

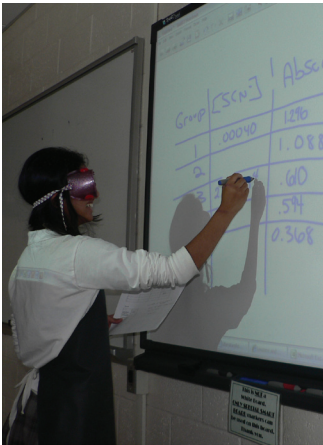
# Energizing Science Lessons

**EDCompass** newsletter

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## Science Teachers Get the Right Reaction with SMART Products

By Kim Hamill



"I give students just enough information to solve the puzzle. This is your learning and I will stand beside you, but you have to go get out of the desk, and you have to go get the laptop and you have to open it."

### Ian Fogarty

Science Teacher  
Riverview High School  
Riverview, New Brunswick

Ian Fogarty's science classes sometimes begin with a story – a real-life example that motivates his students to find the answer or conduct an experiment themselves. Other times, Fogarty asks a question, like the day he surprised his Science 12 class with a big question that led to a class project.

"I walked in and said, 'I'm going to give a project that's too big for you to do by yourself,'" Fogarty recalls. "This project is too big for any one person to do. It's something that there is no right answer to. And it's something that you are going to need to work together as a team to do. In one week, I want a whole-class presentation on, *Is world hunger solvable, yes or no?*"

Faced with this significant question, Fogarty's twelfth-grade students had to come up with their own strategy and their own working groups for the project. Dividing the project according to the world's continents, students researched topics and made calculations on crops, land availability, nutrition and population using the three **SMART Board™ interactive whiteboards** that Fogarty has in his classroom.

But at the end of the week, Fogarty wasn't just grading his students on their research skills and presentation quality, he was looking for how the class came together to communicate, manage its time and behave as a team.

### 'This is your learning'

Fogarty, who is a SMART Exemplary Educator, teaches chemistry, physics and a senior science course at **Riverview High School** in New Brunswick. But to him, science isn't just a class, it's a place for his students to grow as people and take ownership of their learning and their future.

"I give students just enough information to solve the puzzle," Fogarty says, adding that he tells his students, "this is your learning and I will stand beside you, but you have to go get out of the desk, and you have to go get the laptop and you have to open it."

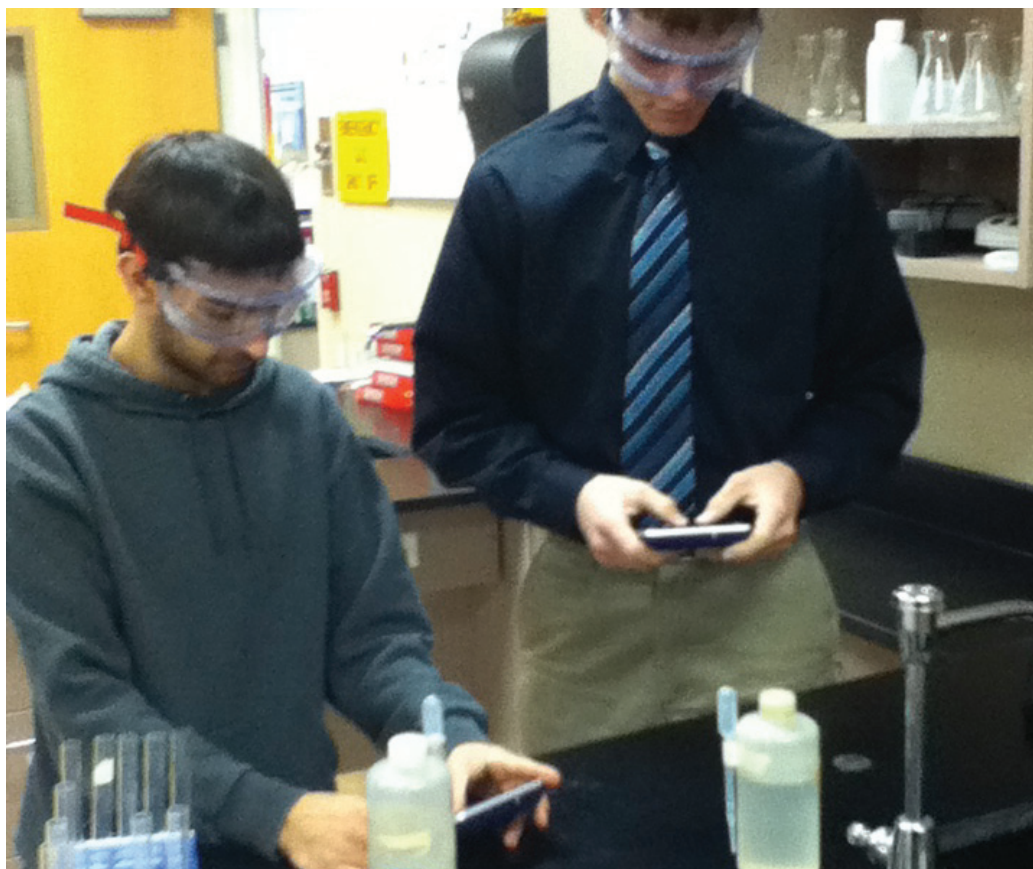
It's this philosophy and these innovative teaching techniques that have won Fogarty both the 2008 **Prime Minister's Award for Teaching Excellence** and the second runner-up prize at the **Microsoft® Partners in Learning 2010 Worldwide Innovative Teacher Awards** for a project called the Xenotransplant Debate.

Read more about Fogarty's Xenotransplant Debate on the [EDCompass blog](#).

### 'The tools to make connections'

One of the ways that Fogarty motivates his students to learn is by incorporating educational technology into his lessons.

Three SMART Board interactive whiteboards dominate the front of his classroom. In addition to enabling group collaboration, Fogarty's multiple interactive whiteboard setup allows him to break down complex concepts like acceleration-time graphs, demonstrate the macroscopic, microscopic and mathematical sides of a chemistry equation, or conduct variations of a physics experiment.



Fogarty also uses the SMART Board interactive whiteboard with [probeware](#) to conduct real-time experiments while he's teaching the theoretical concept.

"One of the lectures I do is take a thermometer and connect it to the computer on one SMART Board and take some ice and warm the ice up slowly. And on the other SMART Boards, I start talking about molecules moving and temperatures and boiling temperatures and heating curves," Fogarty says. "I just keep flipping back and forth between my molecules and my math, and the graph that's being produced in front of their eyes with the probeware. And it's all displayed for everyone to see."

Fogarty also has his students use the [SMART Response™ PE interactive response system](#) to hypothesize on an experiment before they begin. With the SMART Response system, Fogarty finds that his students are required to put some thought into their predictions rather than waiting for the experiment to reveal the right answer.

But it's not the technology products themselves that make a difference in Fogarty's physics, chemistry and science classes, it's how they are used. Fogarty is able to open the world of science to his students through his use of classroom technology, inspiring them to explore topics that apply to their everyday lives – whether it's determining if expensive winter camping pads really work better than economically priced pads or finding out which GOR-TEX® jacket breathes the best.

"Using the technology and getting students excited about using the technology means that they start doing their own things outside of class time that are really important to them," Fogarty says.

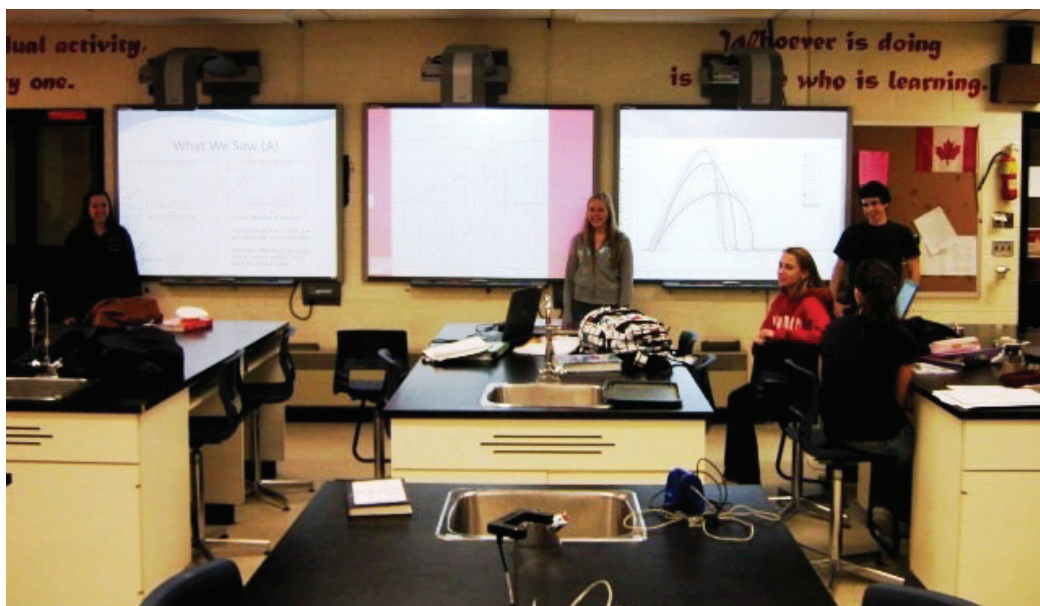
Minnesota teacher Kristin Straumann also uses her science classes as an opportunity to connect scientific concepts to real life. She teaches life science, chemistry, physics and forensics at [Atwater-Cosmos-Grove City School District](#) in Grove City.

"I am here to create experiences for my students and help them have all the tools they need to make connections," Straumann says.

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**Ian Fogarty**

Science Teacher  
Riverview High School  
Riverview, New Brunswick



“The way that I teach now has been completely transformed. I couldn’t do the things I do on a daily basis without my SMART Board. It’s not like I’m just writing notes up there – we wouldn’t be able to do the activities without it.”

**Kristin Straumann**

Science Teacher  
Atwater-Cosmos-Grove City  
School District  
Grove City, Minnesota

Like Fogarty, Straumann is also a SMART Exemplary Educator who incorporates SMART products to help students understand some of the more abstract concepts she teaches.

“Some of the science topics that I teach, especially in chemistry and physics, are such abstract concepts. Right now, in chemistry, we are dealing with the atom, the parts of the atom and electron configurations – things that you can’t see,” Straumann says. “And by using technology like the SMART Board to help with simulations or other hands-on activities, I can help bring a little more concreteness to such abstract concepts.”

And Straumann is always finding new ways to bring the world into her classroom and onto her SMART Board interactive whiteboard – whether it’s recording and marking up videos of her students punting footballs outside to learn about projectile motion, watching video clips about the tundra when studying biomes or researching current crimes to learn about toxicology in her forensics class.

“The way that I teach now has been completely transformed. I couldn’t do the things I do on a daily basis without my SMART Board. It’s not like I’m just writing notes up there – we wouldn’t be able to do the activities without it,” she says.

In addition to the interactive whiteboard, Straumann also uses a [SMART Document Camera™](#), the [SMART Response XE interactive response system](#) and the [SMART Slate™ wireless slate](#).

Straumann says that SMART products not only help students understand concepts, but also get them excited about learning.

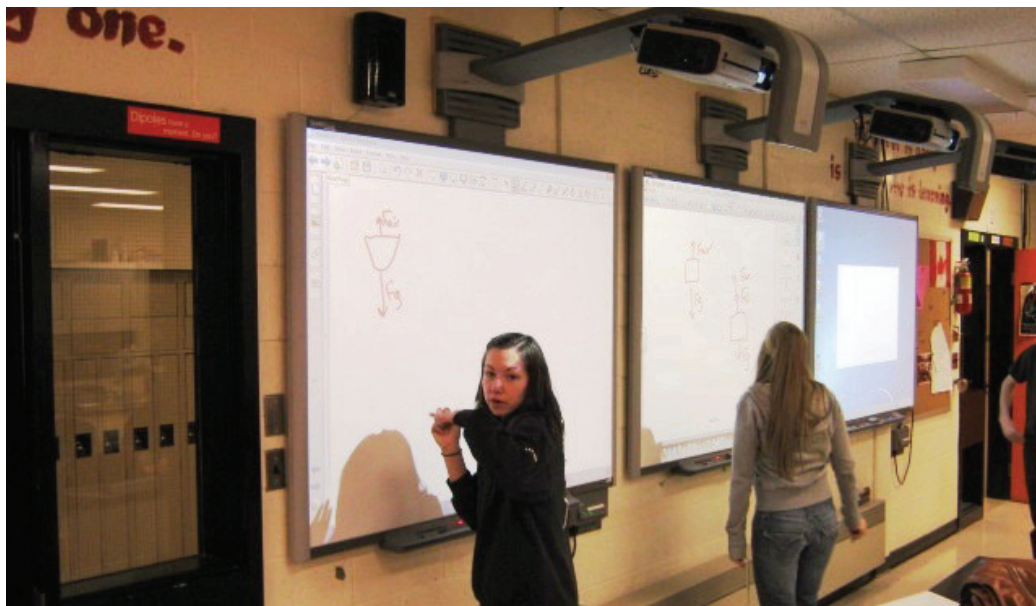
“Students’ enthusiasm and engagement is way up when I’m using the SMART Board, even if we’re just taking notes. It seems like as soon as you turn the projector on, their attention is focused there. Even if that’s just what it takes for a second to get their attention and then for me to move on to other activities, at least they start with me,” Straumann says.

And this holds true even on test days, she says. By using the SMART Response XE system to complete test and quizzes, students pay better attention and are focused more on the task at hand.

Straumann also finds that the SMART Response system gives her more opportunities for reteaching. She says that she spends less time marking tests and more time analyzing and reviewing the results with her students.

“When I’m able to analyze the data collected when using SMART Response XE, I think it’s where I see the most improvement. Because now instead of just seeing what the students’ scores were, they can see what they got wrong, they can see if there’s a pattern in their wrong responses, and we can talk about if there was vocabulary that was an issue,” Straumann notes.





“Through technology, the students have much more of an opportunity to learn on their own, rather than from lecture.”

### Changing the way students learn

Because Straumann teaches middle and secondary level sciences, she’s always looking for new resources, content and inspiration to make the concepts understandable and interesting. Not only does she research and share resources with other teachers in her small school district, but she also started an [online group](#) for high school science teachers.

“I think it’s really important for high school science teachers to start collaborating together, sharing and talking about resources they’ve found that work well in their room, or the kinds of lessons they use. Because if we can share with each other, we are all better off,” Straumann says.

Dr. Elizabeth Christophy shares that sentiment. She teaches college preparatory chemistry, chemical analysis and advanced placement chemistry at [Sacred Heart Academy](#) in Hamdem, Connecticut.

Her students are learning advanced chemistry concepts like organic nomenclature and nuclear chemistry, so it’s important to Christophy that she can incorporate digital resources on her SMART Board interactive whiteboard that will resonate with her students.

This is why she started an interactive whiteboard chemistry [wiki](#) – to create a place where her students and other science teachers can access her chemistry lessons created in [SMART Notebook™ collaborative learning software](#). By having this wiki, her students have access to her interactive lessons anytime, anywhere.

“Through technology, the students have much more of an opportunity to learn on their own, rather than from lecture,” Christophy says. “My teaching philosophy is for students to do more than just memorize random facts. I want them to use higher-order thinking to solve problems. Even if they forget the chemistry, they will still remember how to logically approach a problem.”

Fogarty also believes his use of classroom technology has a bigger impact on his students than just on their test scores.

“I am changing the way kids learn, and I’m changing the way I teach, and technology has a hand in that,” he says. “I figure out the teaching and learning first, and then I attach the technology to it after. It happens I use a lot of SMART products. And that’s the big difference.” **EC**

#### Dr. Elizabeth Christophy

Chemistry Teacher  
Sacred Heart Academy  
Hamdem, Connecticut

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