# 6 – 12 Science Fair Rubric – Engineering

| Objectives | Outstanding Work | Acceptable Work | Needs Some Work | Needs Lots of Work |
|---|---|---|---|---|
| **Engineering Design Process** | **20 19 18 17 16** | **15 14 13 12 11** | **10 9 8 7 6** | **5 4 3 2 1** |
| **1. Shows knowledge of the Engineering Design Process –** Define Problem, Research, Specify Requirements, Propose Solutions, Develop Prototype, Test, Collect Data, Modify, Conclusions | Can explain all the steps in the engineering design process and show how their design meets requirements. Must have a clearly defined problem. | Can explain at least 5 steps in the engineering design process with understanding. | Can explain most steps in the engineering design process with the help of the display board. | Tries to answer questions (posed by judge) and/or has some steps missing. |
| **Understanding/Learning** | **20 19 18 17 16** | **15 14 13 12 11** | **10 9 8 7 6** | **5 4 3 2 1** |
| **2. Demonstrates understanding** of their project and has learned something about engineering design. | Student shows knowledge of the engineering topic beyond the scope of the design and it is evident the project involved a significant amount of work. | Student understands the science behind their design and it is evident they put work into the project. | Student understands their project or design, but not the science behind it or need for their design. | Student doesn't completely understand their own project. |
| **Spoken Presentation** | **20 19 18 17 16** | **15 14 13 12 11** | **10 9 8 7 6** | **5 4 3 2 1** |
| **3. Speaks knowledgably** about their project. | Student is able to share many details about the project through the design process. Has good eye contact and volume. | Student shows an understanding of the project. Speaks willingly about the project using note cards. | Students knows about the project and offers minimal explanation. Gives a brief summary when asked. | Student can answer some questions when asked. Answers questions when asked. |
| **Display Board** | **20 19 18 17 16** | **15 14 13 12 11** | **10 9 8 7 6** | **5 4 3 2 1** |
| **4. Board that is well organized and visually appealing.** | Board shows project in an organized, neat manner, complete with labeled drawings, tables and pictures. Proper spelling, grammar, punctuation. Includes a detailed abstract and problem definition. | Board is neat and attractive and has limited drawings, tables and pictures. Proper spelling, grammar, and punctuation and includes a problem definition. | Board lists major headings of the engineering design process and some data. Spelling, grammar, and punctuation with a couple of errors. | Board lists major headings of the scientific process and limited data. Several spelling, grammar, and punctuation errors. Missing abstract. |
| **Written Report** | **20 19 18 17 16** | **15 14 13 12 11** | **10 9 8 7 6** | **5 4 3 2 1** |
| **5. Written report clearly demonstrates use of research, design, prototype evaluation and analysis skills.** | Report has Cover, Table of Contents, Background Research, Design Requirements, Design Alternatives, Bibliography. | Report has Cover, Table of Contents, Background Research and some of the Design Data. | Report has Cover, some Research, some Data. Report is the exact information from the board just with a cover. | Report is minimal or does not exist. |

Project Title _____ Grade_____

Student's name _____ Engineering Design

School _____

| Objectives | Score | Comments |
|---|---|---|
| **Engineering Design Process** | **/20** | |
| **1. Shows knowledge of the Engineering Design Process –** Define Problem, Research, Specify Requirements, Propose Solutions, Develop Prototype, Test, Collect Data, Modify, Conclusions | | |
| **Understanding/Learning** | **/20** | |
| **2. Demonstrates understanding** of their project and has learned something about engineering design. | | |
| **Spoken Presentation** | **/20** | |
| **3. Speaks knowledgably** about their project. | | |
| **Display Board** | **/20** | |
| **4. Board that is well organized and visually appealing.** | | |
| **Written Report** | **/20** | |
| **5. Written report clearly demonstrates use of research, design, prototype evaluation and analysis skills.** | | |
| **TOTAL SCORE** | /100 | |

Judge's name_____

# Sample Questions Judges May Ask

**Engineering Design Process**

Who needs your design, and why?

What alternative designs did you consider?

What were the most important factors that drove your design choices?

What trade-offs were required in your design?

Which areas of engineering does your design utilize?

**Understanding/Learning**

How does your design meet the specified need?

How does your data support your design choices?

Were there other factors that might have influenced your results?

What did you learn from this process?

What science does your design utilize?

Why is your design an improvement over existing technology?

What changes would improve your design?

**Spoken Presentation**

Can you explain . . . .?

What was the most difficult part of this project?

Where did you get your idea?

**Boards**

Who helped you with your boards?

What did they do?

Can you explain your graph to me?

**Written Report**

Can you show me your background research for this project in your report?

What sources did you use for your research?

Can you show me your design notebook?