The Next Generation Science Standards: An Introduction

In *The Next Generation Science Standards: An Introduction*, you will start with the background and genesis of the standards and conclude with assessment of the three dimensions (3-D) of learning. In between, you will discover the relationship between A Framework for K–12 Science Education and the Next Generation Science Standards (NGSS), science learning progressions, 3-D learning and instruction, and engineering practices and design. Through the in-depth readings, video examples, and supplementary resources, you'll explore ways to begin implementing these standards and this revolutionary new mode of teaching science into your classroom, district, or state.

Course Objectives

By the end of this course, you will be able to

Module 1

- Understand the origins and development of the Next Generation Science Standards (NGSS).
- Analyze the relationship between *A Framework for K–12 Science Education* and the NGSS.
- Explore the implications of the new standards for your own classroom practice.

Module 2

- Understand the philosophy of the three-part structure of the NGSS and analyze how these standards can address the achievement gap in science.
- Analyze a performance expectation, identify its three dimensions, and explain how a PE links with other PEs and the Common Core State Standards.

Module 3

- Understand how the NGSS are built on the notion that learning is a developmental progression that reflects increasing sophistication of student thinking across grade levels.
- Analyze the progression of a disciplinary core idea in the context of increasing sophistication of student thinking.
- Analyze the progression of the science and engineering practices in the context of increasing sophistication of student thinking.

Module 4

- Understand how the 5E Learning Model can be applied to the three-dimensional instruction of the NGSS.
- Understand how the concept of "bundling" performance expectations makes use of the three dimensions in the NGSS to design instruction that builds student proficiency.
- Use the approach of bundling performance expectations to plan a lesson sequence.

Module 5

- Understand the practices unique to engineering and the engineering design process.
- Investigate the differences between engineering in the practices and within Engineering, Technology, and Application of Science to distinguish the work of scientists and engineers.
- Evaluate current classroom instruction in light of science and engineering practices in order to adapt an existing science lesson to the NGSS.

Module 6

- Describe the components necessary to assess three-dimensional learning.
- Analyze and evaluate a sample assessment item for its ability to assess the three dimensions.

Course Syllabus

Module 1	**Why the Next Generation Science Standards Now?** • Module Welcome • Reading: Why the Next Generation Science Standards Now? • Video: Next Generation Science Standards Introduction • Supplemental Reading: Professional Development Strategies for NGSS • Knowledge Check • Application: Turning the Framework/NGSS Spotlight on Your Classroom • Post-Module Reflection
Module 2	**Understanding the Three-Dimensional Architecture of the NGSS** • Module Welcome • Reading 1: Using the Three Dimensions of the NGSS for Deeper Learning • Reading 2: Tips for Engaging Students in Scientific Thinking • Video: How to Read the Next Generation Science Standards • Knowledge Check • Application: Analyze an NGSS Performance Expectation • Post-Module Reflection
Module 3	**Progressions: Building Understanding Over Time** • Module Welcome • Reading 1: A Tale of Two Generations Learning Science • Video: Minds of Our Own: Can We Believe Our Eyes? • Reading 2: EL—What Science Teaching Looks Like: An International Perspective • Knowledge Check • Application: Mapping Learning • Post-Module Reflection

Module 4	**NGSS Implications for Science Instruction** • Module Welcome • Reading 1: Planning Instruction with the Next Generation Science Standards • Video: Minds of Our Own: Lessons from ThinAir • Reading 2: How Would You Grow Plants on the Moon? • Knowledge Check • Application: Bundling PEs for 3-D Instruction • Post-Module Reflection
Module 5	**Engineering in the NGSS** • Module Welcome • Reading 1: Science and Engineering—Similarities and Differences • Reading 2: The Four *C*s of Next Generation Engineering Standards • Videos: Scientific and Engineering Practices • Supplemental Reading: Planning and Delivering an Engineering-Infused Lesson • Knowledge Check • Application: Infusing Engineering into Lessons • Post-Module Reflection
Module 6	**Assessing Three-Dimensional Science Learning** • Module Welcome • Reading 1: Assessing Three-Dimensional Science Learning • Video: NSTA Forum:—The Future of Assessment with the NGSS • Reading 2: *EL*—Learning to Love Assessment • Knowledge Check • Application: Analyzing an Assessment for NGSS Compatibility • Post-Module Reflection

Resources

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