5th Grade Science — Performance Level Descriptors

Reporting Categories	Needs Support	Close	Ready	Exceeding
Interpretation of Data Students apply science knowledge, skills, and practices to locate, translate, infer and extend from, and evaluate data and information in scientific graphs, tables, and diagrams of varying complexity.	*A student performing at the Needs Support level:* • selects one piece of data from a moderately complex data presentation. • finds information in text that describes a moderately complex data presentation. • selects two or more pieces of data from a moderately complex data presentation. • identifies features of a moderately complex table, graph, or diagram (e.g., axis labels, units of measure). • understands common scientific terminology, symbols, and units of measure used in a simple scientific context. • translates simple information into a table, graph, or diagram. • determines how the value of a variable changes as the value of another variable changes in a simple data presentation. • compares data from a simple data presentation (e.g., find the highest/lowest value; order data from a table). • combines data from a simple data presentation (e.g., sum data from a table). • performs an interpolation using data in a simple table or graph.	*A student performing at the Close level:* • selects one piece of data from a complex data presentation. • finds information in text that describes a complex data presentation. • selects two or more pieces of data from a complex data presentation. • identifies features of a complex table, graph, or diagram (e.g., axis labels, units of measure). • understands common scientific terminology, symbols, and units of measure used in a moderately complex scientific context. • translates moderately complex information into a table, graph, or diagram. • determines how the value of a variable changes as the value of another variable changes in a moderately complex data presentation. • compares data from a moderately complex data presentation (e.g., find the highest/lowest value; order data from a table). • combines data from a moderately complex data presentation (e.g., sum data from a table). • compares data from two or more simple data presentations (e.g., compare a value in a table to a value in a graph). • combines data from two or more simple data presentations (e.g., categorize data from a table using a scale from another table). • performs an interpolation using data in a moderately complex table or graph. • performs an extrapolation using data in a simple table or graph. • analyzes presented data when given new, simple information (e.g., reinterpret a graph when new findings are provided).	*A student performing at the Ready level:* • understands common scientific terminology, symbols, and units of measure used in a complex scientific context. • translates complex information into a table, graph, or diagram. • determines how the value of a variable changes as the value of another variable changes in a complex data presentation. • compares data from a complex data presentation (e.g., find the highest/lowest value; order data from a table). • combines data from a complex data presentation (e.g., sum data from a table). • compares data from two or more moderately complex data presentations (e.g., compare a value in a table to a value in a graph). • combines data from two or more moderately complex data presentations (e.g., categorize data from a table using a scale from another table). • determines and/or use a mathematical relationship that exists between simple data (e.g., averaging data, unit conversions). • performs an interpolation using data in a complex table or graph. • performs an extrapolation using data in a moderately complex table or graph. • analyzes presented data when given new, moderately complex information (e.g., reinterpret a graph when new findings are provided).	*A student performing at the Exceeding level:* • compares data from two or more complex data presentations (e.g., compare a value in a table to a value in a graph). • combines data from two or more complex data presentations (e.g., categorize data from a table using a scale from another table). • determines and/or use a mathematical relationship that exists between moderately complex data (e.g., averaging data, unit conversions). • performs an extrapolation using data in a complex table or graph. • analyzes presented data when given new, complex information (e.g., reinterpret a graph when new findings are provided).
Scientific Investigation Students apply science knowledge, skills, and practices to understand the tools, procedures, and design of scientific experiments and to compare, extend, and modify those experiments.	*A student performing at the Needs Support level:* • finds information in text that describes a moderately complex experiment. • identifies similarities and differences between moderately complex experiments. • determines which moderately complex experiments utilized a given tool, method, or aspect of design. • understands the methods, tools, and functions of tools used in a simple experiment. • understands a simple experimental design. • determines the scientific question that is the basis for a simple experiment (e.g., the hypothesis). • predicts the results of an additional trial or measurement in a simple experiment.	*A student performing at the Close level:* • finds information in text that describes a complex experiment. • identifies similarities and differences between complex experiments. • determines which complex experiments utilized a given tool, method, or aspect of design. • understands the methods, tools, and functions of tools used in a moderately complex experiment. • understands a moderately complex experimental design. • determines the scientific question that is the basis for a moderately complex experiment (e.g., the hypothesis). • evaluates the design or methods of a simple experiment (e.g., possible flaws or inconsistencies; precision and accuracy issues). • predicts the results of an additional trial or measurement in a moderately complex experiment. • determines what conditions in a simple experiment would produce specified results.	*A student performing at the Ready level:* • understands the methods, tools, and functions of tools used in a complex experiment. • understands a complex experimental design. • determines the scientific question that is the basis for a complex experiment (e.g., the hypothesis). • evaluates the design or methods of a moderately complex experiment (e.g., possible flaws or inconsistencies; precision and accuracy issues). • predicts the results of an additional trial or measurement in a complex experiment. • determines what conditions in a moderately complex experiment would produce specified results. • determines an alternate method for testing the scientific question that is the basis for a simple experiment. • predicts the effects of modifying the design or methods of a simple experiment. • determines which additional trial or experiment could be performed to enhance or evaluate the results of a simple experiment.	*A student performing at the Exceeding level:* • evaluates the design or methods of a complex experiment (e.g., possible flaws or inconsistencies; precision and accuracy issues). • determines what conditions in a complex experiment would produce specified results. • determines an alternate method for testing the scientific question that is the basis for a moderately complex experiment. • predicts the effects of modifying the design or methods of a moderately complex experiment. • determines which additional trial or experiment could be performed to enhance or evaluate the results of a moderately complex experiment.
Evaluation of Models, Inferences, and Experimental Results Students apply science knowledge, skills, and practices to evaluate the validity of scientific information and formulate conclusions and predictions based on that information.	*A student performing at the Needs Support level:* • determines which hypothesis, prediction, or conclusion is, or is not, consistent with a simple data presentation or piece of information in text. • determines which results of a simple experiment support or contradict a hypothesis, prediction, or conclusion.	*A student performing at the Close level:* • determines which hypothesis, prediction, or conclusion is, or is not, consistent with a moderately complex data presentation or piece of information in text. • determines which results of a moderately complex experiment support or contradict a hypothesis, prediction, or conclusion. • determines which hypothesis, prediction, or conclusion is, or is not, consistent with two or more simple data presentations and/or pieces of information in text.	*A student performing at the Ready level:* • determines which hypothesis, prediction, or conclusion is, or is not, consistent with a complex data presentation or piece of information in text. • determines which results of a complex experiment support or contradict a hypothesis, prediction, or conclusion. • determines which hypothesis, prediction, or conclusion is, or is not, consistent with two or more moderately complex data presentations and/or pieces of information in text. • explains why a hypothesis, prediction, or conclusion is, or is not, consistent with a simple data presentation or piece of information in text. • explains why simple information, already presented or new, supports or contradicts a hypothesis or conclusion. • explains why a hypothesis, prediction, or conclusion is, or is not, consistent with two or more simple data presentations and/or pieces of information in text.	*A student performing at the Exceeding level:* • determines which hypothesis, prediction, or conclusion is, or is not, consistent with two or more complex data presentations and/or pieces of information in text. • explains why a hypothesis, prediction, or conclusion is, or is not, consistent with a moderately complex data presentation or piece of information in text. • explains why moderately complex information, already presented or new, supports or contradicts a hypothesis or conclusion. • explains why a hypothesis, prediction, or conclusion is, or is not, consistent with two or more moderately complex data presentations and/or pieces of information in text.

Simple Data Presentations and Experiments for the Elementary School Grade Band

Concepts/quantities encompassed in a simple data presentation or experiment: Concepts are likely to be familiar to, or readily understood by, elementary school students regardless of their exposure to rigorous science instruction (even if not fully understood, such as temperature) and are often numbers of things, like number of bugs or number of days.

Nature of simple data presentations and experiments: Likely to be familiar to, or readily understood by, elementary school students regardless of their exposure to rigorous, active science instruction. Examples of data presentations include tables with one or two columns and single headings, pictographs, line plots, bar graphs with a few single bars, linear flow diagrams (e.g., a short food chain). Examples of simple experiments include recording insect activity in a backyard, experiments with only a few steps in which the one variable is measured and one (or none) is controlled; methods and tools are very common, such as counting, using a ruler, measuring weight.

Moderately Complex Data Presentations and Experiments for the Elementary School Grade Band

Concepts/quantities encompassed in a moderately complex data presentation or experiment: Concepts are likely to be familiar to an elementary school student who has had rigorous science instruction (but may not be to students lacking this instruction), such as mass, volume, or speed (even if only understood qualitatively); newly introduced but readily understood quantities (e.g., plant height or volume of liquid added); or a simple quantity (or number of things) per another familiar quantity, like number of flowers per bed or inches of rainfall per week.

Nature of moderately complex data presentations and experiments: Likely to be familiar to elementary school students who have had exposure to rigorous, active science instruction but challenging to other elementary school students. Examples of moderately complex data presentations include tables with three or more columns and single headings, bar graphs with several single bars, pictographs with icons representing a certain number of things (e.g., each bird in a pictograph equals 10 birds), very simple line graphs, flow diagrams with two or more levels (like a basic food web). Examples of moderately complex experiments include simple field studies in the playground involving defined test plots, experiments with several, straightforward steps in which the number of variables measured and controlled is three or fewer; methods and tools are very common, such as using a balance, graduated cylinder, or a heat source.

Complex Data Presentations and Experiments for the Elementary School Grade Band

Concepts/quantities encompassed in a complex data presentation or experiment: Concepts are introduced to students and are likely unfamiliar to elementary school students, even many who have had rigorous science instruction, such as density or concentration, or concepts specific to complex scenarios that are fully explained in text but will be challenging to many elementary school students. Students of all levels will likely need to rely heavily on the explanations and definitions provided.

Nature of complex data presentations and experiments: May be challenging to elementary school students regardless of their exposure to rigorous, active science instruction. Examples of complex data presentations include tables with shared and stacked headings, bar graphs with double bars and a legend, line graphs with more than one labeled line, tables with negative quantities, simple scatterplots, flow diagrams with multiple branching and multiple levels. Examples of complex experiments include experiments having several, intricate steps and the number of variables measured and controlled being four or greater, often using unfamiliar, newly introduced methods and tools.