

## Education Daily

### 'Aesthetic' math program helps students visualize equations

An experimental algebra program may help students see mathematics concepts at work in the world around them.

Using "aesthetic computing," a term coined by **University of Florida** computer engineering professor **Paul Fishwick**, students learn to represent algebraic expressions in pictures and stories to better understand concepts such as order of operations or distributive properties.

The process, Fishwick explained, helps students understand the structure for algebraic equations, which may enable them to solve problems more quickly (*see related story, below*). It also is intended to put math into a real-world context for students who don't see its purpose.

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**EducationDaily.com** *related story:*

[How 'aesthetic' math works \(on page 2\)](#)

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**Jodee Alice Rose**, a former **Alachua County** middle school math and art teacher, and now a **National Science Foundation** researcher for the program, said algebra is just too abstract for some students. She said the aesthetic approach helps students who have difficulty understanding the underlying concepts. "I think this is really going to get to the students who are more artistic-minded, who wouldn't normally like math," she said.

Graphic representations are already common in geometry, where students map the results of equations to form simple graphs or complex fractal sets. However, turning the equations themselves into art is something new and requires skills similar to basic computer programming.

### Merging math and art

Rose and NSF colleague **Katie Indarawis** helped adapt Fishwick's university-level course for middle and high school students. Last month, the group held its first training workshop for 10 middle and high school teachers. Fishwick plans to review the curriculum in response to their teaching experiences and said he hopes to create a pilot program at the **P.K. Yonge Developmental Research School**.

The group hopes eventually to develop a program that fosters creativity and a love of math, in addition to increasing test scores.

"I believe that math and art, and other fields too, are not as separate as people think," said **Salam Daher**, a second-year UF engineering student who has taken the course. "It's just that most of the time we're lacking the connection between them."

Using equations digitally helps students "fill the gap between the theoretical and the practical, between the 'have to learn' and 'like to learn,'" Daher said.

*Model aesthetic computing lesson plans are available at*  
[www.cise.ufl.edu/~fishwick/acworkshop/aestheticcomputing.pdf](http://www.cise.ufl.edu/~fishwick/acworkshop/aestheticcomputing.pdf).

--[Sarah Sparks](#) covers research, federal budget and other general education issues for LRP Publications.

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### How 'aesthetic' math works

The following is an example of how a middle school student might adapt an equation into a short story sample or narrative:

**Equation:**  $y=mx+b$

**Expanded:**  $y=m*x+b$ , or  $=(y, +(* (m,x), b))$

**Labels:**  $y$  = electricity bill;  $*$  = circuit breaker;  $m$  = stereo;  $x$  = game console;  $b$  = lamp

**Story form:** Karen prides herself on having one of the most high-tech dorm rooms on her floor, even though she only has one two-socket wall outlet. One quick circuit breaker attachment, and voila! Karen's stereo system and video game console go into one plug, and her lava lamp goes into the other. Only one problem now: All that electricity has created a whopping bill!

Source: [Aesthetic Computing Middle School Curriculum](#). Drawing of the equation "Dorm Life" is available in the curriculum.

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