

Questions to Consider in Lesson Planning to meet Next Generation Science Standards¹

Alignment to standards:

What is the essential question a student should be able to answer?

- These can be located in the [Framework for K-12 Science Education](#) (FSE).
- [Here](#) is an examples for the Disciplinary Core Idea PS1

What evidence of understanding will students be required to demonstrate?

- This can be found in the text of the Performance Expectation(s) that is/are being targeted in the lesson.
- [Here](#) is an example from the NGSS, for 2-PS1
- This statement could be worded...“Students who demonstrate understanding can...”

Explanation of subject matter:

- First, you will want to determine what concepts you want students to learn in the lesson.
- This should be closely followed by mapping out how those concepts in this lesson connect with related concepts in science / engineering.
- Now you are ready to determine and engage your students prior understanding and misunderstandings* regarding the lesson’s topic(s) or “How do I know what students have already learned / experienced?”

* There are many resources that are available that offer ideas on how a students prior “misunderstandings” can be used to the instructors advantage during lesson delivery. Some of the resources have been included in our e-book library on the M / shared drive.

- During the lesson, make sure you explicitly communicate to students what the concepts are that they are to learn during the lesson.

Use of materials:

- Make a materials list for your lesson(s). Identify consumables and non-consumables so you can preorder consumables and be ready at the start of each school year.
- Be sure you determine before the lesson how students will be using the materials in this lesson. This will help you plan their safe and correct use if students are unfamiliar with the materials.
- Consider how materials could be substituted / changed / enhanced for the “mix” of learners you serve.

¹ Adapted from a file Compiled by Greg Wertenberger from the [Achieve Rubrics for Evaluating Open Education Resource \(OER\) Objects](#)

Quality of Assessment:

- Identify the evidence of understanding that you want to observe from each student (use the NGSS performance expectation(s) that you previously identified for the lesson)
 - These can be worded as “Students who demonstrate understanding can...”
- Determine how you will identify when a student has demonstrated proficiency.
- Determine how you will limit assessment to the stated performance expectation(s).
- Consider CCSS connections and whether these will be factored into your assessment of student proficiency (use common rubrics developed by the Math and ELA if available)

Quality of Technological Interactivity: (If technology is used)

- Determine if or how the use of technology will connect with the your expectations of student performance for the lesson.
- Determine if or how the technology that will be used is responsive to student input in a manner that creates a positive individualized learning experience. [I.e., Use the desired technology to do the lesson first, in “dry-run” and modify it if needs be, before using it in a “live” classroom.]

Quality of Instructional & Practice Exercises:

- Determine how students will be able practice, if needed, so that they can meet the performance expectation(s) in the lesson.
 - Be ready with multiple interactions of that practice if needed.
- Determine how the practice can be modified (differentiated) for average students, struggling students, advanced students.
- Determine if or how the practice(s) will allow/will require students to integrate a variety of skills (reading, writing, mathematics, etc.).
 - You might want to determine if those skills are in place beforehand.

Opportunities for Deeper Learning:

- Determine if or how the lesson will challenge students to develop at least three of the following deeper learning skills:
 - Think critically and solve complex problems
 - Work collaboratively
 - Communicate effectively
 - Learn how to learn
 - Reason abstractly
 - Construct viable arguments and critique the reasoning of others
 - Apply discrete knowledge and skills to real world situations
 - Construct, use, or analyze models

Assurance of Accessibility:

- Determine if the materials, tasks, and assessments in this lesson are suitable for all students.
- Determine if or how you can modified any of the above to address the needs of particular students.