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## Opinion: Science Standards boost learning

<http://www.burlingtonfreepress.com/story/opinion/my-turn/2015/10/21/opinion-next-generation-science-standards-boost-learning/74352656/>

Jennifer Stainton 5:21 p.m. EDT October 21, 2015



*(Photo: Free Press)*

When the Vermont State Board of Education adopted the Next Generation Science Standards (NGSS) in 2013, it delivered a clear message to every science teacher in Vermont: engage all students with the core, interconnected ideas of science by allowing them to practice the skills of scientists and engineers. Teachers across the state have embraced this message by taking steps to change their daily teaching practice so their students can meet the new standards.

As science department chair, and an environmental science and chemistry teacher, I talk to a lot of colleagues about the NGSS. Our conversations focus on exciting opportunities and powerful new ways to facilitate productive student conversations on science topics. For example, some fellow department chairs are promoting greater equity in science instruction by ensuring more students have access to course offerings in life, physical, and earth sciences, and engineering.

Teachers also appreciate that the Vermont Agency of Education does not prescribe a one-size-fits-all implementation of these standards. Instead, each district and school has the ability to make decisions about the local changes needed to support an NGSS-rich science education and as a result, I've seen teachers developing new science lessons that engage students by asking them to embrace failure (a word normally scorned in school settings) as they design solutions to local problems.

I'm lucky to work in a school district that is taking advantage of local decision making to take steps to stem summer learning loss for our students. We offer a four-week-long program called SOAK (Summer

Opportunity for Achievement and Knowledge). This summer I jumped on the science education innovation bandwagon with both feet. My hope was to introduce engineering to an underrepresented group, dabble in some engineering design challenges, identify and solve a local problem, and have some summer fun in the process.

I ultimately decided to offer a four-week program designed for middle school girls. It was aptly named Femgineering and as I geared up for the new school year, I looked back on our activities together as a highlight of my summer. We dabbled in chemical engineering with polymer design. We built and raced brush-bots and art-bots. We calculated static forces of stiletto heels and used those calculations to design shoes. We visited a local business, Hypertherm, and saw the application of engineering in its product design and engaged in a panel discussion with female engineers. We also redesigned a problematic footbridge for our local national park, Marsh Billings Rockefeller National Historical Park, and presented our designs to park employees. I was amazed by the thoughtful and original designs these young women developed in a short amount of time. I was equally impressed by their poise as they presented their research and ideas.

Through my ongoing conversations with peers and personal experiences with students, I've learned that there are amazing resources, locally and nationally, to help educators engage students with science and engineering. I've also learned that middle school girls can be amazingly productive and inventive when music plays in the background and impromptu dance parties are the norm. But perhaps most importantly, I've learned how important it is to stretch my own comfort zone as a model for the students I teach.

Thank you, Vermont Agency and State Board of Education, for adopting the Next Generation Science Standards and for giving districts, schools and teachers the flexibility needed to successfully implement these standards. We are just beginning to see the important impact these scientific and engineering practices will have on our children for years to come. Without these new standards – and the flexibility required to implement them – the students who participated in Femgineering may not have ended their summer saying, “Now I want to be an engineer!”

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