Student-Friendly Engineering Notebook Rubric

Note: This is the Student-Friendly edition of the Engineering Notebook Rubric. *It is a teaching tool designed to help students prepare their notebook for judging. It is* ***not*** *the official rubric that judges will use when scoring an engineering notebook.*

What the Stars Mean:

- Exemplary ★★★★ We did this all the time and very well.
- Proficient ★★★ We did this most of the time.
- Developing ★★ We did this sometimes but need more details
- Beginning ★ We rarely did this or forgot to include it.

Is our notebook easy to use? (16 points)

Ask yourself: Could a stranger find something in our notebook? Can you tell who wrote each part? Did we write all season, or just at the end? Did we say where our ideas came from?

Look For	★★★★	★★★	★★	★
Finding Things	Our pages are numbered, our entries are in order (by date or by section), and our table of contents points to the exact page.	Our pages are numbered and we have a table of contents, but you have to hunt a little to find something.	Some parts are organized, but it is hard to find what you are looking for.	We have no page numbers and no table of contents. You cannot find anything.
Who wrote it	Our team number is on the notebook, and every entry is signed or initialed by the person who wrote it.	Our team number is there, and most entries are signed.	Our team number is there, but we hardly ever sign our entries.	Our team number is missing, or we never sign our entries.
Writing all season	Our dated entries cover the whole season. We wrote things down regularly, not once in a while.	Our dated entries cover the whole season, with a few gaps.	Our entries are bunched into a few short stretches. Big parts of the season are missing.	Our entries have no dates, or they all look like we wrote them at the same time.
Where ideas came from	Every time we used someone else's design, mechanism, code, or idea, we said where it came from, right where we used it.	We named most of the sources we used, but a few are missing.	We named 1 or 2 sources we used, but most are missing.	We used other people's work without saying where it came from.

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Did we explain the problem? – Define (12 points) *Ask yourself: Do we say what our robot has to do? Do we say what our plan is for scoring, and what we gave up to do it? Did we come up with more than one idea?* **Criteria** are the things your solution has to do. **Constraints** are the limits you have to work inside (size, parts, time, or rules).				
Look For	★★★★	★★★	★★	★
The problem, criteria, and constraints	We explained the problem we were solving, and the rules and limits that could affect our solutions.	We described the problem and listed the rules and limits, but we did not explain them.	We described a problem but did not say what the rules or limits were.	We never said what problem we were solving, and we listed no rules or limits.
Our scoring plan	We explained what we planned to score and why, including what we gave up by choosing that plan.	We explained what we planned to score and gave some reasons, but did not say what we gave up.	We mentioned our plan but did not say why we chose it.	We never wrote down a plan for scoring.
Our ideas	We wrote down many different ideas (for building, coding, or strategy) with enough detail to see how they were different from each other.	We wrote down 3 or more ideas without comparing them, or 1 or 2 ideas and compared them.	We wrote down 1 or 2 ideas and did not compare them.	We did not write down any brainstorming, or our notebook starts with the answer already picked.

Did we build, test, and decide? – Develop Solutions (16 points) *Ask yourself: Did we try more than one version? Could someone else repeat our tests? Did we write down what our tests showed? Did we explain our choices?*				
Criteria	★★★★	★★★	★★	★
Trying more than one version	We tried 3 or more versions of a solution, and you can see how each one led to the next.	We tried 2 or more versions, and you can see how they connect.	Only 1 build shows up. You cannot tell what we tried before it.	We did not show any builds.

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How we tested	For each test we wrote what we measured, how we measured it, and the conditions. Someone else could run the same test based on what we wrote.	For each test we wrote what we measured and how. There is not enough detail for someone else to run the same test.	We said we tested something, but not what we measured or how.	We did not write about testing, or we only said we tried the robot without describing a test.
What our tests showed	We wrote down both numbers (times, counts, measurements) and words about what we noticed, and we could use them to make decisions.	We wrote down either numbers or what we noticed, but not both.	We described how things went in general, with no measurements.	We did not write down any results.
Explaining our choices	We wrote what we decided, how we decided it, who was part of the decision, and what evidence we used.	We wrote what we decided and the reasons and evidence behind it, but not who was involved.	Our decisions show up with little or no reasoning or evidence.	Changes show up with no explanation of why.

Did we make it better? – Optimize (12 points) *Ask yourself: Can someone see how our robot is built and why? Can someone follow our code? Can someone see why we changed things?*				
Look For	★★★★	★★★	★★	★
Showing how it is built	Our sketches, photos, or CAD show what we built, with labels that explain how or why each part is there.	Our sketches, photos, or CAD show what we built, with basic labels.	We included pictures but did not explain how or why the mechanism works.	We did not show what we built.
Showing our code	We used pseudocode, flowcharts, labeled screenshots, or comments in our code to show what we wanted the code to do and how it changed.	We used one of those ways to show what we wanted the code to do.	Our code shows up with little or no explanation.	We did not include any code documentation.
Why we changed things	Our changes came from test results, and we said so clearly.	Our changes came from testing, but we did not always say so.	We wrote about testing and changes, but we did not connect them.	Our changes show up with no testing behind them.

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Did we try and learn again? – Reflection and Iteration (8 points) *Ask yourself: Did we stop and think about how things were going? Can someone see us go through the whole design process more than once?* **Iteration** means going through the design process more than once — improving, then improving again.				
Look For	★★★★	★★★	★★	★
Thinking about how it is going	We reflected all season, and what we learned from reflecting changed what we did next.	We reflected more than once during the season.	We only reflected at the end, or only in a general summary.	We did not reflect, or we wrote what we did without saying how it went.
Going through the process again	You can see us go through the design process again and again all season — for building, for strategy, and for coding.	You can see us go through it again and again in one or two of those areas.	You can see us go through it more than once in only one area.	You cannot really see us going through the design process again.

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