Sample 3rd Grade Performance Task

Science

Virginia Department of Education

Genre: Design Challenge

This rubric provides guidance to teachers in the assessment of design based performance tasks. Not all of the skills provided below may be reflected in a single performance task; only choose scientific skills that are needed to complete your student performance task.

The design process, the application of science and mathematical skills and processes to grade level content, is used to develop and encourage students to use iterative thinking. The design process is reinforced in the third grade science processes:

1. Asking questions and defining problems
   * define a simple design problem that can be solved through the development of an object, tool, process, or system
2. Planning and carrying out investigations
   * use tools and/or materials to design and/or build a device that solves a specific problem

* use appropriate methods and/or tools for collecting data
* estimate length, mass, volume, and temperature
* measure length, mass, volume, time, and temperature in metric units using proper tools

1. Interpreting, analyzing, and evaluating data

* represent data in tables and bar graphs
* analyze data from tests of an object or tool to determine if it works as intended

1. Constructing and critiquing conclusions and explanations
   * generate and/or compare multiple solutions to a problem
   * describe how scientific ideas apply to design solutions
2. Developing and using models

* develop a model (e.g., diagram or simple physical prototype) to illustrate a proposed object, tool, or process

1. Obtaining, evaluating, and communicating information

* communicate design ideas and/or solutions with others

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|  | | Science Skills and Processes | | | | | | | | |
| Skill | Exceeds Expectations (4) | | 3.5 | Meets Expectations (3) | 2.5 | Developing (2) | 1.5 | Emerging (1) | Not Observed |
| Asking Questions and Defining Problems | Identifies criteria of a problem or design statement that accurately matches the intent of the problem and determines additional possible criteria based on the problem description. | |  | Identifies criteria of a problem or design statement that accurately matches the intent of the problem. |  | Identifies criteria or design statement that matches the intent of the problem with minor errors. |  | Identifies criteria of a problem or design statement but it does not match the intent of the problem. |  |
| Planning and Carrying out Investigations: Designing a Solution | Plans a design that accurately and completely matches the criteria, constraints, and intent of the problem and explains how components of the design match the problem. | |  | Plans a design that matches the criteria, constraints, and intent of the problem. |  | Plans a design that partially matches the criteria, constraints, and intent of the problem. |  | Plans a design that does not match the criteria, constraints, and intent of the problem. |  |
| Developing and Using Models | Creates a diagram with detailed and precise descriptions of the measurements, indicates appropriate materials and tools needed to construct the prototype, and indicates data to be collected to determine device effectiveness. | |  | Creates a diagram with descriptions of the measurements, and indicates materials and tools needed to construct the prototype. |  | Creates a diagram with enough detail that another person could duplicate the design (replicable). |  | Creates a diagram that lack detail and cannot be duplicated by another person. |  |
| Constructs a prototype that aligns to proposed schematic and explains the diagram. | |  | Constructs a prototype that aligns to proposed diagram. |  | Constructs a prototype that partially aligns to proposed diagram. |  | Constructs a prototype that does not align to proposed diagram. |  |
| Planning and Carrying out Investigations: Testing a Design | Conducts repeated trials of the prototype and collects precise data. | |  | Coducts a test of the prototype and collects data. |  | Conducts a test of the prototype but no data is collected. |  | No testing of the prototype is conducted. |  |
| Interpreting, Analyzing and Evaluating Data | Analyze data accurately to determine effectiveness of the prototype and to explain possible error or limitations of the design. | |  | Analyzes data accurately to determine effectiveness of the prototype. |  | Uses data to determine effectiveness of the prototype but makes minor errors analyzing the data. |  | Describes the effectiveness of the prototype without using data generated from testing. |  |
| Obtaining, Evaluating, and Communicating Information | Describes the prototype clearly, accurately, and completely with precise detail. Uses relevant scientific and/or mathematical terms/concepts accurately to explain rationale behind the design of the prototype. | |  | Describes the prototype clearly, accurately, and completely with sufficient detail. Uses relevant scientific and/or mathematical terms/concepts accurately to explain rationale behind the design of the prototype. |  | Describes the prototype simply with minimal detail. Use of relevant scientific and/or mathematical terms/concepts is limited or partially accurate. |  | Describes the prototype simply with minimal detail. Use of relevant scientific and/or mathematical terms/concepts absent or inaccurate. |  |
| Content  SOL\_\_\_\_\_\_\_\_\_\_\_\_\_  (this row should be adapted as appropriate to support foundational core content) | Explains and applies relevant and accurate content. | |  | Explains or otherwise applies relevant and accurate content |  | Identifies or otherwise applies relevant content with minor errors or omission. |  | Identifies or makes connections to irrelevant content OR relevant content with major errors or omissions. |  |