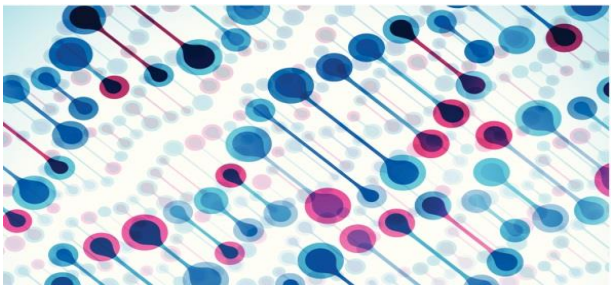
Heredity: Inheritance & Variation of Traits
HS-LS3-1 (9-12)



Course Overview

In this course, high school teachers will investigate the disciplinary core idea of LS3: Heredity: Inheritance and Variation of Traits through the Performance Expectation HS-LS3-1.

Several conceptual shifts are present in these new standards, one of which is the idea that science concepts build coherently from K-12. The use of well-designed learning progressions provides a map that allows students, by the time they finish high school, to master core ideas within science. This course is focused on the topic of LS3: Heredity: Inheritance and Variation of Traits as it pertains to the Performance Expectation HS-LS3-1. Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring (Assessment Boundary: Assessment does not include the phases of meiosis or the biochemical mechanism of specific steps in the process).

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

- Describe the three dimensions of learning (Science and Engineering Practices, the Disciplinary Core Ideas, and the Crosscutting Concepts) within the Performance Expectation.
- Present an argument for the types of lessons that you will need to implement in your classroom to help students reach a level of understanding needed to master a Performance Expectation of the Heredity: Inheritance and Variation of Traits page.
- Articulate what should be expected from a scientifically literate student at this grade level.
- Generate a general description of a lesson to target the three dimensions represented in the Performance Expectation.
- Translate your general description of a lesson into an instructional design model.
- Explain how the Science and Engineering Practices and Crosscutting Concepts support students in deepening their understanding of the Science Disciplinary Core Idea.

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) of the Performance Expectation
- 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 type of lesson you would need to develop to explicitly target the three dimensions represented in the Performance Expectation
- Brainstorm a general description of your lesson

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 instructional design models as a mechanism to help you think about three-dimensional learning
- Correlate your lesson description with the sections of the instructional design model selected

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

- Share your lesson design comparison from Feature 4
- Critically evaluate the comparison made by other participants
- Compare your understanding of three-dimensional learning as evidenced by your arguments with your peers understanding

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.