Overview
This document contains a description of the OpenSciEd High School Program Scope and Sequence (S&S). The scope and sequence articulates how the NGSS high school performance expectations are organized into three courses, and presents which bundles of performance expectations are addressed in the units in each course. The scope and sequence also presents how the three dimensions of NGSS are built incrementally across the units in a course and across the three courses.

Course Sequence
In the OpenSciEd sequence, students begin by taking biology, then chemistry, and then physics. Earth and space science (ESS) and engineering (ETS) are integrated throughout all three courses. Each course provides students with multiple opportunities to engage with DCIs, SEPs, and CCCs targeted in the performance expectations, with scaffolding fading over the course of the year in each dimension. All the performance expectations in high school science, including the engineering standards, are included within the OpenSciEd three-year sequence.

We developed this OpenSciEd High School Scope and Sequence guided by two types of considerations:

a) a purposeful consideration of how to build disciplinary core ideas (DCIs), science and engineering practices (SEPs), and crosscutting concepts (CCCs) coherently within and across the courses; and

b) market considerations (i.e., the most common ordering of courses across schools and districts).

In considering how to build the target DCIs coherently across courses, we found that the target DCIs in HS biology draw on physical science DCIs developed sufficiently in the middle school grade band. This suggested biology could precede chemistry and physics. This strategy also aligns with the more typical sequence of biology before chemistry and physics.

In determining the division of physical science PEs between the chemistry and physics courses, we considered which ideas were foundational for subsequent learning, in consultation with state and strict science coordinators and high school teachers. Organizing DCI elements into a coherent learning progression led to placing a number of these elements typically found in chemistry courses (e.g., atomic structure, inter and intramolecular forces) before elements typically found in physics courses (e.g., electromagnetic radiation). This supported a decision of placing the chemistry course before the physics course.
Approach to integration of Earth and Space Science and Engineering

We integrated earth and space science within units across the three courses where the earth and space disciplinary ideas worked together with the biology, chemistry or physics ideas to address meaningful questions and problems. We integrated ETS PEs where defining engineering problems, developing solutions, or improving designs provided the best opportunities to develop and deepen the target biology, chemistry, physics, or earth and space disciplinary ideas.

Unit Scope and Sequence within Courses

The bundling of PEs was based on consultation with science teachers and leaders, and evaluated in field tests. For each bundle, we identified anchoring phenomena by gathering interest data from a diverse student population, and informed revisions from field test data from teachers and students.

More details about the incremental development of the disciplinary core ideas, science and engineering practices, and crosscutting concepts will be released when the remaining units of OpenSciEd High School are released in 2024.