YPG engineers mentor Yuma school robotics club

By Mark Schauer

In a future world made of Legos, a building is slated for demolition.

The deed will be done by a robot, but only after valuables— golden bathroom fixtures attached to a single Lego block with a loop—are carefully extracted.

The group of 12 sixth through eighth graders have programmed the robot's software again, and feel tingling anticipation that it will succeed this time. They push a button and the robot proceeds, slowing to make a few hairpin turns before reaching its objective. A hook extends, but misses the loop by millimeters, a tiny distance just large enough for it to strike one of the building's pillars, which buckles and brings the entire structure crashing on top of it... along with the golden bathroom fixtures.

"Oooh, almost," said Adam Rinne, YPG test officer.

The students groan and several slap hands atop their heads in exasperation, swiveling away from

the table, but only briefly before turning their attention back to their mentor.

"We'll get it," assures Rinne.
"What did you change this time?"

The club is called the Roboknights, and they are spending their afterschool time preparing to compete against other young robotics enthusiasts. In the competition, students program a small robot made of Lego blocks equipped with a band track to traverse a tabletop obstacle course and perform various tasks. It isn't entirely child's play: the high-tech creature boasts a microprocessor programmed using computer software commonly found in college-level engineering classes. This year's theme is renewable resources and energy, and students use a competition kit with a standardized selection of components to construct their robot and obstacle course. One of the tasks involves dropping off a pair of Lego men in hard hats at their work site by letting gravity propel them from the back of a retractable platform on the robot.



Adam Rinne, YPG test officer, and a group of sixth through eighth graders have programmed the robot's software, and feel tingling anticipation it will succeed this time. They push a button and the robot proceeds, slowing to make a few hairpin turns before reaching its objective. (Photo by Mark Schauer)

"It's a hot drop," Rinne says with a smile.

Like every other task on the tabletop, giving the two Lego men a sliding entrance into their work site is worth points that count toward the team's score. However, time is of the essence in order to achieve success.

"They only have two minutes, and can't possibly get to everything," explained Rinne. "They have to pick and choose what they think they can do versus how many points it is worth."

This strategizing of risk versus reward

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Veterans Day observance held at YPG /Page 2



Kineto Tracking Mounts capture crucial test data /Page 8



YPG engineers help students stage science fair /Page 13



Veteran's Day observance held at YPG





U.S. Army Yuma Proving Ground commemorated the 50th anniversary of the beginning of the Vietnam War at a Veterans Day ceremony attended by a crowd of several hundred people on Tuesday, Nov. 10th in front of the Heritage Center. The ceremony featured remarks by YPG's commander Col. Randy Murray, Vietnam War veteran Vince Lacy and Vietnam War Army wife Sharon Jessup. A ribbon was cut after the ceremony that officially opened a Vietnam War exhibit at YPG's Heritage Center. Refreshments were provided for those attending and a tour of the Heritage Center was provided by Bill Heidner, museum curator. Members of the public are welcome to visit the museum, free of charge. It is open Tuesday through Friday from 10 a.m. to 4 p.m. The phone number is 328-3394. In addition to the YPG's Veterans Day events, Col. Murray participated in a flag raising ceremony at Castle Dome Middle School where he gave a speech about Veterans Day. (Photos by Mark Schauer)



THEOUTPOST

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ROBOTICS

FROM PAGE

is part of the learning experience: some of the more visually enticing tasks, such as an intricate, working Lego conveyor belt in a mock recycling plant that is time consuming and worth relatively few points. Starting another Rube Goldberg-esque contraption further down the track with a well-placed bump, on the other hand, is worth more points. After a brief discussion, the students felt this could be best accomplished by programming the robot to accelerate to ramming speed down a long straightaway: not too fast, though, lest the entire structure be slammed into the lip of the table, and utterly destroyed.

"A lot of the solutions are very technical and it has them program multiple steps and use sensors," said Rinne. "Other times they just drop the hammer and go for it."

The trial and error of the robot's performance are only half of the equation. The robotics club must also create an interesting and engaging five minute presentation that explains their robot and its utility. At each session, half of the club's 12 students work on this portion of the project with social studies teacher Crystal Williams, the robotics club facilitator who says she is grateful for the volunteer assistance from YPG.

"I can do okay helping them with public speaking and things like that, but I am not an engineer," said Williams. "I have kids who are ready to get to the next level: I couldn't get them there, so I found people who could."

This year, the two people are Rinne and YPG test officer Richard Bloomfield, who have each been spending one and a half hours one day a week individually, and one six hour weekend session per month with the students together.

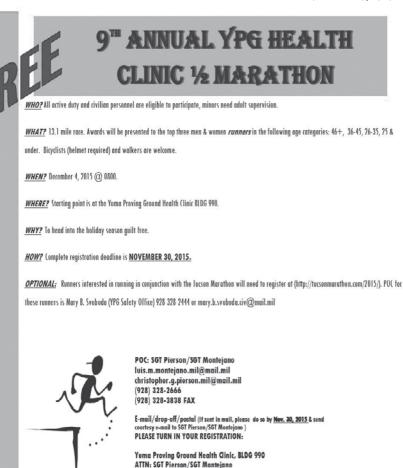
"They're really cool," said Madelyn Flores, an eighth grader in the club. "Mr. Bloomfield taught us how to make a trigger to grab objects and not drop them."

A number of other YPG engineers have volunteered in a similar capacity over the years, and the annual Lego robotics competition has grown by leaps and bounds. When the program started in 2009, Castle Dome Middle School was the only local school participating. Today, Castle Dome students must excel in a heavily-attended Yuma city competition for a chance to advance to the regional competition in which they won first prize in the robot showcase portion of the event six years ago. It is a tall order, but Rinne keeps the team centered by leading them in a mantra at the beginning of each club meeting:

"We are a team: If we win, we win as a team; if we lose, we lose as a team. Either way, we do our best, have fun, and congratulate our opponents. Go Roboknights!"

Next Outpost deadline is noon November 25th Sexual Assault Hotline: 920-3104

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'Power Hour' one of many **Youth Center** programs

By Yolie Canales

Wendy Paul, facility director for Yuma Proving Ground's Youth Services wants every parent in the YPG community to know that 'help with homework' for their children is available free of charge at the Youth Center through a program known as the "Power Hour."

"This is one of the greatest programs our facility has to offer to children in grades kindergarten though 12th," said Paul. "This program gives young people the opportunity to develop skills for their homework assignments."

Members of the staff can provide expert assistance in the following subjects: computer lab, math, science, and reading. Additionally, parents whose careers are in these areas have volunteered their expertise and are welcome to come in and volunteer as often as they wish to help with homework assignments.

The homework help runs Monday through Friday, beginning right after school through 6 p.m., however, Paul said all children need to be registered through Parent Central at the Youth Center before they are eligible.

Paul hailed to YPG in 2014 from



Wendy Paul, facility director for YPG's Youth Services, loves the interaction with children and their families while meeting the needs of the community. (Photo by Yolie Canales)

outside Pittsburg, Penn., and said her plan for Youth Services is to help it grow. "I want to meet the needs of the community and to get our name out there so people understand what we do for our young people," she said. "Throughout the year, we served about 200 kids who participated in the Fall Festival, Christmas tree lighting ceremony and many other programs."

The inspiration Paul gets from working with children is the positive interaction with them and their families. "I've been doing this for over 37 years," she explained. "I love children. I like it when the 'light bulb' goes off in their minds and I see that they learned how to

overcome something and answer questions by themselves."

Since her 2014 arrival, Paul has found YPG's location to be unique. "You have to drive quite a distance to get to YPG and back to Yuma," she explained. "Therefore, it is my responsibility to provide children in the YPG community with things to do within walking distance and, most importantly, fun things."

Paul strongly believes her facility is meeting these milestones. This past summer, for instance, a summer camp was held featuring a wide variety of activities. "We had great responses from the families and that is what's important."



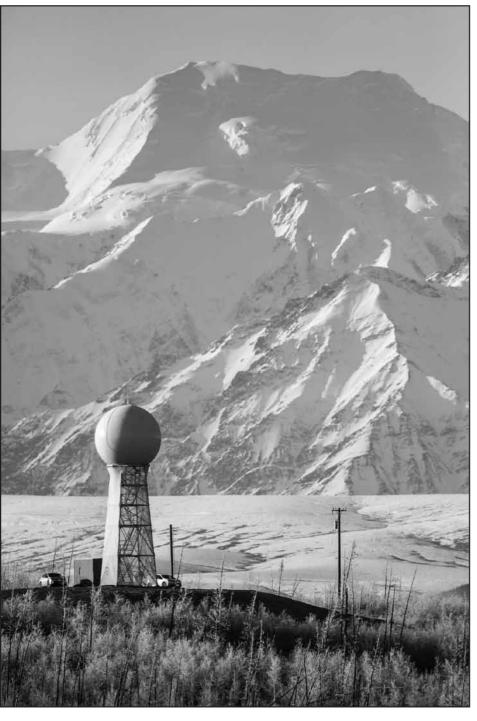


As a veteran, Paul understands the NEEDS OF RELOCATING MILITARY FAMILIES AND IS DEDICATED TO ASSISTING ALL FAMILIES IN LOCATING THEIR NEXT RENTAL HOME. HE IS also a retired Peace Officer who is very SENSITIVE TO THE PARTICULAR NEEDS OF PLACING LAW ENFORCEMENT AND THEIR FAMILIES.

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Cold Region Test Center's new weather radar tower



This photo shows CRTC's new weather radar tower. It is operated and maintained by the CRTC Meteorology Team to provide weather data. This new tower replaced an old communication tower from the late 1970's. (Photo by Sebastian Saarloos)

-VIEWPOINTS =

Oftentimes Soldiers find themselves far from loved ones on Thanksgiving. When they are fortunate enough to spend the holiday with family, the time is particularly special. We asked Soldiers of YPG's Airborne Test Force how they plan to spend Thanksgiving.

By Mark Schauer



Staff Sgt. Jesse Robbins: I will be with my family in California. This is the first Thanksgiving my brother and I are going to spend together since we've both been in the military: he's in the Marine Corps. We're going to play it by ear: as long as we are with family, that's all that matters.

Sgt. Kyle Dunwiddie: I'm going to Texas: my sister and her husband are stationed down there, where we grew up. It's the first Thanksgiving they've hosted since they were married, and it's going to be both sides of the family. I'd really like to go to a Cowboys game on Thanksgiving, but it's pretty expensive and they haven't been doing too well this year, so I'll probably be hanging out with the family.





Staff Sgt. Cliff Warner: My wife and two kids are going to one of the restaurants. We might coordinate something with a few other friends. Wherever we go, it's a matter of my being here and being able to spend the time with my family.



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-chaplain's corner Noah fear of water

Submitted by Chaplain Steven Smith

Noah, far from being a mariner, began building a strange-looking boat with one small window. Some of you may have seen the Hollywood version some time back. However, as he built it, he proclaimed to all who would listen that God told him a flood was coming to destroy civilization. Couple this strange scenario with the fact that in the history of the world it had never rained, and a person has the plot for a very interesting story. But this story is not from the library of ancient Hebrew folklore. The true story of Noah and the ark has leaped from the Bible to capture the imagination of young and old alike in every generation for nearly forty centuries.

When God told Noah it was going to rain, he believed it. When God told Noah to build an ark, he responded by beginning to build. But when Noah relayed this message to the people of his day, they did not believe it. Still, their refusal to believe the message did nothing to deter him from his determination to build an ark. He whom Peter called "a preacher of righteousness" (II Peter 2:5) kept hammering and heralding. Man's wickedness caused God to resort to a destructive flood, and it was Noah's godly fear and righteousness that caused God to warn him and to give him and others an opportunity to escape. Although Noah escaped the judgment of the flood, he was able to save only his own family.

The Bible records only 769 words spoken by God to Noah

during his 950-year life. The Bible records 392 words that God spoke to him before the flood and 377 words that He spoke to Noah after the flood. We, who feel a need to receive reassurance from God regularly should learn a lesson from Noah. God told him to build the ark; and as far as we know, He did not speak to him again until after the flood when He told Noah to leave the ark. It is no wonder the Bible speaks of Noah as an heir of righteousness.

A man of less faith probably would have built the ark near a body of water so that if it did not rain he could launch the craft and charge a fee to visit the floating zoo. But a man of faith provides for no alternative to the commands of God; he simply obeys.

We can be thankful that there is still a moral thread that runs through the fabric of North America. We face numerous challenges in our contemporary culture, but many of our schools and communities still retain a respect for God and moral values. In Noah's day, however, he and his family were the only ones who feared God.

What a great challenge Noah provided for us today by his exemplary life of faith and fear (godly respect)! May we always fear the Lord, for it is the "beginning of wisdom" (Proverbs 9:10).

Please come and visit the Post Chapel (Oasis) on Sunday morning. Catholic Mass 0930 and Protestant Service is at 1100.

It's Combined Federal Campaign time

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Combined Federal Campaign (CFC) is the worlds largest and most successful annual workplace charity campaign, with more than 350 CFC campaigns throughout the United States and internationally to help to raise millions of dollars each year. Nearly four million federal employees and military personnel are able to contribute to the charities of their choice during the annual charity drive, which runs from September 1 through December 15 of each year. Pledges made by Federal civilian and military donors during the campaign season support eligible non-profit organizations that provide health and human service benefits throughout the world. These contributions can be made either by cash or check, or can be automatically deducted from employee's paychecks.

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- To find your favorite charity in the Giving Guide, type a keyword(s) in the "find" block (Ctrl F to open the find box). This will help you find the charity code that is needed for the pledge form.
- The CFC Account Numbers (1st box on the pledge card) are as follows:

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YPG Command Group - 8300

YPG Police Services - 8300B

YPG LOC - 8300Q YPG EEO - 8300R YPG Fire Department - 8300S

YPG MWR - 8300P

If you want to keep your dollars in the local community, Yuma and Yuma County have a total of four listings:

• Humane Society of Yuma (47992)

- Child & Family Services of Yuma, Inc. (35793)
- United Way of Yuma County, Inc. (84225)
- Yuma Family YMCA (63286) Brochures and pledge cards have been sent to all admin personnel in your area. Forms are also available in the Command Group.

You can now contribute to Arizona CFC through your myPay account. If you donate through your myPay account and are requesting a CFC donation gift, please print your confirmation and submit it to Gabby Rios by December 3rd, so your gift can be requested.

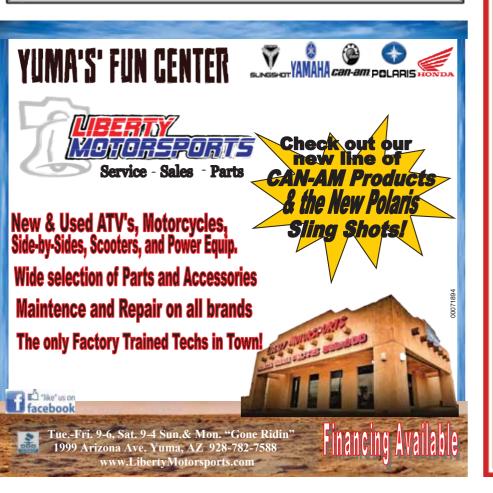
Please return your completed pledge card to Valerie Grimes for YT and Gabby Rios for the rest of YPG by COB on Dec 3rd.

For more information, call Val at ext. 6226 or Gabby at ext. 6110.



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Kineto Tracking Mounts capture crucial test data

By Mark Schauer

Scattered throughout YPG's vast ranges, on tests of artillery or

parachutes, you'll see white squat turrets adjacent to a large van. Those turrets are called Kineto Tracking Mounts (KTM).

Each KTM is equipped with multiple cameras and telemetry devices to capture imagery and other data on projectiles fired from a distant howitzer or helicopter, or parachutes that fall from a cargo aircraft high overhead. All the while, operators inside the turret listen to radio communications, hoping that projections of the test item's anticipated trajectory are accurate: if they aren't, his or her job of tracking a projectile flying hundreds of feet per second is even more difficult. Further, during air drops in

Yuma's brutal summers, the operator is likely seated within an un-shaded mount, hand ready on a joystick,

eyes glued forward.

Data generated by YPG's KTMs and the experts who operate them are vital to YPG's mission. As a matter

of course, test customers have long received impressive footage of test objects in flight, be it a parachute or aircraft, or, even more impressively, track it in flight, but it can't see what is going on with the round."

This dramatic footage comes thanks to the immense skill of

The KTM section has grown immensely in its 30 years of existence, today boasting more than 20 skilled operators and KTMs that have undergone extensive technical upgrades over the years.

a rocket, bullet, or artillery round. Such footage is gathered at all hours of the day and night, depending on the requirements of a given test.

"At night, we can see a lot that standard optical cameras can't," said Rod Pike, team lead. "Radar can operators of YPG's fleet of KTMs, and gaining proficiency is no easy task.

"It takes a minimum of one year to get someone trained to be a first operator, to sit in the seat and perform the full function of the job," said Pike, a 28 year veteran of the proving ground. "We invest a lot of time and effort in getting people trained."

The skill set that suggests a person would perform well on the job can be a recruiting challenge. Aside from being mechanically inclined and having a keen eye, KTM operators transport their instruments to far-flung areas of YPG's range using heavy trucks that require a commercial driver's license to operate.

"It's hard to find someone with a commercial driver's license, a technical background, and really good eye-hand coordination," said Pike. "It's a combination of skills and qualities you don't find in a typical job."

One such operator is Eric Quinonez, who has worked in the shop for over eight years. A

mechanic with a degree in television production, he learned of the job from a friend and applied when a position opened.

"At a news station, everything is stationary in a studio," he said. "Here, we are going 60 miles



Kineto Tracking Mounts like the one seen here are equipped with multiple cameras, some with lenses as wide as 100 inches, and telemetrydevices to capture imagery and other data from artillery and air drop tests. (Photos by Mark Schauer)

downrange, setting up our own equipment, and operating it. Until I worked here, I had no idea this job existed."

"It's not necessarily a hard job, but it is complex," added Pike. "There is a lot to do and there's pressure on KTM operators to do it consistently."

The objects they track are usually flying incredibly fast, and hours and hours of preparation go into setting up to capture an event. KTM operators typically transport and set up their instrument the day before a given test, leveling the trailer it is attached to, installing a compliment of highly specialized cameras from high definition to infrared, some with lenses as wide as 100 inches, and connecting them to computer

equipment inside the trailer. The operators must also calibrate the sights used to track the item under test.

The KTM crew sometimes uses mini-mounts, scaled down KTMs that are easier to transport and emplace, but more difficult to calibrate and hold fewer cameras. Whereas the KTMs can travel 270 degrees in each direction, the mini-mounts traverse 180 degrees.

"They're the same animal, but this one is more mobile," said Jesse Nunez, operator.

Whichever device they use, the real action takes place during a test. Today's mission involves tracking 155mm howitzer rounds,

KTM operators **Eric Quinonez** (foreground) and Andy Martin prepareto track a 155mm howitzer round in flight from inside the KTM's connected trailer. Whereas tracking air drop tests are easier from the saddle aboard the KTM, artillery rounds must be tracked using the sophisticated equipment inside the trailer.



so Quinonez and colleague Andy Martin are sitting inside the KTM's connected trailer and carefully

tracking each projectile in flight, easing a sophisticated joystick to

SEE KINETO page 11

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KTM operators typically transport and setup their instrument the day before a given test, leveling the trailer it is attached to, installing a compliment of highly specialized cameras and connecting them to computer equipment inside the trailer. The operators mustalso calibrate the sights used to track the item under test.

KINETO

FROM PAGE 9

keep the round in the center of the recording frame.

"It took a little bit to get used to this joystick," said Quinonez. "It's like a pilot's stick: forward is down, pulling it back makes the camera go up. After tracking hundreds of rounds, it becomes second nature."

Many evaluations at YPG put a test item under the most punishing conditions. Artillery tests oftentimes seek to fire scores of rounds at their maximum charge in rapid succession. KTM operators make computer simulations of each round's projected flight based on information they get from test

officers: when rounds are being fired multiple times per minute, the pressure can be intense.

"Some programs will start reloading while a round is still flying," said Quinonez.

The KTM section has grown immensely in its 30 years of existence, today boasting more than 20 skilled operators and KTMs

that have undergone extensive technical upgrades over the years. Nonetheless, the crew still finds the exact nature of their intricate job difficult to explain to friends and family.

"It's hard to describe," said Quinonez with a smile. "I say I operate an instrument and track a lot of military stuff."

Asperger Syndrome

Submitted by Paul J. Kilanski, Family Advocacy Program Specialist

Asperger syndrome is named for Hans Asperger, an Austrian pediatrician. In 1944, Asperger published an article describing children whose symptoms were typical in their verbal and cognitive skills.

Children with Asperger syndrome share traits with those who have autism spectrum disorders (ASDs).

Both groups have difficulties with social interactions:

- Trouble looking people in the eye
- Rarely use gestures or facial expressions
- Trouble knowing how close to stand to others
- Less interest in engaging others
- May not share objects or experiences of interest with others

Like children with ASDs, those with Asperger syndrome may also:

- Fixate on narrow interests, sometimes to the exclusion of other topics
 - Prefer rituals and routines
- Become anxious and upset when those are altered or disrupted
- Engage in repetitive behaviors such as spinning or rocking for long periods
- Become preoccupied with parts of objects

Language Skills

A key difference, however, is in language skills. Early language milestones are not delayed in children with Asperger syndrome. In fact, these children may even be early readers who speak in an overly formal way and have an impressive vocabulary. Some may affectionately be referred to as "little professors." Even so, their language skills may be quite unique or different. They may:

- Talk continuously about a limited number of topics
- Have difficulty understanding certain types of humor, figures of speech, and jokes
- Have less understanding of the social use of language, such as how to start and maintain a conversation or how to end one

Cognitive Development

Another difference is that children with Asperger syndrome do not have cognitive delays, which may or may not occur in autism. Children with Asperger syndrome are also capable of doing age-appropriate self-help skills like bathing and dressing and will be curious about their environment in childhood.





YPG engineers help students stage science fair

By Mark Schauer

As Yuma County's largest employer and high technology workplace, U.S. Army Yuma Proving Ground has a vested interest

in encouraging local youngsters to pursue careers in science, technology, engineering, and math (STEM).

The proving ground does just that with a robust outreach program that has touched virtually every school within Yuma County.

Even luckier, perhaps, are the students at Price School, a K-5 elementary school that serves students

living at the proving ground. Not having had a science fair in the recent past, the school recently reached out to YPG test officers for a helping hand.

"We are here to mentor because these kids have never done a science fair before, at least not in this school," said Adam Rinne, test officer. "We're showing them the ropes and teaching them things like what a hypothesis is."

"The school hasn't had the



Stefanie Jacobs, operations research analyst, closely listens to each student as they explain their intended projects. (Photo by Mark Schauer)

opportunity to have a science fair for the past three years, so they were pretty excited about having one this year and being able to compete in the district and county," added Iris Espinoza, training coordinator.

Every Wednesday for more than one month, Espinoza and Rinne visited the school's combined fourth and fifth grade classes, guiding the youngsters through each phase of their science fair projects.

"It's cool for them to help us," said Maggie Vos, a fifth grader.

"When they come they are a lot of help. It's good to have that."

"I think it is a great opportunity for the students to see another point of view and grow," added Edna Pacheco, who teaches fourth and fifth grades at the school. "I think it is really positive for them to learn how to develop the best in science writing."

One recent day, operations research analyst Stefanie Jacobs came along to listen in as each of

the students stood front and center in the classroom to explain their intended project. From the usable lives of different types of batteries to the ability of plants to grow in liquids other than pure water, the children had a variety of creative ideas. Once everyone had their turn, the class broke into three groups to whom each of the three engineers provided individual attention, teasing out more details and offering suggestions for their projects' next steps.

"We're a work in progress," said Espinoza. "These kids have a good idea of what they want to do, and that's half the battle. It's now a matter of execution."

Having a Price School science fair means the best projects will compete in the Yuma County Science Fair, with the potential of going even further. Regardless of how the students' experiments, trifold displays, and presentations fare in the larger competition, Espinoza thinks the exercise has tremendous value for its own sake.

"I love science," said Espinoza.
"I think everyone, whether you go into a STEM career or not, should be able to apply the scientific process.
And I like working with kids."

"It's fun," added Rinne. "If they could pay me full time to do STEM outreach, that's what I'd do."

He paused and smiled.

"Well, maybe one day a week I'd fire artillery. But the rest of the week, I would do STEM stuff."



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