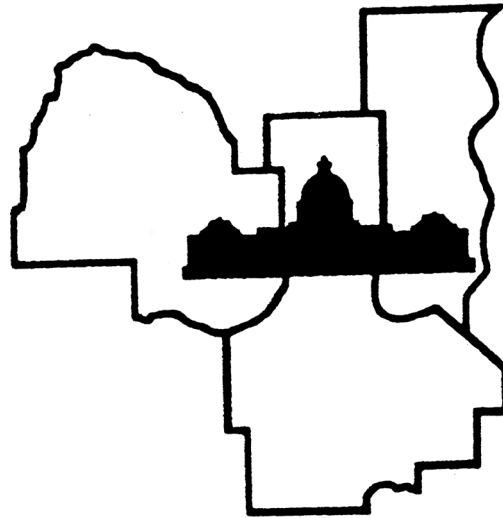


WELCOME TO THE

82nd Annual Twin Cities Regional Science Fair
28th Annual St. Paul Science Fair
26th Annual Western Suburbs Science Fair

Twin Cities Regional Science Fairs



2020

February 28 – 29



REGENERON
ISEF
A PROGRAM OF
SOCIETY FOR SCIENCE & THE PUBLIC



**Affiliated with the International Science & Engineering Fair and the
Minnesota Academy of Science Minnesota State Science & Engineering Fair**



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**WELCOME TO THE 82nd ANNUAL TWIN CITIES REGIONAL SCIENCE FAIR,
THE 28th ANNUAL ST. PAUL REGIONAL SCIENCE FAIR,
THE 26th ANNUAL WESTERN SUBURBS REGIONAL SCIENCE FAIR.**

Our Host this year is the Minnesota State Fairgrounds – Warner Coliseum

Students: YOUR NAME BADGE is required both Friday and Saturday.

All projects must have a **vertically displayed abstract** at their exhibit. Print a copy of this abstract by logging into your student account at www.tcrsf.net and View TCRSF Abstract from your Student Home page. All projects who required a **Form 1C** (for work done in any site other than home, school or field) and/or **Form 7** (for projects that are a continuation from a previous year) must post these vertically on the project exhibit. Save all your project forms after the fair. TCRSF will send project forms to state for those projects advancing to state, but you will still need a copy at your project exhibit during state. Alternates to state: you may be promoted to become a state presenter. Save your display and forms!

1. The 4 numbers & 1 letter is your project number. It shows you where to set up your project. When you find your place, set up your project. If you ordered electricity, find your place in "Electricity Row." *Floor only projects* are at the end of Electricity Row.
2. After your project is completely set up, self-check your display to make sure it meets all the requirements on the green Display & Safety checklist. If you need help, ask. This year, put the green Display & Safety page that you checked on your exhibit table top and WAIT. Our Display & Safety team members will walk up and down the aisles. Wait for them to check your display. If you have any videos or photos to show judges, please be ready to show them to the Display & Safety team. You will need to correct any violations before competition.
3. **There is no food or beverage allowed anywhere in the competition area.** A closed bottle of drinking water is the only exception. (Food may be eaten in the lobby area by the concessions food, or very carefully in the seats around the coliseum. Keep the building clean!)
4. **Wear your TCRSF name badge in a clearly visible place, BOTH Friday and Saturday. Do NOT forget. You need your badge for the awards program!**

TCRSF requires that ALL TEAM members of team projects must be present at judging on Friday night and that all ISEF winners must be at the Saturday Awards Ceremony (unless cleared by the fair director and the SRC chair). Winners of **sponsor's awards must be present** at the Saturday Awards Ceremony to win, have their photo taken with their award and the sponsor. An alternate will become the winner if the student winner is not present.

All ISEF winners and all persons interested in traveling with the group to ISEF **MUST** attend the **Sunday 1:00 p.m.** ISEF meeting. (This meeting is *only* for ISEF winners, ISEF alternates, & their teachers/mentors/and family members.) The location and time of this meeting will be confirmed with the ISEF winners immediately following the Awards Ceremony.

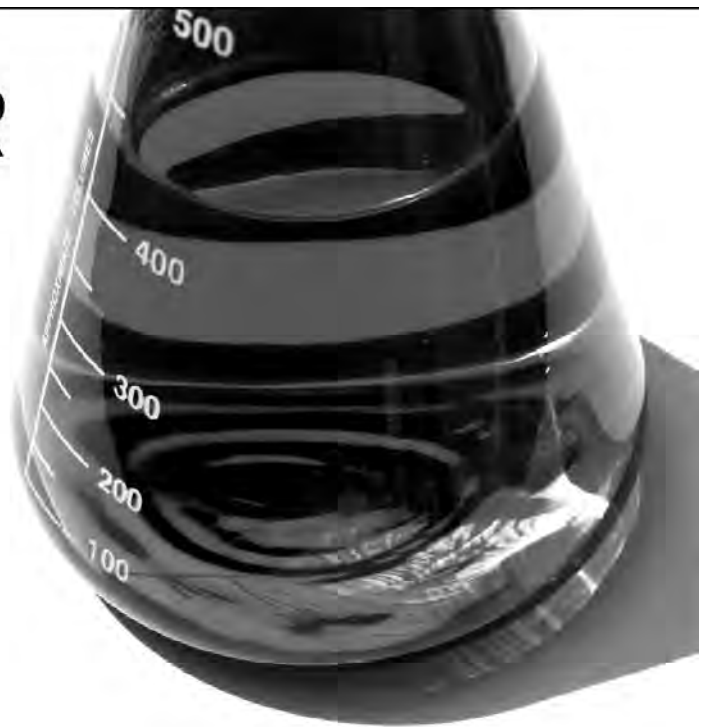
Green, Red, and Blue ribbon winners are all eligible to win special awards. Some special awards are specifically for certain fields of science or other criteria that are separate from the ribbon earned. All students: please listen carefully for your name during the awards program on Saturday. In order to shorten the awards program, the large groups of winners will be posted on a bulletin board Saturday morning in lieu of the students being all called up to the podium. The winners and alternates will receive instructions and/or a purple ribbon or a certificate in their project or paper envelope. **Alternates have an excellent chance of being advanced, so keep your boards and your paperwork ready! Many of those not advancing to state still win awards.**

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USS Nokomis Twin Cities
Star Trek Fan Club
<http://www.usnokomis.org/>

Volunteering to make a difference.

NORTHROP GRUMMAN

Northrop Grumman is a long-time sponsor of STEM in the community and this Science Fair. The hands-on event is inspiring to not only the students, but those from our company who participate as volunteers and judges. We feel that by inspiring curiosity and interest today, we develop our future scientists, engineers and astronauts. Good Luck To All Our Participants – today and for the future.

Northrop Grumman's Plymouth facility has been a sponsor for 30+ years, dating back to the organizations roots as divisions of Honeywell, ATK and Orbital ATK.

SCHEDULE

Friday, February 28, 2020

<u>Time</u>	<u>Activity</u>	<u>Location</u>
1:00 - 3:30 p.m.	Registration	Warner Coliseum Concourse
1:00 - 3:30 p.m.	Set up Projects / Clear Display&Safety Grades 6-8 must be set up by 3:30 Grades 9-12 must be set up by 3:30	Warner Coliseum Arena
4:00-9:30 p.m.	Judging (grades 6 - 8 done earlier)	Warner Coliseum Arena

Saturday, February 29, 2020

8:00- 10:00a.m.	Exhibits open to the public	Warner Coliseum Arena
9:00 - 9:30 a.m.	All Paper and Project Participants pick up envelopes containing ribbons (may be open early!)	Warner Coliseum Arena (next to show floor)

TEACHERS: Please arrange for someone to pick up papers, awards, & exhibits for any students not able to attend the award ceremony. **Please also pick up *Research paper ribbons*.**

DO NOT DISMANTLE YOUR PROJECT UNTIL AFTER THE AWARD CEREMONY!

10:00 a.m. to 12:15 p.m.	Award Ceremony for projects & research papers	Warner Coliseum (seating around arena)
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Winners of Special Sponsor Awards must be present at the Award Ceremony or an alternate will become the winner. Sponsor Award winners must have their photo taken by the official Fair Photographer with the award

If you are picking up awards for a student not present, please pick up their project and/or research paper envelope before the awards AND pick up other announced awards at the Awards Podium right AFTER the awards ceremony. Remember to be sure their project exhibit is removed and returned to them.

All ISEF winners must be at both the Saturday Awards Ceremony AND the Sunday ISEF meeting to be eligible to be named finalist to travel to and compete in ISEF, or they will forfeit their finalist status to an alternate (unless cleared by the Fair Director and the SRC chair).

After Award Ceremony	*ISEF Finalists, Alternates and Advisors meet with the Fair Directors & SRC chair.	Arena near awards podium
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Everyone: 1:30 p.m.	PLEASE help clean up. Throw all trash. ALL PROJECTS MUST BE REMOVED	Please help throw trash & leave the Fairgrounds clean.
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Minnesota State Science & Engineering Fair (grades 6-12 projects)
March 26-28, 2020, **Benilde-St.Margaret School**, 2501 MN-100, St Louis Park, MN 55416

JSHS: Junior Science & Humanities Symposium (grades 9-12 research papers)
March 26, 2020, **Benilde-St.Margaret School**, 2501 MN-100, St Louis Park, MN 55416
State canceled their grades 6-8 research paper competition for 2020 (returns in 2021)

ISEF: Intel International Science & Engineering Fair (grades 9-12 projects)
Anaheim, California May 10–15, 2020 (Twin Cities flies out May 9th)



DuPont Water Solutions congratulates your achievements in competing at the Twin Cities Regional Science Fair.

Water Solutions

We thank DuPont Water Solutions for their sponsorship of this event!

The quality and scarcity of freshwater has become a critical issue worldwide. More than one billion people lack access to safe drinking water today, and experts estimate that by 2025, five billion people will live in areas of significant water stress. While water conservation is one of the most cost-efficient answers, technology, in combination with sound management practices, can help effectively solve the world's worsening water crisis.

DuPont Water Solutions, a subsidiary of DuPont, is committed to advancing water treatment technologies and ensuring availability of clean water to those who need it-through advanced research and industry-leading application expertise.

NORTHROP GRUMMAN

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Custom catering, event planning and memorable spaces for every occasion.

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JUDGING RULES AND SCHEDULE

1. Each student must remain with his/her project during the time scheduled for judging. If you are not at your project when a judge arrives, you may miss your chance to be judged.
2. Students must clear both SRC (Scientific Review Committee) & D&S (Display & Safety) before judging begins at 4:00 p.m. You also need to have the TCRSF photographer take your photo at your project.
3. ONLY judges and students presenting projects are allowed in the exhibit area during judging.
No parents, advisors, teachers, or other non-participants are to be in the exhibit area during judging times, 4:00 PM – close Friday.
4. Stay at your project until the official announcement over the public address system dismisses your grade. If you leave early you may be missing out on judging for other special awards.
5. TCRSF and the Minnesota State Fairgrounds do not accept responsibility for equipment or instruments brought to the Fair. **DO NOT LEAVE SUCH ITEMS OVERNIGHT OR UNATTENDED.**

	Judging Begins	Estimated Dismissal Time (WAIT for official announcement)
Grade 6	4:00p.m.	6:30p.m.
Grade 7	4:00p.m.	7:30p.m.
Grade 8	4:00p.m.	8:00p.m.
Grades 9-12	4:00p.m.	9:30p.m.

ALL TIMES ARE APPROXIMATE. PLEASE LISTEN FOR ANNOUNCEMENTS!

PROJECT LISTING

Student projects are listed by number, grade and affiliation and broken down by category within each grade level. Following this listing is an alphabetical list of all entries by grade. To find a project, or to find out where you are to set up your project, look for the signs. Team members must be all in either middle school or all in high school, not a mix. This year, middle school teams compete at the grade of the team leader.

GRADE	PROJECT NUMBERS	AFFILIATION CODES
6	6000-6999	(S) St. Paul Regional Science Fair
7	7000-7999	(W) Western Suburbs Regional Science Fair
8	8000-8999	(T) Twin Cities Regional Science Fair
9-12	1000-1999	All 3 affiliations are collectively known as "Twin Cities Regional Science Fairs"

RESEARCH PAPERS

All research paper competitors pick up your envelope with your research paper ribbon about 8 or 9 AM Saturday before the awards program. If you entered ONLY a research paper, pick up your competitor's name badge near the research paper envelopes Saturday morning. We will also post a list of competitors & alternates advancing with their research papers. Pick up your envelopes! All who advance to JSHS will present a PowerPoint version of their paper to a panel of judges & observers. Additional awards for papers will be handed out at the Award Ceremony on Saturday morning at 10:00 a.m. in the Warner Coliseum Arena.

TCRSF AND THE State Fairgrounds ARE NOT RESPONSIBLE FOR PAPERS, SRC PAPERWORK, PROJECTS, RIBBONS, AWARDS, PERSONAL ITEMS, OR EQUIPMENT LEFT AT THE State Fairgrounds Coliseum!

REMEMBER - We are guests of the State Fairgrounds. Please keep your area clean and respect the property of others. Your actions reflect not only on you, but also on your school, your parents, your advisors and the fair.



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Premier Bank is a local, community bank, with global reach and supports science education by donating to the Twin Cities Regional Science Fairs.



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Office Depot supports the Twin Cities Regional Science Fairs and applauds the creativity and hard work of the regional competitors.

Grade 6

Animal Sciences (ANIM)

- 6001T **Sophia Beseman**
Dog Toys
Project At Electricity Wall
- 6002T **Ella Ehlers**
Russian Tortoise
Project At Electricity Wall
- 6003T **Shreya Sekar**
Protecting Minnesotas Wood Turtles:
Characterizing the Threats this Endangered
Population Faces

Behavioral and Social Sciences (BEHA)

- 6004T **Lillian Bolle**
Brownie Bonanza
- 6005T **Efrata Eshete**
Lying, The Truth, and Everything in Between
- 6006W **Eric Suh**
Win or Lose: Does it affect test-taking skills?

Biochemistry (BCHM)

- 6007W **Sam McHugh**
Do Dog Foods Meet their Probiotic Claims?
- 6008T **Paige Stone**
The process of mummification

Biomedical Engineering (ENBM)

- 6009T **Ali Weingartz**
Stinky Shoe

Cellular and Molecular Biology (CELL)

- 6010T **Samuel Morgan**
Catching DNA...Clean Handed

Chemistry (CHEM)

- 6011T **Madalynn Beseman, Carley LaMotte
Team** - A Solution
- 6012T **Douglas Buckanaga-Keezer**
The Menthos Effect
- 6013W **Milan Darji**
Freezing Point Depression of Salt Water
- 6014T **Liya Elias**
What pH is it
- 6015T **Neela Josephs, Rachel Countryman
Team** - Brownies in the Mix

- 6016W **Jada Silver**
Casein Plastic: The Biodegradable Solution to Most
of our Planet's Biggest Problems

- 6017T **Elizabeth Sundberg**
What type of salt is most effective for melting ice?

- 6018T **Leland Traiforos**
Enamel Experiment

- 6019T **Francis Warumzer**
The Effects of Potable Liquids on the Appearance
and Texture of Gummy Bears

- 6020T **Deacon Wening**
Growing Gummies

Earth and Environmental Sciences (EAEV)

- 6021T **Olivia Hamann**
Fired Up!

- 6022T **Molly Monahan**
Filter Fad

- 6023T **Alex Nachand**
Ice Melt Race

Energy: Chemical (EGCH)

- 6024T **Ryan Kennedy**
Produce Power

- 6025T **Damien Malm**
Why Do Fruits Turn Brown

Energy: Physical (EGPH)

- 6026T **Brooke Gerber**
Wardrobe Or Warmth

- 6027T **Riley McGowan**
Candy Glass

Engineering Mechanics (ENMC)

- 6028T **Aiden Goberdhan**
Which paper airplane goes the farthest

- 6029T **Spencer Miller**
Are Sharp Skates That Great?

- 6030T **Charles Smith**
Melt Snow 3.0

Environmental Engineering (ENEV)

- 6031T **Takeo Haertel-Strehlow**
Can the Color of Your House Save You Money?

- 6032W **Oliver Nelson**
Which Direction is Most Efficient and Faster for
Circulating Air in a House?

6033T **Ella Yego**
Electric Breeze

6034T **Beza Zewdu**
How Much Water Can You Hold?

Materials Science (MATS)

6035T **Allyson Flom**
Which laundry detergent works the best on stains

Microbiology (MCRO)

6036T **Brian Russell**
Moldy Mayhem

Physics and Astronomy (PHYS)

6037W **Adam Hale**
Sliding with Friction

6038T **Erica Owusu Ansah, Mariam Kanu Team** - Density= Mass/volume

6039W **Isaac Rose**
How Does Temperature Affect Magnetic Force?

Plant Sciences (PLNT)

6040T **Elizabeth Birch**
Growth Rates of Plants in Hydroponics

6041W **Hannah Grosser, Evelyn Danz Team** - How does your greenhouse grow? The impact of temperature on Dandelion seed germination.

6042T **Anggelo Mendoza-Fierro**
Rainbow Flowers
Project At Electricity Wall

Grade 7

Animal Sciences (ANIM)

7001T **Juan Amaro**
Does Catnip Affect All Cats The Same

7002T **Eva De Grace**
What Colors Are Dogs Most Attracted To?

7003S **Ewan Johnson**
Determining the Birdseed Preference Among Backyard Birds

7004T **Amelia Schatteles**
Just a Spoonful of Sugar

Behavioral and Social Sciences (BEHA)

7005T **Zamirah Batie**
Musical minds

7006T **Nichole Bertini, Audrey Aflakpi Team** - Age and Gender Memorization

7007T **Abigail Chinn**
Do Dogs Have a Dominant Paw?

7008T **Caitlin Detailleur**
Snooze or Die!

7009T **Juliana Godina**
Most Common Fingerprint & Fingerprint Personality

7010T **Imogen Holien**
What's That Smell?

7011T **Laysha Jimenez Marin**
Does Personality Effect Memory And If it Does What Personality Does Better?

7012S **Lucy Keenan**
What Color Was That Again

7013S **Petra Korhonen**
Sugar Rush

7014T **Miranda Leon Kass**
Does Petting a Cat Reduce Stress?

7015T **William Paslawski, Marley Jagerson Team** - How Well Do Different Age Groups Wash Their Hands

7016S **Lenea Price**
How does blue light affect sleep patterns

7017T **Tammy Regguinti**
Phases of the Moon and Mood

7018T **Shannon Reilly**
How Color affects Memory

7019S **Ellen Schroeder**
How Do Outside Distractions Affect Our Memory?

7020S **Livina Schubert**
Gender, Memory, and the Stroop Effect

Biomedical and Health Sciences (BMED)

7021S **Megan Cindrich**
How Does Sugar Affect Focus

7022T **Ethan Parcon**
Do Sugary Drinks Affect the Color of your Teeth?

Cellular and Molecular Biology (CELL)

7023S **Hani Nur, Hamda Osman Team** - Steps Of Mitosis

7024S **Ilyas Omar**
Bread Molds

Chemistry (CHEM)

- 7025T **Eddie Bilik**
Which type of coke shoots higher when a mento is added
- 7026T **Collin Elliott**
What fluid causes the worst corrosion in steel
- 7027S **Aunesti Farley**
How does the type of flour affect the size of a cookie?
- 7028T **Eduard Held**
Mentos and Pop Experiment
- 7029S **Amelie Isom**
Cupcake Concoctions
- 7030T **Makayla Moran**
What brand of chocolate hardens the quickest?
- 7031T **Titus Scott**
Keeping It Fresh
- 7032T **Karin Sheeser**
Does Kool-Aid Affect Water's Boiling Point

Earth and Environmental Sciences (EAEV)

- 7033T **Catalina Connell**
Soil Substitutes: Which Works Best?
- 7034W **Quinn Hughes, Tyler Clair**
Team - Fueling the Planet with Coffee:
Engineering a Better Biofuel with Synergistic
Enzymatic Compounds
- 7035S **Takato Muramatsu**
How does the amount of pressure affect the
thickness of a cloud in a bottle?
- 7036S **Alexa Pundsack, Hazel Thrasher**
Team - How Does the Type of Pollutant Affect
Growth in Bacteria?
- 7037W **Wilson Schaefer**
Effects of Blue Green Algae on White Cloud
Minnows
- 7038S **Cecilia Shelby Vazquez**
How does the color of a liquid affect the amount of
heat absorbed
- 7039T **Sriram Sureshkumar**
Residual Pesticides on Produce

Embedded Systems (EBED)

- 7040S **Eve Kitt**
Baking Raspberry pie
- 7041T **Peter Mendez**
WiFi Blockers

Energy: Physical (EGPH)

- 7042W **Logan Kimmel**
A Pitch and a Swing: The Effect of Wind Turbine
Blade Pitch and Shape on Power Output.
- 7043T **Emily Llapa**
How Does the Blade Length of a Wind Turbine
Affect How Much Energy It'll Produce?

Engineering Mechanics (ENMC)

- 7044S **Abdirahman Abass Mohamed, Ahmed Abdi,
Yahya Salah**
Team - Lava Lamp Experiment
- 7045T **Isabella Gutierrez**
Automated Fire Extinguisher
- 7046W **Isaac Weinacht**
Don't Be A Drag: How making semi-trucks more
aerodynamic reduces CO2 emissions
- 7047S **Thura Zaw**
Sink Or Float

Environmental Engineering (ENEV)

- 7048T **Casey Johnston**
Purification

Materials Science (MATS)

- 7050T **Annika Clift**
Making Paper and Testing Its Durability
- 7051S **Ryan Dunlap**
Plastics
- 7052S **Salman Mohamed, Zakeriye Muse**
Team - Bread mold
- 7053T **Liam Murphy**
Fill Diapers Not Landfills
- 7054T **Zoey Paro**
Sketchbook struggle
- 7055T **Julian Plumer**
The Butterless Baker
- 7056T **Shreyas Pradeep**
Testing The Tension
- 7057T **Eli Wuebben**
What Insulation Material Works Best

Mathematics (MATH)

- 7058T **Tyler Nieminski**
All mixed up
- 7059T **Axcel Yust**
Musical Minds

Microbiology (MCRO)

- 7060S **Alejandra Cruz**
How Does the Concentration of Clover Honey Affect the Number of Surviving Bacteria
- 7061T **Emma Dempsey**
How to keep our household drain tiles clear!
Killing the Ocher!!
- 7062T **Lillie Hanto**
Killer Cleaners
- 7063T **Leah Horne**
Germ Invasion
- 7064S **Lewie Leifeld**
Cheeze Louise
- 7065T **Ella O'Hanlon**
Where the Wild Things Grow!
- 7066S **Liam Sackaroff**
Murray Grossology
- 7067T **Kenesey Taylor**
Bacteria in City Water (Mni Ikyoyaka)

Physics and Astronomy (PHYS)

- 7049T **Luke Jolly, Sean Haws**
Team - Cars vs weights
- 7068T **Marcus Bonifas**
Red Sun? White Sun? Blue Sun?
- 7069T **Jairo Cordoba**
Bottle Instruments, Truth or Myth?
- 7070T **Haden Marshall**
Speed Planes

Plant Sciences (PLNT)

- 7071W **Matthew Beekman**
Tomayto Tomahto: Is there a difference between traditional and vertical farming?
- 7072T **Audrey Castro**
Decaffeinated Coffee vs Caffeinated Coffee: Will the Type of Coffee Affect a Plant's Growth?
- 7073T **Emma Klug**
Is Erosion Invincible?
- 7074S **Halina Tompkins**
How does the amount of fertilizer affect the growth of little bluestem?
- 7075T **Renna Zirbel**
Sweet Bean

Systems Software (SOFT)

- 7076T **Coolsjes Singhvi**
What is in a Tone! Sentiment and Emotion
Analysis of School Email Communication Using
Artificial Intelligence

Grade 8

Animal Sciences (ANIM)

- 8001S **Jaeden Allen**
How do the qualities of a pet affect whether or not someone adopts it?
- 8002T **Liam Clift**
The Rusty Crayfish (Invasive species in Aquatic Minnesota)

Behavioral and Social Sciences (BEHA)

- 8003T **Olivia Carle, Starla Eschiti**
Team - Male versus Female Students Memory
- 8004S **Liam Donegan**
Do Smartphones Make You Less Smart
- 8005S **Tristan Engelmann**
Speed Accuracy Tradeoff in Video Games
Project At Electricity Wall
- 8006T **Adeline Heymans, Genevieve Bradshaw**
Team - Cursive versus Print
- 8007S **Teodora Kamenov**
Does A Persons Identified Gender Influence Their Color Choice
- 8008S **Gabi Kirchner**
What is the Best Strategy to Use When Memorizing
- 8009S **Grace Loonan**
Does Hand Dominance Impact Creativity
- 8010S **Grace Nilsson**
How Does the Type of Lineup Affect Accuracy in Choosing a Suspect?
- 8011S **Julia Pletch**
How Does the Music Genre Effect Work Efficiency?
- 8012S **Bennett Wartner**
If Swimmers are Nationally Ranked in the Top 100 At Age 10, Will They Continue to be Ranked in the Top 100 in 10 Years?
- 8013W **Elin Wellamnn, Anna Iordanoglou**
Team - Waking up to different sounds
- 8014S **Aliyah Witte**
Music to the Brain

Biochemistry (BCHM)

8015S **Maria Brenner**
Bean Bush Growth

8016S **Keira Deiman**
Tasteful Ferments

Biomedical and Health Sciences (BMED)

8017S **Olivia Reeder**
Do Homemade or Commercially Made Cleansers
Work Better on Stained Denture Teeth?

8018T **Cassidy Reeves**
Foods Effects on Brain Performance

8019S **Mckenna Schultz**
Which Substance Could Cause the Most Tooth
Decay

8020S **Robbie Wollan**
Does the Fit of Your Football Helmet Affect Your
Risk of Suffering a Concussion

Cellular and Molecular Biology (CELL)

8021S **Anders Ahlberg**
The effect of Heat on the decomposition rate of
Strawberries

Chemistry (CHEM)

8022T **Maggie Banks**
Currently Knocking On Wood: Toward a
Biodegradable Piezoelectric Transducer From
Rochelle Salt and Wood

8023S **Erin Evans**
What Keeps Apple Slices From Browning

8024S **Sophia Kyba**
Do Expiration Dates Correspond With Milk
Spoilage Over Time?

8025S **Anna Lovat**
How Does Salt Compared To Sugar Affect The
Rate Of Evaporation?

8026S **Siri Pattison**
How Does The Amount Of Sugar Added To
Kombucha Pre-Fermentation Affect It's pH After
Fermentation

8027S **Greta Seppanen**
How Does the Type of Tomato Affect the
Consistency of the Tomato Sauce?

8028S **Anne Swanholm**
Which Stain Remover Removes Common Food
Stains The Best?

Earth and Environmental Sciences (EAEV)

8029S **Emily Brenner**
Ph of Precipitation

8030S **Phoebe Finlay**
Leaf senescence across Minnesota

8031T **Madison Frantum**
Fabric Decomposition

8032S **Anna Imbertson**
Disposable Plate Composting

8033S **Madeleine Schilling**
How Does the Type of Ice Melt Affect the Death
Rate of Freshwater Amphipods?

8034S **Riya Stebleton**
How does the type of cleaning product affect the
removal of oil in birds feathers?

8035T **Timothy Trussell, Noah Leipnitz
Team** - Show Me the Mussels

8036S **Alice Wagner- Hemstad**
Micro plastics in our water... will this affect the
freshwater food chain

Energy: Physical (EGPH)

8037T **Carissa Chow**
A Wind-Wind Solution: Effectiveness of Blade
Angle

8038S **Garrett Seppanen**
How does the kind of insulation affect how fast the
ice cube melts

Engineering Mechanics (ENMC)

8039T **Jarissett Reyes Volkov**
50s Flashback

Environmental Engineering (ENEV)

8040S **Oskar Helgen**
Drains on the Brain

8041T **Selene Sanchez**
What filter cleans water best ?

Materials Science (MATS)

8042T **Sara Cooney**
The effect of ice melt

8043S **Liam Harris**
How Different Acids and Bases Effect Different
Surfaces

Microbiology (MCRO)

8044S **Elliot McNally**
Is The 5 Second Rule True?

Physics and Astronomy (PHYS)

- 8045S **Abdullatif Alhumam**
How Does the Diameter of a Reflecting
Telescope's Primary Len Affect Magnification
- 8046S **Zach Bollman**
Magnetic Water: Force or Farce?
- 8047T **Catriona Formby**
Color in the Darkness
- 8048T **Abel Mekonnen**
Out of this World
Project At Electricity Wall
- 8049T **Edward Ortiz**
Boar Hull

Plant Sciences (PLNT)

- 8050W **Adithi Rupireddy**
Plant growth in an enriched carbon environment
Project At Electricity Wall

Systems Software (SOFT)

- 8051S **Audrey Sheehan**
Does Your Phone Take the Personal Information
From Your Text Messages, Phone Calls, and Other
Information Said Near the Phone?
- 8052W **Shreshth Shrivastava**
Wi-C.A.R.E., Being there Always! Designing
Patient-Specific Applications for Elder Care

Translational Medical Science (TMED)

- 8053T **Josh Trussell, Matt Trussell**
Team - Weighted Blankets: Science or Scam

High School

Animal Sciences (ANIM)

- 1001S **Muktar Aden, Mohamed Ali**
Grade 11,11 - **Team** - Flipping cats Physics
- 1002T **Irene Bensus, Karmen Bensus**
Grade 11,9 - **Team** - Maze Madness
- 1003S **Tiyanna Booker, Kahlaila Shambley**
Grade 9,9 - **Team** - How does distance from a lake
affect the number of small mammals present?
- 1004S **Brady German, Hser Gay, Manzi Gael**
Grade 9,9,9 - **Team** - Does Camouflage Affect The
Amount of Small Mammals Trapped?
- 1005S **Nay Hso**
Grade 10 - To Which Flavor Are Ants Most
Attracted to?

- 1006W **Mason Hurt**
Grade 12 - The effects of nitrogen fertilizer on a
lake ecosystem
- 1007T **Mary Juelich, Maia Adams**
Grade 12,12 - **Team** - The Effects of Shapes and
Colors on the Behavior of Siamese Fighting Fish
- 1008W **Thomas Lane**
Grade 12 - Captive breeding of Sahyadria denisonii
without the use of hormonal treatments
- 1009S **Selena Paul, Marco Martinez, Abdisalan
Mohamud**
Grade 9,9,9 - **Team** - Smammals

Behavioral and Social Sciences (BEHA)

- 1010W **Alexander Arnold**
Grade 12 - Examination of the correlation between
music preference, emotion, and personality
- 1011T **Sita Baker**
Grade 12 - Anxiety and the Effect It Has On
Students
- 1012S **Helen Bartlett**
Grade 12 - Associations Between Sexual Risk
Behavior and Adverse Childhood Experiences
Among Minnesota High School Students
- 1013S **Natalie Braga**
Grade 11 - You Look Familiar: A Study Into Facial
Recognition
- 1014W **Reese Chahal**
Grade 11 - Talking Transportation: Using ArcGIS
to model correlations between Wayzata High
School student demographics, accessibility, and
transportation
- 1015T **Alyanna Dixon**
Grade 12 - Mind.Body.Connection
- 1016W **Griffin Dobbins**
Grade 12 - Creating a multidimensional regression
model of the 2020 Democratic primary
- 1017W **Jacob Dominski**
Grade 12 - Evaluating Best Practices For Juvenile
Rehabilitation
- 1018W **Ariella Fogel**
Grade 12 - A Comparative Analysis of the English
Language Acquisition of Somali Students in the
Twin Cities
- 1019W **Aidan Gonzalez**
Grade 12 - Implicit bias and its affect on the
Ultimatium Game
- 1020T **Bonnie Hansen**
Grade 10 - The Impact of Age On Either Auditory
or Visual Memory

- 1021W **Noah Howe**
Grade 12 - Effect of Music on Performance
- 1022W **Chelsea Lai**
Grade 12 - Mirroring neurons in cognitive empathy
- 1023T **Teresa Le-Vu**
Grade 10 - The Effect of Music on Heart Rate
- 1024T **Avery Lehr**
Grade 12 - Effects of Active Learning vs. Passive Learning on Information Retention
- 1025W **Michelle Mazo**
Grade 12 - Biomarkers of Sleep Deprivation and Their Effects on Stress
- 1026S **Hamza Mohammed**
Grade 10 - Video Games
- 1027S **Ansal Mohamud, Amal Yusuf**
Grade 11,11 - **Team** - Effects of music on a person's personality
- 1028S **Ananya Narayan, Pia Schultz**
Grade 12,12 - **Team** - The Influence of Positive vs. Negative Moral Motivations on Sustainable Decision-Making in Middle Schoolers
- 1029W **Jeana Schafer**
Grade 12 - Finding a Correlation between Mental Visualization and Memory
- 1030T **Esha Sekar**
Grade 11 - Cybersecurity Challenges: How Savvy are You?
- 1031W **Sarah Stolar**
Grade 12 - Effects of virtual green space exposure on the adolescent stress response
- 1032W **Dylan Tahnk-Johnson**
Grade 12 - Effects of Adolescent Sleep Health on Overall Health
- 1033T **Aalunya Teso**
Grade 10 - Gender Frustration
- 1034W **Reese Thompson**
Grade 12 - The impact of music on customer behavior: a study of the impact of music tempo and volume on customers and its impact on retail stores
- 1035W **Dylan Vincent, Roberaa Ayana**
Grade 12,12 - **Team** - Chords to Character: Exploring the relationship between musical preference and personality
- 1036W **Ayres Warren, Isabel Smith**
Grade 10,10 - **Team** - Shine On Crazy Sleeper: The Effects of Light Pollution on Sleep Quality
- 1037S **Liam Will**
Grade 12 - Physiological Stress and Internet Addiction in Adolescents

Biochemistry (BCHM)

- 1038W **Ahlaam Abdulwali**
Grade 11 - The effect of artificial food colors on the release of neurotransmitters within model organisms
- 1039T **Anna Blanco**
Grade 11 - Testing the Effect of Temperature on Catalase Reactions
- 1040W **Matthew Eichelman**
Grade 11 - Examination of the effect of dietary restriction and daf-2 mutation on longevity in *C. elegans*
- 1041T **Bingsheng Guo**
Grade 11 - Re-engineering a centrifuge force microscope (CFM) to enable the study of induced crystal nucleation in hypergravity
- 1042W **Lucie Peltier**
Grade 12 - Maximizing lateral elongation of tomato leaves through the combination of kinetin and indole-3-acetic acid
- 1043T **Clara Stein**
Grade 12 - The Effect of Nanoparticles on Cell Functions
- 1044S **Pajntsha Vang**
Grade 11 - Comparing Biodiesel and Diesel Carbon Dioxide Emissions: A Look Into Greener Fuel

Biomedical and Health Sciences (BMED)

- 1045W **Madison Andrews**
Grade 10 - Comparing the efficacy of methods of preparing and cooking avocado (*Persea Americana*) in reducing cross-reactivity with Hevea latex
- 1046W **Ally Chan**
Grade 11 - Correlating dose optimization of CAR T cell immunotherapy and severe post-infusion symptoms of cytokine release syndrome
- 1047T **Elaina Drake**
Grade 12 - Does Race Impact Genetic Traits?
- 1048T **Sarah Elting-Ballard, Cody Petronack, Evan Larsen**
Grade 11,11,11 - **Team** - How Foods Affect PH Levels
- 1049T **Richard Erskine, Bemnet Abebayehu**
Grade 11,11 - **Team** - Yeast Deodorant
- 1050W **Isabella Escalante**
Grade 11 - The Kynurenine Pathway and Depression
- 1051W **Olivia Graupmann**
Grade 12 - The Implications of the Relationship of Cyclical Hormones on Injury in Female Athletes

- 1052W **Rachel Gunderson, Boatemaa Agyeman-Mensah**
Grade 12,12 - **Team** - Healing a Broken Heart: Investigating Endoglin as a Novel Regulator of Heart Muscle Cell Regeneration
- 1053T **Nimco Hassan**
Grade 10 - Water Solubility Of Sunscreen Lotions
- 1054W **Hubert He**
Grade 10 - Analysis of Protein Structural Changes Caused by Various Alzheimer's Disease-associated Single Nucleotide Polymorphisms
- 1055W **Levi Hoogendoorn**
Grade 12 - Balancing of Proprioception and Injury Prevention through the Redesign of Fencing Shoes
- 1056W **Quentin Hughes**
Grade 10 - An Active Role for Machine Learning in the Diagnosis of Atrial Fibrillation
- 1057W **Eera Kale**
Grade 12 - Sick cell disease through patients' eyes: An evaluation of the effectiveness of different treatment approaches in the United States and India
- 1058T **Irshad Moalim**
Grade 9 - Is 15% Really the Max?
- 1059W **Ishan Nadkarni, Nathan DeMichaelis**
Grade 11,11 - **Team** - Therapy or Trauma? Examining the Drawbacks of PERK-Knockout as a Potential Treatment for Heart Rhythm Disorders
- 1060T **Isabelle Peterson**
Grade 12 - Commonly used skincare substances and their unknown consequences
- 1061W **Dylan Pitt**
Grade 12 - An investigation into the long term health risks due to repetitive impacts to the head in high school wrestling to determine if high schoolers should be required to wear protective headgear that is more substantial than what is currently required.
- 1062W **Ava Raffel, Mary O'Grady**
Grade 12,12 - **Team** - A Not so Muscular, Muscular Dystrophy? Discovering abnormal neural differentiation in FSHD-affected stem cells
- 1063T **Breanna Reuter**
Grade 10 - Effects of Caffeine on Blood Pressure
- 1064W **Simren Samba, Fiona Kinney**
Grade 11,11 - **Team** - A Biomarker for Brain Injury: Analyzing the correlation between concussions and car crashes using eye-tracking technology
- 1065W **Nathan Schneider**
Grade 12 - Exploring the Option of a Tau-Targeted Immunotherapy as a Treatment for Alzheimer's
- 1066T **Vincent Volp**
Grade 9 - Living Your Best life! Developing a Health Log to Aid Individual's Well-being
- 1067T **Johnny Yue**
Grade 10 - Role of Protein Aggregation in Huntington's Disease
- Biomedical Engineering (ENBM)***
- 1068W **Frank Isaacson**
Grade 12 - Utilizing episomal gene insertion to reprogram human somatic cells into induced pluripotent stem cells
- 1069W **Karsten Johnson**
Grade 12 - Microfluidic Sweat Biomonitors
- 1070T **Greta Kneisl**
Grade 10 - Planarian Regeneration Compared to Human Regeneration
- 1071W **Sahana Mangipudi**
Grade 11 - The Missing Link: Glycoengineering MSCs for Targeted Cancer Drug Delivery
- 1072W **Ted Peters**
Grade 12 - Blue Light for Bacterial Inactivation
- 1073S **Anindita Rajamani**
Grade 11 - Privacy-Preserving Ubiquitous Activity Recognition with Wearable Sensors
- Cellular and Molecular Biology (CELL)***
- 1074S **Ibrahim Ahmed, Sabrin Adan**
Grade 10,10 - **Team** - Stimulating Osmosis in Gummy Bears
- 1075W **Jacob Bridge**
Grade 12 - The Role of the TRF2 Protein in Gene Expression by TPE-OLD
- 1076W **Talia Dar**
Grade 12 - The Effect of Acute Stress on Protein Expression in the Brains of Female Mice
- 1077W **Aidan Edge**
Grade 12 - Detecting the presence of Powassan Virus in Ixodes scapularis in Stacy, MN
- 1078T **Eric Feng**
Grade 11 - The Time Course of Murine Cardiomyocytes
- 1079W **Grant Foslien**
Grade 12 - Emiliania huxleyi cell viability as an expression of conserved genes under the selective pressures of climate change
- 1080W **Joseph Johnson**
Grade 12 - Endocrine Disruption Quantification in Dreissena polymorpha and Caenorhabditis elegans

- 1081W **Sydney Monge**
Grade 12 - The Effect of Low Magnitude High Frequency (LMHF) Vibration on Osteoblast Differentiation
- 1082W **Jack Peterson, William Bae**
Grade 12,11 - **Team** - Looking Deeper Into Lyme Disease: Reclassifying post-treatment Lyme disease utilizing novel staining methods
- 1083W **Samskrith Sriram**
Grade 12 - Effect of LMNA (lmn-1 protein coding) genes on the longevity of mutated ifa-3 *Caenorhabditis elegans* (*C. elegans*) worms
- 1084W **Ming Ying Yeoh**
Grade 11 - Analyzing the effects of tau protein hyperphosphorylation on microglial phagocytic behavior

Chemistry (CHEM)

- 1085S **Ridwan Ali, Abdimalik Mohamed**
Grade 10,10 - **Team** - Absorption Powder
- 1086W **Berit Cummings**
Grade 11 - Detection of Accelerants Used in Arson Using Single Drop Headspace Microextraction
- 1087W **Matvei Filippov**
Grade 12 - Are Microwave Ovens More Harmful Than Other Food Heating Appliances?
- 1088S **Abdullahi Hassan**
Grade 10 - Water beads
- 1089S **Shukri Jama, Ayan Hassan, Ridwaan Mohamed**
Grade 10,9,9 - **Team** - Candy Chromatography
- 1090S **Fatuma Numan**
Grade 10 - How does time affect bubble gum size?
- 1091S **Fatuma Sayid, Fardowsa Aden, Fatha Osman**
Grade 9,9,9 - **Team** - Do White Candles Burn Faster Than Colored Candles
- 1092W **William Walker**
Grade 10 - Synthesizing PAMAM-like dendrimers using click chemistry and conjugating fluorescein isothiocyanate to their surfaces
- 1093S **Qeng Xiong**
Grade 12 - Convergent Synthesis: Development of a GGPP Analogue for Selective Enzymatic Labeling of Prenylated Targets Related to Diseases

Computational Biology and Bioinformatics (CBIO)

- 1094T **Katie Barry, Meghan Quinlan**
Grade 12,12 - **Team** - Human Gut Microbiota Driving Fatty Acid Composition and its Contribution to Obesity

- 1095W **Sterre Hoogendoorn**
Grade 12 - Designing a Computer-Based Program to Aid Fencing Referees
- 1096W **Hanna Schneider**
Grade 11 - The Effects of Deforestation on Soil Microbial Communities
- 1097T **Helaina Sislo**
Grade 12 - The Evolution of the Human Microbiome

Earth and Environmental Sciences (EAEV)

- 1098T **Arjun Acharya**
Grade 9 - Countering the Eutrophication of Minnesota Lakes Using *Epipremnum Aureum*
- 1099W **Macie Anundson**
Grade 12 - Examination of wintering watermilfoil weevils and differences in Eurasian watermilfoil fragment and root growth
- 1100W **Carmen Curry**
Grade 12 - Acid Rock Drainage and Wild Rice
- 1101W **John Czerwinski**
Grade 12 - Predicting Coral Bleaching on the Great Barrier Reef based on environmental stressors.
- 1102S **Dawan Davis Jr.**
Grade 9 - The Affect Water Intake has on Plant Height
- 1103T **Emmerson Drayton**
Grade 10 - Banana Vs. Potato: Which Food is Consumed by Dubia Roaches at a Higher Rate?
- 1104T **Lucinda Erbes**
Grade 10 - pH Levels on Bromothymol Blue
- 1105T **Isaac Harnack**
Grade 11 - A strive for clean drinking water
- 1106T **Katelyn Hess**
Grade 10 - Effects of eco-friendly dish soap vs. non-eco-friendly dish soap vs. water on cress plants
- 1107S **Carniya Houston, Hawi Tadesse**
Grade 9,9 - **Team** - Aquaponics: How water level effects fish behaviour
- 1108S **November Htoo**
Grade 11 - Wetland filtration
- 1109S **Steven Hu**
Grade 11 - Best Way to Prevent Soil Erosion
- 1110S **Paige Indritz**
Grade 12 - The Effect of pH on Bioremediation of Acid Mine Drainage
- 1111W **Mark Larson**
Grade 12 - Solar versus wind power for implementation in developing countries

- 1112S **Yazarah Lightfeather, Eh Soe Wah, Keanu Casarez**
Grade 9,9,9 - **Team** - How does the soil pH around lakes affect the lake water's pH?
- 1113W **Tessa Lundheim**
Grade 11 - Comparison of the effects of the ingestion of the bio-based microplastic PLA and the petroleum-based microplastic PVC on the health and behavior of *Procambarus clarkii*
- 1114T **Hongxu Ma**
Grade 12 - Growth of Duckweed in Different Environments
- 1115T **Henry McCormick**
Grade 10 - Can Eco-Friendly Detergents Prevent Environmental Toxins?
- 1116S **Sophia Moore, Lashanea Butler, Lindsay Carrion Nunez**
Grade 9,9,9 - **Team** - How does the distance from a body of water affect the soil chemistry?
- 1117S **Ugbaad Noor, Munira Ahmed, Fowsia Ahmed**
Grade 9,9,9 - **Team** - Dry Ice Tornado
Project At Electricity Wall
- 1118T **Zoe Olson**
Grade 10 - The Effect of Dish Detergents on Plant Growth
- 1119W **Addison Pajor**
Grade 12 - Effects of different ratios of phosphorus and nitrogen on the growth of *Pyrocystis fusiformis*
- 1120S **Lah May Paw**
Grade 9 - Aquaponic Systems Amount of Water Effect on Plant Growth
- 1121W **Eli Quist**
Grade 12 - The effectiveness of dreissena polymorpha at removal of aluminum from calcium deficient water
- 1122W **Grayson Roberts, Julian Moyer**
Grade 11,12 - **Team** - Analyzing the Efficacy of Stormwater Treatment at Removing Pathogens
- 1123S **Josue Rocha Maldonado, Sanchita Dhimal**
Grade 9,9 - **Team** - Frogs and bugs
- 1124W **Harini Senthilkumar, Abirami Rajasekaran**
Grade 9,10 - **Team** - A computational analysis of the effects of Dreissena polymorpha on the ecological integrity of Minnesota Lakes
Project At Electricity Wall
- 1125T **Sneha Sureshkumar**
Grade 9 - Global Warming Trend on Agricultural Output
- 1126W **Gabrielle Natalie Tan**
Grade 12 - The effects of common air pollutants on soil pH and microbial populations
- 1127W **Trisha Trinh, Emma Gross**
Grade 12,12 - **Team** - Observing the Effects of Biochar on Radishes and Lettuce Under Reduced Irrigation
- 1128S **KaShonna Wilder**
Grade 9 - What impacted do humans have on frogs and chipmunks
- Embedded Systems (EBED)*
- 1129W **James Clinton, Nathan Rockafellow**
Grade 12,12 - **Team** - Spudfinder 6500: Creating a radar-based system for pre-harvest potato yield mapping, year two
- 1130T **David Wang**
Grade 11 - Improving Temperature Sensor Accuracy
Project At Electricity Wall
- Energy: Chemical (EGCH)*
- 1131W **Sarah Erickson**
Grade 12 - Biophotovoltaic Cells
- Energy: Physical (EGPH)*
- 1132T **Jacob Westerlund**
Grade 10 - The Effect of Blade Angle on Wind Turbine Efficiency
- Engineering Mechanics (ENMC)*
- 1133T **Umith Azad**
Grade 10 - The Effect Chord Length Has On Propeller Power
Project At Electricity Wall
- 1134T **Caleb Boll, Austin Currie, Ethan Ingram**
Grade 11,11,12 - **Team** - Non- Combustion Engine
- 1135W **Treven Bolton**
Grade 12 - Using Sound Waves to Find Changing Density in Objects
- 1136S **Richard Chang**
Grade 12 - Magnetometers as a Navigational Tool: A Correction Algorithm for External Magnetic Fields
- 1137W **Julia Guptail**
Grade 12 - Wearable Device for Drowning Prevention
- 1138W **Austin Hunter**
Grade 11 - Investigating the effect of winglet design on wind turbine performance
- 1139W **Jay Kurup**
Grade 11 - Intercooling Jet Engines

1140W **Rohan Parnerkar**
Grade 11 - Applications of Variable Cant Winglets for Multiphase Drag Reduction and Aircraft Control

1141T **Dhairya Sharma**
Grade 10 - Airfoils Under Distress

Environmental Engineering (ENEV)

1142W **Emre Adabag, Benjamin Rex**
Grade 12,11 - **Team** - Clearing the Air: Assessing the Practicality of a Liquid Piston for Carbon Capture and Storage

1143W **Mina Adabag, Sarah Peterson**
Grade 9,9 - **Team** - Lead plants

1144S **Constance Azonwu, Natali Joachin**
Grade 11,11 - **Team** - Pulp it up! Buckthorn Paper

1145T **Nick Coryell**
Grade 11 - Hurricane house

1146S **Salman Hussein, Raid Macalin**
Grade 10,10 - **Team** - Water Filters

1147T **Marwah Ismail, Charlie Mejia**
Grade 12,12 - **Team** - The Ultimate Plan: Creating High-Temperature Industrial Heat From Solar Energy

1148W **Byron Jia, John Cardwell**
Grade 12,11 - **Team** - Evaluating Ecosystems: Using Drones and Boats to Improve Water Health Assessments

1149T **Isaac Laddusaw**
Grade 12 - Wind Incorporated Buildings

1150T **Minhnhat Le**
Grade 10 - What water filtration system does Mother Nature love?

1151S **Fadumo Mahmood**
Grade 11 - Managing Rivers: Effects of Channel Constriction, Rip Raps and Wing dams on Mississippi River.

1152T **Fatimo Mursal**
Grade 10 - The Effect of Electricity on Plant Growth

1153S **Sydney Therien**
Grade 12 - Testing Bacillus subtilis for estrogen degrading ability using zebrafish as a model organism

1154T **Nancy Wang, Justin Draheim**
Grade 12,11 - **Team** - The Wolf Can't Blow this House Down

Materials Science (MATS)

1155S **Abdikhaliq Aden, Jama Aden, Abdullahi Duba**
Grade 10,10,10 - **Team** - Cleaning Carbonate

1156S **Maryan Ahmed**
Grade 10 - How is the level of oxygen is maintained in air?

1157W **George Cai**
Grade 12 - Citric Acid Cross-linked Nanocellulose Membranes for Hydrogen Fuel Cells

1158S **Hafsa Mahamud**
Grade 11 - How is the level of oxygen maintained in air ?

1159T **Keegan McDevitt**
Grade 10 - The effects of temperature on a golf ball

1160S **Zeinab Mohamed, Najmo Sheikh**
Grade 11,11 - **Team** - Analyzing Crime Scene Through Ink Chromatography

1161W **George Richards, William Sweeney**
Grade 11,11 - **Team** - The Polymer Problem: Creating an Accurate Model of Polymers Using Magnetic Polystyrene Microspheres and Lambda DNA

1162S **Mohamed Said, Suleiman Ali, Abdirahman Mohamed**
Grade 10,10,10 - **Team** - A Battery that makes cents

1163S **Brian Saldana Almaraz**
Grade 12 - Marine Oil Dispersion - Understanding the Fundamental Chemistry Behind the Dispersion Process

1164W **Trisha Samba, Amira Sinclair**
Grade 9,9 - **Team** - SCOPY-Dooby-Doo, Bioplastics Where Are You?

1165T **Orion Tyrrell**
Grade 10 - Compact Magnetic Loop Antenna for Unfriendly Neighborhoods

1166T **Caleb Vollhaber, Ethan Engh**
Grade 11,11 - **Team** - Structural Integrity of Building Materials

1167S **Pao Xiong**
Grade 11 - What Effect Does pH Level Have On Plastic Strength?

Mathematics (MATH)

1168T **Ethan Kilmer**
Grade 12 - C++ Platforming Game Project At Electricity Wall

Microbiology (MCRO)

- 1169T **Isra Abdi**
Grade 10 - Effects of Hand Soap On Bacteria
- 1170S **Maya Choi**
Grade 11 - Degradation of Microplastics: The Efficacy of Various Bacteria in Breaking Down Microplastics in the Environment
- 1171W **Rory Cole**
Grade 10 - Potential biodegradation of perfluorooctanoic acid by Pseudomas bacteria
- 1172W **Thomas Graupmann**
Grade 12 - Expressing the sMMO genes from Methylosinus trichosporium in Escherichia coli for the biocatalysis of methanol production using methane
- 1173S **Aidan Lanz**
Grade 12 - Mycoremediation of Organic Environmental Contaminants
- 1174W **Seyoung Lee**
Grade 12 - Using CRISPR/Cas9 to Create an Iron Rich Form of Arabidopsis Thaliana
- 1175W **Maxwell Maveus**
Grade 10 - Isolation, characterization and identification of chlorpyrifos-degrading bacteria from agricultural soil
- 1176W **Elizabeth Morgan**
Grade 10 - Exploring the Limitations of Phage Therapy
- 1177T **Mandy Pal**
Grade 10 - The Effects of Antiseptics on Bacteria
- 1178S **Joseph Smith**
Grade 10 - Bread Mold Experiment
- 1179W **Andrea Sundem**
Grade 12 - Directed evolution of plastic degrading enzyme PETase for improved efficiency
- 1180W **Julianna Torelli**
Grade 12 - The varying effectiveness of cyanobacteria as a diazotrophic aid in Martian arability

Physics and Astronomy (PHYS)

- 1181S **Noel Abraham**
Grade 11 - The Night Sky of our Intergalactic Neighbors: Creating a Library of Star Maps
- 1182S **Aisha Ali, Amal Mohamud, Khadija Abdullahi**
Grade 9,9,9 - **Team** - Dark matter
- 1183W **Gabe Germain**
Grade 12 - Obtaining a model solution of an asteroid using light-curve inversion

- 1184W **Zachary Levy**
Grade 11 - Photometric search for binary asteroids
- 1185S **Shameer Lopez**
Grade 12 - How does weight affect distance?
- 1186S **Mina Mandic**
Grade 11 - Exploring the Wonders of the Early Universe: Green Pea Galaxies and Luminous Flux
- 1187S **Hla Hla Myint, San Aye**
Grade 9,9 - **Team** - How does the weight of a paper airplane affect its ability to fly?
- 1188W **Belinda Neset**
Grade 11 - Lights, Cameras, Action! An Evaluation of Low Cost Infrared, UV, and Visible Light Detectors in the Stratosphere
Project At Electricity Wall
- 1189W **Zack Zontelli**
Grade 12 - Examining the Phases of Symbiotic Stars

Plant Sciences (PLNT)

- 1190S **Tania Acevedo Garcia**
Grade 12 - Lodging Characteristics in Small Grains
- 1191S **Suudi Adan, Shukri Omar**
Grade 9,9 - **Team** - How does different color of light affect the growth of a plant?
- 1192S **Salma Aden, Fathi Abdi**
Grade 11,11 - **Team** - Effect of music on plant growth
- 1193W **Maya Ballbach**
Grade 12 - CO2 Intake In Trees
- 1194S **Anthony Chen**
Grade 11 - The Effects of Short Term Radiofrequency Electromagnetic Radiation on Diatom Photosynthetic Productivity
- 1195W **Ivy Ferstan, Fiona Reilly**
Grade 10,10 - **Team** - Best pH for Growing Plants
- 1196T **Elisa Guo**
Grade 10 - Creating Auto-luminescent Plants with Fungal Bioluminescence Pathway
- 1197W **Andrew Hartmann**
Grade 12 - The Effects of Heated Soil on Garlic Mustard Survivability
- 1198W **Vaughn Hughes**
Grade 9 - Method of Natural L-Ascorbic Acid Enhancement for Plants Grown in an Abiotic-Stress Environment: Using Environmental Enhancements to Increase Vitamin-C Production in Spinacia oleracea in Varied Agricultural Environments

- 1199W **Mary McDonald**
Grade 12 - Evaluating the protein content of duckweed grown in modified N-media
- 1200T **Nicholas Parten**
Grade 11 - The Effect of radiation on the growth rate and volume of various plants.
- 1201S **Yurneewa Paw, Mea See Da**
Grade 9,9 - **Team** - Do plants change color due to temperature
- 1202W **Abigail Roh, Samantha Detor**
Grade 12,12 - **Team** - Searching the Shadows: Using shadows in aerial imagery to classify trees by genus for urban tree management, Year II
- 1203W **Andrew Seo**
Grade 11 - A study comparing mosses and succulents on their flexibility to adjust and survive in stressful climates while set in a green roof setting

Robotics and Intelligent Machines (ROBO)

- 1204W **Julian Calder**
Grade 12 - The Creation of an Autonomous Snowblower to Replace Human Snow Removal Methods
- 1205W **Justin Carter**
Grade 12 - Creating a Chatbot using a Neural Network
- 1206W **Jai Chadha**
Grade 12 - Using forearm myoelectric sensing to control an upper-extremity 3D printed prosthetic hand
- 1207W **Adarsh Nayar**
Grade 9 - Self driving car that recognizes road features
Project At Electricity Wall
- 1208W **Maya Schrof**
Grade 12 - Using a neural network to build a stylistic recommender program from a set of fashion images
- 1209W **William Sepesi**
Grade 12 - A Machine Learning Approach to Pokemon Battling
- 1210W **Anna Mary Southern**
Grade 9 - I am the Duke: Teaching AI to Deceive, year two
Project At Electricity Wall

Systems Software (SOFT)

- 1211S **Mani Chadaga, Akshay Nambudiripad**
Grade 11,11 - **Team** - Development of WALTER: A Route Planning System That Analyzes Accident Data to Determine Safer Driving Routes in Saint Paul, Minnesota
Project At Electricity Wall

- 1212T **Milan Jostes**
Grade 11 - Developing FourS 2.0 - A Web Hosting Software That Uses Encrypted Quick Response Code to Reduce Violence in Schools
Project At Electricity Wall
- 1213W **Winston Lu**
Grade 11 - Simulated concealed weapon detection and classification using machine learning and acoustic imaging
- 1214W **Charles Roslansky**
Grade 12 - Using machine learning to optimize structural design
- 1215W **Jacob Sandum**
Grade 12 - Malware Detection using TLS fingerprinting and Machine Learning
- 1216T **Nickolas Zander**
Grade 10 - Expediting The Student Check-In Process
Project At Electricity Wall



Grade 6

Beseman, Sophia	6001T
Beseman, Madalynn	6011T
Birch, Elizabeth	6040T
Bolle, Lillian	6004T
Buckanaga-Keezer, Douglas	6012T
Countryman, Rachel	6015T
Danz, Evelyn	6041W
Darji, Milan	6013W
Ehlers, Ella	6002T
Elias, Liya	6014T
Eshete, Efrata	6005T
Flom, Allyson	6035T
Gerber, Brooke	6026T
Goberdhan, Aiden	6028T
Grosser, Hannah	6041W
Haertel-Strehlow, Takeo	6031T
Hale, Adam	6037W
Hamann, Olivia	6021T
Haws, Sean	7049T
Josephs, Neela	6015T
Kanu, Mariam	6038T
Kennedy, Ryan	6024T
LaMotte, Carley	6011T
Malm, Damien	6025T
McGowan, Riley	6027T
McHugh, Sam	6007W
Mendoza-Fierro, Anggelo	6042T
Miller, Spencer	6029T
Monahan, Molly	6022T
Morgan, Samuel	6010T
Nachand, Alex	6023T
Nelson, Oliver	6032W
Owusu Ansah, Erica	6038T
Rose, Isaac	6039W
Russell, Brian	6036T
Sekar, Shreya	6003T
Silver, Jada	6016W
Smith, Charles	6030T
Stone, Paige	6008T
Suh, Eric	6006W
Sundberg, Elizabeth	6017T
Traiforos, Leland	6018T
Warumzer, Francis	6019T
Weingartz, Ali	6009T
Wening, Deacon	6020T
Yego, Ella	6033T
Zewdu, Beza	6034T

Grade 7

Abass Mohamed,	7044S
Abdirahman	
Abdi, Ahmed	7044S

Aflakpi, Audrey	7006T
Amaro, Juan	7001T
Batie, Zamirah	7005T
Beekman, Matthew	7071W
Bertini, Nichole	7006T
Bilik, Eddie	7025T
Bonifas, Marcus	7068T
Castro, Audrey	7072T
Chinn, Abigail	7007T
Cindrich, Megan	7021S
Clair, Tyler	7034W
Clift, Annika	7050T
Connell, Catalina	7033T
Cordoba, Jairo	7069T
Cruz, Alejandra	7060S
De Grace, Eva	7002T
Dempsey, Emma	7061T
Detailleur, Caitlin	7008T
Dunlap, Ryan	7051S
Elliott, Collin	7026T
Farley, Aunesti	7027S
Godina, Juliana	7009T
Gutierrez, Isabella	7045T
Hanto, Lillie	7062T
Held, Eduard	7028T
Holien, Imogen	7010T
Horne, Leah	7063T
Hughes, Quinn	7034W
Isom, Amelie	7029S
Jagerson, Marley	7015T
Jimenez Marin, Laysha	7011T
Johnson, Ewan	7003S
Johnston, Casey	7048T
Jolly, Luke	7049T
Keenan, Lucy	7012S
Kimmel, Logan	7042W
Kitt, Eve	7040S
Klug, Emma	7073T
Korhonen, Petra	7013S
Leifeld, Lewie	7064S
Leon Kass, Miranda	7014T
Llapa, Emily	7043T
Marshall, Haden	7070T
Mendez, Peter	7041T
Mohamed, Salman	7052S
Moran, Makayla	7030T
Muramatsu, Takato	7035S
Murphy, Liam	7053T
Muse, Zakeriye	7052S
Nieminski, Tyler	7058T
Nur, Hani	7023S
O'Hanlon, Ella	7065T
Omar, Ilyas	7024S
Osman, Hamda	7023S
Parcon, Ethan	7022T

Paro, Zoey	7054T
Paslowski, William	7015T
Plumer, Julian	7055T
Pradeep, Shreyas	7056T
Price, Lenea	7016S
Pundsack, Alexa	7036S
Regguinti, Tammy	7017T
Reilly, Shannon	7018T
Sackaroff, Liam	7066S
Salah, Yahya	7044S
Schaefer, Wilson	7037W
Schatteles, Amelia	7004T
Schroeder, Ellen	7019S
Schubert, Livina	7020S
Scott, Titus	7031T
Sheeser, Karin	7032T
Shelby Vazquez, Cecilia	7038S
Singhvi, Coolsjes	7076T
Sureshkumar, Sriram	7039T
Taylor, Kennesey	7067T
Thrasher, Hazel	7036S
Tompkins, Halina	7074S
Weinacht, Isaac	7046W
Wuebben, Eli	7057T
Yust, Axcel	7059T
Zaw, Thura	7047S
Zirbel, Renna	7075T

Grade 8

Ahlberg, Anders	8021S
Alhumam, Abdullatif	8045S
Allen, Jaeden	8001S
Banks, Maggie	8022T
Bollman, Zach	8046S
Bradshaw, Genevieve	8006T
Brenner, Emily	8029S
Brenner, Maria	8015S
Carle, Olivia	8003T
Chow, Carissa	8037T
Clift, Liam	8002T
Cooney, Sara	8042T
Deiman, Keira	8016S
Donegan, Liam	8004S
Engelmann, Tristan	8005S
Eschiti, Starla	8003T
Evans, Erin	8023S
Finlay, Phoebe	8030S
Formby, Catriona	8047T
Frantum, Madison	8031T
Harris, Liam	8043S
Helgen, Oskar	8040S
Heymans, Adeline	8006T
Imbertson, Anna	8032S
Iordanoglou, Anna	8013W

Ingram, Ethan	1134T	Moyer, Julian	1122W	Seo, Andrew	1203W
Isaacson, Frank	1068W	Mursal, Fatimo	1152T	Sepesi, William	1209W
Ismail, Marwah	1147T	Myint, Hla Hla	1187S	Shambley, Kahlaila	1003S
Jama, Shukri	1089S	Nadkarni, Ishan	1059W	Sharma, Dhairya	1141T
Jia, Byron	1148W	Nambudiripad, Akshay	1211S	Sheikh, Najmo	1160S
Joachin, Natali	1144S	Narayan, Ananya	1028S	Sinclair, Amira	1164W
Johnson, Joseph	1080W	Nayar, Adarsh	1207W	Sislo, Helaina	1097T
Johnson, Karsten	1069W	Neset, Belinda	1188W	Smith, Isabel	1036W
Jostes, Milan	1212T	Noor, Ugbaad	1117S	Smith, Joseph	1178S
Juelich, Mary	1007T	Numan, Fatuma	1090S	Southern, Anna Mary	1210W
Kale, Eera	1057W	O'Grady, Mary	1062W	Sriram, Samskrith	1083W
Kilmer, Ethan	1168T	Olson, Zoe	1118T	Stein, Clara	1043T
Kinney, Fiona	1064W	Omar, Shukri	1191S	Stolar, Sarah	1031W
Kneisl, Greta	1070T	Osman, Fatha	1091S	Sundem, Andrea	1179W
Kurup, Jay	1139W	Pajor, Addison	1119W	Sureshkumar, Sneha	1125T
Laddusaw, Isaac	1149T	Pal, Mandy	1177T	Sweeney, William	1161W
Lai, Chelsea	1022W	Parnerkar, Rohan	1140W	Tadesse, Hawi	1107S
Lane, Thomas	1008W	Parten, Nicholas	1200T	Tahnk-Johnson, Dylan	1032W
Lanz, Aidan	1173S	Paul, Selena	1009S	Tan, Gabrielle Natalie	1126W
Larsen, Evan	1048T	Paw, Yurneewa	1201S	Teso, Aalunya	1033T
Larson, Mark	1111W	Paw, Lah May	1120S	Therien, Sydney	1153S
Le, Minhnhat	1150T	Peltier, Lucie	1042W	Thompson, Reese	1034W
Le-Vu, Teresa	1023T	Peters, Ted	1072W	Torelli, Julianna	1180W
Lee, Seyoung	1174W	Peterson, Isabelle	1060T	Trinh, Trisha	1127W
Lehr, Avery	1024T	Peterson, Jack	1082W	Tyrrell, Orion	1165T
Levy, Zachary	1184W	Peterson, Sarah	1143W	Vang, Pajntsha	1044S
Lightfeather, Yazarah	1112S	Petronack, Cody	1048T	Vincent, Dylan	1035W
Lopez, Shameer	1185S	Pitt, Dylan	1061W	Vollhaber, Caleb	1166T
Lu, Winston	1213W	Quinlan, Meghan	1094T	Volp, Vincent	1066T
Lundheim, Tessa	1113W	Quist, Eli	1121W	Wah, Eh Soe	1112S
Ma, Hongxu	1114T	Raffel, Ava	1062W	Walker, William	1092W
Macalin, Raid	1146S	Rajamani, Anindita	1073S	Wang, David	1130T
Mahamud, Hafsa	1158S	Rajasekaran, Abirami	1124W	Wang, Nancy	1154T
Mahmood, Fadumo	1151S	Reilly, Fiona	1195W	Warren, Ayres	1036W
Mandic, Mina	1186S	Reuter, Breanna	1063T	Westerlund, Jacob	1132T
Mangipudi, Sahana	1071W	Rex, Benjamin	1142W	Wilder, KaShonna	1128S
Martinez, Marco	1009S	Richards, George	1161W	Will, Liam	1037S
Maveus, Maxwell	1175W	Roberts, Grayson	1122W	Xiong, Pao	1167S
Mazo, Michelle	1025W	Rocha Maldonado, Josue	1123S	Xiong, Qeng	1093S
McCormick, Henry	1115T	Rockafellow, Nathan	1129W	Yeoh, Ming Ying	1084W
McDevitt, Keegan	1159T	Roh, Abigail	1202W	Yue, Johnny	1067T
McDonald, Mary	1199W	Roslansky, Charles	1214W	Yusuf, Amal	1027S
Mejia, Charlie	1147T	Said, Mohamed	1162S	Zander, Nickolas	1216T
Moalim, Irshad	1058T	Saldana Almaraz, Brian	1163S	Zontelli, Zack	1189W
Mohamed, Ridwaan	1089S	Samba, Simren	1064W		
Mohamed, Abdirahman	1162S	Samba, Trisha	1164W		
Mohamed, Abdimalik	1085S	Sandum, Jacob	1215W		
Mohamed, Zeinab	1160S	Sayid, Fatuma	1091S		
Mohammed, Hamza	1026S	Schafer, Jeana	1029W		
Mohamud, Ansal	1027S	Schneider, Nathan	1065W		
Mohamud, Amal	1182S	Schneider, Hanna	1096W		
Mohamud, Abdisalan	1009S	Schrof, Maya	1208W		
Monge, Sydney	1081W	Schultz, Pia	1028S		
Moore, Sophia	1116S	Sekar, Esha	1030T		
Morgan, Elizabeth	1176W	Senthilkumar, Harini	1124W		



2020 Research Papers

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Adam Hale	6	Sliding with Friction
Molly Monahan	6	Filter Fad
Matthew Beekman	7	Tomayto Tomahto: Is there a difference between traditional and vertical farming?
Aunesti Farley	7	How does the type of flour affect the size of a cookie
Quinn Hughes, Tyler Clair	7,7	Fueling the Planet with Coffee: Engineering a Better Biofuel with Synergistic Enzymatic Compounds
Coolsjes Singhvi	7	What is in a Tone! Sentiment and Emotion Analysis of School Email Communication Using Artificial Intelligence
Maggie Banks	8	Currently Knocking On Wood: Toward a Biodegradable Piezoelectric Transducer From Rochelle Salt and Wood
Catriona Formby	8	Color in the Darkness
Adithi Rupireddy	8	Plant growth in an enriched carbon environment
Selene Sanchez	8	What filters water the best
Shreshth Shrivastava	8	Wi-C.A.R.E., Being there Always! Designing Patient-Specific Applications for Elder Care
Arjun Acharya	9	Countering the Eutrophication of Minnesota Lakes Using Epipremnum Aureum
Vaughn Hughes	9	Method of Natural L-Ascorbic Acid Enhancement for Plants Grown in an Abiotic-Stress Environment: Using Environmental Enhancements to Increase Vitamin-C Production in Spinacia oleracea in Varied Agricultural Environments
Harini Senthilkumar, Abirami Rajasekaran	9,10	A computational analysis of the effects of Dreissena polymorpha on the ecological integrity of Minnesota Lakes
Sneha Sureshkumar	9	Impact of Global Warming Trend on Agricultural Output
Isra Abdi	10	Effects of Hand Soap on Bacteria
Jay Anderson	10	Pets and how they affect your pulse rate
Umith Azad	10	The Effect Chord Length Has On Propeller Power
Julian Banlao	10	The Effect of Temperature on General Instrumental Note Tuning
Rahim Bardai	10	Poisson's Spot
Krista Boaz	10	The Efficiency of Different Angles of Attack on Horizontal Wind Turbines
Samantha Bowlby	10	The Effect of Usage on Tennis Balls
Forrest Bowman	10	Fire Resistance of Siding
Elizabeth Bunnell	10	Effect of Microplastics on Ghost Shrimp
Payton Bunnell	10	Effect of Chlorophyll and Plant Pigments on the Greenness of Plant Leaves
Owen Cadwell	10	Effects of Mobile Phone Usage on Academic Performance
Brian Chhuoy	10	Soil Health Based on the ability to break down cotton
Jayden Chow	10	Gone with the Wind: The Effect of Wind Speed and Blade Length on Wind Turbine Efficiency
Andrew Crawford	10	Dangers of the Sound Levels of Electric Cars
Sylvia Croatt	10	Tree Versus Technology
Jonah Dawson	10	Going Green as You Clean
Christian Delos Santos	10	How Chromatography Can Unmix Mixtures

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Nicole Diaz	10	The Effect The “Chunking Method” Has On Memory
Emmerson Drayton	10	Banana Vs. Potato: Which Food is Consumed by Dubia Roaches at a Higher Rate?
Ian Duncan	10	Effects of Household Chemicals on Fatberg Breakdown
Thomas Dundon	10	The Effect 5 Hour Energy has on Athletic Performance
Lucinda Erbes	10	pH Levels on Bromothymol Blue
Lilliana Ewoldt	10	Volume of Tension
Michael Fisher	10	Effect of Alkalinity on Mold Growth
Zachary Friedmann	10	The Effect of Dimples on the Flight of a Golf Ball
Brooke Friese	10	The Factors of High Stress in Teenagers
Asher Giese	10	Does the Type and Material of a Baseball Bat Have an Effect On the Exit Velocity?
Hanna Gleason	10	Is This White Square Really Necessary?
Nathaniel Grenke	10	The effects of Nano silver on the environment
Elisa Guo	10	Creating Auto-luminescent Plants with Fungal Bioluminescence Pathway
Tyler Haddorff	10	How do Humidity Levels Affect the Electricity Generated from a Solar Cell
Ema Handzija	10	The Effects of Chlorine on Hair
Bonnie Hansen	10	The Impact of Age On Either Auditory or Visual Memory
Safa Hassan	10	Does Age Affect Short Term Memory
Nimco Hassan	10	Water Solubility Of Sunscreen Lotions
Katelyn Hess	10	Effects of eco-friendly dish soap vs. non-eco-friendly dish soap vs. water on cress plants
Dain Honerman	10	Oxygen Depletion in Pond Water Due to Human Activity
Quentin Hughes	10	An Active Role for Machine Learning in the Diagnosis of Atrial Fibrillation
Calvin Hume	10	How pH level affect erosion on teeth
Bushra Kadar	10	Effects of Racism
Katherine Katzmarek	10	The Effect of Mouthwash on E. coli Bacteria
Lucia Kestell	10	Drug Solubility of OTC Painkillers
Brady King	10	The Effect of Companion Planting
Greta Kneisl	10	Planarian Regeneration Compared to Human Regeneration
Tristan Lanska	10	The Effect of Different Substances on the Amount of Corrosion in Aluminum
Minhnhat Le	10	What Water Filtration System Does Mother Nature Love?
Teresa Le-Vu	10	The Effect of Music on Heart Rate
Paige Leagjeld	10	Cloudy to Clear - Water Filtration
Baylor Limberg	10	Bat Attack
Sierra Link	10	The Effects of Green and Conventional Detergents on Bean Plants
Trinity Mac	10	The Manifest of Name Stereotyping in Races
Kaylee Marczak	10	Chirality of Glucose Solutions
Hayden Mathews	10	The Placibo Effect on Physical Activity
Kira McAllister	10	Effectiveness of Water Filters with Increased Usage
Henry McCormick	10	Eco-Friendly Detergents: Can They Prevent Unnecessary Environmental Toxins?
Keegan McDevitt	10	The effects of temperature on a golf ball

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Name	Grade	Title
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Faith Miller	10	Planaria and the Effects of Magnetism on Reproduction
Mariam Mohamed	10	The Effects of Natural Sugars and Artificial
Sergio Moya	10	Colored Lights Effect on Plants
Fatimo Mursal	10	The effects of electricity on plant growth
Anna Nelson	10	Type of soap that removes the most bacteria
Susan Nguyen	10	The Effect of Colored Paper on Readability
Jacob Norton	10	Temporary Flood Barriers
Shaydelis Oliveras Rodriguez	10	Effect of Electromagnetic Field on the growth of Plants
Zoe Olson	10	The Effect of Dish Detergents on Plant Growth
Mandy Pal	10	The Effects of Antiseptics on Bacteria
Simon Palmer	10	Does the Type of Ball Affect its Total Distance When Hit?
Ellietta Phorn	10	Do "Low Fat" Foods Actually Have Less Fat Than The Normal Version of the Food?
Shrey Pothini	10	The Effect of the Growth Rate of Plants when Near Microwave Ovens
Caitlyn Procko	10	The Effect of Exercise on Brain Productivity
Connor Quimby	10	Effects of pH on lead testing
Breanna Reuter	10	Effects of Caffeine on Blood Pressure
Alexandra Reyes-Herrera	10	Burn Rate of Different Fabrics
Everett Sandbo	10	Discovering more effective ways to maintain a constant room temperature
Cassie Santelman	10	How the Brand of a Golf Ball Effects its Distance
Ellie Scheldberg	10	Are Green Detergents Actually Better for the Environment?
Dhairya Sharma	10	Performance of Different Airfoils during Turbulence and Their Effects on the Lift of an Aircraft at different Altitudes
Owen Skonseng	10	Plant Killers
Aaden Spencer	10	Discover Chlorophyll Variety in Different Plants Using Paper Chromatography
Ryan Stanek	10	Natural Repellents and their Effect on Bugs
Alex Stanek	10	The Effect of Composite Material on Structural Integrity of Mechanically Stabilized Earth
Camara Stevenson	10	Beauty Standards Within Race and Ethnicity
Katelyn Stickney	10	Solar Powered Energy Compared To The Energy Produced From A Battery
Gavin Storms	10	Hydroelectric Generator
Sirianna Stortroen	10	Effect of Filler Words and Eye Contact
Jasper Strayer	10	Effect of temperature on enzyme catalase reactions
Aalunya Teso	10	Gender Frustration
Hlina Tessema	10	How Do Video Games Affect Reaction Times
Alex Thompson	10	A Companion of Adult and Juvenile birds migrating
Emma Tobias	10	Female vs Male Knees
Anna Tran	10	Distracted Driving: Conversing in Person vs. Via Cell Phone
Tai-Bruce Tran	10	Meat Preservation with Spices
Jenna Tvedt	10	Vitamin C Preservation in Oranges at Different Temperatures
Alex Ulin	10	The Effect of Supplemental Food Items On Isopod Growth
Jacob Westerlund	10	The Effect of Blade Angle on Wind Turbine efficiency

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Name	Grade	Title
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Mansfield Yiu	10	More Than Just Chromatography
Calvin York	10	The Effect Of Fat On Milk Curdling
Johnny Yue	10	Role of Protein Aggregation in Huntington's Disease
Hannah Zastrow	10	The Bat Debate: Wood or Aluminum?
Noel Abraham	11	The Night Sky of our Intergalactic Neighbors: Creating a Library of Star Maps
Irene Bensus, Karmen Bensus	11,9	Maze Madness
Caleb Boll, Austin Currie, Ethan Ingram	11,11,12	Non- Combustion Engine
Mani Chadaga, Akshay Nambudiripad	11,11	Development of WALTER: A Route Planning System That Analyzes Accident Data to Determine Safer Driving Routes in Saint Paul, Minnesota
Reese Chahal	11	Talking Transportation: Using ArcGIS to model correlations between Wayzata High School student demographics, accessibility, and transportation
Anthony Chen	11	The Effects of Short Term Radiofrequency Electromagnetic Radiation on Diatom Photosynthetic Productivity
Maya Choi	11	Degradation of Microplastics: The Efficacy of Various Bacteria in Breaking Down Microplastics in the Environment
Sarah Elting-Ballard, Cody Petronack, Evan Larsen	11,11,11	How Foods Affect PH Levels
Richard Erskine, Bemnet Abebayehu	11,11	Yeast Deodorant
Eric Feng	11	The Time Course of Murine Cardiomyocytes
Bingsheng Guo	11	Re-engineering a centrifuge force microscope (CFM) to enable the study of induced crystal nucleation in hypergravity
Steven Hu	11	Effects of Soil Erosion and The Best Way to Prevent It
Milan Jostes	11	Developing FourS 2.0 - A Web Hosting Software That Uses Encrypted Quick Response Code to Reduce Violence in Schools
Mina Mandic	11	Exploring the Wonders of the Early Universe: Green Pea Galaxies and Luminous Flux
Sahana Mangipudi	11	The Missing Link: Glycoengineering MSCs for Targeted Cancer Drug Delivery
Ishan Nadkarni, Nathan DeMichaelis	11,11	Therapy or Trauma? Examining the Drawbacks of PERK-Knockout as a Potential Treatment for Heart Rhythm Disorders
George Richards, William Sweeney	11,11	The Polymer Problem: Creating an Accurate Model of Polymers Using Magnetic Polystyrene Microspheres and Lambda DNA
Grayson Roberts, Julian Moyer	11,12	Analyzing the Efficacy of Stormwater Treatment at Removing Pathogens
Simren Samba, Fiona Kinney	11,11	A Biomarker for Brain Injury
Caleb Vollhaber, Ethan Engh	11,11	Structural Integrity of Building Materials
Lorien Zhao	11	Gender Biases: Investigating how Gender and Clothing Color Changes the Perceptions of Leaders
Emre Adabag, Benjamin Rex	12,11	Clearing the Air: Assessing the Practicality of a Liquid Piston for Carbon Capture and Storage
Katie Barry, Meghan Quinlan	12,12	Human Gut Microbiota Driving Fatty Acid Composition and its Contribution to Obesity
Helen Bartlett	12	Associations Between Sexual Risk Behavior and Adverse Childhood Experiences Among Minnesota High School Students

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Richard Chang	12	Magnetometers as a Navigational Tool: A Correction Algorithm for External Magnetic Fields
James Clinton, Nathan Rockafellow	12,12	Spudfinder 6500: Creating a radar-based system for pre-harvest potato yield mapping, year two
Olivia Graupmann	12	The Implications of the Relationship of Relaxin on Injury in Female Athletes
Rachel Gunderson, Boatemaa Agyeman-Mensah	12,12	Healing a Broken Heart: Investigating Endoglin as a Novel Regulator of Heart Regeneration
Paige Indritz	12	The Effect of pH on Bioremediation of Acid Mine Drainage
Frank Isaacson	12	Simulating the spread of Influenza A through a Portland-based mock population
Byron Jia, John Cardwell	12,11	Evaluating Ecosystems: Using Drones and Boats to improve water health assessments
Mary Juelich, Maia Adams	12,12	The Effects of Shapes and Colors on the Behavior of Siamese Fighting Fish
Eera Kale	12	Sickle cell disease through patients' eyes: An evaluation of the effectiveness of different treatment approaches in the United States and India
Aidan Lanz	12	Mycoremediation of Organic Environmental Contaminants
Ananya Narayan, Pia Schultz	12,12	The Influence of Positive vs. Negative Moral Motivations on Sustainable Decision-Making in Middle Schoolers
Jack Peterson, William Bae	12,11	Looking Deeper Into Lyme Disease: Reclassifying post-treatment Lyme disease utilizing novel staining methods
Ava Raffel, Mary O'Grady	12,12	A Not so Muscular, Muscular Dystrophy? Discovering abnormal neural differentiation in FSHD-affected stem cells
Abigail Roh, Samantha Detor	12,12	Searching the Shadows: Using shadows in aerial imagery to classify trees by genus for urban tree management, Year II
Brian Saldana Almaraz	12	Marine Oil Dispersion—Understanding the Fundamental Chemistry Behind the Dispersion Process
Sydney Therien	12	Testing Bacillus subtilis for estrogen degrading ability using zebrafish as a model organism
Dylan Vincent, Roberaa Ayana	12,12	Chords to Character: Exploring the relationship between musical preference and personality
John Vue	12	Comparing the Reactivity of Hydrazine and O-Phenyl Hydroxylamine with Aldehydes to Develop a Chemical Sensor
Liam Will	12	Physiological Stress and Internet Addiction in Adolescents
Chittra Xiong	12	Formation of Nanopores in a Polymer Monolith Through Cleavage of Bulky Side-Groups
Qeng Xiong	12	Convergent Synthesis: Development of a GGPP Analogue for Selective Enzymatic Labeling of Prenylated Targets Related to Diseases
Ruoran Xu	12	The Effects of Atorvastatin, Astragaloside IV, and Cycloastragenol on Mouse Myocardial Gene Expression



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DuPont Water Solutions congratulates your achievements in competing at the Twin Cities Regional Science Fair.

We thank DuPont Water Solutions for their sponsorship of this event!

TWIN CITIES REGIONAL SCIENCE FAIR “ISEF” ALUMNI
Students Chosen to Represent the Twin Cities Fairs at International Science & Engineering Fair

1973	Timara Kulzer Underbakke	1987	Brenda Zenk
	Harding High School, St. Paul		Sibley High School, West St. Paul
1974	Craig Johnson	1987	Ann Bailey
	Harding High School, St. Paul		Mahtomedi High School, Mahtomedi
1975	Dennis Scanlon	1988	Sara Greenslit
	Harding High School, St. Paul		Mounds View High School, Arden Hills
1976	Mark Foertsch	1988	Ann Marie Gentes
	Grace High School, Fridley		Westonka High School, Mound
1976	Linda Ann MacDonald	1989	Ann Marie Gentes
	Mounds View High School, Arden Hills		Westonka High School, Mound
1977	Steve Rabatin	1989	Todd Capistrant
	Benilde-St. Margaret, St. Louis Park		Minnesota Zoo School
1977	Charles Clevenger	1990	Cynthia Schaumburger
	Westonka High School, Mound		Harding High School, St. Paul
1978	Mitchell Voechl	1990	Ryan Egeland
1978	Charles Clevenger		Wayzata High School, Wayzata
	Westonka High School, Mound	1991	Ryan Egeland
1979	Jeffrey Rabatin		Wayzata High School, Wayzata
	Benilde-St. Margaret, St. Louis Park	1991	Jonathon Kubik
1979	Joseph Rabatin		Sibley High School, West St. Paul
	Benilde-St. Margaret, St. Louis Park	1992	Heidi Konkler
1980	Jeffrey Rabatin		Wayzata High School, Wayzata
	Benilde-St. Margaret, St. Louis Park	1992	Ryan Egeland
1980	Joseph Rabatin		Wayzata High School, Wayzata
	Benilde-St. Margaret, St. Louis Park	1993	Ryan Egeland
1981	Jeffrey Rabatin		Wayzata High School, Wayzata
	Benilde-St. Margaret, St. Louis Park	1993	Andrew Grande
1981	Joseph Rabatin		St. Thomas Academy, Mendota Heights
	Benilde-St. Margaret, St. Louis Park	1993	Kelley Lohman
1982	Micheal Rabatin		Harding High School, St. Paul
	Benilde-St. Margaret, St. Louis Park	1993	Jens Strand
1982	Brian Hallberg		St. Paul Academy, St. Paul
	Harding High School, St. Paul	1994	John Hassett
1983	Thinh Hoang Tran		Burnsville High School, Burnsville
	Westonka High School, Mound	1994	Ana Navarro
1983	UNKNOWN		Minnetonka High School, Minnetonka
1984	Susan Kain	1994	Victoria Miller
	Edina High School, Edina		St. Agnes High School, St. Paul
1984	Steve Herrman	1994	Julia Goetzke
	Mahtomedi High School, Mahtomedi		Harding High School, St. Paul
1985	Brenda Zenk	1995	John Hassett
	Sibley High School, West St. Paul		Burnsville High School, Burnsville
1985	Steve Herrman	1995	Adam Tatarynowicz
	Mahtomedi High School, Mahtomedi		Burnsville High School, Burnsville
1986	Brenda Zenk	1995	Victoria R. Miller
	Sibley High School, West St. Paul		St. Agnes High School, St. Paul
1986	Steve Herrman	1995	Marcus Rollins
	Mahtomedi High School, Mahtomedi		St. Paul Open School, St. Paul

TWIN CITIES REGIONAL SCIENCE FAIR “ISEF” ALUMNI
Students Chosen to Represent the Twin Cities Fairs at International Science & Engineering Fair

1995	Anna Navarro	1998	Michael Scott Lohman
	Minnetonka High School, Minnetonka		Expo III High School, St. Paul
1995	Samuel Rush	1998	A. Ben Suri
	Minnetonka High School, Minnetonka		Harding High School, St. Paul
1996	Laurie Louis Parker	1999	Michael Scott Lohman
	Roseville High School, Roseville		Expo III High School, St. Paul
1996	David Loy Bowe	1999	Alison Boutin
	Burnsville Senior High School, Burnsville		Burnsville High School, Burnsville
1996	Michael Scott Lohman	1999	Jennica Slattery
	Expo III High School, St. Paul		Minnehaha Academy, Minneapolis
1996	Victoria Reynolds Miller	1999	Chrissy Jones
	St. Agnes High School, St. Paul		Minnetonka High School, Minnetonka-Team
1996	Anna Navarro	1999	Elizabeth Larkin
	Minnetonka High School, Minnetonka		Breck School, Minneapolis
1996	Michelle Lee Monnens	1999	Melissa Borken
	Minnetonka High School, Minnetonka		Minnetonka High School, Minnetonka
1996	James Justin Wilson	1999	Alli Kellogg
	Minnetonka High School, Minnetonka-Team		Minnetonka High School, Minnetonka-Team
1996	Michael Gary Grotenhuis	2000	Mark Galatowitsch
	Minnetonka High School, Minnetonka-Team		Highland High School, St. Paul
1997	Nguyen Trung	2000	Jennica Slattery
	Burnsville Senior High School, Burnsville		Minnehaha Academy, Minneapolis
1997	Samuel Rush	2000	Chrissy Jones
	Minnetonka High School, Minnetonka		Minnetonka High School, Minnetonka
1997	Anna Navarro	2000	Michael Chansky
	Minnetonka High School, Minnetonka		Burnsville High School, Burnsville
1997	Victoria Reynolds Miller	2000	A. Ben Suri
	St. Agnes High School, St. Paul		Harding High School, St. Paul
1997	Michael Scott Lohman	2000	Emily Letourneau
	Expo III High School, St. Paul		Central High School, St. Paul-Team
1997	Travis Smith	2000	Anna Bishop
	Burnsville Senior High School, Burnsville		Como Park, St. Paul-Team
1997	James Justin Wilson	2001	Megan Bailey
	Minnetonka High School, Minnetonka-Team		Breck School, Minneapolis
1997	Justin Rainey	2001	Kathryn Gieselman
	Minnetonka High School, Minnetonka-Team		Burnsville High School, Burnsville
1998	Dean Harvey	2001	A. Ben Suri
	Burnsville Senior High School-Team		Harding High School, St. Paul
1998	Dan Harakh	2001	Li Mei
	Burnsville Senior High School-Team		Wayzata High School, Wayzata
1998	Bryce Gillespie	2001	Laura Egerdal
	Breck School, Minneapolis		Burnsville High School, Burnsville
1998	Preeya Kshetry	2001	Anna Bishop
	Breck School, Minneapolis		Como High School, St. Paul-Team
1998	Phally Seak	2001	Emily Letourneau
	Burnsville Senior High School		Central High School, St. Paul-Team
1998	Raj Pai	2002	Jacob Fitzpatrick
	Burnsville Senior High School		Burnsville High School, Burnsville

TWIN CITIES REGIONAL SCIENCE FAIR “ISEF” ALUMNI
Students Chosen to Represent the Twin Cities Fairs at International Science & Engineering Fair

2002	Kaonhou Her	2006	Jenna Johnson
	Johnson High School, St. Paul-Team		Burnsville High School, Burnsville
2002	PaCha Yang	2006	Andrea Jensen
	Johnson High School, St. Paul-Team		Burnsville High School, Burnsville
2002	Stephen Morris	2006	Daniel Zeng
	Breck School, Minneapolis		St. Paul Academy & Summit School
2002	Arun Saini	2006	Matthew Weiss
	Burnsville High School, Burnsville		Breck School, Minneapolis
2002	A. Noel Suri	2006	Katherine Schaeffer
	Harding High School, St. Paul		Breck School, Minneapolis
2003	Jessica Swatrz	2007	Ummul Kathawalla
	ISD 287		Blake High School, Minneapolis
2003	Ning Zhou	2007	Daniel Zeng
	ISD 287		St. Paul Academy & Summit School
2003	PaCha Yang	2007	Kyra Underbakke
	Johnson High School, St. Paul		Maranatha Christian Academy, Brooklyn Park
2003	A. Noel Suri	2007	Brandon Lew
	Harding High School, St. Paul		Breck School, Minneapolis
2003	Brendan Doms	2007	John Earl
	Breck School, Minneapolis		Harding High School, St. Paul - Team
2003	Javier Cabrera-Perez	2007	Lucas Gabrielson
	Breck School, Minneapolis		Harding High School, St. Paul - Team
2004	Adam Yock	2007	Jacob Stramer
	Breck School, Minneapolis		Harding High School, St. Paul - Team
2004	William Mitchell	2008	Prithwis Mukhopadhyay
	Breck School, Minneapolis		Lake Junior High, Woodbury
2004	Noel Suri	2008	Michael Cherkassky
	Harding High School, St. Paul		Edina High School, Edina
2004	Adam Hahn	2008	Madeline Taft-Ferguson
	Robbinsdale Armstrong High School, Robbinsdale		Breck School, Minneapolis
2004	Akash Kumar	2008	Kyra Underbakke
	Wayzata High School, Wayzata		Maranatha Christian Academy, Brooklyn Park
2004	Laura Heeter	2008	Aly Xiong
	Breck School, Minneapolis - Team		Johnson High School, St. Paul
2004	Kristina Naranjo-Rivera	2008	Iola Edwards
	Breck School, Minneapolis - Team		Johnson High School, St. Paul
2005	Kyrstin Underbakke	2008	Stephen Trusheim
	Maranatha Christian Academy, Brooklyn Park		Breck School, Minneapolis - Team
2005	Janet Li	2008	Daniel Mohktari
	Wayzata High School, Plymouth		Breck School, Minneapolis - Team
2005	Heidi Chun	2009	Prithwis Mukhopadhyay
	St. Paul Academy, St. Paul		Woodbury Sr High School, Woodbury
2005	Zachary Howland	2009	Tiffanie Stone
	Burnsville High School, Burnsville		AFSA High School, Vadnais Heights
2005	Eric Halverson	2009	Michael Fuad
	Como Park Senior High, St. Paul		Breck School, Minneapolis
2005	Kahli Her	2009	Stephen Trusheim
	Johnson High School, St. Paul		Breck School, Minneapolis

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2009	Chee Xiong	2012	Margaret Green
	Como Park Senior High, St. Paul		Burnsville High School, Burnsville - Team
2009	Martin Camacho	2012	Laura Landgraf
	Central Senior High School, St. Paul		Burnsville High School, Burnsville - Team
2009	Sahar Hakim-Hashemi	2012	Caleb Kumar
	Breck School, Minneapolis - Team		Breck School, Minneapolis
2009	Sierra Danforth	2012	Taylor McCanna
	Breck School, Minneapolis - Team		Breck School, Minneapolis
2009	Nicholas NaSal	2012	Alejandro Fenn
	Burnsville High School, Burnsville - Team		Breck School, Minneapolis - Team
2009	Joseph Lane	2012	William Engel
	Burnsville High School, Burnsville - Team		Breck School, Minneapolis - Team
2010	Prithwis Mukhopadhyay	2012	Thomas Vennemann
	Woodbury Sr High School, Woodbury		Johnson High School, St. Paul
2010	Tiffanie Stone	2013	Andrew Ylitalo
	AFSA High School, Vadnais Heights		Stillwater Area High School, Stillwater
2010	Martin Camacho	2013	Aditi Das
	Central Senior High School, St. Paul		Roseville Area High School, Roseville
2010	Houa Xiong	2013	Connor Duffy
	Johnson High School, St. Paul		Mounds View High School, Arden Hills
2010	Gavin Ovsak	2013	Graham Gabrielson
	Eden Prairie Senior High School, Eden Prairie		Harding High School, St. Paul
2010	Charles Morris	2013	Mai Moua
	Breck School, Minneapolis		Harding High School, St. Paul
2010	Ava Mokhtari	2013	Carolyn Jons
	Breck School, Minneapolis - Team		Eden Prairie Senior High School - Eden Prairie
2010	Addison Weiler	2013	Jessica Ryvlin
	Breck School, Minneapolis - Team		Breck School, Minneapolis
2010	Ashley Santilli	2013	Apurv Hirsh Shekhar
	Burnsville High School, Burnsville - Team		Blake High School - Northrop campus
2010	Emily Bostrom	2014	Carolyn Jons
	Burnsville High School, Burnsville - Team		Eden Prairie Senior High School - Eden Prairie
2011	Alysia Flores	2014	Jason Sylvestre
	Johnson High School, St. Paul		Benilde-St. Margaret's, St. Louis Park
2011	Andrew Ylitalo	2014	Jacob W Levy
	Stillwater Area High School, Stillwater		Breck School, Minneapolis - Team
2011	Martin Anderson	2014	Sofie M Kim
	Burnsville High School, Burnsville		Breck School, Minneapolis - Team
2011	Redeat Abegaz	2014	Aditi Das
	Burnsville High School, Burnsville		Roseville Area Senior High, Roseville
2011	Gavin Ovsak	2014	Heather J Stone
	Eden Prairie Senior High School, Eden Prairie		Mounds View High School, Arden Hills
2011	(Ernst) Tom Erdmann	2014	Amrita Mohanty
	Breck School, Minneapolis		Woodbury Sr High School, Woodbury
2012	Andrew Ylitalo	2014	Nicolina Mao
	Stillwater Area High School, Stillwater		Harding High School, St. Paul
2012	Keshav Mangalick	2014	Rosemary O Olatunbosun
	Mounds View High School		Harding High School, St. Paul

TWIN CITIES REGIONAL SCIENCE FAIR “ISEF” ALUMNI

Students Chosen to Represent the Twin Cities Fairs at International Science & Engineering Fair

2015 Amrita Mohanty
Woodbury Sr High School, Woodbury

2015 Maxwell Ylitalo
Stillwater Area High School, Stillwater

2015 Aadarsh Padiyath
Woodbury Sr High School, Woodbury

2015 Carolyn Jons
Eden Prairie Senior High School - Eden Prairie

2015 Arush Jain
Eden Prairie Senior High School - Eden Prairie

2015 Emilia Topp-Johnson
St Paul Academy and Summit School, St. Paul

2015 Serena Jing
Central Senior High School, St. Paul

2016 Maxwell Ylitalo
Stillwater Area High School, Stillwater

2016 Nathaniel R Farmer
Stillwater Area High School, Stillwater

2016 Claire E Wentzlaff
Burnsville High School, Burnsville

2016 Prashant Godishala
Breck School, Minneapolis - Team

2016 Brennan Clark
Breck School, Minneapolis - Team

2016 Avni Jain
Eden Prairie Senior High School - Eden Prairie

2016 Jessica Weng
Wayzata High School, Plymouth

2016 Emilia Topp-Johnson
St Paul Academy and Summit School, St. Paul

2016 Serena Jing
Central Senior High School, St. Paul

2017 Alex Li
Mounds View High School, Arden Hills - Team

2017 Rebecca Li
Mounds View High School, Arden Hills - Team

2017 Everett Kroll
Stillwater Area High School, Stillwater

2017 Claire E Wentzlaff
Burnsville High School, Burnsville

2017 Archana Murali
Breck School, Minneapolis

2017 Gauri Binoy
Wayzata High School, Plymouth

2017 Meghana Iyer
Edina High School, Edina

2017 Serena Jing
Central Senior High School, St. Paul

2017 Geeta Rajamani
Highland Park Senior High, St. Paul

2018 Everett Kroll
Stillwater Area High School, Stillwater

2018 Manashree Padiyath
Woodbury Sr High School, Woodbury

2018 Justin Duffy
Mounds View High School, Arden Hills

2018 Flannery Enneking-Norton
St.Paul Academy and Summit School, St. Paul

2018 Michael Hall
St.Paul Academy & Summit School, St.Paul-Team

2018 Daniel Ellis
St.Paul Academy & Summit School, St.Paul-Team

2018 Cole Maxwell
Breck School, Minneapolis

2018 Siyuan Ma
Breck School, Minneapolis - Team

2018 Alexander Anderson
Breck School, Minneapolis - Team

2018 Leonardo Clarke
Minnetonka Senior High School, Minnetonka

2019 Manashree Padiyath
Woodbury Sr High School, Woodbury

2019 Haley Jostes
Stillwater Area High School, Stillwater

2019 Osman Warfa
Burnsville High School, Burnsville

2019 Melissa Nie
St.Paul Academy and Summit School, St. Paul

2019 Ethan Dincer
St.Paul Academy and Summit School, St. Paul

2019 Parthiv Krishna
Minnetonka Senior High School, Minnetonka

2019 Kerui Yang
Edina Senior High School, Edina

2019 Rachel Gunderson
Breck School, Minneapolis - Team

2019 Boatemaa Agyeman-Mensah
Breck School, Minneapolis - Team



Twin Cities Regional Science Fair Awards

(This list is an expected list of awards to be given from this fair but does not constitute a guarantee that the award will be given this year.)

3M Commercial Solutions Division Award
3M Display Materials Systems Division Award
3M Film & Material Resource Division Award
3M Young Inventor Recognition Award
American Chemical Society
American Meteorological Society
American Psychological Association
ASM Materials Education Foundation
Association of Women Geoscientists
Award for Science Potential
Broadcom MASTERS (Math, Applied Science, Technology, and Engineering for Rising Stars)
Caffeinated Student Award
Excellence Award
Graduate Women in Science for Excellence in Research
Graduate Women in Science for Excellence in Writing
Inspiring Excellence Award
International Science & Engineering Fair (ISEF)
ISEF Alumni Awards – Kyra Zimmerman (2007, 2008)
ISEF Alumni Awards – Dr. Kyrstin Ball (2005)
ISEF Alumni Awards – Timara Underbakke (1973)
Joel Wagner Caring Bridge Award
Junior Science & Humanities Symposium
Lemelson Early Inventor Prize
Middle School Medals
Minnesota American Society of Microbiology
Minnesota Chapter of American Fisheries Society

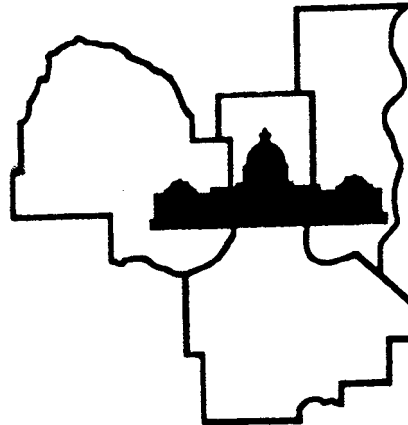
Minnesota State Science & Engineering Fair
Mu Alpha Theta Mathematics
NASA EARTH System Science Award
NOAA National Oceanic and Atmospheric Administration
North Central Tri-state Junior Science & Humanities Symposium Research Papers
Research Paper trophies
Ricoh Sustainable Development Award
Schools trophies
Science Potential Award
Society for In Vitro Biology
Sponsor: 3M Foundation
Sponsor: DuPont Water Solutions
Sponsor: Ecolab
Sponsor: Mintáhoe Hospitality Services
Sponsor: Northrop Grumman
Sponsor: Office Depot
Sponsor: Premier Bank
Sponsor: St. Paul Youth Fund
Stockholm Junior Water Prize
TCRSF Excellence Award
Teacher Excellence Award
USDA-ARS Ag in the Classroom
US Air Force
US Metric Association
US Navy/Marine Office of Naval Research
USAID – US Agency for International Development
USDA Research Service
Yale Science and Engineering Association

The logo for 3M, consisting of the numbers '3' and 'M' in a bold, sans-serif font.The logo for ECOLAB, featuring the word 'ECOLAB' in a bold, sans-serif font with a registered trademark symbol. The letter 'O' is replaced by a stylized sunburst or starburst graphic.

Project presentation hosted by the Minnesota State Fairgrounds

Research paper program hosted on our website at www.tcrsf.net

Special thanks to all our volunteers, new & old, especially the U.S.S. Nokomis



2019-2020 Twin Cities Regional Science Fair Committee

Director:	Timara Underbakke	Committee At Large:	Scientific Review:
SRC Chair:	Karin Ostrand	Nancy Day	Karin Ostrand, Chair
Facilities:	Amy Stone	Jess Day	Dr. Denise Beusen
Public Relations:	Michael Lohman, Sr.	Dr. Denise Beusen	Dr. Kyrstin Ball
Development Director	Karilyn Jons	Dr. Gary Kwong	Dr. Douglas Erbeck
Funding	Michael Lohman, Sr, Karilyn Jons, & Timara Underbakke	Gary Ostrand	Timara Underbakke
Treasurer:	Dr. Gary Kwong	Dr. Caroline Ylitalo	Dr. Jennifer Hugstad-Vaa
Special Awards Chair:	Nancy Day	Dr. Douglas Erbeck	Dr. Caroline Ylitalo
Judging Coordinator:	David & Timara Underbakke	Haley Jostes	Matthew Weingartz
Website & Databases:	David & Timara Underbakke	Karilyn Jons	Dr. Gary Kwong
Data Processing:	David Underbakke	Dr. Steven Jons	Dr. Steven Jons
Display & Safety Chair:	Devi Kyanam & Chandra Papisetty	Dr. Jennifer Hugstad-Vaa	Karilyn Jons
IT Department:	Jess Day & David Underbakke	Dr. Kyrstin Ball	David Underbakke
Volunteer Coordinator:	Denise Jostes	Kyra Zimmerman	Tiffanie Stone
Educational Outreach:	Dr. Steven Jons	Phill Goldmann	Tom Sinn
Social Media Intern:	Manashree Padiyath & Haley Jostes	Lynne Tauer	Board of Directors:
Social Media Coordinator:	position open	Tom Sinn	Timara Underbakke
Science Clubs Outreach:	Mike Lohman & Gary Kwong	Denise Jostes	David Underbakke
		Devi Kyanam	Karin Ostrand
		Chandra Papisetty	Dr. Gary Kwong
		Christine Kroll	Michael Lohman, Sr.
			Nancy Day
			Dr. Steven Jons
			Karilyn Jons

We have additional volunteer openings for those interested. We are currently looking for a Social Media Coordinator and a Logistics person.

If you have time to help, we are 100% Volunteer educational 501c3 non-profit. All donations are tax deductible & are invested in our youth!