Table 3

Science Project Rubrics

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Project Component & Criteria** | **Exceeds Expectations** **4 points** | **Meets** **Expectations****3 points** | **Approaching Expectations****2 points** | **No Evidence****0 points** | **Self Score** | **Score** |
| **Proposal** | **Content & Testability of Question** | Question addresses the phenomenon to be investigated by describing specific factors testable by the student. | Question addresses a phenomenon to be investigated which is testable by the student. | Question identifies a phenomenon which is testable. | Question is omitted, is not stated as a question, doesn’t identify a phenomenon to be investigated, or is not testable by the student. |  |  |
| **Variable Identification & Description** | Independent and dependent variables are correctly identified and described, including SI units. | Independent and dependent variables are identified and described | Independent and dependent variables are identified. | Either or both independent or dependent variables are not identified, or are incorrectly identified. |  |  |
| **Identification of Constants** | All constants listed. | Some constants are listed. | Few constants are listed. | Constants are not considered, or variables are described as constants. |  |  |
| **Description of Control** | Control case, if applicable, is accurately described. If not applicable, justifies why a control is not needed. | Control case, if applicable, is described. | Control case is included but interpreted incorrectly. | Control case is not considered. |  |  |
| **Process** | Proposal thoughtfully incorporates feedback. | Proposal incorporates some feedback. | Proposal incorporates minimal feedback.  | Feedback not considered, or no feedback available because component assignments were missing or incomplete. |  |  |
| **Conventions** | Proposal uses proper formatting and conventions throughout, with only one or two errors.  | Proposal contains no more than three errors in formatting and conventions. | Proposal contains more than five errors in formatting or conventions. | Proposal contains more than 10 errors in formatting or conventions. |  |  |
| **Proposal Final Score (out of 24)** |  |  |
| **Research Paper** | **Introduction**  | Opens with investigative question and describes why question was selected. | Opens with investigative question.  | Mentions investigative question. | Includes a question that cannot be investigated, or omits the question. |  |  |
| **Hypothesis** | States hypothesis and explains briefly why the hypothesis is expected. | States hypothesis and explains why the hypothesis is expected. | States hypothesis. | Hypothesis is omitted, or hypothesis is stated incorrectly. |  |  |
| **Terms & Definitions Presented**  | Presents all relevant terms and definitions in paragraph format. | Presents most relevant terms and definitions in paragraph format. | Omits important relevant terms and/or their definitions, presented in any format. | No relevant terms are presented or correctly defined. |  |  |
| **Terms & Definitions Explained** | Explains how each term relates to the project. | Explains how most terms relate to the project. | Attempts to explain how terms relate to the project. | No explanation attempted, or explanation is incorrect. |  |  |
| **Explanation: Subject** |  |  |  |  |  |  |
| **Explanation: Variables** | Describes effects of different values of the variables. | Describes the effects of at least one value of the variables. | Describes subject(s) in detail. | Describes subject(s).  | Identifies subject(s).  | No attempt to identify or describe subject(s). |
| **Explanation: Hypothesis** | States the hypothesis with specific information. | States the hypothesis with general information. | States the hypothesis.  | Hypothesis is omitted, or hypothesis is incorrectly constructed. |  |  |
| **Explanation: Support** | Supports the hypothesis with explanations linking the definitions and concepts with specific expected results. | Supports the hypothesis with explanations linking definitions and concepts with general expected results. | Attempts to support the hypothesis with an explanation mentioning some definitions and concepts.  | No attempt to support the hypothesis, or explanation is not logical. |  |  |
| **Conclusion: Summary**  | Restates question and hypothesis and clearly summarizes explanation. | Restates question and hypothesis and summarizes explanation.  | Restates question or hypothesis, attempts to summarize explanation. | Summary is omitted. |  |  |
| **Conclusion: Research Approach** | Defends research approach with detailed, appropriate supporting evidence. | Defends research approach with general, appropriate supporting evidence. | Attempts to defend research approach but lacks supporting evidence. | No attempt to defend research approach, or defense is not logical. |  |  |
| **Bibliography** | Includes at least 5 sources in MLA format with references listed alphabetically. | Includes 4 sources in MLA format with references listed alphabetically | Includes 1-2 sources in MLA format, or any number of sources not in MLA format  | No bibliography. |  |  |
| **Process** | Paper thoughtfully incorporates feedback. | Paper incorporates some feedback. | Paper incorporates minimal feedback.  | Feedback not considered, or no feedback available because component assignments were missing or incomplete. |  |  |
| **Conventions** | Paper uses proper formatting and conventions throughout, with only one or two errors.  | Paper contains no more than three errors in formatting and conventions. | Paper contains more than five errors in formatting or conventions. | Paper contains more than 10 errors in formatting or conventions. |  |  |
| **Research Paper Final Score (Out of 52)** |  |
| **Project Plan** | **Purpose** | Purpose states reason for selecting the project in a brief descriptive paragraph. | Purpose states reason for selecting the project in a descriptive sentence.  | Purpose restates question | Purpose is omitted, or is not logical. |  |  |
| **Question**(from Proposal, above) | Clearly states the investigative question  |  |  | Question omitted. |  |  |
| **Hypothesis Justification** | Refers to the Research Paper (above) to justify hypothesis |  |  | Hypothesis justification omitted. |  |  |
| **Hypothesis Statement**(from Research Paper, above). | States hypothesis as a single, testable statement including independent and dependent variables. |  |  | Hypothesis is omitted. |  |  |
| **Methods: Variable Identification**(from Proposal, above) | Independent and dependent variables are correctly identified and described, including SI units. | Independent and dependent variables are identified and described | Independent and dependent variables are identified. | Either or both independent or dependent variables are not identified, or are incorrectly identified. |  |  |
| **Methods: Constants**(from Proposal, above) | All constants listed. | Some constants are listed. | Few constants are listed. | Constants are not considered, or variables are described as constants. |  |  |
| **Methods: Controls**(from Proposal, above) | Control case, if applicable, is accurately described. If not applicable, justifies why a control is not needed. | Control case, if applicable, is described. | Control case is included but interpreted incorrectly. | Control case is not considered. |  |  |
| **Methods: Subjects**(from Research Paper, above) | Describes subject(s) in detail. | Describes subject(s).  | Identifies subject(s).  | No attempt to identify or describe subject(s). |  |  |
| **Methods: Materials** | Lists all materials and equipment, naming specific brands and amounts. | Lists most materials and equipment, naming brands and amounts. | List some materials and equipment; brands are not identified. | Substantially inadequate listing of materials and/or equipment. |  |  |
| **Methods: Procedure** | Lists detailed steps of the procedure. Procedure includes description of data collection method. | Lists steps of the procedure lacking some less important details; includes description of data collection method. | Lists some steps of the procedure and/or does not adequately describe the data collection method. | Inadequate description of the procedure provided, or procedure omitted. |  |  |
| **Methods: Trials** | Procedure includes adequate trials (at least 5) and describes how it will repeated. | Procedure includes adequate trials (at least 5) but only generally describes the process. | Procedure includes up to three trials. | Procedure does not mention trials or how they will be attempted. |  |  |
| **Process** | Project Plan thoughtfully incorporates feedback. | Project Plan incorporates some feedback. | Project Plan incorporates minimal feedback.  | Feedback not considered, or no feedback available because component assignments were missing or incomplete. |  |  |
| **Conventions** | Project Plan uses proper formatting and conventions throughout, with only one or two errors.  | Project Plan contains no more than three errors in formatting and conventions. | Project Plan contains more than five errors in formatting or conventions. | Project Plan contains more than 10 errors in formatting or conventions. |  |  |
| **Project Plan Total Score (Out of 52)** |  |  |
| **Final Report** | **Title Page** | Includes a descriptive project title, with name, date, and period. | Includes a project title with name, date, and period. | Includes a project title; one or more of name, date, and period omitted. | Title page missing. |  |  |
| **Table of Contents** | Includes all sections of the report and includes correct page numbers. | Includes most sections of the report with correct page numbers. | Includes some sections of the report with mostly correct page numbers.  | Table of contents missing, or contains incorrect page numbers. |  |  |
| **Abstract: Formatting** | Included on its own page, single paragraph, and less than 250 words. | Included on its own page, less than 250 words, list or other non-paragraph format | Included on its own page, any format, more than 400 words or less than 100 words. | Abstract is omitted or included on another page. |  |  |
| **Abstract: Content** | Presents purpose, question, hypothesis, summary of procedure, summary of results, conclusion. | Presents five of: purpose, question, hypothesis, summary of procedure, summary of results, conclusion. | Presents at least four of purpose, question, hypothesis, summary of procedure, summary of results, conclusion. | Abstract is omitted, or omits 3 or more of purpose, question, hypothesis, summary of procedure, summary of results, conclusion. |  |  |
| **Project Plan**(from above) | Includes all sections as described in Project Plan Rubric. | Includes most sections as described in the Proejct Plan Rubric | Includes some sections as described in the Project Plan Rubric | Omits more than three sections as described in the Project Plan Rubric. |  |  |
| **Results: Data**  | Data table(s) show all collected data and summary data is presented. | Data table(s) show all collected data. | Data table(s) show some collected data.  | Data tables are omitted. |  |  |
| **Results: Data Table Format** | Tables given appropriate titles; all rows and columns labeled. All numbers are presented in appropriate SI units. | Tables given titles, only 1 or 2 rows or columns lack labels. All numbers presented with appropriate SI units. | Tables lack titles, and/or more than 1 or 2 rows or columns lack labels, and/or numbers are presented lacking SI units. | Data tables are omitted. |  |  |
| **Results: Graph** | At least one graph is included. |  |  | A graph is not included. |  |  |
| **Results: Graph Format** | All graphs have appropriate titles; all axes labeled with appropriate SI units. | Graphs have titles; 1 or 2 axes not labeled with appropriate SI units. | Graphs lack titles, and/or more than 1 or 2 axes lack labels, and/or SI units not used. | Graphs are omitted. |  |  |
| **Results: Analysis of Trends** | Analysis refers to tables and graphs and identifies trends or lack thereof. | Analysis identifies trends or lack thereof. | Analysis does not identify | No analysis attempted. |  |  |
| **Results: Analysis of Variable Effects** | Analysis describes the effects of changing the independent variable on the dependent variable. |  |  | Analysis does not describe the effects of changing the independent variable on the dependent variable. |  |  |
| **Conclusion: Framing** | Conclusion restates question and hypothesis. |  |  | Conclusion omits question and/or hypothesis. |  |  |
| **Conclusion: Support for or against Hypothesis** | Conclusion compares results to the hypothesis and describes whether the hypothesis was supported, partially supported, or not supported. | Conclusion compares results to hypothesis and states whether the hypothesis was supported, partially supported, or not supported.  | Conclusion attempts to describe results in terms of the hypothesis; uses terms other than supported, partially supported, or unsupported.  | Conclusion does not describe results. |  |  |
| **Conclusion: Limitations** | Limitations describes any problems with collection or analysis of data. |  |  | Limitations omitted. |  |  |
| **Conclusion: Applications** | Applications describes real-world use of the project. |  |  | Application omitted. |  |  |
| **Conclusion: Future Research** | Future research describes how the project could be extended. |  |  | Future Research omitted. |  |  |
| **Research Paper Appendix** | Research paper included in the appendix. |  |  | Research Paper not included. |  |  |
| **Logbook Appendix** | Logbook included in the appendix. |  |  | Logbook not included. |  |  |
| **Project Proposal Appendix** | Project proposal included in the appendix. |  |  | Project Proposal not included. |  |  |
| **Process** | Final Report thoughtfully incorporates feedback. | Final Report incorporates some feedback. | Final Report incorporates minimal feedback.  | Feedback not considered, or no feedback available because component assignments were missing or incomplete. |  |  |
| **Conventions** | Final Report uses proper formatting and conventions throughout, with only one or two errors.  | Final Report contains no more than three errors in formatting and conventions. | Final Report contains more than five errors in formatting or conventions. | Final Report contains more than 10 errors in formatting or conventions. |  |  |
| **Final Report Total Score (Out of 84)** |  |  |
| **Display Board** | **Use of Fonts** | Uses appropriate font size to be readable from a reasonable distance, thoughtful use different font faces | Uses appropriate font size to be readable from a reasonable distance; distracting or hard-to-read font faces | Uses inappropriate font size (too small to read easily, or too large), font face difficult to read | Handwritten illegibly |  |  |
| **Summarizes Project Components** | *Summarizes* project components: purpose, question, background research, hypothesis, variables, materials & equipment, procedure, results, analysis, conclusion | Presents without summarizing all project components: purpose, question, background research, hypothesis, variables, materials & equipment, procedure, results, analysis, conclusion | Presents without summarizing, but omits more than 3-4 of: purpose, question, background research, hypothesis, variables, materials & equipment, procedure, results, analysis, conclusion | Presents without summarizing, omits more than 4 of: purpose, question, background research, hypothesis, variables, materials & equipment, procedure, results, analysis, conclusion |  |  |
| **Table & Graph**  | Includes at least one table and one graph. |  |  | Omits table and/or graph. |  |  |
| **Visually Appealing** | Neat & visually appealing. | Minor flaws in visual appeal. | Significant flaws in visual appeal. | Lacks visual appeal. |  |  |
| **Identifying Information** | Shows no identifying information, including in photos. All identifying information placed on back of display board. | Shows no identifying information on front of display board; missing date or period on back; includes name. | Shows identifying information on front of display board of any type. | No identifying information on back of display board. |  |  |
| **Conventions** | Display Board uses proper formatting and conventions throughout, with only one or two errors.  | Display Board contains no more than three errors in formatting and conventions. | Display Board contains more than five errors in formatting or conventions. | Display Board contains more than 10 errors in formatting or conventions. |  |  |
| **Display Board Total Score (Out of 24)** |  |  |