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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  |