# Automoblox Product Enhancement Rubric

| **Project Submittal** – The following criteria assessed based on the project submittal(s). | | | |
|---|---|---|---|
| **Criteria** | **Basic** | **Proficient** | **Advanced** |
| **Design Process – Define the Problem [Design Brief]**<br>LO: Synthesize an ill-formed problem into a meaningful, well-defined problem.<br>LO: Collect, analyze, and interpret information relevant to the problem or opportunity at hand to support engineering decisions. | Presents minimal research that is directly related to the problem. | *Documented* research directly related to the problem is presented. | Comprehensive *documented* research that is directly related to the problem is presented. Uses research to inform problem statement. |
| | Missing one or more elements of the design brief (problem statement, design statement, design criteria, design constraints). Information provided is insufficient to define a successful solution. Design criteria/constraints are vague and unmeasurable. | All elements of the design brief are clearly presented. Information is sufficient to define a successful solution. Includes visual, functional, and structural design requirements with realistic criteria, by which solution alternatives can be compared. | Consideration is given to economic, environmental, social, political, ethical, health and safety, manufacturability, technical feasibility and sustainability considerations, as appropriate. |
| **Design Process – Problem solving approach and documentation**<br>LO: Explain and justify an engineering design process. | Documentation reflects design work inaccurately or sporadically. | Documentation accurately reflects the design work (in PLTW **Engineering Notebook**). | Documentation is neat and clear and comprehensively reflects all design work (in **PLTW Engineering Notebook**). |
| | Documentation often does not follow best practice.<br>Most steps of the design process are documented but may not be verified by appropriate outcomes. | Work is documented according to best practice.<br>Each step of the design process is documented and verified by appropriate outcomes (i.e., a design brief, decision matrix, model, test report, and project recommendations (as appropriate). | Each step of the design process is fully documented in detail (in **PLTW Engineering Notebook**) and verified by appropriate outcomes. Where appropriate and indicated, *iteration* of steps of the design process are documented and justified by evidence. |
| | Documentation does not include explanations of, justifications of, or reflections on design work. | Documentation includes adequate explanations of, justifications of, or reflections on major design decisions. | Documentation includes in depth explanations of, justifications of, or reflections on major design decisions. Includes frequent notations of thoughts and reflections on work that inform the design process. |

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| **Technical Drawings**<br>LO: Create a set of working drawings using 3D computer-aided (CAD) software to represent a design solution.<br>LO: Properly dimension technical drawings of simple objects or parts according to a set of dimensioning standards and accepted practices. | Provides a part drawing for each important component of the design; however, the technical drawings do ***not*** meet all criteria listed in the **Technical Drawings, Part Drawings** checklist above. | Provides technical drawings that include a part drawing for all important components and an assembly drawing of the design and meet all criteria listed in the **Technical Drawings** checklist above. | Provides technical drawings that include all criteria listed in **Technical Drawings** checklist above as well as additional content such as an alternate view (detail view, section view), when appropriate, or exploded assembly view. |
| **Engineering Mindset**<br>LO: Persevere to solve a problem or achieve a goal.<br>LO: Demonstrate independent thinking and self-direction in pursuit of accomplishing a goal.<br>LO: Demonstrate flexibility and adaptability to change. | Frequently off task. | Often uses time wisely. | Plans and uses time efficiently. |
| | Frequently requires direct instructions before working on the project. | Often demonstrates self-direction with little direct oversight. | Always demonstrates independent thinking and self-direction in order to accomplish a goal. |
| | Inflexible and resists making changes. | Usually demonstrates flexibility and is adaptable to change. | Always demonstrates flexibility and adaptability to change. Can explain the benefits to changing direction in the design process. |
| | Gives up easily. | Usually perseveres to solve a problem, but sometimes requires intervention. | Perseveres to solve problems or achieve the goal until the problem is solved. |
| | Does not consider or rejects effective feedback from peers or teacher without justification. | Often uses effective feedback from others to inform performance. | Critically analyzes feedback and strategically implements feedback that will improve work. Provides appropriate justification when feedback is not implemented. |

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| **Portfolio**<br>• Title page includes appropriate information.<br>• Design Brief (includes added criteria, if any)<br>• Image (or video) of the solution prototype<br>• Design process documentation includes a summary of your work during each step of the design process.<br>• Summary is well written and easy to understand.<br>• Working drawings | • The portfolio contains all artifacts requested but is not formatted well or the organization of the material is confusing to the reader;<br>• The portfolio contains typographical errors that distract from the content;<br>• The design of the prototype is bland or lacks an attractive appearance such that it would be hard to market as an accessory;<br>• The process documentation does not contain a summary;<br>• The summary is not well written or is difficult to understand;<br>• The working drawings are not present or are unclear. | • The portfolio contains all artifacts requested.<br>• The portfolio contains few typographical errors;<br>• The design of the prototype is sufficiently attractive.<br>• The process documentation contains a summary;<br>• The summary is easy to understand<br>• The working drawings are clear. | • The portfolio contains all artifacts requested and is organized exceptionally well.<br>• The portfolio contains no typographical errors.<br>• The design of the prototype has a substantially attractive appearance.<br>• The process documentation contains excellent summaries of the team's design process.<br>• The working drawings are very detailed and well-drawn. |