

Teacher Support Materials

Intended Use

These item sets are designed to assess all three dimensions of the performance expectation (PE) when used as written. They are also designed to work with any NGSS-aligned curriculum. In some instances, minor modifications may be necessary based on how the disciplinary core ideas were taught. For example, an item may use the term “particle,” but the term “molecule” may have been used in class. In instances such as this, a simple word-for-word replacement is appropriate. Where possible, the developers have noted these suggestions below, or accompanying the specific exemplar responses or scoring guides.

With very few exceptions, each item set is intended to assess only one PE. Exceptions, if any, are noted in the Specific PE Notes below. Depending on the PEs that you have bundled together in a unit, you may wish to select items from two or more PEs for an assessment. Keep in mind as you do so the amount of time students will need to respond to each item.

Performance Expectation (PE)

This item set assesses [MS-ETS1-4](#): Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

NGSS Assessment Boundaries

No assessment boundaries.

Use Notes

This PE may be assessed as an individual PE, or assessed in combination with PS2-1 in order to integrate engineering and physical science disciplinary core ideas. An integrated set of assessments is also available.

Depending on the terminology used in your curriculum, you may wish to define some of the terms used in this item set (e.g. mutualism) or delete specific material from the item set prior to use.

Scoring and Scoring Guides

The scoring guides focus on students’ conceptual understanding of the three dimensions of the PE. Therefore, the scoring of a response should focus on the aspects described in the scoring guide rather than length of response, spelling and/or grammar, or other features.

Most scoring guides have three columns. The first column specifies 5 levels of performance, from 0 to 4. The second column provides a general description of what should be included in a response at that level. This description is the same across all items that use a particular science and engineering practice (SEP). The third column provides an item-specific description that applies to the three dimensions associated with the PE being assessed by that item.

There are two exceptions to this general approach to scoring guides. One exception occurs when two-dimensional items are included in an item set to elicit student understanding of specific aspects of disciplinary core ideas (DCIs). Another exception occurs for assessments associated with the practices of *Using Mathematics and Computational Thinking*, *Asking Questions*, and *Designing Solutions*, because the student responses for these are so tightly linked to the content or a specific element of the practice that a general description for the levels of the scoring guide across the practice is not appropriate. In these cases, the scoring guides have two columns: one for the five levels of performance and one for the item-specific description.

Student responses will sometimes fall between scoring levels. For example, responses that exceed scoring level 2, but do not fully meet scoring level 3, are fairly common. In these cases, it is up to the teacher to decide whether to give an intermediate score (2.5) or use a 2+ or 3- system. Most important is to use the scoring guide to provide students with feedback on how to improve their responses.

Scoring Guide - Item 1	
Level	Description
4 Complete and Correct	<p>Student's response includes all four of the following:</p> <ul style="list-style-type: none"> • Describes models for the screen and padding and explains what they represent. • Describes how at least one of these components might be varied. • Describes a reasonable procedure for collecting data. • Indicates that they would continue modifying and testing baed on their results.
3 Almost There	<p>Student's response includes three of the following with only minor errors:</p> <ul style="list-style-type: none"> • Describes models for the screen and padding and explains what they represent. • Describes how at least one of these components might be varied. • Describes a reasonable procedure for collecting data. • Indicates that they would continue modifying and testing baed on their results.
2 On the Way	<p>Student's response includes two of the following with only minor errors:</p> <ul style="list-style-type: none"> • Describes models for the screen and padding and explains what they represent. • Describes how at least one of these components might be varied. • Describes a reasonable procedure for collecting data. • Indicates that they would continue modifying and testing baed on their results.
1 Getting Started	<p>Student's response includes one of the following:</p> <ul style="list-style-type: none"> • Describes models for the screen and padding and explains what they represent. • Describes how at least one of these components might be varied. • Describes a reasonable procedure for collecting data. • Indicates that they would continue modifying and testing baed on their results.
0	Student's response is missing, illegible, or irrelevant to the phenomenon.
X	Student had no opportunity to respond.