

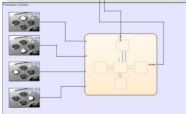
2025 Engineering Notebook Scoresheet (300 Points)
Purpose: To document the process used to design, fabricate, and test the Robot.

Research Paper		Max Points	Score
OBJECTIVE: Students will understand a real world challenge/application for the Robot.			
Superlative 36-40 / Excellent 28-35 / Meets 12-27 / Needs Revision 0-11		40	
Indicators: Discussion of historic, local, regional, and cultural impact of the game theme			
Explain how the game technology is being used at a company/industry/research lab in the team's state or region.		8	<input type="text"/>
Include related information that ties the game theme to history, famous inventor(s), major milestones, etc.		8	<input type="text"/>
Analyze the impact of the game theme/problem & related technology needs, adaptations, and current progress with solutions.		6	<input type="text"/>
Show creativity by linking the game to appropriately related science content and human experience.		6	<input type="text"/>
Cite sources used to gather information (in a list at end of the section).		6	<input type="text"/>
Stay within 2-5 page limit (including sources). This reseach section is an overview.		6	<input type="text"/>
Comments:			
Engineering Design Process			
Ask, Define, and Plan		Max Points	Score
OBJECTIVE: Students will use a Engineering Design Process to choose a robot design.			
Superlative 31-50 / Excellent 24-30 / Meets 10-23 / Needs Revision 0-9		50	
Indicators: Use of an Engineering Design Process to describe the Robot and flow requirements to the HW and SW pieces			
Identify requirements (what does the robot have to do), constraints (limitation, restriction), functions (task, action or process), and objectives (outcome).		10	<input type="text"/>
Explain how the Team creates ideas. Show use of a brainstorming process to create a pool of design ideas.		10	<input type="text"/>
Describe the mock-ups and models used to consider solution alternatives (e.g. simple cardboard or other material model, Simulink models).		10	<input type="text"/>
Explain and show evidence of how the Team evaluated solution alternatives and chose designs to achieve point scoring goals and objectives (e.g. using analysis techniques, measurements, applied math, advanced analysis techniques (such as MATLAB), modeling tools (such as Simulink), trade studies, decision matrix, pros/cons chart, game task sequences, timelines).		10	<input type="text"/>
Explain how the Team allocated/mapped/assigned functions between Hardware and Software to satisfy requirements, constraints, functions, and objectives. Document the HW/SW interface.		10	<input type="text"/>
Comments:			
Hardware (HW) Create Process		Max Points	Score
OBJECTIVE: Students will understand how to partition a Hardware system.			
Superlative 36-40 / Excellent 28-35 / Meets 12-27 / Needs Revision 0-11		40	
Indicators: Discussion of the hardware mechanisms and construction			
Explain and document the Robot Hardware using sketches, CAD drawings, and/or photos as evidence, including: - Propulsion (how it moves on the field, speed, gear ratios, motor selections) - Manipulation (how it interacts with game and/or field elements) NOTE: The Team will choose the number and type of mechanisms, but the score is based on quality of the explanation.		25	<input type="text"/>
Explain construction decisions and impact on robot performance (material choices, special tools, Team custom part). Work-in-process photos may be used as evidence.		15	<input type="text"/>
Comments:			
Software (SW) Create Process		Max Points	Score
OBJECTIVE: Students will use software developent conventions in their work.			
Superlative 36-40 / Excellent 28-35 / Meets 12-27 / Needs Revision 0-11		40	
Indicators: Demonstration of Software development examples (e.g. prototyping [flowchart/diagram/simulation], testing/revisions, final code)			
Explain how the Team considered the software solution needed including how it best helps drivers control the Robot (evidence is logic charts, block diagrams, Simulink simulations, code, etc.)		15	<input type="text"/>
Explain the tools, methods and techniques used to create software (e.g. VEXcode V5, C++, Python, MATLAB/Simulink)		10	<input type="text"/>
Explain SW configuration control, including how software file versions are managed, how compiled code versions are controlled on robot, and back-ups.		9	<input type="text"/>
Show the Team operated a Robot Model on Simulink/Web. (Evidence is a screen capture and a paragraph on the user experience).		6	<input type="text"/>
Comments:			
Integration, Test, and Revision		Max Points	Score
OBJECTIVE: Students will understand the test and revision feedback loop. (Closed-Loop Design)			
Superlative 23-25 / Excellent 18-22 / Meets 8-17 / Needs Revision 0-7		25	
Indicators: Evidence of steps testing the HW/SW interface, driver controls, risk assessment/improvement opportunities and a closed-loop design			
Explain how Hardware and Software are integrated.		6	<input type="text"/>
Explain the test plan used to evaluate the Robot, and descibe results compared to requirements.		6	<input type="text"/>
Show the Team encouraged driver practice, evaluated driver performance, and made changes to meet objectives.		5	<input type="text"/>
Identify opportunities to improve Hardware based on testing. Explain proposed revision/refinements.		4	<input type="text"/>
Identify opportunities to improve Software based on testing. Explain proposed revisions/refinements.		4	<input type="text"/>
Comments:			

Artificial Intelligence (AI)	Max Points	Score
OBJECTIVE: Students will be exposed to next generation design technology, and may use as long as disclosed.		
Superlative 9-10 / Excellent 7-8 / Meets 3-6 / Needs Revision 0-2	10	
Indicators: Discussion of AI usage, whether to develop code, format text, research, or design a 3D component, etc., as applicable		
Identify the AI tool used, show the prompts and summarize what the Team learned. In Appendix if desired, but not required, a screenshot of the prompt and results as evidence.	10	<input type="text"/>
Comments:		
Safety	Max Points	Score
OBJECTIVE: Students will learn and demonstrate safe operating procedures in a laboratory environment.		
Superlative 22-25 / Excellent 18-21 / Meets 8-17 / Needs Revision 0-7	25	
Indicators: Evidence of safety practices		
Show that safety procedures are established and training is given to Team.	5	<input type="text"/>
Explain the risk/injury assessment of workshop tools.	5	<input type="text"/>
Provide evidence that safe practices were followed (e.g. photos, contract, samples of quiz results).	5	<input type="text"/>
Show a team safety plan (e.g. emergency numbers, location of first aid kit and AED).	4	<input type="text"/>
Show example of a completed safety quiz or safety assessment.	4	<input type="text"/>
Reference OSHA Certified Training. (OSHA Training not required, but awareness allows future improvements).	2	<input type="text"/>
Comments:		
Overall Quality and Completeness	Max Points	Score
OBJECTIVE: Students will demonstrate proficiency in creating and formatting a business document.		
Superlative 32-35 / Excellent 25-31 / Meets 10-24 / Needs Revision 0-9	35	
Indicators: Quality and completeness, including proper grammar & composition		
MEET the minimum requirements for a Notebook submission.	10	<input type="text"/>
Cover sheet and/or title page that identifies the school team name, teacher contact information, and team number 1" margins; business font no smaller than 12 pt., double-spaced (single spaced ok in tables and outlines) Table of Contents, page numbers Summary (including team overview and introduction of members).		
Clear labeling of photos, graphics including tables and graphs.	10	<input type="text"/>
Completeness Criteria	10	<input type="text"/>
Headings and sub-headings are used to support organization, internal bookmarks to appendices Lack of extraneous material such as community or promotional efforts, spirit development, team building Proper formal writing, including proper use of grammar and composition throughout Source citations used for gathered information		
Submit as a single PDF file; 35 page max main section (Title page & Table of Contents not counted), 40 page max for appendix.	5	<input type="text"/>
Comments:		
Support Documentation	Max Points	Score
Objective: Students will organize supporting documentation (including captioning) in the main Notebook and the appendix.		
Superlative 45-35 / Excellent 35-44 / Meets 15-34 / Needs Revision 0-14	35	
Indicators: Labeled and linked support documentation present, including, but not limited to, below:		
CAD/other drawings, photos (Screenshots count)	10	<input type="text"/>
Table of Requirements	5	<input type="text"/>
Test results, tables/charts	5	<input type="text"/>
Safety evidence	5	<input type="text"/>
Team organization and roles	4	<input type="text"/>
Flow charts/algorithms/code examples/Simulink models (screenshots are commonly used)	3	<input type="text"/>
Sources not already referenced in the Research section	3	<input type="text"/>
Comments:		
Summary Comments:	Max Points	Score
	300	
Rating Points	Superlative 270-300 / Excellent 211-269 / Meets 90-210 / Needs Revision 0-89	
Percentile Boundaries	Superlative 90 % / Excellent 70 % / Meets 30 % /	
Team Number :		Team Name:
Judge's Name:	NB 2025.4	

FAQs and Clarifications

Could include here to help level set Students, Teachers, Judges.

A1	Best EDU Link https://bestedu.bestrobotics.org/
A2	URL for SimulinkOnline https://www.mathworks.com/products/simulink.html
A3	Document HS/SW Interface : Example: Or a wiring list linked to Control Names 
A4	Mechanisms : includes arms, grippers, plows, "tool" attachments. Use any number of mechanisms. For example, a simple robot that moves and scores may only have wheels.
A5	Test Plan - the sequence of items you need to demonstrate or test with your robot to prove it meets requirements. For example, its speed control, the turn radius, robot center of gravity (no falling over), mechanism functionality (lifting strength), or that motors or servos don't go too far.
A6	AI - Easy Points.... example is a Google search on the Game topic. It shows your search terms and how it helped. Take a screenshot.
A7	Pseudo-Code - logic described in prose, but not syntactically accurate Pseudocode is an informal, high-level description of an algorithm or program, intended for human reading rather than machine execution. It uses a blend of natural language and programming-like constructs to outline the logic and steps of a process without adhering to the strict syntax rules of a specific programming language.
A8	

Feedback ... Just "Overall a great job" in the Summary block is not enough to satisfy students.

It is important that students are given an explanation of the score range to be encouraged to take their deliverable to the next level next year. They need to clearly know that all submissions are judged to fall on the scale of 0 to the max total points both within the rules and when provided feedback.

Constructive Criticism

The goal of evaluations should be to emphasize growth and encourage improvement. There are several techniques that help us in our oral or written constructive criticism.

This is one method to address good ... a Critique Sandwich:

A negative comment about a problem or flaw is presented between positive comments about something done well.

"I like that..." then "I wonder if..." or "Next year, best next steps might be..."

Method 2... Specific Suggestions: a few specifics of biggest gaps or biggest opportunities to raise their overall score.

"This section could be improved by..." "To differentiate yourself, include..."

Judges will often use the form of "this is missing" or "no evidence of that", to explain what would fill the gap to a better score for the section. Judges do not have time to come up with comments in every section, but focus where it will help most.