Making Sense of SCIENCE

MULTIDIMENSIONAL SCIENCE EDUCATION SUPPORTS WHOLE CHILD DEVELOPMENT AND EQUITABLE ENGAGEMENT FOR ALL LEARNERS

Traditional science education has mostly been about teachers helping students master scientific facts. The vision for next generation science is to have students engage in the work of science and engineering — and by doing so develop skills in the practices of science and engineering, adopt the habits of thinking of scientists and engineers, and gain science and engineering knowledge. Thinking of next generation science education as having eight dimensions takes learning further by promoting student engagement and the integrated skills required for modern lives and careers.

EIGHT DIMENSIONS OF NEXT GENERATION SCIENCE EDUCATION

Science & Engineering Content
Knowing science content allows people to fully engage in the work of science and engineering. Contemporary science standards don't focus on discrete facts. Instead, the goal is learning big ideas that apply across disciplines and key concepts within disciplines.

Science & Engineering Practices
While there are many things we can learn about science through reading, the fields of science and engineering are about doing. By practicing science and engineering, we add to the body of scientific knowledge and help to make our world better.

Science & Engineering Crosscutting Concepts
Crosscutting concepts are the lenses that scientists use to look at the world. They differ from science content in that they are habits of thinking that pertain to a multitude of science and engineering work.

Literacy
Reading, writing, and engaging in discourse play an integral role in the sense-making, explaining, and designing that scientists and engineers do.

Mathematics
From simple measurement to complex statistics and probability, math is integral to science and engineering. Both fields rely on quantitative data and utilize mathematical models and computational thinking.

Technology
Technology supports the exploration, discovery, creativity, and collaboration of scientists and engineers. To be effective in 21st century careers, students must be able to effectively use, evaluate, and create information, media, and technology.

Culture and Affective
Attending to this domain is not just a catalyst for learning, but a prerequisite. Classrooms that leverage the diversity of cultures and experiences students bring have deeper learning and more engagement.

Learning, Life, and Career Skills
These skills transcend the boundaries of school and set students up for success in a modern world. They include things like goal setting, critical thinking, stress management, problem solving, and collaboration.

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