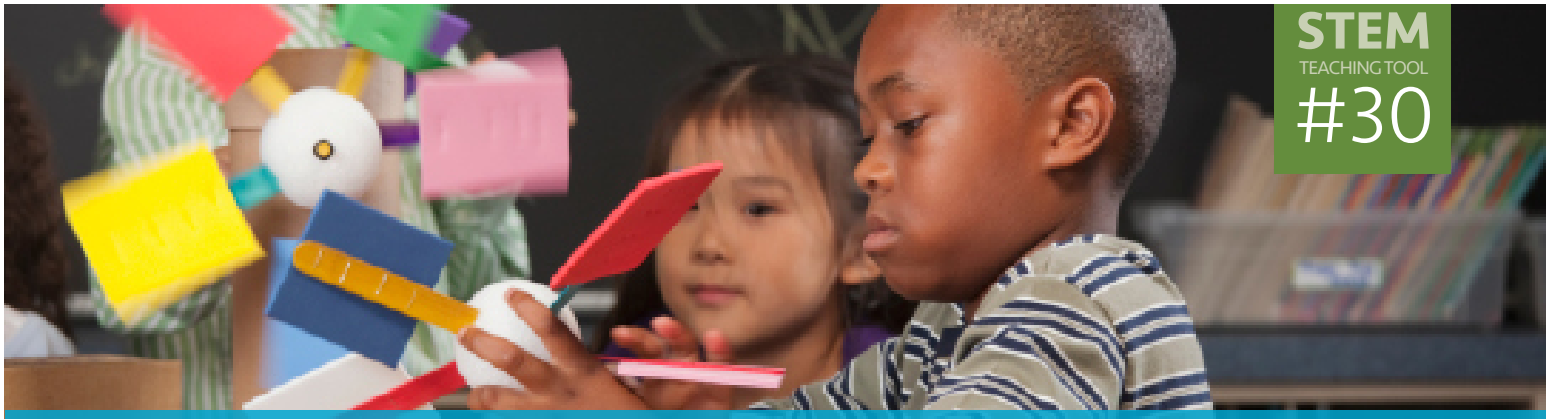

STEM TEACHING TOOL #30

Integrating Science Practices Into Assessment Tasks

The Next Generation Science Standards call for the development of "three-dimensional science proficiency," that is, students' integrated understanding of disciplinary core ideas, science and engineering practices, and crosscutting concepts. Assess three-dimensional science proficiency requires *multicomponent tasks* (National Research Council, 2014). These are a set of prompts linked by a common scenario, phenomenon, or engineering design challenge.

Developing three-dimensional science assessments is challenging. Most current assessments focus on testing students' knowledge of science facts. Few focus on having students apply their understanding of disciplinary core ideas in the context of engaging in a science or engineering practice. Fewer still make connections to crosscutting concepts.

The "task format" templates included in this document are tools to help teachers and district leaders design three-dimensional assessment tasks. They are based on the language of *A Framework for K-12 Science Education* and the NGSS Evidence Statements, focusing on all eight science practices and two engineering practices. These task formats represent different ways that assessment tasks can be written to engage students in science practice. They do not specify precisely which disciplinary core ideas are to be integrated into tasks, which would be determined by the team designing the assessments.

The different formats get at different aspects of a given science and engineering practice. Some formats are likely to be more demanding cognitively for students than others. The idea of presenting multiple formats is to give task developers a sense of the range of tasks that can be written. A good "test" of a student's grasp of a particular practice, in the context of a disciplinary core idea and crosscutting concept, would be comprised of multiple tasks and draw on multiple formats.

How to Read a Template Task

Scenario presented to students

Format	Task Requirements for Students
1	Present students with a textual description of an investigation of an observable phenomenon, *then* Ask students to formulate a scientific question relevant to Investigating that phenomenon.

Task(s) for students to complete

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Potential Task Formats: Asking Questions (Science)

Format	Task Requirements for Students
1	Present students with a scenario that describes a phenomenon using text, images, video, and/or data, *then* Ask students to select from a list of questions to identify which ones can be investigated.
2	Present students with a scenario that describes a phenomenon using text, images, video, and/or data, *then* Ask students to ask questions about the phenomenon based on their observations of the information in the scenario to gather more information, *and/or* Ask students to formulate scientific questions to investigate that phenomenon.
3	Present students with a scenario that describes a phenomenon using text, images, video, and/or data, *then* Ask students to generate a scientific question relevant to investigating that phenomenon, *and* Ask students to describe what evidence is needed to answer the question they generated.
4	Present students with a scenario that describes a phenomenon using text, images, video, and/or data, and a scientific question, *then* Ask students to evaluate whether or not the question is relevant to explaining the phenomenon, *and* If the question is relevant, ask students to describe what evidence is needed to answer that question.
5	Present students with a scenario that describes a phenomenon using text, images, video, and/or data, and a research question, *then* Ask students what questions we need to answer along the way to answer the research question, Ask students to describe what evidence is needed to answer those questions might and how they help build toward an explanation of the phenomenon, *or* Ask students to ask questions about unexpected results.
6	Present students with a scenario that describes an investigation of an observable phenomenon, a research question, and a set of data and findings, *then* Ask students to formulate a follow-up question to extend the investigation.
7	Present students with a scenario that describes an investigation of an observable phenomenon, a research question, *then* Ask students to revise the question to make it investigable with available resources in the classroom.

8	Present students with a scenario that describes an investigation of an observable phenomenon and with a question or a set of questions, *then* Ask students to evaluate and explain whether or not the question(s) is empirically testable.
9	Present students with a scenario of a scientific argument in the context of an investigation, *then* Ask students to generate questions they would ask to clarify the argument or to ask for elaboration of the ideas presented in the argument.
10	Present students with a scenario that describes a phenomenon using text and/or and a model of the phenomenon, *then* Ask students what questions they need to answer to clarify or determine the components and interactions/relationships in the model, and Ask students to explain how those questions will add information necessary for the model to adequately explain the phenomenon.

Potential Task Formats: Defining Problems (Engineering)

Format	Task Requirements for Students
1	Present students with a scenario in which people are using designed object or tool and express frustration that the object or tool cannot perform a specific function, *then* Ask students to define the problem in their own words that the people are facing.
2	Present students with a scenario that describes a problem using text, images, video, and/or data, *then* Ask students to describe what human needs, local issues, or global issues are reflected in the description of the problem.
3	Present students with a scenario that describes a problem using text, images, video, and/or data that includes information about different needs and issues at stake, *then* Ask students to define the problem in their own words that is to be solved, *and* Identify criteria for success for a solution that best meets the needs identified and addresses the issues at stake.
4	Present students with a scenario that describes a problem that includes quantitative and qualitative data in the description, *then* Ask students to describe what human needs, local issues, or global issues are reflected in the description of the problem, *and* Ask students to interpret quantitative and qualitative data to describe the major consequences of the problem if it remains unsolved.
5	Present students with a scenario that describes a problem that includes excerpts from related scientific research, *then* Ask students to describe how each piece of scientific research is relevant background research for defining the problem.
6	Present students with a textual description of a scenario of a need or desire of society and/or the natural world, *then* Ask students to describe the problem, *and* Ask students to define the criteria and constraints for acceptable solutions to the problem perhaps including scientific knowledge that may limit possible solutions..
7	Present students with a scenario that describes a problem using text, images, video, and/or data that includes information about different needs and issues at stake, *or* Present students with a textual description of a scenario of a need or desire of society and/or the natural world and a defined problem, *then* Ask students to define the components and relationships between the components of the system in which the problem is embedded, *and* Ask students to define the boundaries of that system and what is and is not part of the system.

8	Present students with a scenario that describes a problem using text, images, video, and/or data, *or* Present students with a textual description of a scenario of a need or desire of society and/or the natural world along with design criteria and constraints, *then* Ask students to plan an investigation that would allow them to better understand the needs and issues at stake, *and* Ast students to describe what kinds of design solutions would fit within the defined criteria and constraints to design space for the problem.
9	Present students with a scenario that describes a problem using text, images, video, and/or data *then* Ask students to describe what human needs, local issues, or global issues are reflected in the description of the problem, Ask students to define the criteria and constraints for acceptable solutions to the problem, *and* Ask students what evidence is needed to know whether or not a solution fits within the defined criteria and constraints.

Potential Task Formats: Developing and Using Models (Science)

Format	Task Requirements for Students
1	Present students with a scenario that describes a phenomenon using text, images, video, and/or data, *then* Ask student to develop a model that represents amounts, relationships, scales, or patterns in the natural world, *or* Ask students to a simple model based on evidence from the scenario to represent an object or tool.
2	Present students with a scenario that describes a phenomenon using text, images, video, and/or data, and with two different models for that phenomenon, *then* Ask students to compare the two models to identify common features and differences *and* Ask students to revise one of the models and justify their revisions with disciplinary core ideas.
3	Present students with a scenario that describes a phenomenon using text, images, video, and/or data and a question or problem related to the phenomenon, *then* Ask students to develop a model with components, interactions, and mechanisms that answers the question or demonstrates a solution to the problem, *and/or* Asks students to develop a version of their model that shows what will happen if a variable or component changes, *and/or* Ask students to write an explanation for the phenomenon or the problem, using the model as supporting evidence.
4	Present students with a scenario that describes a phenomenon using text, images, video, and/or data, and includes an illustration or drawing of a scientific process, *then* Ask students to label the components, interactions, and mechanisms in the model, *and* Write a description of what is shown in the drawing.
5	Present students with a scenario that describes a phenomenon using text, images, video, and/or data and a question or problem related to the phenomenon, *then* Ask students to develop a model that generates data, *and* Ask students to write an explanation or explain a solution using data generated from the model.
6	Present students with a scenario that describes a phenomenon using text, images, video, and/or data and a question or problem related to the phenomenon, *then* Ask students to develop at least two types of models, *and* Ask students to write an explanation or explain a solution using evidence generated from more than one type of model.
7	Present students with a scenario that describes a phenomenon using text, images, video, and/or data and a model to describe or predict something related to the phenomenon *then* Ask students to develop a test to understand the reliability of the model, *and* Revise the model to improve its reliability.

Potential Task Formats: Planning and Carrying Out Investigations (Science)

Relevant definitions

- An *investigation plan* encompasses a description of data sources and measures to be used, procedures for observing and recording data, and, where relevant, a plan for how observations will be sampled.
- A *data source* refers to a type of data only ("We would need data on the size of the white-colored moth population" or "We would need data comparing the color of tail feathers in birds in the mountains and in the city").

Format	Task Requirements for Students
1a	Present students with a scenario that describes a phenomenon using text, images, video, and/or data to be explained, *then* Ask students to generate a research question to investigate the phenomenon with resources available in the classroom (or with a given list of resources), Ask students to evaluate different ways of observing or measuring a phenomenon to determine which will best answer the question asked, Ask students to identify the variables needed in the investigation to explain the phenomenon, Ask students to characterize each variable as dependent or independent and to explain any variables to be controlled and why, *and* Ask student to make observations/measurements to produce data.
1b	Present students with a scientific model to be tested, *then* Ask students to generate a research question to investigate the phenomenon with resources available in the classroom (or with a given list of resources), Ask students to evaluate different ways of observing or measuring a phenomenon to determine which will best answer the question asked, Ask students to identify the variables needed in the investigation to explain the phenomenon, Ask students to characterize each variable as dependent or independent and to explain any variables to be controlled and why, *and* Ask student to make observations/measurements to produce data.
2	Present students with a scenario that describes a phenomenon using text, images, video, and/or data, a scientific question, and an investigation plan, *then* Ask students to describe how the data will be collected precisely, *and* Ask students to how much data is needed to be reliable.
3a	Present students with a scenario that describes a phenomenon using text, images, video, and/or data to be explained and a scientific question, *then* Ask students to create an investigation plan to study the scientific phenomenon that includes independent and dependent variables and controls (when applicable), what tools will be used to gather data, and how observations/measurements will be recorded, Ask students to describe how the investigation will generate relevant evidence for answering the scientific question, *and/or* Ask students to conduct the investigation and collect data to serve as evidence to answer the scientific question.

3b	Present students with a scientific model, *then* Ask students to create an investigation plan to test the model that includes independent and dependent variables and controls, when applicable, what tools will be used to gather data, and how observations/measurements will be recorded, Ask students to describe how the investigation will generate relevant evidence for testing the model, Ask students to describe the pattern of evidence that would support the model, *and/or* Ask students to conduct the investigation and collect data to serve as evidence to evaluate the model.
4	Present students with a scenario that describes a phenomenon using text, images, video, and/or data and an engineering problem to be solved and a possible design solution, *then* Ask students to design an investigation to test the design solution that considers environmental, social, and personal impacts of the investigation.
5	Present students with a scenario that describes a phenomenon using text, images, video, and/or data to be explained a scientific question, and an investigation plan, *then* Ask students to consider possible confounding variables or effects and evaluate the investigation's design to ensure it will produce the necessary data, Ask student to revise the investigation to ensure it will produce the necessary data and in the revision include the types of data to be collected, how much data will be collected, and the accuracy of data needed to produce reliable measurements, *and/or* Ask students to conduct the investigation and write an explanation to answer the scientific question using data from the investigation as evidence.
6	Present students with a scenario that describes a phenomenon using text, images, video, and/or data to be explained a scientific question, and investigation plan, and data collected from the investigation, *then* Ask students analyze how well the data collected generated relevant evidence to answer the research question, *and* Ask students to revise the investigation plan to be more relevant and to generate more accurate and precise data.

Potential Task Formats: Analyzing and Interpreting Data

Relevant definitions

- A *pattern of evidence* from data is what the data say ("The population of white-colored moths disappeared in cities," or "The birds' tail feathers are whiter in the mountains than in the city")

Format	Task Requirements for Students
1	Describe an engineering design problem, a solution to the problem and a set of data from a test of the solution, *then* Ask students to evaluate which design solution best addresses the problem and constraints.
2	Present students with a scenario that describes an investigation, the phenomenon under investigation, and one or more recorded observations from the investigation directly relevant to explaining the phenomenon, *then* Ask students to make a prediction and compare it to the observations given, Ask students to organize the data and describe how this organization helps them analyze, Ask students to use tables or graphical displays to identify and describe the patterns they see in the organized data, *and* Ask students to student to describe how the patterns of evidence in the data help to explain the phenomenon.
3	Present students with a scenario that describes an investigation, the phenomenon under investigation, and multiple recorded observations from the investigation, only some of which are relevant to explaining the phenomenon *and* Ask students to describe which data are relevant to explaining the phenomenon under investigation, Ask students to analyze the relevant data using mathematics or logical reasoning, *and* Ask students to interpret the analysis as evidence for explaining the phenomenon.
4	Describe an investigation, the phenomenon under investigation, and one or more recorded observations from the investigation, *then* Ask students to organize, represent, and analyze the data in at least two different ways, *and* Ask students to compare how the representations and analyses help them to identify patterns in the data.
5	Present students with a scenario that describes an investigation, the phenomenon under investigation, and one or more recorded observations from the investigation, *then* Ask students to construct graphical displays of data and identify relationships in data sets, Ask students to use grade-level appropriate mathematics and/or statistics to analyze the data including mean, median, mode, and variability, *and* Ask students to draw conclusions supported by their mathematical analysis, Ask students to describe the limitations in data analysis and in relation to the methods for data collection.
6	Present students with a scenario that describes a hypothesis and a phenomenon under investigation, *then* Ask students to create a data set that would support the hypothesis, *and* Ask students say how the pattern of evidence from the data would support the hypothesis.

7	Present students with a scenario that describes tests of engineering design solutions and gives students the relevant data from those tests, *then* Ask students to analyze the data to evaluate and propose refinements to the design solutions, *and* Ask students to compare the analyzed data to criteria for success and then define an optimal operational range for the design solution (an object, tool, process, or system).
8	Present students with a scenario that describes an investigation, the phenomenon under investigation, and one or more recorded observations from the investigation, *then* Ask students to organize, represent, and analyze the data in at least two different ways, Ask students to use tools (digital tools, if appropriate), technologies, or models and apply concepts of statistics and probability (e.g., functions that fit the data, slope, intercept, and correlation coefficient) to analyze the data, Ask students to compare how the representations and analyses help them to identify patterns in the data, Ask students to make a valid and reliable scientific claim using their analyses as evidence, *and* Ask students to consider the limitations of their data analysis.
9	Present students with a scenario that describes an investigation, the phenomenon under investigation, multiple recorded observations from the investigation, and the results of analyses *then* Ask students to use the results to explain the phenomenon.
10	Present students with a scenario that describes an investigation, the phenomenon under investigation, and multiple datasets including a large data set, an archival data set, data generated from a model or self generated, or data presented in graphical format, *then* Ask students to identify relationships in the data including temporal and spatial relationships, Ask students to compare the datasets for consistency of measurements and observations, Ask students to analyze the datasets using mathematics, as appropriate, *and* Ask students to use the results from multiple datasets to explain the phenomenon.
11	Present students with a scenario that describes an investigation, the phenomenon under investigation, one or more recorded observations from the investigation, the results of analyses, and an interpretation of the data *then* Ask students to assess whether the interpretation is consistent with the data and the analysis, *or* Ask students to evaluate how the interpretation is affected by variation or uncertainty in the data.
12	Present students with a scenario that describes a phenomenon using text, images, video, and/or data, and a working explanation or a model of the system, and new data not included in the explanation or model, *then* Ask students to evaluate the impact of new data in relation to the explanation or the model, *and* Ask students to revise the explanation or model based on the new data, if appropriate.

Potential Task Formats: Using Mathematics and Computational Thinking (Science)

Format	Task Requirements for Students
1	Present students with a scenario that describes a phenomenon using text, images, and/or video and data in the form of measured quantities, *then* Ask students to describe patterns in the data using counting and numbers, Ask students to construct a display of the data using simple graphs, *and* Ask students to identify and describe the patterns and relationships from the representation and written description.
2	Present students with a scenario that includes a dataset from an investigation, the question the investigation is intended to answer, *then* Ask students to identify mathematical properties of the dataset (e.g., range, average) that should be analyzed to answer the question.
3	Present students with a scenario that describes a phenomenon using text, images, and/or video and data in the form of measured quantities, *then* Ask students to develop an equation or algorithm that corresponds to the description, *and* Explain how the equation or algorithm represents the textual description.
4	Present students with a scenario that describes a phenomenon using text, images, and /or video and data, measured quantities of data, and a mathematical equation, *then* Ask students to make a prediction about the state of the phenomenon in the future given the data, *and* Ask students to write an explanation for the prediction, using the mathematical model as supporting evidence.
5	Present students with a computational model of a phenomenon, *then* Ask students to describe the patterns and relationships from the computational model by applying concepts and process (e.g., ratio, rate, percent, unit conversions), *and* Write an explanation of the phenomenon using the results of the computational model as supportive evidence.
6	Present students with a simulation of a scientific process, *then* Ask students to describe the patterns and relationships from the simulation, *and* Write an explanation of the rules of the simulation using scientific theory as supporting evidence.
7	Present students with a simulation of a phenomenon, *then* Ask students to compare the simulation results with real-world data analyzed using mathematics, *and* Write an argument for whether or not the simulation makes sense using the comparison as supporting evidence.
8	Present students with a two simulations of the same phenomenon, *then* Ask students to decide which of the two simulations is the most plausible, Compare to real-world data with outputs of each simulation, *and* Write an argument for which simulation is most plausible using the comparison as supporting evidence.

Potential Task Formats: Constructing Explanations (Science)

Relevant definitions

- "Scientific explanations are accounts that link scientific theory with specific observations or phenomena… Very often the theory is first represented by a specific model for the situation in question, and then a model-based explanation is developed." (NRC Framework, 2012).

Format	Task Requirements for Students
1	Present students with a question about how a phenomenon works and related observations (firsthand or from a variety of media sources), *then* Ask students to interpret the observations in order to answer the question, *and* Answer the question by producing an explanation (using words and/or drawings), *and* Give reasons for how the observations support their answer to the question.
2	Describe a phenomenon to students along with some related qualitative or quantitative data/ observations, *then* Ask students produce an explanation about the causal mechanism for the phenomena—at their level of scientific knowledge, *and* Show how their interpretation of the data is evidence for their explanation.
3	Describe a phenomenon to students along with a related set of evidence and an explanation that includes multiple scientific principles, *then* Ask students to say which pieces of evidences support or contradict particular components of the explanation.
4	Present students with a model or representation of an observable scientific process or system, *then* Ask students to write a model-based explanation for a relevant phenomenon.
5	Describe a phenomenon and present students with a causal explanation of it, *then* Ask students to identify gaps or weaknesses in how it scientifically explains the phenomenon based on their level of scientific understanding.
6	Present students with data from independent and dependent variables in an investigation, *then* Ask them to construct a quantitative and/or qualitative claim about how the independent variables relate to the dependent variables.
7	Describe a phenomenon and present students with a range of evidence obtained from a variety of sources (empirical investigations, models, theories, simulations, peer review), *then* Ask students to construct a causal explanation for the phenomena, *and* Describe how the evidence relates to the mechanisms or principles they have included.
8	Present students with an initial explanation for a phenomenon and new data or a model that would require a revision of the initial explanation, *then* Ask students to revise the explanation for the phenomenon, *and* Describe how their revised explanation accounts for the new data or model.

Potential Task Formats: Designing Solutions (Engineering)

Format	Task Design for Students
1	Present students with a scenario that describes a problem, need, or human desire using text, images, video, and/or data that includes descriptions of the needs or concerns to be addressed, design criteria, and design constraints, *then* Ask students to sketch or describe a design approach that develops a possible solution to the problem, *and* Explain how the relevant scientific ideas are taken into account within their design.
2	Present students with a scenario that describes a problem, need, or human desire using text, images, video, and/or data that includes descriptions of the needs or concerns to be addressed, design criteria, and design constraints, *then* Ask students to sketch, prototype or describe a design that is a possible solution to the problem using relevant materials, *and* Construct a prototype of their design.
3	Present students with a description of a designed system and data from a failure scenario (one that did not completely meet criteria for solutions) associated with the design, then Ask students to analyze the data, Identify the scientific causes of the failure, *and* Ask them them to sketch or describe a design iteration that might be an improvement to the design.
4	Present students with a description of a design in active development and a scenario where the design team has encountered a design tension between two or more criteria perhaps also related to the project constraints, *then* Ask students how they would proceed with the design work to develop a working system that requires consideration of trade-offs and prioritizing one design criterion over another in order to accomplish a working design.
5	Present students with a description of two competing solutions to a well-defined problems given a set of described needs, criteria and constraints, along with evidence related to the performance of each solution, *then* Ask students to evaluate which design better addresses the needs, Evaluate which design meets the criteria and constraints, *and* Justify their conclusion using evidence presented.
6	Present students with a scenario that describes a complex real-world problem. Ask students to design a solution that is based on scientific knowledge, prioritized criteria, and student-generated sources of evidence (e.g., from classroom investigations), *and* Ask them discuss tradeoff considerations for their design approach.

Potential Task Formats: Engaging in Argument from Evidence

Relevant definitions

- A *data source* refers to a type of data only ("We would need data on the size of the white-colored moth population" or "We would need data comparing the color of tail feathers in birds in the mountains and in the city")
- A *pattern of evidence* from data is what the data say ("The population of white-colored moths disappeared in cities," or "The birds' tail feathers are whiter in the mountains than in the city")

Format	Task Requirements for Students
1	Describe a phenomenon and give two or more competing arguments with varying degrees of evidence or that account for variable amounts of gathered evidence, *then* Ask students to identify which arguments are more scientific and why.
2	Present students with a claim about a phenomenon, *then* Ask students to identify evidence that supports the claim, *and* Articulate the reasons for how scientific principle(s) connect each piece of evidence to the claim.
3	Describe a phenomenon to students, *then* Ask students to articulate (construct) a claim about that phenomenon, *and* Identify evidence that supports or contradicts the claim, *and* Articulate the reasons for how scientific principle(s) that connect each piece of evidence to the claim.
4a, 4b	Describe a scenario in which two or more explanations are offered for a phenomenon and associated evidence using text, images, video, and/or data, *then* Ask students to identify the different reasoning used in the explanations (easier), *or* Ask students to identify the differences in reasoning and the evidence that supports or contradicts each (harder).
5	Describe an engineering design problem, a proposed solution, a set of criteria, and a set of data collected during testing of the solution, *then* Ask students to interpret the data to identify quality scientific evidence, *and* Support a claim about how well the solution addresses the problem using the evidence.
6a, 6b	Present students with a claim, a list of data sources that are relevant to the claim (but not what the data say), *then* Ask students to identify (select from a list) a pattern of evidence from the data that would support the claim, *or* Ask students to identify (select from a list) what pattern of evidence from the data would refute the claim.
7a, 7b, 7c, 7d	Present students with a claim **and** a pattern of evidence with reasoning relevant to the claim, ***then*** Ask students to assess whether the evidence is logically consistent with the reasoning, *or* Ask students to assess whether the evidence is consistent with a scientific theory or model they have studied, *or* Ask students to generate ideas about additional evidence needed to support the claim, *or* Ask students to critique and refine the reasoning used to support the claim.

8	Describe a scenario in which two or more scientific arguments are offered for a phenomenon that is described using text, images, video, and/or data, *then* Ask students to evaluate the merits and coherence of each argument by analyzing its fit with currently accepted explanations and the claim, evidence, reasoning relationships, *and* Use their evaluation to draw a conclusion about which argument is better supported.
9	Describe a scenario in which two or more contradictory claims are offered for a phenomenon and partial data for evaluating the claim, *then* Ask students to identify additional information needed to draw a conclusion about which claim is accurate, *and* Justify the choice of additional information using reasoning based on a model or scientific principles.

Potential Task Formats: Obtaining, Evaluating, and Communicating Information

Relevant definitions

- A "scientific text" is any form of scientific communication including but not limited to prose, graphs, videos, posters, symbols, and mathematics.

Format	Task Requirements for Students
1	Present students with a scenario that describes a phenomenon and includes a set of resources including grade-appropriate texts, data displays, tables, diagrams, equations, graphs, and models, *then* Ask students to synthesize the information from across the resources and texts, *and/or* Ask students to compare and contrast information across the resources and texts to determine which are most relevant to explaining the phenomenon, *and* Ask students to communicate information from the resources with others in oral or written forms using models, drawings, writing, or numbers.
2	Present students with a scenario that describes a phenomenon and includes a set of at least three multimodal resources with qualitative and quantitative information in written text within visual or media displays, *then* Ask students to integrate information across the resources in order to explain, clarify, or ask questions about claims and findings made in the resources, *or* Ask students to evaluate and integrate information across the resources to address a scientific question or solve a problem.

3	Present students with a set of scientific literature (or grade-appropriate adaptations) and/or media reports related to a scientific phenomenon, *then* Ask students to analyze and write about the validity and reliability of the information in the text (e.g., data, hypotheses, conclusions) Ask students to evaluate the information presented and synthesize across and to address a scientific question or solve a problem and/or ask questions about the phenomenon based on information from relevant texts.
4	Present students with a scenario that describes a phenomenon or an investigation of a phenomenon using text, images, video, and/or data, *then* Ask students use multiple forms of scientific texts (e.g., abstracts, articles, posters, science journalism) and multiple ways to present information (e.g., graphically, mathematically) to communicate about the phenomenon to a given audience or an audience of their choosing.

This work was created as part of the Research + Practice Collaboratory project. The Research + Practice Collaboratory brings educators and researchers together to develop more equitable innovations for STEM teaching and learning. Learn more at researchandpractice.org.

We are constantly updating and evolving our tools in response to user feedback.