Journey to a New Path...

Lavander Shortman, *Utah State University*

I. Introduction

I entered NASMP Program to find a better way to find opportunities and experiences. This Program has a broad list of different fields and areas to explore and most importantly to experience and learn new things. NASMP Program helped me overcome my anxiousness by exposing me to different labs and colleges, thus helping me finding an interest in finding a new major. I am an artist and designer for different companies I work with and I am a advanced piano player.

II. Project One - Dr. Ryan Berke, Mechanical Engineer

- Dr. Ryan Berke main focus is using, testing, and documenting tension, strain, heat, and advanced imaging through specimens. Throughout the week, Dr. Ryan Berke and his students looked through the durability of copper using a technique called ductility scaling. This technique uses strain, stress, tension, stretching, and speckle tracking through the copper specimen.
- To execute this experiment, Dr. Ryan Berke uses a camera that has speckle tracking. It measures the copper specimen area of tension, heat conductivity, and break point called necking.

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III. Project Two - Ben Green and Isabelle McCollum, Agricultural Research

- Ben Green and Isabelle McCollum's lab is based on Agricultural Research. Their main focus is focusing on poisonous plants that harm livestock in Western States. The picture shown is a Larkspur, a poison plant and dangerous to livestock. Fun fact, the meaning of a larkspur symbolizes the strong bond of love or open heart.

I. Introduction Visual - My Art and Designs

IV. Project Three - Clark Riddle, Biology student

- Clark Riddle, a biology student, studying on molecular aspects of water. HIs main focus on his project is to study molecules within water from different regions. In his lab, one of our challenges as a NASMP student is to collect water while keeping track of the location, temperature, water source, moving/stagnant water, clarity, and vegetation surrounding the water source.

NATIVE AMERICAN STEM MENTORSHIP PROGRAM (NASMP)

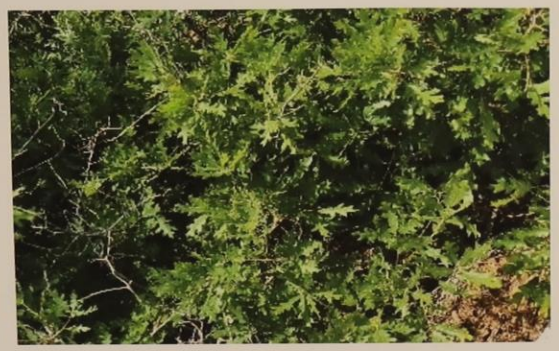
Sydney Yazzie

Introduction

My name is Sydney Yazzie, I come from Chilchinbeto, AZ. I am an undergraduate at Utah State University. I am studying to be a Pharmacy Technician and will be finishing with my Associates degree in Spring 2021.

Lab 1 / Brynja Kohler

This lab we worked with mathematical modeling, basically determining if math problems can be a mathematical mod el. We made our own examples of how it can work with math modeling.



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Lab 2 / Poisonous Plants to Livestock with Anita McCollum

Me and my partner went out to the trails by the Blanding campus. We looked for these poisonous plants that affect livestock if they consume it. It was kind of difficult to find some of them but we managed to take pictures and compared them to the book we were given.

Lab 3 / Jackson Lab with Clark Riddle

For this lab we were given tubes to collect a water sample from anywhere we wanted. I chose my spot at the reservoir, then I sent it off back to Clark, so he could test the water. We were also given foldscopes. We learned about DNA sequencing to get a clear picture of all the life that surrounds us.

Learning something new everyday / NASMP

Shay Curleyhair
Utah State University
Animal Science
Email: shaylynncurleyhair@gmail.com

1.Introduction

Hello my name is Shay Curleyhair and I joined NASMP to further prosper my knowledge within the science field of teachings. I would like to say I'm very interested within the Animal and Veterinary field for I am majoring in animal science preparing to become an Exotic Vet. During the online sessions with the professors thru NASMP it was quite a journey to learn some new information and getting a little replay of what I've learned in the past already. Learning with these professors have been quite an honor.

L2. BeeLab/ Karen Kapheim

During the bee lab it was quite amazing to learn a bit more about bees than what I've already learned in the past. Learning how their brain functions within their lifespan, the queen bee having a special honey called "Royal jelly" which is purple made just for her. What really amazed me was how bees don't just only live in trees, they also live in holes underground! How the queen bee lays up to 20 million babies a year. Also during my sessions in the lab was that even my family would join in as well and learn right along side of me. My sisters and boyfriend have been given information about bees life, species, homes, etc. Me and one of sisters favorite information was that there are over 20, 000 different types of bees in the world and one of them is a bright green bee that licks humans for salt in order to get protein.

L3. Soil samples / David Britt

During this week was one of my favorite labs to do when school was still in session. We gathered soil samples and we would transfer all the bacteria it obtained onto the petrifilm which is similar to an agar. I had to gather two different types of soil within my area so I got mine from the base of a sage brush and the base of a pine tree. I than would transfer the soil samples into two different bottles to dilute it and get all the bacteria from it. After the process i would take 1ml of the soil and put it in middle of the petrifilm. Within a day or two I could see the results, little pink dots started to form within the petrifilm indicating the colony of bacteria growing on it.

L4. Jackson Lab/ Clark Riddle

Within this lab what we learned was like a relapse of DNA structure within the DNA sequencing. Collecting samples and using our foldoscope to see what sequences we have. Learned the basics of Microbiology and Biology, what really interested me was the Molecular Biology which is what shows us what different types of bacteria and viruses are out there in the world.

UtahState University

Me in NASMP

Jaynee Chee
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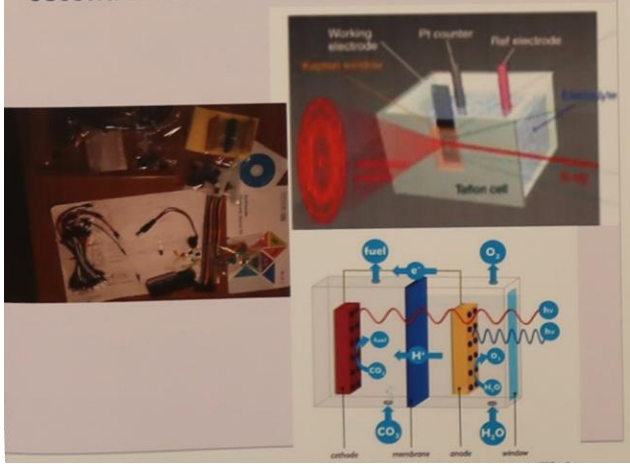
Utah State University

Introduction

- I am a full-blooded Native American and live in the Four Corners region, with a family of four. I am both the middle child and the only daughter in my family.
- I've planned to continue my education since I graduated from high school.
- The upcoming fall semester (2020) it will be my second year in college.
- I joined this program because I attended a dinner ceremony for the students who participated in the program before me. I talked with former NASMP students and, throughout our discussions, got very interested in the program.

Some of the lab experiments I did during the second week...



Whole four weeks

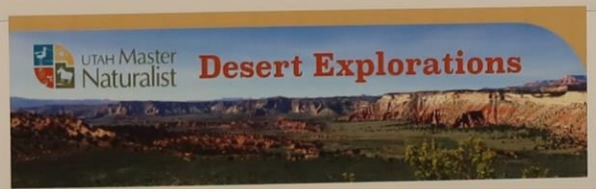
Throughout the four weeks I participated in this program, I faced some hardships balancing my personal life with my education life. As of this point, I've almost balanced it all pretty well.

First week: Campus orientation & College Tours
The program was kind of confusing because I wasn't familiar with the online applications and virtual classes, but I eventually figured it out.

Second week with Hannah Wilson and Yi Rao
I got to do three activities (two of them related to the same instructor). First, I participated in a coding program where I could assemble anything with the provided Arduino materials and input some codes to make the thing I built do things. Then, I got to see two lab experiments. The first involved the separation of CO_2 and the second involved water splitting.

Third Week with Kerry Jordan
I got to do one lab for the whole week and learned a lot of useful materials such as websites I could use to look for research article and to to do a tour of the department.

Fourth week with the Utah Master Naturalist course developed by Mark Larese-Casanova
I got to do modules where it describes the different types of desert climates here in Utah.



Results

- Doing this program help me open my eyes and see that there are more types of research within broad fields of study. That has amazed, inspired, and challenged me.
- I have learned more about programs that are offered at the Logan campus involving different majors.
- To be honest, I had fun with the activities each week, and enjoyed learning new materials from different kinds of people coming from different departments.

Benefits from the program

- A glimpse of what different majors involve
- The chance to meet new people (virtually) who I hope to meet in the future (in person).
- Despite the fact that I didn't go to Logan campus, I got to spend time with my family, especially my little brother, who had a chance to listen to some of the presentations with me.
- More information about scholarships I can apply for to further my education
- Money, for participating in activities and assignments, which I am saving to extend my college education.

Native American STEM Mentorship Program

Chanel Bahe
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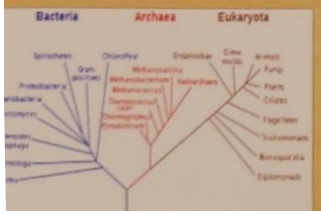
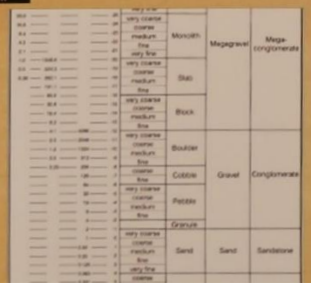
About Me!

Yá'át'ééh! Hello, my name is Chanel Bahe. I am originally from Rough Rock, AZ. This is my first year attending NAMSP as an undergraduate. After completing my first year of college at the campus in Blanding Utah, I've decided to keep exploring my opportunities and gaining more experience. I plan on pursuing an Associate's Degree in nursing and to finish my Bachelors degree at Logan, UT or Albuquerque, NM. I would like to expand my knowledge of Biology and other STEM fields associated with NASMP.





1. Bee Society Lab

Week 2: May 18 – 22

❖ **Who I worked with:** I got the chance to work with Dr. Karen Kapheim and her students (Makenna Johnson, and Kate Hunter) on social behavior, neuroscience, physiology and anatomy

❖ **What we did?**

1. Observed different types of bee in the world, ~20,000 types of bees
2. Studied Leafcutter bees, Carpenter bees
3. Learned about Queen Bees, Worker Bees, and Nursing bees and the following traits:
   Lifespan, Integrity to work with, and pollination.
4. Examined Natural Habitat and behavior, Solitary vs. Social

❑ **Conclusion:** Honeybees exist to preserve nature's greatest gift, honey. All bees play are important for the environment.

2. Insect Evolution and Systematics Lab

Week 3: May 25 -29

❖ **Who I worked with:** I had the opportunity to work with Dr. Carol von Dohlen and her graduate students, Meg Licht and Ashley Dederich

- They share an interest in Insect Systematics & Evolution – This lab generates and structures representing the remarkable diversity of life on Earth today and in the geological past.
- They use phylogenetic trees, molecular techniques, and DNA sequence data to study larger evolutionary patterns
- They focus on species that make galls, abnormal growths that can arise on all parts of a plant.

❖ **What we did?**

1. Observed different types of galls
   These structures are induced by immature insects such as tree-feeding aphids and psyllids.
2. Observed insect diversity through taxonomy and phylogeny increases our understanding of basic biology.

3. Luminescence Lab

Week 4: June 1 – 5

❖ **Who I worked with? What they do?** I got the chance to work with Natalie Tanski and her colleges: Harriet Cornachione and Tammy Rittenour in the Luminscence laboratory.

- The lab itself is specifying and dating any types of sediment and sand to when it was last buried or deposited.
- The lab uses geochronology to measure the energy of photons being released

❖ **What we did?**

1. Collected samples of sand within my community
2. Observed different types of sand from all over the world
3. Learned to classify my samples of sand by color type, Grain size, sorting, rounding, and the surroundings

Characteristics of my sand:

❑ Sub angular -Rounding
❑ Well sorted- Sorting
❑ Dusky purple- Color Type
❑ Very Fine or pebble –Grain size

Experience the possibility in research

Cleve Atene, *Utah State University*

Introduction - About Me

I am from Monument Valley, Utah and currently live in Monticello. I am very interested in going for long hiking trips, fishing and going running. I am interested in geology because I learned of different unique elements.

Major: Associates in Science, aiming to transfer to a Bachelors in Architecture

What I like about NASMP: I believe this program changed me, by helping me use my critical thinking to understand more complex scientific methods.

My favorite part: Researching information to create a planet to live on in the future and whether that could happen with our plant-growing technology.

An artist's rendering of humans on Mars.
Image credit: NASA, https://www.jpl.nasa.gov/spaceimages/details.php?id=PIA23302

Plants in Space Research with Ed Galindo at the University of Idaho

Dr. Galindo works closely with American Indians who are PhD students. He works with them in groups to gain a different perspective from each fo them.

I learned that Dr. Galindo and his team successfully grew Idaho spuds in soil from Mars. Although the soil from Mars is three times lighter than soil from Earth, it is less compact and the potatoes can manage to spout limbs through the ground.

For my research project, Ed Galindo sent seeds for me to plant at home and gave me instruction and information about the seeds. The plants that I'm going to plant are Basil and Oregano. They are edible to eat when full grown. They are used for food recipes that people enjoy eating with. The plants carry potassium and vitamins - a good, healthy choice for people and especially astronauts. They can also add flavor to bland astronaut food.

I gained a lot of interest about Mars, soil, and growing plants there. Traveling out to a different planet is a mystery to explore, like the ocean floor.

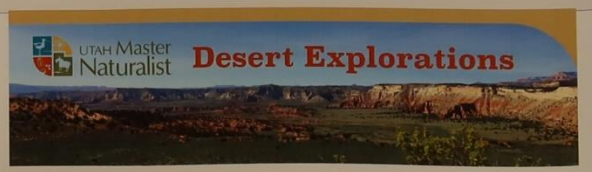
Week 2 research...

I have planted my seeds that have came in, through the mail and the Basils are growing at a normal rate. The basils will grow up to be 18-24 inches long and will emerge from the ground in 7- 14 days.

The oregano plant is going to grow the same width as the basil and is going to grow 12- 24 inches. The seedlings will emerge in 10- 21 days and water consistent each day.

Utah Master Naturalist Course with Mark Larese-Casanova

This program, which I did during the fourth week of NASMP, is incredible for people learning about the local environment through USU extension. I did the Desert Explorations course and learned about nature and other important aspects within desert communities. The program promotes stewardship of different resources and can certify professionals and volunteers. Mark Larese-Casanova gave me great feedback about his experience when he started deciding what to do for a career.



NASMP Summer Program

UtahState University

Introduction

Hello my name is Nichole Butler I am full Navajo. I live on the Navajo Nation in a rural community called Chilchinbeto. This small community is located within the Four Corners in Arizona twenty-five miles out of Kayenta,Az. I am a first generation college student who has finished Fall and Spring 19-20 year of college at Utah State University. I would like to obtain my Associates from the Blanding campus and move onto the Logan campus to get my Bachelors degree.

I was introduced to NASMP by Jim Dandy and Tony Hart. They have shown me what opportunities this program has. They have also advise me to better able myself with my academics, financial needs, and understand myself in ways I never knew was possible. They have even gave me this opportunity to be apart of the summer program. This program has been a new experience and even shined a light on other programs that are available to me.

Nichole O. Butler
Utah State University

Week 1

Week one consist of meeting our Facilitators. Our facilitators are Elisabeth, Hannah, and Megen. We even meet everyone that is going to participate in the summer program. We had some interesting activities like the Zooniverse activity and meeting with other Native American students who are connected to MESAS. We even had virtual tours of other departments at the Logan campus. Some of the tours would be with the department of nursing, technology and learning science, and the college of Engineering. It was a learning process through the first week because we needed to get use to Zoom and Webex. I felt like the cat. Overall week one was success for the first week of the summer program.

Week 2

Week two was an adventurous research Project with Dr. Martinez-Cola. We had discovered many interesting things about comedians that I didn't know before. I was also mistaken for the word "coding" used in our research. The coding that I thought of was the one used for computer coding. Coding with the comedians jokes was very interesting because it helped us better understand what affects the jokes had. Coding helped me understand the background of the joke and what the jokes target was for the audience.The interaction with the comedy show before coding the script also helped me understand the jokes more better. Thanks to this research project I learned many things from Dr. Martinez-Cola that I hadn't known about. It also unlocked another part of my brain that understood what was going on and how to interact with the research. The best part is I'm going to keep in contact with Dr. Martinez-Cola for some help or another research project.

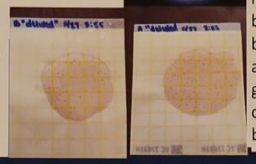
Week 3

Here are some soil samples that I have taken from my backyard.

Here is the fold scope we had to assemble to see what the naked eye can't see. We had seen that there were different structures to what we were looking at. It was like an at home microscope.

Here we have images of a look of what we can see under a foldscope from home. We had worked with David Britt and Anne Anderson within this whole week. It was an amazing experience working with them on this lab.The top image is of Fern Rhizome. You can see that there are lots of cells. Then on the bottom image you can see that it is a butterfly leg.The foldscope helps us see the little hairs on the leg. Also you can see that there are some cells on there that may be bacteria.

Here are the soils diluted in the Aerobic Count Bacteria Petrifilms. The pink dots indicate the colonies of bacteria.

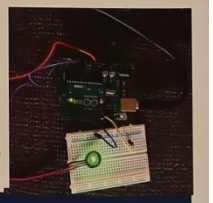


Week 4

Week three was an interesting week with Cedric Mannie. This week we did some coding with some some boards to create a heart monitor from home. Here are the supplies that I received from Cedric for our project. It was an experience to work with boards, circuit playground, and Breadboard wires.

Here is where we used the circuit board to check our heart rate with the Adafruit Circuit Playground board. We noticed that I had a problem because I didn't receive one of my materials that I needed for this specific board. Overall we figured out the situation and managed to finish the project. We also used the pulse sensor to connect to the Breadboard We also used Arduino which is a specific coding app for the boards that we used for the heart monitor. The code that was written made the light on the circuit board on we even added sound to the code. It was an experience to be able to use these boards.

Here is where we used the Arduino Uno to monitor our heart rate. We also used the bread board for this board. We connected both boards with the Breadboard wires and a resistor to make sure the current goes one way. We also used the Arduino coding app again to upload the code to the board.



Conclusion

The NASMP summer program was an experience that I will never forget because I had meet lots of new people and had a diverse group of projects. The projects I was involved in helped me see what different opportunities there were at the university. The diverse group of projects that I had were coding comedians, Soil collecting for bacteria, and also making a heart monitor at home. It also helped me see what different departments that they had and what the departments were about. It was a learning process throughout this whole summer program also because there were many meetings, labs, data collecting through, and the pandemic that we are all facing. It was also remarkable to see how much people were willing to help with scholarships, biographical essays, and even to continue some of the research that we did. It was good to find out that there are still good people that are willing to help and spend their time helping others.

NASMP 2020: Quarantine Edition

UtahState University

Alexis Stewart, *Utah State University*

Introduction

My name is Alexis Stewart. I am going into my junior year at USU-Eastern. I am located at the Blanding campus, but hopefully transferring to the Logan campus soon. After receiving my Associates I want to dual major in Elementary Education and Special Education. I was excited to be apart of the NASMP program because of the experiences that will help broaden my interests.

Lab 1: Qualitative Data Analysis of Comedy with Marisela Martinez-Cola

During my first week in a research project, I worked with Dr. Marisela Martinez-Cola. In the project my objective was to understand how to code different jokes in comedy. Coding is a process where parts of something are identified and categorized. I identified concepts given and found relationships and correlations between comedy strips. I observed two different comedy shows, The Kings of Comedy and The Latin Queens of Comedy. I took the jokes they made and categorized them into different sections. One joke could be under multiple sections. The different sections jokes could be categorized were gender, sexual, gibberish, white people, racism, in-group and out-group, other languages, and class. I really enjoyed learning about coding and how to do it myself.

Lab 2: Frog Project with Molly Womack

During my second lab I learned how to use digital programs to measure real-life creatures. The creatures I learned about were three different types of frogs: tree frogs, burrowing frogs, and water frogs. I measured skeletons in order to see the differences between frog types. Each were unique in their own way, tree frogs had longer stronger legs that helped them jump. Burrowing frogs had wide heads and pointed noses that helped them dig in order to burrow underground. Water frogs had longer toe bones that helped them with swimming.

Examples of the frog skeletons I measured in Lab 2.

Latin Divas of Comedy

JOKE/SCENE	"Why don't you sit"	"I'm going to recharge"	"Student loan, jeez"	"Don't play us"	"Singing"	"Change the song to"
COMEDIAN	Sarah Contreras	Sarah Contreras	Sarah Contreras	Sarah Contreras	Sarah Contreras	Sarah Contreras
TIME	12 mins 42 sec	13 mins	13 mins 28 sec	14 mins 0 sec	14 mins 30 sec	14 mins 30 sec
Accents	X			X	X	
Class			X			
Code Switching		X			X	X
Colonialism						
Gender						
Immigration						
In-group				X	X	
Out-group						
Political						
Racism						
Sexual		X	X			
Stereotypes				X		
White People						

An example of a coding table from researching comedy in Lab 1.

Lab 3: Luminescence Dating with Natalie Tanski

My last week in NASMP I was in the luminescence lab. During the lab I learned about luminescence dating is used to know how old things like sand, artifacts, bones, sand dunes, and rivers are. Sand underneath the surface can be taken and tested to see how old it dates back through radiation. Some samples that were given to me dated back even 500 thousand years ago!

Conclusion

The NASMP program taught me about the various opportunities that USU Logan campus has to offer. It has also helped broaden my interests to minor in bioengineering . The program was an amazing experience and I hope to be in the program again, without the quarantine. :)

Pathway of NASMP

Shastee Holliday, *Utah State University* | Student, *Utah State University*

Shastee Holliday
Utah State University
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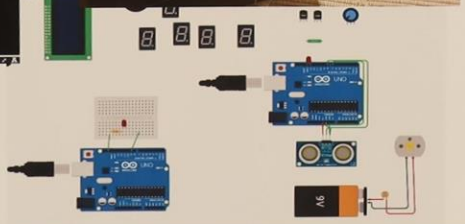
Holliday0725@gmail.com

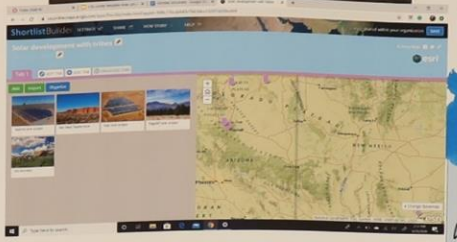
INTRODUCTION

Ya'a'teeh, my name is Shastee Holliday. I am a proud Navajo tribal member from the Navajo Nation. I am currently attending Utah State University-Blanding. I will be pursuing an Associate of Science in Nursing.

ARDUINO LAB

In the second week, we began using Tinkercad to get us familiar with the material. Tinkercad is a free, easy-to-use app for 3D design, electronics, and coding. After getting the feel of this website we got mailed a starter kit. I got to experience how to use an Arduino. Arduino is an open-source programmable circuit board that is used in many ways and a variety of maker space projects. Shown on the bottom photo below is a diagram that I created. the second photo shows a LED blinking by using a breadboard.





THE NATUARAL RESOURCE MANAGEMENT LAB

I worked with Dr. Sarah Klain's we worked with graphs and maps on StoryMaps, StoryMaps is a software that enables us to develop spatial data about solar development with tribes. Conducts research on facilitators and barriers to developing large scale wind and solar farms. I got the chance to do a lot of research on tribal solar, and how solar offers the opportunity to bring outside dollars in and contribute to the financial strength of the Navajo economy. With all the research, I create a graph of tribal solar near Monument Valley, Utah which is shown in the photo above.

WATER HERITAGE ANTHROPOLOGY PROJECT

We learn how to enter data into a spreadsheet, visualize data, conduct interviews, and archival research, and present our findings to the public. This project is committed to increasing the ability of individuals to engage in influencing and informing water resources, engage, and listen to individuals tell their story about why water matters to them personally. In addition, the project is strongly committed to growing a conservation ethic, and that shared cultural experiences contribute to a sense of place and communal identity.

Ahéhéé.
Thank you

UtahState University