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## What Is Three-Dimensional Learning and How Do I Engage Students in Three-Dimensional Learning?

Three-dimensional learning involves more than students learning science content. It involves students doing science to learn science ideas and being able to connect those ideas to ones that are common to all science disciplines. This is a switch from the way science has traditionally been taught, but it provides students with a science education that will help them to understand the world in a new way. First, we'll discuss what makes up three-dimensional learning and teaching, and then we'll provide ways to engage students in doing three-dimensional learning.

### WHAT IS THREE-DIMENSIONAL LEARNING AND TEACHING?

Three-dimensional learning and teaching as articulated by the Next Generation Science Standards (NGSS) is a process in which teachers focus on three aspects of science:

- Disciplinary Core Ideas,
- Science and Engineering Practices,
- Crosscutting Concepts.

Without intentional focus on these three aspects, students (and teachers) may concentrate more on the facts of science and less on *doing* science. With a three-dimensional approach, students do the fun and engaging work of figuring out and making sense of phenomena. In this way, students are motivated to learn since they are trying to answer a specific question in the real world.