

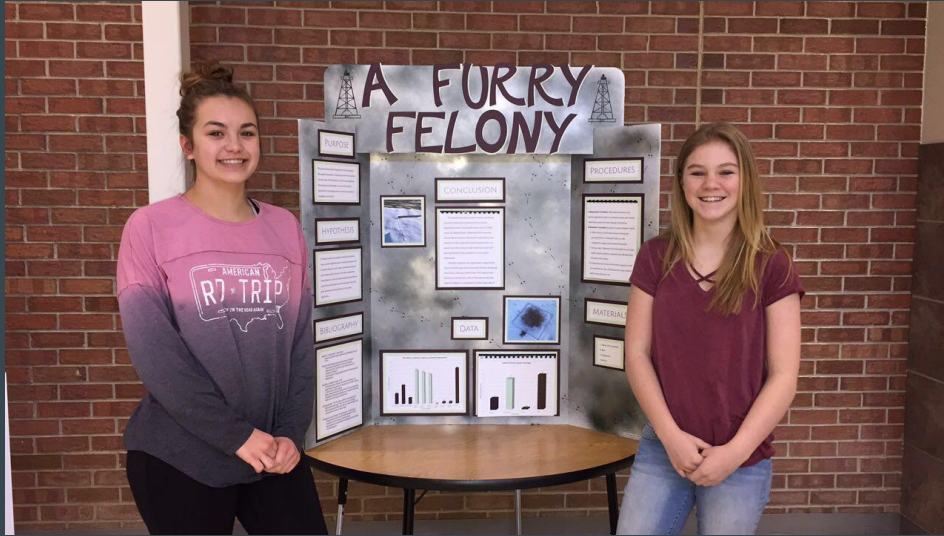
2018 Wyoming State Science Fair Awards





Animal & Plant Sciences

Animal & Plant Sciences -Junior Division



3rd Place

A Furry Felony

Alena Mika & Katie Labuda

Pinedale Middle School

Pinedale, Wy

Animal & Plant Sciences -Junior Division



2nd Place

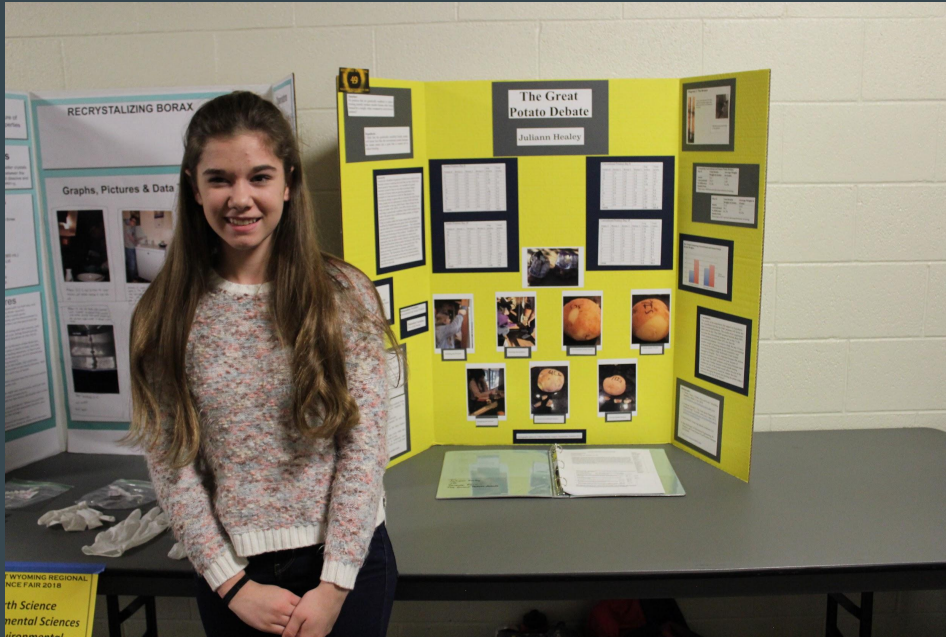
Trail of Deers

Claire & Zane Hayward

Pinedale Middle School

Daniel, Wy

Animal & Plant Sciences -Junior Division



1st Place

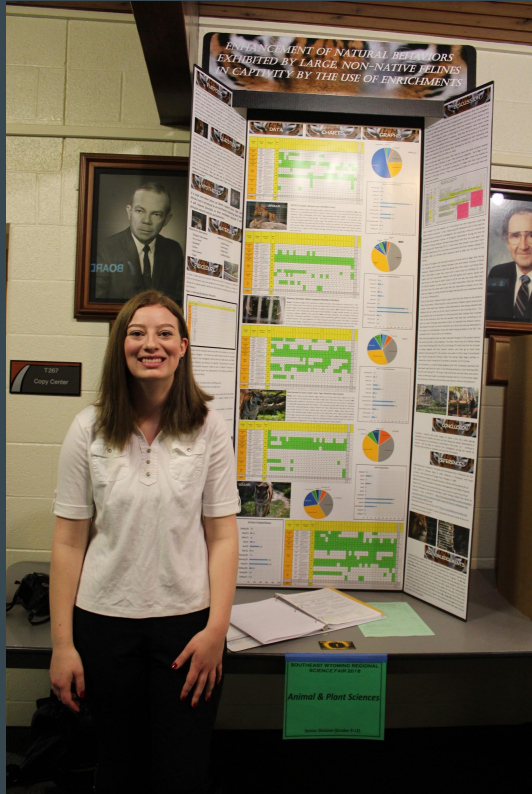
The Great Potato Debate

Juliann Healey

McCormick

Cheyenne, Wy

Animal & Plant Sciences -Senior Division



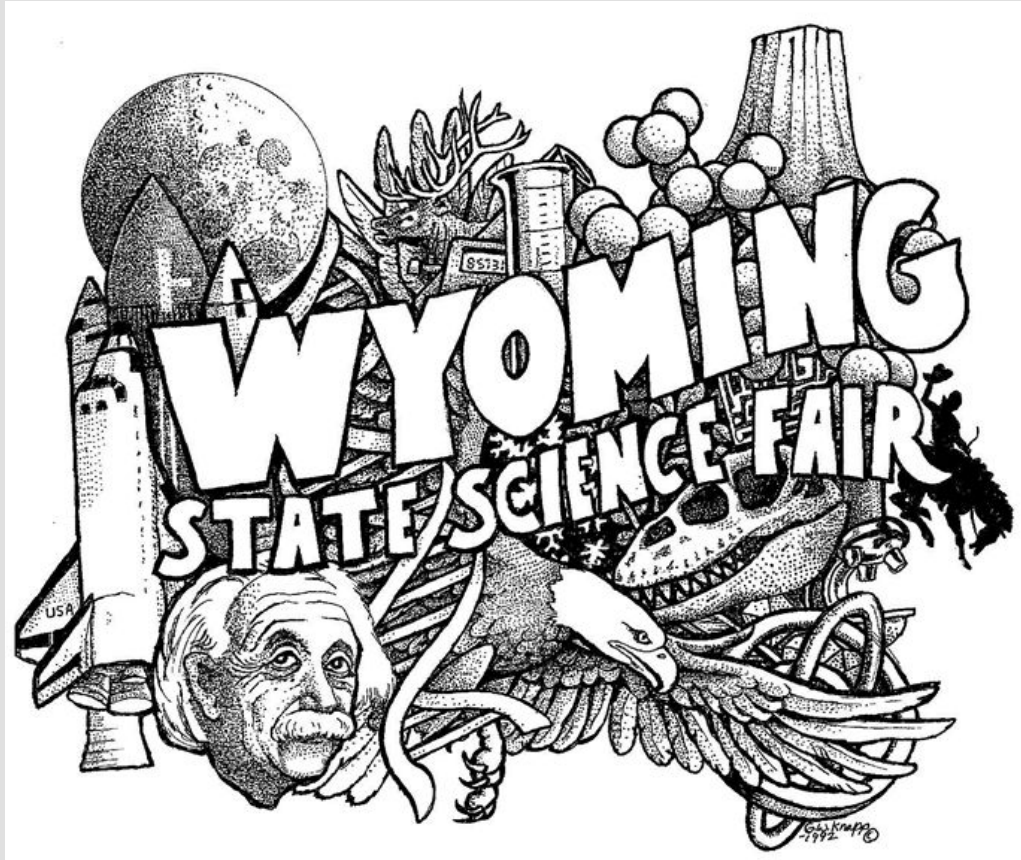
1st Place

Enhancement of Natural Behaviors
Exhibited by Large, Non-Native Felines
in Captivity by the Use of Enrichments

Sierra Spears

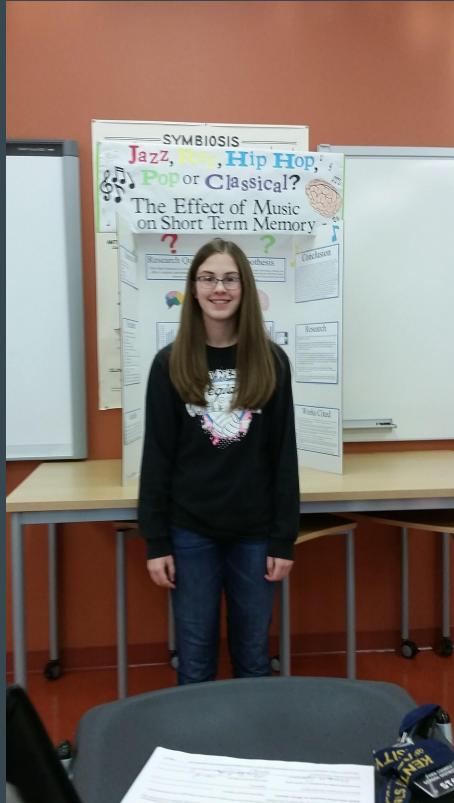
Lingle-Fort Laramie High School

Lingle, Wy



Behavioral & Social Sciences

Behavioral & Social Sciences -Junior Division



3rd Place

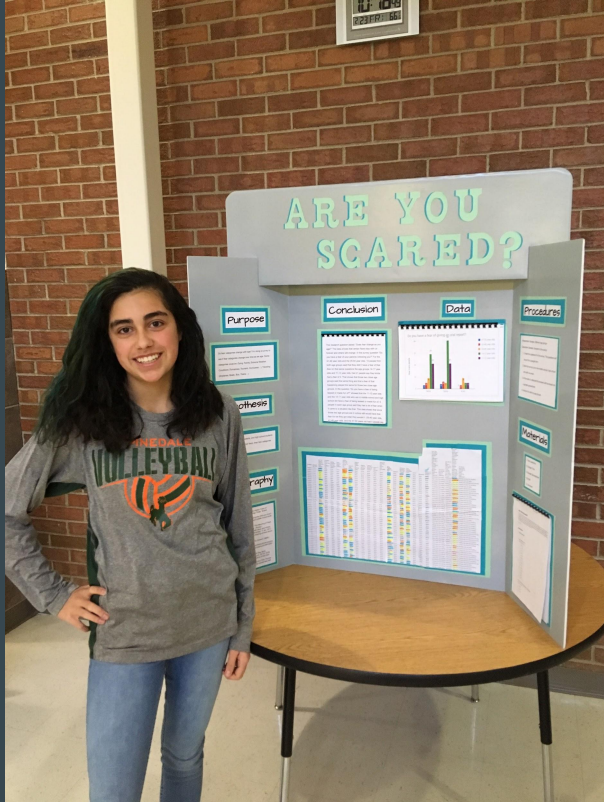
Jazz, Rap, Hip Hop, Pop or Classical? The Effect of Music on Short Term Memory

Megan Jacobsen

Powell Middle School

Powell, Wy

Behavioral & Social Sciences -Junior Division



2nd Place

Are You Scared?

Riley Mason

Pinedale Middle School

Pinedale, Wy

Behavioral & Social Sciences -Junior Division



1st Place

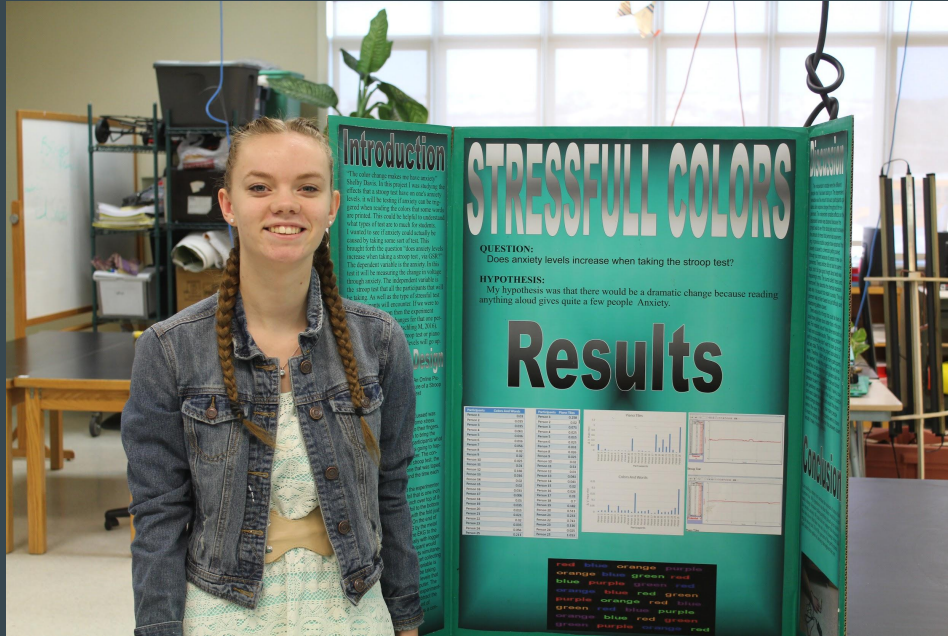
Playing Games With Your Health

Camden Rose

Baggs Elementary School

Cheyenne, WY

Behavioral & Social Sciences -Senior Division



2nd Place

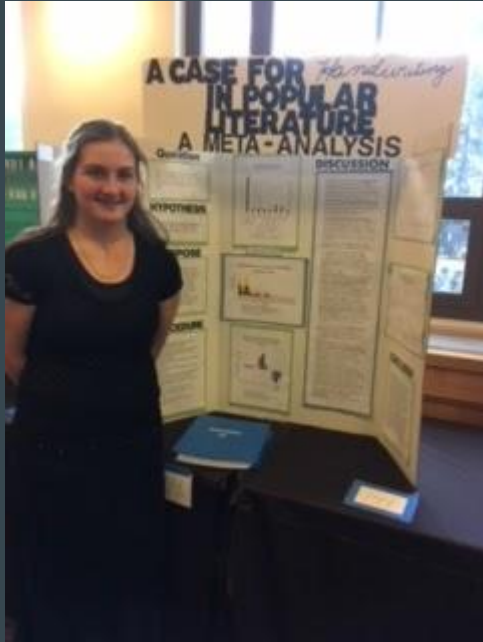
Stressful Colors

Emily Rushton

Newcastle High

Newcastle, Wy

Behavioral & Social Sciences -Senior Division



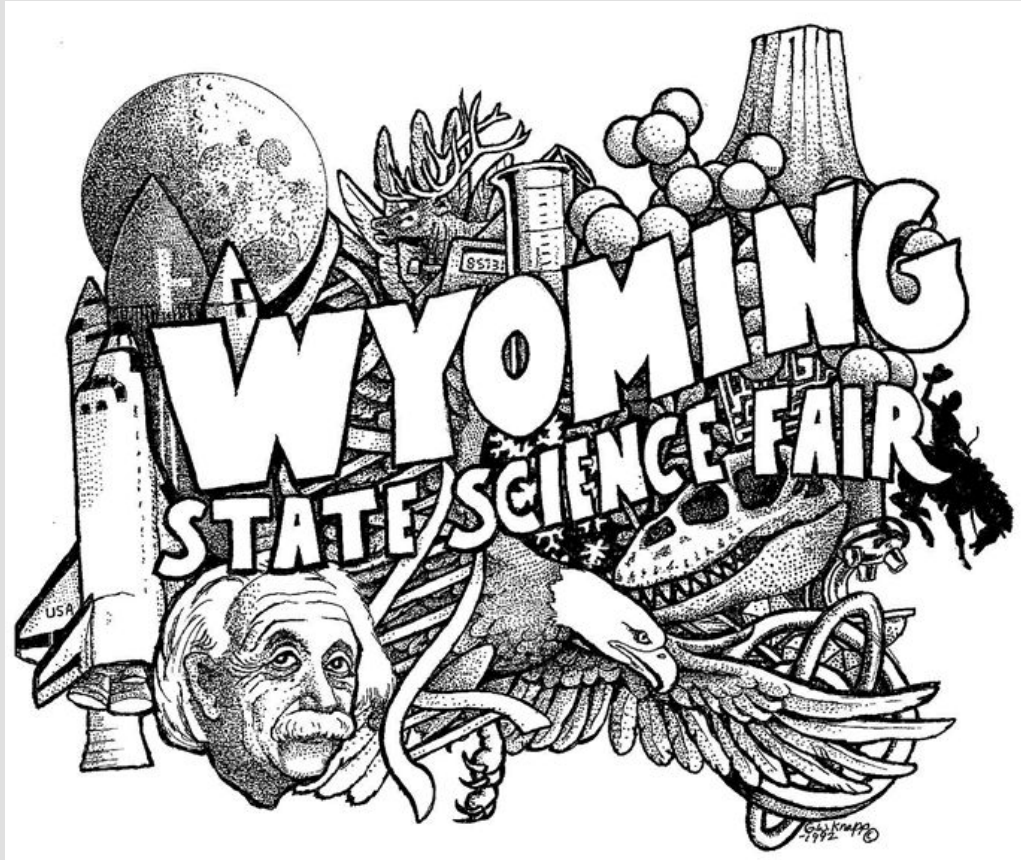
1st Place

Handwriting's Case in Public Literature

Malea Christensen

C.H.I.L.D Homeschool

Buford, Wy



Biochemistry & Biological Sciences

Biochemistry & Biological Sciences -Junior Division



3rd Place

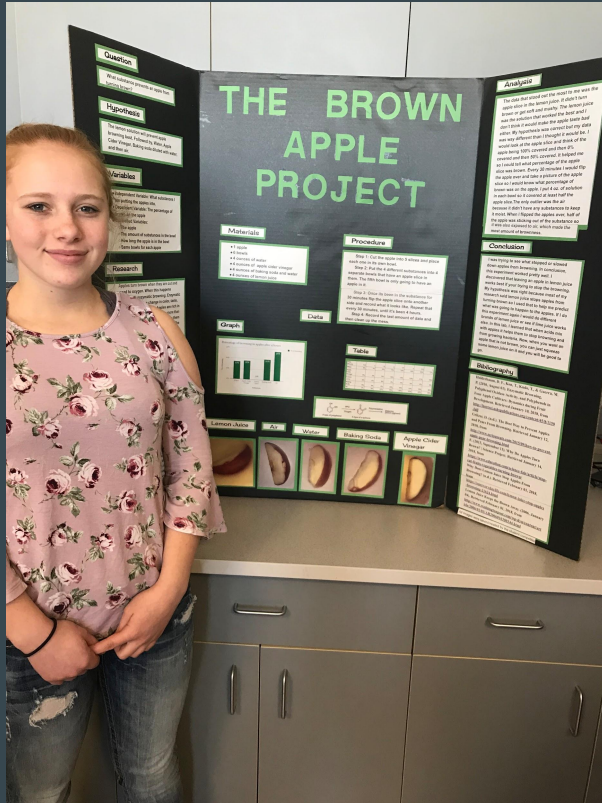
Dissolving Doses

Allison Gregory

Pinedale Middle School

Pinedale, Wy

Biochemistry & Biological Sciences -Junior Division



2nd Place

The Brown Apple Project

McKenzie Ferguson

Wheatland Middle School

Wheatland, WY

Biochemistry & Biological Sciences -Junior Division



1st Place

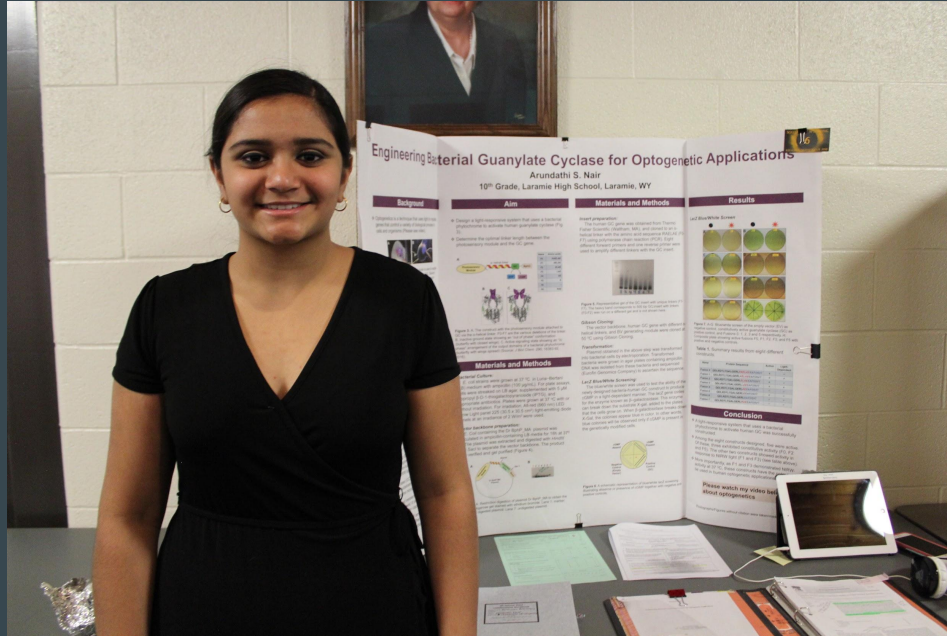
Just the Fats Ma'am

Tess Palen

Glendo Middle School

Glendo, Wy

Biochemistry & Biological Sciences -Senior Division



1st Place

Engineering Bacterial Guanylate
Cyclase for Optogenetic Applications

Arundathi Nair

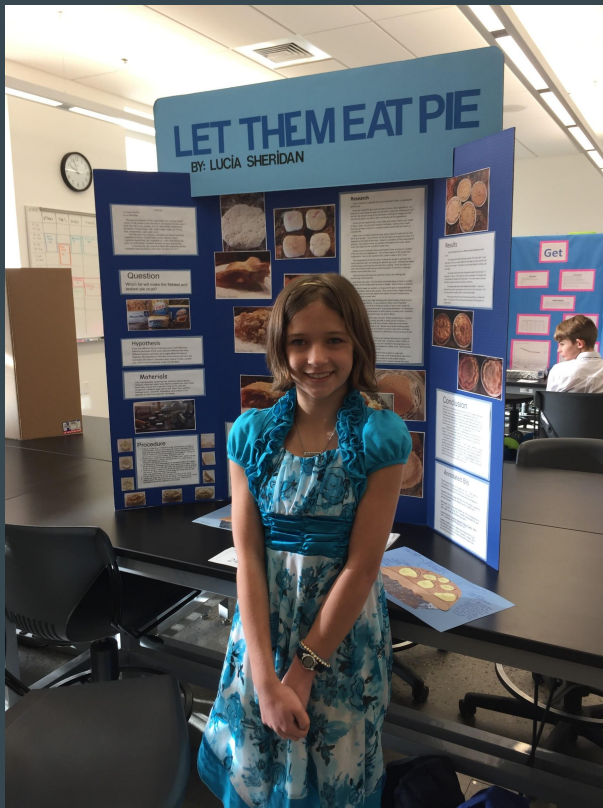
Laramie High School

Laramie, Wy



**Chemistry/
Energy:
Chemical**

Chemistry/ Energy: Chemical -Junior Division



3rd Place

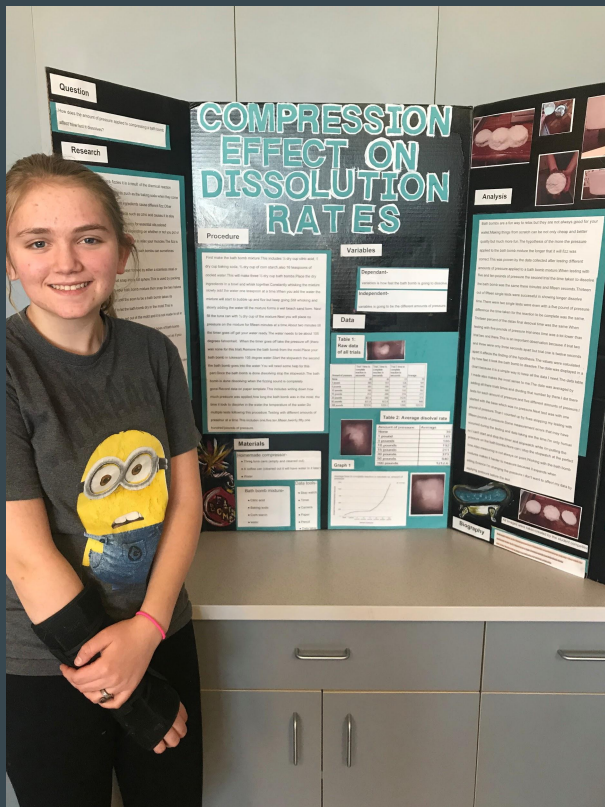
Let Them Eat Pie

Lucia Sheridan

Lander Middle School

Lander, Wy

Chemistry/ Energy: Chemical -Junior Division



3rd Place

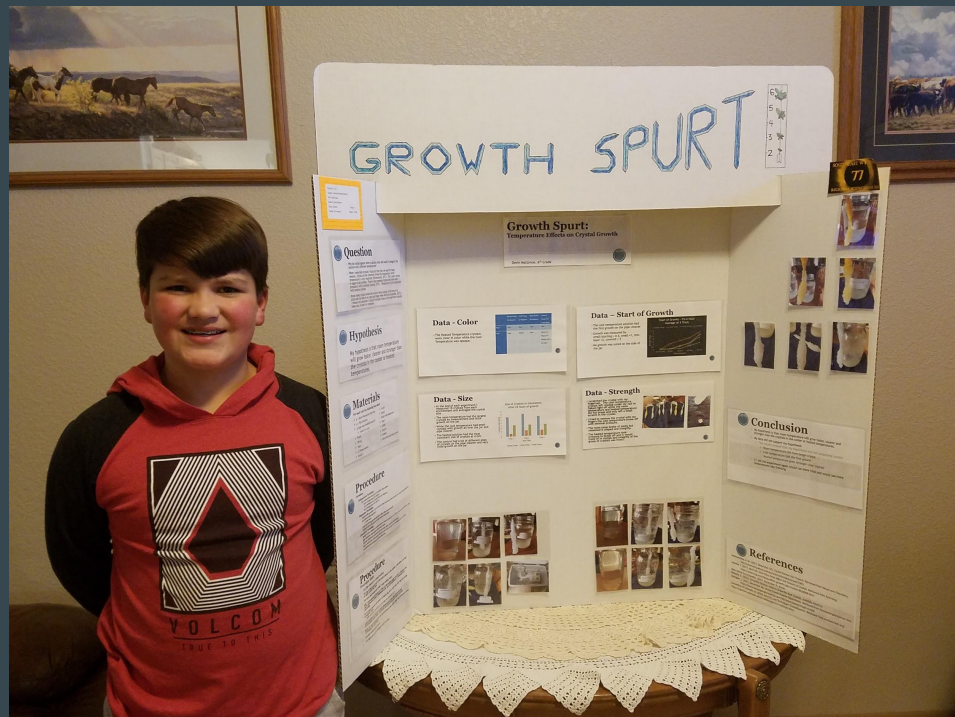
Compression Effects On Dissolution Rates

Navaeh Kuebel

Wheatland Middle School

Wheatland, Wy

Chemistry/ Energy: Chemical -Junior Division



2nd Place

Growth Spurt: Temperature Effects On
Crystal Growth

Davin Mattimoe

Gilchrist Elementary

Cheyenne, Wy

Chemistry/ Energy: Chemical -Junior Division



1st Place

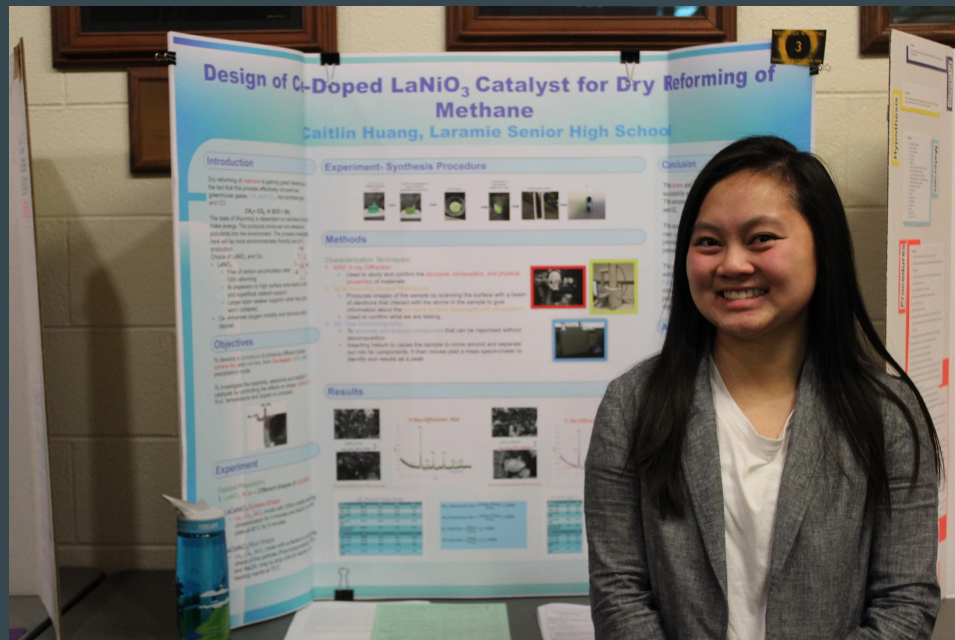
It's a Sticky Situation

Meile Chebotarev

Wheatland Middle School

Wheatland, Wy

Chemistry/ Energy: Chemical -Senior Division



3rd Place

Design of Ce-Doped LaNiO₃ Catalysts
for Dry Reforming of Methane

Caitlin Huang

Laramie High School

Laramie, WY

Chemistry/ Energy: Chemical -Senior Division

2nd Place

Calico Chemistry

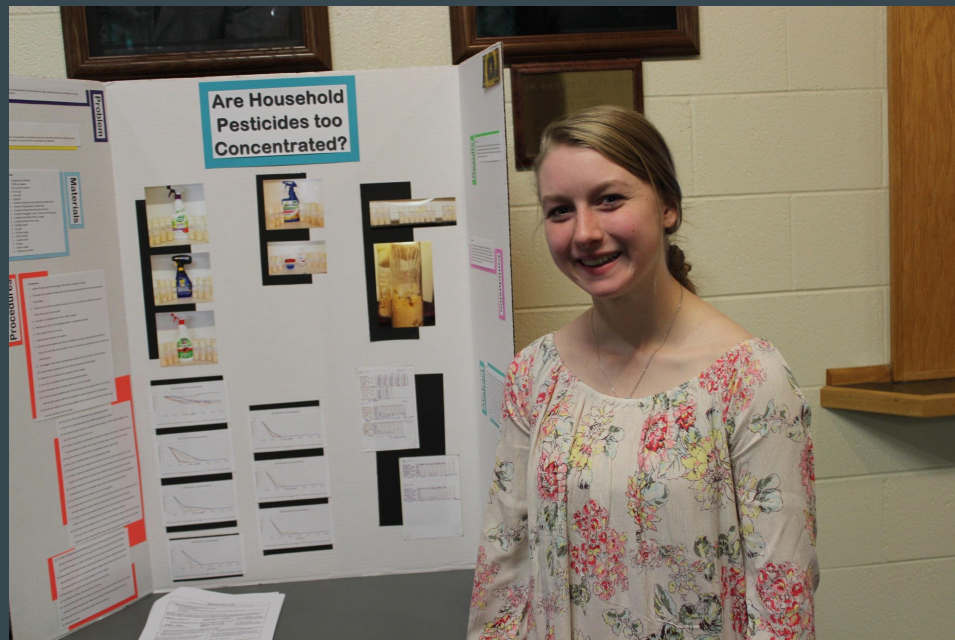
Chloe Smith

Newcastle High School

Newcastle, Wy



Chemistry/ Energy: Chemical -Senior Division



1st Place

Are Household Insecticides Too Concentrated?

Ashlyn Bailey

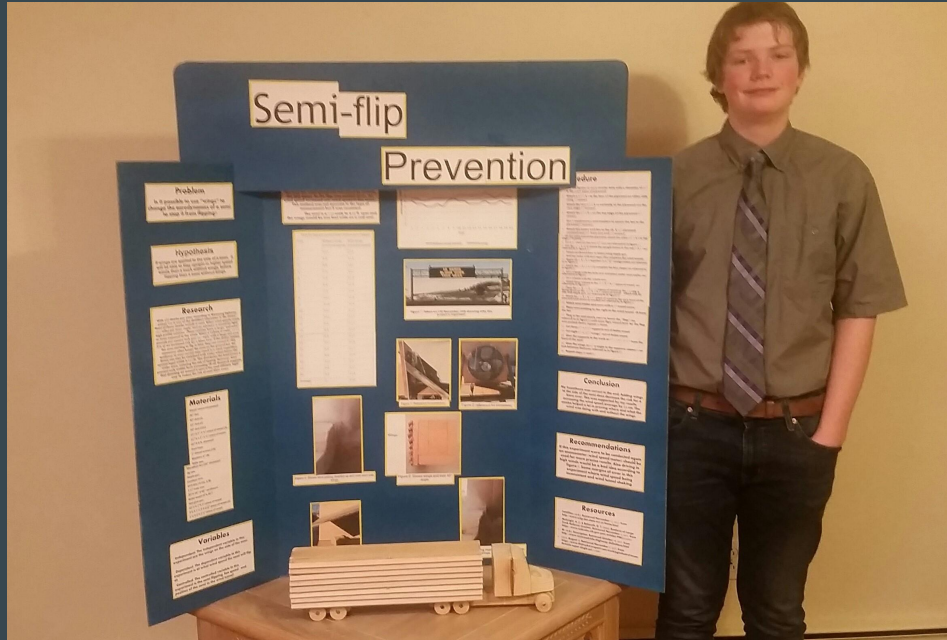
Cheyenne East High School

Cheyenne, Wy



Engineering Sciences & Energy: Physical

Engineering Sciences & Energy: Physical -Junior Division



3rd Place

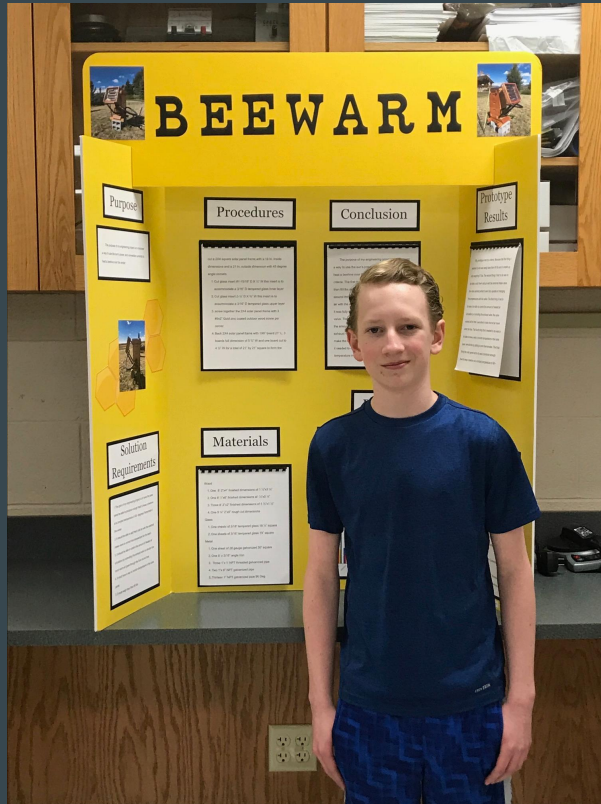
Semi Flip Prevention

Ashton Ford

Saratoga Middle High School

Saratoga, Wy

Engineering Sciences & Energy: Physical -Junior Division



2nd Place

Beewarm

Max Shaw

Pinedale Middle School

Pinedale, Wy

Engineering Sciences & Energy: Physical -Junior Division



1st Place

Making The Invisible Visible

Theresa Bautz

Lander Middle School

Lander, Wy

Engineering Sciences & Energy: Physical -Senior Division



3rd Place

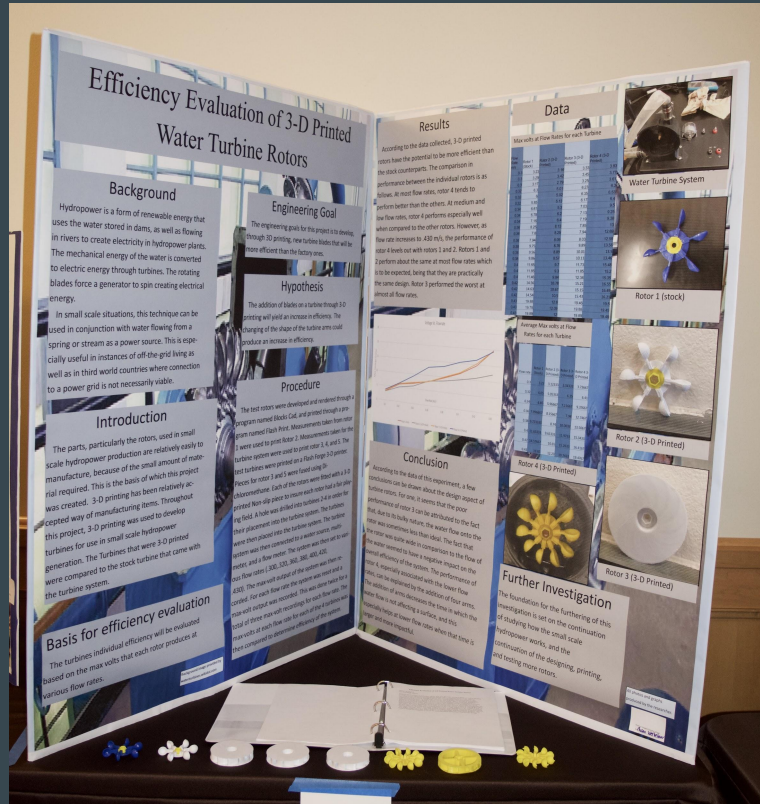
Bioplastics

Courtney Rainbolt

Newcastle High School

Newcastle, Wy

Engineering Sciences & Energy: Physical -Senior Division



2nd Place

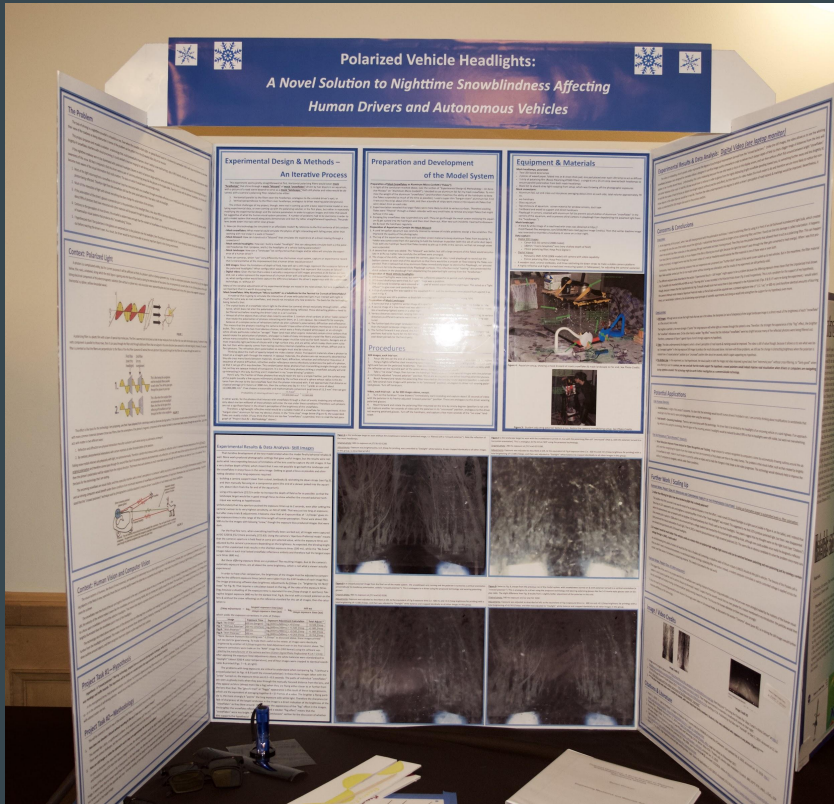
Efficiency Evaluation of 3D Printed Water Turbine Rotors

Mason Werbelow

Greybull High School

Greybull, Wy

Engineering Sciences & Energy: Physical -Senior Division



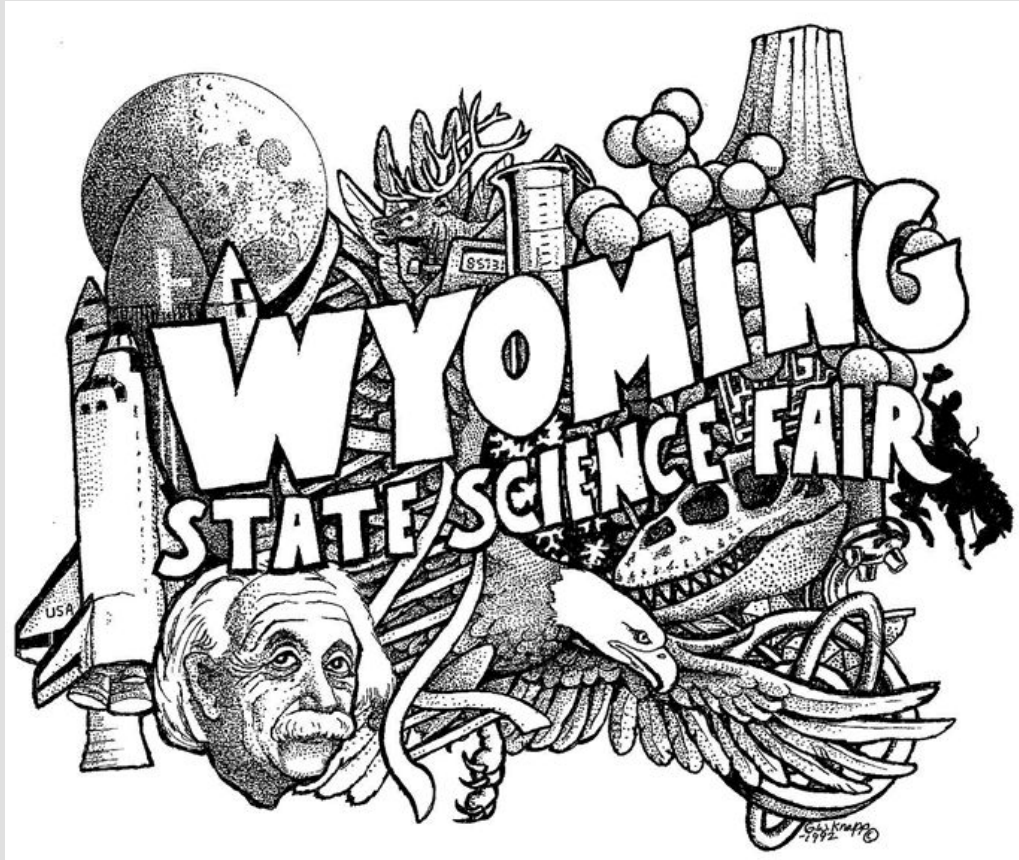
1st Place

Polarized Headlamps: A Novel Solution
To Nighttime Snow Blindness
Affecting Human Drivers and
Autonomous Vehicles

Nicholas Primanis-Erickson

Pinedale High School

Cora, Wy



Environmental Sciences & Engineering

Environmental Sciences & Engineering -Junior Division



3rd Place

A Heap of Heat

Janae Arne & Emmaline Vrska

Pinedale Middle School

Pinedale, Wy

Environmental Sciences & Engineering -Junior Division



2nd Place

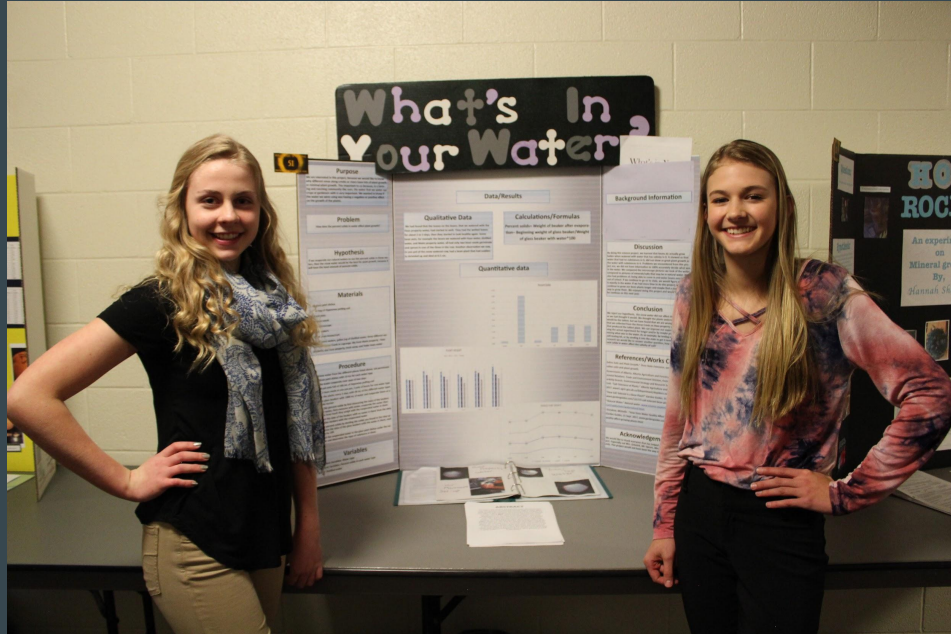
Stop Flooding

Connor Doering

Prairie Wind Elementary

Cheyenne, Wy

Environmental Sciences & Engineering -Junior Division



1st Place

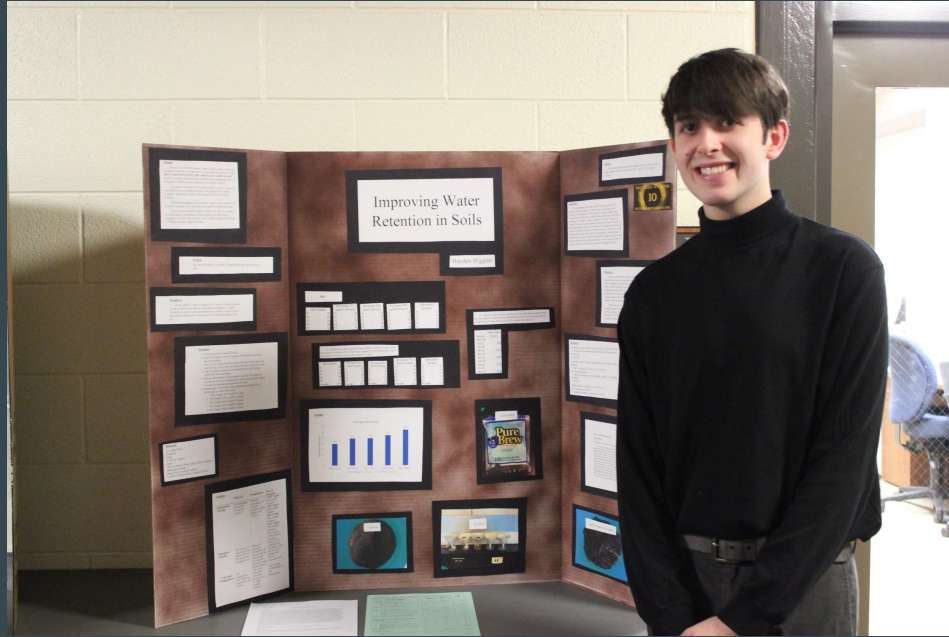
What's In Your Water

Jordan Stoddard & Margie Schmidt

Southeast School

Torrington, Wy

Environmental Sciences & Engineering -Senior Division



3rd Place

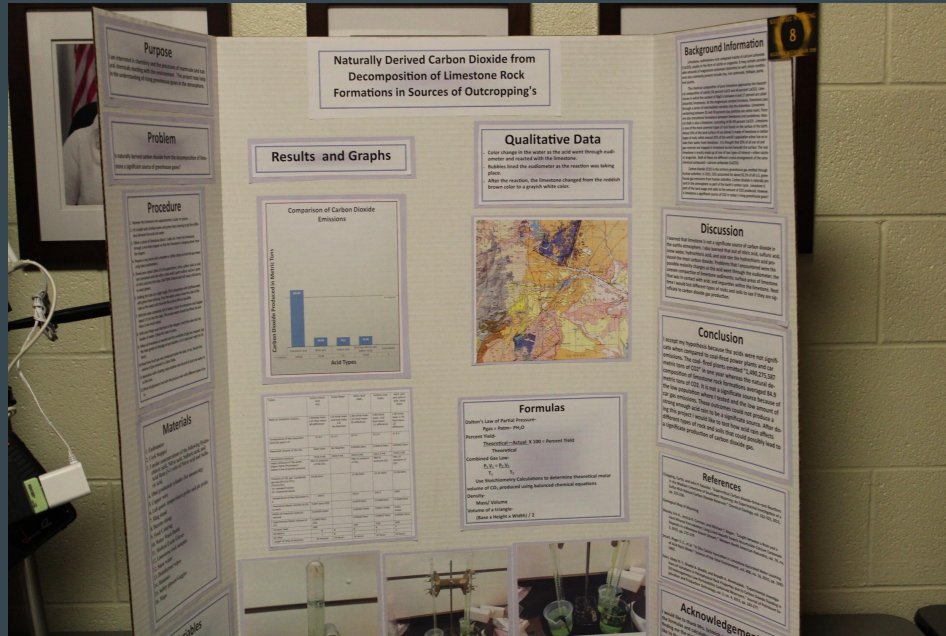
Improving Water Retention in Soils

Hayden Higgins

Cheyenne East High School

Cheyenne, Wy

Environmental Sciences & Engineering -Senior Division



2nd Place

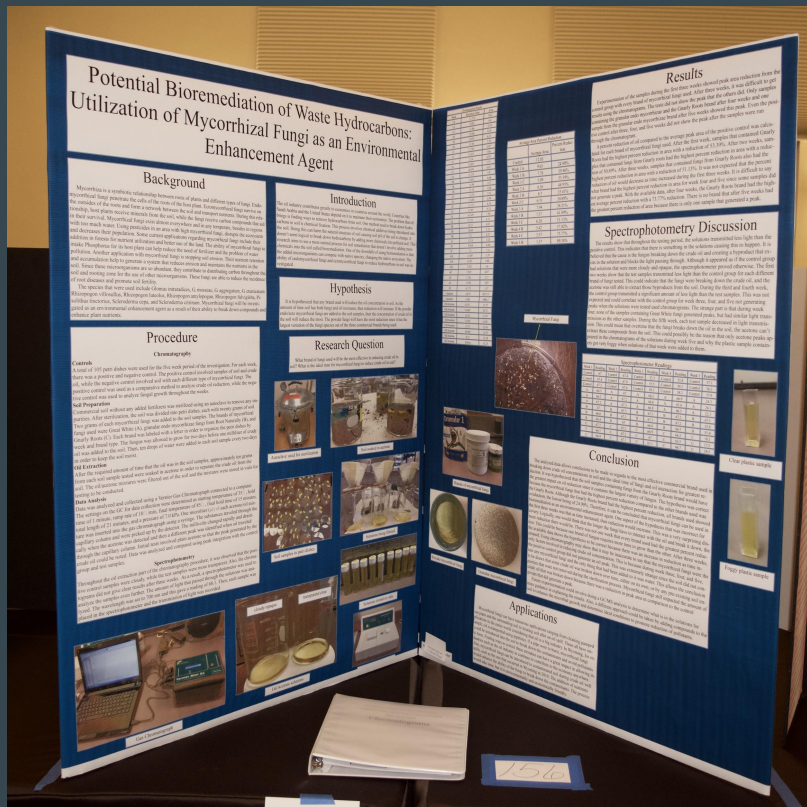
Naturally Derived Carbon Dioxide
from Decomposition of Limestone
Rock Formations in Sources of
Outcroppings

Anna Schmick

Southeast High School

Torrington, Wy

Environmental Sciences & Engineering -Senior Division



1st Place

Potential Bioremediation of Waste Hydrocarbons: Utilization of Mycorrhizal Fungi as an Environment Agent

Eduardo Burgos

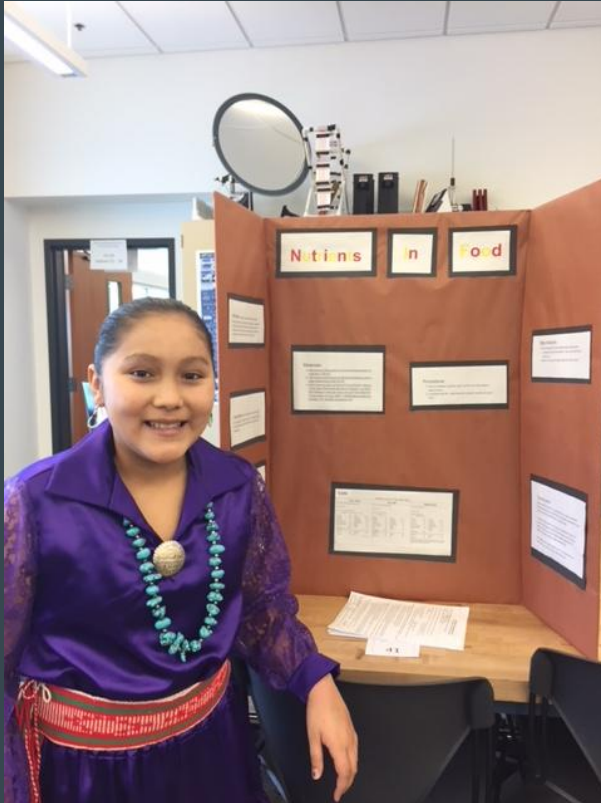
Greybull High School

Emblem, Wy

Mathematics



Mathematics -Junior Division



3rd Place

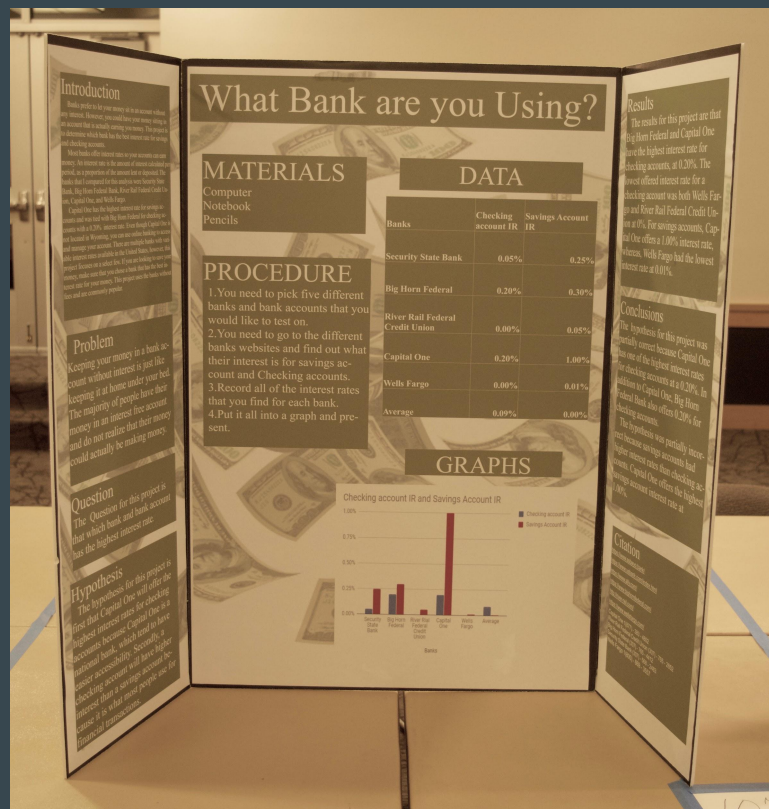
Nutrients in Food

Sandra St. Claire

Lander Middle School

Lander, Wy

Mathematics -Junior Division



2nd Place

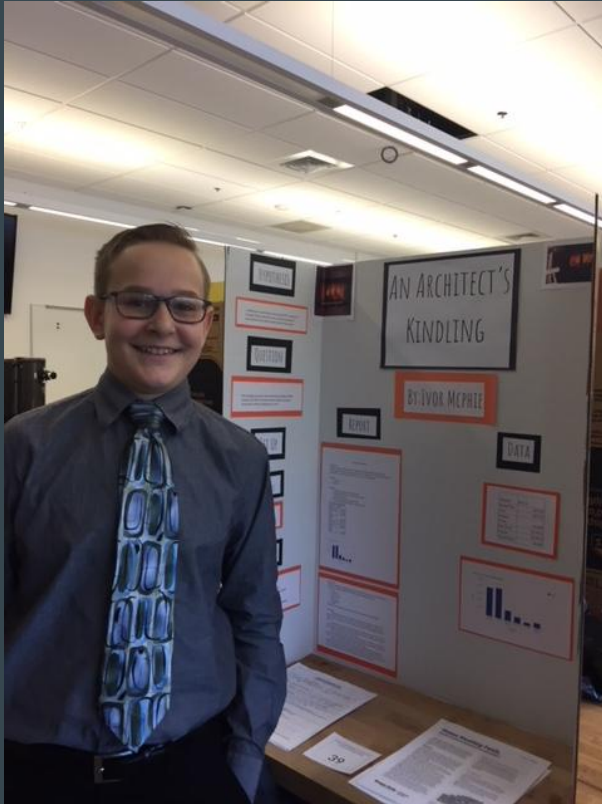
What Bank Are You Using?

Isabella Lungren

Greybull Middle School

Greybull, Wy

Mathematics -Junior Division



1st Place

An Architects Kindling

Ivor McPhie

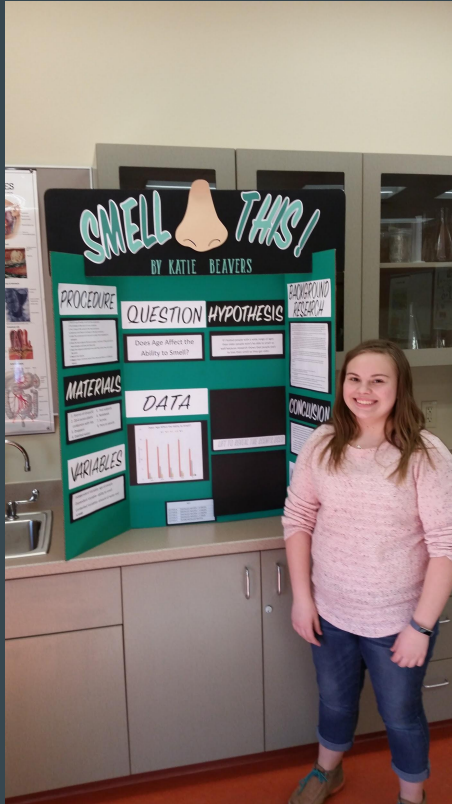
Lander Middle School

Lander, Wy



Medical Sciences

Medical Sciences -Junior Division



3rd Place

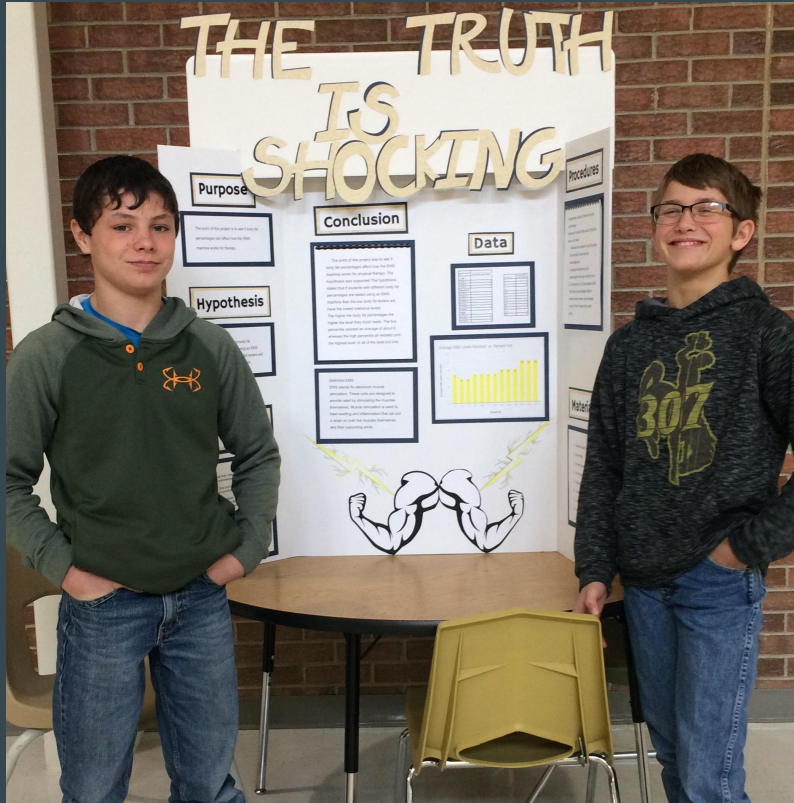
Smell This!

Katie Beavers

Powell Middle School

Powell, Wy

Medical Sciences -Junior Division



2nd Place

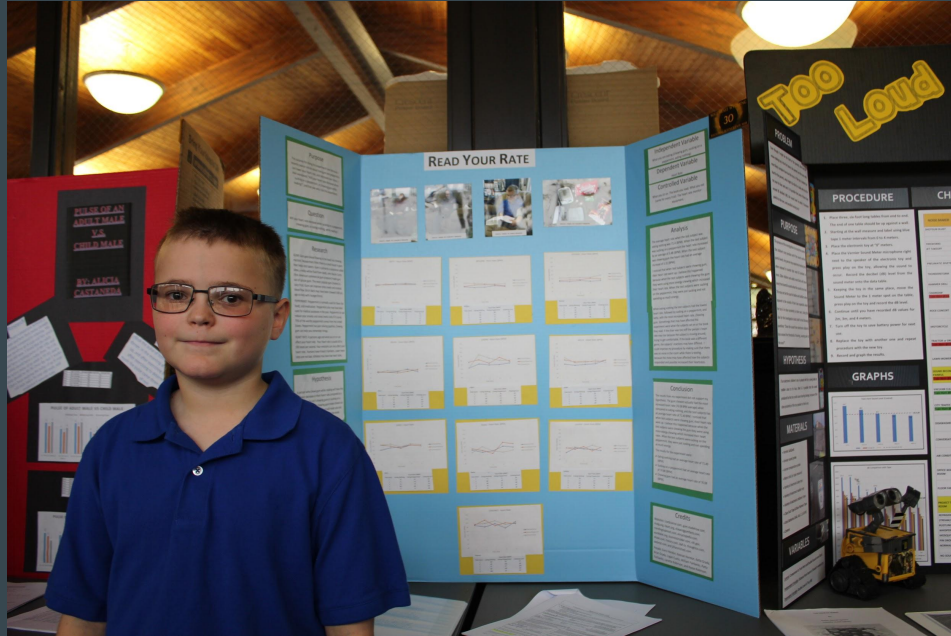
The Truth is Shocking

Colton Gehlhausen & Cody Phelps

Pinedale Middle School

Pinedale, Wy

Medical Sciences -Junior Division



1st Place

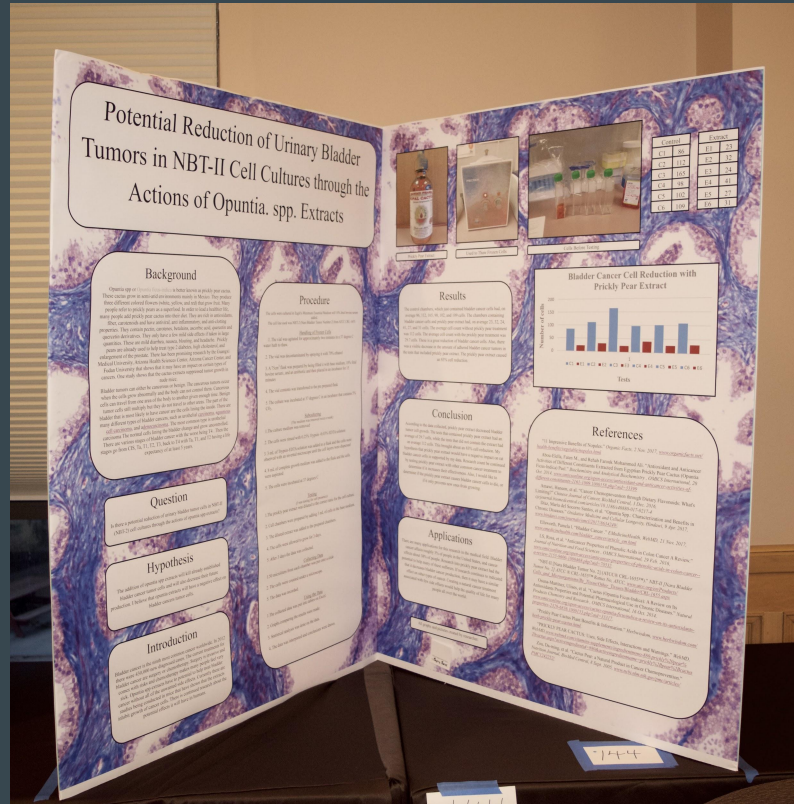
Read Your Rate

Chauncy Hendon

Davis Elementary

Cheyenne, Wy

Medical Sciences -Senior Division



3rd Place

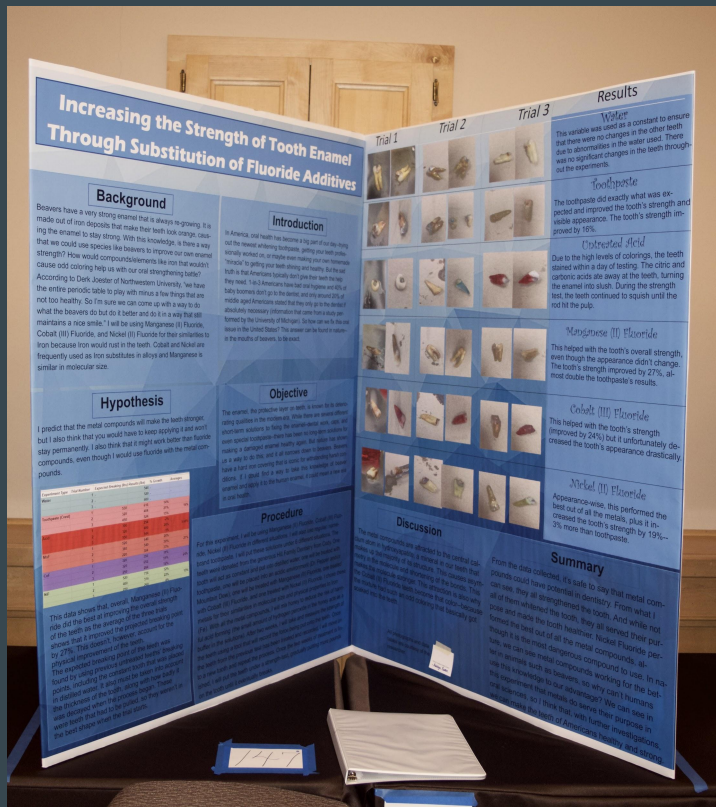
Reduction of Urinary Bladder Tumors in NBT-II Cell Cultures through the Actions of *Opuntia* spp. Extracts

Bayley Burns

Greybull High School

Greybull, Wy

Medical Sciences -Senior Division



2nd Place

Increasing Your Strength of Tooth Enamel through Substitution of Fluoride Additives

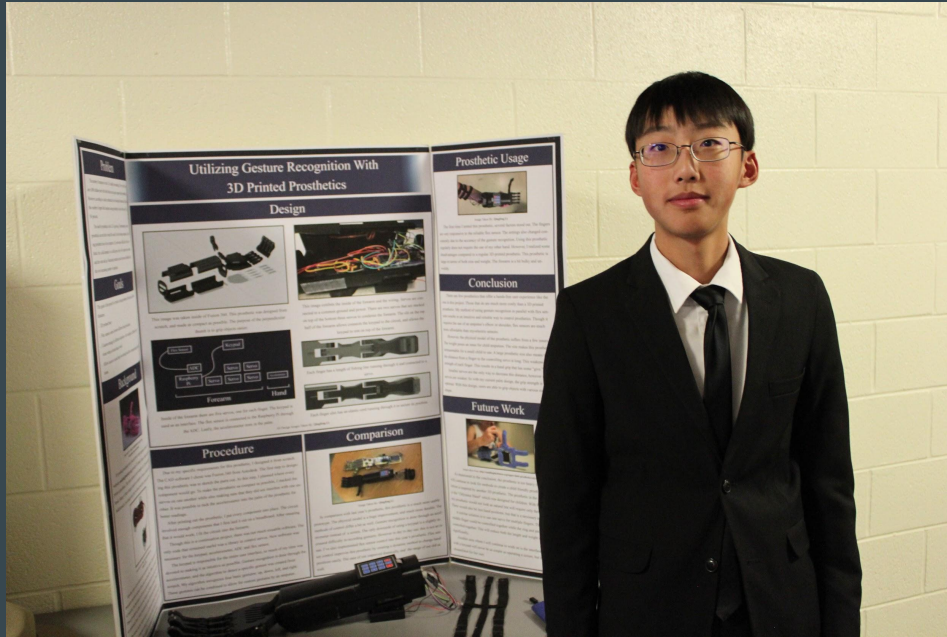
Ashlyn Ewen

Greybull High School

Greybull

High School

Medical Sciences -Senior Division



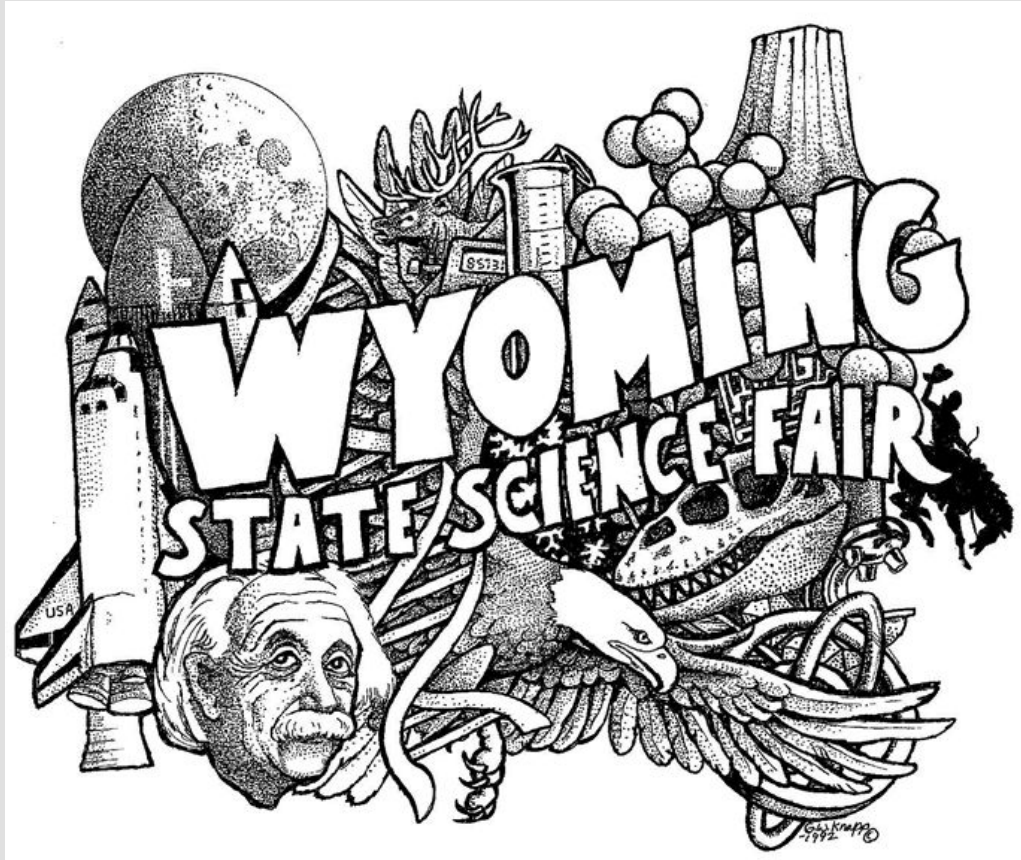
1st Place

Utilizing Gesture Recognition with 3D
Printed Prosthetics

Qingfeng Li

Laramie High School

Laramie, Wy



Microbiology

Microbiology -Junior Division



3rd Place

Meat Your Death

Gracelyn Farnham

St. Mary's Catholic School

Cheyenne, Wy

Microbiology -Junior Division



2nd Place

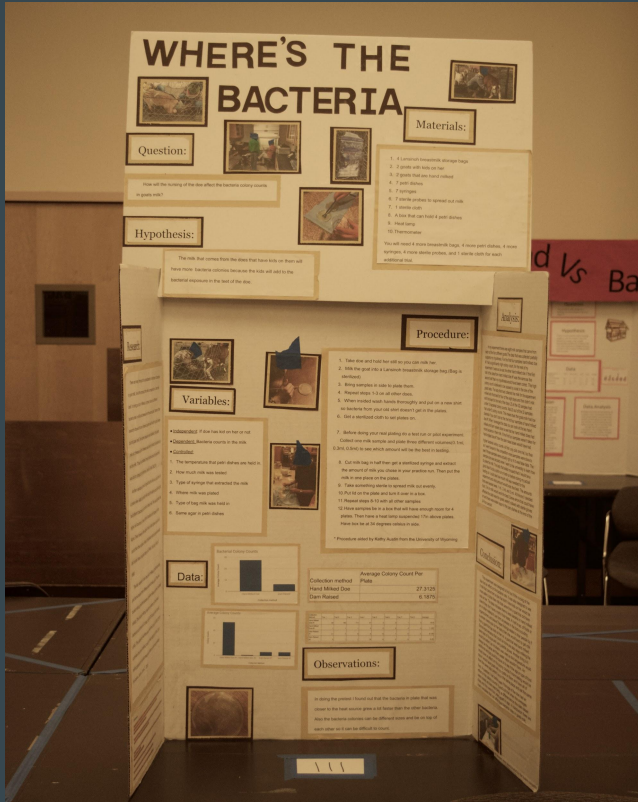
A Bite Into Bacteria

Sara Kunard & Mandy Majhanovich

Pinedale Middle School

Pinedale, Wy

Microbiology -Junior Division



1st Place

Where's the Bacteria

Jake Hicks

Wheatland Middle School

Wheatland, Wy

Microbiology -Senior Division



2nd Place

Keeping Those Berries Fresh

Taylur DiCamillo

Wyoming Connections Academy

Cheyenne, Wy

Microbiology -Senior Division



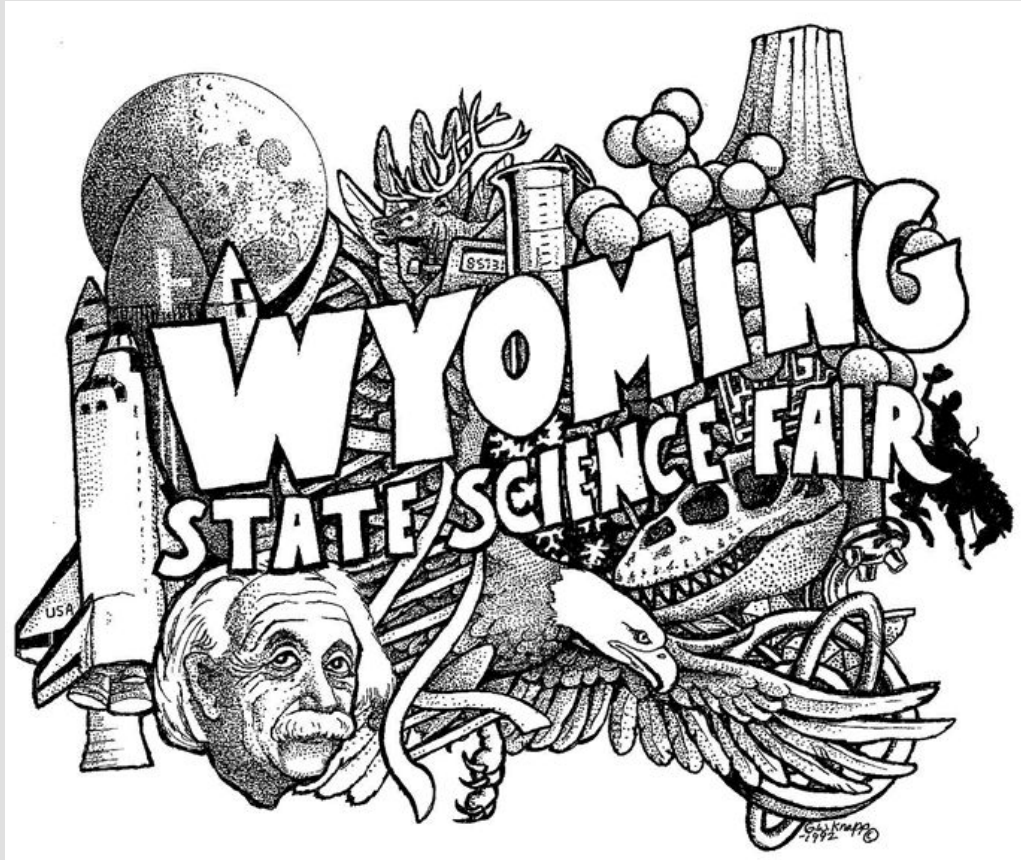
1st Place

Don't Breathe

Carly Keller & Danielle Clapper

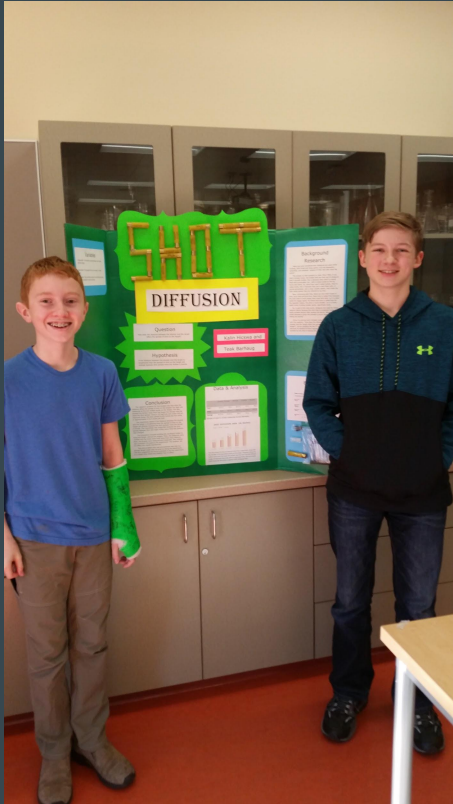
Southeast High School

Torrington/ Veteran, Wy



Physics & Astronomy

Physics & Astronomy -Junior Division



3rd Place

Shot Diffusion


Teak Barhaug & Kalin Hicswa

Powell Middle School

Powell, Wy

Hypothesis

If a homopolar motor with one magnet can generate electricity without an electromagnet, then using a homopolar motor with three magnets will generate more movement because there is more "electricity" to move the dancer.



Just Dance!

Homopolar Motor Dancers

APPLICATION

When my family purchased some land where there was no electricity, I began to think about ways that we could generate electricity without using gasoline. I decided to use what as my rationale for picking out to do this science fair project which, in turn, led me to making my robot that uses only batteries and magnets. In my research I learned that creating electricity in this fashion is much cleaner for our environment because there is no exhaust. Some places around the world even use magnets to power their trains. They are called maglev trains. As science continues to move toward cleaner energy, magnets could be used to provide the world with power!

Rationale

You can generate electricity with an electromagnet, or even powered by an electromagnet without an electromagnet? I am interested in magnetism and electromagnetism because I am interested in learning how to generate electricity if you are living off the grid.

Discussion

What is a Homopolar Motor?

Unlike a motor that is gasoline powered or even powered by an electromagnet, a homopolar motor is a simple motor that spins because of what is called the Lorentz force.

A Lorentz force is when an electrical current is moving, or flowing, from the positive end of the battery to the negative and into the magnet(s). Then, the electricity moves from the middle of the magnets to the edge where the wire touches it and travels back to the positive end of the battery.

This may seem simple, but how might this generate movement? When copper wire is in a magnetic field the wire begins to turn and when the wire eventually turns back into the magnetic field everything repeats, and the dancer pirouettes!

PROCEDURE


- Decorate the dancer with magnet and glue
- Set 1 magnet on tabletop.
- Set negative side of battery on the magnets.
- Balance dancer in the middle of the positive pole.
- Release dancer and let it spin.
- Use a clock time the dancer for 15 seconds.
- Count how many complete spins the dancer makes in 15 seconds.
- Take dancer off of the battery.
- Record spins in chart.
- Repeat steps 4-9 two more times.
- Repeat experiment using 2 and 3 magnets.
- Find average spins of each number of magnets

CONCLUSION

My hypothesis stated that when a homopolar motor was standing on 3 magnets it would generate more spins. My hypothesis was supported because when standing on 3 magnets the dancer made 27 full revolutions in 15 seconds when standing on 1 or 2 magnets the spun about 12 and 16 time per 15 seconds.

MATERIALS

- Three AA batteries
- 1/2 x 1/4 Neodymium disc magnets
- 16 gauge or copper hobby wire
- Pliers
- Dancer Template
- Dress Material of Your Choice
- Glue
- Tape Measure



Variables

INDEPENDENT VARIABLE
Amount of magnets

DEPENDENT VARIABLE
How many spins per 15 seconds

CONTROLLING VARIABLES
Size of battery
Brand of Battery
Type of Magnets
Gauge of Wire
Same Dancer

Results

Number of Spins in 15 Seconds	Spins	Time	Spins	Time	Spins	Time
12	15	16	15	12	15	16
15	12	16	15	12	15	16
16	15	12	16	15	12	16
12	15	16	15	12	15	16
15	12	16	15	12	15	16
16	15	12	16	15	12	16
12	15	16	15	12	15	16
15	12	16	15	12	15	16
16	15	12	16	15	12	16
12	15	16	15	12	15	16
15	12	16	15	12	15	16
16	15	12	16	15	12	16
12	15	16	15	12	15	16
15	12	16	15	12	15	16
16	15	12	16	15	12	16
12	15	16	15	12	15	16
15	12	16	15	12	15	16
16	15	12	16	15	12	16
12	15	16	15	12	15	16
15	12	16	15	12	15	16
16	15	12	16	15	12	16
12	15	16	15	12	15	16
15	12	16	15	12	15	16
16	15	12	16	15	12	16
12	15	16	15	12	15	16
15	12	16	15	12	15	16
16	15	12	16	15	12	16
12	15	16	15	12	15	16
15	12	16	15	12	15	16
16	15	12	16	15	12	16
12	15	16	15	12	15	16
15	12	16	15	12	15	16
16	15	12	16	15	12	16
12	15	16	15	12	15	16
15	12	16	15	12	15	16
16	15	12	16	15	12	16
12	15	16	15	12	15	16
15	12	16	15	12	15	16
16	15	12	16	15	12	16
12	15	16	15	12	15	16
15	12	16	15	12	15	16
16	15	12	16			

Lusk, Wy

Physics & Astronomy -Junior Division



1st Place

Aired Up!

Logan Wietzki

Classical Conversations-Lander
Campus

Lander, Wy

Physics & Astronomy -Senior Division



3rd Place

Soccer Balls and Forces

Carolina Anderson

Newcastle High School

Newcastle, Wy

Physics & Astronomy -Senior Division

Physics & Astronomy -Senior Division

Dimples??

A Study in Aerodynamics

Research Question
Can dimples affect the air resistance on a ball and improve the aerodynamic properties of a ball?

Hypothesis
If I make multiple dimples on a ball, the air resistance will be reduced, and the ball will travel further than a ball with no dimples. The dimples will create a boundary layer that will reduce the air resistance on the ball.

Errors
The ball was not perfectly spherical, and the dimples were not perfectly uniform. The air resistance was not measured in a vacuum, and the ball was not launched from the same height.

Future Research
The next step would be to test the ball in a vacuum, and to test the ball with different dimple patterns. It would also be interesting to test the ball with different materials.

Resources
The following resources were used in the research: [List of resources]

Procedure
The procedure for this experiment was as follows: [Detailed procedure]

Results
The results of the experiment are shown in the following table: [Table with 4 columns: Trial, Distance (m), Time (s), and Average Distance (m)]

Conclusion
The results of the experiment show that the ball with dimples traveled further than the ball without dimples. This is because the dimples created a boundary layer that reduced the air resistance on the ball.

2nd Place

Dimples??

Taylor Choal

Natrona County High School

Casper, Wy

Physics & Astronomy -Senior Division



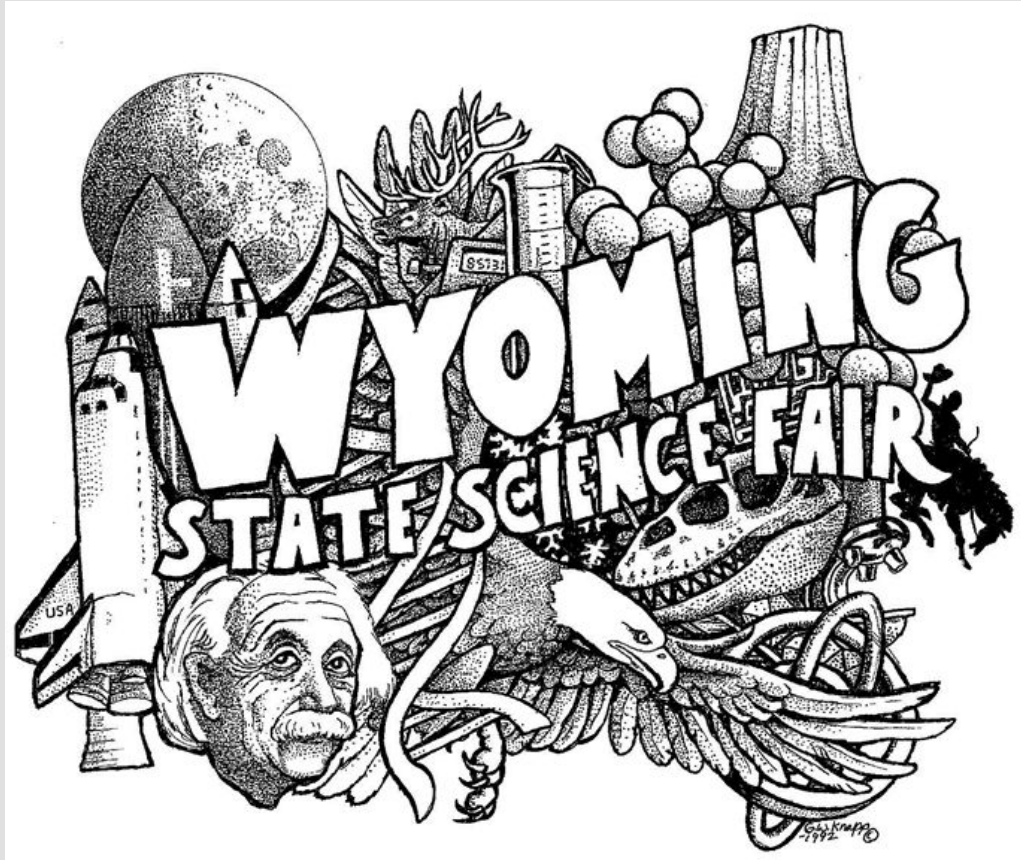
1st Place

The Effect of an Eclipse on Muon
Count Rates

Perry Martin & Markie Whitney

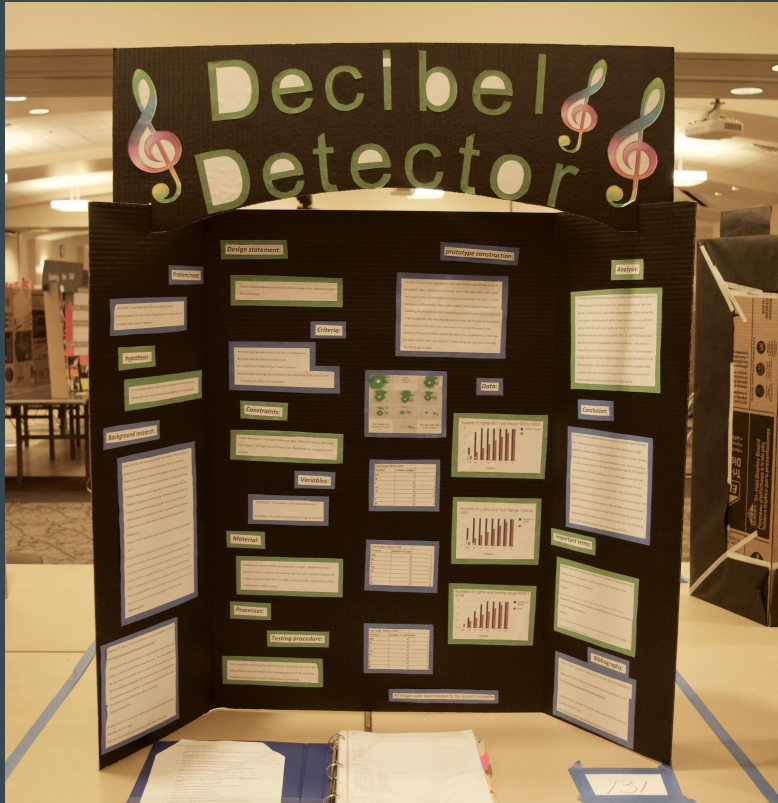
Newcastle High School

Newcastle, Wy



Robotics & Computer Sciences

Robotics & Computer Sciences -Junior Division



3rd Place

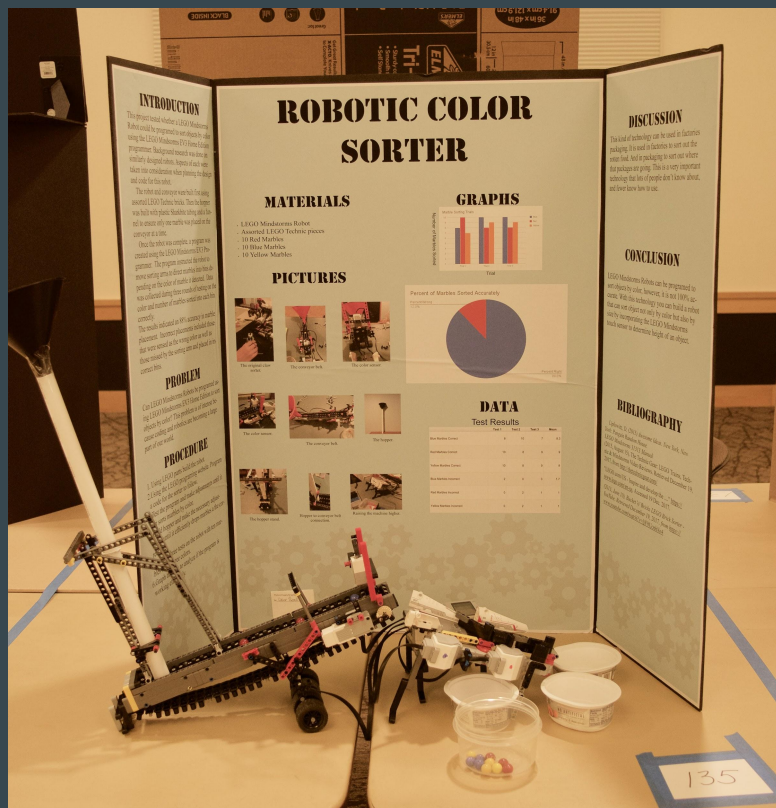
Decibel Detector

Deacan Heinz

Wheatland Middle School

Wheatland, Wy

Robotics & Computer Sciences -Junior Division



2nd Place

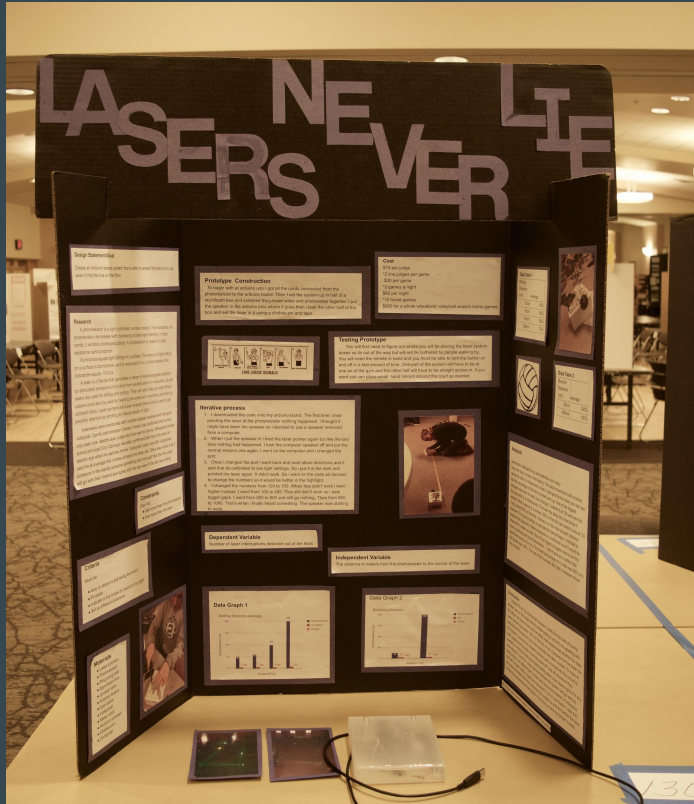
Robotic Color Sorter

Catcher Russell

Greybull Middle School

Basin, Wy

Robotics & Computer Sciences -Junior Division



1st Place

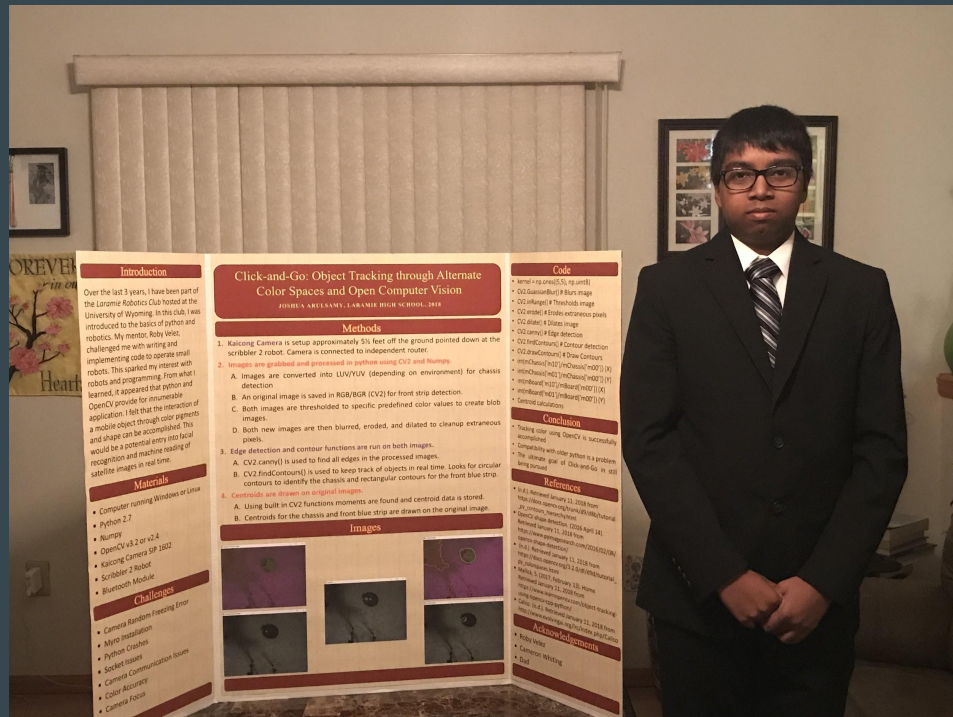
Lasers Never Lie

Serenity Jones

Wheatland Middle School

Wheatland, Wy

Robotics & Computer Sciences -Senior Division



1st Place

Click-and-Go: Object Training through
Alternate Color Spaces and Open
Computer Vision

Joshua Arulsamy

Laramie High School

Laramie, Wy

