

EDUCATION

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STEM pilot program lifts off at Newtown Friends School

Regina Young

When Andrew Zwicker told them he was going to print out a model rocket, three sixth-grade girls at Newtown Friends School expected the finished product to look something like a pop-up book.

Never in their wildest imaginations did Isabel, Abby and Lizzy believe they would be able to wrap their hands around the green, plastic model or put it in their pockets.

The three friends and the rest of Newtown Friends' sixth-, seventh- and eighth-grade students watched the toy rocket literally take shape during a special assembly to announce the school's involvement in a new pilot program that, its supporters hope, will excite and inspire a new generation of inventors, scientists and problem solvers. The program's kickoff took place Sept. 23 and if its launch is any indication, NFS students certainly are going to have a blast learning about science, technology, engineering and mathematics (STEM).



A Newtown Friends School student plays with a plasma ball after the kickoff presentation of a new STEM initiative, Lift Off to Mars.

"It was really cool," said Abby, who watched the 3D printer layer plastic on top of pastic for 20 minutes — until the rocket was completely formed.

Abby and her friends are too young to take part in the eighth-grade pilot project, Lift Off to Mars, which will eventually be extended to other grades, said Dana Harrison, head of school. But thanks to the kickoff presentation, she's already thinking about the possibilities a STEM career can provide.

"I learned that in science there is a really wide variety of things you can do," Abby said. "I didn't know just how getting one thing put together can change everything."

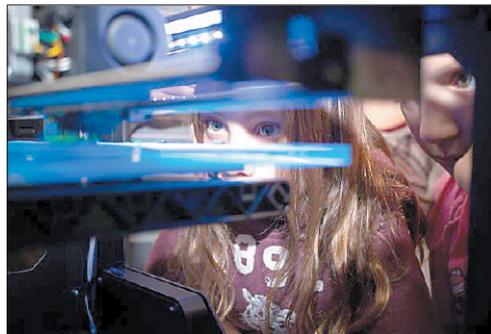
The new STEM program, Harrison said, is the brainchild of parents, teachers, scientists and corporate partners who "care very much about science and math education."

It took shape nine months ago, when NFS parent Stephen DeAngelis, president and CEO of Enterra Solutions, approached

Zwicker, head of the science education department at Princeton Plasma Physics Laboratory, about establishing a nonprofit that would promote STEM education in schools. Zwicker suggested "a project-based learning approach to make science tangible and interesting to all students," DeAngelis said.

A new nonprofit, the Project for STEM Competitiveness, was born from these talks. The nonprofit will shepherd the Lift Off to Mars pilot program at NFS, which is also being supported by corporate partners Bristol-Myers Squibb, Lockheed Martin and CA Technologies (NFS parents Joan Amatniek, Michael Bradshaw and Tom Angle work for these firms respectively).

"With the world changing as fast as it is, and with many professions marching ever more towards technology, we would be deficient if we did not look for ways to begin even earlier to prepare our students for the world they will inherit," Harrison said.



Children at Newtown Friends School watch closely as a 3D printer produces a copy of a miniature rocket.

Photographs by Allure West Studios



Tom Angle, CA Technologies; Andrew Zwicker, Princeton Plasma Physics Laboratory; former Congressman Jim Greenwood, Biotechnology Industry Organization; Stephen DeAngelis, Enterra Solutions; Michael Bradshaw, Lockheed Martin; Joan Amatniek, Bristol-Myers Squibb; and Dana H. Harrison, head of school, Newtown Friends School.

DeAngelis noted his firm and others have experienced a shortage in talented young people entering the STEM industry.

"From the beginning of the Industrial Revolution, the United States has enjoyed extraordinary preeminence in science and technology. We became known as the nation of inventors, entrepreneurs, engineers and scientists," he said. "... And I believe now we are on the cusp of a losing that international preeminence."

"Part of the reason that we're here today is to try to turn that around," said guest speaker and former Congressman Jim Greenwood, president and CEO of Biotechnology Industry Organization. "We have to have American kids as excited about learning these kinds of science and mathematical studies as kids around the world because we want to be part of the solution."

Evoking images from "Star Trek," DeAngelis said eighth-graders are being asked "to go where no one has gone before — Mars."

"The challenge for you," Zwicker

said, "is how do you design a rocket to go to Mars, and how do you design it so that you can get people to Mars and back?"

Eighth-graders will have to factor in the red planet's climate and geology, financial costs and the physical effects of prolonged weightlessness. "And what it would be like, psychologically, to be away from Earth for years," Zwicker added. What would happen, trapped with just a few other astronauts in a little rocket."

In about a month, the school will have its own 3D printer for students to utilize, Zwicker said.

"If you can imagine it, you can print it," he added.

The Lift Off to Mars program will help students better understand the challenges of space exploration and will give them an opportunity to apply what they learn in class to real problems, DeAngelis said.

"You represent the future of this great country," he said, "and you're going to find out that the future is a blast... maybe even a blast off."

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Andrew Zwicker explains how he used math to shrink the proportions of the rocket so that it would print to completion during his presentation to students.

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