

VISION



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NM MESA staff photo

Red Mountain MS poses after staging a NM best-ever performance at the MESA USA National Championship. Advisor Monika Velez, rear, leads the team of (l to r) Freddy Sanchez, Adrianna Darrow and Javier Rodriguez. The team won three sets of medals, including third-place overall.

NM MESA teams score high, win events at 2015 MESA USA National Competition

Terry Ramirez

SW Regional Coordinator

The 2015 MESA USA National Competition was held June 17-20, 2015 in Ogden, Utah. This high-level competition showcased the best of middle-school and high-school MESA engineering from 10 MESA USA states, and New Mexico competitors fared quite well against participants from other states.

The competition this year was the Prosthetic Arm Challenge, designing and using an engineering-based solution to a real world challenge. Teams built a low cost Prosthetic Arm and had to demonstrate that it could complete a set of pre-defined tasks. They also had to write a technical paper, create a poster and make an oral presentation. This year the NM Southwest Region sent both the middle and high school teams to the competition. The middle-school team from Red Mountain MS in Deming consisted of Adriana Darrow, Freddy San-

chez and Javier Rodriguez, led by advisor Monika Velez. The high-school team is from Las Cruces Mayfield HS and consisted of Jacob Hammond, Lachlan Boyd, Kevin Brooks and Timothy Trujillo, led by their Advisor Kaelin Redmond. Both teams brought home several medals in different categories!

While in Utah, the students also enjoyed touring Downtown Ogden and went to Lagoon Amusement Park. The students also visited with students from other MESA states, made new friends and even got to devour s'mores cooked over open flames one evening!

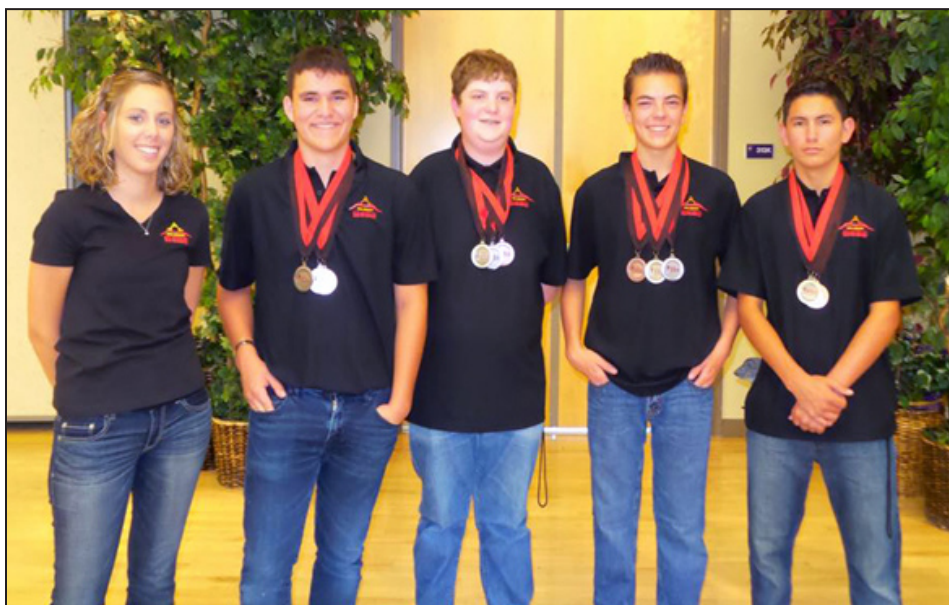
Red Mountain brought home the following MS division medals/trophies:

Overall - 3rd
Object Relocation - 2nd
Design efficiency - 1st

See MESA USA on page 2

NM MESA Staff Photo

After winning three sets of medals at MESA USA Nationals in June, the Las Cruces Mayfield HS MESA team beams with success. From left to right, the team consists of advisor Kaelin Redmond and team members Tim Trujillo, Kevin Brooks, Jacob Hammond and Lachlan Boyd.



NM MESA gears up for productive school year

Ya'at'eeh (Hello),

I am enthusiastic to announce the start of NM MESA's 33rd year! NM MESA had its humble beginning on the campus of the University of New Mexico in 1982. In its first year, 150 ninth grade students from five Albuquerque high schools and Bernalillo High School became the first NM MESA class.

Today, the NM MESA program is in 105 middle and high schools throughout the state. This statewide coverage results in over 4,500 students participating in any given year. This expands to tens of thousands of students, teachers and parents impacted by the MESA model.

NM MESA is the only year-round youth educational program that provides educational enrichment for up to seven consecutive (6th to 12th grade) years. More than 71% of NM MESA participants are students of color. NM MESA has successfully delivered programs to students and teachers by creating partnerships. NM MESA's partners vary, and include five universities and one community college and 31 New Mexico school districts administered through Memorandum of Understanding agreements.

After more than 30 years, NM MESA has learned a thing or two. This summer NM MESA shared some of this precious knowledge as staff members presented best practices in STEM enrichment at two state

conferences impacting hundreds of teachers. And to be proactive in the education field, NM MESA have either renewed or obtained New Mexico Full Teacher/Substitute Teacher Licensure for its staff because NM MESA comes in contact with students continually during the course of the academic year. Regional Coordinators and our State Events Coordinator conduct workshops, coordinate leadership summits, guide field trips and work side-by-side with students in developing projects for competition.

You will learn about the important work my staff is

doing in this issue. NM MESA has a long tradition of implementing STEM education enrichment to prepare students for university/college and the workforce by investing resources such as financial, partnerships and man hours in the future leaders. As I conclude, do not forget to “like” us on Facebook to stay aware of NM MESA activities and achievements.

Toney Begay
NM MESA Executive Director



Photo by Rick Cole

NM MESA Executive Director Toney Begay addresses student competitors at the 2015 Middle School MESA Day.



Photo by Rick Cole

North Regional Coordinator Matt Solano explains various components of the Alice computer software program to teachers who attended the Second Annual STEM Symposium, hosted by the New Mexico Public Education Department (PED). For more details, refer to the STEM Symposium article on page 6.

MESA USA Success
From Page 1

Mayfield brought home the following HS division medals:
Academic display –3rd
Distance accuracy – 1st
Design efficiency -2nd

Following are the 2015 MESA USA National Engineering Design competition results:

MIDDLE SCHOOL

Overall – 1st Washington (Jason Lee MS), 2nd Oregon (Meadow Park MS), 3rd New Mexico (Red Mountain MS)

Technical paper – 1st Oregon (Meadow Park MS), 2nd Maryland (Lake Elkhorn MS), 3rd Utah (Granite Park Junior High)

Oral presentation – 1st Oregon (Meadow Park MS), 2nd Washington (Jason Lee MS), 3rd California (Elizabeth Hudson K-8), 3rd Maryland (Lake Elkhorn Middle School)

Technical display – 1st Oregon (Meadow Park MS), 2nd Washington (Jason Lee MS), 3rd Arizona (Montebello K-8)

Distance accuracy – 1st Washington (Jason Lee MS), 2nd California (Elizabeth Hudson K-8), 3rd Oregon (Meadow Park MS)

Object relocation – 1st Washington (Jason Lee MS), 2nd New Mexico (Red Mountain MS), 3rd Arizona (Montebello K-8)

Design efficiency – 1st New Mexico (Red Mountain MS), 2nd Arizona (Montebello K-8), 3rd Washington (Jason Lee MS)

HIGH SCHOOL

Overall – 1st California (Dominguez HS), 2nd Colorado (Mountain Range HS), 3rd Arizona (Tucson HS)

Technical paper – 1st Colorado (Mountain Range HS), 2nd Pennsylvania (George Washington Carver Engineering and Science HS), 3rd California (Dominguez HS)

Oral presentation – 1st Colorado (Mountain Range HS), 2nd Pennsylvania (George Washington Carver Engineering and Science HS), 3rd Arizona (Tucson High School)

Academic display – 1st Colorado (Mountain Range HS), 2nd Pennsylvania (George Washington Carver Engineering and Science HS), 3rd New Mexico (Mayfield HS)

Distance accuracy – 1st New Mexico (Mayfield HS), 2nd California (Dominguez HS), 3rd Arizona (Tucson HS)

Object relocation – 1st Pennsylvania (George Washington Carver Engineering and Science HS), 2nd Oregon (Liberty HS), 3rd Arizona (Tucson HS)

Dexterity – 1st Arizona (Tucson HS), 2nd California (Dominguez HS), 3rd Colorado (Mountain Range HS)

Design efficiency – 1st California (Dominguez HS), 2nd New Mexico (Mayfield HS), 3rd Colorado (Mountain Range HS)

On the Road Again

Linda Andrews
NM MESA Deputy Director

New Mexico roads were busy with MESA staff on June 8, 2015, as they headed for Bishop’s Lodge in Santa Fe. They were travelling offsite for the annual Staff Retreat to an inspiring and restful location that aided in the planning process for the upcoming school year.

Three days were spent reviewing the 2014-2015 school year and planning for 2015-2016. Sounds easy, right? Well, not so much. When you put 12 dedicated, creative people in one room, ideas fly around

so fast that one can get dizzy! It is important work but also a lot of fun to find the best things for advisors and students in terms of STEM enrichment. We came away with great plans for the upcoming year but also with a renewed feeling of dedication to our NM MESA programs.

For 2015-2016, we decided the events of our MESA Day competition, planned activity/event dates, brainstormed on many topics, shared activity and event ideas from all regions, planned regional rallies, leadership summits, statewide events, professional development meetings, and cel-

ebrated staff milestones. Regional coordinators will share the plans with Advisors at the first RAM of the year.

Two staff members were recognized as having served NM MESA for 10 years. These were Toney Begay, Executive Director, and Helena Kirkwood, Accounting Technician. As a “familia,” we all celebrated their milestones together. Each of the two received a Nambe platter engraved with the NM MESA logo. Congratulations to Toney and Helena!

We left tired but fulfilled and are ready to begin the new school year with a bang!



Photo by Rick Cole

The New Mexico MESA staff sport their new black jackets and are ready to “rumble” in the 2015-2016 school year. From left to right, Central Inner Regional Coordinator Kimi Scheerer, Southwest RC Terry Ramirez, West RC (and mother of a new baby girl) Shawndeana Smith, Southeast RC Betty Chancey, North RC Matt Solano, Accounting Technician Helena Kirkwood, State Events Coordinator Anita Gonzales, Executive Director Toney Begay, Deputy Director Linda Andrews, Central Outer RC Rick Cole, IT Manager John Davis and North Central RC Nick Kunz. This close-knit staff, alternatively known as “La Familia, delights in working together as well as with teachers and students across the Land of Enchantment.

North Region Summer Highlights

Matt Solano
NO Regional Coordinator

The forests are green and the prairies are lush as northeast New Mexico enjoys one of its wettest summers ever. In fact, a number of ranches between Las Vegas and Santa Rosa received more than 12 inches of rain between June 15 and August 15 - nearly a year’s precipitation in just two months.

But some MESA students in the region have also had a “verdant” summer. The North region had one summer enrichment program that demonstrated abundant STEM growth amongst its participants. The Robertson High School MESA program conducted a Math enrichment class

where students completed four different Algebra 2 topics. The students were able to attend the Santa Fe Community College this summer where they participated in a ropes course. They also presented their completed projects at a symposium at Kirtland Air Force Base in Albuquerque July 23. Robertson students joined other MESA summer enrichment programs from around the state to present their summer research and participate in a series of STEM workshops conducted by the Air Force Research Laboratory. Dignitaries from the Air Force and the NM MESA Board of Directors also attended the symposium to listen to student presentations and interact with students in a question and answer session.

NO MESA staff and advisors were also

busy preparing for the 2015-2016 school year researching STEM concepts for this year’s competitions and activities and making preparations for the many events that will take place during the year. The North program will begin the school year with three new advisors. They have already been trained in MESA protocol and prepared for the many challenges that will come their way. These three advisors replace four veteran advisors who had to resign their positions for various reasons. Their expertise and rapport with students will be missed, but like the new growth that follows bountiful rain, the new advisors bring fresh ideas and energy to the students at their respective schools. Look for North students to rock the competition!

Dancing with MESA and Life – Helena Kirkwood

Rick Cole
CO Regional Coordinator

Famed actress and screen legend Audrey Hepburn actually devoted more time to humanitarian causes than her renowned entertainment career. This is all the more amazing considering she earned Academy, Emmy, Grammy, Tony and Golden Globe awards – a feat unmatched by any of her contemporaries. Also considered one of the best-dressed women of her generation, Hepburn coined the phrase, “Happy girls are the prettiest.”

This slogan hangs in the office of New Mexico MESA Accounting Technician Helena Kirkwood, who shares much in common with Hepburn. Both were born in Europe (Hepburn – Belgium, Kirkwood – Ireland), could speak multiple languages, dance in multiple styles, appreciate good fashion and fine food and dedicate themselves to non-profit causes. However, only Kirkwood has experience with New Mexico MESA, where she has worked since November 17, 2005

Helena was born into a large family in Dublin in 1955. As they grew up, she and many of her siblings spread across the globe but retain close relationships in spite of often being separated by thousands of miles. Helena left home at age 21 to move to Munich, Germany on a whim.

“I had no specific plan,” explained Helena. “It was simply an adventure.”

The 5-6 blonde did not speak German but found a job as a nanny during the day so she could take language classes at night.

“It took about nine months before I could speak fluently and began dreaming in German,” Kirkwood recalled.

German fluency enabled her to get a job as a cashier at a restaurant where she met her future husband, a charming American from St. Paul, Minnesota. She then attended technical school in Germany learning computer science in German. This enabled her to land a job with an Israeli shipping company based in Munich, where she became exposed to the politics of international business. Because of the Palestinian attack on Israeli athletes at the 1972 Munich Olympics, the company took every precaution to prevent sabotage of its business, including x-raying every piece of mail shipped to the company office.

Although she enjoyed her job and life in Germany, her husband was transferred back to the United States and thus Helena found herself living in Silicon Valley, California in the computer explosion that was the 1980s. Helena worked in the high tech industry until her marriage dissolved some years later. Having no children, she then worked for a relational data base company until 1996 when Helena was confronted with the prospect of “move to San Diego or get laid off.”

Helena again chose “adventure” and opted to return to school to earn a bachelor’s degree in computer science. Ms. Kirkwood attended Mills College, a prestigious (ranked sixth in the West by U.S. News and World Report) women’s university in



Photo Submitted by Helena Kirkwood
NM MESA Accounting Technician Helena Kirkwood is good with numbers in the office but fervently dances to all kinds of “numbers” as her favorite hobby. In fact, Helena typically dances five days a week and travels the nation to participate in various dance events. Helena is pictured above dancing with Ed Scoglietti at an Albuquerque Dance Club event.

Oakland founded in 1852.

“I could have gone to any number of schools in the bay area, but I wanted to attend a women’s university,” said Helena. “I wanted to experience a ‘sisterhood’ and I did. There was such great camaraderie among the students. I’m so glad I attended.”

Helena also pursued graduate studies in Creation Spirituality, an evolving philosophy which (according to spiritual theologian Matthew Fox who initiated the movement in the 1970s) “integrates the wisdom of Eastern and Western spirituality and global indigenous cultures, with the emerging scientific understanding of the universe, and the passion of creativity. It is both a tradition and a movement, celebrated by mystics and agents of social change from every age and culture.”

“This was a life-changing experience for me,” noted Kirkwood. “It was so richly

rewarding as I began to appreciate life as never before and became passionate about serving humanity.”

In 1999, Kirkwood began working for Operation Dignity, an Oakland-based non-profit agency begun in 1993 to minister to homeless veterans and since expanding its mission to serve any homeless citizen in Alameda County (CA).

“I enjoyed working for Operation Dignity and getting to help the homeless,” Kirkwood remembered of her six-year tenure with the agency. “However, it is tough working with the homeless. You don’t often see change.”

During this time, Helena also dabbled in real estate investments as a way to supplement her income. She bought a small condominium in Oakland and also bought a house in Boise, Idaho. She traveled to Albuquerque to look at a possible purchase and became enchanted with the Duke City.

Again, being the adventurous spirit that she is, Helena made the rather spontaneous decision to resign from Operation Dignity and move to Albuquerque to pursue a job through the help of an employment agency. She connected with an agency in October, 2005, was referred to a job opening for an accounting technician with New Mexico MESA, applied for the job and was hired to begin November 17. The rest is history as Helena became an integral part of the NM MESA family, bought a home and actively engaged with the culture of the city.

“I absolutely love working for MESA,” exclaimed Helena. “The MESA teamwork is outstanding. I am so impressed with the caliber of my colleagues, their creativity, cohesion in working together and the commitment to organizational goals and the organization’s ability to make a difference in the lives of students.

“One of the biggest differences between Operation Dignity and MESA is that we see so many more results with MESA. Kids, even those from disadvantaged environments, learn and grow and achieve great things through MESA. So, the job is so satisfying. After all, education is the most important thing beyond the basic necessities of life. And MESA is stellar in STEM education. It does so much to benefit society.”

Besides her passionate devotion to MESA, Helena has become fervent about dancing. Although she has danced since she was a child, Ms. Kirkwood has become especially active as a dancer in the Duke City.

“I love the dancing community here,” stated Helena. “Albuquerque dancing is worthwhile because it is a hotbed of various types of dancing: West Coast Swing, Ballroom, Country Waltz, Argentine Tango, etc. Truly, you could dance every night of the week if you wanted.”

In fact, there are some weeks where Helena is on the dance floor every night. She also dances in festivals and contests in other cities, sometimes planning vacations around dance events. Helena notes that not only is the dancing fun but is an integral part of health and fitness for this peppy 60-year old who has the energy traditionally associated with someone decades younger than herself.

Sparking such youth, Helena has no immediate plans for retirement.

“I just want to continue to provide the best support that I can so that the MESA staff can be the best, creative people they can be,” Kirkwood reflected.

Helena was recognized for 10 years of service at a MESA retreat this summer and received an engraved Nambe bowl in her honor. Indeed, the MESA staff is enthused that this avid dancer, this passionate servant so like Audrey Hepburn in many ways but so special in her own unique ways, plans to continue “waltzing” with our organization for many years to come. Truly, Helena Kirkwood is the New Mexico MESA version of “My Fair Lady,” a role immortalized by Hepburn.

NM MESA Students Thrive During Space Camp Experience Provided by Northrop Grumman

Albuquerque, NM – A rising 8th-grade MESA student from Cleveland Middle School, Leola Begay, Truman MS MESA Advisor Lynn Schuler and Belen MS MESA Advisor Rhett Burt attended Space Camp at the U.S. Space and Rocket Center in Huntsville, Alabama in July.

These NM MESA representatives were sponsored by The Northrop Grumman Foundation. The Space Camp is a summer program in which students and teachers from across the United States have the opportunity to experience the ultimate space

adventure during their summer break.

Space Camp aims to inspire and motivate the next generation of explorers, scientists, teachers, and engineers. Space campers participated in a wide variety of activities such as building and launching rockets, simulating space travel preparation, and weightlessness experiences in the astronaut-training simulator. NM MESA advisors attended the Space Academy for Educators, a program designed to give teachers an immersive learning experience and provide them with the tools to enhance

their use of STEM concepts in their classrooms. NM MESA is proud to partner with the Northrop Grumman Foundation, who is “committed to expanding and enhancing the pipeline of diverse, talented STEM students globally”.

“For the last several years, Tracie O’Geary, New Mexico MESA Board of Director, and her employer, Northrop Grumman, have been providing Space Camp opportunities to students and teachers of NM MESA. NM MESA’s mission of motivating New Mexico’s culturally

diverse students in STEM is aligned with Northrop Grumman’s strong commitment to improve education and human services, and promote cultural awareness and diversity.” says NM MESA Executive Director, Toney Begay.

NM MESA is grateful to Tracie for seeking opportunities for NM MESA students and to Northrop Grumman for their support. Similar opportunities will certainly be sought next year for students and advisors who want to experience space science just like the astronauts.

Largest region, Southeast, will partner with NMMI for many events

Betty Chancey
SE Regional Coordinator

The 2014-15 school year is over and planning for another great year is in progress. We were pleasantly surprised to learn that the Southeast Region had more students in 2014-15 than any other NM region with a total head count of 873 students. We plan to keep this record for the 2015-16 academic year as well!

In visiting with my Advisors at our end of year Regional Advisors Meeting, I learned that most of my programs were in need of a locking cabinet to safely store tools, competition supplies, robots etc. I began contacting possible donors in addition to my SE Region Advisory Board for help in obtaining used equipment. Robby Gains, a member of the SE Advisory Board, was able to get seven new metal cabinets donated for my programs from his employer, Holly Frontier Companies dba Navajo Refinery. They purchased these beautiful new cabinets for my schools. They are 3 feet wide and almost six feet tall with locks for the top and bottom. Gary and Enid Smith of Roswell donated their time, pickup, trailer and gasoline to travel to Artesia to pickup and deliver the cabinets.

The Southeast Region is looking forward to partnering with New Mexico Military Institute again this year in a number of events. NMMI will again host the State MESA USA competition in April, 2016 and will also be providing the SE Region with middle school and high school leadership fieldtrips in September. Our MESA students love interacting with NMMI cadets and leaders at these types of events.

There are four other NMMI events in



Photo Courtesy of Betty Chancey
SE Coordinator Betty Chancey poses with Robert Boans, Assistant Plant Manager of the Holly Frontier Navajo Refinery, and Becky Neal of Bryan Printers who provided a great discount for the purchase of storage cabinets for regional MESA programs. THANK YOU!!!!!!

which SE MESA schools get to participate:

Sept 19 – Aviation and Fly-In: Students may construct a model rocket to launch, fly a drone and fly a flight simulator. The Civil Air Patrol will be on hand to do a glider demonstration and allow students to see inside their airplane.

Sept 14 -20 Tentative time for the International Space Station Fly Over: MESA students are invited to join the NMMI Flight Program cadets in connecting to the Space Station and be able to ask questions etc. The Civil Air Patrol will also be part of this event and have interactive activities with the students including planning the mission for a trip to Mars.

Sept 30 – Free Teacher Workshop – from 8am to 3pm: Any MESA teacher may attend and receive materials to use in the classroom. Attendees will hear stories from Medal of Honor recipients. Coffee will be provided in the morning followed by a Cadet March viewing and lunch at Bates. Students are invited to the evening Lyceum when a Medal of Honor recipient shares his story and students may ask questions.

Sept 28 – Oct 1 – Center for American Values at NMMI: Teachers can bring students to the Daniel’s leadership Center for a 50-minute class presented by the Center personnel. There are eight different classes to choose from. Please contact Major Lee Ann Wade at WadeN@NMMI.edu for more information on these events.

CI Highlights Include Off-Campus Learning

Kimi Scheerer
CI Regional Coordinator

The Central Inner (CI) region finished the previous school year with multiple delights. Read on to see how fun and easy it is to integrate science, technology, engineering and math (STEM) with school!

Students got to enjoy the finality of their academic year with some fabulous adventures around the state. East Mountain students traveled south to visit White Sands National Monument. Students and teachers

Education Officer Judy Stanley shared her knowledge of this amazing program while on tour. She helped our Albuquerque Public School kids see the variety and creativity of STEM careers with her friendly nature and ability to connect with students.

For some groups, keeping it local worked out best. Several schools including Albuquerque High School, Cleveland Middle School, East Mountain High School, Manzanito High School and Valley High School chose to get wild by visiting the animals and keepers at the City of Albuquerque’s Biopark Zoo. Connecting with hippo keeper Brent Tretton just before the new baby was born proved to be an interesting insight into the career world of animal keepers.



Photo by Kimi Scheerer
Cleveland MS students jump with joy after seeing a pregnant hippopotamus at the Rio Grande Zoo (Albuquerque Biopark).

learned about the geology, natural history and unique features of the monument. Personally, it was my first visit and I giggled and laughed as we sled down the dunes, flew my kite and tried to keep sand off our watermelon snacks.

Van Buren MS, led by the courageous Mrs. Aleli Colon, toured the Very Large Array near Socorro. Getting to tour the facility and chat with real technicians and engineers was a treat for the science-minded middle schoolers. After packing a picnic lunch and loading up in Albuquerque,

Finally, high school seniors within the region qualified for nearly \$19,000 of Loyalty award money. This money, provided to students after submitting their fall university/college transcripts, works to support MESA students in their pursuit of STEM careers. Both MESA seniors and their families were excited for the help in launching their college careers!



Photo by Rick Cole
NM Governor Suzanna Martinez addresses educators at the Annual NM STEM Symposium. NM MESA conducted workshops at the meeting.

MESA Impacts NM STEM Symposium

Kimi Scheerer
CI Regional Coordinator

The 2nd Annual STEM Symposium, hosted by the NM Public Education Department (PED) at the Albuquerque Embassy Suites May 29-30, was a great success as more than 400 educators from around the state came to learn more about STEM!

Looking to network, learn, share and connect about the hot topics of STEM, many educators acquired activities they can use in their classrooms.

NM MESA hosted two of the multiple workshops that were presented as a part of the two-day affair. Regional Coordinators Rick Cole and Kimi Scheerer presented educators with six STEM case study/lesson plans designed to be low cost, hands on and correlated to Next Generation Science Standards. Topics included:

1. Collecting, graphing & analyzing data using demographics
2. Data interpretation with population and climate
3. Observation, vocabulary & labeling using bees & flowers

4. Health Science with snacks and physical activity
5. Utilizing technology on campus to understand careers and curriculum, and
6. Systems science focusing on cells and community

They also covered ways to apply STEM education to the diverse demographics and cultures of NM.

Regional Coordinator Matt Solano presented tips, techniques and opportunities to use computer programming in schools. Using Alice Software, Matt guided educators through the introductory skills of this unique computer programming. Alice is interactive software that enables students to program objects, movements and tasks as part of building a video game. Matt shared tips and skills to give students another way to learn programming terminology and methods. The fun and interactive process of creating and objects across cyber landscapes, and being “silly” with technology was evident through the sound of laughter.

“STEAM” Power in the North Central Region

Nicholas Kunz

NC Regional Coordinator

Seeing the acronym STEAM may make one think of the superheated gaseous state of water. But it actually stands for Science, Technology, Engineering, Art and Mathematics. This synthesis of art and traditional STEM education is quite apparent in the investigation of the science behind music.

For example, what are compression and rarefaction? What is oscillation and how does change of speed affect it? How is a sound wave processed and recognized by the human body? Middle school students in NM MESA's North Central Region investigated the answers to these questions and many others at the end of last school year, during an interactive workshop en-

titled, Acoustics: The Science of Sound.

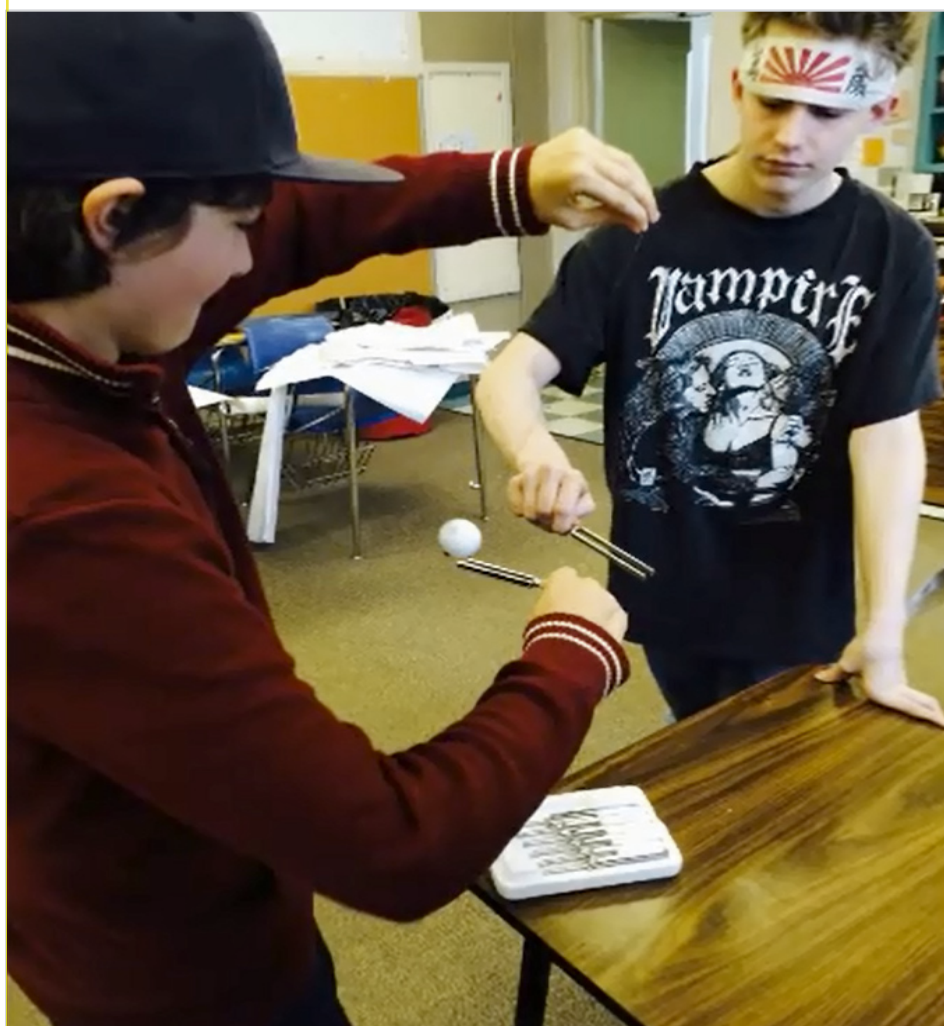
During the informational portion of the workshop, facilitated by MESA North Central Regional Coordinator Nick Kunz, students gained basic understanding of how a sound wave works, including vibration of an object, oscillation of molecules in the medium of transfer, movement of sound waves, etc. Students, who have played a musical instrument, related their experiences to the physical phenomena that produce pitch and volume to those who had no instrumental experience. Once this phenomenon was understood by all, students got up, moved around, and had fun applying these principles! Participants created a human sound wave, which began as a wave similar to those seen in the crowd at

a soccer game, but is refined to mimic oscillation of individual molecules. As they progressed through the activities, they explored the transfer of sound through a solid medium, the ability of sound to physically move objects, the nature of tuning forks and the relationship of size to frequency, and finally they produced their own musical sound.

A company called littleBits Electronics has collaborated with KORGE, a company that makes musical instruments and audio electronics to produce the littleBits Synth Kit. This pre-packaged kit makes a traditional analog synthesizer with individual circuits that attach to each other magnetically to produce “infinite combos of audio, visual and sensory experiences.”

Using this kit, workshop participants began by hearing two oscillators simultaneously producing identical tones. When one tone is slightly altered, what happens? The physical phenomenon known as “beating” was explained and demonstrated. Then students were turned loose to create their own sounds and music, like creating intervals with different combinations of tuning forks, making musical patterns with the littleBits Micro Sequencer, and exploring the auditory changes that occur when an envelope or filter is attached to an oscillator.

All in all, it was a scientific exploration of the auditory senses that changed students' perception of sound for the rest of their lives. That is the power of MESA learning!



Photos by Nick Kunz

(Left) During a workshop at Santo Domingo Middle School, students experiment with tuning forks to create sounds of varying pitch. (Right) Students use components of a littleBits Synth Kit to create a wide variety of sounds and understand the scientific principles that determine how sounds are made and sensed.

CO Summer Adventures Help Prepare for School Year

Rick Cole

CO Regional Coordinator

For students and teachers, summer is ideally a time of rest and renewal amidst a host of “fun” activities like vacation, playtime and outings with family and friends. Sometimes, summer adventures include “camp.” Such was the case for MESA advisors Rhett Burt and Lynn Schuler.

Burt of Belen Middle School and Schuler, Truman MS lead advisor, attended Space Camp the last week of July while escorting a seventh-grade Cleveland Middle School student to the event. The camp, which has been a summer destination since 1982, has trained more than 700,000 students and teachers in matters relating to space science, such as astrophysics, the engineering of space travel and the effects of low-gravity environments on life processes. Both Burt and Schuler brought home a plethora of curriculum and lesson plan ideas to enrich their classroom and MESA students this year. Some of these ideas will be shared at the Central Outer Regional Advisors Meeting (RAM) August 26.

Several new advisors in the region will be attending a RAM for the first time. NM MESA welcomes the following advisors to their new positions: Sabra Smartt – Cibola HS, Theresa Illgen – West Mesa HS, Marc Montañó – Truman MS, Joe Hartsock – John Adams MS, Julie Archuleta – Polk

MS, Andrea Jackson – Ernie Pyle MS, Elizabeth Scharrer and Michael Romero – Rio Grande HS, Chelsea Servantes – Belen HS and Juanita Silva – Belen MS. In addition, the CO region could be welcoming new advisors at Volcano Vista HS and Valencia HS. Details will be forthcoming in future Vision newsletter articles.



Socorro's Virginia Chang explored Alaska during the summer.

Other regional advisors who had exceptional summer adventures included John Davies of Los Lunas, who at 75+ years of age worked an internship at Sandia National Laboratories. Socorro advisor Virginia Chang spent part of the summer exploring Alaska while Truman Middle

School's Shelby Chavez spent all but two weeks of her summer traveling throughout the Western Hemisphere and beyond. Other advisors were more domestic and family-oriented while quietly preparing for another great year in the classroom and MESA activities.

Even the CO Regional Coordinator spent significant time preparing for the new school year. Besides a plethora of office duties and a variety of farm and vacation activities, Rick Cole attended summer workshops on forestry, wildlife biology, computer coding, newsletter management and software-based organization. He is eager to share workshop information with regional advisors and will do so throughout the year as well as at quarterly RAMs.

CO schools have numerous opportunities to partner their students with several organizations during the upcoming year. This includes Cottonwood Gulch (wilderness adventures and related field sciences), the United States Forest Service (workshops, guest speakers, field trips and internships), Intel (in-class engineering workshops) and CNM Community College (workshops, guest speakers, field trips and dual-credit enrollment). In addition, CO teachers can attend a two-day workshop on ocean exploration and research at the Albuquerque Aquarium conducted by the NOAA and the United States Naval Academy.

PDC Preview

Nick Kunz

NC Regional Coordinator

As the long, warm days of summer begin to wane, and school begins anew, NM MESA is looking to prepare each MESA program and provide tools for student, advisor and school success.

Each of NM MESA's regions will facilitate a Professional Development Conference (PDC), for advisors to prepare for the coming school year. The PDC typically focuses on providing in-depth understanding of the upcoming MESA Day competition, and the tradition will continue again this year. So here's a sneak peek!

The day will begin with a review of the MESA Day Handbook. This will be a first look at this year's two MESA Day events: Prepared Design-Prosthetic Arm 2.0, and On-Site Challenge-MESA FUNDamentals. The new prosthetic arm challenge will involve the use of electronics and programming, so significant time will be spent exploring Arduino programming, working with hands-on activities, and brainstorming ideas with colleagues. Each attending advisor will receive a kit for his/her program to be used by one of the program's competing MESA Day teams. Finally, a bit of time will be devoted to explaining and understanding MESA FUNDamentals. Students will EXPERIENCE learning in new and exciting ways using science and math.



Photo by Anita Gonzales

While touring the Kennedy Space Center in Florida in April, the 2015 NM SIFT delegation plays with rockets in the foreground of rockets designed for space travel.

2015 SIFT a “blast;” 2016 SIFT will “explore history”

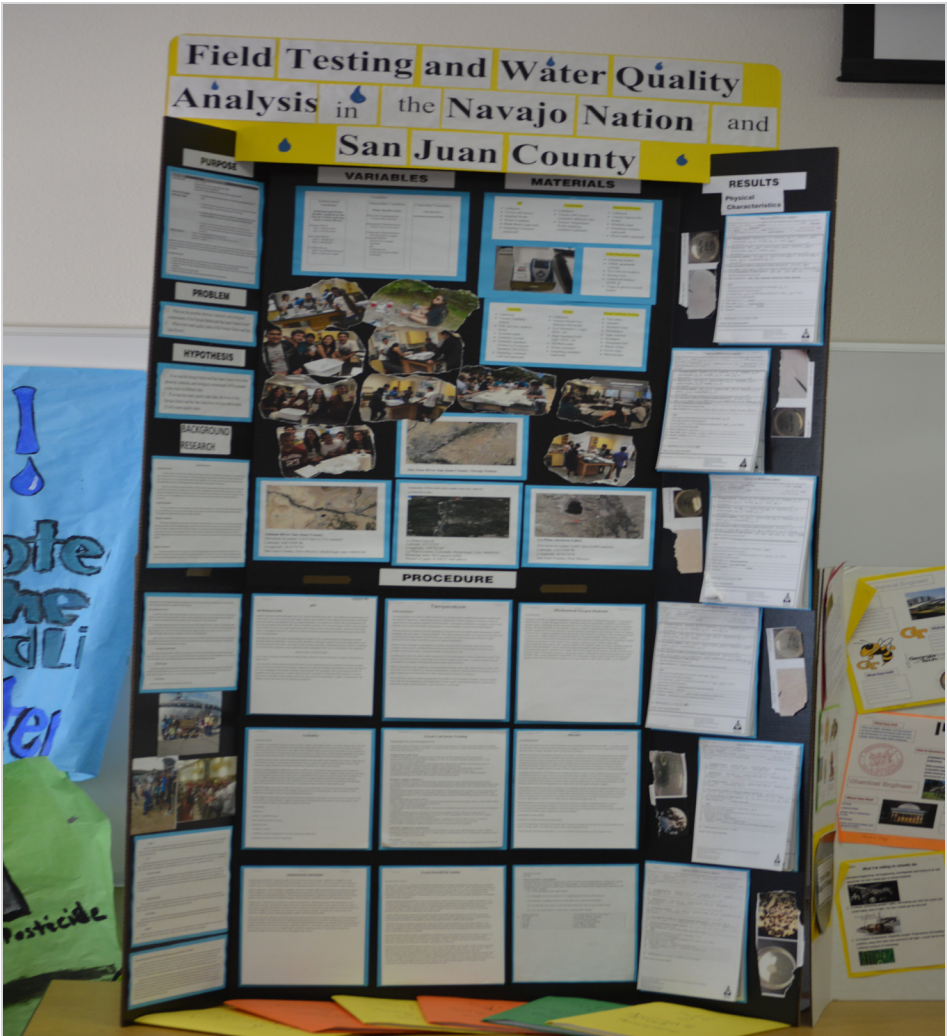
Anita Gonzales
State Events Coordinator
The annual NM MESA Senior Incentive Field Trip (SIFT) in April was a “blast” as students learned about rocketry at Cape Canaveral among many other adventures. In delightful subtropical conditions, a group of 40 participated in the 2015 SIFT to Orlando and other Florida destinations.

The happy travelers included 34 students, four teacher advisors, and two MESA staff from across the Land of Enchantment. Students were selected based upon their participation in MESA activities and application essay responses. During the trip students experienced once in a lifetime adventures: They went behind the scenes at Sea World to explore zoological careers;

they were able to calculate their own terminal velocity and learn physics while indoor skydiving; they were able to explore Kennedy Visitor Center and learn about space explorations, aeronautics, and trajectory; they were able to learn about ride design and related engineering at Universal Studios; they experienced the Florida ecosystem up close and personal through marsh

EcoTours and then there was the food! The 2016 Senior Incentive Field Trip is scheduled for April 27-30, 2016 to Washington, DC. It’s also a once-in-a-lifetime opportunity to learn and have fun alongside some of MESA’s best students. Applications will be released in the fall semester and have a completion deadline of early December. DO NOT MISS OUT!

The 2015 NM MESA Summer Enrichment program concluded with a symposium at the Air Force Research Laboratories La Luz Academy July 23. Students from around the state participated in the day-long event which included showcasing research as demonstrated by participants from Navajo Prep in the lower left photo. Indeed, this research was concluded just two weeks prior to massive contamination entered the San Juan River from an accidental spill at an abandoned mine 150 miles upstream in Colorado. Participants also play science jeopardy at the symposium as noted in the lower right photo. (Photos by Rick Cole)



VISION

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