# 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:

(NOTE: In 2020, ISEF was virtual instead of in CA.)

## 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 |

# ISEF Finalists (St. Paul)

1211S    Mani Chadaga, Akshay Nambudiripad — Development of WALTER: A Route Planning System that Analyzes Accident Data to Determine Fast, Simple, and Safe Driving Routes

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

# 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     plaque & $500.00

1093S   Qeng Xiong             Convergent Synthesis: Development of a GGPP
                               Analogue for Selective Enzymatic Labeling of Prenylated
                               Targets Related to Diseases

# Ecolab Sponsor Award     plaque & $500.00

1038W   Ahlaam Abdulwali       The effect of artificial food colors on the release of
                               neurotransmitters within model organisms

# DuPont Water Solutions Sponsor Award     plaque

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

# Northrop Grumman Sponsor Award     plaque

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

# Office Depot Sponsor Award     plaque

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

# City of St. Paul Youth Fund Sponsor Award     plaque

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

# Minta'hoe Catering and Events Sponsor Award     plaque

1060T   Isabelle Peterson      Commonly used skincare substances and their unknown
                               consequences

# Premier Bank Sponsor Award     ribbon

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

*Thank you to our sponsors who make these fairs possible!*

# 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 $CO_2$ 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 |

# 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 |

# 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 Pyrocystis fusiformis |

# Teacher Excellence

Sahra Al - Minnesota Math and Science Academyi

# 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 |

# US 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 $CO_2$ 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 |

# 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      Pulp it up! Buckthorn Paper
       Joachin

# 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)

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

# Lemelson Early Inventor Prize (Western)

8052W   Shreshth Shrivastava             Wi-C.A.R.E., Being there Always! Designing Patient-
                                         Specific Applications for Elder Care

# Mu Alpha Theta (St. Paul)

1211S   Mani Chadaga, Akshay             Development of WALTER: A Route Planning System
        Nambudiripad                     that Analyzes Accident Data to Determine Fast, Simple,
                                         and Safe Driving Routes

# Mu Alpha Theta (Twin Cities)

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

# 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          The Wolf Can't Blow this House Down
        Draheim

# US Metric Association (Western)

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

# 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 Bacillus subtilis 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 Dreissena polymorpha on the ecological integrity of Minnesota Lakes |

# Research Paper Trophies

## 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 MS Second Place

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

## Research Papers MS Third Place

515     Catriona Formby          Color in the Darkness

## Research Papers HS First Place

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

## Research Papers HS Second Place

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

## Research Papers HS Third Place (tie)

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 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 |
| 141 | Krista Boaz | The Efficiency of Different Angles of Attack on Horizontal Wind Turbines |
| 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 |

# Broadcom MASTERS® (Math, Applied Science, Technology, and Engineering for Rising Stars) - top 10% of affiliation in middle school. Students have opportunity to enter a national online competition for middle school projects.

## 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 (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 (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 |
| 6020 | Deacon Wening | Growing Gummies |
| 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 Cindrich | How Does Sugar Affect Focus |
| 7022 | Ethan Parcon | Do Sugary Drinks Affect the Color of your Teeth? |
| 7026 | Collin Elliott | What fluid causes the worst corrosion in steel |
| 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? |
| 7038 | Cecilia Shelby Vazquez | How does the color of a liquid affect the amount of heat absorbed |
| 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 | Burning Down The House, Or Not! |
| 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 |
| 8024 | Sophia Kyba | Do Expiration Dates Correspond With Milk Spoilage Over Time? |
| 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 |
| 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 Sahyadria denisonii 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 |
| 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 |
| 1038 | Ahlaam Abdulwali | The effect of artificial food colors on the release of neurotransmitters within model organisms |
| 1039 | Anna Blanco | Testing the Effect of Temperature on Catalase Reactions |
| 1040 | Matthew Eichelman | Examination of the effect of dietary restriction and daf-2 and daf-16 mutations on longevity in Caenorhabditis elegans |
| 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, Boatemaa 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 |
| 1058 | Irshad Moalim | Postural Change Vs. Backpack Weight |
| 1059 | Ishan Nadkarni, Nathan DeMichaelis | Therapy or Trauma? Examining the Drawbacks of PERK-Knockout as a Potential Treatment for Heart Rhythm Disorders |
| 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 |
| 1064 | Simren Samba, Fiona Kinney | A Biomarker for Brain Injury: Analyzing the correlation between concussions and car crashes using eye-tracking technology |
| 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 Biomoniters |
| 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 |
| 1080 | Joseph Johnson | Endocrine Disruption Quantification in Dreissena polymorpha and Caenorhabditis elegans |
| 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 (lmn-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 Epipremnum Aureum |
| 1099 | Macie Anundson | Examination of wintering watermilfoil weevils and differences in Eurasian watermilfoil fragment and root growth |
| 1100 | Carmen Curry | Acid Rock Drainage and Wild Rice |
| 1102 | Dawan Davis Jr. | The Affect Water Intake has on Plant Height |
| 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 Pyrocystis fusiformis |
| 1121 | Eli Quist | The effectiveness of Dreissena polymorpha 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 Dreissena polymorpha 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 |
| 1150 | Minhnhat Le | What water filtration system does Mother Nature love? |
| 1152 | Fatimo Mursal | The Effect of Electricity on Plant Growth |

| 1153 | Sydney Therien | Testing Bacillus subtilis 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 |
| 1175 | Maxwell Maveus | Isolation, characterization and identification of chlorpyrifos-degrading bacteria from agricultural soil |
| 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 |
| 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 Fast, Simple, and Safe Driving Routes |
| 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
Avail Academy
Bdote Learning Center
Blessed Trinity Catholic School
Breck School
Burnsville Senior High School
Central High School St. Paul
Central Middle School Eden Prairie
Century Middle School Lakeville
Chaska High School
Como Park Senior High School
Concordia Academy Roseville
Convent of the Visitation School
Eagle Ridge Academy Charter School
Eagle Ridge Middle School
Eden Prairie High School
Edina High School
Highland Park High School
Highland Park Middle School
Humboldt Senior High
Lakeville North High
Mahtomedi Middle School
Mahtomedi Senior High
Metcalf Middle School
Minnehaha Academy North Campus

Minnesota Math and Science Academy
Minnetonka East Middle School
Minnetonka Senior High School
Minnetonka West Middle School
Mounds Park Academy
Mounds View High School
Murray Middle School
Nativity of Mary
Nativity of Our Lord
New Life Academy
Nicollet Middle School
Oak-Land Middle School
Orono Senior High
Parnassus Preparatory School
Presentation of the Blessed Virgin Mary
St. Helena
St. Paul Academy & Summit School
Stillwater Area High School
Stillwater Junior High School
Transfiguration
Twin Cities Academy
Valley Middle School of STEM
Valley View Middle School Edina
Washington Technology Magnet
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***