**Constructing Explanations and Designing Solutions (6 – 8)**

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| 1. **Constructing Explanations** | **0** | **1** | **2** |
| 1. **Explanation**   a. Students clearly explain a phenomenon, including a grade-appropriate level of the mechanism involved. |  |  |  |
| **2. Evidence to construct or support the explanation**  a. Students cite evidence to support the explanation. The evidence can come from student-generated data or from other sources, such as observations, reading material, or archived data. The evidence needs to be both appropriate and sufficient to support the explanation |  |  |  |
| **3**. **Reasoning to connect the evidence to construct or support the explanation**  a. Students describe the reasoning that connects the evidence to phenomena, including scientific background knowledge, scientific theories, or models as appropriate. |  |  |  |

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| 1. **Designing Solutions** | **0** | **1** | **2** |
| 1. **Using scientific knowledge to generate the design solution**   - - - - - - - - - - - - - - - - - -  a. Given a problem to solve, students design a solution to the problem. In the design, students:  i. Identify the scientific information (e.g., observations, scientific knowledge, evidence) that is related to the problem. |  |  |  |
| ii. Describe a solution(s) to the problem. |  |  |  |
| iii. Specify how the design solution(s) uses the scientific information to address the problem. |  |  |  |
| 1. **Describing criteria and constraints, including quantification when appropriate**   a. Students describe the criteria and constraints for the problem, based on the factors presented in the problem and any resource considerations.  b. Students describe the rationale for which criteria should be given highest priority, if tradeoffs must be made. |  |  |  |
| 1. **Evaluating potential solutions**   a. Students evaluate the design solution(s) systematically by analyzing how the solution meets each criterion and constraint described. |  |  |  |
| 1. **Refining the design solution**   a. Students modify the solution(s) based on the results from the evaluation. |  |  |  |
|  | **0** | **1** | **2** |