JUDGING: AN INTEGRAL PART OF REC FOUNDATION COMPETITIONS

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BEFORE WE BEGIN

BEST PRACTICES

This is for YOU - the Coaches. Please ask questions when you have them.

Utilize the Chat
Share Pro Tips

Take Breaks

Ask Questions in the Chat

Be Respectful

JUDGING INTEGRAL TO REC FOUNDATION PROGRAMS

TAKEAWAYS FOR COACHES

- Why Judging?
- How your team can prepare for judging
- Engineering Notebook and Team Interview best practices
- Differentiation between judged awards

THE IMPORTANCE OF JUDGING

WHY DO JUDGING?

The Judging Process gives students an opportunity to:

- practice written communication skills through the Engineering Notebook
- practice verbal communication skills through the Team Interview
- demonstrate the values of the REC Foundation **Code of Conduct** and **Student-Centered** policies

Judging recognizes and celebrates what teams have learned and the hard work they have put into the robotics competition as an educational activity

Judged awards can qualify teams to higher levels of competition

STUDENT CENTERED

TEAMS SHOULD KNOW AND UNDERSTAND

STUDENT-CENTERED LEARNING

Students actively involved in learning to increase knowledge and skills under the guidance of adult mentorship

01

STUDENT-CENTERED APPLICATION

Student ownership of robot design, build, programming and utilization

02

CODE OF CONDUCT

Act with integrity, honesty, reliability, courtesy and respect of others

Exhibit maturity and class in difficult and stressful situations

Good sportsmanship

03

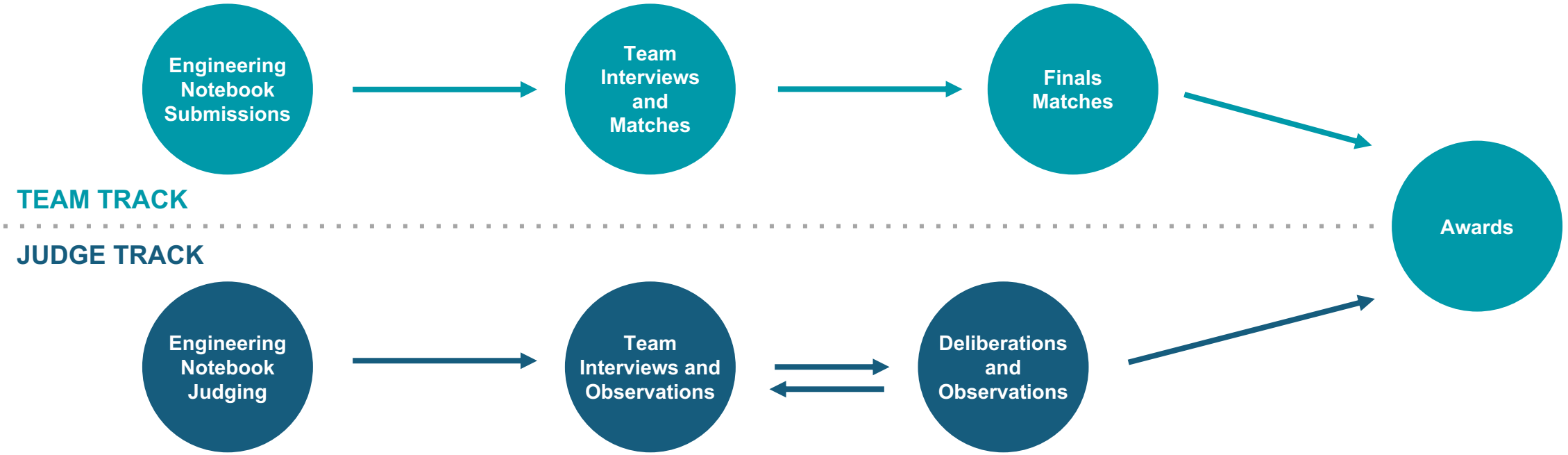
THE ETHOS OF JUDGING

CORE PRINCIPLES FOR TEAMS

- A team that earns an award should be **Student-Centered**
- A team that earns an award should abide by the REC Foundation **Code of Conduct**
- The **Team Interview is a conversation between students and judges** - it is not a prepared presentation
- The Interview and Notebook are **genuine reflections** of student work
- The Engineering Notebook is developed **by the team, for the team** - not a “presentation notebook” designed for the judges to look at
- There is **no magic formula** for winning an award
- **Each award is a worthy accomplishment** in its own right - no award should be seen as a consolation prize

QUICK JUDGING OVERVIEW

A TEAM-CENTRIC VIEW OF THE JUDGING PROCESS



HOW TO PREPARE FOR JUDGING

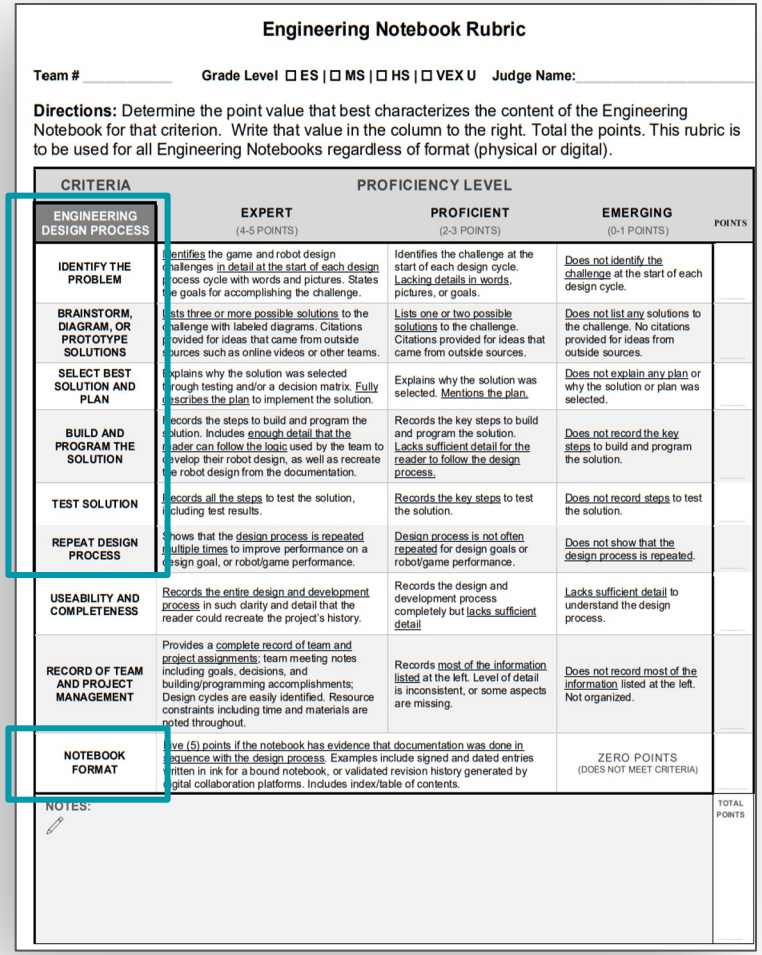
KNOW BEFORE YOU GO!

- Read and understand the Student Centered and Code of Conduct Policies
- Read and understand the Judge Guide
- Review the Team Interview Rubric, the Engineering Notebook Rubric, and the Award Descriptions
- Two components of Judging at events
  - Engineering Notebook evaluation
  - Judged team interview (10-15 minutes)
- Have students self-evaluate their notebook throughout the season
- Conduct mock interviews and notebook reviews with trusted adults
- Do the Skills Challenges at events - Match rankings (qualification and Skills Challenges) factor into the Excellence Award
- Manage expectations - it is possible to do everything ‘right’ and still not earn an award

ENGINEERING NOTEBOOK RUBRIC

UPDATED AND IMPROVED

- Highlighted the **Engineering Design Process** Criteria in criteria list
- Teams earn 5 points for evidence that Notebook creation is contemporaneous with the design process
- Format-neutral verbiage applies to both bound and digital notebooks alike
- Cleaner formatting
- More instructive language for ease-of-use by judges and to help teams prepare



Engineering Notebook Rubric

Team # _____ Grade Level ☐ ES | ☐ MS | ☐ HS | ☐ VEX U 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. Total the points. This rubric is to be used for all Engineering Notebooks regardless of format (physical or digital).

CRITERIA	PROFICIENCY LEVEL			
ENGINEERING DESIGN PROCESS	EXPERT (4-5 POINTS)	PROFICIENT (2-3 POINTS)	EMERGING (0-1 POINTS)	POINTS
IDENTIFY THE PROBLEM	Identifies the game and robot design challenges in detail at the start of each design process cycle with words and pictures. States the goals for accomplishing the challenge.	Identifies the challenge at the start of each design cycle. Lacking details in words, pictures, or goals.	Does not identify the challenge at the start of each design cycle.	
BRAINSTORM, DIAGRAM, OR PROTOTYPE SOLUTIONS	Lists three or more possible solutions to the challenge with labeled diagrams. Citations provided for ideas that came from outside sources such as online videos or other teams.	Lists one or two possible solutions to the challenge. Citations provided for ideas that came from outside sources.	Does not list any solutions to the challenge. No citations provided for ideas from outside sources.	
SELECT BEST SOLUTION AND PLAN	Explains why the solution was selected through testing and/or a decision matrix. Fully describes the plan to implement the solution.	Explains why the solution was selected. Mentions the plan.	Does not explain any plan or why the solution or plan was selected.	
BUILD AND PROGRAM THE SOLUTION	Records the steps to build and program the solution. Includes enough detail that the reader can follow the logic used by the team to develop their robot design, as well as recreate the robot design from the documentation.	Records the key steps to build and program the solution. Lacks sufficient detail for the reader to follow the design process.	Does not record the key steps to build and program the solution.	
TEST SOLUTION	Records all the steps to test the solution, including test results.	Records the key steps to test the solution.	Does not record steps to test the solution.	
REPEAT DESIGN PROCESS	Shows that the design process is repeated multiple times to improve performance on a design goal, or robot/game performance.	Design process is not often repeated for design goals or robot/game performance.	Does not show that the design process is repeated.	
USEABILITY AND COMPLETENESS	Records the entire design and development process in such clarity and detail that the reader could recreate the project's history.	Records the design and development process completely but lacks sufficient detail	Lacks sufficient detail to understand the design process.	
RECORD OF TEAM AND PROJECT MANAGEMENT	Provides a complete record of team and project assignments; team meeting notes including goals, decisions, and building/programming accomplishments; Design cycles are easily identified. Resource constraints including time and materials are noted throughout.	Records most of the information listed at the left. Level of detail is inconsistent, or some aspects are missing.	Does not record most of the information listed at the left. Not organized.	
NOTEBOOK FORMAT	Give (5) points if the notebook has evidence that documentation was done in sequence with the design process. Examples include signed and dated entries written in ink for a bound notebook, or validated revision history generated by digital collaboration platforms. Includes index/table of contents.		ZERO POINTS (DOES NOT MEET CRITERIA)	
NOTES:				TOTAL POINTS

ENGINEERING NOTEBOOK
EXPERT PROFICIENCY LEVEL

- CRITERIA
- ENGINEERING DESIGN PROCESS
  - IDENTIFY THE PROBLEM
  - BRAINSTORM, DIAGRAM, OR PROTOTYPE SOLUTIONS
  - SELECT BEST SOLUTION AND PLAN
  - BUILD AND PROGRAM THE SOLUTION
  - TEST SOLUTION
  - REPEAT DESIGN PROCESS
- USEABILITY AND COMPLETENESS
- RECORD OF TEAM AND PROJECT MANAGEMENT
- NOTEBOOK FORMAT

IDENTIFY THE PROBLEM

At the start of each design cycle, **identify the** game and robot design **challenges** IN DETAIL, using words, pictures, and diagrams

State goals for accomplishing the challenge

REPEAT DESIGN PROCESS

Show that the design process is repeated **MULTIPLE TIMES** to improve performance on a design goal, robot or game performance

TEST SOLUTION

Record **ALL STEPS** IN DETAIL to test the solution

Record the **results** of testing
Record notes and observations from competition performance

BRAINSTORM SOLUTIONS

List **three or more** possible solutions to the game or robot design challenge with labeled diagrams IN DETAIL

Citations provided for ideas from outside sources like videos or other teams

SELECT BEST SOLUTION

Explain **why** the solution was selected - by design matrix? by testing?

Fully describe IN DETAIL **the plan** to implement the chosen solution

BUILD AND PROGRAM

Record IN DETAIL the **steps** to build and program the solution

Include enough detail for reader to **follow the logic and recreate** the design

ENGINEERING NOTEBOOK
EXPERT PROFICIENCY LEVEL

USEABILITY AND COMPLETENESS

Record the entire design and development process in such clarity that the reader could recreate the project's history

RECORD OF TEAM AND PROJECT MANAGEMENT

Provide a complete record of team and project assignments

Provide team meeting notes including goals, decisions, and accomplishments

Project timeline and design cycles are easily identified

Resource constraints including time and materials are noted throughout

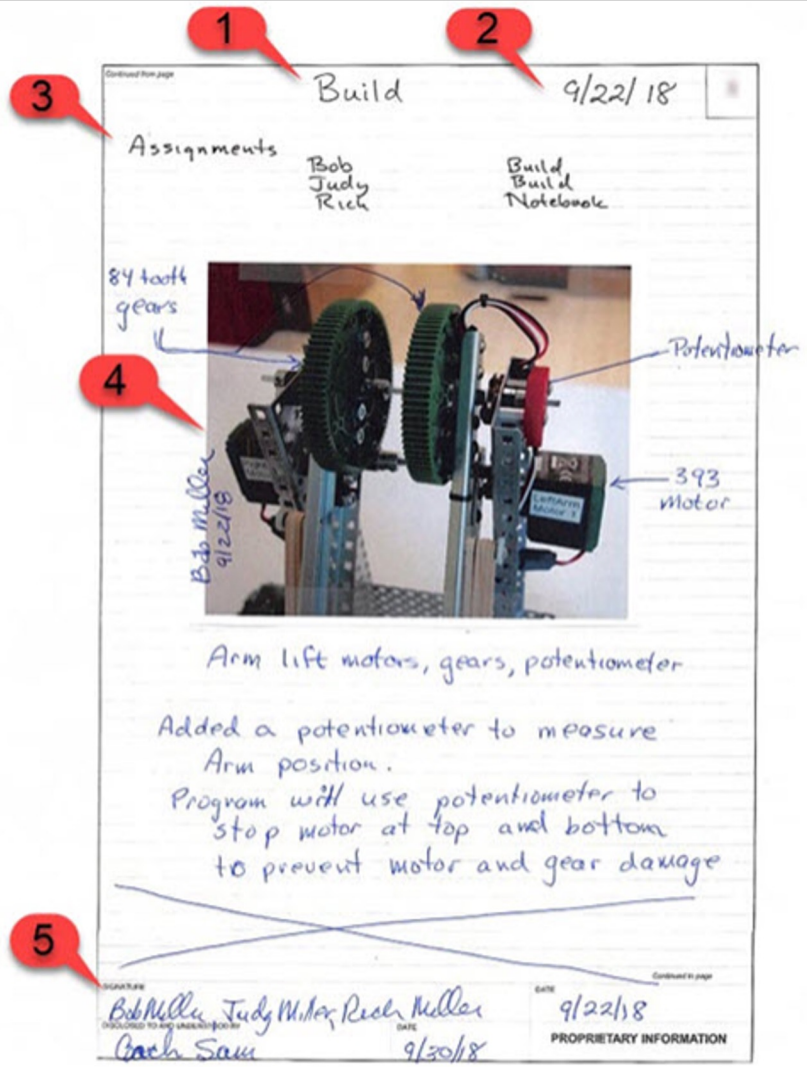
NOTEBOOK FORMAT

The Notebook has evidence that the documentation was done in sequence with the design process

Signed and dated entries written in ink (for bound notebooks), or validated revision history (generated by digital platforms)

Notebook includes a Table of Contents

BEST PRACTICES ENGINEERING NOTEBOOK



These are the minimum daily notebook entries for robotics students.

1. The Title is the type of work (or information) on that page. The Title should be on the top of every page the students worked.

2. The date the work was done. The Date should be on the top of every page the students worked.

3. The team members who are there and what they are assigned to. This should be entered once at the beginning of their day.

4. The work done that day. It can be text, drawings, or photos of any building; the code printout for any programming; or the results of any practice matches or other tests.

   Drawings and photos should have a title (or caption) with labels of important items.

   Sign and date any items taped into the notebook.

5. "X-out" any empty space, team members that were there sign in the signature area, and date the closing of the page.

   Have a Coach or Mentor witness the page.

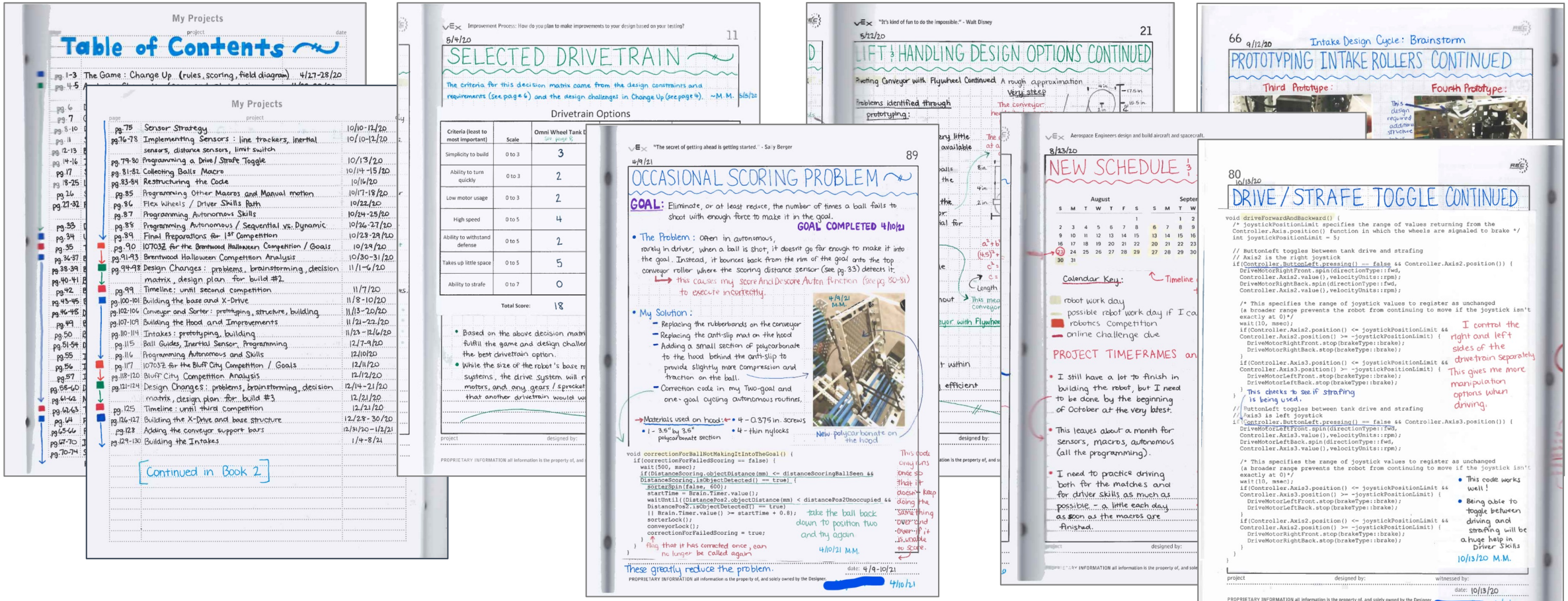
***Source**: R. Miller - Engineer, Team Mentor, Key Volunteer and Judge Advisor - Tuesday Tech Talks, October 20, 2020*

BEST PRACTICES ENGINEERING NOTEBOOK

- Table of Contents filled out with title and page number(s)
- Every page needs to be numbered with date and full signatures of team member(s)
- Use full names when signing each page
- Photographs of the team are good
- All team members should add comments to the Notebook
- All notes and decisions from team meetings detailed in the Notebook
- Citations from online videos, other teams, competitions should be included
- Notebooks had awesome sketches where we could tell what we were looking at
- Code changes should stay in chronological order with the robot build throughout the Notebook
- In general, when anything is changed
  - Describe reason for the change
  - What motivated the change (testing? competition results?)
  - Fully describe the change(s)
  - Describe advantages and disadvantages
  - Write the timeline to complete the change and list updates to the plan
  - Sketches need to be neat and identifiable
  - Repeat this sequence EVERY time a change occurs

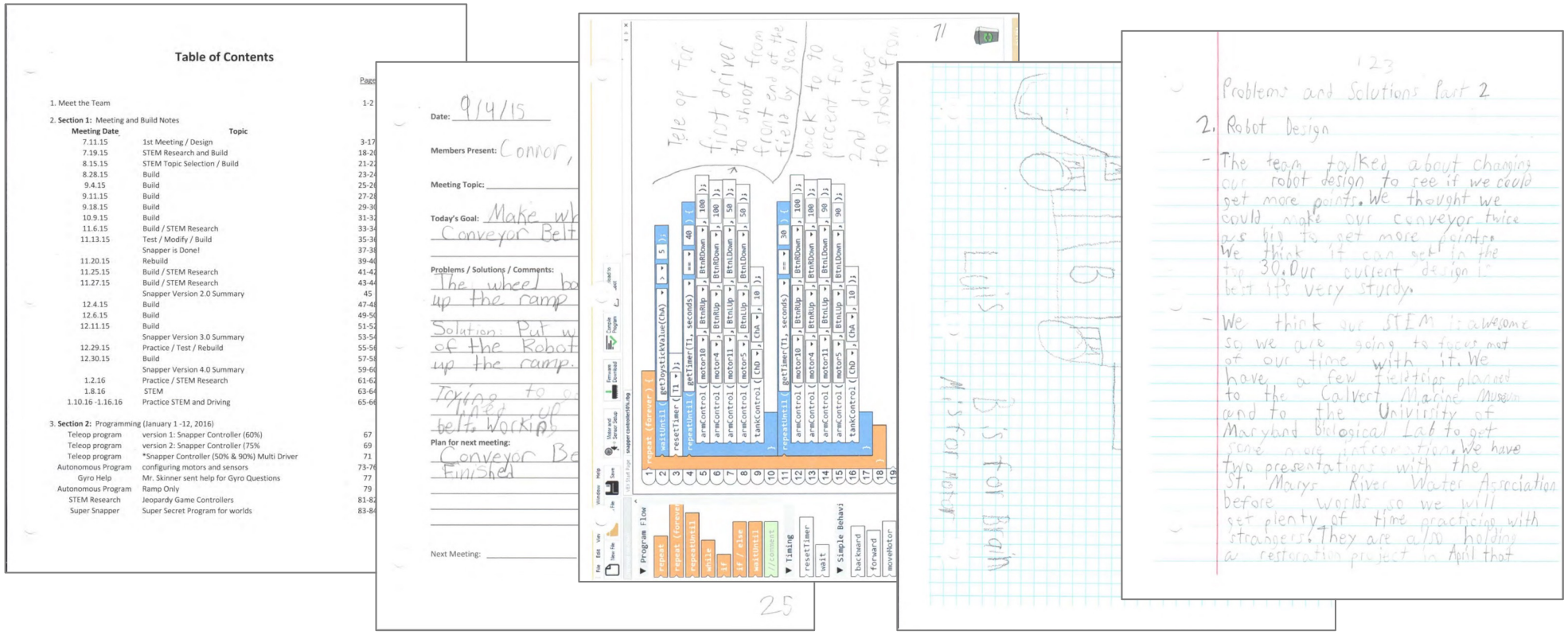
***Source**: Slide with tips from Judge Advisor B. Sweet, 2019-2020 Judge Training presentation by S. Brasher/L. Cruse*

BEST PRACTICES ENGINEERING NOTEBOOK



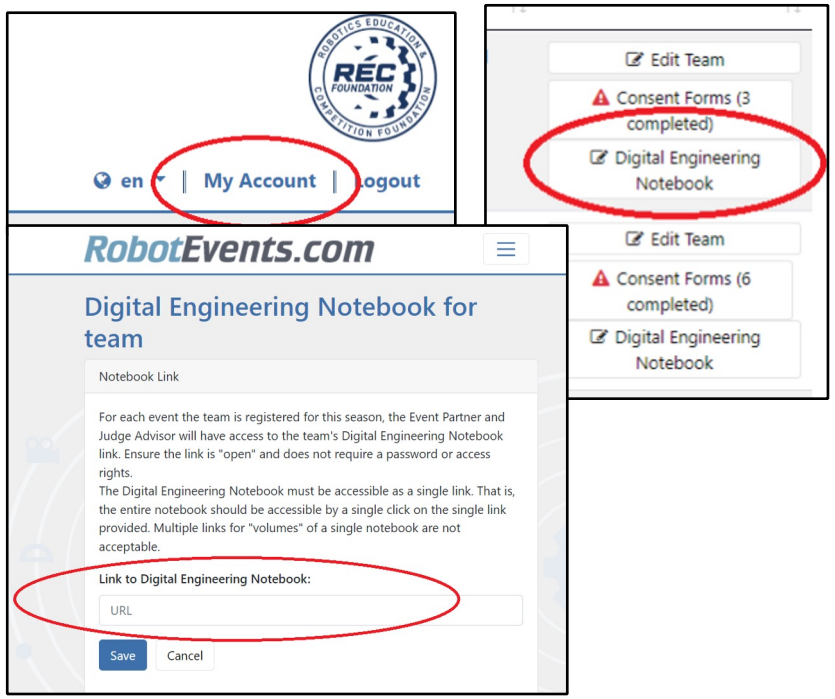
Source: *Team 10703Z*

BEST PRACTICES ENGINEERING NOTEBOOK



Source: https://www.roboticseducation.org/teams/vex-iq-competiton/
https://www.roboticseducation.org/resources_library/sample-vrc-design-notebook/

UPLOAD THE ENGINEERING NOTEBOOK



- Robotevents.com > Login > “**My Account**”
- Digital Engineering Notebook **upload button is found to the right** of each registered team on Account Dashboard
- Enter **full URL** to the team’s Engineering Notebook
- Ensure sharing settings **do not require login credentials** to view
- If link requires login credentials to view, an error message will appear and the sharing settings of the link must be modified to clear the error message
- The notebook link is in the system when it appears in blue below
- Options to disable or delete the link appear after the link has been posted
- **The link should allow viewing the notebook without requesting permission or requiring huge files to be downloaded**

TEAM INTERVIEW RUBRIC

UPDATED AND IMPROVED

- Removed reference to the Engineering Notebook as part of the Team Interview
- Added criteria to represent **all** Judged Awards
- Award names identify which criteria are linked to which awards
- Added criterion for team attributes that may not ‘fit’ other award criteria
- Reworded all criteria descriptions for ease of use by judges and for teams to prepare
- Added space for notes

Team Interview Rubric

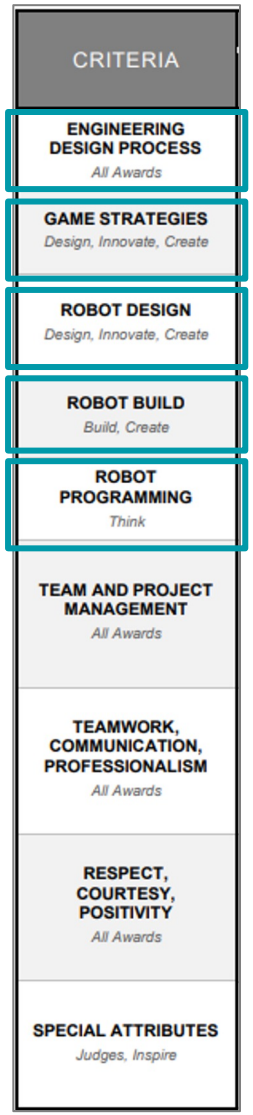
Team # _____ **Grade Level** ☐ **ES** | ☐ **MS** | ☐ **HS** | ☐ **VEX U** **Judge Name:** _____

Directions: Determine the point value that best characterizes the content of the Team Interview for that criterion. Write that value in the column to the right. Total the points.

CRITERIA	PROFICIENCY LEVEL			POINTS
	EXPERT (4-5 POINTS)	PROFICIENT (2-3 POINTS)	EMERGING (0-1 POINTS)	
ENGINEERING DESIGN PROCESS *All Awards*	Students clearly explain all aspects design process	Students can explain most aspects design process	Students can explain only limited aspects of design process	
GAME STRATEGIES *Design, Innovate, Create*	Students explain the entire evolution of their game strategy	Students can explain their current strategy with limited evidence of evolution	Students did not explain game strategy/strategy is not student-directed	
ROBOT DESIGN *Design, Innovate, Create*	Students can fully explain the evolution of their robot design to the current design	Students can provide a limited description of why the current robot design was chosen, but shows limited evolution	Students did not explain robot design /design is not student-directed	
ROBOT BUILD *Build, Create*	Students can fully explain their robot construction. Ownership of the robot build is evident	Students can describe why the current robot design was chosen, but with limited evolution	Students did not explain robot build/build is not student-directed	
ROBOT PROGRAMMING *Think*	Students can fully explain the evolution of their programming	Students can describe how the current programs work, but with limited evolution	Students did not explain programming/programming is not student-directed	
TEAM AND PROJECT MANAGEMENT *All Awards*	Students can explain how team progress was tracked against an overall project timeline, students can explain management of material and personnel resources.	Students can explain how team progress was monitored, and some degree of management of material and personnel resources	Students cannot explain how team progress was monitored or how resources were managed.	
TEAMWORK, COMMUNICATION, PROFESSIONALISM *All Awards*	Students can explain how multiple team members contributed to the robot design and game strategy. All students answer questions independently.	Students can explain how some team members contributed to the robot design and game strategy. Some students answer questions independently.	Only one team member answered questions or contributed to the robot design process.	
RESPECT, COURTESY, POSITIVITY *All Awards*	Students answer respectfully and courteously. Students make sure each team member contributes. Students wait to speak until others have finished.	Students answer respectfully and courteously. Some students attempt to contribute but are interrupted by other students.	Students do not answer respectfully and courteously. Students interrupt each other or the Judges.	
SPECIAL ATTRIBUTES *Judges, Inspire*	Does the team have any special attributes, accomplishments, or exemplary effort in overcoming challenges at this event? Please describe:			TOTAL POINTS

NOTES:

All Judging materials are strictly confidential. They are not shared beyond the Judges/Judge Advisor and shall be destroyed at the end of the event.



TEAM INTERVIEW
EXPERT PROFICIENCY LEVEL

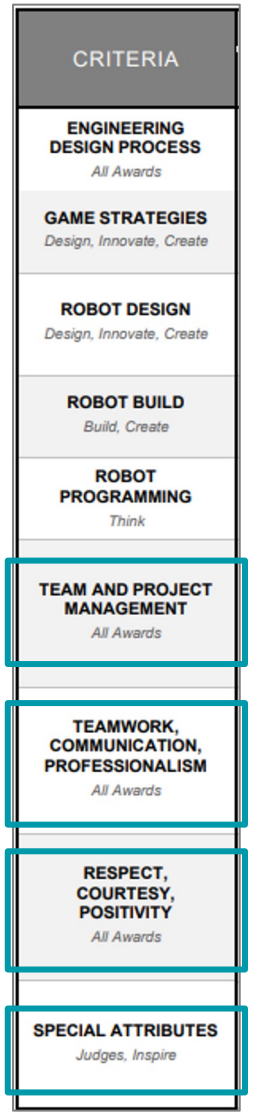
ENGINEERING DESIGN PROCESS
Students clearly explain all aspects design process

GAME STRATEGIES
Students explain the entire evolution of their game strategy

ROBOT DESIGN
Students can fully explain the evolution of their robot design to the current design

ROBOT BUILD
Students can fully explain their robot construction, and ownership of the robot build is evident

ROBOT PROGRAMMING
Students can fully explain the evolution of their programming



TEAM INTERVIEW
EXPERT PROFICIENCY LEVEL

TEAM AND PROJECT MANAGEMENT
Students can explain how team progress was tracked against an overall project timeline, students can explain management of material and personnel resources

TEAMWORK, COMMUNICATION, PROFESSIONALISM
Students can explain how multiple team members contributed to the robot design and game strategy. All students answer questions independently

RESPECT, COURTESY, POSITIVITY
Students answer respectfully and courteously. Students make sure each team member contributes. Students wait to speak until others have finished

SPECIAL ATTRIBUTES
Special attributes, accomplishments, or exemplary effort in overcoming challenges at the event

WHAT ARE THE JUDGED AWARDS?

THE REQUIRED AWARDS

DESIGN AWARD (Engineering Notebook Required)

Be at or near the **top of Engineering Notebook Rubric rankings**

Exhibit a **high-quality team interview**

Team demonstrates **effective management of time, talent, and resources**

Team interview demonstrates their ability to explain their **robot design and game strategy**

EXCELLENCE AWARD (Engineering Notebook Required)

All Design Award criteria, **plus**:

Be ranked in the **top 10 or top 30% of teams in Qualification Rankings**

Be ranked in the **top 5 or top 20% of teams in Robot Skills Rankings**

Be a candidate in consideration for other Judged Awards

JUDGES AWARD

Team displays **special attributes, exemplary effort, and perseverance at the event**

Team **overcomes an obstacle or challenge** and **achieves a goal or special accomplishment** at the event

Earned by a team that distinguishes themselves in some way that may not fit in other award categories

WHAT ARE THE JUDGED AWARDS?

OPTIONS FOR EVENTS

INNOVATE AWARD
(Engineering Notebook Required)

Recognizes an effective and **well documented design process**

The team who earns the Innovate Award should be among the **top contenders for the Design Award**

The submission of an Engineering Notebook is a requirement for the Innovate Award

THINK AWARD
Recognizes the most effective and consistent use of **coding techniques and programming design solutions** to solve the game challenge

AMAZE AWARD
Recognizes a **consistently high-performing** and competitive robot

BUILD AWARD
Recognizes a **well-constructed robot** that is constructed with high attention to detail to hold up to the **rigors of competition**

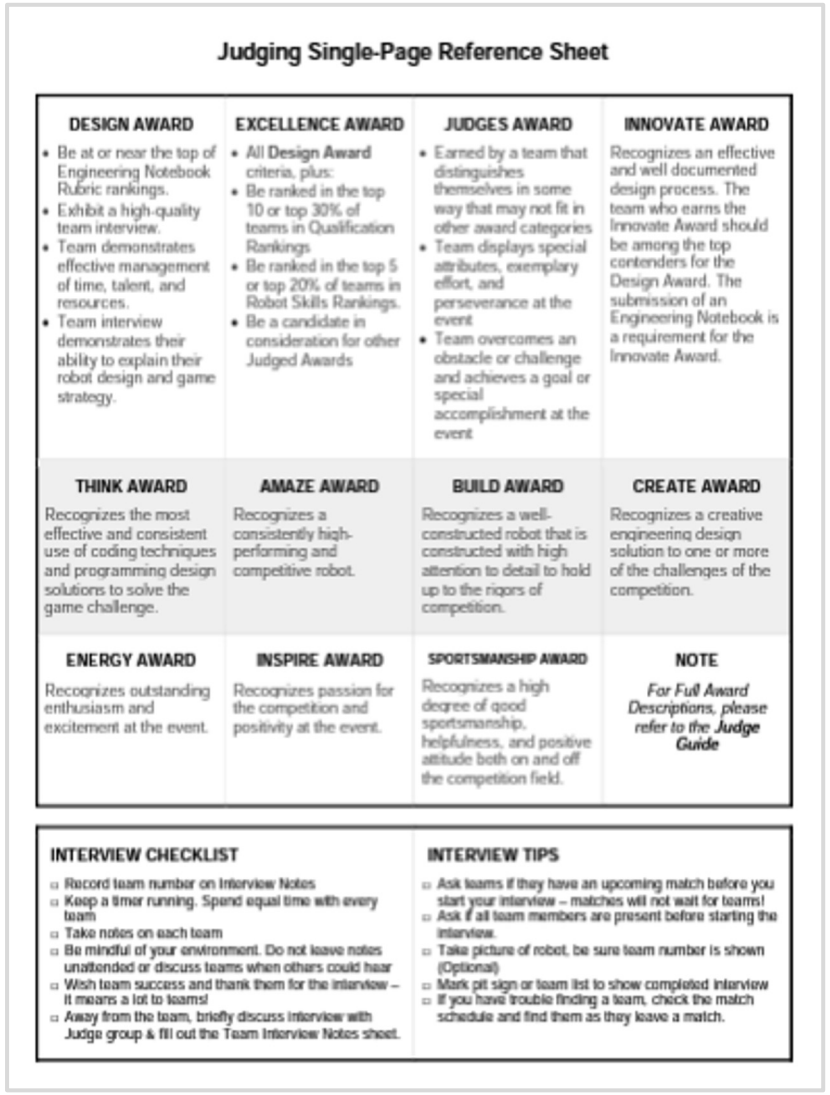
ENERGY AWARD
Recognizes outstanding **enthusiasm and excitement** at the event

INSPIRE AWARD
Recognizes **passion for the competition and positivity** at the event

SPORTSMANSHIP AWARD
Recognizes a high degree of **good sportsmanship**, helpfulness, and positive attitude both on and off the competition field

CREATE AWARD
Recognizes a **creative engineering design solution** to one or more of the challenges of the competition

Note: Full Award Descriptions Are Found In the Judge Guide



Judging Single-Page Reference Sheet

DESIGN AWARD	EXCELLENCE AWARD	JUDGES AWARD	INNOVATE AWARD
• Be at or near the top of Engineering Notebook Rubric rankings. • Exhibit a high-quality team interview. • Team demonstrates effective management of time, talent, and resources. • Team interview demonstrates their ability to explain their robot design and game strategy.	• All **Design Award** criteria, plus: • Be ranked in the top 10 or top 30% of teams in Qualification Rankings • Be ranked in the top 5 or top 20% of teams in Robot Skills Rankings. • Be a candidate in consideration for other Judged Awards	• Earned by a team that distinguishes themselves in some way that may not fit in other award categories • Team displays special attributes, exemplary effort, and perseverance at the event • Team overcomes an obstacle or challenge and achieves a goal or special accomplishment at the event	Recognizes an effective and well documented design process. The team who earns the Innovate Award should be among the top contenders for the Design Award. The submission of an Engineering Notebook is a requirement for the Innovate Award.
THINK AWARD	**AMAZE AWARD**	**BUILD AWARD**	**CREATE AWARD**
Recognizes the most effective and consistent use of coding techniques and programming design solutions to solve the game challenge.	Recognizes a consistently high-performing and competitive robot.	Recognizes a well-constructed robot that is constructed with high attention to detail to hold up to the rigors of competition.	Recognizes a creative engineering design solution to one or more of the challenges of the competition.
ENERGY AWARD	**INSPIRE AWARD**	**SPORTSMANSHIP AWARD**	**NOTE**
Recognizes outstanding enthusiasm and excitement at the event.	Recognizes passion for the competition and positivity at the event.	Recognizes a high degree of good sportsmanship, helpfulness, and positive attitude both on and off the competition field.	*For Full Award Descriptions, please refer to the Judge Guide*

INTERVIEW CHECKLIST	INTERVIEW TIPS
▫ Record team number on Interview Notes ▫ Keep a timer running. Spend equal time with every team ▫ Take notes on each team ▫ Be mindful of your environment. Do not leave notes unattended or discuss teams when others could hear ▫ Wish team success and thank them for the interview – it means a lot to teams! ▫ Away from the team, briefly discuss interview with Judge group & fill out the Team Interview Notes sheet.	▫ Ask teams if they have an upcoming match before you start your interview – matches will not wait for teams! ▫ Ask if all team members are present before starting the interview. ▫ Take picture of robot, be sure team number is shown (Optional) ▫ Mark pit sign or team list to show completed interview ▫ If you have trouble finding a team, check the match schedule and find them as they leave a match.

JUDGED AWARDS
ONE PAGE REFERENCE SHEET

ALL IN ONE PLACE!

Thumbnail **descriptions** of each Judged Award for quick reference and side-by-side comparison

Interview Checklist and Best-Practice **Interview Tips** facilitate consistency among interviews… **all on one page!!**

IN SUMMARY

CORE PRINCIPLES FOR TEAMS

- A team that earns an award should be **Student-Centered**
- A team that earns an award should abide by the REC Foundation **Code of Conduct**
- The **Team Interview is a conversation between students and judges** - it is not a prepared presentation
- The Interview and Notebook are **genuine reflections** of student work
- The Engineering Notebook is developed **by the team, for the team** - not a “presentation notebook” designed for the judges to look at
- There is **no magic formula** for winning an award
- **Each award is a worthy accomplishment** in its own right - no award should be seen as a consolation prize

THANK YOU

2022 REC FOUNDATION COACH SUMMIT