|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Constructing Arguments about Natural Phenomena and Evaluating Design Solutions |  |  |  |  |
| **Identify the claims or design solutions** | **1** | **2** | **3** | **4** |
| * Students make claims about phenomena or solutions to problems that are supported by evidence. | Make no claim or solution. | Make a claim or design a solution that supports the phenomena with no evidence. | Make a claim or design a solution that supports the phenomena with limited evidence. | Make a claim or design a solution that supports the phenomena with evidence. |
| * Students identify given claims, explanations, or design solutions to be evaluated, supported, or refuted with argumentation. | Make no claim, explanation, or solution. | Make a claim, explanation, or design solutions supported with no argumentation. | Make a claim, explanation, or design solutions supported with limited argumentation. | Make a claim, explanation, or design solutions supported with argumentation. |
| * Students make claims about the merits of design solutions. |  |  |  |  |
| **Identify scientific evidence** | **1** | **2** | **3** | **4** |
| * Students identify and describe scientific evidence, models, and/or data that are relevant to supporting or evaluating claims about the particular phenomenon or design problem. | Misidentify the scientific evidence, models, and/or data. | Identify and describe scientific evidence, models, and/or data with no support or relevance. | Identify and describe scientific evidence, models, and/or data that support the claim of the phenomenon. (not relevant) | Identify and describe scientific evidence, models, and/or data that support or are relevant to the claim of the phenomenon. |
| **Evaluating and critiquing evidence** | **1** | **2** | **3** | **4** |
| * Students evaluate whether the evidence supports logical and reasonable arguments about the claims, explanations, or design solutions. | No evaluation | Evaluate whether the evidence is logical OR reasonable but not relevant to the claim explanation, or design solution. | Evaluate whether the evidence is logical OR reasonable about the claims, explanations, or design solutions. . | Evaluate whether the evidence is logical and reasonable about the claims, explanations, or design solutions. |
| * Students evaluate whether other explanations or factors of the explanation could be supported by the evidence. |  |  |  | Evaluate whether other explanations could be supported by evidence. |
| * Students distinguish among facts, reasoned arguments based on evidence, and speculation. |  |  |  |  |
| **Reasoning and Synthesis** | **1** | **2** | **3** | **4** |
| * Students use reasoning to connect the evidence and evaluation logically to construct arguments. |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Evaluating given design solutions** |  |  |  |  |
| Identifying the given solutions and information about the problem. | **1** | **2** | **3** | **4** |
| * Students clearly identify the given solutions and information, including their relevant features. | Statement of incorrect phenomenon or no description was produced | Statement of correct phenomenon without description | Incomplete description of phenomenon or description has errors | Complete description of the phenomenon without errors |
| * Students clearly identify the problem, including specific relevant to the evaluation. |  |  |  |  |
| Identifying any potential additional evidence that is relevant to the evaluation | **1** | **2** | **3** | **4** |
| * Students identify and describe evidence from data, scientific theories, or models, including necessary information that students obtain from the given materials, prior knowledge, and through additional research, that is relevant to the evaluation. |  |  |  |  |
| **Evaluating and critiquing** | **1** | **2** | **3** | **4** |
| * Students use a systematic method to identify the strengths and weakness of the solution(s).   . |  |  |  |  |
| * Students evaluate the solution(s) against each criterion and constraint |  |  |  |  |
| * Students use the evidence to assess the given features of the solution. |  |  |  |  |
| **Reasoning and Synthesis** | **1** | **2** | **3** | **4** |
| * Students use reasoning to make a claim about the effectiveness (or relative effectiveness, when appropriate) of the solution(s) based on the strengths and weaknesses of the solution(s). |  |  |  |  |