

Twin Cities Regional Science Fairs Awards

February 28-29, 2020

Students selected to compete at International Science and Engineering Fair in Anaheim, CA in May, 2020 are:

ISEF Finalists (Twin Cities)

1212T	Milan Jostes	Developing FourS 2.0 - A Web Hosting Software That Uses Encrypted Quick Response Code to Reduce Violence in Schools
1041T	Bingsheng Guo	Re-engineering a centrifuge force microscope (CFM) to enable the study of induced crystal nucleation in hypergravity
1078T	Eric Feng	The Time Course of Murine Cardiomyocyte Maturation

ISEF 1st Alternate (Twin Cities)

1067T	Johnny Yue	Role of Protein Aggregation in Huntington's Disease
-------	------------	---

ISEF 2nd Alternate (Twin Cities)

1196T	Elisa Guo	Creating Auto-luminescent Plants with Fungal Bioluminescence Pathway
-------	-----------	--

ISEF 3rd Alternate (Twin Cities)

1132T	Jacob Westerlund	The Effect of Blade Angle on Wind Turbine Efficiency
-------	------------------	--

Students selected to compete at International Science and Engineering Fair in Anaheim, CA in May, 2020 are:

ISEF Finalists (St. Paul)

- | | | |
|-------|-----------------------------------|---|
| 1211S | Mani Chadaga, Akshay Nambudiripad | Development of WALTER: A Route Planning System That Analyzes Accident Data to Determine Safer Driving Routes in Saint Paul, Minnesota |
| 1073S | Anindita Rajamani | Privacy-Preserving Ubiquitous Activity Recognition with Wearable Sensors |

ISEF 1st Alternate (St. Paul)

- | | | |
|-------|-----------|--|
| 1170S | Maya Choi | Degradation of Microplastics: The Efficacy of Various Bacteria in Breaking Down Microplastics in the Environment |
|-------|-----------|--|

ISEF 2nd Alternate (St. Paul)

- | | | |
|-------|--------------|--|
| 1194S | Anthony Chen | The Effects of Short Term Radiofrequency Electromagnetic Radiation on Diatom Photosynthetic Productivity |
|-------|--------------|--|

Students selected to compete at International Science and Engineering Fair in Anaheim, CA in May, 2020 are:

ISEF Finalists (Western)

1202W	Abigail Roh, Samantha Detor	Searching the Shadows: Using shadows in aerial imagery to classify trees by genus for urban tree management, Year II
1209W	William Sepesi	A Machine Learning Approach to Pokemon Battling
1056W	Quentin Hughes	An Active Role for Machine Learning in the Diagnosis of Atrial Fibrillation

ISEF 1st Alternate (Western)

1062W	Ava Raffel, Mary O'Grady	A Not so Muscular, Muscular Dystrophy? Discovering abnormal neural differentiation in FSHD-affected stem cells
-------	--------------------------	--

ISEF 2nd Alternate (Western)

1124W	Harini Senthilkumar, Abirami Rajasekaran	A computational analysis of the effects of Dreissena polymorpha on the ecological integrity of Minnesota Lakes
-------	--	--

ISEF 3rd Alternate (Western)

1035W	Dylan Vincent, Roberaa Ayana	Chords to Character: Exploring the relationship between musical preference and personality
-------	------------------------------	--

3M Sponsor Award

1093S Qeng Xiong

Convergent Synthesis: Development of a GGPP Analogue for Selective Enzymatic Labeling of Prenylated Targets Related to Diseases

Northrup Grumman Sponsor Award

1140W Rohan Parnerkar

Applications of Variable Cant Winglets for Multiphase Drag Reduction and Aircraft Control

Dow DuPont Water Solutions Sponsor Award

1153S Sydney Therien

Testing *Bacillus subtilis* for estrogen degrading ability using zebrafish as a model organism

Ecolab Sponsor Award

1038W Ahlaam Abdulwali

The effect of artificial food colors on the release of neurotransmitters within model organisms

Premier Bank Sponsor Award

7076T Coolsjes Singhvi

What is in a Tone! Sentiment and Emotion Analysis of School Email Communication Using Artificial Intelligence

Office Depot Sponsor Award

8037T Carissa Chow

A Wind-Wind Solution: Effectiveness of Blade Angle

City of St. Paul Youth Fund Sponsor Award

1194S Anthony Chen

The Effects of Short Term Radiofrequency Electromagnetic Radiation on Diatom Photosynthetic Productivity

Minta'hoe Catering and Events Sponsor Award

1060T Isabelle Peterson

Commonly used skincare substances and their unknown consequences

Graduate Women in Science Projects

6009T	Ali Weingartz	Stinky Shoe
7043T	Emily Llapa	How Does the Blade Length of a Wind Turbine Affect How Much Energy It'll Produce?
8036S	Alice Wagner- Hemstad	Micro plastics in our water... will this affect the freshwater food chain
1058T	Irshad Moalim	Postural Change Vs. Backpack Weight
1023T	Teresa Le-Vu	The Effect of Music on Heart Rate
1188W	Belinda Neset	Lights, Cameras, Action! An Evaluation of Low Cost Infrared, UV, and Visible Light Detectors in the Stratosphere
1095W	Sterre Hoogendoorn	Creating an algorithm to assist saber referees using biomechanical data

3M Film and Materials Resource Division

1209W	William Sepesi	A Machine Learning Approach to Pokemon Battling
1143W	Mina Adabag, Sarah Peterson	Plants to the Rescue: Removal of Lead Through Phytoremediation
1087W	Matvei Filippov	Are Microwave Ovens More Harmful Than Other Food Heating Appliances?
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?
7028T	Eduard Held	Mentos and Pop Experiment

3M Display Materials and Systems Division

1170S	Maya Choi	Degradation of Microplastics: The Efficacy of Various Bacteria in Breaking Down Microplastics in the Environment
1054W	Hubert He	Analysis of Protein Structural Changes Caused by Various Alzheimer's Disease-associated Single Nucleotide Polymorphisms
6029T	Spencer Miller	Are Sharp Skates That Great?
7046W	Isaac Weinacht	Don't Be A Drag: How making semi-trucks more aerodynamic reduces CO2 emissions
8027S	Greta Seppanen	How Does the Type of Tomato Affect the Consistency of the Tomato Sauce?

3M Personal Safety Division

6021T	Olivia Hamann	Fired Up!
7039T	Sriram Sureshkumar	Residual Pesticides on Produce
8048T	Abel Mekonnen	Out of this World
1102S	Dawan Davis Jr.	The Affect Water Intake has on Plant Height
1216T	Nickolas Zander	Expediting The Student Check-In Process
1073S	Anindita Rajamani	Privacy-Preserving Ubiquitous Activity Recognition with Wearable Sensors
1051W	Olivia Graupmann	The Implications of the Relationship of Cyclical Hormones on Injury in Female Athletes

3M Inventor Recognition

1137W	Julia Guptail	Wearable Device for Drowning Prevention
1152T	Fatimo Mursal	The Effect of Electricity on Plant Growth
1184W	Zachary Levy	Photometric search for binary asteroids
6039W	Isaac Rose	How Does Temperature Affect Magnetic Force?
1136S	Richard Chang	Calibration of Magnetometers
1140W	Rohan Parnerkar	Applications of Variable Cant Winglets for Multiphase Drag Reduction and Aircraft Control
1077W	Aidan Edge	Detecting the presence of Powassan Virus in Ixodes scapularis in Stacy, MN
1078T	Eric Feng	The Time Course of Murine Cardiomyocyte Maturation
8048T	Abel Mekonnen	Out of this World
1039T	Anna Blanco	Testing the Effect of Temperature on Catalase Reactions
8022T	Maggie Banks	Currently Knocking On Wood: Toward a Biodegradable Piezoelectric Transducer From Rochelle Salt and Wood

Inspiring Excellence Project

7046W	Isaac Weinacht	Don't Be A Drag: How making semi-trucks more aerodynamic reduces CO2 emissions
8033S	Madeleine Schilling	How Does the Type of Ice Melt Affect the Death Rate of Freshwater Amphipods?
8036S	Alice Wagner- Hemstad	Micro plastics in our water... will this affect the freshwater food chain
8037T	Carissa Chow	A Wind-Wind Solution: Effectiveness of Blade Angle

Inspiring Excellence Teacher

Tracey Plante

MN American Society of Microbiology

6036T	Brian Russell	Moldy Mayhem
7060S	Alejandra Cruz	How Does the Concentration of Clover Honey Affect the Number of Surviving Bacteria
8026S	Siri Pattison	How Does The Amount Of Sugar Added To Kombucha Pre-Fermentation Affect It's pH After Fermentation
1164W	Trisha Samba, Amira Sinclair	SCOBY-Dooby-Doo, Bioplastics Where Are You?
1175W	Maxwell Maveus	Isolation, characterization and identification of chlorpyrifos-degrading bacteria from agricultural soil
1170S	Maya Choi	Degradation of Microplastics: The Efficacy of Various Bacteria in Breaking Down Microplastics in the Environment
1173S	Aidan Lanz	Mycoremediation of Organic Environmental Contaminants

United States Department of Agriculture Research

6042T	Anggelo Mendoza-Fierro	Rainbow Flowers
7071W	Matthew Beekman	Tomayto Tomahto: Is there a difference between traditional and vertical farming?
7074S	Halina Tompkins	How does the amount of fertilizer affect the growth of little bluestem?
1096W	Hanna Schneider	The Effects of Deforestation on Soil Microbial Communities
1190S	Tania Acevedo Garcia	Lodging Characteristics in Small Grains

Award for Science Potential

8042T	Sara Cooney	The effect of ice melt
7071W	Matthew Beekman	Tomayto Tomahto: Is there a difference between traditional and vertical farming?
7003S	Ewan Johnson	Determining the Birdseed Preference Among Backyard Birds
6012T	Douglas Buckanaga-Keezer	The Menthos Effect

American Chemical Society

1093S	Qeng Xiong	Convergent Synthesis: Development of a GGPP Analogue for Selective Enzymatic Labeling of Prenylated Targets Related to Diseases
1092W	William Walker	Synthesizing PAMAM-like dendrimers using click chemistry and conjugating fluorescein isothiocyanate to their surfaces
1044S	Pajntsha Vang, Camille Dokken	Comparing Biodiesel and Diesel Carbon Dioxide Emissions: A Look Into Greener Fuel
1131W	Sarah Erickson	Biophotovoltaic Cells

MN Chapter of American Fisheries

8033S	Madeleine Schilling	How Does the Type of Ice Melt Affect the Death Rate of Freshwater Amphipods?
1119W	Addison Pajor	Effects of different ratios of phosphorus and nitrogen on the growth of <i>Pyrocystis fusiformis</i>

US Air Force

1188W	Belinda Neset	Lights, Cameras, Action! An Evaluation of Low Cost Infrared, UV, and Visible Light Detectors in the Stratosphere
1140W	Rohan Parnerkar	Applications of Variable Cant Winglets for Multiphase Drag Reduction and Aircraft Control
1138W	Austin Hunter	Investigating the effect of winglet design on wind turbine performance
1136S	Richard Chang	Calibration of Magnetometers
1181S	Noel Abraham	The Night Sky of our Intergalactic Neighbors: Creating a Library of Star Maps
8048T	Abel Mekonnen	Out of this World
1141T	Dhairya Sharma	Airfoils Under Distress
1134T	Caleb Boll, Austin Currie, Ethan Ingram	Non- Combustion Engine
1132T	Jacob Westerlund	The Effect of Blade Angle on Wind Turbine Efficiency
8037T	Carissa Chow	A Wind-Wind Solution: Effectiveness of Blade Angle

Naval Science Award

8052W	Shreshth Shrivastava	Wi-C.A.R.E., Being there Always! Designing Patient-Specific Applications for Elder Care
1190S	Tania Acevedo Garcia	Lodging Characteristics in Small Grains
7046W	Isaac Weinacht	Don't Be A Drag: How making semi-trucks more aerodynamic reduces CO2 emissions
6013W	Milan Darji	Freezing Point Depression of Salt Water
8022T	Maggie Banks	Currently Knocking On Wood: Toward a Biodegradable Piezoelectric Transducer From Rochelle Salt and Wood
1051W	Olivia Graupmann	The Implications of the Relationship of Cyclical Hormones on Injury in Female Athletes
7076T	Coolsjes Singhvi	What is in a Tone! Sentiment and Emotion Analysis of School Email Communication Using Artificial Intelligence
1056W	Quentin Hughes	An Active Role for Machine Learning in the Diagnosis of Atrial Fibrillation
1165T	Orion Tyrrell	Compact Magnetic Loop Antenna for Unfriendly Neighborhoods
1188W	Belinda Neset	Lights, Cameras, Action! An Evaluation of Low Cost Infrared, UV, and Visible Light Detectors in the Stratosphere
1212T	Milan Jostes	Developing FourS 2.0 - A Web Hosting Software That Uses Encrypted Quick Response Code to Reduce Violence in Schools
1206W	Jai Chadha	Using forearm myoelectric sensing to control an upper-extremity 3D printed prosthetic hand

Teacher Excellence

Sahra Ali

ISEF Alumni Award - Timara Underbakke

6007W Sam McHugh

Do Dog Foods Meet their Probiotic Claims?

ISEF Alumni Award - Dr. Kyrstin Ball

8052W Shreshth Shrivastava

Wi-C.A.R.E., Being there Always! Designing Patient-Specific Applications for Elder Care

ISEF Alumni Award - Kyra Zimmerman

8036S Alice Wagner- Hemstad

Micro plastics in our water... will this affect the freshwater food chain

Caffeinated Student Award

7076T Coolsjes Singhvi

What is in a Tone! Sentiment and Emotion Analysis of School Email Communication Using Artificial Intelligence

8050W Adithi Rupireddy

Plant growth in an enriched carbon environment

1121W Eli Quist

The effectiveness of Dreissena polymorpha at removal of aluminum from calcium deficient water

1144S Constance Azonwu, Natali Joachin

Pulp it up! Buckthorn Paper

Joel Wagner Caring Bridge Award

1071W Sahana Mangipudi

The Missing Link: Glycoengineering MSCs for Targeted Cancer Drug Delivery

American Meteorological Society (St. Paul)

8030S Phoebe Finlay

Leaf senescence across Minnesota

American Meteorological Society (Twin Cities)

1125T Sneha Sureshkumar

Global Warming Trend on Agricultural Output

1165T Orion Tyrrell

Compact Magnetic Loop Antenna for Unfriendly Neighborhoods

American Meteorological Society (Western)

1111W Mark Larson

Solar versus wind power for implementation in developing countries

1138W Austin Hunter

Investigating the effect of winglet design on wind turbine performance

American Psychological Association (St. Paul)

1012S Helen Bartlett

Associations Between Sexual Risk Behavior and Adverse Childhood Experiences Among Minnesota High School Students

American Psychological Association (Twin Cities)

7009T Juliana Godina

Most Common Fingerprint & Fingerprint Personality

American Psychological Association (Western)

1017W Jacob Dominski

Evaluating Best Practices For Juvenile Rehabilitation

ASM Materials Educational Foundation (St. Paul)

1037S Liam Will

Physiological Stress and Internet Addiction in Adolescents

ASM Materials Educational Foundation (Twin Cities)

1067T Johnny Yue

Role of Protein Aggregation in Huntington's Disease

ASM Materials Educational Foundation (Western)

7071W Matthew Beekman

Tomayto Tomahto: Is there a difference between traditional and vertical farming?

Association of Women Geoscientists (St. Paul)

8036S Alice Wagner- Hemstad

Micro plastics in our water... will this affect the freshwater food chain

Association of Women Geoscientists (Twin Cities)

7033T Catalina Connell

Soil Substitutes: Which Works Best?

Association of Women Geoscientists (Western)

1180W Julianna Torelli

The varying effectiveness of cyanobacteria as a diazotrophic aid in Martian arability

Lemelson Early Inventor Prize (St. Paul)

7051S Ryan Dunlap

Plastics

Lemelson Early Inventor Prize (Twin Cities)

Lemelson Early Inventor Prize (Western)

Mu Alpha Theta (St. Paul)

1211S Mani Chadaga, Akshay
Nambudiripad

Development of WALTER: A Route Planning System
That Analyzes Accident Data to Determine Safer Driving
Routes in Saint Paul, Minnesota

Mu Alpha Theta (Twin Cities)

1154T Nancy Wang, Justin
Draheim

The Wolf Can't Blow this House Down

Mu Alpha Theta (Western)

1209W William Sepesi

A Machine Learning Approach to Pokemon Battling

NASA Earth System Science Award (St. Paul)

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

NASA Earth System Science Award (Twin Cities)

1098T Arjun Acharya Countering the Eutrophication of Minnesota Lakes Using *Epipremnum Aureum*

NASA Earth System Science Award (Western)

1126W Gabrielle Natalie Tan The effects of common air pollutants on soil pH and microbial populations

1180W Julianna Torelli The varying effectiveness of cyanobacteria as a diazotrophic aid in Martian arability

National Oceanic and Atmospheric Administration (St. Paul)

1170S Maya Choi Degradation of Microplastics: The Efficacy of Various Bacteria in Breaking Down Microplastics in the Environment

National Oceanic and Atmospheric Administration (Twin Cities)

1125T Sneha Sureshkumar Global Warming Trend on Agricultural Output

National Oceanic and Atmospheric Administration (Western)

1101W John Czerwinski Predicting Coral Bleaching on the Great Barrier Reef based on environmental stressors.

1164W Trisha Samba, Amira Sinclair SCOBY-Dooby-Doo, Bioplastics Where Are You?

Ricoh Sustainable Development Award (St. Paul)

1144S Constance Azonwu, Natali Pulp it up! Buckthorn Paper
Joachin

Ricoh Sustainable Development Award (Twin Cities)

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

Ricoh Sustainable Development Award (Western)

1164W Trisha Samba, Amira SCOBY-Dooby-Doo, Bioplastics Where Are You?
Sinclair

Society for In Vitro Biology (St. Paul)

1170S Maya Choi Degradation of Microplastics: The Efficacy of Various
Bacteria in Breaking Down Microplastics in the
Environment

Society for In Vitro Biology (Twin Cities)

1078T Eric Feng The Time Course of Murine Cardiomyocyte Maturation

Society for In Vitro Biology (Western)

USAID - US Agency for International Development (St. Paul)

1073S Anindita Rajamani

Privacy-Preserving Ubiquitous Activity Recognition with Wearable Sensors

USAID - US Agency for International Development (Twin Cities)

1125T Sneha Sureshkumar

Global Warming Trend on Agricultural Output

USAID - US Agency for International Development (Western)

1180W Julianna Torelli

The varying effectiveness of cyanobacteria as a diazotrophic aid in Martian arability

US Metric Association (St. Paul)

1109S Steven Hu Best Way to Prevent Soil Erosion

US Metric Association (Twin Cities)

1154T Nancy Wang, Justin Draheim The Wolf Can't Blow this House Down

US Metric Association (Western)

1164W Trisha Samba, Amira Sinclair SCOBY-Dooby-Doo, Bioplastics Where Are You?

Yale Science and Engineering Association Inc. (St. Paul)

1181S Noel Abraham The Night Sky of our Intergalactic Neighbors: Creating a Library of Star Maps

Yale Science and Engineering Association Inc. (Twin Cities)

1165T Orion Tyrrell Compact Magnetic Loop Antenna for Unfriendly Neighborhoods

Yale Science and Engineering Association Inc. (Western)

1086W Berit Cummings Detection of Accelerants Used in Arson Using Single Drop Headspace Microextraction

Stockholm Junior Water Prize (St. Paul)

1173S	Aidan Lanz	Mycoremediation of Organic Environmental Contaminants
1170S	Maya Choi	Degradation of Microplastics: The Efficacy of Various Bacteria in Breaking Down Microplastics in the Environment
1153S	Sydney Therien	Testing <i>Bacillus subtilis</i> for estrogen degrading ability using zebrafish as a model organism

Stockholm Junior Water Prize (Twin Cities)

1105T	Isaac Harnack	A strive for clean drinking water
1007T	Mary Juelich, Maia Adams	The Effects of Shapes and Colors on the Behavior of Siamese Fighting Fish
1114T	Hongxu Ma	Growth of Duckweed in Different Environments

Stockholm Junior Water Prize (Western)

1122W	Grayson Roberts, Julian Moyer	Analyzing the Efficacy of Stormwater Treatment at Removing Pathogens
1100W	Carmen Curry	Acid Rock Drainage and Wild Rice
1124W	Harini Senthilkumar, Abirami Rajasekaran	A computational analysis of the effects of <i>Dreissena polymorpha</i> on the ecological integrity of Minnesota Lakes

Research Papers MS Third Place

515 Catriona Formby Color in the Darkness

Research Papers MS Second Place

508 Quinn Hughes, Tyler Clair Fueling the Planet with Coffee: Engineering a Better
Biofuel with Synergistic Enzymatic Compounds

Research Papers MS First Place

510 Coolsjes Singhvi What is in a Tone! Sentiment and Emotion Analysis of
School Email Communication Using Artificial Intelligence

Research Papers HS Advancing to JSHS

145	Emre Adabag, Benjamin Rex	Clearing the Air: Assessing the Practicality of a Liquid Piston for Carbon Capture and Storage
204	Katie Barry, Meghan Quinlan	Human Gut Microbiota Driving Fatty Acid Composition and its Contribution to Obesity
117	George Cai	Citric Acid Cross-linked Nanocellulose Membranes for Hydrogen Fuel Cells
202	Mani Chadaga, Akshay Nambudiripad	Development of WALTER: A Route Planning System That Analyzes Accident Data to Determine Safer Driving Routes in Saint Paul, Minnesota
237	Reese Chahal	Talking Transportation: Using ArcGIS to model correlations between Wayzata High School student demographics, accessibility, and transportation
148	Richard Chang	Magnetometers as a Navigational Tool: A Correction Algorithm for External Magnetic Fields
157	Anthony Chen	The Effects of Short Term Radiofrequency Electromagnetic Radiation on Diatom Photosynthetic Productivity
146	James Clinton, Nathan Rockafellow	Spudfinder 6500: Creating a radar-based system for pre-harvest potato yield mapping, year two
168	Jonah Dawson	Going Green as You Clean
126	Ian Duncan	Effects of Household Chemicals on Fatberg Breakdown
156	Nathaniel Grenke	The effects of Nano silver on the environment
107	Rachel Gunderson, Boatemaa Agyeman-Mensah	Healing a Broken Heart: Investigating Endoglin as a Novel Regulator of Heart Regeneration
185	Bingsheng Guo	Re-engineering a centrifuge force microscope (CFM) to enable the study of induced crystal nucleation in hypergravity
155	Steven Hu	Effects of Soil Erosion and The Best Way to Prevent It
207	Quentin Hughes	An Active Role for Machine Learning in the Diagnosis of Atrial Fibrillation
184	Vaughn Hughes	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
162	Byron Jia, John Cardwell	Evaluating Ecosystems: Using Drones and Boats to improve water health assessments
203	Milan Jostes	Developing FourS 2.0 - A Web Hosting Software That Uses Encrypted Quick Response Code to Reduce Violence in Schools
113	Aidan Lanz	Mycoremediation of Organic Environmental Contaminants
234	Teresa Le-Vu	The Effect of Music on Heart Rate
245	Mina Mandic	Exploring the Wonders of the Early Universe: Green Pea Galaxies and Light Flux
110	Sahana Mangipudi	The Missing Link: Glycoengineering MSCs for Targeted Cancer Drug Delivery

164	Henry McCormick	Eco-Friendly Detergents: Can They Prevent Unnecessary Environmental Toxins?
181	Sergio Moya	Colored Lights Effect on Plants
112	Ishan Nadkarni, Nathan DeMichaelis	Therapy or Trauma? Examining the Drawbacks of PERK-Knockout as a Potential Treatment for Heart Rhythm Disorders
211	Susan Nguyen	The Effect of Colored Paper on Readability
109	Jack Peterson, William Bae	Looking Deeper Into Lyme Disease: Reclassifying post-treatment Lyme disease utilizing novel staining methods
108	Ava Raffel, Mary O'Grady	A Not so Muscular, Muscular Dystrophy? Discovering abnormal neural differentiation in FSHD-affected stem cells
118	George Richards, William Sweeney	The Polymer Problem: Creating an Accurate Model of Polymers Using Magnetic Polystyrene Microspheres and Lambda DNA
152	Grayson Roberts, Julian Moyer	Analyzing the Efficacy of Stormwater Treatment at Removing Pathogens
151	Abigail Roh, Samantha Detor	Searching the Shadows: Using shadows in aerial imagery to classify trees by genus for urban tree management, Year II
183	Brian Saldana Almaraz	Marine Oil Dispersion—Understanding the Fundamental Chemistry Behind the Dispersion Process
230	Simren Samba, Fiona Kinney	A Biomarker for Brain Injury
159	Harini Senthilkumar, Abirami Rajasekaran	A computational analysis of the effects of Dreissena polymorpha on the ecological integrity of Minnesota Lakes
172	Owen Skonseng	Plant Killers
255	Alex Stanek	The Effect of Composite Material on Structural Integrity of Mechanically Stabilized Earth
150	Sydney Therien	Testing Bacillus subtilis for estrogen degrading ability using zebrafish as a model organism
209	Anna Tran	Distracted Driving: Conversing in Person vs. Via Cell Phone
225	Dylan Vincent, Roberaa Ayana	Chords to Character: Exploring the relationship between musical preference and personality
136	Jacob Westerlund	The Effect of Blade Angle on Wind Turbine efficiency
226	Liam Will	Physiological Stress and Internet Addiction in Adolescents
130	Chittra Xiong	Formation of Nanopores in a Polymer Monolith Through Cleavage of Bulky Side-Groups
115	Ruoran Xu	The Effects of Atorvastatin, Astragaloside IV, and Cycloastragenol on Mouse Myocardial Gene Expression
238	Lorien Zhao	Gender Biases: Investigating how Gender and Clothing Color Changes the Perceptions of Leaders

Research Papers HS Third Place

- | | | |
|-----|-----------------------------------|---|
| 202 | Mani Chadaga, Akshay Nambudiripad | Development of WALTER: A Route Planning System That Analyzes Accident Data to Determine Safer Driving Routes in Saint Paul, Minnesota |
| 110 | Sahana Mangipudi | The Missing Link: Glycoengineering MSCs for Targeted Cancer Drug Delivery |

Research Papers HS Second Place

- | | | |
|-----|----------------|---|
| 207 | Quentin Hughes | An Active Role for Machine Learning in the Diagnosis of Atrial Fibrillation |
|-----|----------------|---|

Research Papers HS First Place

- | | | |
|-----|------------|--|
| 117 | George Cai | Citric Acid Cross-linked Nanocellulose Membranes for Hydrogen Fuel Cells |
|-----|------------|--|

Broadcom MASTERS - top 10% middle school students advance to national online competition

Broadcom MASTERS (St. Paul)

8033S	Madeleine Schilling	How Does the Type of Ice Melt Affect the Death Rate of Freshwater Amphipods?
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?
8036S	Alice Wagner- Hemstad	Micro plastics in our water... will this affect the freshwater food chain
8009S	Grace Loonan	Does Hand Dominance Impact Creativity
8034S	Riya Stebleton	How does the type of cleaning product affect the removal of oil in birds feathers?
8007S	Teodora Kamenov	Does A Persons Identified Gender Influence Their Color Choice

Broadcom MASTERS (Twin Cities)

8022T	Maggie Banks	Currently Knocking On Wood: Toward a Biodegradable Piezoelectric Transducer From Rochelle Salt and Wood
7050T	Annika Clift	Making Paper and Testing Its Durability
8037T	Carissa Chow	A Wind-Wind Solution: Effectiveness of Blade Angle
8053T	Josh Trussell, Matt Trussell	Weighted Blankets: Science or Scam
6021T	Olivia Hamann	Fired Up!
7041T	Peter Mendez	WiFi Blockers
6015T	Neela Josephs, Rachel Countryman	Brownies in the Mix
7039T	Sriram Sureshkumar	Residual Pesticides on Produce

Broadcom MASTERS (Western)

8050W	Adithi Rupireddy	Plant growth in an enriched carbon environment
6039W	Isaac Rose	How Does Temperature Affect Magnetic Force?

State Science Fair MS

6003	Shreya Sekar	Protecting Minnesotas Wood Turtles: Characterizing the Threats this Endangered Population Faces
6004	Lillian Bolle	Brownie Bonanza
6006	Eric Suh	Win or Lose: Does it affect test-taking skills?
6007	Sam McHugh	Do Dog Foods Meet their Probiotic Claims?
6009	Ali Weingartz	Stinky Shoe
6013	Milan Darji	Freezing Point Depression of Salt Water
6014	Liya Elias	What pH is it
6015	Neela Josephs, Rachel Countryman	Brownies in the Mix
6016	Jada Silver	Casein Plastic: The Biodegradable Solution to Most of our Planet's Biggest Problems
6019	Francis Warumzer	The Effects of Potable Liquids on the Appearance and Texture of Gummy Bears
6021	Olivia Hamann	Fired Up!
6022	Molly Monahan	Filter Fad
6023	Alex Nachand	Ice Melt Race
6024	Ryan Kennedy	Produce Power
6029	Spencer Miller	Are Sharp Skates That Great?
6031	Takeo Haertel-Strehlow	Can the Color of Your House Save You Money?
6032	Oliver Nelson	Which Direction is Most Efficient and Faster for Circulating Air in a House?
6039	Isaac Rose	How Does Temperature Affect Magnetic Force?
6041	Hannah Grosser, Evelyn Danz	How does your greenhouse grow? The impact of temperature on Dandelion seed germination.
6042	Anggelo Mendoza-Fierro	Rainbow Flowers
7002	Eva De Grace	What Colors Are Dogs Most Attracted To?
7004	Amelia Schatteles	Just a Spoonful of Sugar
7006	Nichole Bertini, Audrey Aflakpi	Age and Gender Memorization
7009	Juliana Godina	Most Common Fingerprint & Fingerprint Personality
7012	Lucy Keenan	What Color Was That Again
7014	Miranda Leon Kass	Does Petting a Cat Reduce Stress?
7015	William Paslawski, Marley Jagerson	How Well Do Different Age Groups Wash Their Hands
7018	Shannon Reilly	How Color affects Memory
7019	Ellen Schroeder	How Do Outside Distractions Affect Our Memory?
7021	Megan Cindrigh	How Does Sugar Affect Focus
7022	Ethan Parcon	Do Sugary Drinks Affect the Color of your Teeth?
7027	Aunesti Farley	How does the type of flour affect the size of a cookie?
7028	Eduard Held	Mentos and Pop Experiment
7029	Amelie Isom	Cupcake Concoctions
7033	Catalina Connell	Soil Substitutes: Which Works Best?
7034	Quinn Hughes, Tyler Clair	Fueling the Planet with Coffee: Engineering a Better Biofuel with Synergistic Enzymatic Compounds

7036	Alexa Pundsack, Hazel Thrasher	How Does the Type of Pollutant Affect Growth in Bacteria?
7039	Sriram Sureshkumar	Residual Pesticides on Produce
7040	Eve Kitt	Baking Raspberry Pie
7041	Peter Mendez	WiFi Blockers
7042	Logan Kimmel	A Pitch and a Swing: The Effect of Wind Turbine Blade Pitch and Shape on Power Output.
7043	Emily Llapa	How Does the Blade Length of a Wind Turbine Affect How Much Energy It'll Produce?
7045	Isabella Gutierrez	Automated Fire Extinguisher
7046	Isaac Weinacht	Don't Be A Drag: How making semi-trucks more aerodynamic reduces CO2 emissions
7050	Annika Clift	Making Paper and Testing Its Durability
7053	Liam Murphy	Fill Diapers Not Landfills
7055	Julian Plumer	The Butterless Baker
7057	Eli Wuebben	What Insulation Material Works Best
7060	Alejandra Cruz	How Does the Concentration of Clover Honey Affect the Number of Surviving Bacteria
7061	Emma Dempsey	How to keep our household drain tiles clear! Killing the Ocher!!
7066	Liam Sackaroff	Murray Grossology
7069	Jairo Cordoba	Bottle Instruments, Truth or Myth?
7070	Haden Marshall	Speed Planes
7071	Matthew Beekman	Tomayto Tomahto: Is there a difference between traditional and vertical farming?
7074	Halina Tompkins	How does the amount of fertilizer affect the growth of little bluestem?
7076	Coolsjes Singhvi	What is in a Tone! Sentiment and Emotion Analysis of School Email Communication Using Artificial Intelligence
8001	Jaeden Allen	How do the qualities of a pet affect whether or not someone adopts it?
8002	Liam Clift	The Rusty Crayfish (Invasive species in Aquatic Minnesota)
8005	Tristan Engelmann	Speed Accuracy Tradeoff in Video Games
8006	Adeline Heymans, Genevieve Bradshaw	Cursive versus Print
8007	Teodora Kamenov	Does A Persons Identified Gender Influence Their Color Choice
8008	Gabi Kirchner	What is the Best Strategy to Use When Memorizing
8009	Grace Loonan	Does Hand Dominance Impact Creativity
8011	Julia Pletch	How Does the Music Genre Effect Work Efficiency?
8012	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?
8020	Robbie Wollan	Does the Fit of Your Football Helmet Affect Your Risk of Suffering a Concussion
8022	Maggie Banks	Currently Knocking On Wood: Toward a Biodegradable Piezoelectric Transducer From Rochelle Salt and Wood

8025	Anna Lovat	How Does Salt Compared To Sugar Affect The Rate Of Evaporation?
8026	Siri Pattison	How Does The Amount Of Sugar Added To Kombucha Pre-Fermentation Affect It's pH After Fermentation
8027	Greta Seppanen	How Does the Type of Tomato Affect the Consistency of the Tomato Sauce?
8029	Emily Brenner	Ph of Precipitation
8031	Madison Frantum	Fabric Decomposition
8032	Anna Imbertson	Disposable Plate Composting
8033	Madeleine Schilling	How Does the Type of Ice Melt Affect the Death Rate of Freshwater Amphipods?
8034	Riya Stebleton	How does the type of cleaning product affect the removal of oil in birds feathers?
8035	Timothy Trussell, Noah Leipnitz	Show Me the Mussels
8036	Alice Wagner- Hemstad	Micro plastics in our water... will this affect the freshwater food chain
8037	Carissa Chow	A Wind-Wind Solution: Effectiveness of Blade Angle
8038	Garrett Seppanen	How does the kind of insulation affect how fast the ice cube melts
8039	Jarissett Reyes Volkov	50s Flashback
8040	Oskar Helgen	Drains on the Brain
8044	Elliot McNally	Is The 5 Second Rule True?
8047	Catriona Formby	Color in the Darkness
8048	Abel Mekonnen	Out of this World
8050	Adithi Rupireddy	Plant growth in an enriched carbon environment
8051	Audrey Sheehan	Does Your Phone Take the Personal Information From Your Text Messages, Phone Calls, and Other Information Said Near the Phone?
8052	Shreshth Shrivastava	Wi-C.A.R.E., Being there Always! Designing Patient-Specific Applications for Elder Care
8053	Josh Trussell, Matt Trussell	Weighted Blankets: Science or Scam

State Science Fair HS

1002	Irene Bensus, Karmen Bensus	Maze Madness
1006	Mason Hurt	The effects of nitrogen fertilizer on a lake ecosystem
1008	Thomas Lane	Captive breeding of <i>Sahyadria denisonii</i> without the use of hormonal treatments
1010	Alexander Arnold	Examination of the correlation between music preference, emotion, and personality
1012	Helen Bartlett	Associations Between Sexual Risk Behavior and Adverse Childhood Experiences Among Minnesota High School Students
1013	Natalie Braga	You Look Familiar: A Study Into Facial Recognition
1014	Reese Chahal	Talking Transportation: Using ArcGIS to model correlations between Wayzata High School student demographics, accessibility, and transportation
1016	Griffin Dobbins	Creating a multidimensional regression model of the 2020 Democratic primary
1018	Ariella Fogel	A Comparative Analysis of the English Language Acquisition of Somali Students in the Twin Cities
1019	Aidan Gonzalez	Implicit bias and its affect on the Ultimatum Game
1023	Teresa Le-Vu	The Effect of Music on Heart Rate
1029	Jeana Schafer	Finding a Correlation between Mental Visualization and Memory
1030	Esha Sekar	Cybersecurity Challenges: How Savvy are You?
1031	Sarah Stolar	Effects of virtual green space exposure on the adolescent stress response
1032	Dylan Tahnk-Johnson	Effects of Adolescent Sleep Health on Overall Health
1034	Reese Thompson	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
1035	Dylan Vincent, Roberaa Ayana	Chords to Character: Exploring the relationship between musical preference and personality
1037	Liam Will	Physiological Stress and Internet Addiction in Adolescents
1039	Anna Blanco	Testing the Effect of Temperature on Catalase Reactions
1040	Matthew Eichelman	Examination of the effect of dietary restriction and <i>daf-2</i> and <i>daf-16</i> mutations on longevity in <i>Caenorhabditis elegans</i>
1041	Bingsheng Guo	Re-engineering a centrifuge force microscope (CFM) to enable the study of induced crystal nucleation in hypergravity
1043	Clara Stein	The Effect of Nanoparticles on Cell Functions
1044	Pajntsha Vang, Camille Dokken	Comparing Biodiesel and Diesel Carbon Dioxide Emissions: A Look Into Greener Fuel
1051	Olivia Graupmann	The Implications of the Relationship of Cyclical Hormones on Injury in Female Athletes

1052	Rachel Gunderson, Boatema Agyeman- Mensah	Healing a Broken Heart: Investigating Endoglin as a Novel Regulator of Heart Muscle Cell Regeneration
1054	Hubert He	Analysis of Protein Structural Changes Caused by Various Alzheimer's Disease-associated Single Nucleotide Polymorphisms
1055	Levi Hoogendoorn	Improving fencing footwear for injury prevention through the analysis of biomechanical and preference data
1056	Quentin Hughes	An Active Role for Machine Learning in the Diagnosis of Atrial Fibrillation
1057	Eera Kale	Sickle cell disease through patients' eyes: An evaluation of the effectiveness of different treatment approaches in the United States and India
1060	Isabelle Peterson	Commonly used skincare substances and their unknown consequences
1061	Dylan Pitt	An investigation into the dangers of wrestling relating to head impacts and the inadequacy of the currently required headgear
1062	Ava Raffel, Mary O'Grady	A Not so Muscular, Muscular Dystrophy? Discovering abnormal neural differentiation in FSHD-affected stem cells
1065	Nathan Schneider	Exploring the Option of a Tau-Targeted Immunotherapy as a Treatment for Alzheimer's
1067	Johnny Yue	Role of Protein Aggregation in Huntington's Disease
1069	Karsten Johnson	Mircofluidic Sweat Biomonitors
1071	Sahana Mangipudi	The Missing Link: Glycoengineering MSCs for Targeted Cancer Drug Delivery
1073	Anindita Rajamani	Privacy-Preserving Ubiquitous Activity Recognition with Wearable Sensors
1075	Jacob Bridge	The Role of the TRF2 Protein in Gene Expression by TPE-OLD
1077	Aidan Edge	Detecting the presence of Powassan Virus in Ixodes scapularis in Stacy, MN
1078	Eric Feng	The Time Course of Murine Cardiomyocyte Maturation
1082	Jack Peterson, William Bae	Looking Deeper Into Lyme Disease: Reclassifying post-treatment Lyme disease utilizing novel staining methods
1083	Samskrith Sriram	Effect of LMNA (Imn-1 protein coding) genes on the longevity of mutated ifa-3 Caenorhabditis elegans (C. elegans) worms
1084	Ming Ying Yeoh	Inflammation in Alzheimer's disease: effects of tau protein hyperphosphorylation on microglial phagocytic behavior
1086	Berit Cummings	Detection of Accelerants Used in Arson Using Single Drop Headspace Microextraction
1093	Qeng Xiong	Convergent Synthesis: Development of a GGPP Analogue for Selective Enzymatic Labeling of Prenylated Targets Related to Diseases
1094	Katie Barry, Meghan Quinlan	Human Gut Microbiota Driving Fatty Acid Composition and its Contribution to Obesity
1095	Sterre Hoogendoorn	Creating an algorithm to assist saber referees using biomechanical data

1097	Helaina Sislo	The Evolution of the Human Microbiome
1098	Arjun Acharya	Countering the Eutrophication of Minnesota Lakes Using <i>Epipremnum Aureum</i>
1099	Macie Anundson	Examination of wintering watermilfoil weevils and differences in Eurasian watermilfoil fragment and root growth
1109	Steven Hu	Best Way to Prevent Soil Erosion
1110	Paige Indritz	The Effect of pH on Bioremediation of Acid Mine Drainage
1119	Addison Pajor	Effects of different ratios of phosphorus and nitrogen on the growth of <i>Pyrocystis fusiformis</i>
1121	Eli Quist	The effectiveness of <i>Dreissena polymorpha</i> at removal of aluminum from calcium deficient water
1122	Grayson Roberts, Julian Moyer	Analyzing the Efficacy of Stormwater Treatment at Removing Pathogens
1124	Harini Senthilkumar, Abirami Rajasekaran	A computational analysis of the effects of <i>Dreissena polymorpha</i> on the ecological integrity of Minnesota Lakes
1126	Gabrielle Natalie Tan	The effects of common air pollutants on soil pH and microbial populations
1127	Trisha Trinh, Emma Gross	Observing the Effects of Biochar on Radishes and Lettuce Under Reduced Irrigation
1129	James Clinton, Nathan Rockafellow	Spudfinder 6500: Creating a radar-based system for pre-harvest potato yield mapping, year two
1132	Jacob Westerlund	The Effect of Blade Angle on Wind Turbine Efficiency
1136	Richard Chang	Calibration of Magnetometers
1137	Julia Guptail	Wearable Device for Drowning Prevention
1142	Emre Adabag, Benjamin Rex	Clearing the Air: Assessing the Practicality of a Liquid Piston for Carbon Capture and Storage
1143	Mina Adabag, Sarah Peterson	Plants to the Rescue: Removal of Lead Through Phytoremediation
1144	Constance Azonwu, Natali Joachin	Pulp it up! Buckthorn Paper
1148	Byron Jia, John Cardwell	Evaluating Ecosystems: Using Drones and Boats to Improve Water Health Assessments
1149	Isaac Laddusaw	Wind Incorporated Buildings
1153	Sydney Therien	Testing <i>Bacillus subtilis</i> for estrogen degrading ability using zebrafish as a model organism
1154	Nancy Wang, Justin Draheim	The Wolf Can't Blow this House Down
1157	George Cai	Citric Acid Cross-linked Nanocellulose Membranes for Hydrogen Fuel Cells
1161	George Richards, William Sweeney	The Polymer Problem: Creating an Accurate Model of Polymers Using Magnetic Polystyrene Microspheres and Lambda DNA
1164	Trisha Samba, Amira Sinclair	SCOBY-Dooby-Doo, Bioplastics Where Are You?
1170	Maya Choi	Degradation of Microplastics: The Efficacy of Various Bacteria in Breaking Down Microplastics in the Environment

1172	Thomas Graupmann	Expressing the sMMO genes from Methylosinus trichosporium in Escherichia coli for the biocatalysis of methanol production using methane
1173	Aidan Lanz	Mycoremediation of Organic Environmental Contaminants
1181	Noel Abraham	The Night Sky of our Intergalactic Neighbors: Creating a Library of Star Maps
1183	Gabe Germain	Creating a synthetic lightcurve using a python script with a free animation software
1186	Mina Mandic	Exploring the Wonders of the Early Universe: Green Pea Galaxies and Light Flux
1188	Belinda Neset	Lights, Cameras, Action! An Evaluation of Low Cost Infrared, UV, and Visible Light Detectors in the Stratosphere
1190	Tania Acevedo Garcia	Lodging Characteristics in Small Grains
1193	Maya Ballbach	CO2 Intake In Trees
1194	Anthony Chen	The Effects of Short Term Radiofrequency Electromagnetic Radiation on Diatom Photosynthetic Productivity
1195	Ivy Ferstan, Fiona Reilly	Ideal Environmental pH for plants
1196	Elisa Guo	Creating Auto-luminescent Plants with Fungal Bioluminescence Pathway
1198	Vaughn Hughes	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
1199	Mary McDonald	Evaluating the protein content of duckweed grown in modified N-media
1202	Abigail Roh, Samantha Detor	Searching the Shadows: Using shadows in aerial imagery to classify trees by genus for urban tree management, Year II
1206	Jai Chadha	Using forearm myoelectric sensing to control an upper-extremity 3D printed prosthetic hand
1209	William Sepesi	A Machine Learning Approach to Pokemon Battling
1211	Mani Chadaga, Akshay Nambudiripad	Development of WALTER: A Route Planning System That Analyzes Accident Data to Determine Safer Driving Routes in Saint Paul, Minnesota
1212	Milan Jostes	Developing FourS 2.0 - A Web Hosting Software That Uses Encrypted Quick Response Code to Reduce Violence in Schools
1216	Nickolas Zander	Expediting The Student Check-In Process

Schools Participating in 2020

AFSA Agricultural and Food Sciences Academy	Minnesota Math and Science Academy
Avail Academy	Minnetonka East Middle School
Bdote Learning Center	Minnetonka Senior High School
Blessed Trinity Catholic School	Minnetonka West Middle School
Breck School	Mounds Park Academy
Burnsville Senior High School	Mounds View High School
Central High School St. Paul	Murray Middle School
Central Middle School Eden Prairie	Nativity of Mary
Century Middle School Lakeville	Nativity of Our Lord
Chaska High School	New Life Academy
Como Park Senior High School	Nicollet Middle School
Concordia Academy Roseville	Oak-Land Middle School
Convent of the Visitation School	Orono Senior High
Eagle Ridge Academy Charter School	Parnassus Preparatory School
Eagle Ridge Middle School	Presentation of the Blessed Virgin Mary
Eden Prairie High School	St. Helena
Edina High School	St. Paul Academy & Summit School
Highland Park High School	Stillwater Area High School
Highland Park Middle School	Stillwater Junior High School
Humboldt Senior High	Transfiguration
Lakeville North High	Twin Cities Academy
Mahtomedi Middle School	Valley Middle School of STEM
Mahtomedi Senior High	Valley View Middle School Edina
Metcalf Middle School	Washington Technology Magnet
Minnehaha Academy North Campus	Wayzata High School
	Woodbury Senior High School

Thank you to our financial sponsors:

3M Foundation
Ecolab Foundation
DuPont Water Solutions
Northrop Grumman
Office Depot
Mintahoe Catering
Premier Banks
Individual Contributions