 teams of one grade level and 15 in the other, thus meeting the requirements for two grade level specific Excellence Awards, then 50% of 10 teams comes out to 5, and 50% of 15 comes out to 7.5 which rounds up to 8. In this instance, teams would need to be ranked 5th place or higher or 8th place or higher **within their respective grade levels** in the above performance metrics to be eligible for the grade level specific Excellence Award.

- For events with fewer than 16 teams present, and which qualify teams directly to the RECF World Championship, RECF Regional Support Managers may authorize that the 50% ranking requirements for alliance match, solo match, and coding match rankings be waived. Teams are still required to have a solo coding score above zero to be eligible. Judges should still consider a team's performance rankings in their deliberations for the award.

# Innovate Award

Recognizes an effective and well documented design process for a novel aspect of the team's robot design or gameplay strategy.

## Key criteria:

- Teams identify a specific section or specific pages in their notebook that describes the origin and development of a single design element, strategy, or other attribute that is a key part of their team's robot design or gameplay that is in use at the event.
- This design element, strategy, or other attribute is unique or uncommon among Innovate Award submissions at the event.
- The development of this design element, strategy, or other attribute is well-documented from initial conception through execution.
- The engineering notebook is fully developed, and demonstrates a clear, complete, and organized record of the engineering design process.
- The engineering notebook is consistent with the qualities demonstrated in the team interview and robot design.
- Both the team interview and engineering notebook demonstrate independent inquiry from the beginning stages of their design process through execution.
- Team demonstrates effective management of time, personnel, and resources.
- Team interview demonstrates their ability to explain their robot design and game strategy.
- Team interview demonstrates effective communication skills, teamwork, professionalism, and a student-centered ethos.

## **Innovate Award Notes:**

- Submission of an engineering notebook and an Innovate Award Submission Form are required.
- The team must indicate to judges where their novel aspect can be found in their engineering notebook via the Innovate Award Submission Form, which must be placed within their engineering notebook as described below.
- Teams can only submit a single aspect for consideration at an event.
- The team who earns the Innovate Award should also meet all of the criteria for the Design Award.
- The Innovate Award Submission Form or an exact recreation of that form, including all questions, answers, and all other form information can be included by the team in one of two places:
  1. Immediately after the cover page of the team's engineering notebook. In the case of physical notebooks, this form can be printed out and placed in the notebook. For digital notebooks, this form can be scanned in or recreated and included.
  2. In a clearly labeled section in their engineering notebook. In this instance, teams should take care to date all entries and arrange them chronologically, fully filling out the information required on the Innovate Award Submission Form. Judges are to only consider the entry with the latest effective date. Teams are encouraged to put a diagonal line through out-of-date entries to clearly indicate this to judges.
- The intent of this award is to emphasize design aspects that are unique, novel, and creative, in addition to being well documented and in use at the current event. Design aspects that are commonplace, basic, or not in use at the event will not be considered.

# Think Award

Recognizes effective and consistent use of coding techniques and programming design solutions to solve the game challenge.

## Key criteria:

- Must participate in solo coding matches, with a score greater than zero.
- Code is cleanly written, well commented, and easy to follow.
- Team clearly explains the programming strategy to solve the game challenge.
- Team clearly explains their programming management process / version control.
- Students understand and explain how they worked together to develop their robot code.
- Programming is effective at solving the game challenges for both alliance matches and solo coding matches.
- Team interview demonstrates effective communication skills, teamwork, professionalism, and a student-centered ethos.
- The engineering notebook is consistent with the qualities demonstrated in the team interview and robot design.

# Amaze Award

Recognizes a consistently high-performing and competitive robot.

## Key criteria:

- Robot reliably contributes to high-scoring matches with their alliance partners.
- Robot performs at a high level in solo driving and solo coding matches at the event, with a solo coding score greater than zero.
- Programming is effective at solving the game challenges for both alliance matches and solo matches.
- Students understand and explain how they worked together to develop their robot design to consistently execute an effective game strategy.
- Team interview demonstrates effective communication skills, teamwork, professionalism, and a student-centered ethos.
- The engineering notebook is consistent with the qualities demonstrated in the team interview and robot design.

# Build Award

Recognizes a well-constructed robot that is built with a high degree of attention to detail in order to hold up to the rigors of competition.

## Key criteria:

- Robot construction is durable and robust.
- Robot is reliable on the field and withstands the rigors of competition.
- Robot is designed with attention to safety and detail.
- Students understand and explain how they worked together to develop their robot design.
- Team interview demonstrates effective communication skills, teamwork, professionalism, and a student-centered ethos.
- The engineering notebook is consistent with the qualities demonstrated in the team interview and robot design.

# Create Award

Recognizes a creative engineering design solution to one or more of the challenges of the competition.

## Key criteria:

- Team demonstrates a creative approach to accomplish game objectives.
- Team has committed to ambitious and creative approaches to solving the game challenge.
- Team explains how they worked together to develop their robot design and game strategy.
- Team interview demonstrates effective communication skills, teamwork, professionalism, and a student-centered ethos.
- The engineering notebook is consistent with the qualities demonstrated in the team interview and robot design.

# Judges Award

Recognizes attributes judges felt were deserving of special recognition.

## Criteria to consider:

- Team displays special attributes, exemplary effort, or perseverance at the event.
- Team distinguishes themselves in some way that may not fit in other award categories
- Team stands out to judge volunteers as being deserving of special recognition.
- Team interview demonstrates effective communication skills, teamwork, professionalism, and a student-centered ethos.

## Notes:

- Required award if judging is being conducted at an event.
- Optionally, a second Judges Award may be presented at an event at the discretion of the event partner and judge advisor. This second Judges Award may be required for some event types.

# Inspire Award

Recognizes passion for the competition and positivity at the event.

## **Key criteria:**

- Team exhibits passion and a positive attitude at the event.
- Team exhibits integrity and goodwill toward other teams, coaches, and event staff.
- Team overcomes an obstacle or challenge, or achieves a goal or special accomplishment at the event.
- Team interview demonstrates effective communication skills, teamwork, professionalism, and a student-centered ethos.

# Sportsmanship Award\*

Recognizes a high degree of good sportsmanship, helpfulness, respect, and a positive attitude both on and off the competition field.

## **Key criteria:**

- Team is courteous, helpful, and respectful to everyone, on and off the field.
- Team interacts with others in the spirit of friendly competition and cooperation.
- Team acts with honesty and integrity, enriching the event experience for all.

\*Potentially a volunteer-nominated award. Volunteers at the event may discuss amongst themselves and nominate teams for consideration.

# Energy Award\*

Recognizes outstanding 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 the robotics competition that enriches the event experience for all.

\*Potentially a volunteer-nominated award. Volunteers at the event may discuss amongst themselves and nominate teams for consideration.

# 3D Printing & Fabrication Award\*

Recognizes a team who have effectively designed and utilized 3D printing or other fabrication techniques to create solutions to engineering design challenges.

## Key criteria:

- Team provides documentation outlining the conception, creation, and implementation of their component(s) for all iterations, which includes ample evidence of a student-centered design and fabrication process.
- Component(s) are designed with attention to detail.
- Team demonstrates effective use of materials and material selection.
- Component(s) provide clear functionality for solving an engineering design problem.

\*Potentially a volunteer-nominated award. Volunteers at the event may discuss amongst themselves and nominate teams for consideration.

## Notes:

- This can include 3D printing, laser cutting or engraving, or any other legal fabrication method resulting in competition legal components that are used by the team to create an effective solution to a design challenge.
- Judges will need to check for appropriate documentation to support the award nomination.

# Team Spirit Award\*

Recognizes a team that has an approach to team identity, image, and theme that unifies team logos, uniforms, and overall aesthetics.

## Key Criteria:

- Team has an effective and original logo or theme.
- Team's logo, apparel, pit space, and other collateral represent a unified aesthetic.
- Team aesthetic has a positive and respectful message and/or cultural significance, and a bold approach to a memorable team identity.
- Team enhances the event experience for all by exhibiting positive energy and good sportsmanship throughout the event.

\*Potentially a volunteer-nominated award. Volunteers at the event may discuss amongst themselves and nominate teams for consideration.

## Notes:

- This team is immediately recognizable even without a team number visible and are outstanding ambassadors for their organization and the competition as a whole.

# Individual Recognition Awards

The **Mentor of the Year Award** recognizes a team mentor who has helped students achieve goals that were seemingly out of reach. This individual is a role model, a leader, and an extraordinary mentor who shows students new ways to expand their knowledge and solve problems in the world of STEM.

The **Partner of the Year Award** recognizes an organization that consistently supports students and schools as they pursue excellence in competitive robotics. The recipient of this award is recognized as a champion who dedicates their time, abilities, and resources to ensure affordability and accessibility for all participants.

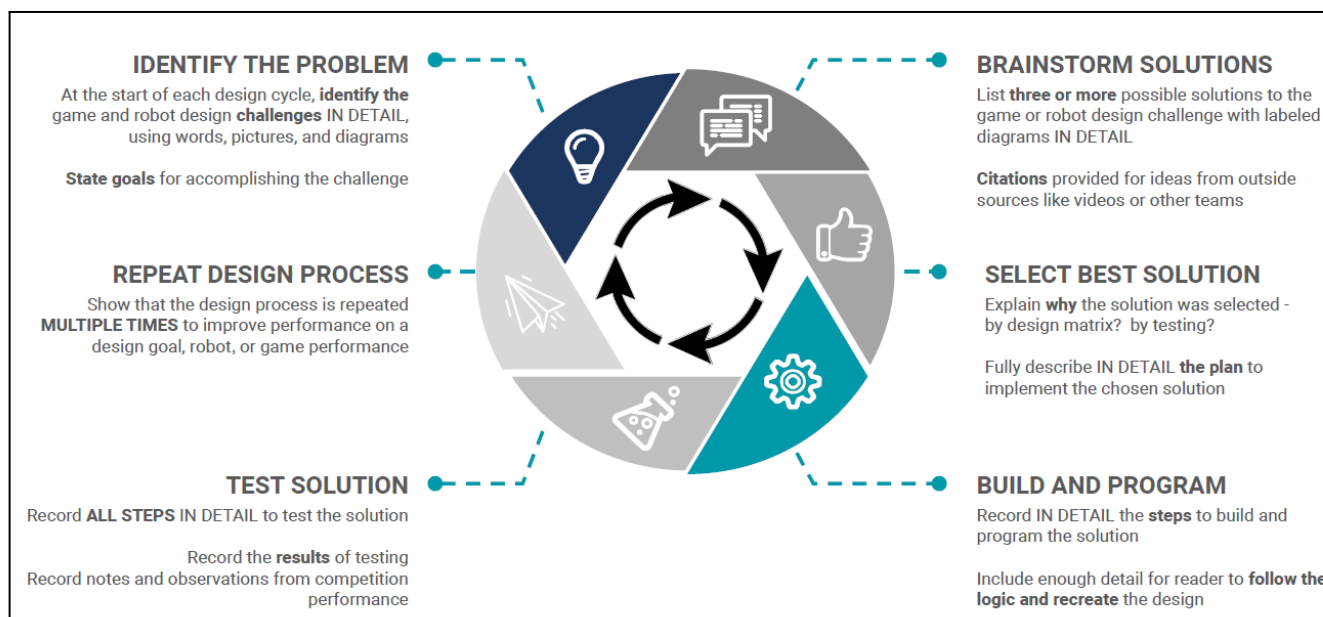
The **Teacher of the Year Award** recognizes a teacher who shows true leadership and dedication to their group of students. The winner of this award continually exceeds expectations to ensure a safe, enjoyable, and educational experience for all students.

The **Volunteer of the Year Award** recognizes an individual who leads the effort to "make things happen." Hosting a robotics event takes the collective effort of many people who give their time and effort for the sake of the participants. The Volunteer of the Year demonstrates a commitment and devotion to their community, putting in many hours of hard work with persistence and passion to make events happen.

# Single-Page Outline of the Judging Process

Teams are expected to demonstrate good sportsmanship, courtesy, and respect for other teams, volunteers, and event staff, and to follow the RECF Student-Centered Policy and Code of Conduct. All aspects of a team's work are expected to represent the skill level of the students on the team. Teams that violate these policies are not eligible for judged awards.

The judging process is focused on a team's journey through the Engineering Design Process, represented by the graphic below. It is not just about having a great robot design, but rather how the team of students has worked together to turn ideas into a working robot that sets out to achieve their goals.



The judging process at events consists of four main parts:

**Part 1: Initial team interviews:** judges are arranged into groups of two or more by the judge advisor and interview a set of teams. Judges ask teams open ended questions about their engineering design process and project management. Judges take notes and use these notes to recommend teams for follow-up interviews for specific awards.

**Part 2: Engineering notebook evaluations:** judges evaluate teams' engineering notebooks using the Engineering Notebook Rubric. A team's engineering notebook should support / corroborate with their interview and vice-versa.

**Part 3: Follow-up Interviews:** Teams nominated by judges based on their Initial team interview and Engineering Notebook evaluation are then interviewed again for award-specific follow-up interviews to create a ranked list of the top candidates for each award.

**Part 4: Final Deliberations:** Final award winners are decided through deliberations that are facilitated by the judge advisor. Teams are recognized at the conclusion of the event with an awards ceremony.

# Judging Single-Page Reference Sheet

|                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>DESIGN AWARD</b> <ul style="list-style-type: none"> <li>Team is at or near the top of engineering notebook rankings</li> <li>Team exhibits a high-quality team interview</li> <li>Team demonstrates effective management of time, personnel, and resources</li> <li>Team interview demonstrates their ability to explain their robot design and game strategy</li> </ul> | <b>EXCELLENCE AWARD</b> <ul style="list-style-type: none"> <li>Meets all <b>Design Award</b> criteria, plus: <ul style="list-style-type: none"> <li>Team is ranked in the top 50% of teams in alliance match rankings, overall solo match rankings, and solo coding match rankings</li> <li>Team is a candidate in consideration for other judged awards</li> </ul> </li> </ul> | <b>INNOVATE AWARD</b> <ul style="list-style-type: none"> <li>Recognizes an effective and well-documented design process in some aspect of the team's work</li> <li>Teams will identify a section or pages in their notebook where this aspect can be found so judges can follow its development</li> <li>The team who earns the Innovate Award should be among the top contenders for the Design Award</li> </ul> | <b>JUDGES AWARD</b> <ul style="list-style-type: none"> <li>Earned by a team that distinguishes themselves in some way that may not fit in other award categories</li> <li>Team may display special attributes, exemplary effort, and perseverance at the event</li> <li>Team may have overcome an obstacle or challenge to achieve a goal or special accomplishment</li> </ul> |
| <b>THINK AWARD</b> <ul style="list-style-type: none"> <li>Recognizes the most effective and consistent use of coding techniques and programming design solutions to solve the game challenge</li> </ul>                                                                                                                                                                     | <b>AMAZE AWARD</b> <ul style="list-style-type: none"> <li>Recognizes a consistently high-performing and competitive robot</li> </ul>                                                                                                                                                                                                                                            | <b>BUILD AWARD</b> <ul style="list-style-type: none"> <li>Recognizes a well constructed robot that is built with high attention to detail to hold up to the rigors of competition</li> </ul>                                                                                                                                                                                                                      | <b>CREATE AWARD</b> <ul style="list-style-type: none"> <li>Recognizes a creative engineering design solution to one or more of the challenges of the competition</li> </ul>                                                                                                                                                                                                    |
| <b>INSPIRE AWARD</b> <ul style="list-style-type: none"> <li>Recognizes passion for the competition and positivity at the event</li> </ul>                                                                                                                                                                                                                                   | <b>SPORTSMANSHIP AWARD</b> <ul style="list-style-type: none"> <li>Recognizes a high degree of good sportsmanship, helpfulness, and positive attitude both on and off the competition field</li> </ul>                                                                                                                                                                           | <b>ENERGY AWARD</b> <ul style="list-style-type: none"> <li>Recognizes outstanding enthusiasm and excitement at the event</li> </ul>                                                                                                                                                                                                                                                                               | <p><b>Not all awards or award criteria may be listed.</b></p> <p>For full award descriptions, please refer to the <b>Guide to Judging</b>. Awards are not listed in any order of precedence.</p>                                                                                                                                                                               |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>INTERVIEW CHECKLIST</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Record team number on the interview notes sheet.</li> <li><input type="checkbox"/> Keep track of time – your judge advisor will give guidance about the event schedule.</li> <li><input type="checkbox"/> Give a consistent amount of time to each team.</li> <li><input type="checkbox"/> Take notes on each team.</li> <li><input type="checkbox"/> Be mindful of your environment. Do not leave notes unattended or discuss teams where others could hear.</li> <li><input type="checkbox"/> Wish teams success and thank them for the interview.</li> <li><input type="checkbox"/> Away from the team, briefly discuss interview with judge group &amp; fill out the Team Interview Notes sheet.</li> </ul> | <b>INTERVIEW TIPS</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Ask teams if they have an upcoming match before you start your interview. If yes, interview them later. Matches will not be delayed or replayed if teams miss the match due to an interview.</li> <li><input type="checkbox"/> Ask if all team members are present before starting the interview.</li> <li><input type="checkbox"/> Take a picture of the team's robot, and be sure the team number is shown (optional).</li> <li><input type="checkbox"/> If you have trouble finding a team, check the match schedule and find them as they leave a match.</li> </ul> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

# Award Candidate Ranking Sheet

**Judge Name / Judge Group:** \_\_\_\_\_

Check the boxes below to indicate teams that are strong candidates for awards. All judge groups will cross-reference their lists to create a final award nomination list. The blank columns should indicate any additional awards given at the event. The empty cell below each award name can be filled in with the award descriptions. Use multiple checkmarks to help sort recommendations.

| TEAM<br>NUMBER | Think<br>Award | Amaze<br>Award | Build<br>Award | Create<br>Award |  |  | Judges<br>Award |
|----------------|----------------|----------------|----------------|-----------------|--|--|-----------------|
|                |                |                |                |                 |  |  |                 |
|                |                |                |                |                 |  |  |                 |
|                |                |                |                |                 |  |  |                 |
|                |                |                |                |                 |  |  |                 |
|                |                |                |                |                 |  |  |                 |
|                |                |                |                |                 |  |  |                 |
|                |                |                |                |                 |  |  |                 |
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|                |                |                |                |                 |  |  |                 |
|                |                |                |                |                 |  |  |                 |
|                |                |                |                |                 |  |  |                 |

*All judging materials are strictly confidential. They are not shared beyond the judges and judge advisor and shall be destroyed at the end of the event.*

# Final Award Nominee Ranking Sheet

This form is a tool for the judge advisor to record the ranked candidates for each award. The blank columns will indicate any additional awards given at the event. A team can appear in multiple award categories. Excellence Award candidates are developed by considering engineering notebook scores, team interview scores, and on-field performance rankings. If more rankings are needed beyond the five fields provided below, or if there are additional awards being judged, a second sheet should be used.

It is important that there are multiple ranked candidates for each award. The selection of the Excellence Award winner may cause other award winners to change, as each team can only earn one judged award at an event.

|                                             |
|---------------------------------------------|
| <b>Excellence Award</b><br>(Required Award) |
|                                             |

| Design Award<br>(Required Award) | Innovate Award<br>(Required Award) |    |    |    |    | Judges Award<br>(Required Award) |
|----------------------------------|------------------------------------|----|----|----|----|----------------------------------|
| 1.                               | 1.                                 | 1. | 1. | 1. | 1. | 1.                               |
| 2.                               | 2.                                 | 2. | 2. | 2. | 2. | 2.                               |
| 3.                               | 3.                                 | 3. | 3. | 3. | 3. | 3.                               |
| 4.                               | 4.                                 | 4. | 4. | 4. | 4. | 4.                               |
| 5.                               | 5.                                 | 5. | 5. | 5. | 5. | 5.                               |

*All judging materials are strictly confidential. They are not shared beyond the judges and judge advisor and shall be destroyed at the end of the event.*

# Engineering Notebook Rubric (Page 1 of 2)

Team # \_\_\_\_\_ Grade ☐ ES | ☐ MS | ☐ HS Judge Name \_\_\_\_\_

**Directions:** Determine the point value that best characterizes the content of the engineering notebook for that criterion. Write that value in the column to the right. This rubric is to be used for all engineering notebooks regardless of format (physical or digital). Please refer to Section 5 of the Guide to Judging for information on how to use this rubric.

**Note:** Any student-centered or academic honesty concerns, such as plagiarism, should be brought to the attention of the judge advisor and/or event partner.

| CRITERIA                                                                                                            | CRITERIA DESCRIPTION                                                                                                                                                                                                                                                                              |                                                                        |                                                                     | POINTS |
|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------|--------|
|                                                                                                                     | PROFICIENCY LEVEL                                                                                                                                                                                                                                                                                 |                                                                        |                                                                     |        |
| ENGINEERING DESIGN PROCESS                                                                                          | EXPERT<br>(4-5 POINTS)                                                                                                                                                                                                                                                                            | PROFICIENT<br>(2-3 POINTS)                                             | EMERGING<br>(0-1 POINTS)                                            |        |
| IDENTIFY THE PROBLEM / DESIGN GOAL(S)                                                                               | Clearly identifies the problem/design goal(s) at the start of each design process cycle. This can include elements of game strategy, robot design, or programming, and should include a clear definition and justification of the design problem(s), goal(s), criteria, and constraints.          |                                                                        |                                                                     | _____  |
|                                                                                                                     | Great detail                                                                                                                                                                                                                                                                                      | lacking details or justification                                       | Few or no details                                                   |        |
| BRAINSTORM SOLUTIONS                                                                                                | Explores different solutions with explanation. Citations are provided for ideas that came from outside sources such as online videos or other teams.                                                                                                                                              |                                                                        |                                                                     | _____  |
|                                                                                                                     | Several solutions with explanation and citations                                                                                                                                                                                                                                                  | Few solutions with minimal explanation and citations                   | one or no solution with little/no explanation and no citations      |        |
| SELECT BEST SOLUTION                                                                                                | Explains the “why” behind design decisions in each step of the design process for all significant aspects of a team’s design.                                                                                                                                                                     |                                                                        |                                                                     | _____  |
|                                                                                                                     | Fully explains                                                                                                                                                                                                                                                                                    | Inconsistently explains                                                | Minimally explains                                                  |        |
| BUILD AND PROGRAM THE SOLUTION                                                                                      | Records the steps the team took to build and program the solution so that the reader can follow the logic used by the team to develop their robot design, as well as recreate the robot design process from the documentation.                                                                    |                                                                        |                                                                     | _____  |
|                                                                                                                     | Full detail                                                                                                                                                                                                                                                                                       | Lacks sufficient detail                                                | No detail                                                           |        |
| ORIGINAL TESTING OF SOLUTIONS                                                                                       | Records the steps to test the solution, including test results. Testing methodology is explained. Testing results are original to the team and explained, and conclusions are drawn from that data.                                                                                               |                                                                        |                                                                     | _____  |
|                                                                                                                     | All steps recorded, clearly explained.<br>Results original to the team.                                                                                                                                                                                                                           | Key steps recorded.<br>Methodology/results/<br>conclusions incomplete. | No steps recorded.<br>Results borrowed from others.                 |        |
| REPEAT DESIGN PROCESS                                                                                               | Shows that the design process is repeated to work towards a design goal. This process can be repeated in full iterations or for specific parts of the overall design. The notebook shows setbacks that the team learned from, and shows design alternatives that were considered but not pursued. |                                                                        |                                                                     | _____  |
|                                                                                                                     | Repeated multiple times.<br>Shows setbacks and/or alternatives                                                                                                                                                                                                                                    | Not often repeated.<br>No setbacks, alternatives, or learning shown.   | Not repeated.<br>No setbacks shown or curated to craft a narrative. |        |
| NOTES / GENERAL IMPRESSIONS:<br> |                                                                                                                                                                                                                                                                                                   |                                                                        |                                                                     |        |

# Engineering Notebook Rubric (Page 1 of 2)

| FORMAT AND CONTENT                                                                                                      | EXPERT<br>(4-5 POINTS)                                                                                                                                                                                                                                                                                                                                                                                                                          | PROFICIENT<br>(2-3 POINTS)                                     | EMERGING<br>(0-1 POINTS)                                                                                                                                                    | POINTS              |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| INDEPENDENT INQUIRY                                                                                                     | Team shows evidence of independent inquiry of their design process. Notebook documents whether the implemented ideas have their origin with students on the team, or if students found inspiration elsewhere.                                                                                                                                                                                                                                   |                                                                |                                                                                                                                                                             | _____               |
|                                                                                                                         | Through whole process<br>Idea sources documented                                                                                                                                                                                                                                                                                                                                                                                                | Some elements of process<br>Most idea sources documented       | Little to no evidence<br>Source not documented                                                                                                                              |                     |
| USABILITY & COMPLETENESS                                                                                                | Records the design and development process with enough clarity and detail that the reader could recreate the project's history. Notebook has recent entries that align with the robot the team has brought to the event.                                                                                                                                                                                                                        |                                                                |                                                                                                                                                                             | _____               |
|                                                                                                                         | Records entire design, consistent, and current                                                                                                                                                                                                                                                                                                                                                                                                  | Lacks sufficient detail, is inconsistent with possible gaps    | Missing significant detail and has large gaps of time or not current                                                                                                        |                     |
| ORIGINALITY & QUALITY                                                                                                   | Content is kept to relevant information and all content not original to the team longer than a paragraph is located in appendices to the engineering notebook. Information originating from outside the team is always properly cited in the notebook with the source and date accessed. Engineering notebook content is original to the submitting team members.                                                                               |                                                                |                                                                                                                                                                             | _____               |
|                                                                                                                         | Content is relevant, appropriately placed, properly cited, and original to the team.                                                                                                                                                                                                                                                                                                                                                            | Content is mostly relevant/properly placed/cited/original      | Non-original content is excessive, is not kept in appendices, and/or not cited. Plagiarised content should be noted to the JA pursuant to the RECF Code of Conduct process. |                     |
| ORGANIZATION / READABILITY                                                                                              | Entries are logged in a table of contents (ToC). Organization makes it easy to reference, such as color coded entries, tabs for key sections, or other markers. Notebook contains little to no extraneous content that does not further the engineering design process.                                                                                                                                                                         |                                                                |                                                                                                                                                                             | _____               |
|                                                                                                                         | Well organized with ToC. Little to no extraneous content                                                                                                                                                                                                                                                                                                                                                                                        | Somewhat organized with ToC. Contains some extraneous content. | No ToC. Missing organization. Excessive content.                                                                                                                            |                     |
| RECORD OF TEAM & PROJECT MANAGEMENT                                                                                     | Provides a complete record of team and project assignments:<br>– Contains team meeting notes including goals, decisions, and building/coding accomplishments.<br>– Design cycles are easily identified.<br>– Resource constraints including time and materials are noted throughout.<br>– Notebook has evidence that documentation was done in sequence with the design process.<br>– Entries include dates and names of contributing students. |                                                                |                                                                                                                                                                             | _____               |
|                                                                                                                         | Records all information listed                                                                                                                                                                                                                                                                                                                                                                                                                  | Records most of the information listed                         | Missing key information listed. Unable to understand progress. Significant gaps in key design aspects. Little evidence of date entries and student contributions.           |                     |
| INNOVATE AWARD NOTES (optional):<br> |                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                |                                                                                                                                                                             | TOTAL POINTS: _____ |
|                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                |                                                                                                                                                                             |                     |

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# Design & Innovate Awards Interview Rubric

Team # \_\_\_\_\_

Grade ☐ ES | ☐ MS | ☐ HS

Judge Name \_\_\_\_\_

**Directions:** Determine a point value that best characterizes the content of the team interview for that criterion.

| CRITERIA                                 | CRITERIA DESCRIPTION                                                                                                                                              |                                                         |                                               | POINTS                |
|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------|-----------------------|
|                                          | EXPERT<br>(4-5 POINTS)                                                                                                                                            | PROFICIENT<br>(2-3 POINTS)                              | EMERGING<br>(0-1 POINTS)                      |                       |
| ENGINEERING DESIGN PROCESS               | Team shows evidence of independent inquiry through the stages of their design process. This includes brainstorming, testing, and exploring alternative solutions. |                                                         |                                               | _____                 |
|                                          | Through all stages                                                                                                                                                | Some elements                                           | Little to no evidence                         |                       |
| GAME STRATEGY                            | Team can explain their entire game strategy including game analysis.                                                                                              |                                                         |                                               | _____                 |
|                                          | Full explanation                                                                                                                                                  | Current strategy with limited evidence of game analysis | Not explained or not student-directed         |                       |
| ROBOT DESIGN                             | Team can explain the evolution of their robot design to the current design.                                                                                       |                                                         |                                               | _____                 |
|                                          | Full explanation                                                                                                                                                  | Limited explanation or evolution                        | Not explained or not student-directed         |                       |
| ROBOT BUILD                              | Team can explain their robot construction. Ownership of the robot build is evident.                                                                               |                                                         |                                               | _____                 |
|                                          | Full explanation                                                                                                                                                  | Current robot with limited explanation                  | Not explained or not student-directed         |                       |
| ROBOT PROGRAMMING                        | Team can explain the evolution of their programming                                                                                                               |                                                         |                                               | _____                 |
|                                          | Full explanation                                                                                                                                                  | Current programs with limited evolution                 | Not explained or not student-directed         |                       |
| CREATIVITY / ORIGINALITY                 | Team can describe the creative aspect(s) of their robot.                                                                                                          |                                                         |                                               | _____                 |
|                                          | With clarity and detail.                                                                                                                                          | Lacks detail                                            | Has difficulty describing or minimal response |                       |
| TEAM AND PROJECT MANAGEMENT              | Team can explain how team progress was tracked against an overall project timeline, including management of material and personnel resources.                     |                                                         |                                               | _____                 |
|                                          | Full explanation                                                                                                                                                  | Limited explanation                                     | Cannot explain                                |                       |
| TEAMWORK, COMMUNICATION, PROFESSIONALISM | Team members contribute to explanations of the design process, game strategy, and other work done by the team.                                                    |                                                         |                                               | _____                 |
|                                          | Most or all members contribute                                                                                                                                    | Some members contribute                                 | Few members contribute                        |                       |
| RESPECT, COURTESY, POSITIVITY            | Team interacts respectfully, courteously, and positively in their interview.                                                                                      |                                                         |                                               | _____                 |
|                                          | Consistently                                                                                                                                                      | Limited                                                 | Lacking                                       |                       |
| OVERALL IMPRESSIONS                      |                                                                                |                                                         |                                               | TOTAL POINTS<br>_____ |

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# Team Interview Notes

**Directions:** Use this sheet to take notes during each initial team interview. As a judge group, ask open ended questions to teams that give insight into each of the criteria below.

**Team Number** \_\_\_\_\_

**Judge Name** \_\_\_\_\_

Did the team submit an Innovate Award Submission Form? ☐ Yes ☐ No

| CRITERIA                                                             | CRITERIA EXPLANATION                                                                                                                            | JUDGE'S NOTES |
|----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| <b>ENGINEERING DESIGN PROCESS</b><br><i>All Awards</i>               | How well does the team explain the process they used to create their robot design?                                                              |               |
| <b>GAME STRATEGY</b><br><i>Design, Innovate, Create, Amaze</i>       | Can the students explain their game strategy, how they came up with it, & how well it fits with their robot design?                             |               |
| <b>ROBOT DESIGN</b><br><i>Design, Innovate, Create, Amaze, Build</i> | Do students demonstrate ownership of the design process? Is the robot well designed to accomplish their goals?                                  |               |
| <b>ROBOT BUILD</b><br><i>Innovate, Build, Create, Amaze</i>          | Do students demonstrate ownership of the build process? Is the robot well-built and robust?                                                     |               |
| <b>CREATIVITY / ORIGINALITY</b><br><i>Innovate / Create</i>          | Does team describe creative aspect(s) of their robot with clarity and detail?                                                                   |               |
| <b>ROBOT PROGRAMMING</b><br><i>Think</i>                             | Do students demonstrate ownership of the robot's programming? How well can they explain their code?                                             |               |
| <b>TEAM &amp; PROJECT MANAGEMENT</b><br><i>All Awards</i>            | Can students explain how they managed their time, resources, and people to work effectively?                                                    |               |
| <b>TEAMWORK, COMMUNICATION, PROFESSIONALISM</b><br><i>All Awards</i> | Do all team members share in the work of being a team? Does everyone contribute in some way? Were students respectful to judges and each other? |               |
| <b>SPECIAL ATTRIBUTES</b><br><i>Judges, Inspire</i>                  | Does the team have any special attributes or accomplishments?                                                                                   |               |

## Potential Award Nominations Quick Reference:

☐ Create Award | ☐ Think Award | ☐ Amaze Award | ☐ Build Award | ☐ Judges Award | ☐ Inspire Award

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# Excellence Award Criteria Checklist

**Please review the Excellence Award criteria in full.** This checklist is a summary of the overall Excellence Award description. **Teams must satisfy all requirements to be eligible for the Excellence Award.** Teams that do not run skills are given a score of zero for ranking purposes.

- ☐ Team is in the top 50% of overall solo match rankings.\*
- ☐ Team is the top 50% of solo coding rankings\* with a score above zero.
- ☐ Team is in the top 50% of alliance match rankings.\*
- ☐ Team has exhibited a high-quality team interview.
- ☐ Team has submitted a notebook that is ranked at or near the top of engineering notebook rankings and is a strong candidate for the Design Award.
- ☐ Both the team interview and engineering notebook demonstrate independent inquiry from the beginning stages of their design process through execution.
- ☐ Team has been nominated or ranked for multiple other judged awards at the event.
- ☐ Team exhibits positive and student-centered team conduct, good sportsmanship, and professionalism.

\*For events with a single Excellence Award, percentages are based on the number of teams at the event. **For blended grade level events with two grade specific Excellence Awards**, percentages should be based on the teams **in each grade level** for each award.

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- ☐ Team has exhibited a high-quality team interview.
- ☐ Team has submitted a notebook that is ranked at or near the top of engineering notebook rankings and is a strong candidate for the Design Award.
- ☐ Both the team interview and engineering notebook demonstrate independent inquiry from the beginning stages of their design process through execution.
- ☐ Team has been nominated or ranked for multiple other judged awards at the event.
- ☐ Team exhibits positive and student-centered team conduct, good sportsmanship, and professionalism.

\*For events with a single Excellence Award, percentages are based on the number of teams at the event. **For blended grade level events with two grade specific Excellence Awards**, percentages should be based on the teams **in each grade level** for each award.

# Script for Award Not Given Out

*If no team fulfills the criteria for an award and an award is not given out, it should be addressed prior to any other awards being given out to avoid disruptions to the rest of the award ceremony.*

“The awards offered at qualifying events are based on specific criteria, which may include such things as having an engineering notebook, attaining certain performance rankings, or other requirements as described in the Guide to Judging. It has been determined that at this event, no team fulfilled all the required criteria for the \_\_\_\_\_ Award.

“While it is disappointing not to be able to recognize an award winner, we encourage teams to continue their hard work and dedication to their program. For future reference, all award criteria and descriptions can be found in the RECF Guide to Judging.”

*Conclude with a transition, such as:*

“...Now let's give out the following awards... \_\_\_\_\_”

*or*

“...Now let's get back to matches... \_\_\_\_\_”

*or*

“...Now let's get back to our emcee... \_\_\_\_\_”

Effective Date: \_\_\_\_\_

Event Name (Optional) \_\_\_\_\_

## Innovate Award Submission Form

**Instructions for the team:** Please fill out all the information below, printing clearly. This form should be included either behind the front cover, or in a clearly marked section in your engineering notebook. Teams may only submit **one** aspect of their design to be considered for this award at each event. Submission of multiple aspects will nullify the team's consideration for this award. The date and event name fields above exist to help differentiate different forms permanently included in a notebook for archival purposes. Teams may consider putting a diagonal line through past entries.

Full Team Number: \_\_\_\_\_

Brief description of the novel aspect of the team's design:

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Identify the page numbers and/or the section(s) where documentation of the development of this aspect can be found:

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---

Explain why your submission is unique from other approaches to the problem it solves or task it performs:

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# Judge Volunteer Check-in Sheet

**Directions:** Use this sheet to check in judge volunteers. Record each judge's name, email (for follow up contact), cell phone number (to reach judges during the event), and team affiliation (to avoid potential conflicts of interest). Print additional sheets for larger events.

[illegible]

# Judge Volunteer Interest Form

If you are interested in learning about in person or remote judging for the RECF World Championship or other volunteering opportunities with the Robotics Education & Competition Foundation, please visit [this link](#).



# Volunteer Field Note to Judge Advisor

|                                |  |
|--------------------------------|--|
| <b>Match # (if applicable)</b> |  |
| <b>Team Number</b>             |  |
| <b>Team Name</b>               |  |
| <b>Organization Name</b>       |  |

|                                          |                                                                                                                                                                                                                                                                                                                                                                      |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>THIS NOTE IS FROM:</b>                | <b>Name:</b> _____<br><b>Volunteer Position:</b> _____                                                                                                                                                                                                                                                                                                               |
| Check one below:                         | Please provide either positive or negative feedback about a specific team for the judges to consider in their deliberations for awards.<br><br>This form should be filled out in its entirety and signed by a head referee, division manager, or event partner at the bottom of the sheet. Including details in your notes is helpful for the judges' consideration. |
| <input type="checkbox"/> <b>POSITIVE</b> |                                                                                                                                                                                                                                                                                                                                                                      |
| <input type="checkbox"/> <b>NEGATIVE</b> |                                                                                                                                                                                                                                                                                                                                                                      |
|                                          |                                                                                                                                                                                                                                                                                                                                                                      |

|                                                                                           |                                          |
|-------------------------------------------------------------------------------------------|------------------------------------------|
| <b>Head Referee / Division Manager / Event Partner</b><br>Print and sign full name: _____ | <b>Date:</b> _____<br><b>Time:</b> _____ |
|-------------------------------------------------------------------------------------------|------------------------------------------|

# Sportsmanship Award Nomination Form

**Judge advisor:** Please consult with the volunteers at the event for this award. It is advisable to have **at least 3 nominees**. Please collect this form at the conclusion of alliance matches.

**Award description:** The **Sportsmanship Award** is presented to a team that has earned the respect and admiration of the volunteers at the event. This team is a model for all to follow because team members interact with everyone in a positive, respectful manner in the spirit of friendly competition and cooperation. This award is judged during the event by referees and volunteers.

Please rank the **top** teams that you have observed to display the best **sportsmanship**.

***Please write neatly!***

Rank 1 – Team Number: \_\_\_\_\_

Rank 2 – Team Number: \_\_\_\_\_

Rank 3 – Team Number: \_\_\_\_\_

Rank 4 – Team Number: \_\_\_\_\_

Rank 5 – Team Number: \_\_\_\_\_

# Energy Award Nomination Form

**Judge advisor:** Please consult with the volunteers at the event for this award. It is advisable to have **at least 3 nominees**. Please collect this form at the conclusion of alliance matches.

**Award description:** 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.

Please rank the **top** teams that you have observed to display the most **energy**.

***Please write neatly!***

Rank 1 – Team Number: \_\_\_\_\_

Rank 2 – Team Number: \_\_\_\_\_

Rank 3 – Team Number: \_\_\_\_\_

Rank 4 – Team Number: \_\_\_\_\_

Rank 5 – Team Number: \_\_\_\_\_

# Team Spirit Award Nomination Form

**Judge advisor:** Please consult with the volunteers at the event for this award. It is advisable to have **at least 3 nominees**. Please collect this form at the conclusion of alliance matches.

**Award description:** The **Team Spirit Award** recognizes a team that has an approach to team identity, image, and theme that unifies team logos, uniforms, and overall aesthetics. The team aesthetic has a positive and respectful message, and/or cultural significance, and a bold approach to a memorable team identity. Additionally, the team enhances the event experience for all by exhibiting positive energy and good sportsmanship throughout the event.

Please rank the **top** teams that you have observed to display the most **team spirit**.

***Please write neatly!***

Rank 1 – Team Number: \_\_\_\_\_

Rank 2 – Team Number: \_\_\_\_\_

Rank 3 – Team Number: \_\_\_\_\_

Rank 4 – Team Number: \_\_\_\_\_

Rank 5 – Team Number: \_\_\_\_\_

# 3D Printing and Fabrication Award Nomination Form

**Judge advisor:** Please consult with the volunteers at the event for this award. It is advisable to have **at least 3 nominees**. Please collect this form at the conclusion of alliance matches.

**Award Description:** The **3D Printing and Fabrication Award** recognizes a team who have effectively designed AND utilized 3D printing OR other fabrication techniques to create solutions to engineering design challenges. This can include 3D printing, laser cutting or engraving, or any other legal fabrication method resulting in competition legal components that are used by the team to create an effective solution to a design challenge.

- Team provides documentation outlining the conception, creation, and implementation of their component(s) for all iterations which includes ample evidence of a student-centered design and fabrication process
- Component(s) are designed with attention to detail and effective use of materials
- Component(s) provide clear functionality for solving an engineering design problem.

Please rank the **top** teams that you have observed to display **outstanding use of 3D printing or custom fabricated parts**.

***Please write neatly!***

Rank 1 – Team Number: \_\_\_\_\_

Rank 2 – Team Number: \_\_\_\_\_

Rank 3 – Team Number: \_\_\_\_\_

Rank 4 – Team Number: \_\_\_\_\_

Rank 5 – Team Number: \_\_\_\_\_

# Team Interview Tips and Sample Questions

## Best Practices

- Ask if the team has a few minutes for the interview. If the team has an upcoming match that may interfere with the interview, tell them you will come back at a better time. **Do not** keep the students from heading to a match and make them late!
- Ask if all team members are present. Try to include all team members in the interview.
- Ask a quick “icebreaker” question such as, “That’s a really great team logo! Who designed it?” or “How is your team doing so far today?”
- Being a judge gives you a unique opportunity to impact students through positive reinforcement. Just a few words of encouragement can make their day.
- Try to avoid “yes or no” questions. Encourage teams to elaborate on their answers.
- Be prepared to rephrase your questions. Be mindful of differences in communication styles.
- Be mindful of students who do not speak the language that you are using as their first language.
- Be aware of different age levels. Approach students in an age-appropriate way, especially when talking to younger students.
- Be attentive to students. Refrain from side conversations / phone use during interviews.
- It is acceptable to take a picture of each robot so the license plate is visible. This will help you identify teams and robots later during deliberations.
- If you are having trouble finding a team, wait for them at the field for their next match.

## Sample Questions

- Is this a good time for an interview? Are all of your team members here?
- 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?
- What was the most difficult challenge your team has overcome so far?
- 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. Who was the primary programmer?
- 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?
- What are your goals for solo driving and solo coding scores? What are your average scores?

# Coach/Student Guide to the Engineering Notebook Rubric

| CRITERIA                              | Criteria Description / Explanation / Questions (page 1 of 4)                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IDENTIFY THE PROBLEM / DESIGN GOAL(S) | Clearly identifies the problem/design goal(s) at the start of each design process cycle. This can include elements of game strategy, robot design, or programming, and should include a clear definition and justification of the design problem(s), goal(s), criteria, and constraints.                                                                                                                                                        |
|                                       | The engineering design process is about creating a solution to an engineering problem. An expert notebook provides <b>great details</b> for: problem identification, game strategy, robot design/programming, and clear justification of design goals, criteria, and constraints.                                                                                                                                                               |
|                                       | <input type="checkbox"/> Is the challenge of the game clearly defined?<br><input type="checkbox"/> Are goals to overcome these challenges clearly defined?<br><input type="checkbox"/> Are key criteria and constraints that guide the solution defined and justified?<br><input type="checkbox"/> Are other challenges defined after the initial challenge?<br><input type="checkbox"/> Are the above criteria repeated for each design cycle? |
| BRAINSTORM SOLUTIONS                  | Explores different solutions with explanation. Citations are provided for ideas that came from outside sources such as online videos or other teams.                                                                                                                                                                                                                                                                                            |
|                                       | The engineering design process is about exploring different solutions, including reviewing solutions that others have come up with. An expert notebook explores <b>several solutions with explanations and citations</b> for ideas that came from outside sources.                                                                                                                                                                              |
|                                       | <input type="checkbox"/> Are multiple solutions explained, including the chosen solution?<br><input type="checkbox"/> Were ideas that were inspired by something else cited?                                                                                                                                                                                                                                                                    |
| SELECT BEST SOLUTION                  | Explains the “why” behind design decisions in each step of the design process for all significant aspects of a team’s design.                                                                                                                                                                                                                                                                                                                   |
|                                       | Providing justification for decisions made can help in current and future adjustments to the design. An expert notebook <b>fully explains</b> design decisions.                                                                                                                                                                                                                                                                                 |
|                                       | <input type="checkbox"/> Are key constraints identified and their impact on the design explained?<br><input type="checkbox"/> Are rationales, testing information, or a decision matrix used to explain major decisions?                                                                                                                                                                                                                        |

| CRITERIA                              | Criteria Description / Explanation / Questions (page 2 of 4)                                                                                                                                                                                                                                      |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>BUILD AND PROGRAM THE SOLUTION</b> | Records the steps the team took to build and program the solution so that the reader can follow the logic used by the team to develop their robot design, as well as recreate the robot design process from the documentation.                                                                    |
|                                       | Recording the building and programming steps can help if a disaster happens, such as a robot falls on floor or a program is erased, the design can be reproduced. An expert notebook contains <b>full detail</b> about the designs build and programming.                                         |
|                                       | <input type="checkbox"/> Are the build and programming steps documented in detail and in chronological order?<br><input type="checkbox"/> Are pictures and/or diagrams explained?<br><input type="checkbox"/> Can you recreate the solution from the entries?                                     |
| <b>ORIGINAL TESTING OF SOLUTIONS</b>  | Records the steps to test the solution, including test results. Testing methodology is explained.<br>Testing results are original to the team and explained, and conclusions are drawn from that data.                                                                                            |
|                                       | Explaining the test plan and documenting test results helps in the justification of design decisions. In an expert notebook, <b>all steps are recorded and clearly explained, and the results are original to this team.</b>                                                                      |
|                                       | <input type="checkbox"/> Is it explained how and why certain aspects of the design were chosen to be tested?<br><input type="checkbox"/> Is the team doing their own testing?<br><input type="checkbox"/> Is the team interpreting test results?                                                  |
| <b>REPEAT DESIGN PROCESS</b>          | Shows that the design process is repeated to work towards a design goal. This process can be repeated in full iterations or for specific parts of the overall design. The notebook shows setbacks that the team learned from, and shows design alternatives that were considered but not pursued. |
|                                       | The engineering design process is built on repeating the process until the identified problem meets the defined goals, criteria, and constraints. In an expert notebook, the design process is <b>repeated multiple times, showing setbacks and/or alternatives</b> pursued.                      |
|                                       | <input type="checkbox"/> Are multiple design cycles defined? This could be complete solutions or smaller changes to improve a previous design.<br><input type="checkbox"/> Does the team show what worked, what did not, and the path they took to arrive at their current design?                |

| CRITERIA                 | Criteria Description / Explanation / Questions (page 3 of 4)                                                                                                                                                                                                                                                                              |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| INDEPENDENT INQUIRY      | Team shows evidence of independent inquiry of their design process. Notebook documents whether the implemented ideas have their origin with students on the team, or if students found inspiration elsewhere.                                                                                                                             |
|                          | Exploring, experimenting, and discovery is an important part of learning and the engineering design process. An expert notebook will show evidence <b>through the whole process with sources documented.</b>                                                                                                                              |
|                          | <input type="checkbox"/> Is the team working through the engineering design process from start to finish?<br><input type="checkbox"/> Is the team properly crediting sources of information or inspiration for ideas?                                                                                                                     |
| USABILITY & COMPLETENESS | Records the design and development process with enough clarity and detail that the reader could recreate the project's history. Notebook has recent entries that align with the robot the team has brought to the event.                                                                                                                  |
|                          | An expert notebook <b>records the entire design, consistently, and is current.</b>                                                                                                                                                                                                                                                        |
|                          | <input type="checkbox"/> Does the team record their entire process, and not just what worked, or the end product?<br><input type="checkbox"/> Is the notebook up to date?                                                                                                                                                                 |
| ORIGINALITY & QUALITY    | Content is kept to relevant information and all content not original to the team is located in appendices to the engineering notebook. Information originating from outside the team is always properly cited in the notebook with the source and date accessed. Engineering notebook content is original to the submitting team members. |
|                          | In an expert notebook, <b>content is relevant, appropriately placed, properly cited, and original to the team.</b>                                                                                                                                                                                                                        |
|                          | <input type="checkbox"/> Does the notebook consist of the team's own work?<br><input type="checkbox"/> Is content not original to the team placed in an Appendix to the Engineering Notebook?<br><input type="checkbox"/> Does the team properly cite external ideas and information?                                                     |

| CRITERIA                                     | Criteria Description / Explanation / Questions (page 3 of 4)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ORGANIZATION<br>/ READABILITY                | <p>Entries are logged in a table of contents. Organization makes it easy to reference, such as color coded entries, tabs for key sections, or other markers. Notebook contains little to no extraneous content that does not further the engineering design process.</p>                                                                                                                                                                                                                                                                                 |
|                                              | <p>An expert notebook is <b>well organized with a table of contents</b> and has <b>little to no extraneous content</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                              | <p><input type="checkbox"/> Is there an up-to-date table of contents?</p> <p><input type="checkbox"/> Is formatting made for easier use as a reference document later, including a table of contents, reference and other non-design process materials put in an appendix, design cycles identified, and the notebook is easy for a reader to follow?</p>                                                                                                                                                                                                |
| RECORD OF<br>TEAM &<br>PROJECT<br>MANAGEMENT | <p>Provides a complete record of team and project assignments:</p> <ul style="list-style-type: none"> <li>– Contains team meeting notes including goals, decisions, and building/coding accomplishments.</li> <li>– Design cycles are easily identified.</li> <li>– Resource constraints including time and materials are noted throughout.</li> <li>– Notebook has evidence that documentation was done in sequence with the design process.</li> <li>– Entries include dates and names of contributing students.</li> </ul>                            |
|                                              | <p>An expert notebook <b>records all information listed</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                              | <p><input type="checkbox"/> Are team assignments recorded?</p> <p><input type="checkbox"/> Do meeting notes include goals, decisions, and accomplishments?</p> <p><input type="checkbox"/> Are design cycles identified?</p> <p><input type="checkbox"/> Does the notebook address resource constraints and personnel management?</p> <p><input type="checkbox"/> Are entries dated and are done in sequence with the design process?</p> <p><input type="checkbox"/> Are the names of the students involved in each entry in the notebook included?</p> |

# Coach/Student Guide to the Design & Innovate Award Interview Rubric

| CRITERIA                   | Criteria Description / Explanation / Questions (page 1 of 2)                                                                                                                                                                                                                   |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ENGINEERING DESIGN PROCESS | Team shows evidence of independent inquiry <b>through all the stages</b> of their design process. This includes brainstorming, testing, and exploring alternative solutions.                                                                                                   |
|                            | <input type="checkbox"/> Is team able to explain going through the design process from start to finish of their robot design, including researching alternatives and testing solutions?                                                                                        |
| GAME STRATEGY              | Team can <b>fully</b> explain their entire game strategy including game analysis.                                                                                                                                                                                              |
|                            | <input type="checkbox"/> Does the team explain their game strategy, including an analysis of the different gameplay and scoring options?                                                                                                                                       |
| ROBOT DESIGN               | Team can <b>fully</b> explain the evolution of their robot design to the current design.                                                                                                                                                                                       |
|                            | <input type="checkbox"/> Is the team able to talk about previous iterations of their design, what alternatives they considered, and how their robot represents their design process?                                                                                           |
| ROBOT BUILD                | Team can <b>fully</b> explain their robot construction. Ownership of the robot build is evident.                                                                                                                                                                               |
|                            | <input type="checkbox"/> Can the team explain any aspect of their robot if pointed out?<br><input type="checkbox"/> Is it clear that the students who are speaking did the actual designing and building?                                                                      |
| ROBOT PROGRAMMING          | Team can <b>fully</b> explain the evolution of their programming                                                                                                                                                                                                               |
|                            | <input type="checkbox"/> Can the team explain their robot programming, including the use of sensors, controls, and changes to programming over time?<br><input type="checkbox"/> If they used a coding library, would students be able to independently recreate that library? |

| CRITERIA                                 | Criteria Description / Explanation / Questions (page 2 of 2)                                                                                                                                                                      |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CREATIVITY / ORIGINALITY                 | Team can describe the creative aspect(s) of their robot <b>with clarity and detail</b> .                                                                                                                                          |
|                                          | <input type="checkbox"/> Can the team discuss creative aspect(s) – design or material choice, a creative solution to a problem or design challenge on robot or part of programming?                                               |
| TEAM AND PROJECT MANAGEMENT              | Team can <b>fully</b> explain how team progress was tracked against an overall project timeline, including management of material and personnel resources.                                                                        |
|                                          | <input type="checkbox"/> Is the team able to explain how they managed their time and keep on track in order to meet their goals, including how the work of the team was divided and other limitations such as parts were managed? |
| TEAMWORK, COMMUNICATION, PROFESSIONALISM | <b>Most or all team members contribute</b> to explanations of the design process, game strategy, and other work done by the team.                                                                                                 |
|                                          | <input type="checkbox"/> Are all team members able to share what they have contributed to the team's design process, strategy, and other aspects of the competition?                                                              |
| RESPECT, COURTESY, POSITIVITY            | Team <b>consistently</b> interacts respectfully, courteously, and positively in their interview.                                                                                                                                  |
|                                          | <input type="checkbox"/> Does the team treat both the judges and each other with respect and courtesy during the interview?<br><input type="checkbox"/> Do team members allow each other to speak and share their contributions?  |