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| **Pts.** | **Evaluation Criteria** | **Excellent**  **17-20 points** | **Good**  **13-16 points** | **Fair**  **9-12 points** | **Poor**  **0-8 points** |
| **20.**  **score** | **Science Project:**  • Objectives  • Hypothesis  (question)  • Use of Resources\* **\*jr/sr projects only**  **Engineering Project:** • Problem Statement (design criteria) | -- Clearly stated & well-written  -- Appropriate for grade level & original -- Creative approach to problem solving –––––––––––––––––––––––––––– I. Testable, clear, bounded hypothesis  –––––––––––––––––––––––––––– – A comprehensive, correctly formatted bibliography was included & footnotes are present in text and display  – Student(s) used full resources available (e.g. labs, advisors, experts, scientific periodicals & texts, internet)  –––––––––––––––––––––––––––– A. Clear, original problem statement that meets potential users’ needs  B. Clearly defined design criteria and goals | --Lacking in **1** area: clarity, appropriate level, or  creativity  –––––––––––––––– I. Hypothesis present, but not completely testable  –––––––––––––––– – Incomplete citations  – Used **most** available resources  – **Most** internet resources are scientific & reputable  –––––––––––––––– A. Statement is **not** original B. Goals/criteria are  measurable but **vague** | --Lacking in **2** areas: clarity, appropriate level, and/or creativity  ––––––––––––––  I. Hypothesis incomplete or not testable  ––––––––––––––  – **Minimal** effort on citing sources  – Used **some** available resources  – **Some** internet resources are scientific & reputable  –––––––––––––––– A. **Incomplete** statement B. Goals/criteria are **poorly defined**/not measurable | --Poorly conceived or  lacking in all **3** areas  –––––––––––––––– I. Hypothesis **missing** or poorly defined  –––––––––––––––– – **No** sources or citations – Project suffered as a result of **not** using  available resources  – Internet resources are **not** scientific or reputable  –––––––––––––––– A. Statement **missing** or poorly defined  B. Goals/criteria **missing** |
| **20.**  **score** | **Science Project:**  • Design &  Procedures  Experimental design & implementation  (hypothesis testing)  **Engineering Project:** • Engineering process  (design & prototype) | I. Exemplary, creative plan to support / refute hypothesis with valid testing  II. Sequential experimental procedures are quantitatively and/or qualitatively listed, and connect hypothesis, data & results  III. Procedures are logical and repeatable IV. Sample sizes, number of trials are sufficient. Valid control group.  V. All other variables are carefully controlled  –––––––––––––––––––––––––––– A. Design goals & approach clearly stated & reproducible, alternatives considered B. Design creative, schematics / software provided (as applicable), well labeled C. Assembly details or set-up instructions for device are clearly laid out  D. Photos provided or prototype on display E. Materials used in appropriate ways | I. Sufficient plan to support / refute hypothesis with all other criteria met, **or**  II. Exemplary plan and **3** of **4** other criteria for  excellence met, **or**  III. **Some** improvements needed throughout  –––––––––––––––– A. **3-4** of 5 criteria required for excellence are met **or** B. **Some** improvements could be made | I. Sufficient plan with **3** of **4** other criteria for  excellence met, **or**  II. Exemplary plan and **2** of **4** other criteria for  excellence met, **or**  III. **Major** improvements needed throughout  –––––––––––––––– A. **1-2** of 5 criteria required for excellence are met **or** B. Existing information is **incomplete**, or needs  **major** improvement | I. Sufficient plan with **1-2** of **4** other criteria for  excellence met, **or**  II. Plan information is  unclear / missing /  insufficient, **or**  III. Criteria II-V are **lacking** or grossly defficient  –––––––––––––––– A. Description of design & implementation not  included or **inadequate** to show how design  works and/or if design meets requirements  B. No engineering. Project was merely **tinkering**. |
| **20.**  **score** | **Science Project:**  • Data & Results  (experimentation)  • Documentation\*  (notebook)  **\*jr/sr projects only**  **Engineering Project:** • Problem Solution  (testing and redesign) | I. Experiments run are appropriate for hypothesis being tested  II. Sufficient data. Repetition of experiments III. Correct & appropriate statistical tests run  –––––––––––––––––––––––––––– – Clearly written, complete and clear – Procedures are easy to follow  – Comments, observations included – Records include dates, signatures  –––––––––––––––––––––––––––– A. Measures of performance/improvement have been made (including cost)  B. Functionality is fully tested & validated C. Records on testing are included D. Prototype was redesigned or potential design improvements were identified | I. **2** of the **3** criteria for  excellence met  II. **Some** improvements could be made  –––––––––––––––– – **3** of **4** standards for  excellence were met **or** – **Some** improvements could be made  –––––––––––––––– A. Final design **works** but has not been fully tested B. **No advantage** over original  C. **Some** improvements could be made | I. **1** of the **3** criteria for  excellence met  II. **Major** improvements required  –––––––––––––––– **– 2** of **4** standards for  excellence were met **or** – **Major** improvements required  –––––––––––––––– A. Final design does **not** meet end user’s needs B. **No improvement** over original  C. **Major** improvements required | I. **Incorrec**t experiments and data analysis for  hypothesis  II. **Insufficient** data  –––––––––––––––– – **1** of the standards for excellence were met **or** – No notebook or **missing**  –––––––––––––––– A. Little or **no** testing  B. **No** records  C. **No** redesigns |
| **20.**  **score** | **Science Project:**  • Discussion &  Conclusions  **Engineering Project:** • Evaluation | I. Status of the hypothesis is correctly and logically addressed, and stated in an unbiased manner (confirmed / refuted)  II. Completeness of work and validity of conclusions are substantiated  III. Discussion is insightful, demonstrates clear understanding of research project, broader subject & suggested new work  –––––––––––––––––––––––––––– A. Significance, relevance, applications, utility, cost effectiveness, improvements, benefits and performance addressed | I. **2** of **3** criteria for  excellence met, **or**  II. **Some** improvements could be made  –––––––––––––––– A. **Some** evaluation areas not addressed | I. **1** of **3** criteria for  excellence met **or**  II. Overall information is **lacking** in quality and  perspective  –––––––––––––––– A. **Many** evaluation areas not addressed | I. **No** discussion /  conclusions provided  –––––––––––––––– A. **No** evaluation areas addressed |
| **20.**  **score** | **Science+Engineering:** • Interview  • Display | Exemplary understanding…  – Research findings / design results – Ability to interpret graphs, statistics, etc... – Related background information  – Project rational, details & validity  –––––––––––––––––––––––––––– Exemplary display…  -- Creativity, clarity, logic, interpretability, construction, writing, graphics, grammar -- All information directly relates to project | **Good** understanding... – Research findings  – Ability to interpret graphs, statistics, etc.  – Related background information  –––––––––––––––– **Good** display  -- Most information is  appropriate, organized and easily accessible. | **Fair** understanding…  – Research findings  – Ability to interpret graphs, statistics, etc…  – Related background information  –––––––––––––––– **Fair** display …  -- Some information is appropriate, organized and easily accessible. | **Poor** understanding…  – Cannot answer questions adequately and precisely – Does not incorporate display into interview  – Unfamiliar with related background information  –––––––––––––––– **Poor** display…  -- Confusing, unorganized, incorrect or inappropriate information |