VEX IQ
Design Award
Judging Process

Documents

Awards Appendix

- Description of Design Award & judging criteria

Judge's Guide

- Design Award Rubric
- Standard Judges' questions

RoboticsEducation.org/event-partners/event-partner-resources-documents/

The Design Award

The **Design Award** recipient demonstrates the ability to implement the most effective and efficient robot design process. Their Engineering Notebook and discussion with the Judges will demonstrate the team's ability to produce a quality robot with minimal adult assistance. Only teams that submit Engineering Notebooks are eligible for the Design Award.

Key criteria:

- Engineering Notebook is a clear, complete, and organized document of the robot design process.
- Team demonstrates effective management of skills, time, and material resources.
- Students understand and explain how they developed an effective game strategy and robot design.
- Students demonstrate teamwork and effective communication skills.

The Design Notebook

The VEX IQ Engineering Notebook provided by the REC Foundation with team registrations includes hints on good notebook practices and gives examples of good practices.

- Bound quad-ruled notebook is best.
- The notebook should never be edited.
- The team number should be on the cover.
- The notebook should be written in ink with errors crossed out using a single line.
- Pages should be numbered and entries should be dated in chronological order with each page signed or initialed by the students.
- Additional materials such as computer code or CAD drawings should be glued or taped into the notebook.
- Pages should never be removed from the Notebook even if they contain errors.

The Design Notebook

Judges will not accept Electronic notebooks on lap tops, thumb drives, or cloud based servers.

- Will accept hard copy print outs
- Will accept 3 ring binders (see bonus on rubric)

Journals vs. Engineering Notebooks

- Remember younger students may communicate engineering ideas in pictures rather than words, this does not make their communication a journal

Process

Five Steps at local regional events:

- Collect Notebooks
- Quick preliminary review of notebooks
- Review using the Design Rubric
- Interview top teams using the Design Rubric
- Final deliberation

Collect Team Notebooks

- EP should arrange to collect all notebooks during the team check in process.
- Notebooks taken to judges room for evaluation.
- Record team numbers of all teams submitting notebooks (for Excellence Award)

Preliminary Notebook Evaluation

- Judges should look at **all** submitted notebooks and very quickly place them into one of two categories.
- Emerging programs
  - These are very rudimentary notebooks that may consist of just a few pages and which are typically not going to be contenders for the Design Award
  - This team would score mostly 1's on the design rubric for their notebook
  - If only one team submits at an event they are still eligible for excellence even if they are emerging
- Proficient to Expert
  - These are more advanced notebooks that appear to be contenders for the design award
  - This team would score 2's and 3's on the design Award rubric for their notebook

The Design Notebook Rubric

- Once the initial quick inspection of notebooks is completed use the Design Award Rubric to evaluate the Proficient to Expert notebooks.
- Score all Proficient to Expert notebooks.
- Score emerging notebooks with the rubric if time permits.
- Identify top contenders for follow up team interviews.

Design Award Rubric

Team Name: _____ **Team Number:** _____ ☐ Elementary ☐ Middle **Judges:** _____

For Design Award details, review the Awards Appendix on www.roboticseducation.org/vex-iq-challeng/viq-current-game/

Directions: Mark the descriptor that best describes the team's performance for each criterion.

The Engineering Notebook …

Criteria		Expert (3 points)	Proficient (2 points)	Emerging (1 point)	Points
Clear document of Robot Design Process	Identify the challenge(s)	Describes the challenge at the start of each design process iteration with words and pictures, and states the teams' goals for accomplishing that challenge	Identifies the challenge at the start of each design cycle	Does not identify the challenge at the start each design cycle	
	Brainstorm solutions	Lists 3 or more possible approaches to the challenge with labeled diagrams	Lists 1-2 possible approaches to the challenge.	Does not list the results of the brainstorming sessions.	
	Select the best approach and plan	Explains why the selected approach was chosen and why the other alternatives were not chosen. Fully describes the plan	Explains why the selected approach was chosen. Mentions the plan	Does not explain why the selected approach was chosen	
	Build, Program and Test	Records the building, programming and test processes and the test results in such detail that someone outside the team could recreate the robot by following the steps in the notebook	Documents the key steps to build, program and test the robot and the key test results	Leaves out important information about building, programming and testing the robot	
	Repeat process steps, if needed	Contains a complete history of the design process iterations for the season that resulted in the current robot design, repeating the steps above for each iteration	Describes most of the design process iterations, including most of the steps for each iteration	Leaves out most of the design process iterations	
Complete and organized document of Robot Design Process		Contains Project and Team Assignments, Entries from team meetings, with goals, decisions and accomplishments, and recorders' names or initials and dates. Indexed so that anyone can easily locate any needed information	Contains most of the information listed at left. Organized so that team members can locate most needed information	Leaves out important information and/or is poorly organized	
Team demonstrates effective management of skills, time, and material resources		Includes an overall project timeline against which progress is checked regularly as well as daily goals and accomplishments. Documents the assignments of each team member based on skills and availability.	Documents most daily goals and accomplishments and most team member assignments	Does not document the team's management of key resources	
Describe the best features of this **Engineering Notebook**: _____ **Total the number of points earned from Notebook (Add 3 pts for a bound notebook & enter the number on page 2 of this rubric):**					**Total Points**

Rubrics are confidential judging documents and should not be returned to the team, coach, or Event Partner. Rubrics should be destroyed immediately after the Judge Advisor has recorded the winning team.

Interviewing Teams

- Judges will conduct follow up interviews with the top contenders
- Judges should use the Student Interview portion of the Design Rubric to evaluate selected teams in their pit area
- Place final 5 best teams based on rubric onto the list of finalists for the Design Award

Design Award Rubric

Robot Design Interview

Criteria	Expert (3 points)	Proficient (2 points)	Emerging (1 point)	Points
Engineering Notebook is a clear, complete, and organized document of the robot design process	Students can explain clearly the robot design process and how they documented their use of the process in their Engineering Notebook	Students can explain most aspects of the design process and how they documented their use of the process	Students can explain only limited aspects of the design process and/or how they documented their use of the process	
Team demonstrates effective management of skills, time, and material resources	Students can explain how team progress was tracked against an overall project timeline and how students were assigned to tasks based on their skills and availability	Students can explain how team progress was monitored and how students were assigned to tasks	Students cannot explain how team progress was monitored and/or how students were assigned to tasks	
Students understand and explain how they developed an effective game strategy and robot design	Students can describe multiple game strategies and robot designs that were considered, and they can fully explain how and why the current game strategy and robot design were selected	Students can describe at least two strategies and designs that were considered, and can explain how or why the current strategy or design were selected	Students can only describe the current strategy and design, or they cannot explain how and why the current strategy or design were selected	
Students demonstrate teamwork and effective communication skills	Students demonstrate high level of teamwork, fluency, and courtesy	Students demonstrate some teamwork, fluency, and courtesy	Students demonstrate limited teamwork, fluency, and courtesy	
Describe the best features of this **Robot Design Interview**:		**Total the number of points earned from Student Interview and Discussion:**		
		Total the number of points earned from Notebook: (including bonus for bound notebook)		
		Total the number of points combined:		

Rubrics are confidential judging documents and should not be returned to the team, coach, or Event Partner. Rubrics should be destroyed immediately after the Judge Advisor has recorded the winning team.

Final Deliberation

Rubric are quantitative in nature.

- The rubrics are intended to be used by judges to narrow down the field of contenders for each award.

Judges are expected to apply their qualitative judgement when making a final decision on all awards.

- Multiple teams often score “perfect” 3’s on a rubric or fall within a couple of points of one another.

Confidentiality

Rubrics are confidential judging documents and should not be returned to the team, coach, or Event Partner. Rubrics should be destroyed immediately after the Judge Advisor has recorded the winning team.

- Teams with a perfect rubric score often do not understand why they were not selected for an award.
- Judges should also be aware that they must be very careful in discussing these awards with teams after an event. A judge's best intentions are often misinterpreted by teams resulting in students with hurt feelings.

The Judge Advisor must properly dispose of these and all other judging materials at the conclusion of the event.

- Teams will "dumpster dive"

Design Award at VEX Worlds

- Teams must have been awarded the Design, STEM Research or Excellence at state/regional/provincial/national championship event to be eligible for Design at VEX Worlds.
- Eligible teams will be notified in advance to submit their Engineering Notebooks at check in.
- Teams with high quality Engineering Notebooks will be selected for Design Award interviews in the Team Pit Areas.
- Teams are not given scheduled sit down interviews for the Design Award at VEX Worlds.

Judging Questions

Email: tarek@roboticseducation.org