

THE CRUSADER

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USA Science and Engineering Festival



**Aquinas Celebrates Science,
Technology, Engineering and Math
at the Washington Convention Center**



PLUS

The New Evangelization

Middle school students see the sun in *Annie, Jr.*

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**2011 Blue Ribbon
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STEM TAKES CENTER STAGE



AT THE USA SCIENCE AND ENGINEERING
FESTIVAL EXPO IN WASHINGTON D.C.



Approximately 325,000 people participated in a four day celebration of science, technology, engineering, and mathematics (STEM) at the USA Science and Engineering Festival on April 24–27, 2014, at the Washington Convention Center in Washington, D.C. Known as the “*Superbowl of STEM*”, it is the largest, free opportunity in the United States for students from kindergarten through high school to try seemingly endless amounts of STEM activities. Aquinas students and faculty fully enjoyed the amazing opportunities associated with the Festival Expo.

The Festival Expo is designed to inspire the next generation of innovators in STEM fields. “Staying competitive as a nation means we have to encourage more kids to think about careers in STEM. What better way to capture their imaginations than gathering the rock stars of science in one place and providing activities that they can really do?” explained Larry Bock, Festival Expo co-Founder. Students were able to choose from over 3,000 hands-on exhibitor activities as demonstrated by schools including colleges/universities, corporations, and non-profit and professional organizations from across the nation. The Festival Expo occupied the entire convention center of 703,000 total square feet of exhibitor space, which is spread across multiple levels of three city blocks. Families traveled from as far away as New York, New Jersey and Ohio for their children to participate in the Festival Expo. There were multiple stages that hosted speakers with larger science demonstrations, a Career Pavilion and a Book Fair section for authors to meet students and sign books.

Science celebrities were in abundance at the Festival Expo. There were those who are familiar to many: Mayim Bialik, from the cast of CBS’ *The Big Bang Theory*, who

is also neuroscientist; Mike Rowe from the Discovery Channel’s *Dirty Jobs with Mike Rowe* and a section sponsor in the Festival Expo that promoted technical training; *Bill Nye the Science Guy*; two-time Grammy Award winning band, They Might Be Giants, who specialize in children’s music with

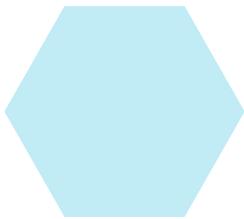
professional cheerleaders pursuing science and technology careers.

Not all of the guest speakers had accomplished amazing scientific feats as adults, however. One of the notable participants, Jack Andraka, is a 16-year old Baltimore high school student, who

“STAYING COMPETITIVE AS A NATION MEANS WE HAVE TO ENCOURAGE MORE KIDS TO THINK ABOUT CAREERS IN STEM. WHAT BETTER WAY TO CAPTURE THEIR IMAGINATIONS THAN GATHERING THE ROCK STARS OF SCIENCE IN ONE PLACE AND PROVIDING ACTIVITIES THAT THEY CAN REALLY DO?”

science themes; three astronauts including Cady Coleman, Sandy Magnus and B. Alvin Drew; the mathematician behind *Money Ball*, Paul DePodesta; and Nobel prize-winning physicist, William Phillips. There were also many who are not household names but are legends in their respective fields including doctors, mathematicians, physicists, authors, engineers, hosts of science television shows, meteorologists, magicians, computer programmers, government policy advisors, historical scientist impersonators, and even sports cheerleaders from a network of current and former NFL and NBA

developed (at age 15) an innovative diagnostic test that detects pancreatic cancer. His test is 368 times more sensitive, 150 times quicker and 26,000 times cheaper than the medical standard currently used for pancreatic cancer. Jack is only a couple of years older than our middle school students at Aquinas but he is an example of someone who accomplished something remarkable as a student. “We want to show students that STEM is fun, and that scientists and engineers change the world for the better,” said Dr. Ray O. Johnson, Festival co-Founder and Lockheed Martin senior vice president and chief technology advisor.



Top: The Aquinas booth with our students, visitors and an Aquinas faculty member

Right: Ice cream being made with liquid nitrogen

Bottom: One of the X-STEM School Symposium sessions that demonstrated a walking, inflatable elephant, designed by the expert presenter

Aquinas got involved early by becoming an X-STEM school (X, as in, extreme), to become a recognized partner of the Festival Expo. Five middle school students were identified by the Aquinas faculty to act as “student ambassadors” for the Festival Expo activities, and Aquinas STEM teacher, Ms. Walsh, served as faculty advisor. The student ambassadors wrote a mission statement for Aquinas: “‘STEM Crusaders’ will actively promote STEM subject areas throughout the school community in fun and exciting ways. Our goals are to provide greater awareness of STEM opportunities for students and to share knowledge on STEM topics with the community.” X-STEM schools met regularly to share their team’s activities and discuss the latest developments for the festival. Aquinas student ambassadors received a neon green Festival Expo t-shirt for their support of the festival. All of the X-STEM schools who fulfilled the qualifications were showcased on the Festival Expo website (usasciencefestival.org) with a picture of each school’s student ambassadors. X-STEM schools were able to participate in exciting opportunities throughout the 2013–14 school year leading up to the festival.

Aquinas was selected to host a “Nifty Fifty” speaker, from a signature program only available to X-STEM schools. The “Nifty Fifty” are a group of noted professionals who spoke about their work and careers at various middle and high schools in the Washington, D.C. area. In early December, 2013, Aquinas Middle School students heard a discussion about the future of technology careers by Ruthe Farmer, Director of Strategic Initiatives for the National Center for Women and Information Technology (NCWIT). Ms. Farmer was one of ten achievers honored by the White House as “Champions of Change for Tech Inclusion”, an initiative to better equip American graduates for the demands of a high-tech economy. Ms. Farmer spoke to our students about the expanding deficit between the number of computer programmers needed to fill future high-tech jobs and the number of American students who are taking computer classes. She also discussed some girls from diverse backgrounds (including a homeless teen) that she worked with in her organization while they were the same age as our Middle School students, and who were currently college students with job offers after college with Google or Apple Inc. Students

asked questions about ethics in using computers and recommended courses they could take in high school.

After Ms. Farmer's talk, she was invited to lunch and conversation with our student ambassadors and science and math faculty members. Ms. Farmer asked each student ambassador about their interests and hobbies and then suggested possible career options that would incorporate the student's interests in a STEM field. For example, she suggested that one student who enjoyed dance might consider a career in biomechanics because a thorough understanding of kinetic articulation was a requirement for this position and she would already have that knowledge from her dance classes. Ms. Farmer and a Festival representative, Julie Reiss, both thought that our students had very interesting questions and they were excited to hear about Aquinas student science projects. Ms. Reiss enthused, "I was incredibly amazed that a core group of the X-STEMmers (mostly girls) are building a hologram cube... That's truly amazing!"

While the Festival Expo occurred during our Easter Break, our student ambassadors actively

promoted the event the week before by greeting the students during morning announcements with a fun STEM fact and an invitation to come to the Festival Expo. One morning, students were asked "did you know you can make a diamond from peanut butter?" (answer: It is possible, under conditions of intense pressure and very high temperatures!) Each student was also given a Festival Expo bookmark with the festival dates, location and more STEM facts, quizzes or scientist biographical information.

A highlight for X-STEM schools, including Aquinas student ambassadors, was exclusive participation in an all-day X-STEM Symposium before the Festival Expo opened with noted science visionaries. Students were able to attend a series of lecture demonstrations or workshops in a stunning array of topics, ranging from a cockroach neurosurgery demonstration to a paleontology lecture that included sifting through potentially millions-of-years-old fossils. Aquinas students attended lectures and demonstrations by a three dimensional (3D) printer company, stunt scientist, pyrotechnic expert and storm chasers, among others. "The speakers at the Symposium were so cool and that whole day was really beneficial. I'm

so glad I got to be a part of Aquinas' team of ambassadors," said Aquinas student, Claire Bassett. Aquinas students experienced a scientific symposium many years before their friends might have that opportunity later in their education. STEM teacher, Ms. Walsh, quoted C.S. Lewis in saying, "'The task of the modern educator is not to cut down the jungles, but to irrigate the deserts.'" At the Symposium, I witnessed many a-ha moments from my students, and happily, I was able to check off another oasis formed in my presence."

Sneak Peek Friday was the kick-off day for the Festival Expo. Aquinas participated as a booth exhibitor throughout the festival from Friday through Sunday. More than 40,000 students, teachers, military families, government officials and members of the press attended Sneak Peek Friday as special guests. The cover photograph of the convention floor was taken

Nifty Fifty speaker, Ruthe Farmer, Director of Strategic Initiatives at NCWIT, with Aquinas X-STEM school student ambassadors and students in the Aquinas STEM program





AQUINAS WAS THE ONLY CATHOLIC SCHOOL IN NORTHERN VIRGINIA TO PRESENT A HANDS-ON ACTIVITY FOR CHILDREN AS A FESTIVAL EXPO EXHIBITOR.



on Sneak Peek Friday, which had the lightest attendance of the weekend.

Sneak Peek Friday was the first time many of our students had a chance to look around and see all of the exhibits. Aquinas student, Maria Mendoza, was thrilled by the 3D printer demonstrations. She watched the 3D printer make a variety of objects like race car figures, SmartPhone cases, and action figures. She said, “while I was there, I learned that 3D printers could also make working prosthetic limbs, piece by piece!” Another Aquinas student, Tristin Youtz, especially loved the Lockheed Martin F-16 flight simulator. He said, “it was very realistic and well-built to inspire young minds.” Claire added, “Just being at the festival all day on Friday really gave me an idea of how many organizations and schools are out there in the world, looking for interest in STEM. It was really an inspiration to know that there are many people who want to know more.” Participating exhibitors were invited to a special VIP reception on Friday including opportunities to meet celebrities and enjoy snacks, such as instant ice cream sundaes made with the assistance of liquid nitrogen.

Neurosurgery is performed on a cockroach by an X-STEM School Symposium expert and demonstrated on an ohmmeter application

Aquinas was the only Catholic school in Northern Virginia to present a hands-on activity for children as a Festival Expo exhibitor. Student ambassadors and mentors volunteered—over their Easter Break—to demonstrate a computer program at the Aquinas booth. Students previously learned the computer animation program in Mr. Wage’s computer class. Aquinas students worked one-on-one with each child to create a short animation using stick figures and their imagination. Tristin commented, “It was fun teaching other kids at our booth.” Maria agreed, “I loved working at the Aquinas booth!” The finished product was put on a large screen television to the delight of the children and their family. Many children spent a long time perfecting their stick figure animations and experienced the beginning of how popular animated movies are created. Some Aquinas STEM students also demonstrated their programming skills with their LEGO Mindstorms robot configurations. Faculty members including Ms. Walsh, Mrs. Mendell, Mrs. Glascock, Mr. Wage, and Mrs. Wage, managed the booth activities and answered questions. Parent visitors inquired about Aquinas programs while they watched their children work on the computers. All visitors to the Aquinas booth also received heat sensitive pencils, that change color from blue to white when they come into contact with a heat source (like a human hand!) The Aquinas pencils were very popular with Festival Expo participants. When they were not at the Aquinas booth, students from Aquinas were able to enjoy all of the Festival Expo shows, exhibits and activities.

The Festival Expo itself was an incredible sight, with so many activities and things to learn about, it was impossible to see everything. Roughly 140,000 people came to the Washington Convention Center each day. We accomplished our goal in giving our students the opportunity to participate in the largest, ultimate celebration of science and engineering in the country, inspire children of all ages to explore careers in STEM and show off the great things we are doing at Aquinas!