



Course Overview

In this course, middle school teachers will investigate the background, structure, and major conceptual shifts inherent to the Next Generation Science Standards. Your specific learning goal in this course is to focus on how to use these major conceptual shifts as a guide to support you in your classroom work.

Several major, overarching conceptual shifts are present in the new science standards. To better understand these shifts you will have an opportunity to examine some of the background research that was used to frame the standards, think about what major shifts you see, and then compare your thoughts with the major shifts documented within the standards. This course is focused on the development, structure, and major shifts of the Next Generation Science Standards as they relate to middle school grades. **Think about this course as an initial experience into thinking through the design and classroom implications of the new science standards.**

You will experience information through a variety of media formats targeted to the following objectives:

- Describe the need and vision for new science standards.
- Understand and use the three dimensional structure of the Performance Expectations of the Next Generation Science Standards (**Science and Engineering Practices**, the **Disciplinary Core Ideas**, and the **Crosscutting Concepts**).
- Present an argument for the need of instructional supports for students as they develop a 3-dimensional understanding of science.
- Articulate the major conceptual shifts of the Next Generation Science Standards.
- Generate a general description of the types of resources that will help you in your work

Goals & Purpose

This course is focused on a Question (Big Question). The activities are divided into five features.

Feature 1 –Big Question

In Feature 1 of the course, you will be asked to respond with your initial ideas related to the Big Question. In every additional feature of the course, you have the opportunity to provide any further thoughts or questions that arise.

- What are the major conceptual shifts of the Next Generation Science Standards?
- How can you use these shifts to inform classroom practices?

Feature 2 – Explore the Evidence

Feature 2 of the course is a group of related activities where you are required to collect and explore some evidence related to the content of the Big Question. This evidence is used throughout the remaining features of the course.

- Explore the three dimensions; Science and Engineering Practice (SEP), Disciplinary Core Idea (DCI), and the Crosscutting Concept (CCC) used to develop the Next Generation Science Standards
- Collect evidence from both a reading and video clip related to the Scientific Big Idea

Feature 3 – Constructing Explanations

Feature 3 of the course involves analyzing your evidence and using it to generate an explanation (also called a claim statement) about the ideas of the course. Typically, your analysis will produce an artifact that you will describe and justify to your peers and teacher in Feature 5's Research Council.

- Develop an argument for what you think are the major changes from your past science standards
- Brainstorm some ways in which you can use these shifts in your practice

Feature 4 – Compare Explanations to Scientific Knowledge

The research associated with teaching and learning science described in the course is further presented in Feature 4. In addition to demonstrating a thorough understanding of the knowledge of the content, you will be asked to compare and contrast your explanation from Feature 3.

- Explore the described major conceptual shifts of the Next Generation Science Standards
- Compare what you think are major shifts with the documented major conceptual shifts

Feature 5 – Communicate and Justify Explanations

Finally, Feature 5 of the course involves sharing and justifying your explanation and artifact from Feature 2 and 3 among your peers and with your instructor at Research Council. The culminating activity of the course is to reflect on the Big Question of Feature 1 and synthesize your understanding by using your collected evidence to compare and contrast your ideas with those of your peers and teacher.

- Share your comparison from Feature 4
- Critically evaluate the comparison made by other participants
- Describe how these shifts, both your discovered and the documented shifts, can be used to inform your classroom practice

Throughout the course, opportunities are provided for you to connect your learning across sessions and to explicitly consider the implications of your learning for your classroom practice. You will also be able to revisit your work and reflections by viewing your individual Course Portfolios.