Common Core-Next Gen-STEM

• English Language Arts Standards » Sci. & Technical Subjects
  - Grade 9-10 - Grades 11-12
  - Common Core Science Standards

• Science and Engineering Practices in the NGSS:
  - Research Process

• Science, Technology, Society and the Environment
  - Environmental Standards / Community Related

• Crosscutting Concepts:
  Crosscutting Concepts That Bridge Disciplinary Boundaries

• Stem Program of Study
Next Generation Science Standards (NGSS)

- The National Research Council
- National Science Teachers Association
- American Association for the Advancement of Science
- Achieve
Next Generation Science Standards (NGSS)

Students cannot fully understand scientific and engineering ideas without engaging in the practices of inquiry and the discourses

(NRC Framework, 2012, p. 218)
Home/Community Connections to School Science for Student Diversity

NGSS

• Long been recognized that building home-school connections is important for the academic success

• Rarely done in an effective manner

• Perceived disconnect between the science practices taught in schools and the science supported in the homes (National Research Council, 2009)

• Students ...“funds of knowledge” that ...validate and activate this prior knowledge (González, Moll, & Amanti, 2005)
Build Connections Between Home/Community And School Science NGSS

• Increasing parent involvement in their children’s science classroom and encouraging parents’ roles as partners in science learning

• Engaging students in defining problems and designing solutions of community projects in their neighborhoods

• Focusing on science learning in informal environments
Cross Cutting Concepts

NGSS

1. Patterns
2. Cause and effect
3. Scale, proportion, and quantity
4. Systems and system models
5. Energy and matter: Flows, cycles, and conservation
6. Structure and function
7. Stability and change

http://www.nextgenscience.org/sites/ngss
Common Core: 9th-10th

Integration of Knowledge and Ideas:

• A table or chart, [statistical] equations ELA-LITERACY.RST.9-10.7
• Compare and contrast findings to those from other sources ...noting support or contradict.ELA-LITERACY.RST.9-10.9
• Cite specific textual evidence to support [with] precise details of explanations or descriptions RST.9-10.1
• Analyze the structure of the relationships among concepts RST.9-10.5
Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results.
Integration of Knowledge and Ideas:

- Multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) [CCSS.ELA-LITERACY.RST.11-12.7]

- Evaluate the... data, analysis, and conclusions in a science or technical text [CCSS.ELA-LITERACY.RST.11-12.8]

- Synthesize information ...into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible [CCSS.ELA-LITERACY.RST.11-12.9]
**STEM Goals**

- A curriculum driven by problem-solving, discovery and exploratory learning that requires students to actively engage a situation in order to find its solution.

- Nature of technology; engineering design; and systems thinking, maintenance and troubleshooting incorporated into the science and mathematics curricula.

- Innovative instruction allows students to explore greater depths of all of the subjects by utilizing the skills learned.

STEM Goals

• Technology provides creative and innovative ways to solve problems and apply what has been learned

• Independent and collaborative research projects embedded in the curricula

• Collaboration, communication, and critical thinking skills threaded throughout the curricula

• Opportunities for mentoring by business, industry, and research organization leaders