

# CAREERS IN ACTION

ADULT, CAREER AND TECHNICAL EDUCATION SCHOOL DISTRICT OF MANATEE COUNTY

Students...  
Toss a tomato,  
learn something  
new!

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## STEM and a Terrifically Teachable Trebuchet Tomato Toss

Look up in the sky! It's a bird...it's a plane...it's a flying tomato! Yes, that's right! McNeal Elementary School students launched tomatoes 150 – 200 feet into the air, over a field, a fence, and into a pond, and experienced engineering while they were at it! This terrifically teachable trebuchet tomato toss was part of the school's annual Wildcat Walk-a-Thon. (Say THAT ten times in a row!)

Each year, McNeal's PTO hosts an outdoor fundraising event to support additional school needs, and this year's Walkathon centered on the study of Science, Technology, Engineering, and Math, or STEM. Students and staff kept a brisk pace as they walked laps around the field, moving and grooving to the music played by dynamic DJ Troy Wise. A variety of activity stations were set up for tattoos, fresh fruit, popsicles, bubbles, refreshments, and a towering, five-foot-tall trebuchet for a turn at sending a tomato soaring.

Technology teacher Mrs. Cheryl McGrew was the force behind the trebuchet portion of the event. Five years ago, Cheryl implemented McNeal's Engineering by Design™ (EbD) program for kindergarten thru fifth grade students. The EbD curriculum provides a strong STEM concentration and features eight units over a two-year timeframe. Units include Manufacturing, Power/Energy, Innovations/Inventions, Force/Motion, Construction, Robotics, Transportation, and Systems/Technical Toys. Students studied, compared, and contrasted the trebuchet, slingshot, and catapult in the Force/Motion unit. Students learned about load, effort, and levers. Along with these STEM concepts, they researched the history and geography of the Middle Ages. Next they applied their knowledge of angles and axels to build their own tabletop catapults in class.

"We need to graduate students who are better prepared for their futures," Cheryl said. "We can do that by increasing critical thinking skills, developing higher level thinking, practicing cooperative learning, and applying learned knowledge in STEM."

"The EbD program gets students excited to learn because the program focuses on high energy activities that encourage problem solving," she continued. "When students successfully solve problems, they are building confidence and self esteem. This love of learning spills over into their middle and high school education where they are more at ease with selecting classes such as physics and calculus."

McNeal's trebuchet was built of wood by former Lakewood Ranch High School technology teacher Mr. Steve Harvey. Mr. Harvey used a 40-pound cement block as the counterweight. When students pulled the ripcord, the floating arm released, the counterweight cement block lurched downwards, and the tomato soared through the air in a long, steady arc until it splashed down in the pond. With each launch, students marveled and cheered at their success. Meanwhile, Lakewood Ranch High School engineering students also participated in the event by displaying their own catapult that stretched far into the sky and hurled grapefruit through the air.

Today's students from elementary through high school are benefitting from studying STEM as they prepare for future careers and success. The earlier they start, the more equipped they will be! The EbD program is available at McNeal, Freedom, and Abel Elementary schools.



Fifth grade students Kyle Wray and Michael Balars problem solve while working on the trebuchet as Elizabeth MacDonald and Cheryl McGrew look on.



Boxes of tomatoes form a barricade as students wait anxiously for their turn to flex their engineering skills and toss a tomato.

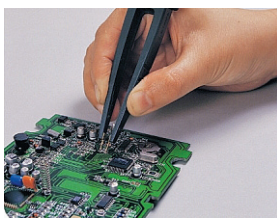
## JOBS



**Computer Programmers**  
Salary: \$39,300 – \$71,300  
Workplace: technology industry  
Hours: office hours



**Surveying Technicians**  
Salary: \$27,000 – \$42,800  
Workplace: construction, mapping industry  
Hours: daylight



**Electronic Engineering Technicians**  
Salary: \$35,100 – \$59,700  
Workplace: technology, manufacturing  
Hours: office hours



The Engineering by Design™ (EbD) program is built on the belief that the ingenuity of children is untapped, unrealized potential that, when properly motivated, will lead to the next generation of technologists, innovators, designers, and engineers. This curriculum is defined by the International Technology Education Association's Center to Advance the Teaching of Technology and Science (ITEA-CATTS).

## PARENT CORNER

- ✓ Discussion starter: STEM is all around us. Take every opportunity to discuss science, technology, engineering, and math with your students. For example, every time you change the channel using your TV remote control, STEM principles are at work. (Infrared signals, microprocessors, bit-binary commands...Google it!) Use everyday moments as teachable moments.
- ✓ The next time you are in line at a bank's drive-through lane, try to name as many STEM activities and products as possible. For example, the pneumatic tube system uses compressed air to push objects through a tube. What about the microphone and speakers? The computer system? The security cameras? The ATM?
- ✓ "We want to prepare our students for high-level science jobs." Cheryl McGrew, McNeal Elementary Engineering by Design teacher. For further information contact Cheryl at 941-751-8162 or the guidance counselor at your school.

## FCAT reading comprehension QUESTION

★ What does STEM stand for?

Answer: Science, Technology, Engineering, and Math

What's on the WEB?

www.stemcareer.com  
www.floridatsa.com  
www.jets.org/explore



EdVantage Strategic Objective #2: Each student will articulate personal goals, create plans to achieve those goals, and exhibit progress toward their attainment.



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