

VISION



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Fall Issue, 2015

www.nmmesa.org

2015 AMP Conference creates enthusiasm for research

Rick Cole

Central Outer Regional Coordinator

While it was 90-degrees outside, warm camaraderie filled the inside of the Las Cruces Convention Center October 2 for the 2015 New Mexico AMP Student Research Conference. It was the camaraderie of more than 300 participants, officials and volunteers celebrating the joys of quality learning.

Amongst those participants were 75 New Mexico MESA students and advisors from the Southwest, Central Inner and Central Outer regions of the state. Response to the conference was overwhelmingly positive as students listened to national caliber speakers, workshop leaders and university student scientists. Three gourmet meals certainly contributed to the festive spirit filling the convention center.

Participants were welcomed by Ricardo Jacquez, long-time leader of the New Mexico AMP, who energized them with his zest for learning and achievement through research. Jacquez recently retired as a professor from New Mexico State University only to begin a second career as Dean of the College of Engineering, Computer Science and Construction Management at California State University – Chico. He also announced that he would be leaving NM AMP after 22 years of leadership to which he received a standing ovation.

Dr. J. Phillip King, a NMSU Civil Engineering Professor, has been appointed as the new New Mexico AMP Project Director. King began his new tenure noting that he had “big shoes to fill” and he already wears size 13. Such is the legacy of Dr. Jacquez and all that he has done for the thousands of students who have benefited from AMP participation during the past 22 years. King also gave a rousing PowerPoint tribute to recently deceased U.S. Congressman Louis Stokes, who was legendary in his support of STEM research and the recruitment of minorities to become part of these life-changing procedures.

Conference participants were also enlightened by Dr. Sandra McGuire, Director Emerita of the Center for Academic Success at Louisiana State University. Dr. McGuire presented a series of easy-to-learn methods to make studying a much more efficient process for college students (and for teachers and MESA coordinators as

well). Her speech was lively but focused, visual but applicable. Acquiring these principles for learning from the author of the renowned book, *Teach Students How to Learn*, made the conference a worthwhile academic experience in itself. But that was only the first presentation – the keynote address after breakfast.

MESA students then participated in a workshop on technical writing and creating effective abstracts before learning about water management in the American Southwest from NMSU Professor Dr. Kenneth Carroll. Carroll’s presentation was not only engaging but provocative as listeners had to consider their own use of water as well as how society would manage the precious resource of water in years to come.

The Luncheon Guest Speaker was NM Representative Sarah Maestas Barnes, a former MESA student who now owns her own business in addition to serving the constituents of her district in the Roundhouse in Santa Fe. Ms. Barnes, a 12th generation New Mexican, credited MESA with stimulating her love of learning at Laguna Acoma High School where she graduated Valedictorian. Her story is a classic tale of humble beginnings to great success because of a focus on quality education combined with wisdom. Ms. Barnes is married to Harry Barnes, a NMSU graduate, and they are the proud parents of two daughters.

The dazzle continued into the afternoon as Dr. Kenneth White, a NMSU Civil Engineering Professor, presented a bridge-building demonstration in conjunction with a PowerPoint presentation on inspecting bridges in New Mexico and around the nation. The 30-inch balsa-wood bridge built for the demonstration held nearly 100 pounds of copy paper before the glue holding the bridge components broke, allowing the bridge and its load to collapse three feet to the floor. An energetic question and answer session followed the presentation.

Energy filled the competition hall where more than 50 contestants vied for top prizes in STEM research. Officials and HS MESA students alike were impressed with the complexity and practical applications of the various research projects on display. In the end, a NMSU student took first place

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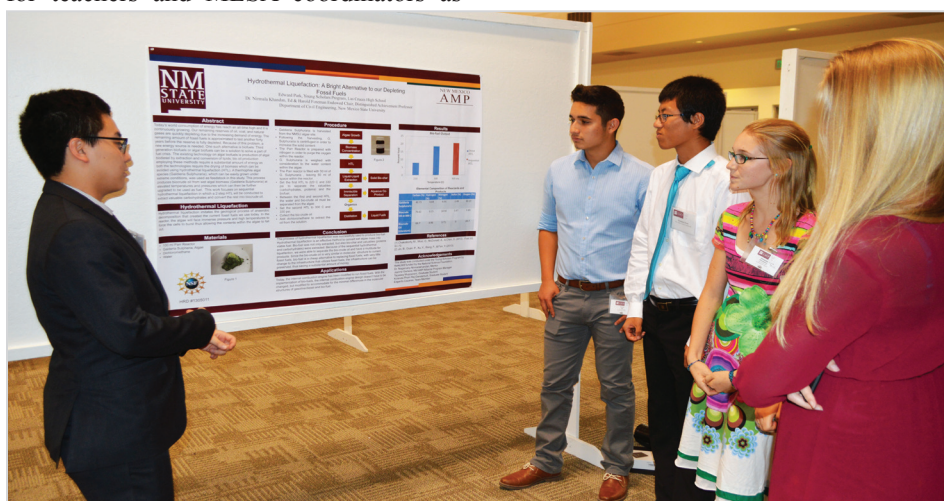


Photo by Rick Cole

Las Cruces High School MESA student Edward Park explains his research on hydrothermal liquefaction to other MESA students attending the AMP Conference.

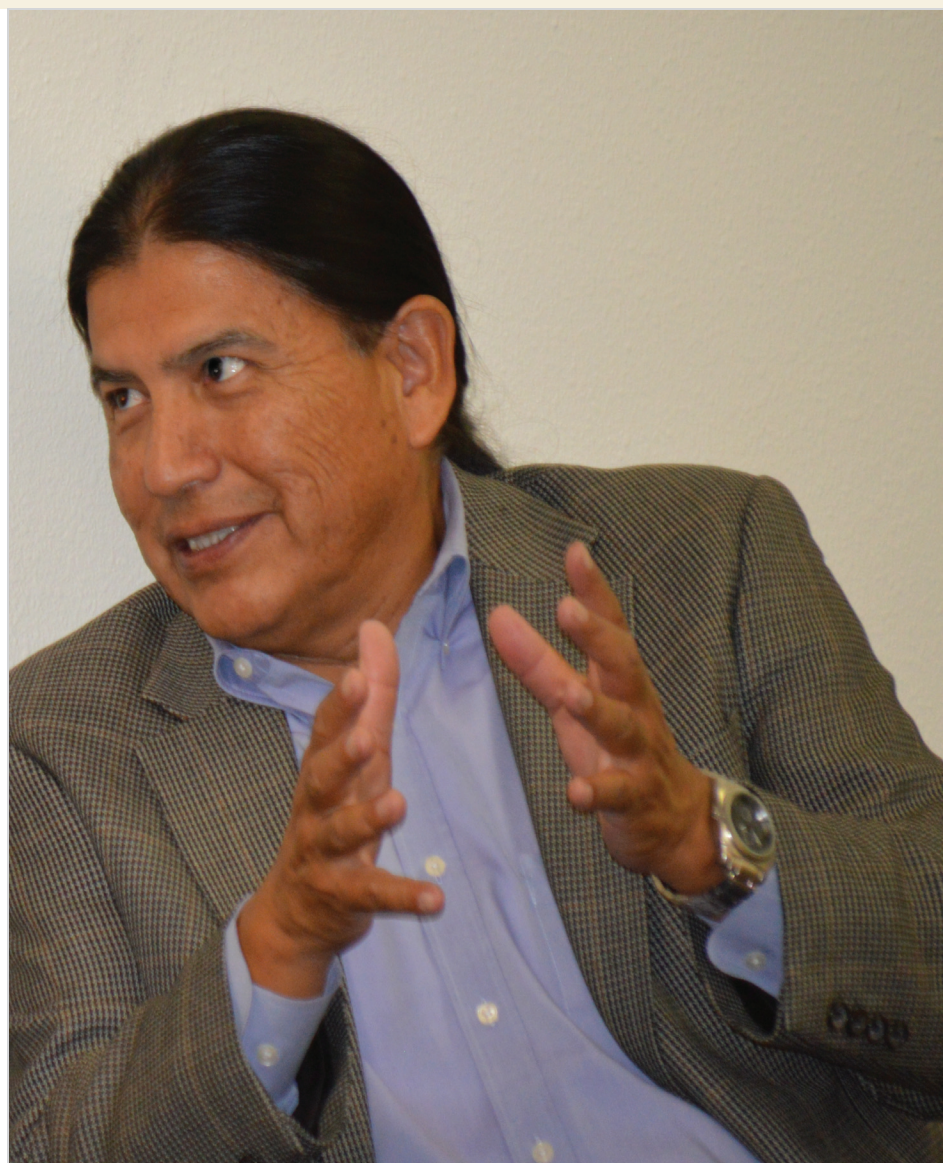


Photo by Rick Cole

NM MESA Executive Director Toney Begay explains plans for upcoming MESA activities to a NM MESA Board member after student presentations at the MESA Summer Enrichment Conference.

New Mexico MESA - 34 Years and Going Strong

Toney Begay
NM MESA Executive Director

Welcome to another edition of the New Mexico Mathematics, Engineering, Science Achievement, Inc. (NM MESA) e-newsletter. The change in the season is upon us with the cooler temperatures, leaves falling from the trees and the fascinating colors of the leaves of plants and trees. We are happy to share news of our organization from all corners of New Mexico.

With the start of the 2015-2016 school year, we at NM MESA are encouraged with our 34th year in operation. This longevity didn’t come easily. We have strived to be the best and serve as a trail blazer all those years. Our emphasis on quality and detail has been recognized by numerous organizations. We are proud of our successes and would like to share some of them with you through this electronic newsletter.

Thank you for your association with NM MESA.

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AMP Conference

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for four-year university students while Central New Mexico Community College and Southwestern Indian Polytechnic Institute students shared honors in the two-year college division.

“Wow! The AMP conference was even better than I thought it would be!” exclaimed Los Lunas High School senior and MESA Club President Damian Fountain. “I want to do research at the college level now.”

Already doing college-level research while in high school is Las Cruces High School senior Edward Park. Park is one of three high school students displaying their work in exhibition alongside the college students. But Park is no rookie to research. He has qualified for the International Science and Engineering Fair three times and has also competed in a variety of other venues around the nation during a stellar high school career.

“Research is so worthwhile,” explained Park, who is also a member of the LCHS MESA Club. “One gets to find answers to problems, maybe even do something that can change the world.”

And that is why NM MESA students go to the AMP Conference year after year: to learn that they, too, can change the world.

Jane Nguyen – MESA changed my life

Jane Nguyen
MESA Intern

I have been a member of MESA ever since I was a freshman in high school, and I am still with MESA now as a sophomore in college. MESA was the reason why I decided to become an engineer and it paved the way to my very first invaluable research

experience in high school. As a student participating in MESA, I was able to challenge myself academically, meet new colleagues from all over the state, and

get a glimpse of what I truly wanted to do with my future.

Working with MESA as a regional intern was no different. Instead of being challenged to build a robotic arm, I was challenged to create learning materials such as mathematic PowerPoints that would assist students in their own rendition of a robotic arm. I was able to experience MESA logistical efforts behind the scenes, and this only made me appreciate the work that people, ranging from the MESA staff to the volunteers, put into this non-profit organization for the sake of the students. MESA allowed me to contribute back to my pre-college community and it gave me the ability to continue to meet new people and maintain the connection with those who share the same ambitions as me. It is one thing to experience MESA as a student and it another realm to experience it as an employee.

While I was working for MESA, I realized many things about myself that I would not have been able to realize if I just kept myself working in a lab. I have learned to better express my ideas and thoughts with others. Being an engineer, communication is not one of my strong points, but it is a point that is undeniably vital in my career. The most valuable knowledge I have learned from MESA is to present my ideas in a more eloquent concise manner. Being a part of MESA is one of the most treasured experiences in my career.



Photo submitted by Linda Andrews

The NM MESA staff visited a Wax Museum in Los Angeles, CA in conjunction with last winter's National Science Teachers Association Convention—SO MUCH FUN!

FUN FOR ALL AND ALL FOR FUN!

Linda Andrews
Deputy Director

NM Mathematics, Engineering, Science Achievement (MESA)'s mission is to “Empower and motivate New Mexico's culturally diverse students with science, technology, engineering, and math (STEM) enrichment.” Does that sound like fun for students and teachers? Yes, it does! The NM MESA staff strives to create engaging and fun activities for all of our stakeholders. The staff also gets to participate in each unique activity so why not make the learning fun!

What makes learning fun? Maybe a few examples will help. Consider how NM MESA is reaching the goal of making learning fun as well as engaging and rigorous.

The Senior Incentive Field Trip (SIFT) is a great example. Selected seniors are taken on a trip that is fun, educational, and inspirational. Locations in the past have included New York City, Silicon Valley in California, and NASA in Houston. Last year was a Florida trip to Orlando. Highlights of the trip included visits to SeaWorld, NASA-Kennedy Space Center, Universal Studios, the marshes of Florida...and students, teachers, and staff went indoor skydiving. Anita Gonzales and Terry Ramirez were seen levitating above the floor with big smiles on their faces.

Terry was heard saying, “OMG, I'm getting paid to do these fun things!”

Now that was fun! Wonder what great happenings the staff will plan for this spring's SIFT trip to Washington, D.C.? It will undoubtedly be both exhilarating and

educational.

Other examples are field trip activities that the Regional Coordinators (RC) plan. Kimi Scheerer, Central Inner RC, loves to lead groups of students on fun trips through the Rio Grande Bosque to help keep the natural area pristine as they learn about the wonders of this ecosystem. She has also been known to take students horseback riding for team building events. Of course, Kimi is riding also and having a “yee-haw” time. Not to be outdone, the North Region goes to Wind River Ranch to help build rock dams. It is hard work but very fun and rewarding. Alejandra Carmona, the new North RC, already has the students working on conservation and sustainability in northern New Mexico.

The Southeast and Southwest regions like to see how the oil and gas industry works in New Mexico. Betty Chancey and Terry Ramirez travel to Artesia with their schools to tour the oil fields, learn how geologists can determine the presence of oil in a specific rock formation, examine how engineers obtain oil from the ground and how it is then refined for a plethora of uses in society. All that is complemented by feasting upon the great barbeque supplied by the oil industry. Students even build small pump jacks using engineering design principles. NM MESA staff members love this trip and can't wait to go every October.

The Central Outer region and RC Rick Cole takes students to a wide variety of engineering and laboratory facilities in addition to as many outdoor sites as possible. Don't be surprised if Rick has one

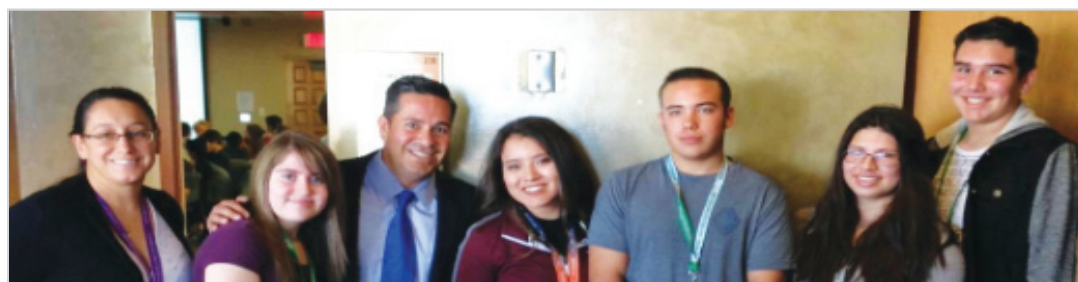
group of students analyzing food production technology in the morning and blood pathogen detection in the afternoon only to take another group to assess river basin characteristics the following day. And, of course, hiking up the nearest high mountain in the name of STEM seems to get in the itinerary!

Shawndean Smith, the West region RC, likes to take the students to the various colleges in the region. She also sent many schools out to New Mexico national parks one year to enjoy what the state has to offer in terms of land formations. The North Central region, led by Nick Kunz, is definitely providing fun activities for all: working in Georgia O'Keefe's garden in Abiquiu, volunteering at the Tesuque Pueblo Agricultural Initiative, visiting the versatile and economical sustainable green building designs of the Taos Earthship Biotechture Center, and visiting El Monte Sagrado in Taos to see the Biolarium and The Living Machine, a holistically designed eco-structure that incorporates recycled water, plants, and rock formation into a self-sustaining ecosystem that flows throughout the resort and creates an enclosed, lush sanctuary around the resort's pool.

So, the NM MESA staff creates great activities for students, teachers, and themselves for STEM enrichment but also as a reward for working hard to become the STEM leaders of tomorrow. Fun is contagious and students return year after year to see what is next on the NM MESA agenda. Kudos to the NM MESA staff for making STEM learning FUN FOR ALL AND ALL FOR FUN!

Photo by Nick Kunz

Student leaders and staff of the Pojoaque MESA program gather around U.S. Representative Ben Lujan at a recent MESA activity in the North Central Region. Part of the fun of MESA is meeting leaders.



Powered by Passion

Shawndeana Smith's passion for family, rodeo and MESA

Rick Cole

Central Outer Coordinator

Shawndeana Smith is passionate about rodeo. Indeed, she has competed in virtually every rodeo arena in eastern Arizona, western New Mexico and many other spots beyond. The 5-3 spark plug of energy parlays this passion for excellence to effectively nurture and support her husband and three children while also motivating and inspiring thousands of students as the NM MESA West Regional Coordinator.

Mrs. Smith, the former Shawndeana Parker who is affectionately called "Sparky" by her colleagues, has been competing in rodeo since the age of eight. She has concentrated primarily on barrel racing but has also done some breakaway roping. Her deep love for horses and longing to compete has motivated her to participate in rodeo through high school, in college and through her adult life.

"I lived for rodeo," explained Shawndeana. "As soon as school was done, I'd be on my horse. And even after I grew up, when I finished work, I'd be on my horse."

This dedication to perfect her horsemanship carried over to Shawndeana's efforts at Chinle High School. Shawndeana was an honors student, who took as many science and math courses, including calculus, as she could. Her focus on a STEM education was because her love of horses also motivated her to become a veterinarian. She majored in Veterinary Science and minored in Chemistry at the University of Arizona graduating in 2004.

However, about the time she graduated, it became apparent to Shawndeana that a career as a veterinarian was not a practical choice for her.

"I'm very dedicated to my roots," noted Shawndeana, who is a proud member of the Navajo Nation. "I knew that I was going to go back to the reservation to work with my people. But there is little demand for a vet on the reservation. Most people there don't use a vet. There is hard access to services and poor funding. I couldn't see myself going into big debt to go to vet school and then not have a lucrative income to pay for it."

Thus, not being sure of what she really wanted to do besides rodeo, Shawndeana worked for Coronado National Forest in Tucson for two years before returning to Chinle where she worked brief stints for a tribal agency and as a substitute teacher, none of which were satisfying.

"I got to where I was willing to work anywhere just to get a meaningful job," Shawndeana remembered.

Then her dad saw an ad in the paper for a job opening with New Mexico MESA in Gallup and encouraged her to apply, even though Gallup is 90 miles from Chinle. Shawndeana applied, was interviewed and hired. Soon she was packing up all that she owned, including her horse, to move in with relatives in Gallup to begin her career with NM MESA.

That was October of 2006 and in the subsequent nine years the West region has grown and changed much for the better. However, Shawndeana notes that MESA has changed her just as much.

"I grew up in MESA. I'm a totally different person now than when I started," Shawndeana recalled. "I grew up an only child and everything revolved around me. At first I worked, practiced with my horse every day after work and rodeoed every weekend. But as I got into the job, I saw how I was able to make a difference in



Photo submitted by Smith Rodeo Photos

Shawndeana Smith is more than the West Regional Coordinator for NM MESA; she is also a skilled breakaway roper as demonstrated above. Smith has been competing in rodeo since she was 8, focusing on breakaway roping and barrel racing.

kids' lives. My eyes were opened to the possibilities with STEM education, and I became very motivated to educate students as to the possibilities in their lives with a STEM education."

Not only did Shawndeana find a career that reignited her passions for STEM education and serving her fellow Navajos, it still allowed her to rodeo and it is there where yet another passion ignited...with Kyle Smith.

"I had heard of Kyle, because he was a good steer wrestler and we were often competing in the same rodeos," said Shawndeana. "But we finally met and I really liked him. We were together for two years and I still didn't know if I wanted to

get married because I had seen too many bad marriages and didn't want to do that. So people were surprised when Kyle and I did get married."

Now Kyle and Shawndeana are the proud parents of three children, Luke -6, RaeLee - 4, and Blake - 4 months, and her passion for family is the strongest passion of all.

"I now have a different vision for life," states Shawndeana. "My vision revolves around my family. I am still pushing to make great things happen with MESA, but it is with my family in mind. As much as ever, I want my MESA students to thrive, but I am making sure that my children grow up to be educated, respectable human

beings."

And the passion is now passing on to the next generation.

"Luke is now riding my horse," chuckled Shawndeana. "And he is doing it because he wants to. He even became a wooly rider (riding sheep) on his own this summer. We haven't pushed him, he just loves doing it."

Shawndeana's passion for rodeo is no longer focused on her own ability. Nor is her passion for STEM confined to her career. The passion of Shawndeana Smith is focused on others and how to make their lives better. Continuing to live with such passion, the West region of NM MESA will never be the same.



Photo by Linda Andrews

A family passionate for life: (from left to right) Shawndeana, baby Blake, Luke, RaeLee and Kyle. Be it loving each other, education or rodeo, this family lives each day to the fullest.

From ‘Beshbitoh’ to How ‘Best We Go’

The Journey of NM MESA Executive Director Toney Begay

Rick Cole

CO Regional Coordinator

New Mexico MESA has prospered and effectively enhanced STEM education among middle and high school students during the past 10 years because of stable, progressive leadership. Although many individuals have contributed to MESA success, the visionary leadership of Toney Begay, who has served as NM MESA Executive Director for the past nine years and has one year additional experience as a regional coordinator, has been especially crucial to effective MESA service to the Land of Enchantment.

Begay, who is also the President of the 10-state MESA USA, brings a wealth of significant and unique experiences to his role as NM MESA’s leader: a B.S. in Environmental Chemistry, published scientific research, an internship and employment in analytical chemistry at Los Alamos National Laboratory, grant management for the All-Indian Pueblo Council, a Presidential Appointment in coordinating federal education policy with Native American Colleges and Universities and legislative analysis for the NM Legislature. This combination of scientific and political proficiencies enabled Begay to be especially qualified to lead NM MESA.

But Toney’s beginnings were certainly quite humble. He was born the eighth of 13 children to Navajo parents who did not speak English and had no formal education. He was also born in a village so small and remote that it is not even named on maps of the Navajo Reservation, which is generally

of artists and photographers come to capture its scenic delight each year), it was one of the last large-scale areas in the nation to get electricity, the internet and even modern water systems.

It is into this culturally rich but economically impoverished landscape that Toney began his life journey of discovery and building relationships which would serve him so well later in life. Some of those discoveries were in conjunction with his grandfather, a renowned medicine man in the area.

“He (grandfather) taught all of us different ceremonies,” explained Toney. “These were religious, spiritual activities to help people. Among other things, this included three different series of night chants – one group of nine night (ceremonies), another of five nights and yet another of two nights – which were learned through oral tradition.”

Toney’s father also became a medicine man later in life, not only helping his neighbors spiritually but also helping preserve Navajo traditions. However, as much as Toney respects his heritage, he felt led to pursue learning the ways of the world through a formal education. And his parents agreed. So, at the tender age of five, Toney left home for boarding school as there was no school within walking distance and there was no school bus service to and from the towns. Toney attended the Keams Canyon Boarding School through eighth grade but was able to come home a few times during the school year.

“Sure, it was hard to be gone that long,” Toney recalled. “But my mother and father wanted us to go to

school, and even though they did not know what an education was, they knew it was a good thing. They could see the roads, buildings and economy that resulted from an education.”

“And the BIA (Bureau of Indian Affairs) had this grand plan for education. They built schools – boarding schools – that kids could attend in spite of distances and the lack of infrastructure on the reservation.” To help his children get their educations and support his large family, Toney’s father often took jobs off of the reservation. Indeed, he sometimes got jobs with the railroad where he would be gone for months at a time. Thus, for parents and children alike, being gone from home was a part of living, a part of survival.

High school was completed at Holbrook, 70 miles south of Keams Canyon. Toney attended and graduated from Holbrook High



School while living with other reservation students in a dormitory in town. Again, because of the distance and because the family did not have a vehicle for Toney to drive back and forth, he didn’t go home like he would have liked. This was a routine that Toney and all of his siblings followed. All 13 earned their high school diplomas in spite of the separation from home and family.

However, Toney was hungry for more. “I knew I was smart enough to go to college. I knew I could do it.”

Toney and a group of friends were admitted to Arizona State University in Tempe, a college campus with 40 times as many students as Holbrook High School. Not only was it a huge complex with big classes, it features the hottest overall climate of any major American university. There were many adjustments to be made and Toney found himself struggling and eventually leaving after three semesters.

“I went there (ASU) because my friends went there,” said Toney. “I had to leave because I didn’t know what I wanted. I didn’t know what I wanted to study.”

As a result, Toney returned home and landed a job with the Navajo tribal government in an environmental science capacity. The director of the agency for which Toney worked (Mr. Tso) had a degree in biology and motivated Toney to learn and apply scientific principles. Toney also had to become familiar with the statutes of the Clean Water Act. Mr. Tso challenged Toney to return to college and get a degree so that he “could better serve his people.”

Thus, in 1982, after three productive years working for the tribe, Toney returned to college – this time to Northern Arizona University in Flagstaff. Toney initially majored in environmental science, but when this program was dropped by NAU, he changed his major to environmental chemistry. Toney thought seriously about this major switch, contemplating if this is what he really wanted to do.

A NAU Professor, Dr. Savage, observed Toney’s pondering and commented, “Toney, you’re not gonna make it.”

“Well, that pissed me off,” exclaimed Toney. “I became determined to make it. And three years later, just before I was to graduate, I went to Dr. Savage and told him, ‘You said I couldn’t do it. But I did do it.’ His comment to me was a big motivational factor for me to learn and succeed.”

While pursuing his chemistry degree, Toney participated in a minority emphasis biology grant where minority students conducted original research and presented their findings in formal papers and presentations in forums around the nation, including Washington D.C. and Miami. This not only sparked his passion for research, but enabled Toney to polish his public speaking skills and build a network with students and professionals around the nation. A colleague of Toney’s research professor asked him if he’d be interested in an internship with Los Alamos National Laboratory. Toney replied yes and so without an application or an interview, Toney secured an 18-month internship at LANL in molecular biology and flow cytometry research.

“The hardest part about getting that internship was calling Mr. Tso,” noted Toney. “He had a job waiting for me back at the tribe, but he understood my choice. He said, ‘That’s great. That’s pure research.’ And so I went to LANL.”

Using flow cytometry, Toney then began conducting research on how to separate chromosomes that became the forerunner of genetic mapping that is now crucial to the development of so many medicines. Upon completion of the internship, Toney was able to secure a full-time position with LANL as an analytical chemist. Indeed, he was analyzing the nuclear waste stockpiles that have been a point of serious concern since LANL was built during World War II. Toney enjoyed the scientific challenge the job presented to him. And he also enjoyed building relationships with top-notch scientists.



Photo courtesy of the Bureau of Indian Affairs

Keams Canyon, the nearest incorporated community to Beshbitoh, is located in a sheltered valley in the heart of the rim-rock country that constitute the reservations of northeast Arizona.

considered remote in the first place. Toney was born in Beshbitoh (Navajo for “Iron Water”), which is about 15 miles east of the “big” town of Keams Canyon, which had an official population of 260 in the 2000 census.

The Beshbitoh Valley, in the western reaches of the Navajo Reservation and not far from the eastern boundary of the Hopi Reservation, features scattered Navajo dwellings and averages 28 citizens per square mile according to the US Census Bureau. Many of the dwellings are traditional hogans dotting a landscape of sagebrush valleys and juniper/piñon shaded mesas. Subsistence farming of corn, squash and other vegetables accompanies small-scale animal husbandry of sheep, cattle and horses. Although the natural beauty of the terrain is striking (scores of movies have been shot on the reservation and thousands



Photo courtesy of Northern Arizona University

Northern Arizona University is nestled in verdant pine forests at the base of the majestic San Francisco Peaks in Flagstaff. It is here that Begay developed his passion for scientific research, experimentation and a long-lasting commitment to academic excellence.

But one thing began to nag him even as he was working at one of the most prestigious scientific laboratories in the world: Less than 10% of the LANL workforce was Native American and each day when he commuted to work from Santa Fe he would travel through the Tesuque, Nambe and San Ildefonso Pueblos, he would witness the relative poverty of the reservations while he would work with state-of-the-art equipment in a billion dollar facility.

“The lab did outreach to Native Americans, but it seemed to be more lip service than a serious effort at recruiting,” stated Toney. “I began to think about how I could make a difference (for Native Americans).”

An opportunity to make a difference came about through a job opening with the All Indian Pueblo Council in 1996. The

Council had struggled to effectively manage an EPA grant and needed someone to properly administer the grant. Toney applied for the position and was hired. He resigned from LANL and then worked diligently to monitor the grant and capitalize on his relationships with LANL and other agencies to fulfill the grant obligation.

After a couple of years, Toney was encouraged by his college friend to apply to manage a US Department of Energy grant to establish science education programs and facilities with several southwest Tribal Colleges. He got the job and Toney worked with the Southwest Indian Polytechnic Institute in Albuquerque, the Crownpoint Institute of Technology and Dine College in Tsaile, Arizona.

Consistent strides of improvement were made in STEM research at each of these institutions as Toney managed the Tribal College Initiative project. And Toney's successes did not go unnoticed as he was asked by President George W. Bush to fill an appointment as liaison between the U.S. Department of Education and the Tribal Colleges and Universities. Toney's response to the request was "Hell yeah!" as he now had a chance to affect STEM education



Photo courtesy of White House Archives
President George W. Bush appointed Toney Begay to be a special liaison with the U. S. Dept. of Education.

for Native Americans on a national scale. So, in January, 2002, Toney packed up the car and left his wife, Elizabeth, and child in Albuquerque to move to Washington, D.C. to begin his quest to enhance Native American education. Over the next two-and-one-half years Toney traveled around the country meeting with Tribal College officials to try and align the President's education agenda with the government worker's agenda with the people's agenda. And when he was in Washington, he was traveling the halls of Congress to meet legislators or traversing the Department of Education headquarters to consult with Secretary Roderick Paige, the much-heralded former Superintendent of Houston Public Schools, who radically improved student performance in that district with tough, no-nonsense reforms, and/or his legions of staff. Toney acknowledged that he was very busy during this time, but he learned how to work the (federal education) system even though he only had limited success in changing policy at Tribal Colleges.

"Because Bush was a Republican and most Native Americans are Democrats, they were not too receptive to his agenda," recalled Begay. "This was in contrast to the Historically Black Colleges and Universities and the Hispanic Serving Institutes, which seemed to adjust to policies no matter who was President. I found that a lot of the time, I was just spinning my wheels."

But through this Presidential appointment, Toney had experienced politics and yet still had a passion for STEM careers and education. And he knew that the appointment was temporary and that someday he would return to Albuquerque and his family. So in late 2004, Toney returned to the Duke City and promptly approached the Republican Minority Whip of the New Mexico House of Representatives saying that he would like to volunteer in working for the legislature. However, after review-

ing Toney's extensive résumé, the Whip informed Toney that he didn't want him as a volunteer, he wanted him as a full-time employee for the 2005 legislative session and that he also found funding to pay his salary.

Thus, after learning much about how the federal government operated during his Presidential appointment, he now began to develop expertise in how the state legislature functioned. Indeed, Toney began to do work akin to that of the Legislative Council Service: research, consulting with legislators, drafting bills, legislative committee presentations, bill revisions, amendments, etc.

"I learned the state government system for a year," explained Toney. "I knew pretty much every representative and senator. This job was not STEM policy. But it helped me understand how legislation makes policy."

Again, Toney knew that this was not a permanent position and a job opening for North Central Regional Coordinator of NM MESA caught his eye in the summer of 2005. He applied and was hired in August and began to blend his practical knowledge of laboratory skills with STEM education policy and MESA protocol to administer the region. Toney thrived on helping inspire students to prepare for STEM careers but his legislative skills were not forgotten and he received a phone call asking if he could work the legislature again in 2006.

"They (legislators) told me, 'We really need you,' but I also had all my MESA duties," said Toney. "However, I had an excellent, excellent assistant in Daryl Garcia. And after talking it over with the Executive Director and Daryl, we worked it out where he could fill in for me while I worked the legislature juggling back and forth between liaison work and legislative analyst. It wasn't easy, but we made it happen with lots of hard work and some all-night sessions. And we achieved many great things for MESA during that legislative session."

Four months after the legislative session concluded, Toney was appointed by the NM MESA Board of Directors to serve as the Interim Executive Director as the previous director resigned. At first he did not want to apply for the Executive Director position, but after thinking about it and this golden opportunity to develop two of his greatest passions – STEM education and STEM career preparation – Toney applied and was selected.

"I knew that my experience, my knowledge and relationships were essential

to MESA success," explained Toney. "I knew that I could build this organization."

He assumed his new duties August 5, 2006 and has faithfully served in that capacity for the past nine years, which is believed to be the longest running tenure of any Executive Director in the 34-year history of NM MESA.

Personal sacrifice has been necessary for Toney during this time frame due his family moving to Austin, Texas. There have been many trips to and from Austin to keep the family bonds strong while Toney steers the ship that is NM MESA.

"Steering the MESA ship" is a complex journey that takes vision. Toney began the journey by strengthening the relationships with the sponsoring institutions at the time: New Mexico Tech, New Mexico Highlands, UNM, UNM-Gallup, NMSU and ENMU-Roswell (Santa Fe Community College has since been added). Toney worked with management of each of these colleges to increase rapport, cooperation and subsequent support of MESA. Toney notes that this is an ongoing task.

In addition, he worked closely with the NM Public Education Department and the offices of the Secretary of Higher Education to make these personnel aware of MESA and its mission and how supporting MESA aligned with their respective policies. This bond-building also continues to this day. Both Hanna Skandera, NM PED Secretary, and Barbara Damron, NM HED Secretary, attended and presented at the NM MESA Legislative Day at the State Capitol March 17, 2015.

Other key initiatives that Toney has pursued and established include –

- MIMS (MESA Information Management System) – a database unique to New Mexico MESA (amongst the 11 MESA states) that facilitates the entry, access, retrieval and analysis of student and



Photo by Rick Cole

Begay challenges students to evaluate their experiences, competitive and academic, at the MESA USA State Championship in April.

advisor data.

- Information Technology Manager for NM MESA to coordinate, monitor and troubleshoot the entire computer network, respective softwares and associated equipment to make the organization fully functional for 21st-century communications.

- Campaign to identify, recruit and utilize the talents and energies of the thousands of NM MESA alumni.

And after nine years at the helm, Toney is still visionary for NM MESA's future. He wants to enhance the stature of NM MESA among the other MESA states through operations, competition results and data collection. This will be achieved through enabling the NM MESA staff to have a true understanding of the program.

"We're really good at putting on and coordinating events," notes Toney. "But we don't really look back and evaluate – did it do what we want it to do? If I can get the staff to understand that, we would be so much more effective."

Hence, Toney spearheaded the formation of a new strategic vision for NM MESA this year that includes the staff evaluating each and every function to determine strengths and weaknesses of the event. Adjustments can then be made accordingly.

Quality, rather than quantity, is also the name of the game. NM MESA has been as big as 125 member schools but is currently about 105. At this point, Toney is focusing on making sure that NM MESA maximizes achievement among these schools in terms of making sure that 1) Students take the math and science courses necessary for adequate college and career preparation. This is true at both the middle and high school level; 2) Competitions include fewer events but every team from each school participates in every event. The emphasis is on teamwork to succeed in a variety of STEM applications rather than specializing in just one; 3) Increase emphasis on higher levels of technical applications. Students will learn to use and apply more sophisticated technology as a part of MESA curriculum and competitions.

"There is no looking back," Toney summarizes. "We have to embrace technology and work together to prepare students for the future. That is why I am confident that we will make progress. We have a dedicated staff and we have a very good board of directors. There is positive feedback and so much can happen because the board works well together and with me."

The journey from Beshbitoh, Arizona to the NM MESA headquarters in Albuquerque is less than 250 miles. But for Toney Begay, it is the journey of a lifetime that is preparing thousands of students, including many Navajos, to plot their own journeys of self-discovery into the realms of science, technology, engineering and mathematics. It is not the same medicine of his grandfather, but it is delivering vision and purpose.



Photo by Mike Caruso

NM MESA Executive Director Toney Begay has spent many a day in the New Mexico State Capitol during the past decade, first as a legislative analyst and then on behalf of MESA. In 2006, he worked the Capitol in both venues. "I knew pretty much every representative and senator," Begay noted. This relationship with legislators and a working knowledge of the system have been invaluable to Begay in guiding MESA's growth and success in STEM education enhancement.

North Coordinator Alejandra Carmona learning through MESA adventures

Alejandra Carmona
North Coordinator

Hello! My name is Alejandra Carmona. I am pleased and honored to be a part of the MESA community. I am happy to say that I am the NEW North Region Coordinator! I started off with the MESA team as an assistant for the North Region but like leaves in autumn, things have changed. I have taken the responsibility and, of course, amazing journey as Coordinator.

I am originally from Albuquerque, NM and have a background in Psychology, Spanish and American Studies. I have a strong experience working with youth and I am looking forward to learning more and adding a twist to student experiences.

In the past month, I have experienced so many new and aspiring things, events and ideas from students, advisors, other regional coordinators, MESA leaders and community members! I am having an amazing time visiting schools all around the North Region and learning what they are all about.

All this has been getting me into the groove of things here in the North. We recently held a leadership event, which I am proud to say was a success. I had eight schools attend, bringing together about 75 MESA high school and middle school students! All who attended learned about leadership and about other MESA Day related topics. I learned three main things from students at leadership: 1) Be aware of others around you, especially the young ones - they're always watching! I had a student from Santa Rosa Middle school ask me, "Why

are you taking so many pictures of us?" I did not think to let them know I would be capturing memories that day! This led to 2) Question everything! And 3) I learned that educational activities can sometimes break the law.

Do not be alarmed! I learned my lesson, handled it with care and was excused! Elyssa Duran, Bureau of Land Management Forester, and awesome presenter had students simulate two types of forests.

The students modeled a thin forest and a crowded forest using a few materials: styrofoam, sticks, cupcake holders, and newspaper.

The students and Elyssa went outside, where Elyssa demonstrated the difference in how fast forests catch fire by burning their models. This was a very exciting and interesting activity for students.

Not aware of potentially breaking the law with this educational activity, we continued to go right ahead. Unfortunately the fire department was called and came to visit the workshop. The gentleman who came and inspected was mostly impressed with the idea and let it go on. He stated that

he might use it for training his department.

I never thought MESA would bring such edge and excitement in my life, but it has indeed. MESA has also brought plenty of joy from watching many young and smiling faces not only at leadership but at every site visit and workshop that I have done. I continue to look forward for more! These young and eager students sure bring back memories of me when I was a MESA student. I thank them for that.



Photo by Rick Cole

Alejandra Carmona speaks to students at a leadership event at West Mesa High School in her first week on the job.

Central Inner Region explores nature, museums and begins Rallies first

Kimi Scheerer
CI Coordinator

Central Inner MESA students and teachers have moved into the Fall season with excitement! Our region has had two Litter & Learning service learning events along the Rio Grande this school year. During each hike students learned about their local aquatic ecosystem and left the world a cleaner, happier place. Our region has one hike per month that any MESA student can attend - friends and family are also welcome. Check out the Central Inner webpage to see the date and location of the next one.

We have also experienced the natural and human-created wonders of our region. Van Buren Middle School, with teacher Aleli Colon, visited the Valle de Oro National Wildlife Refuge in October. Students worked with Talking Talons educators to understand water quality, macro-invertebrates and exotic/invasive plants management. Working with government officials, students worked to determine the type and amounts of "water

bugs" in the agricultural drainage ditch. We were surprised with a fly-by of seven Sandhill Cranes at our picnic lunch along

the Rio Grande.

Upstream, East Mountain High School with teacher Marie Booth, popped into



Photo by Kimi Scheerer
East Mountain High School MESA students revel at the NMNH as part of a super-fun field trip.

Learning Highlights North Region

Alejandra Carmona
North Coordinator

In Northern New Mexico, October brought continuity and change throughout the landscape. The Aspen leaves turned yellow, the air outside became crisp, and the overall beauty high up in Carson National Forest is just breathtaking!

Not only is the North Region rocking new colors on trees, but two schools are rocking NEW advisors as well! But do not forget, the North is thankful for the hard work and loyalty of the previous and current veteran advisors. This year Springer High School and middle school will be mentored by Nancy Kastning, and Memorial Middle School will be mentored by Leroy Conway.

To highlight what students and advisors have to offer in the North region, the following story gives a better picture. Nancy Kastning brings great energy and plenty of experience to our MESA program as a new advisor. Nancy is working towards teaching her students grant writing as part of their Service Learning project this year.

"Our goal in our service learning project is to make the best science laboratory in this MESA region." So far students have inventoried supplies, and thrown out old stuff. MESA students have been divided into five groups: life science, earth science, environmental science, physics, and chemistry. They are in the middle of seeing what works and what they need." Nancy

says, "Once we get lists of items the school cannot afford to buy but yet we still need, we will start writing grants to obtain equipment and supplies from various granting organizations; such as the American Chemical Society and the American Geological Institute."

Before teaching, Ms. Nancy Kastning was a Research Scientist for many years, and she will be teaching grant writing to her students with help from mentors at several universities. Ms. Kastning noted that students have self-initiated to work numerous after-school hours on the project. Wow! I commend Springer for setting high standards for everyone this year!

Many other schools in the Region are also setting the tone for this year and are actively participating in regional events like leadership, field trips, as well as workshops. At the North Region leadership event, students were exposed to knowledge that covered the Natural Resources Sciences. Kenneth Alcon, who is the District's Conservationist, donated his time to present to MESA students about his career and what the Natural Resource Conservation Service is about. Students seemed inspired by Alcon's career and asked about internship opportunities at his office. With hard work and determination from the great advisors in this region and support from the Regional Coordinator, the North students will produce amazing outcomes this year!



Photo by Alejandra Carmona

Building a forest model to determine wildfire potential is just one of several engaging activities at the North Region Leadership Conference in October.

Albuquerque's Old Town to see National Geographic's 3D movie Robots at the Museum of Natural History and Science's Dynatheater. The 45 minute show amazed us with the variety and history of Robotics. It's a recommendation for any MESA group traveling into Albuquerque! Students also wandered the Old Town area and stopped in the Innovation gallery at the Albuquerque Museum of Art and History.

Other adventures included the development of a prototype remote-controlled prosthetic arm that has been demonstrated at several of the regional schools. Site visits included tips on how to design, build and code prosthetic arms in addition to building relationships.

The MESA Central Inner region hosted its Rallies at three different community centers in late October and early November. We will be continuing our fall activities with campus-based leadership workshops and continuing to prepare for MESA Day.

Arduino for 2016 MESA Day

John Davis
IT Manager

New Mexico Mathematics, Engineering, Science Achievement (NM MESA), as part of the 11 state MESA USA organization, develops competitions that stimulate students to develop Science, Technology, Engineering and Math (STEM) skills. This year one of the competitions is the Prosthetic Arm 2.0 event.

In last year's competition, the students built a prosthetic arm that they controlled mechanically. The students had to perform certain tasks with the arm to demonstrate the arm's effectiveness. This year, the students will still have to perform certain tasks with the arm but will now operate the arm remotely using an Arduino board and code.

The NM MESA students, like all MESA students in the 10 other MESA states, will use the Arduino board (about 2x3 inches) that has a microcontroller (the CPU brain), inputs, and outputs that connect to objects like sensors and motors. The students will program the board with Arduino code to control objects.

In the competition, there will be teams of 2-4 students. The students will: research the project and develop a plan to build the arm, make a budget (under \$80) and purchase materials, build the arm using their hands-on skills and the engineering process, and write programming code to control the arm. They work together as a team and, based on student responses, the value of teamwork is one of the aspects they like most about the event.

This competition reaches schools and communities that might not otherwise have the chance to interest their students in programming. In urban areas of the state there are a lot of STEM programs in which students can participate. But New Mexico as a state has a large portion of its population (23%- 2010 Census) that lives in rural communities. NM MESA, as part of our mission, strives to empower underserved students, giving them the same STEM education enrichment opportunities as those students that live in urban areas of the state.

Sixty percent of NM MESA students live in small towns or rural New Mexico, where technology is not easily acquired and many careers require students to move to where the jobs are found. This competition allows students to learn that there are many opportunities in computer programming to serve not only the local community but also to work at home hundreds of miles from the employer's office. According to the United States Bureau of Labor Statistics, computer programmers make on average \$74K a year.

We understand that many schools in New Mexico have some programming classes and introduce students to technology. However, many schools do not have this offering. This event allows all the students that are in NM MESA across the state to participate, learn the relatively simple Arduino language, and use it to control an object (Prosthetic Arm). It may or may not lead to a programming career, but students will certainly appreciate the technology.

West Region lives the MESA Mission and Vision in school and in competition

Shawndeana Smith
West Coordinator

With fall festivities underway, the West Region Advisors have been doing a great job since the beginning of the school year. With the Regional Coordinator out for the first part of the school year on maternity leave, the West Advisors hit the ground running with recruiting students, planning MESA activities and preparing for the MESA Day competition. The West region



Photo submitted by Terry Ramirez

The Ramirez family pauses for a photo during their busy schedule. From left to right, Javier Sr., Terry, Paulina, Eduardo and Javier Jr.

A day in the life of RC Terry Ramirez

Terry Ramirez
SW Coordinator

It's 5:30 p.m. and I'm racing down the highway to go see my husband and kids. I'm wondering what greeting I will get first—"What did you bring me?," "I missed you", or a little grunt from behind the Xbox.

To my surprise one of them calls me on the cell phone before I make it into town. I pick up to hear, "Mom, I need my clarinet that's somewhere in the house and a costume; oh, and I forgot to tell you there's a band concert tonight!"

So, I race a little faster to get home, pick up my two other kids and race off to a concert. I'm running in the school parking lot when I realized one kid is still putting on her shoes and the other is wearing a dirty shirt! Today must be my lucky day because I had bought that kid a t-shirt from the trip (he's kid number two and is the one that asks "What did you bring me?" from every trip). In hand, I carry shoes and barefoot toddler and with the other I grab the clarinet and costume and make it just in time to see my child play with the band.

As the concert ends and I start to realize how tired I am, my phone alarm rings on my phone. I read 'arts and crafts playdate' I had set up for my kids! So, there we go racing on the highway again to our next event. I finally get home around 9:30 at night and just when I think my couch looks so good, I have to start homework with the boys!

Finally, everyone's asleep and I can start unloading my car from my last NM MESA field trip! It was an excellent trip. Spending time with 45 amazing high school students traveling through the caverns at Carlsbad and then riding to Artesia to learn about oil and gas! I could go on and on about how awesome my students and advisors are, but we're limited to about 400 words so I will leave that for another day.

Besides, it's time to start preparing for the next event. That's where those three little kids I live with come in. You see I'm not the only one that talks about MESA at my house.

As my husband and I are getting breakfast ready the next morning, I realize it's not even 7 am and I'm having way too

many conversations: "No, we cannot take the puppy to school with us," "Yes I will see your football practice today," "Where are your shoes?!"

We rush to get into the car and as we are driving away from the house, one of my children asks "Which school will you visit today? Do they have their prosthetic arm ready?" I giggle a little and I tell him, "I will let you know tonight when we are packing bags for my next event."

And from the backseat I hear three loud cheers of excitement to get 300 bags ready in an assembly line style. In my children's eyes it translates to at least an hour and a half of us sitting in our living room (where we are stuffing bags with candy, pencils and information packets) giggling, telling jokes and not having to rush anywhere!

Time has flown by both at home and at work for the three years I have been working with NM MESA. Such is the life of a woman who likes her job and loves her family. With MESA, I coordinate the extracurricular STEM activities of nearly 500 students. But at home (and wherever we are together), I am the happy wife of Javier and the very proud momma of Javier Jr. (age 13), Eduardo (age 11) and Paulina (age 4). Although, there are days that I feel I'm juggling 17 different items blindfolded and speeding down the freeway, I wouldn't want to miss this incredible journey of being a wife, mom and MESA Regional Coordinator all at the same time!

By the way, the Southwest region is off to a great start this school year! We have had several events this year. In just a few short months, the schools have recruited, had their leadership events, high schools went to the Oil and Gas Fair and are now preparing for AG Day and Rally. Slowly but surely, students are making progress on Prosthetic Arm 2.0 and MESA FUNDamentals. I thoroughly enjoy getting to visit the students in their classes or after-school programs, see their progress, offer tips on how to progress on their designs and planning for upcoming activities both at school and on the road.

Now, do I go to a football game or pick up Rally supplies at Walmart?

MESA students. For several years, MESA has held various events on campus in conjunction with the campus departments and always with productive results.

This year's Leadership event was attended by 13 West region schools which included 200 students and 16 advisors. With assistance from advisors, students were engaged with several hands-on and interactive activities throughout the day. The students were also given an over-

MESA Day FUNDamentals: updates and tips

Kimi Scheerer
CI Coordinator

As our MESA Day February competition days move closer, MESA students and teachers can get a leg up on our spontaneous FUNDamental challenge components by focusing on the three over-arching themes: 1) Teamwork with an IT twist via Syntax Charades; 2) Environmental and Natural Resource career exposure and 3) Sustainability in our everyday lives. Take a look at the tips below to do your best!

Syntax Charades: increase your teamwork skills by playing Charades during MESA meeting/class, add a STEM twist by incorporating STEM career and equipment words. Take it a step farther by brainstorming and acting out Arduino ideas and concepts like breadboard, servo and algorithm.

Sustainability Supermarket: get a global perspective on everyday life by noticing the materials your lunch is packaged in OR where it came from OR measure the waste your class or club creates. Easy tips include finding a scale to measure your student snack or lunch waste in weight and learning about the materials that our products come in. Put the lunch waste into categories that are similar (plastics, food waste, aluminum, etc.) and create a chart. Add to your materials chart at every MESA meeting. You can also poll your peers to find the original location of where their snacks or lunch items were grown/harvested, packaged or shipped from. Get a US or World map and pin or mark each location. Determine the distance your group's food has traveled.

For a more comprehensive idea, students can research local recycling options and learn more about the New Mexico Recycling Coalition. America Recycles Day is Nov. 15th and students could tie into activities connected to this celebration of reusing resources.

Environmental Career Exploration: be sure to check out the user friendly Science Buddies website. All MESA Day career challenge information will be taken from the following nine career categories: Aquaculture Manager, Climate Change Analyst, Environmental Engineer, Geographer, Hydrologist, Park Ranger, Soil Scientist, Sustainability Specialist and Wildlife Biologist.

An easy preparation idea is to brainstorm local professionals in your MESA club or class and then have student leaders give them a call or send a personal e-mail to invite them to address the group. Also, see what parents or other teachers can share from their related experiences. It will be enlightening to find environmental links to people and places that students did not previously know. Learning the basics about the careers, such as educational requirements, typical salaries, job descriptions, work conditions, etc. will give students great insight into these outdoor STEM careers.

In addition to be factually prepared, encourage students to be spontaneous on MESA day. Just like real scientists and engineers, we will be asking students to work together to think, identify, design and solve.

view of MESA guidelines, incentives and important deadlines. There was also an opportunity for students to donate items to the local Humane Society in a Service Learning effort.

The high school students also look forward to attending this year's New Mexico Tech Field trip in December. There will also be many Rally events in the West so that more students will be able to attend from each school. Things are looking good.



Santa Fe High School MESA students revel in the fun of touring Pecos National Monument on an October fieldtrip.

Photo by Nick Kunz

Excitement in the NC Region – Fall Highlights

Nicholas Kunz
NC Coordinator

NM MESA’s North Central Region has been doing great things this semester. After starting the year together with the Professional Development Conference, advisors began recruiting students and holding meetings.

In early September, Capshaw Middle School and Pojoaque High School became the first schools to complete this year’s Regional Service Learning Project. At Santa Fe Community College they spent the morning working in the Culinary Garden, a large operation that supplies produce to the Culinary Arts Program. In the afternoon, the students toured the School of Advanced Trades and Technology, where they also participated in a workshop led by Luke Spangenberg, Director of Biofuels and Dr. Stephen Gomez, Assistant Professor of Biology.

Another Regional Service Learning and workshop project took place at Tesque Pueblo Farms and was led by Emigdio Ballon of the Tesuque Agricultural Initiative. Ballon is a plant geneticist from Bolivia who manages the Pueblo’s vast farm which aims to feed pueblo community members and educate a wide audience about healthy

food choices. Students and advisors from Espanola High School and Carlos F. Vigil Middle School, along with those from Santo Domingo Middle School and Cochiti Middle School spent a day working in the crisp autumn air with views of the Sangre de Cristo Mountains to the east. They harvested large amounts of seeds, learning about traditional methods for seeds of the Sunflower, Hopi Red Bean, and Echinacea. They also dug ditches and cleared plenty of weeds.

Late October saw the Annual North Central Region Leadership Summit, where students heard an inspiring talk from Keynote Speaker, Congressman Ben Ray Lujan, and participated in workshops with topics including Math Class Success, Materials Engineering, College Prep, Environmental Science Careers, and Etiquette. One of the notable field trips has been Santa Fe High School’s trip to Pecos. They spent the morning at the Lisboa Springs Fish Hatchery and learned about its complex operation, while also hearing about related careers with New Mexico Department of Game and Fish. The group also visited Pecos National Historical Park and learned about the history of the Pecos Pueblo and saw the ancient ruins on the grounds.

STEM education booming at Santa Fe Community College

Nicholas Kunz
NC Coordinator

Santa Fe Community College (SFCC) has served as an affordable gateway to success for students since 1983, and they now have more opportunities than ever for people interested in careers in Science, Technology, Engineering and Math (STEM). Students can choose between four primary STEM degree programs.

The resulting Associates Degree in General Engineering, Computer Science, Physical Science, or Biological Science includes 100% transferable credits for a four-year degree. SFCC also offers STEM related degrees in Sustainable Technologies and Health Sciences, and certificates in Phlebotomy, Dental and Medical Assisting and Computer Network Security.

In addition to hosting NM MESA events and workshops each year, SFCC provides notable experiential opportunities for its own students. During the last year, SFCC students have contributed to professional research in a number of areas. Recently, six students from SFCC participated in the Science, Technology, Engineering, and Math Advancement Program, sponsored by

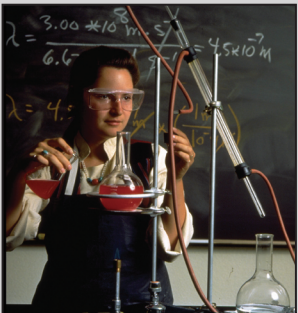


Photo courtesy of Santa Fe Community College

NM EPSCoR and held at NM Institute of Mining and Technology. This program involves nine weeks of research at NM Tech in conjunction with EPSCoR researchers. A few of the subjects of research by SFCC students include imaging of cell function

in micro algae, effects of geothermal fluids on surface water in the Jemez river, and improving feasibility of algal biofuels.

SFCC students also presented research this year at the annual Alliance for Minority Participation Conference at New Mexico State University. The conference provides opportunities for students to participate in research experiences and gain presentation experience. Research topics from SFCC students included river soil characterization, hydrothermal modeling, and performance of nose cone design.

Participation in these research experiences often results in scholarship and grant monies being awarded to SFCC students. According to Phyllis Baca, Director of STEM initiatives at SFCC, money is available. Baca also manages the STEM Club at SFCC, which serves as a conduit for grant money available to STEM majors, and opens doors to internship opportunities.

Southeast Region is BIG and BUSY

Betty Chancey
SE Coordinator

The Southeast Region had a really busy and exciting three months! My wonderful program advisors at the 16 SE NM MESA schools recruited 913 students so far this year, the most of any region.

In addition to SparkFun training, working on building a Robotic Prosthetic Hand and organizing their MESA programs, the SE Advisors have had teams compete in the Best Robotics Competitions, work on their Innoventure projects and the NM Electric Car Challenge. They also participated in High School and Middle School Leadership programs at New Mexico Military Institute.

Russ Fisher-Ives and his crew provided the SE Region with four workshops on programming of the Lego NST and EV3 Lego Robots. He provided six hours of training for 100 MESA students at Goddard HS on Oct 12, 100 students from Roswell HS, Berrendo MS and Mt. View MS on Oct 13, 100 students from Artesia HS and Artesia Jr. HS on Oct 14 and 100 students from Alamogordo HS, Chaparral MS, Holloman MS and Mt. View MS-Alamogordo on October 15. Many of these students had not worked with robots before and in each of these events, students learned to build and program the robots for three different purposes. Thank you Russ and crew!!! These were four wonderful days of learning and fun.

The Southeast Region also hosted the Annual NM MESA Oil & Gas Education Fair October 28 in Artesia. This year the SE and SW Regions were invited to attend

the one-day event. Approximately 100 students enjoyed a great breakfast and presentation by Concho Resources, Inc. staff on the function and importance of a Pump Jack. They then participated in the Pump Jack building competition. Portales HS was the Overall Build Winner. Schools



Photo by Betty Chancey

Students negotiate an obstacle course during the New Mexico Military Institute Leadership Summit this Fall.

were taken to the Devon Energy Corp’s Employee Training Facility, where engineers were able to work with pump jacks, tank batteries and learned how crude oil is removed, stored and transported. The last event of the day was a visit to the Navajo Refinery owned by Holly Frontier Corp. They received a presentation from chemical, mechanical and electrical engineers. Most students were surprised to learn that almost everything we use in our daily life requires products made from refined crude oil. Watch for more information on this event on the Southeast page of the NM MESA website soon.

The ENGINEERING REVOLUTION

#SoAmputeesCan

Trevor Bergman
Executive Director
Limbs International

LIMBS is excited to be partnering with MESA nation-wide this year to bring students the opportunity to make a positive change and spread some love by giving amputees across the globe a second chance at life through our Engineering Revolution initiative.

There are two specific goals for MESA/LIMBS partnership:

1. Raise awareness about the amazing things MESA students are doing in schools throughout the state (such as their prosthetic arm projects), and spark student interest in joining a MESA club.
2. Show the real-world connection of how LIMBS is using low-cost technologies to change the lives of amputees throughout the developing world, and give

students the opportunity to be a part of that change in a tangible way.

This partnership raises funds to provide a LIMBox (complete leg system) to an amputee at one of LIMBS’ partner clinics. For every \$300 raised, LIMBS provides one LIMBox and changes a life for less than the cost of a smart phone. The exciting part of this program is that none of the funds raised by schools are used for LIMBS’ administrative costs.

Students will also find out where each of their funded legs goes and will receive a picture and a story of an amputee whose life has been changed because of their efforts. To date, students have provided hundreds of legs to amputees in over a dozen countries! The goal for this year is for each NM MESA school to provide one leg which would result in over 100 amputees around the world being give the gift of mobility! All tax deductible donations can be given online at the following NM MESA campaign page: <https://www.limbsinternational.org/funding/mycampaign?id=101>

LIMBS also has t-shirts available for sale to spread the word about the amazing things MESA students are doing in NM. Use the link to get a t-shirt: <https://www.limbsinternational.org/mesa/youth.php>.

VISION

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Vision is an electronic newsletter published quarterly by New Mexico MESA. It is published by the MESA staff as a public service to all stakeholders of NM MESA and the general public. Opinions are the views of the MESA staff and those who submit articles or letters to the editor on issues of concern, or in response to any material produced in the newsletter. Submissions can be made electronically to reole@nmmesa.org. The editor reserves the right to edit any submission for grammar, clarity, the omission of profanity or libelous material. All editing will retain author’s intent.