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-LS2-1: Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.

NGSS Assessment Boundaries

No assessment boundaries.

Use Notes

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 1a and 1b		
Level	**General Description**	**Item-Specific Description**
4 Complete and Correct	Student analyzes the data with appropriate tools, techniques, and reasoning. Student identifies and describes patterns in the data and interprets them completely and correctly to identify and describe relationships. When appropriate, student: • makes distinctions between causation and correlation • states how biases and errors may affect interpretation of the data.	Student uses the data table to correctly describe the trend in data for all four variables (deer population, average mass of deer, number of births, % malnourished) AND correctly describes overall effects of the event [grassland conversion (1a) or harsh winter (1b)] on the deer population
3 Almost There	Student analyzes the data with appropriate tools, techniques, and reasoning. Student identifies and describes patterns in the data BUT incorrectly and/or incompletely interprets them to identify and describe relationships.	Student uses the data table to correctly describe the trend in data for at least three of four variables (deer population, average mass of deer, number of births, % malnourished) AND correctly describes overall effects of the event [grassland conversion (1a) or harsh winter (1b)] on the deer population
2 On the Way	Student analyzes the data with appropriate tools, techniques, and reasoning. BUT does not interpret them to identify and describe patterns and relationships.	Student uses the data table to correctly describe the trend in data for at least two of four variables (deer population, average mass of deer, number of births, % malnourished) AND correctly describes overall effects of the event [grassland conversion (1a) or harsh winter (1b)] on the deer population
1 Getting Started	Student attempts to analyze the data BUT Does not use appropriate tools, techniques, and/or reasoning to identify and describe patterns and relationships.	Student uses the data table to correctly describe the trend in data for one variable (deer population, average mass of deer, number of births, % malnourished) AND correctly describes overall effects of the event [grassland conversion (1a) or harsh winter (1b)] on the deer population. OR Student uses the data to correctly describe the trend in up to four variables (deer populations, average mass of deer, number of births, % malnourished) BUT is missing or incorrectly describes overall effects of the event [grassland conversion (1a) or harsh winter (1b)] on the deer population.

0	Student's response is missing, illegible, or irrelevant to the phenomenon.	
X	Student had no opportunity to respond.	

Scoring Guide - Item 1c		
Level	**General Description**	**Item-Specific Description**
4 Complete and Correct	Student analyzes the data with appropriate tools, techniques, and reasoning. Student identifies and describes patterns in the data and interprets them completely and correctly to identify and describe relationships. When appropriate, student: • makes distinctions between causation and correlation • states how biases and errors may affect interpretation of the data.	Student uses the data table to correctly describe the trend in data for all four variables (deer population, average mass of deer, number of births, % malnourished) AND predicts the overall effect of the event (nature preserve established) on the deer population.
3 Almost There	Student analyzes the data with appropriate tools, techniques, and reasoning. Student identifies and describes patterns in the data BUT incorrectly and/or incompletely interprets them to identify and describe relationships.	Student uses the data table to correctly describe the trend in data for at least three of four variables (deer population, average mass of deer, number of births, % malnourished) AND predicts the overall effect of the event (nature preserve established) on the deer population.
2 On the Way	Student analyzes the data with appropriate tools, techniques, and reasoning. BUT does not interpret them to identify and describe patterns and relationships.	Student uses the data table to correctly describe the trend in data for at least two of four variables (deer population, average mass of deer, number of births, % malnourished) AND predicts the overall effect of the event (nature preserve established) on the deer population.
1 Getting Started	Student attempts to analyze the data BUT Does not use appropriate tools, techniques, and/or reasoning to identify and describe patterns and relationships.	Student uses the data table to correctly describe the trend in data for one variable (deer population, average mass of deer, number of births, % malnourished) AND predicts the overall effect of the event (nature preserve established) on the deer population. OR Student uses the data to correctly describe the trend in up to four variables (deer populations, average mass of deer, number of births, % malnourished) BUT is missing or incorrectly describes overall effect of the event (nature preserve established) on the deer population.

0	Student's response is missing, illegible, or irrelevant to the phenomenon.	
X	Student had no opportunity to respond.	

Scoring Guide - Item 2a	
Level	**Description**
2 Complete and Correct	Student's response • states that fish and ducks are competing AND that they are competing for food (plants).
1 Partially Correct	Student's response • states that fish and ducks are competing OR that there is competition for food.

Scoring Guide - 2b		
Level	**General Description**	**Item-Specific Description**
4 Complete and Correct	Student analyzes the data with appropriate tools, techniques, and reasoning. Student identifies and describes patterns in the data and interprets them completely and correctly to identify and describe relationships. When appropriate, student: • makes distinctions between causation and correlation • states how biases and errors may affect interpretation of the data.	Student uses the data to completely and correctly interpret the effects of competition on all organisms (fish, ducks, plants) in the pond.
3 Almost There	Student analyzes the data with appropriate tools, techniques, and reasoning. Student identifies and describes patterns in the data BUT incorrectly and/or incompletely interprets them to identify and describe relationships.	Student uses the data to completely and correctly interpret the effects of competition on at least two organisms organisms (fish, ducks, plants) in the pond. BUT does not interpret at least one example/ effect of competition
2 On the Way	Student analyzes the data with appropriate tools, techniques, and reasoning. BUT does not interpret them to identify and describe patterns and relationships.	Student uses the data BUT incorrectly interprets effects of competition on at least two organisms.
1 Getting Started	Student attempts to analyze the data BUT Does not use appropriate tools, techniques, and/or reasoning to identify and describe patterns and relationships.	Student incorrectly interprets the effects of competition on organisms AND / OR does not use the data to explain their interpretation.
0	Student's response is missing, illegible, or irrelevant to the phenomenon.	
X	Student had no opportunity to respond.	

Scoring Guide - Item 2c		
Level	**General Description**	**Item-Specific Description**
4 Complete and Correct	Student analyzes the data with appropriate tools, techniques, and reasoning. Student identifies and describes patterns in the data and interprets them completely and correctly to identify and describe relationships. When appropriate, student: • makes distinctions between causation and correlation • states how biases and errors may affect interpretation of the data.	Student uses the data to completely and correctly predict the effects of changes to competition on BOTH fish and ducks.
3 Almost There	Student analyzes the data with appropriate tools, techniques, and reasoning. Student identifies and describes patterns in the data BUT incorrectly and/or incompletely interprets them to identify and describe relationships.	Student uses the data to completely and correctly predict the effects of changes to competition on EITHER fish and ducks.
2 On the Way	Student analyzes the data with appropriate tools, techniques, and reasoning. BUT does not interpret them to identify and describe patterns and relationships.	Student uses the data BUT incorrectly predicts at least one effect of changes to competition on fish and ducks.
1 Getting Started	Student attempts to analyze the data BUT Does not use appropriate tools, techniques, and/or reasoning to identify and describe patterns and relationships.	Student incorrectly predicts the effects of changes to competition on fish and ducks.
0	Student's response is missing, illegible, or irrelevant to the phenomenon.	
X	Student had no opportunity to respond.	