

## Project Detail - Placement Added, Errata Inserted, Withdrawn Removed

### Grade 6

#### *Animal Sciences (AS)*

6001S **Marissa Schneider**  
The Effect of Nocturnal Cycles of Animal Learning

6002T **Kayley R Winkelman**  
You Hairy Dog

#### *Behavioral and Social Sciences (BE)*

6003S **Evan J Anderson**  
Eyewitness Memory

6004S **Esefany Garcia**  
Can Food Temperature Affect its Taste, Even on Paper?

6005S **Ellie Johnson**  
Music vs. Heart

6006S **Isabella Sandoval**  
Music and Marketing: Kermit gets a Makeover  
**Project At Electricity Wall**

#### *Cellular and Molecular Biology (CB)*

6007W **Ridhima Mishra**  
Extraction of DNA from Vegetables and the Electrophoresis Method

#### *Chemistry (CH)*

6008S **Ayana I Anderson**  
Are sports drinks worth the cost?

6009S **Maya E Ba**  
Does table salt conduct electricity as well as saltwater?

6010S **Emma Celebrezze**  
Got Milk?

6011W **Olivia Chen**  
Plastics and Dissolve rates

6012S **Anna M Hyatt**  
Why is corn syrup in most our food?

6013T **Joe Johnson**  
In What Do Crystals Grow Best, Water, Apple Juice, or Sprite?

6014S **Clara June Lee**  
What type of liquid will cause a penny, a nail, a paper clip, and a sewing needle to rust faster?

6015S **Oscar J Mulvaney**  
Measuring Solubility in Tap and Deionized Water

6016T **Mary Anna E Preble**  
Leavenings in Banana Bread

6017T **Abrielle L Prunty**  
Lowering The Freezing Point Of Water With Salt

6018W **Shana V Tran**  
Bursting your Bubble

#### *Earth and Planetary Science (EA)*

6019T **Seamus H. Flynn**  
Cloud Gazing Forecast: Predicting the Weather by Observing Cloud Patterns

#### *Energy and Transportation (ET)*

6020W **Jacob Koppendrayner, Wyatt Holmes Team** - Cool Cola

6021T **Ruthie E Nordquist**  
Watt Causes Evaporation

#### *Engineering: Electrical and Mechanical (EE)*

6022S **Samuel A Geiger, Nick Wagner Team** - The Biefeld-Brown Effect  
**Project At Electricity Wall**

6023S **Lexi Hilton, Ruth McInerney Team** - Magnetic Levitation Trains

6024T **John Kostohris**  
Which Terrain Is Best?

6025S **James A Kunau**  
Which model bridge best resists weight

6026T **Robert S Nygaard**  
Does Different Terrain Affect the Performance of Lego Mindstorm Robots?

6027S **Breanna N Simon**  
How does the type of light bulb affect the amount of electricity it uses?

6028S **Tuomas P Sivula, David M White Team** - Hovercraft

6029T **Sean Tsai**  
What's up electrons?

#### *Engineering: Materials and Bioengineering (EN)*

6030T **Jacob M Zwak**  
Baseballs

*Environmental Management (EM)*

- 6031S **Georges Glen Mefleh**  
Does Pollution in the Mississippi River increase as it goes downstream
- 6032S **Lydia R Rolfes**  
Slippery Subject: What gives better traction on ice sand, salt or road chemicals

*Environmental Sciences (EV)*

- 6033S **CeCe E Johnson, Hunter B Johnson Team** - If You Hit The Gas Will The Water Last?
- 6034T **Mickelle L Kaufer**  
Solar Oven Science
- 6057T **Anya Magnuson**  
Danger: Oil Clean Up in Progress
- 6035T **Lucas W Nelson**  
MN Salt Water on Plants
- 6036S **Aceif J Oubaha**  
Does the taste of water affect its quality?
- 6037S **Daniel J Rockcastle**  
Survival Science: Water
- 6038T **Max R Ylitalo**  
Absorbing Oil Spills: What Works Best?

*Mathematical Sciences (MA)*

- 6039S **Noah S Cordes**  
How does a flexagon and Why?

*Medicine and Health Sciences (ME)*

- 6040S **Emily A Connors, Mary McConville Team** - Are Wii Fit?
- 6041S **Gus L Johnson**  
Red Bull meets X Box
- 6042S **Daniel A Martinez, Kenneth U Udoibok II Team** - The Effects of Rapid Exercise
- 6043W **Sarah E Stefanik**  
Too Sweet to be Blue
- 6044T **Aisha Tahir**  
Are Your Eyes Deceiving You?

*Microbiology (MI)*

- 6045T **Ben R Caswell**  
What Hand Drying Materials Prevent the Spread of Germs?
- 6046T **Kevin P Moonen**  
Handwashing and Germs

*Physics and Astronomy (PH)*

- 6047W **Zachary J Becka**  
Sham Wow or Scam Wow
- 6048T **Grace Elizabeth Clemens**  
Through The Air
- 6049T **Amelia Daddi**  
Punch vs. Palm strike
- 6050T **Zoe Gale**  
Big Magnets, Small Magnets
- 6051S **Johnny M Goodson, Liam B Kelly Team** - Which Cleats for my Feet
- 6052S **Daniel R. Johnson**  
Golf Balls: Which are Better
- 6053W **Carolyn K Jons**  
Photon Cannon of Balloon Doom
- 6054W **Alan Z. Lu**  
Motor Motion!

*Plant Sciences (PS)*

- 6055S **Charlie L Anderson**  
Water Wonders
- 6056W **Brett Burbank**  
Spotlight on Plant Growth  
**Project At Electricity Wall**

**Grade 7**

*Animal Sciences (AS)*

- 7001T **Kasey Jane Kalthoff**  
Color or Plain?
- 7002S **Anton J Konieczny**  
Ant Feeding Habits
- 7003S **Lydia R Neus**  
How Does Light Affect Change In Cricket Mass?

*Behavioral and Social Sciences (BE)*

- 7006S **Joe Amble**  
Virtual Training: Here Today For Tomorrow  
**Project At Electricity Wall**
- 7007S **Sarah M Bordsen Bailey**  
The Brains Behind "Where's Waldo?"
- 7119T **Quin Brudney**  
Mind Over Matter
- 7008W **Elizabeth A Cullen**  
Which Form of Practice Helps the Most When Shooting Free Throws?

- 7010T **Madalyn A Elmquist**  
What Works Best for Alleviating Brain Freezes?
- 7011W **Elizabeth Erb**  
Does music affect how you study?
- 7012S **Kaitlyn Ewine**  
Visual Perception: a Matter of Context
- 7013S **Hennok Ghebeye, Kyle Ferguson**  
**Team** - Can Drawing Improve Short Term Memory?
- 7014T **Luke G Heimer**  
Emotions and Scores
- 7015W **Claire S Hogan**  
Actions Speak Louder Than Words
- 7016T **Ellie S Honerman**  
Do Mnemonics Improve Memory?
- 7017T **Emily A Kriegel**  
Does Music Loudness Affect Concentration?
- 7018T **Sara J Kumerow**  
Gender and the Brain
- 7019S **Awet Melake**  
An Interaction of Physical and Auditory Balance
- 7020W **Erin S O'Connor**  
If You Are Right or Left Handed Does That Mean You Use Your Right or Left Ear, Eye, or Leg?
- 7021S **Nenagh A O'Leary**  
The Stroop Test
- 7022W **Camille I Smith**  
Are Children Being Desensitized By Media Exposure?
- Biochemistry (BI)**
- 7025T **Riley P Lokrantz**  
Tanning Booths
- 7026W **Kristen L Shand**  
Does Bad or Expired Yeast Affect How well Bread Rises?
- 7024S **Micaela J Yarosh**  
Does the Amount of Acid in Various Types of Apples Affect the Sugar Concentration
- Cellular and Molecular Biology (CB)**
- 7027S **Alexis M Martin**  
Speed and Method of Cryogenics
- Chemistry (CH)**
- 7028W **Nathan M Carroll**  
How Does Salt Affect the Rate of Temperature Change in Water?
- 7029W **Axl A Delgadillo Bonequi**  
Which cleans metal better, Coca-Cola or aspirin?
- 7030T **Griffin A Egan**  
Microwave Popcorn
- 7031W **Cole M Freeman**  
Which metal is most corrosion resistant?
- 7032T **Ty E Gale**  
Coke Kills: The Dangers of Drinking Soda Pop
- 7035T **Jenna J Grundtner**  
Light and Vitamin C
- 7036S **Zachery M Inskip**  
How Does The Shape Of An Ice Cube Affect How Fast It Melts?  
**Project At Electricity Wall**
- 7037W **Abigail L Knipp**  
What Effect Does the Type of Solute have on the Rate of Crystallization?
- 7038S **Maddie J Lee**  
Brownie Battle: Sugar vs. Splenda
- 7040W **Theresa M Narog**  
Iron
- 7041W **Mivi Chi Nguyen**  
How Does Dish Soap Expand Food Coloring in Different Liquids?
- 7129S **Connor Norby**  
Stop the Pop
- 7042W **Annalise P Podewils**  
Which Stain Removers is Most Effective in Removing Various Stains?
- 7044S **Lila C. Scher**  
Which Orange Drink is the Least Acidic?
- 7045S **Maura O Walde**  
Stain, Stain Go Away
- 7046W **Kyle J Walz**  
Did you know that sugar can slow you down?
- Computer Science (CS)**
- 7047T **Anthony Y Hu**  
The Effect of Camera Shutter Speed on the Brightness of a Photo
- Earth and Planetary Science (EA)**
- 7048T **Emily J Blosberg**  
How Does Earth Weather Affect HF Amateur Radio Frequency Signal Strength?
- 7049T **Isabella M Christensen**  
Plant Growth and Wavelength

- 7051W **Zoe A Vickerman**  
Whether, Weather Forecasting Is Accurate
- Energy and Transportation (ET)*
- 7052T **Brennan A Daily**  
How To Build A Simple Hydrogen Fuel Cell
- 7053S **Isaac Hamilton**  
Bike Gear Ratios
- 7054W **Matthew Harkema**  
A New Way of Producing Electricity
- 7055S **Conor Hetzel**  
Parallel Versus Series Circuiting in a Solar Car  
**Project At Electricity Wall**
- 7120T **Tim Kemp**  
Where there is smoke, there is supper
- 7056T **Wencel Kust**  
Insulation
- 7057T **Madeline L Warner**  
The Search for Energy Efficient Lighting
- Engineering: Electrical and Mechanical (EE)*
- 7058T **Jupiter U.G. Adams-Phipps**  
Fruits, and Vegetables, and-Batteries? Oh my!
- 7121T **Emma O'Keefe**  
Sound Shields
- 7060S **David M. Sherman**  
Are fair dice fair?
- 7061W **Chase Ward**  
Hydroelectric Power Plant
- Engineering: Materials and Bioengineering (EN)*
- 7062S **Lucy H Franzen**  
Battle of the Bridges
- 7063S **Mikayla M Klein**  
The Sound Of Tap Shoes
- 7064S **Conor J Leyden**  
Shocking Shoes
- Environmental Management (EM)*
- 7065S **Zack Wosika**  
Aspen Tree Growth: As a product of Temperature,  
Precipitation and Atmospheric CO<sub>2</sub> Levels
- Environmental Sciences (EV)*
- 7066T **Matthew J Danley**  
Saving The Earth: One Drop At A Time
- 7128S **Seamus Dickson**  
Birds in Distress
- 7126W **Samuel Joseph Fleming**  
Outdoing other plants
- 7122S **Lili Hagg**  
Water Wars
- 7067W **Emilie Nordhues**  
What materials make the strongest recycled paper?
- 7123T **Michael Ochs**  
Crack the Bat
- 7068T **Colin D Salchow**  
Insulation
- 7069W **Vivien D Schultz**  
Does The Richfield School District Have The Best  
Quality Drinking Water
- 7070T **Abby I Vakulskas**  
Is Minnesota Getting Warmer?
- 7124S **Amira E Warren**  
Activated Charcoal Filtration
- 7071W **Rachel S Woell**  
Acid Rain
- Mathematical Sciences (MA)*
- 7072W **Elizabeth M Hienz**  
Stategies in Twenty-One
- 7073W **Sarah R Pope**  
Fibonacci Apples
- Medicine and Health Sciences (ME)*
- 7075S **Anna K Fryxell**  
Cereal Nutrition
- 7076T **Jayne Elise Gruenhagen**  
Sugar VS. Sugar Subtitutes
- 7077T **Zahara s Kathawalla**  
Swimming strokes heartrate and oxygen
- 7078W **Brandon L Mundahl**  
How does the type of music affect your heart rate?
- 7079W **Katarina H Podewils**  
Which Beverage Produces the Most Tooth Decay
- 7080S **Morgan J Riddle Kimm**  
Does Your Age Affect Your Peripheral Vision?
- 7081T **Kelley Jo Trimble**  
Cure it Fast!
- 7082T **Kristyn A Waldhauser**  
Diabetes & Exercise: Which Exercise Affects Your  
Blood Sugar the Most?

*Microbiology (MI)*

- 7083S **Duncan E Anderson**  
Solving the Urban Legend: Who Has the Cleanest Mouth?
- 7085W **Katerina M. Friedman**  
Where are Germs?
- 7086W **Eleanor R Goblirsch**  
Bacteria in Schools
- 7087W **Connor M Knapp**  
Pool Vs. Lake
- 7088T **Miranda K. Smith**  
Micro-organisms: What household cleaner works the best to Eliminate Micro-organisms?
- 7089S **Samantha Yang**  
Investigating Which different storage types spoils apple in the shortest amount of time

*Physics and Astronomy (PH)*

- 7090W **Ellen M Bakke**  
Color and Heat Absorption
- 7091S **Rebecca A Bergmann**  
Meteor Madness
- 7092T **Joel Blanchard, Mark Blanchard Team** - Basketball Court Friction
- 7093S **Emily A Devaney**  
Sound Barriers
- 7095T **Tanon Hanzal**  
Get in the Loop
- 7096S **Victoria Meza-Ortiz**  
Sugar: Fertilizer or Plant Toxin?
- 7097S **Alice Louise Michell**  
Witch part of your foot, toe or side has more accuracy and force when kicking a soccer ball?
- 7098W **Emily K Ness**  
What Surface is the Best for Thawing Meat?
- 7099S **Grant c Palas**  
Trebuchet - How does mass affect distance thrown
- 7100T **Bradley J Peterson**  
Does Size and Shape Effect a Magnet's Strength
- 7101W **Matthew Reed**  
Rocket Board  
**Project At Electricity Wall**
- 7102T **Laura C Soday**  
Seatbelts: Will You Be Safe or Sorry?

- 7103T **Gina M Spoden**  
Do Artificial Bulbs Let You See the Light?  
**Project At Electricity Wall**
- 7104W **Margaret A Vergara**  
Can food be cooked by calling cell phones?
- 7105W **Maria Vogel**  
Sound Waves  
**Project At Electricity Wall**
- 7106W **Alexander M. Warner**  
Does the Temperature of a Baseball Affect How Far You Hit It?
- 7107S **Joseph B Wenger**  
Newton in Action
- 7108W **Spencer D Wyrick**  
Do Objects with less textures slide down a ramp easier?

*Plant Sciences (PS)*

- 7109W **Autumn L. Boxum**  
Apple Mummification
- 7110W **Kara Mae G Caron**  
Does Seed Spacing of Various Soybean Hybrids Affect the Yield?
- 7112W **Carolyn A Klaesges**  
Water and Plants
- 7125S **Rosie E Laine**  
Drought Drama
- 7113T **Benjamin M Larson**  
Are you Attracted?
- 7114T **Colin J Moriarty**  
Do Different Colored Lights Affect Plant Growth
- 7115T **Sasha K Oines**  
How Do Different Liquids Affect Plant Life?
- 7118W **Ava C Schroedl**  
Fertilizers Poop or Goop
- 7127S **Cameron Swenson**  
Fertilizer Fight

**Grade 8**

*Animal Sciences (AS)*

- 8001S **Maria E Engstrom**  
Pavlov's Theory: Rats Vs. Dogs
- 8002T **Abby M Piechowski**  
Does Dog Saliva Kill Bacteria
- 8003T **Zachary M Reidell**  
How Do Light and Dark Cycles Affect Ant Tunneling Behavior?

8004T	<b>Josh W Vievering</b> What is the Best Cat Food Based on Taste, Nutrition, and Price?		
			<i>Chemistry (CH)</i>
		8020S	<b>Ariana E Conroy</b> Bubbles
	<i>Behavioral and Social Sciences (BE)</i>	8021T	<b>Brienne Francis</b> Baking Soda vs. Baking Powder Difference?      Whats the
8005S	<b>Katie M Conners, Mary M Pickett</b> Team - Improving America's Test Scores Using BAVX	8022T	<b>Gabbie N Grau</b> Digital Versus Film Photography
8006W	<b>Erin M Gorman</b> The Stroop Effect	8023S	<b>Mason A Krelitz</b> Snack Smack Down!
8007T	<b>Sarah A Hansen</b> Impact of Gender Identity on Career Choice	8024T	<b>Miriam Grace Nordquist</b> I'm Melting I'm Melting!
8008S	<b>Della R Kurzer-Zlotnick</b> Face-to-Face with the truth about stereotypes	8025W	<b>Maria C Pfister</b> Ice Cream
8009T	<b>Andrew S McCabe</b> The Stroop Effect	8026S	<b>Ella G Vasquez</b> Soda Secrets
8010S	<b>Jeremy Pierce</b> The Effect of Tempo and Key on Subconscious Emotional Valence		<i>Computer Science (CS)</i>
8011W	<b>Venessa M Scott, Cassandra Galvan-Pizana</b> Team - How Do Different Book Genres Affect a Student's Reading Rate?	8027S	<b>Henry W Johnson</b> Can Young People Tell the Difference Between High Quality and Low Quality Sound Better than Older People?
8012W	<b>Marta L Seitz</b> Does Music Affect Memory	8028S	<b>William D Kieser</b> Memory Power
8013S	<b>Katherine A Slifer</b> Do Different Kinds of Music Affect the Way People Perform on Tests?		<i>Earth and Planetary Science (EA)</i>
8014S	<b>Stryker C Thompson</b> Reward And Revenge	8029S	<b>Alyssa E Kolb</b> Crystal Growth
8015T	<b>Travis J Urness</b> Warping the Stroop Effect	8030S	<b>Whitney C Manning</b> Crystals
8016W	<b>Claire M Walker, Emily M Quandt</b> Team - Reading Comprehension	8031W	<b>Benjamin T Suek</b> Accuracy, Are Meterologists Always Correct?
	<i>Biochemistry (BI)</i>		<i>Energy and Transportation (ET)</i>
8017S	<b>Rawley d Crow</b> What drink is worse for your teeth?	8032S	<b>Tiana K Bellamy</b> Wind Turbines
8018S	<b>Elizabeth Abigail Zalanga</b> Does Mold Grow Faster in Warmer or Colder Areas	8033T	<b>Roman E Faller</b> Aerodynamics of cars
	<i>Cellular and Molecular Biology (CB)</i>	8034T	<b>Luis J Guzman</b> How Will Winglets Affect the Output of a Wind Turbine?
8019S	<b>Madeline R Nicol</b> The Effects of Temperature and PH on Boiological Enzymes in Animal Cells	8035T	<b>Claire Honerman</b> LEDs vs Incandescents: How much money are you actually saving?
		8036T	<b>Andy R Munkelwitz</b> Window film

8037S **Lydia M Newman-Heggie**  
Propellers and Propulsion

8038T **Patty A O'Brien**  
The Speed of Light

8039W **Apurv H Shekhar**  
Can wind Turbines Operate in Marginal Wind  
Speeds? A Venturi Approach  
**Project At Electricity Wall**

8040T **Malcolm D Smith**  
Nuclear Science - Should it be in the US Energy  
future?

*Engineering: Electrical and Mechanical (EE)*

8041T **Michael D Allen, Daniel S Fairbanks**  
**Team** - Hydroelectricity

8042T **Alex C Barrette**  
Now you see me Now you don't

8043S **Joe D Herbeck**  
Bridge Break Through/The effects of stress on  
different types of bridges

8044T **Gunnar M Nelson**  
Shocking Solutions: Conductivity levels of  
different liquids

8045S **Sam O Quiney**  
What's a Theremin?

*Engineering: Materials and Bioengineering (EN)*

8046T **Ben A Betzold**  
Lake iron fertilization a possible geoengineering  
solution

8047S **Arthur T E Dobbs**  
What's more cost efficient, Gasoline or Hydrogen  
**Project At Electricity Wall**

8048S **Viola K Holman**  
How Stent Design Geometry Affects Quality of  
Performance

8049W **Alexander W Richards**  
Box Girder vs. Suspension

8050T **Gretta C Steigauf**  
Can You Buy Game?

8051T **Victoria E Stusek**  
It's Getting Hot in Here: Testing the Insulation  
Power of Different Windows

8052T **Thomas Vlasak**  
A Study of The Effect of Surface Treatments on  
The Strength of Rope

8053T **Christine M Walz**  
Hot vs Cold Bounce

*Environmental Sciences (EV)*

8054S **William Bauer**  
Kill the Watts Not the Planet: A Study in Home  
Electronics Conservation

8055T **Julia E Bina**  
Does Location Affect the Cleanliness of River  
Water

8056T **Jake P Bischel**  
Are green roofs really cool?

8057S **Connor J Burke**  
Population Pollution pH The Minnesota River

8058T **Katelyn Deutsch**  
How Do Heavy Metals Affect Corals?

8059T **Michael J Fratto**  
Water Desalination

8060S **Caroline N Lucas**  
The Meltdown

8061T **Iman Y Pakzad**  
Artemia as a Natural Indicator of Dissolved  
Oxygen Levels

8062S **Brooke R R Rogers**  
Let the Sun Shine In: Which glass pane scheme will  
achieve optimum solar efficiency?

8063T **Connor G Salchow**  
Storm Water Runoff: Affects on Aquatic Life

8064T **Joseph W Schaefer**  
Polluted Ponds

8065T **Deena J Star**  
Composting

8066T **Rebecca J Sward**  
Ocean Wave Energy

8067W **Katherine T Wratkowski**  
Mr. Clean vs Mr. Green: The Effect of Household  
Cleaners on Plants

*Mathematical Sciences (MA)*

8068T **Audrey L Parker**  
Just How Steep Is That Hill

*Medicine and Health Sciences (ME)*

8069S **Daniel L Baden**  
Did Yu See That?

8070S **Calista S Dunbar**  
Dance Dance Coordination!

8071T **Jenna R Evenson, Bailey E Shanley**  
**Team** - Peripheral Vision

8072T **Jonathan M Hjelmgren, John A Blanda**  
Team - The Effects of Music on Pulse Rate

8073T **Heather M Huna**  
Fountain of Youth? The Effects of Resveratrol on  
Lifespan in Drosophila melanogaster

8074S **Ismail J Khadar**  
Thumbs Up!

8110T **Jack Piram**  
Concussions and the M 11 Hockey Helmet

8075S **Meishan B Roen**  
Which Are Denser, Girls or Women?

8076S **Chloe M Sekhran**  
Just Dance; You'll Burn Calories

8111T **Max Smith**  
I Have a Headache: Barometric Pressure and the  
Brain

8077T **Heather J Stone**  
Is Cinnamon Zeylenicum a Sugar Replacer?

8078W **Marleny E Thompson**  
HPV spread the word, not the disease

8079T **Blake E Timm**  
Arthritis

#### *Microbiology (MI)*

8080T **Makayla L. Brummer**  
Meat Bacteria

8081W **Rachel Chiodo**  
Pooch Smooch

8082T **Isabelle D.H. Falk, Meg M Adams**  
Team - Where are germs most common in the  
household?

8083S **Martha Mulugeta**  
What types of bacteria are grown in the immediate  
environment and what does it take for them to be  
stopped?

8084S **Rachel C Oberst**  
Deadly Veggies What is the most effective way to  
kill E. coli on fruits and vegetables?

8085S **Megan E Ostenby**  
Who Ya Gonna Call? Breath Busters!

8086S **Dane E Ostlie-Olson**  
Dirty Water to Drinking Water

8087S **Margaret M Stover**  
Are You At a Greater Risk Of Harboring  
Staphylococcus aureus if You Have a Nose Stud?

8112T **Sophia Warwick**  
Bathroom Bacteria

#### *Physics and Astronomy (PH)*

8088W **Fiona K Daley**  
Waterproof

8089S **Margaret M Johnson**  
The Effects of Temperature on Rocket Engine  
Performance

8090W **Molly C Knapp**  
Egg-cellent!

8091S **Stephen M Maxam**  
Can The Frequency Of Sound Waves Be Measured  
With The Use Of A Flame Tube?  
**Project At Electricity Wall**

8092S **Alex Mongin**  
The Effect of Color on the Clarity of a Photograph

8093T **Austin t Otto**  
Truss Bridges

8095T **Lincoln D Rother**  
Pulp Friction

8096T **Benjamin E Weil**  
How does Gravity Affect Small Objects?

#### *Plant Sciences (PS)*

8097S **Jessica J Anderson**  
Rad Radishes

8098W **Gena R Berendt**  
Flower Power

8099W **Alyssa R Bollensen**  
Pine Needle Preservation

8100T **Kayla C Chuhel**  
Fresh...Fresher....Freshest.....

8101T **Megan E Donnelly**  
Allelopathy Garlic vs. Broccoli

8103S **Ariana L Iepson**  
The Great Plant Maze  
**Project At Electricity Wall**

8104T **Amber A Klein**  
Alkalinity V.S. Acidity

8105T **Zach R. Krueger, Derek A. Stalcar**  
Team - The Effect of Sugar and Caffeine on Plants

8106S **Emma M Marshall**  
Do Different Brands of Popcorn Leave You a  
Different Percent of Duds?

8107W **Taylor V O'Borski**  
The Power of Plants

8108S **Brielle C Sowards**  
Bean Growth

8109W **Erika Elise Swant**  
Smoky Plants

## High School

### *Animal Sciences (AS)*

1001W **Somer M Drummond**  
Grade 12 - Using reverse vaccinology to identify gene candidates to use in a vaccine to prevent Escherichia coli-induced post-weaning diarrhea in swine (*Sus domestica*)

1002T **Danielle Gunder**  
Grade 12 - Can Beethoven Make it Happen?

1003T **Michael D Pickett-Leonard**  
Grade 12 - PRRSV in Mexican Farms

1004T **Samantha M Reigstad-Bayless**  
Grade 10 - Classical Conditioning of Mice Through Mazes

1005T **Jeannie T Taylor**  
Grade 10 - Effect of an Electric Field on Aquarium Fish  
**Project At Electricity Wall**

### *Behavioral and Social Sciences (BE)*

1006T **Thatcher Banh**  
Grade 10 - Savior Siblings For The Better Or The Worse: Psychological Perceptions Of Bioethics

1007T **Annie M Beckel**  
Grade 10 - Parental Engagement In Adolescents' Grades

1008T **Darryn Freeman**  
Grade 10 - Do Videogames Affect Memory?

1009W **Kelly M Gu**  
Grade 9 - The relationship between the amount of sleep and school performance in high school students

1010T **Ellen E Johnson**  
Grade 10 - Developed Intonation

1011T **Kelsey Larson**  
Grade 10 - The Effects Of Sequence On Recollection Accuracy

1012S **Shyanne Lor**  
Grade 9 - Duchenne Smile: Real... Or Not?!

1013T **Heather J Milne**  
Grade 10 - The Effect of Constant Daylight on *Pogonomyrmex Occidentalis* Colony Behavior

1014T **Christopher Phenicie**  
Grade 10 - The Effects Of Trimethylxanthine On Chess Playing Ability

1015T **Mark A Rugnetta**  
Grade 10 - Brain Categorization

1016T **Nadirah J Salam**  
Grade 11 - Improving Native American Test Outcomes

1017T **Nathan J Schmid**  
Grade 10 - The Short-Term Memory Capacity of High School Students

1019S **Houa Xiong**  
Grade 9 - Music Therapy

1020S **Soumaly Yang**  
Grade 9 - How to Attract

### *Cellular and Molecular Biology (CB)*

1022W **Elizabeth A Nelson**  
Grade 9 - Testing the Effects of Household cleaners against E-coli

### *Chemistry (CH)*

1024S **Marisol Castillo, Viviana Baltazar, Cassie Moua**  
Grade 9,9,9 - **Team** - Crystal Formation

1025T **Brian C Hall**  
Grade 10 - Ocean Acidification: The Other CO<sub>2</sub> Problem

1026W **Madeline M Johnson**  
Grade 9 - The Affects of Coverings on Fresh Fruits

1027T **John P Lindemann**  
Grade 10 - A Study on the Shelf Life of Carbonated Beverages

1028S **Gael K. Missoh, Sahal Dirie, Minh Phung**  
Grade 9,9,9 - **Team** - Viscous Honey

1029W **Daniel A Mokhtari**  
Grade 12 - Medicinal applications of bis(trimethylsilyl)acetylene in copper(I)-catalyzed azide-alkyne "click" chemistry

### *Computer Science (CS)*

1031W **Arun L Chadda**  
Grade 9 - Does RAM make a difference?

1032W **Gavin G Ovsak**  
Grade 11 - Efficiency Study of a Head Controlled Computer Interface Using Embedded Circuitry  
**Project At Electricity Wall**

1033T **Brita A Preus**  
Grade 10 - Password Cracking: Effects of Length, Characters, and Other Factors

- 1034W **Mark B Ulrich**  
Grade 12 - The Mind Surfer  
**Project At Electricity Wall**
- 1035T **Allison N Waters**  
Grade 10 - Text Analysis: Whodunnit?
- 1036W **Roy H Zhao**  
Grade 9 - Computer Sudoku Solver
- Earth and Planetary Science (EA)*
- 1037W **Melissa R Stefanik**  
Grade 9 - Moon Phases in Comparison to Tides
- 1038T **Erin M Suel**  
Grade 12 - Effects of Atmospheric Pollution on Plant Growth
- Energy and Transportation (ET)*
- 1039T **Samuel H Dahlke**  
Grade 9 - Voltage of a Small Wind Turbine Based on Varying Blade Shape and Angle
- 1041T **Samuel M Weiss, Alexandria C Herr**  
Grade 10,9 - **Team** - Quantitative Analysis of Wind and Solar Power in Minnesota
- Engineering: Electrical and Mechanical (EE)*
- 1042T **Chris B Behnke**  
Grade 10 - Optimizing Efficiency in Lift Rotors for Commercial And Recreational Vehicles
- 1043T **Alex J Claseman**  
Grade 10 - The Effects of Different Airfoils on a Wind Turbine
- 1044W **Hari L Ganti**  
Grade 11 - Optimizing an Airfoil for Inviscid Airflow  
**Project At Electricity Wall**
- 1045T **Henry D Grittner**  
Grade 10 - Effects of Variables on Catapult Strength and Accuracy
- 1046W **Ashley M Hamer**  
Grade 9 - The Bullet/Shell With the Best Shot Pattern
- 1048T **Michelle J LaGarde**  
Grade 10 - Windmill Propeller Torque: Year Two
- 1049T **Tad D Neeser**  
Grade 10 - Resistance in Electrical Wires as a Function of Temperature
- 1050T **Charlie Schiappacasse, Mike Rankin**  
Grade 12,12 - **Team** - The Feasibility of Self-Sufficient Electrolysis Powered by Hydroelectricity
- 1051T **Lucas Thoresen, Paul Storvick**  
Grade 12,11 - **Team** - WIFI++
- Engineering: Materials and Bioengineering (EN)*
- 1052T **Nicholas J Ehlers**  
Grade 10 - Do different roof angles change the inside temperature of a house?
- 1053T **Mike Dell Furney III**  
Grade 10 - Effects of Materials and Deflectors on Acoustics
- 1054W **Sidharth D Gopinath**  
Grade 9 - Floating Cities
- 1055W **Elaina E Hamann**  
Grade 11 - Mosquitoes  
**Project At Electricity Wall**
- 1056W **Brandon L Onopa**  
Grade 12 - Engineering J-aggregate thin-films for implementation in photovoltaic devices
- 1057T **Andy S Ylitalo**  
Grade 9 - Windows of the Future: Saving Energy Year-Round
- Environmental Management (EM)*
- 1058W **Eric M Chien**  
Grade 12 - The Biological Control of Invasive Soybean Aphids (Aphis glycines) Through Apparent Competition
- 1059T **Juana Espinoza**  
Grade 10 - Wetland Health Monitoring: Hester Dendy Versus Bottle Traps
- 1060W **Sachin D Rao**  
Grade 9 - Water Filter
- Environmental Sciences (EV)*
- 1061T **Jesse Acosta**  
Grade 11 - Compost Components
- 1062W **Emily R Cherkassky**  
Grade 9 - Visual Analysis of Minnesota Soil Survey Data
- 1063W **Elise E Christianson**  
Grade 9 - Do Native Plants Hold Back More Runoff Than Lawn Grass?
- 1064W **Marra M Clay**  
Grade 9 - Is Green Really Green?
- 1065T **Carissa Klonecz**  
Grade 10 - Insulation: The Real Truth
- 1066W **Allison ann Lero**  
Grade 9 - Water works

1067W **Katherine M Paulsen**  
Grade 12 - Effects of microbes and sodium chloride (a micronutrient) on CO<sub>2</sub> flux into the atmosphere from decomposition of plant matter

1068T **Lacie T Roberts**  
Grade 10 - Growth Rate and Survival of *Cipangopaludina chinensis* Versus Physa

1069T **Nisha L Singh**  
Grade 10 - Water Quality in Dakota Country Wetlands in Correlation with the Index of Biotic Integrity

1070W **Kristina L Tester, Kara M Lillehaug**  
Grade 12,12 - **Team** - Effects of Cardenolide Levels in Milkweed on Monarch Butterfly (*Danaus plexippus*) Development (2009)

1071T **Josh M Ylinen**  
Grade 10 - Absorbing Acidic Water

#### *Mathematical Sciences (MA)*

1072S **Martin A Camacho**  
Grade 12 - On the Lattice Representations and Linear Extensions of Series-Parallel and (m+n)-free Posets

1073T **Maggie M Green**  
Grade 10 - The Angle of Perfection

1074T **Zack W Keller**  
Grade 10 - The effects of properties on variations on the Koch Snowflake  
**Project At Electricity Wall**

1075T **Paimon Y Pakzad**  
Grade 10 - Scale Factor in Generalized Koch Snowflakes

#### *Medicine and Health Sciences (ME)*

1076W **Sarah Benton**  
Grade 9 - Is Wii "Fit?"

1077T **Laura E Brown**  
Grade 12 - Can Shampoo be Harmful to Reproduction?

1078T **Micah Hill**  
Grade 10 - Spicy Food = Better Eyesight ?

1079T **Michelle L Korthauer**  
Grade 10 - Effects of Expectations on Eyesight

1080T **Laura S Landgraf**  
Grade 10 - The Effects of Vodka on the Reproduction Rate of *Drosophila Melanogaster*

1081T **Marissa Lane**  
Grade 10 - Protein Supplements: Mental or Physical? The Effects of Protein Supplements on Athletes' Performance

1082T **Anuja Modi P Modi**  
Grade 10 - To mimic the body condition for dissolution of coated and uncoated aspirin tablets  
**Project At Electricity Wall**

1083W **Ava K Mokhtari, Addison L Weiler**  
Grade 12,11 - **Team** - Expanding a Gene-Expression Profile for Theiler's Virus as a Diagnostic Tool for Multiple Sclerosis

1084W **Charles D Morris**  
Grade 12 - Role of PKC/ in carrageenan-induced inflammatory pain response

1085T **Prithwis K Mukhopadhyay**  
Grade 11 - Food Additive or Carcinogen? Carrageenan Inhibits ASB Activity and Induces Cell Invasion Involving RhoA Activation and MMP-9 Secretion

1086T **Ashley R Santilli, Emily K Bostrom**  
Grade 12,12 - **Team** - The Effects of Oxygen on Smooth Muscle Cell Function: A Potential Role in Preventing Intimal Hyperplasia  
**Project At Electricity Wall**

1087W **Shelby Ullrich**  
Grade 9 - The Effect of Hand Snitizer on Bacteria

1088T **Samuel A Wehling**  
Grade 10 - The sound exposure associated with playing the drums in a heavy metal band and the effect of hearing protection to decrease the damage of the decibels

#### *Microbiology (MI)*

1089W **Lisa K Persson**  
Grade 9 - Which Hand Soap is Best at Inhibiting Bacterial Growth?

1090S **Soua Thao**  
Grade 9 - Solutions and Sterilizing Bacteria

1091T **Brian J Zetah**  
Grade 10 - The Effect of Different Disinfectants on the Growth of *Bacillus subtilis*

#### *Physics and Astronomy (PH)*

1092T **Mark R Dennis**  
Grade 10 - The Effect of Aerodynamic Grooving on Projectiles

1093T **Teresa J DiGregorio**  
Grade 10 - Which of the Four Stokes is the most Hydrodynamic?

1094T **Kevin A Janu**  
Grade 10 - Pitch of a Sound

1095W **Ryan L Mathison**  
Grade 9 - The Soccer Kick

1096W **Saurabh Mishra**  
Grade 10 - Is Infrared or Laser More Efficient For  
Data And Voice Communication?

1097W **Katasha Pearl Nail Dasilva**  
Grade 9 - The Fine Structure Constants Effect on  
Life's Development

*Plant Sciences (PS)*

1101W **Evan A Dickinson**  
Grade 9 - The affect of magnets on plant growth

1102T **Jamie L Gromoff**  
Grade 12 - Pinus strobus Damage and Repair

1103T **Aditi Gupta**  
Grade 9 - A Tale of Two Fertilizers: Comparing  
The Effect of A. brasiliense and Arbuscular  
Mycorrhhyzia on Non-Leguminous Plants

1104T **Sarah N Kroska**  
Grade 9 - Are they Pollutants?

1105W **Hannah A Kumar**  
Grade 12 - Effects of Chilling Stress on Glutathione  
Cycle in Spinach (Spinacia oleracea)

1106T **Lexi L. Palmer**  
Grade 12 - The Effect of Sulfuric Acid on the  
Growth of Brassica rapa

1107T **Thomas J Sherman, Joshua D Treimer**  
Grade 12,12 - **Team** - The Comparison of Weigh  
Wagon and Combine Yield Monitors for  
Evaluation of Corn Hybrid Performance

1108T **Valerie P Smith**  
Grade 10 - Cryobiology: Vaucheria Survival Rates

1109T **Tiffanie F Stone**  
Grade 12 - Identification of a Super Hybrid Rice  
Variety Guangzhan 635/1128 Using Simple  
Sequence Repeat Molecular Markers