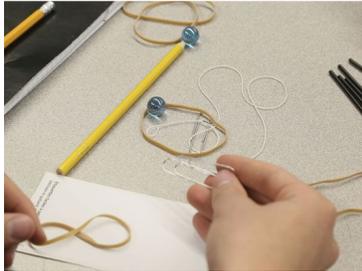


# Iowa's 'Next Generation' science standards improve learning

Abby Richenberger 2 p.m. CST January 21, 2016



(Photo: Rodney White/The Register)

Ushering in a new direction in K-12 science education, [Iowa recently adopted new standards based on the Next Generation Science Standards](#). As a middle school science teacher and member of the state's review team for academic standards, I have had a front row seat to this exciting transition.

While the Iowa Science Standards are still new to many teachers, I have been integrating these clearer, more comprehensive and rigorous standards into my teaching over the last three years. I can already see drastic improvements in the way I teach, and my students have been reaping the benefits.

The new Iowa Science Standards still contain the same science content students need to learn, but are written with specificity that demands students *show* me what they know, not just *tell* me. Students have to go beyond filling in a worksheet or simply regurgitating information they learned. This requires me to break down the big ideas of science so my students understand that same content much more deeply. The shift enables my students to apply their knowledge by running experiments, developing models and testing and retesting their ideas.

Temperature and thermal energy are concepts that were part of the previous science standards, but the new standards incorporate thermal energy transfer as an engineering-and-design practice, which asks students to develop solutions for thermal energy transfer. While I have covered this topic in my classroom for many years, my students now actually design, construct and test a device that maximizes heat transfer. One of the most important elements in this process is when students analyze performance and make adjustments. Having students reflect on the science beyond why their design is or is not working is a crucial part of learning science deeply and meaningfully.

Our students are growing up in a fast-paced, digital and interactive world, and getting and holding their attention is even more challenging for teachers than in the past. The teaching and learning called for by the new standards requires students act more like scientists by making observations, asking questions and exploring a range of possible answers to those questions. Most importantly, I encourage them to make mistakes, then apply what they learn to try again — much like the skills and practices used by actual scientists. As a result, science is more engaging for them, and my students get excited and really enjoy learning science.



Riley and Peter Deacon, both 5, make free-standing structures from pasta and marshmallows with their mother, Pam Deacon of Johnston, during a STEM festival for students in grades K-12 and their families at Drake last month. Iowa is working to encourage interest at a young age in science, technology, engineering and mathematics. *(Photo: Zach Boyden-Holmes/The Register)*

The new standards also provide more guidance to me as a teacher. The standards make clear what my students should have learned before they reached my class, and also provide clarity for how far I need to take them to be ready for next year.

Since I started aligning my teaching to what has become the new Iowa Science Standards, I have really seen my students' engagement increase. They are excited to come to class. My students appreciate the interactive approach, and they are learning more science and doing so in a deeper way. I even recently received a note from a former student who thanked me and said I taught her a lot, "... and most of it was fun to learn about."

I am thrilled to make the necessary changes in my own practice to meet the challenge of the new Iowa Science Standards, and I encourage parents to engage with their students' teachers to learn more about these important instructional shifts. We can't underestimate the importance of capturing students' curiosity and making connections that engage them in the learning process. Besides, making science exciting for my students is why I became a teacher in the first place.



Abby Richenberger *(Photo: Special to the Register)*

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