

**Professional development provided by RVCC's Science Education Institute follows the recommendations from "Science and Engineering for Grades 6-12: Investigation and Design at the Center", National Academy Press, pages 275-278 ([www.nap.edu/25216](http://www.nap.edu/25216))**

**RECOMMENDATION 1: Science investigation and engineering design should be the central approach for teaching and learning science and engineering.**

- Teachers should arrange their instruction around interesting phenomena or design projects and use their students' curiosity to engage them in learning science and engineering.
- Administrators should support teachers in implementation of science investigation and engineering design. This may include providing teachers with appropriate instructional resources, opportunities to engage in sustained professional learning experiences and work collaboratively to design learning sequences, choose phenomena with contexts relevant to their students, and time to engage in and learn about inclusive pedagogies to promote equitable participation in science investigation and engineering design.

**RECOMMENDATION 2: Instruction should provide multiple embedded opportunities for students to engage in three-dimensional science and engineering performances.**

- Teachers should monitor student learning through ongoing, embedded, and post-instruction assessment as students make sense of phenomena and design solutions to challenges.
- Teachers should use formative assessment tasks and discourse strategies to encourage students to share their ideas, and to develop and revise their ideas with other students.
- Teachers should use evidence from formative assessment to guide instructional choices and guide students to reflect on their own learning.

**RECOMMENDATION 4: High-quality, sustained, professional learning opportunities are needed to engage teachers as professionals with effective evidence-based instructional practices and models for instruction in science and engineering. Administrators should identify and encourage participation in sustained and meaningful professional learning opportunities for teachers to learn and develop successful approaches to effective science and engineering teaching and learning.**

- Professional development leaders should provide teachers with the opportunity to learn in the manner in which they are expected to teach, by using *Framework*-aligned methods during professional learning experiences. Teachers should receive feedback from peers and other experts while working throughout their careers to improve their skills, knowledge, and dispositions with these instructional approaches.
- Professional development leaders should prepare and empower teachers to make informed and professional decisions about adapting lessons to their students and the local environment.
- Administrators and education leaders should provide opportunities for teachers to implement and reflect on the use of *Framework* aligned approaches to teaching and learning.