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| Project ID: | Project Title: | | Judge ID: | |
| | Category: | | | |
| Science & Engineering Practice | | Grades 9-12 Proficient (2) | Score | Total |
| Asking Questions and Defining Problems | Investigation | 1) Ask a question or define a problem that can be investigated, seek additional information & relationships to determine the relationship between variables or models, or to clarify and refine a model, provide an explanation or an engineering problem, Or evaluate a question to determine its testability, relevance or challenge the premise(s) of an argument, data set, or sustainability of a design. | 1) | |
| | | 2) Students' investigation builds on or expands on previous work (with multiple reputable references) or observations. | 2) | |
| Planning and Carrying out Investigations | | 3) Plan and conduct an experimental or engineering design procedure, using appropriate materials and methodology, with a clear directional hypothesis of expected outcomes of dependent variable when independent variable is manipulated (including null) and all variables or criteria are defined. | 3) | |
| | | 4) Testing of, or replications of the experiment or design are evident, and appropriate for the context (and age level) of the project. | 4) | |
| Using Mathematical and Computational Thinking | | 5) Create, revise or use mathematical models, algorithms or simulations, to test expressions, programs, algorithms or simulations, in order to compare or predict applications to the real world. | 5) | |
| Developing & Using Models | Sensemaking | 6) Develop, revise or use complex Models (mathematical, physical or computational) to generate, predict or describe data, test ideas & solutions, or show relationships among variables in a proposed process or system. | 6) | |
| | | 7) Models analyze the generated data to refute, support or predict explanations, analyze systems, or solve real-world problems. | 7) | |
| Analyzing & interpreting Data | | 8) Apply concepts of statistics & probability to science or engineering problems, to make valid & reliable claims or solutions, examine consistency of measurement, evaluate the impact of new data on an explanation or proposed solution, and consider the limitations of the data analysis. | 8) | |
| Constructing Explanations & Designing Solutions | | 9) Conclusion that clearly describes the relationship among variables, or the design, evaluation or refine of a solution to a problem, based on scientific theories and laws, linking evidence from a variety of data sources (including their own), with the reasoning and data to support the explanation or conclusions. | 9) | |
| Engaging in Argument from Evidence | Critiquing | 10) Conclusion, solution, or design is compared and evaluated against competing arguments, designs and evidence, against new evidence, currently accepted explanations, limitations, constraints and ethical issues, to determine the merits of these arguments. | 10) | |
| Obtaining, Evaluating, and Communicating Information | | 11) Respectfully provide and receive feedback and/or critique of scientific arguments and explanations, procedures, models, & clarifications by probing reasoning & evidence, and challenging ideas and conclusions, responding thoughtfully to diverse perspectives, and determining what additional information (next steps) required to resolve contradictions. | 11) | |
| | | 12) Communicates understanding of scientific or technical information or ideas, in both oral and written form (board, abstract, interview , notebook...) that summarizes, compares and integrates evaluated reliable sources of information to address a scientific question or solve a problem. | 12) | |
| Score: 0=No evidence, 1=some evidence, 2=proficient, 3= exceeds | | | Total Score: | |
| Notes: | | | | |