NextGen TIME
What is NextGen TIME?

NextGen TIME is a suite of tools and processes designed to:

- help districts and educators collaboratively evaluate and select materials based on specified criteria,
- provide a transformative learning experience that, in part, increases shared understanding of the characteristics of high-quality instructional materials designed for next generation science, and
- increase district capacity to plan for curriculum-based professional learning to support the broad and effective implementation of instructional materials designed for next generation science.

The materials targeted by NextGen TIME are either larger units of study or year-long programs. NextGen TIME consists of five phases, each of which requires commitment from districts including educator time.

Why Use NextGen TIME?

NextGen TIME challenges and enables educators to use the instructional materials selection process as something more than just choosing better materials. Districts that use NextGen TIME capitalize on what is typically the largest investment in a science program and use it as a lever to improve science teaching and the learning experiences of all students.

Get Started Now

Check out the NextGen TIME tools and processes, available free online, at nextgentime.org.
NextGen TIME
Paperscreen Overview

Identify Criteria

Foundations
- Gather Evidence
  - Analyze Evidence and Apply Rubric
  - Score Components

Student Thinking
- Gather Evidence
  - Analyze Evidence and Apply Rubric
  - Score Components

Student Progress
- Gather Evidence
  - Analyze Evidence and Apply Rubric
  - Score Components

Teacher Support
- Gather Evidence
  - Analyze Evidence and Apply Rubric
  - Score Components

Program
- Gather Evidence
  - Analyze Evidence and Apply Rubric
  - Score Components

Summarize Results

Merge Paperscreen and Pilot Results

Select Instructional Materials
NextGen TIME
Paperscreen Overview

Designed for the NGSS: Foundations
- Presence of Phenomena/Problems
- Presence of Three Dimensions
- Presence of Logical Sequence

Designed for the NGSS: Student Thinking
- Phenomena/Problems
- Three-Dimensional Conceptual Framework
- Prior Knowledge
- Metacognitive Abilities
- Equitable Learning Opportunities

Designed for the NGSS: Student Progress
- Three-Dimensional Performances
- Variety of Measures
- Student Progress Over Time
- Equitable Access

Designed for the NGSS: Teacher Support
- Phenomenon/Problem-Driven Three-Dimensional Learning
- Coherence
- Effective Teaching
- Support for Students with Diverse Learning Needs
- Support to Monitor Student Progress

Designed for the NGSS: Program
- Unit-to-Unit Coherence
- Progressions of Learning Across Three Dimensions
- Program Assessment System
- Program Consistency
**Paperscreen Score Sheet**

Title of Program: 

Unit Title: 

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**Grand Total (out of 100)**
THE THREE DIMENSIONS OF THE
NEXT GENERATIONS SCIENCE STANDARDS (NGSS)

Disciplinary Core Ideas

Life Sciences
LS1: From Molecules to organisms: Structures and Processes
LS2: Ecosystems: Interactions, Energy and Dynamics
LS3: Heredity: Inheritance and Variation of Traits
LS4: Biological Evolution: Unity and Diversity

Physical Sciences
PS1: Matter and Its interactions
PS2: Motion and Stability: Forces and Interactions
PS3: Energy
PS4: Waves and Their Application in Technologies for Information Transfer

Earth and Space Science
ESS1: Earth’s Place in the Universe
ESS2: Earth’s Systems
ESS3: Earth and Human Activity

Engineering and Technology
ETS1: Engineering Design

Scientific and Engineering Practices
1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations.
4. Analyzing and interpreting data
5. Using mathematic and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument for evidence
8. Obtaining, evaluating, and communicating information.

Crosscutting Concepts
1. Patterns
2. Cause and effect: Mechanism and explanation
3. Scale, proportion, and quantity
4. System and system models
5. Energy and matter, flows, cycles, and conservation
6. Structure and function
7. Stability and change
MS-LS2 | Ecosystems: Interactions, Energy, and Dynamics

Students who demonstrate understanding can:

**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. [Clarification Statement: Emphasis is on cause and effect relationships between resources and growth of individual organisms and the numbers of organisms in ecosystems during periods of abundant and scarce resources.]

**MS-LS2.2.** Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. [Clarification Statement: Emphasis is on predicting consistent patterns of interactions in different ecosystems in terms of the relationships among and between organisms and abiotic components of ecosystems where aspects of interactions could include competitive, predatory, and mutually beneficial.]

**MS-LS2.3.** Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. [Clarification Statement: Emphasis is on describing the conservation of matter and flow of energy into and out of various ecosystems, and on defining the boundaries of the system. [A assessment Boundary: Assessment does not include the use of chemical reactions to describe the processes.]

**MS-LS2.4.** Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. [Clarification Statement: Emphasis is on recognizing patterns in data and making warranted inferences about changes in populations, and on evaulating empirical evidence supporting arguments about changes to ecosystems.]

**MS-LS2.5.** Evaluate competing design solutions for maintaining biodiversity and ecosystem services. [Clarification Statement: Examples of ecosystem services could include water purification, nutrient recycling, and prevention of soil erosion. Examples of design solution constructs could include scientific, economic, and social considerations.]

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education:  12 Science Education: Practices, Cross-Cutting Concepts, and Core Ideas.*

### Science and Engineering Practices

**Developing and Using Models**
Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.

- Develop a model to describe phenomena. (MS-LS2.3)
- Analyze and Interpreting Data
  - A nalyze a data set from 6–8 builds on K–5 experiences and progresses to extending quantitative and visualizing data to investigate criticisms, distinguishing between correlation and cause, and basic statistical techniques of data and error analysis.
- Analyze and interpret data to provide evidence for phenomena. (MS-LS2.1)
- Constructing Explanations and Designing Solutions
  - Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.
  - Construct an explanation that includes qualitative or quantitative relationships between variables that predict phenomena. (MS-LS2.2)
- Engaging in Argument from Evidence
  - Engage in argument from evidence in 6–8 builds on K–5 experiences and progresses to constructing a claim that supports or refutes claims for either explanations or solutions about the natural and designed world(s).
  - Construct an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or solution to a problem. (MS-LS2.4)
  - Evaluate competing design solutions based on jointly developed and agreed upon design criteria. (MS-LS2.5)

### Disciplinary Core Ideas

**LS2.A: Interdependent Relationships in Ecosystems**
- Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with the nonliving environment. (MS-LS2-1)
- In any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with each other for limited resources, to which consequently constrains their growth and reproduction. (MS-LS2-1)
- Growth of organisms and population increases are limited by access to resources. (MS-LS2-1)
- Similarly, predatory interactions may reduce the number of organisms or eliminate whole populations of organisms. Mutual beneficial interactions, in contrast, may become so interdependent that each organism requires the other for survival. Although the species involved in these competitive, predatory, and mutual beneficial interactions vary across ecosystems, the patterns of interactions of organisms with their environment, both living and nonliving, are shared. (MS-LS2-2)

**LS2.B: Cycle of Matter and Energy Transfer in Ecosystems**
- Food webs are models that demonstrate how matter and energy is transferred between producers, consumers, and decomposers as the three groups interact within an ecosystem. Transfers of matter into and out of the phytoplanckton occur at every level. Decomposers recycle nutrients from dead plant or animal matter back to the soil in terrestrial ecosystems or to the water in aquatic environments. The atoms make up the organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem. (MS-LS2-3)

**LS2.C: Ecosystem Dynamics, Functioning, and Resilience**
- Ecosystems are in dynamic nature; their characteristics can vary over time. Disruptors to any physical or biological component of an ecosystem can lead to shifts in all its populations. (MS-LS2-4)
- Biodiversity describes the variety of species found on Earth's terrestrial and aquatic ecosystems. The complexity or integrity of an ecosystem's biodiversity is often used as a measure of its health. (MS-LS2-5)

**LS4.D: Biodiversity and Humans**
- Changes in biodiversity can influence human's resources, such as food, energy, and medicines, as well as ecosystem services that humans rely on—for example, water purification and recycling. (secondary to MS-LS2.3)

### Crosscutting Concepts

**Patterns**
- Patterns can be used to identify cause and effect relationships. (MS-LS2-2)
- Cause and Effect Relationships
  - Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MS-LS2-1)
- Energy and Matter
  - The transfer of energy can be tracked as energy flows through a natural system. (MS-LS2-3)
- Stability and Change
  - Small changes in one part of a system might cause large changes in another part. (MS-LS2-4)

**Connections to Engineering, Technology, and Applications of Science**

### Influence of Science, Engineering, and Technology on Society and the Natural World
- The use of technologies and any limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions. Thus technology use varies from region to region and over time. (MS-LS2-5)

### Connections to Nature of Science

**Scientific Knowledge Assumes an Order and Consistency in Natural Systems**
- Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation. (MS-LS2-3)
  - Science Addresses Questions About the Natural and Material World
  - Scientific knowledge can describe the consequences of actions but does not necessarily prescribe the decisions that society takes. (MS-LS2-5)

* The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea. The section entitled "Disciplinary Core Ideas" is reproduced verbatim from *A Framework for K-12 Science Education: Practices, Cross-Cutting Concepts, and Core Ideas.* Integrated and reprinted with permission from the National Academy of Sciences.
### MS-LS2 Ecosystems: Interactions, Energy, and Dynamics

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Disruptions in Ecosystems

Ecosystem Interactions, Energy, & Dynamics

Middle School Unit aligned with the Next Generation Science Standards

Third Field Test Version
Disruptions in Ecosystems

Ecosystem Interactions, Energy, & Dynamics

Third Field Test Version

Middle School Unit aligned with the Next Generation Science Standards

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Imagine you could travel back in time a thousand years. What differences would you notice in the animals and plants in the area where you live? What kind of animals might you see? Bears, wolves, and eagles used to live where New York City now stands. Today, coyotes, deer, and peregrine falcons can sometimes be found in the city. In many places in the world, the populations of plants and animals have changed as human populations have grown. In some places the changes haven’t been as extreme. In Rocky Mountain National Park in Colorado there used to be wolves, black bears, and grizzly bears, but now there are only black bears. What do you think caused such changes? What effects do you think these changes have had on the other animals and the plants that live in the area? What do you think would happen if some animals, like bears, were brought back to live in these environments?

In this chapter you will focus on the relationships between living things and the non-living things in the environment. You will investigate the effects of disruptions—events that change environments—caused by human populations and their actions. As you study scientific questions, you will engage in scientific practices—the things scientists do to understand and explain the world. For example, scientists analyze the data they collect to develop explanations for how things work. Scientists also construct arguments about which explanation makes the most sense. You will develop scientific explanations about relationships and changes in the environment. You will learn how to use your explanations to construct scientific arguments about the ways humans affect the environment, and whether people should try to reduce disruptions.
# Chapter 1: Wolves in Yellowstone

## Activity 1.1 Engage

**How do living things interact with living and non-living parts of the environment?**

Students begin the unit by discussing a familiar local environment. They share their ideas about the living and non-living parts of the environment and any interactions that they may have observed or be aware of. Through a short video and reading, students are introduced to the issue of wolf reintroduction to Yellowstone National Park. They discuss the effects that the reintroduction might have had on the environment and people.

## Activity 1.2 Explore

**What effect did the reintroduction of wolves have on the food web in Yellowstone National Park?**

Students explore feeding relationships and develop a food web of organisms in Yellowstone National Park. They speculate as to the influence of humans on food webs and how the reintroduction of wolves in Yellowstone might impact the food web.

## Activity 1.3 Explain

**How do organisms interact with each other?**

Students are formally introduced to patterns of ecological interactions, including predator-prey, competition, and symbiosis. They look at examples of these interactions both within and outside of Yellowstone. Students are able to further develop their ideas about patterns of interactions between organisms within an ecosystem.

## Activity 1.4 Explain

**What effects do living and non-living factors have on populations?**

Students interpret graphs as they examine changes in populations of organisms over time. They try to determine cause and effect relationships related to the changes. In doing so, they learn that populations of organisms are dependent on their environmental interactions both with living and with non-living factors.

## Activity 1.5 Elaborate

**How do biotic and abiotic factors affect patterns of interaction among organisms?**

Students interpret data from graphs and match them to ecological scenarios describing patterns of interaction that affect population size. This allows them to deepen their understanding of the concepts of ecological interactions, biotic and abiotic factors, cause and effect relationships, and graphing. Scientific explanations are formally introduced as students use an Explanation Tool to construct a scientific explanation about the pattern of interaction described in one of the scenarios.

## Activity 1.6 Evaluate

**Should wolves be reintroduced into the northeastern United States?**

Students revisit the concept of reintroducing a predator into an ecosystem. This time the context is the northeastern United States and their specific impact on deer. They begin by constructing a scientific explanation about the deer’s impact on the ecosystem. They apply concepts that they have learned from the chapter as they debate the possible reintroduction of wolves to the Adirondacks.
In Chapter 1 you studied interactions between organisms, and developed food webs to model feeding relationships. Why do organisms need food? What does food provide? What else do organisms need to live, grow, and reproduce? And what happens to an organism when it dies? In Chapter 2 you will take a closer look at the roles of producers, consumers, and decomposers in the overall function of an ecosystem. The crosscutting concepts of energy and matter will be critical to thinking about interactions among organisms and between organisms and the abiotic parts of the environment.

You will use the scientific practice of developing and using models to understand and explain the movement of matter and energy in ecosystems. Scientists use models to show how things work, to construct explanations for why things happen, and to make predictions. You will use models to represent the movement of energy and matter in ecosystems. These models will help you describe, explain, and predict how ecosystems are affected by disruptions, such as forest fires or volcanic eruptions.
Activity 2.1  
**Engage**  
How do organisms get matter and energy?  
Students begin the chapter by thinking about where organisms get the matter, or stuff, and energy they need to live, grow, and reproduce. They also begin to think about the fate of matter in dead organisms and wastes.

Activity 2.2  
**Explore**  
How do life and death affect the movement of matter and energy in ecosystems?  
Students expand their model of a food web from Chapter 1 to include additional higher-level consumers and decomposers (bacteria). They then create a draft model to explore and describe their ideas about the source and fate of matter and energy in a food chain. They will revise this model throughout the chapter.

Activity 2.3  
**Explain**  
How does matter move between biotic and abiotic parts of an ecosystem?  
Students focus specifically on modeling the movement of matter into and out of the biotic component of the ecosystem in this activity. They use scientific findings (observations and evidence) as they work in groups to develop a consensus model, and use the revised model to develop an explanation for the sources and fate of matter transferred between components of the biotic part of the system and between the abiotic and biotic components.

Activity 2.4  
**Explain**  
How does energy flow in an ecosystem?  
Students add the transformations and flow of energy in an ecosystem to the models they developed in the previous activity. They focus on the source and fate of energy and movement of energy within the biotic component of the system and between the biotic and abiotic components.

Activity 2.5  
**Elaborate**  
How does a disruption affect the flow of energy and cycling of matter in an ecosystem?  
Students elaborate on their understanding of the flow of energy and cycling of matter in an ecosystem by exploring the effects of natural disasters on the biotic and abiotic components of an ecosystem. They describe how a fire would affect the food web in Yellowstone and they describe the changes in the ecosystem that would occur over time following a fire.

Activity 2.6  
**Evaluate**  
How can a model be used to represent and make predictions about an ecosystem?  
Students apply what they have learned to create a model of the movement of matter and energy in their local ecosystem. They use the model to predict the effect of a disruption—a landslide that buries part of a hillside—on the flow of matter and energy in the system.
You have learned in previous chapters that all organisms need resources to live and grow. For example humans breathe oxygen, eat food, drink water, and do many other things that require resources of one type or another. Although some resources are available in large quantities, all are limited.

In this chapter you will investigate cause and effect relationships as you examine how resources are affected by populations of organisms. You will analyze and interpret data as you look at how populations are affected by the resources available to them. You will also learn about some ways that humans’ use of resources is managed to prevent overuse. Finally, you will construct arguments supported by evidence for how increases in the human population impact Earth’s systems.

Engage
3.1 Shopping for Fish

Explore
3.2 Going Fishin’

Explain
3.3 Three Fisheries

Elaborate
3.4 Dead Zones

Evaluate
3.5 Chesapeake Bay Oysters
Interactions Between Populations and Resources

CHAPTER 3

Activity 3.1 Engage
What factors should you consider when purchasing fish to eat?
Students begin the chapter thinking about fishing as an example of human use of natural resources. Students start considering how the health of one population might affect the ecosystem it lives in.

Activity 3.2 Explore
Can fishing limits prevent the overuse of an ecosystem?
Students explore how fishing limits can change the effect of human natural resource use, and examine how changes to the surrounding ecosystem can be a compounding factor. This allows students to investigate their initial ideas about natural resource use and about how multiple factors can affect populations.

Activity 3.3 Explain
What effect have humans had on the health of fisheries?
Students transition from analyzing their own data about a fictitious fishery to an analysis of long-term data from three real fisheries. Students use this analysis to develop an initial explanation about humans’ effect on fisheries and a formal argument about the health of one fishery.

Activity 3.4 Elaborate
How do humans affect the size of dead zones?
Students expand on their understanding of human disruption of ecosystems by looking at a more complex problem: the creation and expansion of dead zones. Students use their analysis of a variety of data to inform a debate on limiting human use of fertilizers to prevent dead zones.

Activity 3.5 Evaluate
How do increases in the human population affect the resources available to organisms?
Students conclude the chapter with an investigation that examines the effects of fishing and dead zones on the Chesapeake Bay Oyster fishery. This allows for the evaluation of students’ understanding of the effects of resource availability on organisms and populations of organisms as well as how increases in the human population impact the Earth’s systems. This also prepares them to investigate another complex ecosystem disruption, invasive species, in the next chapter.
Imagine you took a fish from the Amazon River in South America. If you let it go in the Hudson River, it would die because the Hudson is too cold. But what if you took a fish from another cold river in North America, like the Colorado River, and let it go in the Hudson. Could the fish survive? What would the fish need in its new environment in order to survive? How might the fish affect the other animals in its new environment?

In this chapter you will learn what happens when an organism that is native to one ecosystem is introduced to another ecosystem. You will analyze and interpret data as you investigate how ecosystems change when new organisms are introduced. You will develop explanations and construct arguments supported by evidence about how the introduction of new organisms affects ecosystems.
CHAPTER 4

Zebra Mussels

Activity 4.1 Engage
How might the introduction of the zebra mussel affect the health of the Great Lakes and Hudson River ecosystems?
Students begin the chapter with an introduction to a different type of ecosystem disruption, an invasive species. Students draw on what they have learned previously in the unit to begin to ask questions about how the introduction of the zebra mussel might disrupt the Hudson River and Great Lakes ecosystems.

Activity 4.2 Explore
What biotic and abiotic factors are affected when a new species is introduced to an ecosystem?
Students explore how the introduction of the zebra mussel has affected the Hudson River and Great Lakes ecosystems. Students use this knowledge to develop a testable question to investigate their initial ideas about the effect of an invasive species prior to looking at real-world data.

Activity 4.3 Explain
How did the zebra mussel initially affect the health and biodiversity of the Hudson River ecosystem?
Students investigate short-term data on the effects of the introduction of the zebra mussel to the Hudson River ecosystem. Students analyze data on three biotic and abiotic factors to determine the accuracy of their predictions from the previous activity about the effect of the zebra mussel.

Activity 4.4 Elaborate
What are the long-term effects of the zebra mussel invasion of the Hudson River?
Students transition to looking at long-term data on the effects of the zebra mussel. This allows them to deepen their understanding of dynamic ecosystems, and the importance of looking at disruption of ecosystems in both the short- and long-term.

Activity 4.5 Evaluate
Has the quagga mussel had a positive or negative effect on the Lake Michigan ecosystem?
Students conclude the chapter with an investigation of another invasive species in the Great Lakes ecosystem, the quagga mussel, which has displaced much of the zebra mussel population. This allows for the evaluation of students’ understanding of dynamic ecosystems and the effects of invasive species, while setting them up to investigate possible solutions for ecosystems disruptions in the following chapter.
In this unit you have seen many ways in which humans interact with ecosystems. For example in chapter 4 you learned that we receive ecosystem services, such as food, water, and recreation. Throughout the unit you have also learned that humans can cause disruptions to ecosystems. Many disruptions create a threat to the biodiversity of the ecosystem. Although humans cause environmental problems, we also have the ability to solve them. Scientists work to make sense of phenomena. Engineers use this understanding to design solutions. In doing so it is possible to develop solutions to lessen the negative impact that humans have on the earth.

In this chapter you will examine more environmental problems. However, this time you will make decisions. You will consider cause and effect relationships as the decisions you make have environmental consequences. You will also act as engineers. As engineers you will develop and use criteria to evaluate solutions to environmental problems. Finally, you will design your own solution to a problem.
Activity 5.1
Engage

What are some of the ways to deal with an insect problem?
This chapter engages students with a phenomenon that is woven throughout this unit, that of humans using more and more resources which causes environmental problems and thus creates the need for the development of solutions. Students begin the chapter by looking at a particular environmental problem, that of a crop infestation. They consider various solutions to the problem and discuss the advantages and disadvantages of each. In doing so they learn that for each course of action there are consequences, some foreseen and some not.

Activity 5.2
Explore

How can we balance human needs with those of the environment?
Human impact plays an important role in this activity as students play a game where each member of a group manages a connected area of a fictitious community. As a group they make decisions that affect ecosystem services and the environment, concepts that were introduced in the previous chapter. Each decision has consequences, some of them immediate and some delayed. Some of the consequences are also unanticipated by the group. By the end of the game, students realize that balancing environmental needs with human needs can be difficult.

Activity 5.3
Explain

What factors should be considered when choosing, or designing, a solution to an environmental problem?
Students revisit the previous two activities as they analyze the impacts of decisions made in terms of the effects on the environment, people, and communities. They learn that solutions are designed to operate within constraints and that criteria are used to develop or choose the optimal solution. Finally, they apply criteria and constraints as they use a framework to evaluate potential solutions to the crop infestation problem from an environmental, economic, and social perspective.

Activity 5.4
Elaborate

How can we evaluate solutions to decide how well they might work?
In the previous activity, students were introduced to a system that could be used in designing and evaluating solutions. In this Elaborate activity they apply the system to potential solutions for real world environmental problems. They develop and use environmental, economic, and social criteria to choose the best combination of solutions that fall within the limits of identified constraints. They complete the activity by suggesting refinements to their solutions.

Activity 5.5
Evaluate

How can the negative impact of humans on coral reefs be reduced?
Students are introduced to a broad range of threats to coral reefs around the world. They draw upon their understanding of designing solutions as groups develop and present a solution to one of the threats. As part of their presentation, groups make an argument for why their solution is a good response to minimizing human impact on the reef. After the presentations the class evaluates how well the solutions meet the specified criteria and constraints and how the threat illustrates how increases in human populations and resource use negatively impact the environment.
# Designed for the NGSS: Foundations Rubric

<table>
<thead>
<tr>
<th>Components and Indicators</th>
<th>High Quality</th>
<th>Medium Quality</th>
<th>Low Quality</th>
</tr>
</thead>
</table>
| **F1. Presence of Phenomena/Problem.** The materials include phenomena/problems. The phenomena or problems  
  • have some *potential* to drive student learning.  
  • have some *potential* to connect across the dimensions.  | Phenomena and/or problems are consistently present in the materials. | Phenomena and/or problems are occasionally present in the materials. | Phenomena and/or problems are rarely present in the materials. |
| **F2. Presence of Three Dimensions.** The materials include the three dimensions, such that  
  • the DCIs, SEPs, and CCCs are present and have the *potential* to be the focus of student learning.  
  • when engineering design is a learning focus, it is integrated with the appropriate dimensions (i.e., engineering is not isolated).  | The three dimensions are consistently present in the materials. | The three dimensions are occasionally present in the materials. | The three dimensions are rarely present in the materials. |
| **F3. Presence of Logical Sequence.** Materials demonstrate appropriate sequencing of three dimensions when  
  • they include a targeted set of DCIs, SEPs, and CCCs within a sequence;  
  • the sequence is clear and logical across the DCIs;  
  • the sequence *does not* include distracting ideas; and  
  • the SEPs and CCCs are potentially sufficient and appropriate for students to figure out the phenomena or problems.  | The materials consistently exhibit a clear, logical, and appropriate sequence across the three dimensions. | The materials occasionally exhibit a clear, logical, and appropriate sequence across the three dimensions. | The materials rarely exhibit a clear, logical, and appropriate sequence across the three dimensions. |
### Designed for the NGSS: Foundations

#### Analyze Evidence

**Directions**

1. Review the *Designed for the NGSS: Foundations Rubric*.
2. Reflect on the evidence (or lack of evidence) that you and your team gathered and represented.
3. Record strengths and limitations for each component based on your evidence. Cite specific examples.

<table>
<thead>
<tr>
<th>Components</th>
<th>Strengths</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1. Presence of Phenomena/Problems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F2. Presence of Three Dimensions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F3. Presence of Logical Sequence</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Designed for the NGSS: Student Thinking

### Evidence Chart

**Directions**

1. Review your assigned materials to describe the path of student thinking.
2. Represent your answers to the questions in the space provided.
3. Be prepared to share the path of student thinking visually on a public chart.

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer (in words, graphics, or both)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Answer the following questions as you describe the path of student thinking in the materials. Consider what you would expect students to be thinking about through the learning experiences. How is students’ thinking changing as they figure out/solve?</td>
<td></td>
</tr>
<tr>
<td>How do students access, engage, and use prior knowledge and experiences to advance their thinking?</td>
<td></td>
</tr>
<tr>
<td>What is driving student learning (e.g., question, scenario, problem, phenomenon)?</td>
<td></td>
</tr>
<tr>
<td>How do students develop metacognitive abilities?</td>
<td></td>
</tr>
<tr>
<td>What ideas and practices do students develop through these experiences?</td>
<td></td>
</tr>
</tbody>
</table>
## Designed for the NGSS: Student Thinking Rubric

<table>
<thead>
<tr>
<th>Components and Indicators</th>
<th>High Quality 5</th>
<th>Medium Quality 3</th>
<th>Low Quality 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>● engage students as directly as possible in authentic and relevant experiences.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>● are matched to targeted learning goals across the three dimensions.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>● can be figured out/solved using scientifically accurate understandings and abilities.</td>
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<td></td>
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</tr>
<tr>
<td>● make connections beyond and to their daily lives, including to their homes, neighborhoods, communities, and/or cultures.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ST2. Three-Dimensional Conceptual Framework.</strong> Materials include learning experiences that help students to build scientifically accurate understandings and abilities through opportunities for students to</td>
<td>Materials consistently include learning experiences that help students build from prior experiences to negotiate new understandings and abilities and apply their understandings in a variety of ways.</td>
<td>Materials sometimes include learning experiences that help students build from prior experiences to negotiate new understandings and abilities and apply their understandings in a variety of ways.</td>
<td>Materials rarely include learning experiences that help students build from prior experiences to negotiate new understandings and abilities and apply their understandings in a variety of ways.</td>
</tr>
<tr>
<td>● link prior knowledge to negotiated new understanding and abilities.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>● use reasoning to connect grade-appropriate SEP, DCI, and CCC elements.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>● ask and answer questions that link learning over time.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>● negotiate new understandings and abilities by comparing their ideas, their peers’ ideas, and ideas encountered in the learning experience(s).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>● apply their understandings and abilities in a variety of ways.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ST3. Prior Knowledge.</strong> Materials leverage students’ prior knowledge and experiences to motivate student learning in ways that</td>
<td>Materials consistently leverage student prior knowledge and experiences to motivate their learning.</td>
<td>Materials sometimes leverage student prior knowledge and experiences to motivate their learning.</td>
<td>Materials rarely leverage student prior knowledge and experiences, and when included, they do not relate to the phenomena or problems.</td>
</tr>
<tr>
<td>● make visible students’ prior knowledge and experiences related to the phenomena/problems and relevant SEPs, DCIs, and CCCs.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>● revisit students’ early ideas to see how they have changed (or not) as they figure out phenomena/solve problems.</td>
<td></td>
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</tr>
<tr>
<td>● make explicit links to new ideas and practices being developed by students.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>ST4. Metacognitive Abilities.</strong> Materials include learning experiences for students to</td>
<td>The materials provide students with regular, explicit opportunities to consider how their learning experiences changed their thinking.</td>
<td>The materials provide students with some opportunities to consider how their learning experiences changed their thinking.</td>
<td>The materials provide few opportunities for students to consider how their learning experiences changed their thinking.</td>
</tr>
<tr>
<td>● set and monitor their learning in light of the targeted learning goals.</td>
<td></td>
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</tr>
<tr>
<td>● consider, over time, what and how they have learned across the three dimensions.</td>
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<td></td>
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</tr>
<tr>
<td>● articulate how the three dimensions helped them figure out phenomena/solve problems.</td>
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</tr>
<tr>
<td><strong>ST5. Equitable Learning Opportunities.</strong> Materials ensure that all students, including those from nondominant groups and with diverse learning needs, have access to the targeted learning goals and experiences, including</td>
<td>Most learning experiences in materials are designed such that students can engage meaningfully in a variety of ways, with multiple access points, and with supports for all students.</td>
<td>Some learning experiences in materials are designed such that students can engage meaningfully in a variety of ways, with multiple access points, and with supports for all students.</td>
<td>Few learning experiences in materials are designed such that students can engage meaningfully in a variety of ways, with multiple access points, and with supports for all students.</td>
</tr>
<tr>
<td>● appropriate reading, writing, listening, and/or speaking alternatives for students who are English language learners, have special needs, read below the grade level, or have high interest and have already met the intended learning goals.</td>
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<td></td>
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</tr>
<tr>
<td>● culturally relevant contexts and examples or supports that help students connect to the context or examples.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>● opportunities to cultivate interest and confidence as scientists and engineers.</td>
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</tr>
</tbody>
</table>

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Developed in collaboration with the K-12 Alliance at WestEd and Achieve, Inc.

Paperscreen: Student Thinking
version 2.3
Directions
1. Review the *Designed for the NGSS: Student Thinking Rubric*.
2. Reflect on the evidence (or lack of evidence) that you and your team gathered.
3. Record strengths and limitations for each criterion based on your observations. Cite specific examples.

<table>
<thead>
<tr>
<th>Components</th>
<th>Strengths</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST1: Phenomena/ Problems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ST2: Three-Dimensional Conceptual Framework</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ST3: Prior Knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ST4: Metacognitive Abilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ST5: Equitable Learning Opportunities</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Designed for the NGSS: Student Progress

### Evidence Chart

**Directions**
1. Review your assigned materials (both the student and teacher materials) to identify assessments of and for learning.
2. Respond to the prompts or answer the questions in the space provided for each identified assessment.
3. Be prepared to represent your responses visually on a public chart.

<table>
<thead>
<tr>
<th>Assessment Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Page</strong></td>
</tr>
<tr>
<td><strong>Purpose of Assessment</strong></td>
</tr>
<tr>
<td><strong>Type of Measure</strong></td>
</tr>
<tr>
<td><strong>Note evidence of bias or problems with accessibility.</strong></td>
</tr>
</tbody>
</table>

### Match among Assessment, Phenomena/Problems, and Three Dimensions

<p>| What phenomenon or problem, if any, are students trying to figure out in this assessment? |
| What is the 2- or 3-dimensional learning goal assessed in this task? |</p>
<table>
<thead>
<tr>
<th>Components and Indicators</th>
<th>High Quality 5</th>
<th>Medium Quality 3</th>
<th>Low Quality 1</th>
</tr>
</thead>
</table>
| **SP1. Three-Dimensional Performances.** Materials include assessments designed to  
- match the targeted learning goals and  
- elicit observable evidence of students' use of grade-appropriate elements of the three dimensions to make sense of phenomena and/or to design solutions to problems. | Materials include assessments that are consistently designed to connect to learning goals and require students to apply appropriate elements of the three dimensions to make sense of the phenomenon/solve the problem. | Materials include assessments that are sometimes designed to connect to learning goals and require students to apply appropriate elements of the three dimensions to make sense of the phenomenon/solve the problem. | Materials include assessments that are designed such that they have limited connection to learning goals and/or they require students to apply elements of only one dimension to demonstrate their understanding of the phenomenon/solve the problem. |
| **SP2. Variety of Measures.** Assessments within a unit of instruction are matched to the targeted learning goals and elicit a full range of student thinking through  
- use of a variety of measures (e.g., performance tasks, discussion questions, constructed response questions, project- or problem-based tasks, portfolios, justified multiple choice) and  
- multiple assessment opportunities so that students can demonstrate their understanding of the same learning goals in a variety of ways. | Materials include assessments that include a wide variety of formats with clear expectations that allow students to demonstrate their understanding of the learning goals in multiple ways. | Materials include assessments that include some variety of formats with clear expectations that allow students to demonstrate their understanding of the learning goals in multiple ways. | Materials include assessments that use only one format, and/or the expectations for students to demonstrate their knowledge are absent or unclear. |
| **SP3. Student Progress Over Time.** The unit of instruction includes assessments that serve a variety of purposes (e.g., pre/post, formative, summative, peer, self) to measure students' progress over time. The assessments  
- provide opportunities to see growth and development in the use of the dimensions over time and  
- allow students to reflect on and monitor their sensemaking/problem solving over time. | Materials include assessments that offer multiple opportunities, using more than one type of measure, to demonstrate learning, and these measures are strongly connected to show student progress both in and across the three dimensions. | Materials include assessments that offer multiple opportunities, using more than one type of measure, to demonstrate learning, and these measures are somewhat connected to show student progress in or across the three dimensions. | Materials include assessments that offer limited opportunities for students to demonstrate progress on the three dimensions. |
| **SP4. Equitable Access.** Assessments within the unit of instruction are designed to  
- be free from bias (e.g., gender, racial, socioeconomic status, cultural) and  
- be accessible to all students (e.g., reading level, accommodations). | Most assessments in the materials are free from bias and are accessible. | Some assessments in the materials are free from bias and are accessible. | Few assessments in the materials are free from bias and are accessible. |
## Designed for the NGSS: Student Progress

### Analyze Evidence

**Directions**
1. Review the *Designed for the NGSS: Student Progress Rubric*.
2. Reflect on the evidence (or lack of evidence) that you and your team gathered.
3. Record strengths and limitations for each criterion based on your observations. Cite specific examples.

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<tr>
<th>Components</th>
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<th>Limitations</th>
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<tbody>
<tr>
<td>SP1: Three-Dimensional Performances</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SP2: Variety of Measures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SP3: Student Progress Over Time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SP4: Equitable Access</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Designed for the NGSS: Foundations
#### Teacher Support Evidence Chart

<table>
<thead>
<tr>
<th>Teacher materials</th>
<th>Strong</th>
<th>Adequate</th>
<th>Weak</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F1. Presence of Phenomena/Problems.</strong> Identify and provide background information about the phenomena/problems in the unit and how they match the targeted learning goals.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>F2. Presence of Three Dimensions.</strong> Identify and provide background information about each of the three dimensions in the unit. Also take note of any support for nature of science and engineering, technology, and applications of science.</td>
<td>- the SEPs</td>
<td>- the DCIs (including engineering)</td>
<td>- the CCCs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- <em>also note</em> NoS and ETS</td>
</tr>
<tr>
<td><strong>F3. Presence of Logical Sequence.</strong> Identify and provide background information on the sequence of learning in the unit.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strengths related to these Teacher Supports</th>
<th>Limitations related to these Teacher Supports</th>
</tr>
</thead>
</table>
## Designed for the NGSS: Student Thinking Teacher Support Evidence Chart

<table>
<thead>
<tr>
<th>Teacher materials</th>
<th>Strong</th>
<th>Adequate</th>
<th>Weak</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ST1. Phenomena/Problems.</strong> Provide support and strategies for how to help students figure out/solve authentic and relevant phenomena/problems using the three dimensions.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| **ST2. Three-Dimensional Conceptual Framework.** Provide support and strategies for how teachers help students develop a conceptual framework of scientifically accurate understandings and abilities related to  
• help students develop a conceptual framework of scientifically accurate understandings and abilities related to  
• create a learning environment that values students’ ideas, motivates learning, and helps students negotiate new meaning as they interact with others’ ideas, new information, and new experiences. |        |          |      |
| **ST3. Prior Knowledge.** Provide support and strategies to leverage students’ prior knowledge and experiences to motivate learning. |        |          |      |
| **ST4. Metacognitive Abilities.** Provide support and strategies for how to help students develop metacognitive abilities. |        |          |      |
| **ST5. Equitable Learning Opportunities.** Provide support and strategies for how to ensure that all students, including those from nondominant groups and with diverse learning needs, have access to the targeted learning goals and experiences. |        |          |      |

### Strengths related to these Teacher Supports

### Limitations related to these Teacher Supports
### Designed for the NGSS: Student Progress
### Teacher Support Evidence Chart

<table>
<thead>
<tr>
<th>Teacher materials</th>
<th>Strong</th>
<th>Adequate</th>
<th>Weak</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SP1. Three-Dimensional Performances.</strong> Provide support with a range of sample student responses and/or rubrics for interpreting evidence of student learning across the three dimensions, specific to the element of each dimension, and related to the phenomenon/problem that provides context for the student performance.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>SP2. Variety of Measure.</strong> Provide guidance and scoring tools for using a variety of measures matched to the targeted learning goals to help students monitor their progress toward learning goals and reflect on what they have learned, how they learn it, and how to use metacognition productively.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SP3. Student Progress Over Time.</strong> Provide guidance for using formative and summative assessments to monitor student progress over time. Examples include support for capturing student growth, interpreting results, adjusting instruction and planning for future instruction, providing feedback to students, and prompting students to consider what and how they’ve learned.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SP4. Equitable Access.</strong> Provide support and strategies for ensuring that assessments are accessible to students from diverse backgrounds and with diverse learning needs.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Strengths related to these Teacher Supports</th>
<th>Limitations related to these Teacher Supports</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>
## Components and Indicators

| TS1. Phenomenon-/Problem-Driven Three-Dimensional Learning. Teacher materials provide  
• background information about the phenomena or problems included in the learning sequence and across sequences.  
• an explanation of the role of phenomena or problems in driving student learning.  
• rationale for why the unit phenomena or problems were selected for the targeted DCIs, SEPs, and CCCs. Refer to F1, F2, ST1, ST2, SP1. | High Quality 5 | Medium Quality 3 | Low Quality 1 |
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Materials provide clear guidance to teachers on how students develop, use, and integrate the three dimensions to make sense of phenomena or design solutions to problems.</td>
<td></td>
<td>Materials provide some guidance to teachers about how students develop, use, and integrate the three dimensions to make sense of phenomena or design solutions to problems.</td>
<td>Materials provide little guidance on developing, using, or integrating the three dimensions to make sense of phenomena or design solutions to problems.</td>
</tr>
</tbody>
</table>

| TS2. Coherence. Teacher materials describe and provide a rationale for  
• the conceptual framework and sequence of ideas, practices, and learning experiences in the learning sequences and across sequences.  
• strategies for linking student experiences across lessons to ensure student sensemaking and/or problem-solving focused on phenomena or problems is linked to learning across all three dimensions.  
• connections to other science domains, nature of science, engineering, technology, and applications of science, math, and English language arts. Refer to F2, F3, ST2, SP2. | High Quality 5 | Medium Quality 3 | Low Quality 1 |
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials provide strong support for understanding unit coherence and helping students link experiences to learning across all three dimensions and to phenomena or problems.</td>
<td></td>
<td>Materials provide some support for understanding unit coherence and helping students link experiences to learning across all three dimensions and to phenomena or problems.</td>
<td>Materials provide little support for understanding unit coherence and helping students link experiences to learning across all three dimensions and to phenomena or problems.</td>
</tr>
</tbody>
</table>

| TS3. Effective Teaching. Teacher materials support the use of and provide a rationale and evidence of effectiveness for strategies that  
• support students in learning through authentic and meaningful phenomena or design problems.  
• support student learning across the three dimensions.  
• make student thinking visible; promote reasoning, sensemaking, and problem-solving; challenge student thinking; and develop metacognitive abilities. Refer to ST1, ST2, ST3, ST4, SP3. | High Quality 5 | Medium Quality 3 | Low Quality 1 |
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials provide rationale and robust support for implementing strategies that enhance student performances, thinking, and metacognition.</td>
<td></td>
<td>Materials provide some rationale and support for implementing strategies that enhance student performances, thinking, and metacognition.</td>
<td>Materials provide little rationale and support for teachers to implement strategies that enhance student performances, thinking, and metacognition.</td>
</tr>
</tbody>
</table>

| TS4. Support for Students with Diverse Learning Needs. Teacher materials provide an array of strategies  
• to support student access to the targeted learning goals, experiences, and performances.  
• that help teachers differentiate instruction. Refer to ST5, SP4. | High Quality 5 | Medium Quality 3 | Low Quality 1 |
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials include robust and comprehensive strategies for supporting learners with diverse needs.</td>
<td></td>
<td>Materials include some robust strategies for supporting learners with diverse needs.</td>
<td>Materials include few robust strategies for supporting learners with diverse needs.</td>
</tr>
</tbody>
</table>

| TS5. Support to Monitor Student Progress. Materials provide support for teachers to  
• monitor student learning and progress over time.  
• make decisions about instruction and provide feedback to students. Refer to ST3, ST4, SP1, SP2, SP3. | High Quality 5 | Medium Quality 3 | Low Quality 1 |
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Materials provide robust support for interpreting and using data generated from assessments.</td>
<td></td>
<td>Materials provide some support for interpreting and using data generated from assessments.</td>
<td>Materials provide little support for interpreting and using data generated from assessments.</td>
</tr>
</tbody>
</table>
## Designed for the NGSS: Program Rubric

<table>
<thead>
<tr>
<th>Components and Indicators</th>
<th>High Quality 5</th>
<th>Medium Quality 3</th>
<th>Low Quality 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PROGRESSIONS OF LEARNING.</strong> Within a program, learning experiences are more likely to help students develop a greater sophistication of understanding of the elements of SEPs, CCCs, and DCIs when teacher materials</td>
<td>Materials enact progressions of learning that have all or most of the quality characteristics.</td>
<td>Materials enact progressions of learning that have some of the quality characteristics.</td>
<td>Materials enact progressions of learning that have none or few of the quality characteristics.</td>
</tr>
<tr>
<td>● make it clear how each of the three dimensions builds logically and progressively over the course of the program and make clear how students</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>o engage in the science and engineering practices with increasing grade-level-appropriate complexity over the course of the program.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>o utilize the crosscutting concepts with increasing grade-level-appropriate complexity over the course of the program.</td>
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<td></td>
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</tr>
<tr>
<td>o engage in grade-level/band-appropriate disciplinary core ideas.</td>
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<td></td>
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<tr>
<td>o make clear how the performance expectations are addressed in the program.</td>
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<td></td>
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<tr>
<td>● provide a rationale for a logical sequence and treatment of ETS and NoS.</td>
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<tr>
<td><strong>UNIT-TO-UNIT COHERENCE.</strong> Units across a program demonstrate coherence when student materials</td>
<td>The materials consistently justify sequencing and demonstrate strong unit-to-unit coherence for developing competence in three dimensions.</td>
<td>The materials occasionally justify sequencing and sometimes demonstrate strong unit-to-unit coherence for developing competence in three dimensions.</td>
<td>The materials never justify sequencing and rarely demonstrate unit-to-unit coherence for developing competence in three dimensions.</td>
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<td>● are designed with an appropriate sequence and development of DCIs, CCCs, and SEPs to support students in demonstrating learning across a program as they figure out phenomena/problems.</td>
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<td>● make explicit connections from one unit to the next across the three dimensions to connect prior learning, current learning, and future learning as students figure out phenomena/problems.</td>
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<td>● support students in making connections across units and disciplines by helping students negotiate more sophisticated understandings and abilities.</td>
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<td><strong>PROGRAM ASSESSMENT SYSTEM.</strong> Over the course of the program, teacher materials demonstrate a system of assessments that</td>
<td>The materials use a program-level assessment system that has all or most of the quality characteristics.</td>
<td>The materials use a program-level assessment system that has some of the quality characteristics.</td>
<td>The materials use a program-level assessment system that has few or none of the quality characteristics.</td>
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<td>● coordinates the variety of ways student learning is monitored to provide information to students and teachers regarding student progress for all three dimensions of the standards and toward proficiency at the identified grade-level/band performance expectations.</td>
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<td>● includes support for teachers and other leaders to make program-level decisions based on unit, interim, and/or year-long summative assessment data.</td>
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<td>● is driven by an assessment framework and provides a structured conceptual map of student learning along with details of how achievement of the outcomes can be measured.</td>
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**Designed for the NGSS: Program**

**Analyze Evidence**

**Directions**
1. Review *Designed for the NGSS: Program Rubric* (see last page)
2. Review the teacher materials and/or student materials to assess the strength of each element.
3. Record strengths and limitations for each component based on your evidence. Cite specific examples.

## PROGRESSIONS OF LEARNING

Within a program, learning experiences are more likely to help students develop a greater sophistication of understanding of the elements of SEPs, CCCs, and DCIs when teacher materials make it clear how each of the three dimensions builds logically and progressively over the course of the program and make clear how students engage in the science and engineering practices with increasing grade-level-appropriate complexity over the course of the program.

- Utilize the crosscutting concepts with increasing grade-level-appropriate complexity over the course of the program.
- Engage in grade-level/band-appropriate disciplinary core ideas.
- Make clear how the performance expectations are addressed in the program.
- Provide a rationale for a logical sequence and treatment of ETS and NoS.

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### UNIT-TO-UNIT COHERENCE

Units across a program demonstrate coherence when student materials are designed with an appropriate sequence and development of DCIs, CCCs, and SEPs to support students in demonstrating learning across a program as they figure out phenomena/problems.

- make explicit connections from one unit to the next across the three dimensions to connect prior learning, current learning, and future learning as students figure out phenomena/problems.

- support students in making connections across units and disciplines by helping students negotiate more sophisticated understandings and abilities.

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PROGRAM ASSESSMENT SYSTEM. Over the course of the program, teacher materials will demonstrate a system of assessments that

- coordinates the variety of ways student learning is monitored to provide information to students and teachers regarding student progress for all three dimensions of the standards and toward proficiency at the identified grade-level/band performance expectations.

- includes support for teachers and other leaders to make program-level decisions based on unit, interim, and/or year-long summative assessment data.

- is driven by an assessment framework and provides a structured conceptual map of student learning along with details of how achievement of the outcomes can be measured.

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