

# Some students use art to connect the dots with science and math

By Chicago Tribune, adapted by Newsela staff on 04.08.15

~ Word Count 771 ~



*Eugenia Cheng, a pure mathematician and visiting scientist, speaks to a combined physics and studio class called "Articulating Time and Space" about mathematical concepts at the School of the Art Institute of Chicago, March 18, 2015. Photo: Brian Cassella/Chicago Tribune/TNS*

Eugenia Cheng had just cut a bagel into the twisted cylinder known as a Möbius strip and was explaining why a liquid could not take the same shape, when a student asked a question: "That bagel looks like water coming from a waterfall," Nico Camargo said. "What if you froze water?"

Cheng considered, delighted by the idea.

"A frozen Möbius strip," she mused. "Why didn't I think of that?"

"Art school," Camargo shrugged, grinning.

Camargo attends the School of the Art Institute of Chicago (SAIC), which increasingly is exploring the connections between art and science.

## **Thinking In 3-D**

SAIC already had science and math classes, but the school is now offering a class that connects those subjects to art. Cheng, a mathematician, is SAIC's second scientist-in-residence.

The new class combines studio art and physics, a branch of science that studies the nature and properties of matter and energy.

Other advanced SAIC students are working together with University of Chicago physics students. Their joint projects include things like creating a 3-D fabric representation of the dark matter in the universe.

The work at SAIC reflects a growing interest around the nation. The National Endowment for the Arts (NEA) and the National Science Foundation held a summit in 2010 on how artists, scientists and technology experts can work together. The NEA has funded some 30 arts-science and arts-technology projects a year since 2011.

"Artists and scientists are both looking to advance understanding and meaning," said the NEA's Bill O'Brien.

The Rhode Island School of Design is another of the nation's premier art schools. These days it is heavily involved with efforts to broaden science, technology, engineering and mathematics by adding art to the mix.

At the Museum of Science and Industry, the Art of Science Learning project is developing ways to teach science by using art. The project first brought together scientists, artists, educators and students in 2014.

## **Da Vinci's Dual Role**

In a way, all this is a return to old ways of thinking about science and the arts, which were not always so separate. Through much of history, many artists were scientists as well, a dual role that is perfectly illustrated by Leonardo da Vinci. Only within the last 200 years have the two fields grown far apart.

At SAIC, the new efforts have been championed by the school's president, Walter Massey, a physicist.

"There's a lot of science in art," he said, from the reflection of light on various surfaces to the technology of materials used in making art.

Massey wanted to explore the connections between science and art more deeply. He began holding teacher meetings that examined the similarities in the ways artists and scientists see the world and express what they consider truth.

The school now has a scientist-in-residence program. The first scientist, preceding Cheng, was David Gondek, who helped develop IBM's supercomputer, Watson, which is known for beating two champions on the "Jeopardy!" quiz show.

SAIC also offers Conversations on Art and Science, a public lecture series that recently featured Cheng. In addition, SAIC offered a course taught in collaboration with Northwestern University's engineering school. For that class, students and teachers worked on ways to visually represent scientific information.

"It's amazing," Massey said. "I feel like I just stumbled into this."

## **Music, Math And A YouTube Hit**

To Cheng, a concert pianist as well as a mathematician, there is a strong connection between math and art. Both work with things that exist only as ideas, not as objects in the real world.

For Cheng, teaching at SAIC is part of her work in bringing mathematics to wider audiences. Her short math videos on YouTube have been viewed more than 800,000 times, and her new popular math

book, "How to Bake Pi: An Edible Exploration of the Mathematics of Mathematics," will be published in May.

Cheng does not expect SAIC students to master complicated mathematics. However, she said, that frees her to introduce the kind of advanced ideas that she finds most exciting about her field.

"I always say you can appreciate listening to music even if you can't play it yourself," she said. The same is true of math, she feels.

Charles Shields, a student in her math class, said he finds the ideas intriguing even if he cannot always do the computations.

For one of his projects, Shields made a stained glass work depicting rectangles of color spelling out "1 + 1 equals 1."

Cheng was startled at first, but in the end, she loved it.

"There are mathematical systems where 1 plus 1 does not equal 2," she said. "There are some in which it's zero."