

62nd Annual Twin Cities Regional Science Fair
8th Annual St. Paul Science Fair
6th Annual Western Suburbs Science Fair
Augsburg College, Minneapolis, Minnesota
March 10-11, 2000

Cosponsored by the NASA Grant Consortium
At Augsburg College, Minneapolis, Minnesota

Research Paper Program hosted by the College of Biological Sciences at the
University of Minnesota, St. Paul, Minnesota

Planning Facilities Provided by the
American Academy of Neurology

Fair Volunteers Provided by U.S.S. Nokomis

We wish to say a special THANK YOU to our financial sponsors

Platinum Level

City of St. Paul Youth Fund

Gold Level

Alliant Techsystems

Silver Level

Medtronic

Bronze Level

Ecolab

MTS Systems

3M Foundation

Valspar Corporation

HENNEPIN COUNTY MEDICAL SOCIETY ALLIANCE: Book and Certificate

162 W, Varun Kshetry: Pathways of brain stimulation induced by hypocretin-1
7082 S, Edward Curtiss: Cardiovascular stimuli

IOTA SIGMA PI-Women in Chemistry Award: Certificate

168 T, Jennica Slattery: Adherence of *E. coli* 0157:H7 to alfalfa sprouts

ASSOCIATION OF WOMEN GEOSCIENTISTS: Certificate

TWIN CITIES:

149 T, Charles Simcox: Distribution uniformity of tracer spheres in soil

ST. PAUL:

147 S, Mark Galatowitsch Invertebrate abundance & diversity in habitat fragments of Equador

WESTERN:

7072 W, Kari Nelson: Removing pollutants from our H₂O

SOCIETY FOR IN VITRO BIOLOGY: Certificate & \$200 check

TWIN CITIES:

168 T, Jennica Slattery: Adherence of *E. coli* 0157:H7 to alfalfa sprouts

167 T, Lindsay Severson: Effects of protein vs. carbohydrate on mouse weight gain

ST. PAUL:

169 S, A. Benjamin Suri: Triazine degradation in soils

WESTERN:

163 W, Peter Lundquist: Comparison of diagnostic melanoma techniques

U.S. DEPARTMENT OF HEALTH & HUMAN SERVICES: Certificate

TWIN CITIES:

153 T, Mark Bergstrom: Correlation between negative health factors & heart rate

ST. PAUL:

170 S, Anna Bishop & Emily Letourneau: Natural antibiotics

WESTERN:

163 W, Peter Lundquist: Comparison of diagnostic melanoma techniques

EAST SIDE SCIENCE CLUB ALUMNI AWARD: Medals

624 W, Jenny Marshall: Warm gloves make warm hands

637 T, Kyrstin Underbakke: The primes of cryptography

643 W, Drew Carlson: Matchbox momentum

7100 T, Jessica Bertram: Go hamster go

8068 S, Nick Pitera: Clay animation

130 W, Christine Jones: Effects of fatty acids on transpiration & temperature

114 T, Mary-Celeste Korte: Impact of personal attire on behavior of children

103 T, Michael Belisle: Correlation between economic class & knowledge

168 T, Jennica Slattery: Adherence of *E. coli* 0157:H7 to alfalfa sprouts

7102 T, Clare Longendyke: Magnificent yet mysterious monarch

8093 T, Alison VonAchen & Sara Cooke: Best washing implement against bacteria

ISEF ALUMNI AWARDS

105 T, Katie Brenno: Correlation between parent, memory & offspring

146 W, James Cook: A comparison of EMF Radiation from bulbs

158 T, Emily Forbes: Prevalence of *Toxocara cati* in feces of free-ranging cats

169 S, A. Benjamin Suri: Triazine degradation in soils

MN PSYCHOLOGIST ASSOCIATION: Certificate & Gift Certificate

108 T, Kyle Davis: Early-elementary test performance

7009 T, Lily Taylor: Who is smarter, cats or dogs?

AMERICAN METEOROLOGICAL SOCIETY: Certificate & clock

- First: 7073 T, Joel Scott : Acid rain
Second: 7074 T, Shae Seivert: There acid in our snow?
Third: 7054 S, Angelique Edgerton: Barometric pressure affects the weather

EASTMAN KODAK COMPANY: Camera Kit to Student and School

TWIN CITIES:

157 T, Cathy Cozad: Herbal medications vs traditional antibiotics on pathogens

ST. PAUL:

170 S, Anna Bishop & Emily Letourneau: Natural antibiotics

WESTERN:

154 W, Chenelle Boatswain Effects of SHU 9119 on rat feeding behavior

UNITED STATES METRIC ASSOCIATION: Certificate

TWIN CITIES:

180 T, Adam Arakawa & Erik Swanson: Excess ferrite in bovine diets

ST. PAUL:

170 S, Anna Bishop & Emily Letourneau: Natural antibiotics

WESTERN:

130 W, Christine Jones: Effects of fatty acids on transpiration & temperature

INTEL COMPUTER AWARD: Certificate and \$200 (in the mail)

TWIN CITIES:

152 T, Michael Chansky: Analyzing iterations of the chaotic function $A^x(1-x)$: phase II

ST. PAUL:

8060 S, Anne Griffin: Black holes

WESTERN:

145 T, Thomas Wisted: Effects of the thickness of a titanium liner on electromigration

BIODIVERSITY CONSERVATION SCIENCE AWARD: Certificate

TWIN CITIES:

168 T, Jennica Slattery: Adherence of *E. coli* 0157:H7 to alfalfa sprouts

ST. PAUL:

147 S, Mark Galatowitsch Invertebrate abundance & diversity in habitat fragments of Ecuador

WESTERN:

158 T, Emily Forbes: Prevalence of *Toxocara cati* in feces of free-ranging cats

STOCKHOLM JUNIOR WATER PRIZE:

TWIN CITIES:

150 T, Jennifer Warner: Testing water quality in Twin Cities lakes

ST. PAUL:

7075 S, Lucie Stein-Cartford: Testing water quality in varying terrains

WESTERN:

7072 W, Kari Nelson: Removing pollutants from our H₂O

DISCOVERY JUNIOR SCIENCE COMPETITION: T-shirt, lapel pin, certificate, and nomination to the next level of competition.

- 624 W, Jenny Marshall: Warm gloves make warm hands
638 S, Bobby Johnson: How will exercise affect my blood glucose values?
643 W, Drew Carlson: Matchbox momentum
645 S, Stephanie Cheng: Will a heated nickel wire be attracted to a magnet?
649 T, Steven Lu: Which brand tape is the strongest.
657 T, Rebecca Pine: Baking cookies
7019 T, Jimmy Galt: Will classical music affect plants?

- 7027 T, Martha Hughes: Effect of saline on bean plants
- 7055 T, Justine Marosi: How a seismograph records
- 7064 T, Samuel Gleason: Unknown
- 7072 W, Kari Nelson: Removing pollutants from our H₂O
- 7069 W, Lindsey Ford: What natural things help control riverbed erosion?
- 7082 S, Edward Curtiss: Cardiovascular stimuli
- 7083 S, Greta Heaps: Diabetes
- 7087 W, Emily Stiever: Growing antibiotic resistant bacteria
- 7091 T, Benjamin Dill: Grip or stick: Flour or sand on ice
- 7102 T, Clare Longendyke: Magnificent yet mysterious monarch
- 8006 T, Rebecca Hendlin: How does music instruction affect students' grades?
- 8009 T, James Kenney: Analysis of Light on test-taking
- 8011 S, Ashley Peterson: Does exercise increase memory?
- 8021 T, Rachel Uppgaard: The saccharides
- 8030 T, Julia Remes: Effectiveness of beta carotene against plant cancer
- 8041 S, Betsy Johnson: Growing "mixed crystals" in gel
- 8056 S, PaCha Yang: Does sourness affect limestone dissolving?
- 8059 S, Ann Fisher: Testing soil erosion on sloped surfaces
- 8089 S, Kilty McGowan: Meal composition & carbohydrate counting
- 8093 T, Alison VonAchen & Sara Cooke: Best washing implement against bacteria
- 8100 T, Daniel Flaherty: "May the Force Uplift You"
- 8117 S, Matt Olson: Dog taste preference
- 8064 S, Chris Madden & Dylan France: River formation & erosion in a model stream

CONSULTING ENGINEERS COUNCIL OF MINNESOTA:

First Award: Certificate & calculator

- 8100 T, Daniel Flaherty: "May the Force Uplift You"

Certificate

- 619 T, Marcus Basiri: Can solar energy be used to heat water?
- 623 T, Timothy Marrs: Strength of bridges
- 7055 T, Justine Marosi: How a seismograph records
- 7063 T, Andre Francisco: Making a submarine sink & rise
- 8067 S, Ian McHattie: Bridges
- 8109 T, Erik Stoeckeler: Will it fly?
- 140 T, Kenny Dally: Effect of composition on concrete structural integrity
- 141 T, Bryan Gruhlke: Comparison of number of propeller blades

NATIONAL COUNCIL OF TEACHERS OF MATHEMATICS: Certificate and book

TWIN CITIES:

- 637 T, Kyrstin Underbakke: The primes of cryptography

ST. PAUL:

- 8066 S, Matt Haefemeyer: How fast do model rockets go?

WESTERN:

- 7053 W, Christie Anderson: Solar power heat with colored lights

YALE SCIENCE AND ENGINEERING ASSOCIATION, INC.: Certificate and Medallion sent directly to winners.

TWIN CITIES:

- 141 T, Bryan Gruhlke: Comparison of number of propeller blades

ST. PAUL:

- 169 S, A. Benjamin Suri: Triazine degradation in soils

WESTERN:

- 163 W, Peter Lundquist: Comparison of diagnostic melanoma techniques

PAT HENDERSON AWARD: \$50 each

- 129 T, Jamie Graden: Effects of nitrogen, phosphorus & potassium on *Tagetes erecta*
- 8030 T, Julia Remes: Effectiveness of beta carotene against plant cancer

USDA – AGRICULTURAL RESEARCH SERVICE:

- 601 S, Mackensie Cramblit: Does the darkness in the green of plants relate to chlorophyll
- 7072 W, Kari Nelson: Removing pollutants from our H₂O
- 8030 T, Julia Remes: Effectiveness of beta carotene against plant cancer
- 130 W, Christine Jones: Effects of fatty acids on transpiration & temperature
- 147 S, Mark Galatowitsch: Invertebrate abundance & diversity in habitat fragments of Equador

MINNESOTA AGRICULTURE IN THE CLASSROOM: Certificates and \$75 (Project competition winners not eligible in paper competition)

- 7040 S, Noel Suri: Effect of pH on the yield of NK2979 corn in Waukegan soil
- 168 T, Jennica Slattery: Adherence of *E. coli* 0157:H7 to alfalfa sprouts

TCSRF TEAM PROJECT AWARDS: Trophies

- 641 S, Jeff Kotta & Scott Boeser: Do mouthwashes fight bacteria?
- 7049 T, Courtney Wiley & Sierra Burris: Floor cleaners
- 8093 T, Alison VonAchen & Sara Cooke: Best washing implement against bacteria
- 124T, Kimberly Masters, Nicole Gullekson & Katie Bergner, Female Stereotypes by age & gender

USS NOKOMIS NCC1858 AWARD: Plaque & bookmark

- 610 S, Matthew Gergen: Drawing water from an egg
- 7012 T, Dorothy Hansen: Does egg size matter when overcooking in the microwave?
- 8100 T, Daniel Flaherty: “May the Force Uplift You”
- 170 S, Anna Bishop & Emily Letourneau: Natural antibiotics
- 136 W, Peter Hauck: Non-toxic bleaching of cake flour with ozone
- 141 T, Bryan Gruhlke: Comparison of number of propeller blades
- 154 W, Chenelle Boatwain: Effects of SHU 9119 on rat feeding behavior

HERBERT HOOVER YOUNG ENGINEER AWARD:

TWIN CITIES:

- 141 T, Bryan Gruhlke: Comparison of number of propeller blades

ST. PAUL:

- 8066 S, Matt Haefemeyer: How fast do model rockets go?

WESTERN:

- 7061 T, Christina Cotter: How does wing shape affect flight

INTEL EXCELLENCE IN ENVIRONMENTAL HEALTH AND SAFETY AWARD:

TWIN CITIES:

- 151 T, Beth Wittnebel: *Minesium tardigadum*

ST. PAUL:

- 147 S, Mark Galatowitsch: Invertebrate abundance & diversity in habitat fragments of Equador

WESTERN:

- 146 W, James Cook: A comparison of EMF Radiation from bulbs

U.S. MARINES CORPS

- 147 S, Mark Galatowitsch: Invertebrate abundance & diversity in habitat fragments of Eq.?
- 152 T, Michael Chansky: Analyzing iterations of the chaotic function $A*x*(1-x)$: phase II
- 162 W, Varun Kshetry: Pathways of brain stimulation induced by hypocretin-1
- 120 T, Kimberly Sans: Perceptual gender bias in suburban students

U.S. NAVY -NAVAL SCIENCE AWARDS: Certificate & Calculator, Invitation to Open competition for Minnesota Academy of Science Junior Science & Humanities Symposium.

TWIN CITIES:

- 168 T, Jennica Slattery: Adherence of *E. coli* 0157:H7 to alfalfa sprouts
- 108 T, Kyle Davis: Early-elementary test performance

- 116 T, Lindsay Lucas: Behavioral indicators of lying
107 T, Katie Davis: Validity of employment inventories to job preference
- ST. PAUL:
169 S, A. Benjamin Suri: Triazine degradation in soils
170 S, Anna Bishop & Emily Letourneau: Natural antibiotics
147 S, Mark Galatowitsch: Invertebrate abundance & diversity in habitat fragments of Ecuador
- WESTERN:
136 W, Peter Hauck: Non-toxic bleaching of cake flour with ozone
162 W, Varun Kshetry: Pathways of brain stimulation induced by hypocretin-1
176 W, Stephanie Friedland: Effect of *B. thuringiensis* on *D. plexippus* Larvae
130 W, Christine Jones: Effects of fatty acids on transpiration & temperature

SCHOOL TROPHIES

ARNOLD AIR SOCIETY, AIR FORCE ROTC, UNIVERSITY OF ST. THOMAS:

- 141 T, Bryan Gruhlke: Comparison of # of propeller blades

U.S. AIR FORCE: Medals, daypack, planner & certificate

Senior Division

1. 147 S, Mark Galatowitsch: Invertebrate abundance & diversity in habitat fragments of Ecuador
2. 134 W, Christopher Dale: Separation distance on electrochemical properties of ferrocenes
3. 104 T, Robert Borchart: Can listening to music increase test scores?

Junior Division

1. 7061 T, Christina Cotter: How does wing shape affect flight
2. 8079 T, Chris Najjar: Human hair vs. animal fur to absorb oil spills
3. 7004 S, Carl Magnason: Can humans show signs of esp?

UNITED STATES ARMY SCIENCE & ENGINEERING AWARDS:

TWIN CITIES:

- 168 T, Jennica Slattery: Adherence of *E. coli* 0157:H7 to alfalfa sprouts
149 T, Charles Simcox: Distribution uniformity of tracer spheres in soil
152 T, Michael Chansky: Analyzing iterations of the chaotic function $A*x*(1-x)$: phase II
141 T, Bryan Gruhlke: Comparison of # of propeller blades
126 T, Richard Stern: Effect of ellagic acid on Ca-ATPase pump
167 T, Lindsay Severson: Effects of protein vs. carbohydrate on mouse weight gain
156 T, John Capen: Fitness level of cross-country skiers and non-skiers

ST. PAUL:

- 147 S, Mark Galatowitsch: Invertebrate abundance & diversity in habitat fragments of Ecuador
170 S, Anna Bishop & Emily Letourneau: Natural antibiotics
169 S, A. Benjamin Suri: Triazine degradation in soils

WESTERN:

- 136 W, Peter Hauck: Non-toxic bleaching of cake flour with ozone
130 W, Christine Jones: Effects of fatty acids on transpiration & temperature
146 W, James Cook: A comparison of EMF Radiation from bulbs

NACE: Certificate

TWIN CITIES:

- 8040 T, Julia Hardman: CMA vs. NaCl

ST. PAUL:

- 8044 S, Heng Li: How can I make iron nails rust the fastest?

FOUNDATION FOR VISION AWARENESS: Certificate

- 7006 S, Matthew Schuweiler: Optical Illusions

VALSPAR CORPORATION AWARDS: \$50 Savings Bonds

- 146 W, James Cook: A comparison of EMF radiation from bulbs
 624 W, Jenny Marshall: Warm gloves make warm hands
 619 T, Marcus Basiri: Can solar energy be used to heat water?
 7055 T, Justine Marosi: How a seismograph records
 7036 W, Lani Pickard: Germination of *Phaseolus aureus* R.
 7095 W, Alex Stuart: Physics of pendulums
 7093 S, Erica Konkol: Conductors of heat
 8100 T, Daniel Flaherty: "May the Force Uplift You"
 8067 S, Ian McHattie: Bridges
 8051 T, Matt White: Color principles of hair coloring
 8064 S, Chris Madden & Dylan France: River formation & erosion in a model stream
 152 T, Michael Chansky: Analyzing iterations of the chaotic function $A*x*(1-x)$: phase II
 147 S, Mark Galatowitsch: Invertebrate abundance & diversity in habitat fragments of Equador
 130 W, Christine Jones: Effects of fatty acids on transpiration & temperature
 180 T, Adam Arakawa & Erik Swanson: Excess ferrite in bovine diets

SPONSOR AWARDS: Winners must present at the Award Ceremony**BRONZE LEVEL: Ribbons**

- Valspar Corporation: 146 W, James Cook: A comparison of EMF radiation from bulbs
 3M Foundation: 127 T, Richard Timm: Familial hypertrophic cardiomyopathy on light chain protein
 MTS Systems: 152 T, Michael Chansky: Analyzing iterations of the chaotic function $A*x*(1-x)$: phase II
 Ecolab Foundation: 169 S, A. Benjamin Suri: Triazine degradation in soils

SILVER LEVEL: Plaque

- Medtronic: 168 T, Jennica Slattery: Adherence of *E. coli* 0157:H7 to alfalfa sprouts

GOLD LEVEL: Plaque

- Alliant Techsystems: 176 W, Stephanie Friedland: Effect of *B. thuringiensis* on *D. plexippus* Larvae

PLATINUM LEVEL: Plaque

- City of St. Paul Youth Fund: 147 S, Mark Galatowitsch: Invertebrate abundance & diversity in habitat fragments of Equador

PROJECT MEDALISTS:**Sixth Grade**

- 601 S, Mackensie Cramblit: Does the darkness in the green of plants relate to chlorophyll
 604 T, Katherine Becker: Effect of music on plant growth
 606 S, Claire Luby: What pigments are in rose and carnation flowers?
 607 S, Laura Quist: Will there be tune?
 614 T, Nishant Kumar: Which fabric is most permeable?
 615 T, Marie Kuplic: Can a nail be made rust proof
 619 T, Marcus Basiri: Can solar energy be used to heat water?
 624 W, Jenny Marshall: Warm gloves make warm hands
 628 T, Michael Stark: What paper plane flies best?
 629 T, Rosie Szyhalski: Which bridge design is strongest?
 631 S, Catherine Holzer & Sophia Block: Testing strength in wires & cables
 633 T, Joshua Novacheck: Leaves & fertilizer decreasing water quality
 634 S, Meredith Pain: How clean is the water round us?
 636 S, Nachiket Krishnamarti: The Trachtenberg system of mathematics
 638 S, Bobby Johnson: How will exercise affect my blood glucose values?
 639 T, Kaitlin Ward: Does an inhaler improve breathing?
 146 W, James Cook: A comparison of EMF radiation from bulbs
 641 S, Jeff Kotta & Scott Boeser: Do mouthwashes fight bacteria?
 642 S, Mark McCloughan & Terrence Higgins: Impact of environmental factors on mold growth
 643 W, Drew Carlson: Matchbox momentum
 644 S, Madeline Carlson: What size catapult flings the farthest?
 645 S, Stephanie Cheng: Will a heated nickel wire be attracted to a magnet?
 646 S, Samantha Fung: How does depth affect the pressure of water?
 647 T, Lori Hellermann: Battery power
 649 T, Steven Lu: Which brand tape is the strongest.

- 650 S, Jonah Miller: Which travels faster when thrown with the same force
 651 T, Mara Sunday: Bubbles—Can you change their natural shape?
 652 S, Cole Stewart: Does pressure effect how far an object will travel?
 654 S, Albert Wang: What factors affect an electromagnet’s strength?
 657 T, Rebecca Pine: Baking cookies

Seventh Grade

- 7006 S, Matthew Schuweiler: Optical illusions
 7019 T, Jimmy Galt: Will classical music affect plants?
 7027 T, Martha Hughes: Effect of saline on bean plants
 7044 T, Nicole Kraus: Drinking water
 7055 T, Justine Marosi: How a seismograph records
 7064 T, Samuel Gleason: Unknown
 7068 W, Kevin Cope: Affects of salt on Wisconsin fast growth plants
 7072 W, Kari Nelson: Removing pollutants from our H₂O
 7069 W, Lindsey Ford: What natural things help control riverbed erosion?
 7075 S, Lucie Stein-Cartford: Testing water quality in varying terrains
 7082 S, Edward Curtiss: Cardiovascular stimuli
 7083 S, Greta Heaps: Diabetes
 7087 W, Emily Stiever: Growing antibiotic resistant bacteria
 7088 T, Lydia Stone: Best way to prevent bread mold
 155 T, Lena Olson: Comparison of guitar sounds
 7091 T, Benjamin Dill: Grip or stick: Flour or sand on ice
 7099 T, Kevin Gillmor & Max Hoiland Which car frame is most aerodynamic?
 7100 T, Jessica Bertram: Go hamster go
 7102 T, Clare Longendyke: Magnificent yet mysterious monarch

Eighth Grade

- 8006 T, Rebecca Hendlin: How does music instruction affect students’ grades?
 8007 T, Erica Johnson: Music & memory
 8009 T, James Kenney: Analysis of light on test-taking
 8011 S, Ashley Peterson: Does exercise increase memory?
 8019 T, Eva Caruso: Effects of *E. coli* in different temperatures
 8021 T, Rachel Uppgaard: The saccharides
 8030 T, Julia Remes: Effectiveness of beta carotene against plant cancer
 8041 S, Betsy Johnson: Growing “mixed crystals” in gel
 8054 S, Yee Xiong: Does water evaporate faster with salt when heated?
 8055 T, Maly Yang: Which gum lasts the longest
 8056 S, PaCha Yang: Does sourness affect limestone dissolving?
 8059 S, Ann Fisher: Testing soil erosion on sloped surfaces
 8060 S, Anne Griffin: Black holes
 8086 T, Corrine Harrison: Skool kids need skool-aid
 8089 S, Kilty McGowan: Meal composition & carbohydrate counting
 8093 T, Alison VonAchen & Sara Cooke: Best washing implement against bacteria
 8100 T, Daniel Flaherty: “May the Force Uplift You”
 8113 S, Adam Zaklika: Balancing on a tightrope
 8117 S, Matt Olson: Dog taste preference
 8064 S, Chris Madden & Dylan France: River formation & erosion in a model stream

Senior High

- 157 T, Cathy Cozad: Herbal medications vs traditional antibiotics on pathogens
 168 T, Jennica Slattery: Adherence of *E. coli* 0157:H7 to alfalfa sprouts
 169 S, A. Benjamin Suri: Triazine degradation in soils
 170 S, Anna Bishop & Emily Letourneau: Natural antibiotics
 107 T, Katie Davis: Validity of employment inventories to job preference
 108 T, Kyle Davis: Early-elementary test performance
 120 T, Kimberly Sans: Perceptual gender bias in suburban students
 136 W, Peter Hauck: Non-toxic bleaching of cake flour with ozone
 178 W, Ginger Larsen: Comparison of rate of fish growth
 175 T, Rayna DeMaster: Effect of H₂O on *Mus musculus*
 176 W, Stephanie Friedland: Effect of *B. thuringiensis* on *D. plexippus* Larvae
 134 W, Christopher Dale: Separation distance on electrochemical properties of ferrocenes
 125 T, William Martin: Myosin head interaction during muscle contraction

- 130 W, Christine Jones: Effects of fatty acids on transpiration & temperature
 126 T, Richard Stern: Effect of ellagic acid on Ca-ATPase pump
 145 T, Thomas Wisted: Effects of the thickness of a titanium liner on electromigration
 147 S, Mark Galatowitsch: Invertebrate abundance & diversity in habitat fragments of Equador

SELECTED FOR COMPETITION AT THE MINNESOTA ACADEMY OF SCIENCE STATE FAIR DULUTH, MINNESOTA, APRIL 14-16, 2000.

Seventh Grade

- 7006 S, Matthew Schuweiler: Optical illusions
 7019 T, Jimmy Galt: Will classical music affect plants?
 7027 T, Martha Hughes: Effect of saline on bean plants
 7031 S, Paul Kramer: Effect of ground water pollutants on plants
 7044 T, Nicole Krause: Drinking water
 7055 T, Justine Marosi: How a seismograph records
 7064 T, Samuel Gleason: Unknown
 7068 W, Kevin Cope: Affects of salt on Wisconsin fast growth plants
 7072 W, Kari Nelson: Removing pollutants from our H₂O
 7069 W, Lindsey Ford: What natural things help control riverbed erosion?
 7075 S, Lucie Stein-Cartford: Testing water quality in varying terrains
 7082 S, Edward Curtiss: Cardiovascular stimuli
 7083 S, Greta Heaps: Diabetes
 7087 W, Emily Stiever: Growing antibiotic resistant bacteria
 7088 T, Lydia Stone: Best way to prevent bread mold
 155 T, Lena Olson: Comparison of guitar sounds
 7091 T, Benjamin Dill: Grip or stick: Flour or sand on ice
 7098 T, Timothy Underbakke: Thermal effect on AA batteries with a cycled load
 7099 T, Kevin Gillmor & Max Hoiland: Which car frame is most aerodynamic?
 7100 T, Jessica Bertram: Go hamster go
 7102 T, Clare Longendyke: Magnificent yet mysterious monarch

Eighth Grade

- 8006 T, Rebecca Hendlin: How does music instruction affect students' grades?
 8007 T, Erica Johnson: Music & memory
 8008 W, Jessica Johnson: Perception
 8009 T, James Kenney: Analysis of light on test-taking
 8011 S, Ashley Peterson: Does exercise increase memory?
 8019 T, Eva Caruso: Effects of E. coli in different temperatures
 8021 T, Rachel Uppgaard: The saccharides
 8029 S, Chris Peltier: Plant nutrition
 8030 T, Julia Remes: Effectiveness of beta carotene against plant cancer
 8041 S, Betsy Johnson: Growing "mixed crystals" in gel
 8054 S, Yee Xiong: Does water evaporate faster with salt when heated?
 8055 T, Maly Yang: Which gum lasts the longest
 8056 S, PaCha Yang: Does sourness affect limestone dissolving?
 8057 S, Clare Cloyd & Patrick Laine: Acid or base?
 8059 S, Ann Fisher: Testing soil erosion on sloped surfaces
 8060 S, Anne Griffin: Black holes
 8066 S, Matt Haefemeyer: How fast do model rockets go?
 8078 S, Kristina Lanphear: This is high quality H₂O
 8083 S, Andrew Greenlee: The chaos game
 8086 T, Corrine Harrison: Skool kids need skool-aid
 8089 S, Kilty McGowan: Meal composition & carbohydrate counting
 8093 T, Alison VonAchen & Sara Cooke: Best washing implement against bacteria
 8100 T, Daniel Flaherty: "May the Force Uplift You"
 8113 S, Adam Zaklika: Balancing on a tightrope
 8117 S, Matt Olson: Dog taste preference
 8064 S, Chris Madden & Dylan France: River formation & erosion in a model stream

Senior High

- 157 T, Cathy Cozad: Herbal medications vs traditional antibiotics on pathogens
 152 T, Michael Chansky: Analyzing iterations of the chaotic function $A \cdot x \cdot (1-x)$: phase II

- 142 T, Eric Olson: Effects of fire on different colored structures
 158 T, Emily Forbes: Prevalence of *Toxocara cati* in feces of free-ranging cats
 168 T, Jennica Slattery: Adherence of *E. coli* 0157:H7 to alfalfa sprouts
 169 S, A. Benjamin Suri: Triazine degradation in soils
 170 S, Anna Bishop & Emily Letourneau: Natural antibiotics
 107 T, Katie Davis: Validity of employment inventories to job preference
 108 T, Kyle Davis: Early-elementary test performance
 120 T, Kimberly Sans: Perceptual gender bias in suburban students
 136 W, Peter Hauck: Non-toxic bleaching of cake flour with ozone
 118 T, Eric Olson: Correlation between music preference & destructive behavior
 178 W, Ginger Larsen: Comparison of rate of fish growth
 175 T, Rayna DeMaster: Effect of H₂O on *Mus musculus*
 176 W, Stephanie Friedland: Effect of *B. thuringiensis* on *D. plexippus* Larvae
 134 W, Christopher Dale: Separation distance on electrochemical properties of ferrocenes
 125 T, William Martin: Myosin head interaction during muscle contraction
 130 W, Christine Jones: Effects of fatty acids on transpiration & temperature
 126 T, Richard Stern: Effect of ellagic acid on Ca-ATPase pump
 145 T, Thomas Wisted: Effects of the thickness of a titanium liner on electromigration
 147 S, Mark Galatowitsch: Invertebrate abundance & diversity in habitat fragments of Equador

**SELECTED TO GO DIRECTLY TO THE
 INTERNATIONAL SCIENCE AND ENGINEERING FAIR
 Detroit, Michigan May, 2000**

Finalists:

TWIN CITIES:

- 152 T, Michael Chansky: Analyzing iterations of the chaotic function $A*x*(1-x)$: phase II
 168 T, Jennica Slattery: Adherence of *E. coli* 0157:H7 to alfalfa sprouts

ST. PAUL:

- 169 S, A. Benjamin Suri: Triazine degradation in soils

WESTERN:

- 130 W, Christine Jones: Effects of fatty acids on transpiration & temperature
 176 W, Stephanie Friedland: Effect of *B. thuringiensis* on *D. plexippus* Larvae

TEAM:

- 170 S, Anna Bishop & Emily Letourneau: Natural antibiotics

Alternates:

TWIN CITIES:

- First Alternate: 157 T, Cathy Cozad: Herbal medications vs traditional antibiotics on pathogens
 Second Alternate: 107 T, Katie Davis: Validity of employment inventories to job preference

ST. PAUL:

- 147 S, Mark Galatowitsch: Invertebrate abundance & diversity in habitat fragments of Equador

WESTERN:

- 134 W, Christopher Dale: Separation distance on electrochemical properties of ferrocenes

TWIN CITIES REGIONAL RESEARCH PAPER COMPETITION

OUTSTANDING AGRICULTURE-RELATED RESEARCH PAPER SPONSORED BY MINNESOTA AGRICULTURE IN THE CLASSROOM: \$75 award and Certificate

Senior High School

Galatowitsch, Mark: How Does Invertebrate Abundance & Density Vary in Habitat Fragments, Agricultural Areas, Rural & Urban Settings in Andean Ecuador?

Junior High School

Hughes, Martha: What Effect Will Saline Have on Plants?

TOP SENIOR HIGH SCHOOL PAPERS: Trophy

1. Slattery, Jennica: Adherence of *E. coli* 0157:H7 to Alfalfa Sprouts: A Qualitative & Quantitative Study
2. Galatowitsch, Mark: How Does Invertebrate Abundance & Density Vary in Habitat Fragments, Agricultural Areas, Rural & Urban Settings in Andean Ecuador?
3. Friedland, Stephanie: The Effect of *Bacillus thuringiensis* on the Health and Eating Habits of *Danaus Plexippus* Larvae

TOP JUNIOR HIGH SCHOOL PAPERS

1. McGowan, Kilty: Meal Composition & Carbohydrate Counting: A Single Case Study of Blood Glucose Levels & Insulin Requirements.
2. Suri, Noel: Determining the Effect of pH on the Yield of NK2879 Corn When Grown in Waagegan Soil.
3. Hughes, Martha: What Effect Will Saline Have on Plants?

MEDALLISTS

Seventh Grade

Hughes, Martha: What Effect Will Saline Have on Plants?

Langfus, Ashlie: Fetal Alcohol Syndrome

Longendyke, Clare: The Magnificent Yet Mysterious Monarch

Morris, Zachary: Lima Bean Growth

Suri, Noel: Determining the Effect of pH on the Yield of NK2879 Corn When Grown in Waagegan Soil

Eighth Grade

Knutson, Matthew: Effect of Nitrogen Growth of Duckweed

Lanphaer, Kristina: This is High Quality H₂O: A Personal Study of the Cannon River

McGowan, Kilty: Meal Composition and Carbohydrate Counting: A Single Case Study of Blood Glucose levels and Insulin Requirements

Olson, Matt: Does a Dog Prefer a Sweet, Salty, Sour, or Plain Taste the Most?

Rivard, Molly: Comparing Dissolved Oxygen Levels at Bass Ponds

Seeley, Emma: Is It Getting Wetter? Trends in Precipitation

Stein-Cartford, Lucie: Testing Water Quality in Varying Terrain

Waelen, Marta: How Ripe is It?

Eleventh Grade

Bergstrom, Mark: Correlation Between Negative Health Factors and Heart Rate

Cozad, Catherine: Herbal Medicines versus Traditional Antibiotics on Common Pathogens

Davis, Kyle: Early Elementary Students' Test Performance as a Function of Positive & Negative Statements Prior to Test Taking

Flavin, Patrick: The Effect of Aging on the Short Term Memory of *Homo Sapiens*

Griffith, Chad: A Comparative Analysis for the Ability to Retain Information

Plog, Melissa: Effect of *Ginkgo biloba* on the Ability of *Mus musculus* to Complete a maze

Reddall, Kristin: The Effects of Acetaminophen, Aspirin, & Naproxin Sodium on *Lipidium savatum*

Ruh, Jennifer: Effect of Caffeine and *Panax ginseng* on Memory

Severson, Lindsay: The Effects of the Protein Diet vs. the Carbohydrate Diet on the Weight Gain of *Mus musculus*

Slattery, Jennica: Adherence of *E. coli* 0157:H7 to Alfalfa Sprouts: A Qualitative & Quantitative Study

Wardell, Miranda: A Comparative analysis of Cultivated and Conserved Soil

Warner, Jennifer: Testing of Water Quality in Twin City Lakes

Twelfth Grade

Boatswain, Chenelle: The Effects of SHU 9119 on Rat Feeding Behavior

Forbes, Emily: Prevalence of *Toxocara cati* in Feces of Free-Ranging Cats Impounded at a Municipal Animal Shelter:

Phase II

Friedland, Stephanie: The Effect of *Bacillus thuringiensis* on the Health and Eating Habits of *Danaus plexippus* Larvae

Galatowitsch, Mark: How Does Invertebrate Abundance & Density Vary in Habitat Fragments, Agricultural Areas, Rural & Urban Settings in Andean Ecuador?

Kshetry, Varun: Pathways of Brain Stimulation Induced by Hypocretin-1

RESEARCH PAPERS CHOSEN TO BE PRESENTED AT THE MINNESOTA ACADEMY OF SCIENCE FAIR, APRIL 14 – 16, 2000, DULUTH, MN

Junior High Division

Hughes, Martha

Langfus, Ashlie

Longendyke, Clare

Morris, Zachary

Suri, Noel

Knutson, Matthew

Lanphaer, Kristina

McGowan, Kilty

Rivard, Molly

Seeley, Emma

Stein-Cartford, Lucie

Senior High Division

Davis, Kyle

Flavin, Patrick

Griffith, Chad

Plog, Melissa

Reddall, Kristin

Ruh, Jennifer

Severson, Lindsay

Slattery, Jennica

Wardell, Miranda

Warner, Jennifer

Boatswain, Chenelle

Forbes, Emily

Friedland, Stephanie

Galatowitsch, Mark

Kshetry, Varun

REGIONAL MINNESOTA ACADEMY OF SCIENCE JUNIOR SCIENCE AND

HUMANITIES SYMPOSIUM: Selected to present in tri-state competition, October 29-31

Marta Waalen: How ripe is it?