



## Next Generation Science Standards (NGSS) Starter Activity

NGSS Starter Activity icon This NGSS Starter Activity is a scaffolded entry into understanding the meaning and structure of the Next Generation Science Standards (NGSS). The activity provides a few processes and an online locator tool to align existing curriculum content to the NGSS. The end product is a grade-level performance expectation that is aligned with the relevant understanding, knowledge, and practices designated in the NGSS.

- First, you start with the NGSS Storylines and identify connections between your big ideas and inquiry questions, and the concepts and practices outlined in the NGSS.
- Next, your team should familiarize itself with the general structure and organization of the NGSS.
- Finally your team can use an online tool to locate the most relevant P\performance expectations (PE), science and engineering practices (SEP), disciplinary core ideas (DCI), and crosscutting concepts (CCC) for your grade level.

This is ideally a team activity that should take around 45 minutes, a typical length of a PLC meeting. It affords an opportunity to come to shared agreements about goals and content, align your current work to the new standards, and talk about the “big picture” of potential cross-curricular connections. The shared agreement on goals and performance expectations provides the clear foundation to develop assessment tasks, checklist, and rubrics, which are the focus of the next two tools in the PBL set: Assessment Design Activity and the Assessment Review Protocol.



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**Source:** NCTAF Learning Studios Toolkit. (2014): <http://www.nctaf.org/learningstudiostoolkit/>



# Next Generation Science Standards (NGSS) Starter Activity

## 1. Start with the Storylines

Storylines are narratives that explain the content focus and breadth of STEM explorations in a grade band or level. They present the various elements of the NGSS framework by introducing the performance expectations for STEM understanding, knowledge, and practices. Starting at the middle grades, inquiry questions are introduced that are linked to the NGSS Performance Expectations. For example, LS4: Biological Evolution: Unity and Diversity: *How do organisms change over time in response to changes in the environment?* The storylines for Engineering, Technology, and Applications of Science explain the expectations for the stages of defining the problem, developing possible solutions, and improving designs.

Guiding Questions for Storylines:

- Which Disciplinary Core Idea (DCI) most closely matches your curricular module's *big idea* or content?
- What *essential or inquiry question* is highlighted?
- What science and engineering *practices* are relevant?

The Storylines:

[K-2](#) | [3-5](#)

Physical Sciences (PS): [Middle School](#) (6–8) | [High School](#) (9–12)

Life Sciences (LS): [Middle School](#) (6–8) | [High School](#) (9–12)

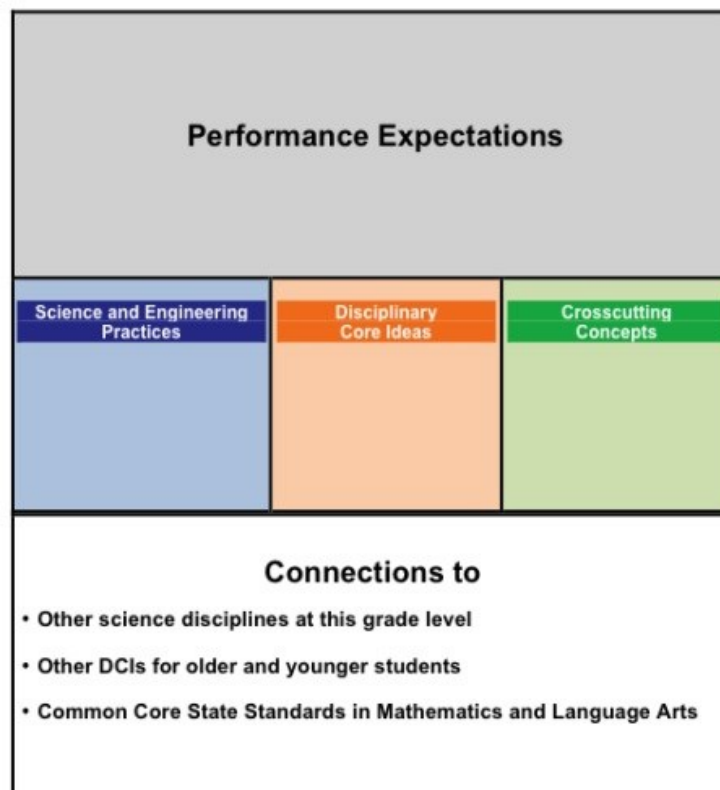
Earth and Space Sciences (ESS): [Middle School](#) (6–8) | [High School](#) (9–12)

Engineering, Technology, and Applications of Science (ETS): [Middle School](#) (6–8) | [High School](#) (9–12)

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## 2. Familiarize yourself with the structure of the NGSS

How to Read the NGSS: [PDF](#) | [Media](#)



Source: NCTAF Learning Studios Toolkit. (2014): <http://www.nctaf.org/learningstudiostoolkit/>

Performance Expectations and the Three Dimensions of the NGSS:

**Performance Expectations (PE):** Accessible statements of what students should know and be able to do. The performance expectations are written to communicate a big idea that connects the content from the Science and Engineering Practices, Disciplinary Core Ideas, and Cross-cutting Concepts.

**Science and Engineering Practices (SEP):**

- Asking Questions and Defining Problems
- Developing and Using Models
- Planning and Carrying Out Investigations
- Analyzing and Interpreting Data
- Using Mathematics and Computational Thinking
- Constructing Explanations and Designing Solutions
- Engaging in Argument from Evidence
- Obtaining, Evaluating, and Communicating Information

**Disciplinary Core Ideas (DCI):**

- Physical Sciences (PS)
- Life Sciences (LS)
- Earth and Space Sciences (ESS)
- Engineering, Technology and Applications of Science (ETS)

**Crosscutting Concepts (CCC):**

- Patterns
- Cause and Effect
- Scale, Proportion, and Quantity
- Systems and System Models
- Energy and Matter
- Structure and Function
- Stability and Change
- Interdependence of Science, Engineering, and Technology

**Source:** NCTAF Learning Studios Toolkit. (2014): <http://www.nctaf.org/learningstudios toolkit/>


- Influence of Engineering, Technology, and Science on Society and the Natural World

### 3. Find your Performance Expectations

Performance Expectations are the accessible statements of what students should know and be able to do. The *Performance Expectations* are written to communicate a big idea that connects the content from the *Science and Engineering Practices*, *Disciplinary Core Ideas*, and *Cross-cutting Concepts*.

#### [Search Performance Expectations](#)

1. Select Your Grade Band/Level
2. Find the relevant *Disciplinary Core Idea* from your Storyline!
3. Select “Apply” to find a *Performance Expectation(s)* that best describes what you want student to demonstrate.
4. Note the aligned *NGSS* dimensions and the *Common Core State Standards* connections in your **Curriculum Map!**

<b>DESIRED RESULTS</b>	Big Idea   Enduring Understanding					
	Driving Question   Essential Question					
		<b>NGSS:</b> Science and Engineering Practices	<b>NGSS:</b> Disciplinary Core Ideas (DCI)	<b>NGSS:</b> Crosscutting Concepts		
		<b>NGSS:</b> Common Core Math/ELA Connections				
<b>ASSESSMENT EVIDENCE</b>	<b>NGSS:</b> Performance Expectations					
	Baseline/Diagnostic Assessment					
	Formative Assessments					
	Summative Assessment					
<b>LEARNING PLAN</b>		Workforce Partner	Science	Math	ELA/Arts	
	Week 1					
	Week 2...					

### NEXT STEPS...

4. Design an NGSS-aligned Authentic Assessment Task.
5. Generate an Assessment Checklist Using the NGSS and Student Work Samples.
6. Generate an Assessment Rubric and Select Anchor Student Work Samples.
7. Team Score Student Work and Refine Criteria.
8. Design Formative Assessments to provide Formative Feedback towards the Authentic Assessment Task.

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