March 31 & April 1, 2022

Hosted by

UNIVERSITY OF NORTH DAKOTA
Table of Contents

Committee Members ............................................................................................................................... 2
Sponsors .................................................................................................................................................. 3
Directors and Acknowledgements ....................................................................................................... 4
Schedule ................................................................................................................................................ 5
Instructors by Region ............................................................................................................................ 6-8
    Northwest .......................................................................................................................................... 6
    Northeast .......................................................................................................................................... 6
    Southwest Central ............................................................................................................................ 7
    Southeast .......................................................................................................................................... 8
Map of Regions ....................................................................................................................................... 9
Science Project List ............................................................................................................................... 10-17
    Northwest Junior ............................................................................................................................. 10
    Northeast Junior ............................................................................................................................... 11
    Southwest Central Junior ................................................................................................................ 12
    Southeast Junior .............................................................................................................................. 13
    Northwest Senior ............................................................................................................................. 14
    Northeast Senior ............................................................................................................................. 15
    Southwest Central Senior ............................................................................................................... 16
    Southeast Senior ............................................................................................................................. 17
Scholarship ............................................................................................................................................... 18
UND Affiliated Awards and Sponsors .................................................................................................. 19-20
Other Organizations, Societies and Agencies Sponsoring Awards .................................................... 21-22
UND Campus Map .............................................................................................................................. 23
Thank you! ............................................................................................................................................. 24
North Dakota Science and Engineering Fair

Committee Members

2022 Chair:
Brian Tande, Dean, College of Engineering and Mines

Publicity and Promotions:
Deb Austreng, College of Engineering and Mines

Program & Activities:
Gwen Klawon, College of Engineering and Mines
Karen Cisek, School of Medicine and Health Sciences
Dr. Laura Munski, Dakota Science Center

Logistics & Communication:
Gwen Klawon, College of Engineering and Mines
Karen Cisek, School of Medicine and Health Sciences
Dr. Laura Munski, Dakota Science Center

Awards:
Dustin McNally, College of Engineering and Mines

Judging:
Nuri Oncel, College of Arts and Sciences

Resources & Budget:
Hunter Sherlock, College of Engineering and Mines
Brian Tande, Dean, College of Engineering and Mines

Other Committee Members:
Kaitlin Lockett, Financial Aid Advisor
Chad O’shea, Assistant Director of Admissions
Special Thanks to Our Sponsors

**Major Sponsors**
ND IDeA Network of Biomedical Research Excellence (ND INBRE)
UND Office for Research & Economic Development
UND School of Medicine & Health Sciences
UND College of Engineering & Mines
UND College of Arts & Sciences
UND Aerospace

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Greater Grand Forks Convention & Visitors Bureau
UND Memorial Union
March 31st & April 1st, 2022

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Patty Kratcha          Ciera Kroh          Tina Pierce
Elisa Kensinger     Deb Moe            Peter Sykora-Executive
Bill Malaski         Katelyn Jespersen  Secretary
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2019 Regional State Directors:
Northwest (1)--------------------------------------------------------Katelyn Jesperson – Grenora
Northeast (2)--------------------------------------------------------Lorraine O’Shea - Grand Forks
Southwest Central (3)------------------------------------------------Ciera Kroh - Mandan
Southeast (4)----------------------------------------------------------Patty Kratcha – Hankinson, Tina Pierce – Lisbon

Awards Coordinator:
Peter Sykora, Langdon

2019 ISEF Trip Director:
Peter Sykora, Langdon

Scientific Review & Rules Compliance Committee:
Deb Moe, Tioga and Bill Malaski, Strasburg, Tara Mertz-Hack, Ellendale

2022 Host Facilitator:
Brian Tande (Overall Chair), Dean, UND College of Engineering and Mines

The North Dakota State Science & Engineering Fair is operated by the NDSSEF Board. All inquiries regarding the Fair, its judging, and its rules should be directed to the NDSSEF Board.

Acknowledgements
The North Dakota State Science & Engineering Fair would like to thank all Sponsors, UND Faculty and Staff, Graduate Students, and Engineering Student Ambassadors for their tremendous support in making this year’s Science & Engineering Fair a success. Your enthusiastic involvement is greatly appreciated.
72nd North Dakota State Science and Engineering Fair
University of North Dakota

Thursday, March 31, 2022
8:00-11:00am  Registration and Setup
   Main Ballroom, Second floor, Memorial Union
11:00-12:45pm  Lunch on your own
1:00p,  Gather in Main Ballroom 214 A-D
1:00-3:30pm  Hands-on activities, Teacher's chaperone students
4:00pm  Students meet at Memorial Union Main Ballroom /Dismiss
5:00-7:30pm  Northern Air Family Fun Center
   1600 32nd Ave South, Grand Forks

Friday, April 1, 2022
8:00am  Judges Report/Breakfast
   Small Ballroom, Second floor Room 220, Memorial Union
8:30am  Judges’ Meeting
   Small Ballroom, Second floor Room 220, Memorial Union
9:00am  Judging Begins
9:00am  Teachers’ Meeting
   Room 340, Third floor, Memorial Union
11:30am-1:00pm  Students’ Lunch (2 separate groups)
   Food Court, First floor, Memorial Union ($10 cards provided)
   11:30am Juniors; 12:00pm Seniors
12:00pm-12:45pm  Judges’ Lunch
   Small Ballroom, Second floor, Memorial Union
12:45pm-1:15pm  Judges’ Meeting (All Afternoon Judges)
   Small Ballroom, Second floor Room 220, Memorial Union
1:15pm  Judging Resumes
3:30-4:30pm  Open to the public
4:30pm  Takedown and setup for Awards Ceremony, this time is determined by the judges.
   Main Ballroom, Second floor 214 A-D, Memorial Union
5:30pm  Awards Ceremony*
   Main Ballroom, Second floor 214 A-D, Memorial Union

*Following Awards Ceremony: ISEF winners meet with Peter Sykora at the UND Memorial Union Main Ballroom Room 214 A-D.
Northwest Regional Instructors

Linda Haugland
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Bjorn Halvorson
Schroeder Middle School
bhalvorson060@mygfschools.org
# Southwest Central Instructors

<table>
<thead>
<tr>
<th>Instructor</th>
<th>School</th>
<th>Address</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gretchen Flatz</td>
<td>Dickinson Middle School</td>
<td>2675 21st Street West</td>
<td><a href="mailto:gflatz@dpsnd.org">gflatz@dpsnd.org</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dickinson, ND 58601</td>
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<td></td>
<td></td>
<td>701-456-0021 (S)</td>
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</tr>
<tr>
<td>Erica Larson</td>
<td>Elgin/New Leipzig Public School</td>
<td>PO Box 197</td>
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<td></td>
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<td>100 West St. N</td>
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<td>Elgin, ND 58533</td>
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<td>701-584-2374 (S)</td>
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<td>906-367-1352 (C)</td>
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<td></td>
<td><a href="mailto:Erica.Larson@k12.nd.us">Erica.Larson@k12.nd.us</a></td>
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<tr>
<td>Nicole Purintun</td>
<td>Linton Public School</td>
<td>101 3rd St NE</td>
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<td>Linton, ND 58552</td>
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<td>701-400-5222 (C)</td>
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<td></td>
<td><a href="mailto:nicole.purintun@k12.nd.us">nicole.purintun@k12.nd.us</a></td>
<td></td>
</tr>
<tr>
<td>Ciera Kroh</td>
<td>Mandan High School</td>
<td>905 8th Ave NW</td>
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<td>Mandan, ND 58554</td>
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<td>701-751-6501 (S)</td>
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<td><a href="mailto:ciera.kroh@msd1.org">ciera.kroh@msd1.org</a></td>
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<tr>
<td>Bill Malaski/Steve Midboe</td>
<td>Strasburg Public School</td>
<td>307 W Main</td>
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<td>Strasburg, ND 58573</td>
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<td>701-336-2667 (S)</td>
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<td><a href="mailto:bill.malaski@k12.nd.us">bill.malaski@k12.nd.us</a></td>
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<td></td>
<td></td>
<td><a href="mailto:steve.midboe@k12.nd.us">steve.midboe@k12.nd.us</a></td>
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<tr>
<td>Lisa Rowland</td>
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<td>Glen Ullin, ND 58631</td>
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<td>701-348-3590 (S)</td>
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<td>701-202-8266 (C)</td>
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<td><a href="mailto:lrowland@glenullinbearcats.org">lrowland@glenullinbearcats.org</a></td>
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</tr>
<tr>
<td>Garret Roemmich</td>
<td>Scranton Public School</td>
<td>First &amp; Fries</td>
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<td>Scranton, ND 58653</td>
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<td><a href="mailto:Garret.Roemmich@k12.nd.us">Garret.Roemmich@k12.nd.us</a></td>
<td></td>
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<tr>
<td>Tana Schafer</td>
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<td>206 3rd Ave E</td>
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<td>Flasher, ND 58535</td>
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<td>701-412-1381 (C)</td>
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<td><a href="mailto:Tana.Schafer@k12.nd.us">Tana.Schafer@k12.nd.us</a></td>
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</tr>
</tbody>
</table>
Southeast Instructors

Patty Kratcha (Director)
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FargoVictoria@gmail.com
North Dakota Science & Engineering Fair Regions
## Northwest (1) Junior Division

**Director:** Katelyn Jespersen

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Project Title</th>
<th>School</th>
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<tbody>
<tr>
<td>101</td>
<td>Zoey Conyers</td>
<td>Think Beyond the Herb</td>
<td>East Fairview</td>
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<tr>
<td>102</td>
<td>Kingdom Façade</td>
<td>How does playing sports affect you brain</td>
<td>ASB</td>
</tr>
<tr>
<td>103</td>
<td>Abigail Ferguson</td>
<td>Bubbling Water Tanks</td>
<td>Tioga</td>
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<tr>
<td>104</td>
<td>Landon Graudreau</td>
<td>Can an engine run on gasoline vapors?</td>
<td>ASB</td>
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<tr>
<td>105</td>
<td>Madelynn Greco</td>
<td>Electrolysis</td>
<td>ASB</td>
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<tr>
<td>106</td>
<td>Jacob Grunenwald</td>
<td>Rubberband Paddle Boat</td>
<td>Williston</td>
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<tr>
<td>107</td>
<td>Caden Holte</td>
<td>Do bigger seeds grow bigger plants?</td>
<td>Tioga</td>
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<tr>
<td>108</td>
<td>Anthony Kram</td>
<td>The Mpemba Effect</td>
<td>Williston</td>
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<td>109</td>
<td>Emma McCoy</td>
<td>Salty Solution: The effect of salts on the boiling point of water</td>
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<tr>
<td>110</td>
<td>Isabella Miller</td>
<td>Condiments out? They “Mayo” “Ketchup” to their Expiration</td>
<td>East Fairview</td>
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<td>111</td>
<td>Marriane Reyes</td>
<td>Stressed Teen? What could be the reason?</td>
<td>Tioga</td>
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<td>112</td>
<td>Sydney Rudningen</td>
<td>Yogurt Science</td>
<td>Grenora</td>
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<td>113</td>
<td>Jake Schlothauer</td>
<td>How Does Music Affect the Heart Rate</td>
<td>East Fairview</td>
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<td>114</td>
<td>Oliver Slade</td>
<td>Power On!</td>
<td>East Fairview</td>
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<td>115</td>
<td>Trevon Soiseth</td>
<td>The “Par”fact Temperature to Golf in</td>
<td>Grenora</td>
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<td>116</td>
<td>Kiya Sparks</td>
<td>Did you or Didn’t you?</td>
<td>Tioga</td>
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<tr>
<td>117</td>
<td>Billee Sundhagen</td>
<td>Do the Different Wave Lengths of Light Affect Solar Energy</td>
<td>Tioga</td>
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<tr>
<td>118</td>
<td>Abigayle TeSoro</td>
<td>What makes ice melt fastest?</td>
<td>Williston</td>
</tr>
</tbody>
</table>

**Alternates**

- NW-A1 Lander Monson What Tag Marker Stays on the Tag the Longest? East Fairview
- NW-A2 Emma Melberg The Science of a Wind Turbine Tioga
- NW-A3 Henry Rohde Bouncing Balls Tioga
- NW-A4 Dwayne Declaro Static Electricity Tioga
<table>
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<tr>
<th>No.</th>
<th>Name</th>
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<tr>
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<td>Amaa Wijetunga</td>
<td>Filtering Water Through Denim Cloth Efficiency</td>
<td>Grand Forks Public Library</td>
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<tr>
<td>120</td>
<td>Sonakshi Singhal</td>
<td>Variation in snow due to air pollution and presence of impurities</td>
<td>South Middle School</td>
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<td>121</td>
<td>Malory Kemp</td>
<td>Defeating the Drought through Soil Management Practices</td>
<td>Cavalier Public Schools</td>
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<td>122</td>
<td>Mckayla Sagini</td>
<td>Desalination: Light Bulb vs. Plastic Wrap</td>
<td>Schroeder Middle School</td>
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<td>123</td>
<td>Abby Boe</td>
<td>Bathroom Born Bacteria</td>
<td>South Middle School</td>
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<td>124</td>
<td>Ella Lizakowski</td>
<td>Acid Fever</td>
<td>Schroeder Middle School</td>
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<tr>
<td>125</td>
<td>Ingrid Myrdal &amp; Scarlett Dreger</td>
<td>Jam-boree!</td>
<td>Valley-Edinburg Middle School</td>
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<td>126</td>
<td>Layton Pribula</td>
<td>Hearing the Rainbow</td>
<td>Schroeder Middle School</td>
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<td>Jocelynne Hoefs</td>
<td>Baby Got Bacteria</td>
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<td>128</td>
<td>Elizabeth Fedje,</td>
<td>A Race to Light</td>
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<td>Brooke Gullickson &amp; Jacey Nelson</td>
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<td>129</td>
<td>Blake Solberg</td>
<td>Fast and the Fungus</td>
<td>Schroeder Middle School</td>
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<td>130</td>
<td>Cohen Dunigan</td>
<td>LEGO My Domino</td>
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<td>Synje Peterson</td>
<td>Beefy Backpacks</td>
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<td>132</td>
<td>Jakob Kehrwald</td>
<td>Hand Eye Coor-drone-ation</td>
<td>Schroeder Middle School</td>
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<td>Swakchha Bista &amp;</td>
<td>Does SmartWater Make You Smarter?</td>
<td>South Middle School</td>
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<td>McKenna Gothberg</td>
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<td>134</td>
<td>Kylie Pierce</td>
<td>Highlighter of the Day</td>
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<td>135</td>
<td>Kenai Auch</td>
<td>Buzz Words</td>
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<td>136</td>
<td>Victoria Owens</td>
<td>Rock Paper Winner</td>
<td>Schroeder Middle School</td>
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<tr>
<td>NE-A1</td>
<td>Nora VanLooy</td>
<td>Albedo v Ice</td>
<td>Schroeder Middle School</td>
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<tr>
<td>NE-A2</td>
<td>Brooke Grzadzielewski &amp;</td>
<td>Palpable Placebo</td>
<td>South Middle School</td>
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<tr>
<td></td>
<td>Yajarira Elina Paneru</td>
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</tbody>
</table>
## Southwest Central (3) Junior Division

**No.** | **Name**       | **Project Title**                                           | **School**       |
---     | -------------- | ----------------------------------------------------------- | ----------------|
137     | Kinley Stadheim | The Uterine Swim Team                                       | Scranton         |
138     | Kyan Stadheim   | Match-Up                                                    | Scranton         |
139     | Summer Meyer    | Kill That Bad Breath!                                       | Grant County     |
140     | Mykenzie Winkler| Zap That Zit                                                | Grant County     |
141     | Sadie Freitag   | What’s Cooking                                              | Scranton         |
142     | Phillip Schuetzle| Just Swish It                                               | Linton           |
143     | Cynthia Deichert| Geodes                                                      | Flasher          |
144     | Carried LaDuke  | The Effect Of Egg Substitute On Muffin Quality              | Flasher          |
145     | Brenna Eckroth  | An Analysis Of Toothpaste Efficacy Using Various Potable Solutions | Flasher          |
146     | Taelyn Boldt    | There Goes The Fabric                                       | Flasher          |
147     | Cassy Hartman   | Ice, Ice, Baby                                              | Flasher          |
148     | Aidyn Fisher    | Under Pressure                                              | Scranton         |
149     | Jacob Ohlhauser | Got Bacteria?                                               | Linton           |
150     | Kevin Dziuk     | Farm vs. Town                                               | Glen Ullin       |
151     | Chaskee Schmidt | Germ Busters                                                | Flasher          |
152     | Sky Weinberger  | Efficacy of Hand Hygiene While Using Public Restrooms       | Flasher          |
153     | Micah Levene    | Sound To Light                                              | Strasburg         |
154     | Logan Van Beek  | Keeping It Fresh                                            | Strasburg         |

### Alternate

**SWC-A1** | Madalyn Bohl | Apple Oxidation | Flasher |
**SWC-A2** | Bree Rivinius | School vs. Work | Grant County |
**SWC-A3** | Ashlie Raktke | How Sugar Affects Mice | Dickinson |
**SWC-A4** | Shylee Eiffert | Light Bristle Bot | Dickinson |
# Southeast (5) Junior Division

**Directors:** Patty Kratcha  **Assistant Directors:** Tina Pierce

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Project Title</th>
<th>School</th>
</tr>
</thead>
<tbody>
<tr>
<td>155</td>
<td>Cora Oster</td>
<td>Water-What’s in it?</td>
<td>Lisbon Public School</td>
</tr>
<tr>
<td>156</td>
<td>Henry VonBank</td>
<td>It’s a Bird, It’s a Plane, It’s a Man Yes It’s a Paper Plane</td>
<td>Hankinson Public School</td>
</tr>
<tr>
<td>157</td>
<td>Avery Schoonover</td>
<td>Battle of the Cups</td>
<td>Kidder County School</td>
</tr>
<tr>
<td>158</td>
<td>Keegan Isakson</td>
<td>Die-fi, What Kills Your Wi-Fi</td>
<td>Kidder County School</td>
</tr>
<tr>
<td>159</td>
<td>Sidney Mock</td>
<td>What Cleaner Works Better?</td>
<td>Kidder County School</td>
</tr>
<tr>
<td>160</td>
<td>Addison Salzwedel</td>
<td>The Efficacy of UV Light for Sanitation</td>
<td>Lisbon Public School</td>
</tr>
<tr>
<td>161</td>
<td>Evelyn Chambers</td>
<td>Clean Cate=Healthy Pet</td>
<td>Woodhaven Academy</td>
</tr>
<tr>
<td>162</td>
<td>Quincy Welder</td>
<td>Bank it or Clank it</td>
<td>Kidder County School</td>
</tr>
<tr>
<td>163</td>
<td>Jacobsen/Schmidt/Carlson Team</td>
<td>Tie Dye T’s</td>
<td>Hope-Page Elementary</td>
</tr>
<tr>
<td>164</td>
<td>Haylee Mauch</td>
<td>The Analysis of Local Slough Water</td>
<td>Hankinson Public School</td>
</tr>
<tr>
<td>165</td>
<td>Rali Kautz</td>
<td>Ewww, Gross! What is that?!</td>
<td>Kidder County School</td>
</tr>
<tr>
<td>166</td>
<td>Ava Frolek</td>
<td>Hatching Brine Shrimp</td>
<td>Lidgerwood Public School</td>
</tr>
<tr>
<td>167</td>
<td>Cambyll Fanta</td>
<td>Bright &amp; White</td>
<td>Kidder County School</td>
</tr>
<tr>
<td>168</td>
<td>Avery Mosset</td>
<td>Does Surface Matter?</td>
<td>Kidder County School</td>
</tr>
<tr>
<td>169</td>
<td>Teegan Bohnensting!</td>
<td>Best Paper Towel Brand</td>
<td>Lidgerwood Public School</td>
</tr>
<tr>
<td>170</td>
<td>Jenna Rode</td>
<td>Rethink Your Drink</td>
<td>Kidder County School</td>
</tr>
<tr>
<td>171</td>
<td>Amla Prochnow</td>
<td>The Hidden Antimicrobial Potential of Houseplants</td>
<td>Hankinson Public School</td>
</tr>
<tr>
<td>172</td>
<td>Mia Mittleider</td>
<td>Luscious, Luscious Lashes</td>
<td>Kidder County School</td>
</tr>
</tbody>
</table>

**Alternate**

| SE-A1  | Wyatt Tufte                | From Trash to Biogas                             | Kidder County School        |
| SE-A2  | Lucas Larson               | Are You in Need of Fresh Water?                  | Kidder County School        |
| SE-A3  | Ellie Baasch               | Heart Rate                                      | Lisbon Public School        |
| SE-A4  | Ava Schmidt                | Bubbles vs. Material                            | Kidder County School        |
Northwest (1) Senior Division

**Director:** Katelyn Jesperson

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Project Title</th>
<th>School</th>
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</thead>
<tbody>
<tr>
<td>201</td>
<td>Emma Berg</td>
<td>Colorful Learning</td>
<td>Grenora</td>
</tr>
<tr>
<td>202</td>
<td>Anthony Cardona</td>
<td>Between Boys and Girls, who has a better reaction time with virtual reality games</td>
<td>Tioga</td>
</tr>
<tr>
<td>203</td>
<td>Tayzie Cox</td>
<td>Obedience vs. Morality</td>
<td>Tioga</td>
</tr>
<tr>
<td>204</td>
<td>Hunter Davis</td>
<td>Throwing Touchdowns and Kicking Field Goals with Ease</td>
<td>Tioga</td>
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<tr>
<td>205</td>
<td>Grace Fedler</td>
<td>Emotional Intelligence vs. Physical Well-Being</td>
<td>Tioga</td>
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<tr>
<td>206</td>
<td>Brayden Fosburgh</td>
<td>Brain Power</td>
<td>Tioga</td>
</tr>
<tr>
<td>207</td>
<td>Katherine Haakenson</td>
<td>The Catapult</td>
<td>Tioga</td>
</tr>
<tr>
<td>208</td>
<td>Kaden Keller</td>
<td>Eyewitness Accuracy</td>
<td>Tioga</td>
</tr>
<tr>
<td>209</td>
<td>Payton Lee</td>
<td>Does Motivation Music Improve Athletic Ability?</td>
<td>Tioga</td>
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<tr>
<td>210</td>
<td>Gracie Nutt</td>
<td>A.I. T.A.</td>
<td>Tioga</td>
</tr>
<tr>
<td>211</td>
<td>Mandy Oster</td>
<td>Wind Power vs. Solar Power</td>
<td>Tioga</td>
</tr>
<tr>
<td>212</td>
<td>Brody Rasmussen</td>
<td>The Germiest Place, where is it?</td>
<td>Tioga</td>
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<tr>
<td>213</td>
<td>Lindsey Vachal</td>
<td>Effectiveness of Cattle Dewormers</td>
<td>Tioga</td>
</tr>
<tr>
<td>214</td>
<td>Abrianna Volz</td>
<td>Animals vs. Human Bacteria</td>
<td>Tioga</td>
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<tr>
<td>215</td>
<td>Allie Wolla</td>
<td>Egg Evolution</td>
<td>Tioga</td>
</tr>
<tr>
<td>216</td>
<td>Nicholas Wolla</td>
<td>What Blocks Radio Waves Most Effectively?</td>
<td>Tioga</td>
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<tr>
<td>217</td>
<td>Abby Zochert</td>
<td>Test Cramming</td>
<td>Tioga</td>
</tr>
<tr>
<td>218</td>
<td>Isaiah Zochert</td>
<td>Number Memory</td>
<td>Tioga</td>
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**Alternates**

<table>
<thead>
<tr>
<th>NW-A1</th>
<th>Name</th>
<th>Project Title</th>
<th>School</th>
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</thead>
<tbody>
<tr>
<td>NW-A1</td>
<td>Graham Wright</td>
<td>What’s dirties: girls or boys bathroom?</td>
<td>Grenora</td>
</tr>
<tr>
<td>NW-A2</td>
<td>Austin Fretheim</td>
<td>Aerodynamics and the Effects on Cars</td>
<td>Tioga</td>
</tr>
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</table>
## Northeast (2) Senior Division

**Director:** Lorraine O’Shea

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Project Title</th>
<th>School</th>
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</thead>
<tbody>
<tr>
<td>219</td>
<td>Rebecca Sather &amp; Olivia Whitney</td>
<td>D.B.D. 101 (Dead Body Decomposition)</td>
<td>Red River High School</td>
</tr>
<tr>
<td>220</td>
<td>Benjamin Ellingson</td>
<td>Brining Contaminated Soils Back to Life: Remediating Brine Contaminated and Alkaline Soils Using Phytoremediation and Engineered Drainage Techniques</td>
<td>Maddock High School</td>
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<tr>
<td>221</td>
<td>Sudiksha Singhal</td>
<td>The Physical Effects of Sound; the Unconscious Impact of Sound Waves on Human Heart Rates</td>
<td>Red River High School</td>
</tr>
</tbody>
</table>
## Southwest Central (3) Senior Division

**Directors:** Ciera Kroh  

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Project Title</th>
<th>School</th>
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<tbody>
<tr>
<td>237</td>
<td>Summer Fleck</td>
<td>Conception Rates in Cattle As Affected By Mineral Consumption</td>
<td>Flasher</td>
</tr>
<tr>
<td>238</td>
<td>Sean Rolle</td>
<td>Are Colors And Words Interchangeable</td>
<td>Glen Ullin</td>
</tr>
<tr>
<td>239</td>
<td>Tyler Rossow</td>
<td>Stressors And More</td>
<td>Flasher</td>
</tr>
<tr>
<td>240</td>
<td>Sydney Newman-Klein</td>
<td>Genetics vs. Mental Health</td>
<td>Flasher</td>
</tr>
<tr>
<td>241</td>
<td>Sheyanne Jevne</td>
<td>The Effect Type One Diabetes Can Have On Mental Health</td>
<td>Flasher</td>
</tr>
<tr>
<td>242</td>
<td>Sophia Jochim</td>
<td>What's Their Emergency?</td>
<td>Flasher</td>
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<tr>
<td>243</td>
<td>Cody Bahm</td>
<td>Games vs Mental Health</td>
<td>Flasher</td>
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<tr>
<td>244</td>
<td>Dakotah Haralson</td>
<td>Brain Games</td>
<td>Scranton</td>
</tr>
<tr>
<td>245</td>
<td>Vanessa Oase</td>
<td>Feel The Burn</td>
<td>Scranton</td>
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<tr>
<td>246</td>
<td>Rylee Fleck</td>
<td>How Does Chiropractic Care Benefit Athletes?</td>
<td>Flasher</td>
</tr>
<tr>
<td>247</td>
<td>Victoria Richter</td>
<td>Pretty In Pink</td>
<td>Flasher</td>
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<tr>
<td>248</td>
<td>Javin Friesz</td>
<td>Testing Water Quality</td>
<td>Flasher</td>
</tr>
<tr>
<td>249</td>
<td>Daci Wells</td>
<td>3 Way Bend Test Comparison</td>
<td>Flasher</td>
</tr>
<tr>
<td>250</td>
<td>Alivia Geffre</td>
<td>Antibiotics vs. Oils</td>
<td>Flasher</td>
</tr>
<tr>
<td>251</td>
<td>Jada Bonogofsky</td>
<td>Antibiotic Resistance</td>
<td>Flasher</td>
</tr>
<tr>
<td>252</td>
<td>Grant Hauge</td>
<td>How Much Is Too Much</td>
<td>Flasher</td>
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<tr>
<td>253</td>
<td>Morgan Huizenga</td>
<td>Trash Talk</td>
<td>Strasburg</td>
</tr>
<tr>
<td>254</td>
<td>Addison Wagner</td>
<td>Absorbing The Drip</td>
<td>Strasburg</td>
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### Alternate

<table>
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<tr>
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<tbody>
<tr>
<td>SWC-A2</td>
<td>Jordyn Heidrich</td>
<td>It's Raining Acid</td>
<td>Strasburg</td>
</tr>
<tr>
<td>SWC-A3</td>
<td>Sophia Freitag</td>
<td>Heart Beats</td>
<td>Scranton</td>
</tr>
<tr>
<td>SWC-A4</td>
<td>Maddox Pierce</td>
<td>Holy Smokes</td>
<td>Scranton</td>
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<tr>
<td>No.</td>
<td>Name</td>
<td>Project Title</td>
<td>School</td>
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<tr>
<td>255</td>
<td>Denver Nelson</td>
<td>An Analysis of Various Drinking Water Sources</td>
<td>Hankinson Public School</td>
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<tr>
<td>256</td>
<td>Baasch/Jordan Team</td>
<td>The Stroop Effect</td>
<td>Lisbon Public School</td>
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<tr>
<td>257</td>
<td>Kardelen Hanson</td>
<td>The Psychology and Demographics of Panic Buying</td>
<td>Hankinson Public School</td>
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<tr>
<td>258</td>
<td>Gavin Kratcha</td>
<td>An Innovative Approach to Manage the Environmental Impact of Agricultural Drainage Water</td>
<td>Hankinson Public School</td>
</tr>
<tr>
<td>259</td>
<td>Mackenzie Schoonover</td>
<td>Do Dogs Have A Favorite Color?</td>
<td>Kidder County School</td>
</tr>
<tr>
<td>260</td>
<td>Samuel Elliot</td>
<td>Can You Estimate?</td>
<td>Hankinson Public School</td>
</tr>
<tr>
<td>261</td>
<td>Hailey Qual</td>
<td>Testing Pasteurization Levels in Milk</td>
<td>Lisbon Public School</td>
</tr>
<tr>
<td>262</td>
<td>Elise Elliot</td>
<td>Antibacterial Effectiveness of Hand Soaps</td>
<td>Hankinson Public School</td>
</tr>
<tr>
<td>263</td>
<td>Reagan Chambers</td>
<td>Monitoring Honeybee Hive Health With Computer Vision</td>
<td>Woodhaven Academy</td>
</tr>
<tr>
<td>264</td>
<td>Cale Benson</td>
<td>Significant Sunscreen</td>
<td>Hankinson Public School</td>
</tr>
<tr>
<td>265</td>
<td>Kenadi David</td>
<td>Farmers Versus Athletes: Which Has the Stronger Hand Strength</td>
<td>Hankinson Public School</td>
</tr>
<tr>
<td>266</td>
<td>Adrianna Krump</td>
<td>An Analysis of Air Quality in Elevators Around Harvest</td>
<td>Hankinson Public School</td>
</tr>
<tr>
<td>267</td>
<td>Brayden Sutherland</td>
<td>Social Confidence</td>
<td>Lisbon Public School</td>
</tr>
<tr>
<td>268</td>
<td>Sofia Hanson</td>
<td>Music In Different Cultures</td>
<td>Hankinson Public School</td>
</tr>
<tr>
<td>269</td>
<td>Elizabeth Sherbrooke</td>
<td>Analysis of Smiling Back</td>
<td>Hankinson Public School</td>
</tr>
<tr>
<td>270</td>
<td>Olivia Frolek</td>
<td>Gel Electrophoresis</td>
<td>Lidgerwood Public School</td>
</tr>
<tr>
<td>271</td>
<td>Emma Kratcha</td>
<td>Soil Farms II: Optimizing Cropland Soil Conditions for Microbiological Supplementation</td>
<td>Hankinson Public School</td>
</tr>
<tr>
<td>272</td>
<td>Sophia Puklich</td>
<td>Effects of Body Position on Blood Pressure</td>
<td>Kidder County School</td>
</tr>
</tbody>
</table>

**Alternate**

| SE-A1 | Levi Svanes           | Testing Calories in Food                                                      | Kidder County School            |
| SE-A2 | Kiera Volk            | Can Milk Make Plastic?                                                        | Wishek                          |
| SE-A3 | McKynzee Thmpson      | Gas Station Bacteria Growth                                                   | Kidder County School            |
| SE-A4 | Madelyn Foertsch      | The Effect of Soil Type on Field Corn Yields                                  | Hankinson Public School         |
North Dakota State Science & Engineering Fair Awards: Junior Division

At the North Dakota State Science & Engineering Fair, five junior division students from each of the four regions are selected to receive special recognition. Three are selected as second-place winners, and two are selected as first-place winners. In addition, one presenter is selected as the junior division runner-up, sweepstakes award winner and one as the junior division sweepstakes winner. Awards are as follows:

- Second-place winners: each second-place winner receives a silver plaque.
- First-place winners: each first-place winner receives a gold plaque.
- Runner-up sweepstakes winner: the runner-up sweepstakes winner is judged as presenting the second-best junior division project from all regions and from any discipline category, and receives a silver North Dakota plaque and a monetary award of $100 from the UND Graduate School.
- Sweepstakes winner: the sweepstakes winner is judged as presenting the best junior division project from all regions and from any discipline category. The sweepstakes winner receives a gold North Dakota plaque, a monetary award of $150 from the UND Graduate School, and a $250 monetary award in honorarium of Marcus J. Friskop from the Maddock High School Science Fair Alumni Students.

North Dakota State Science & Engineering Fair Awards: Senior Division

From among the students presenting projects in the senior division: In the Northwest Region, six students will be selected to receive special recognition (three will be selected as second-place winners and three will be selected as first-place winners). In the Northeast Region, four students will be selected to receive special recognition (three will be selected as second-place winners and one will be selected as a first-place winner). In the Southwest Central Region, five students will be selected to receive special recognition (three will be selected as second place winners and two will be selected as first-place winners). In the Southeast Region, seven students will be selected to receive special recognition (three will be selected as second place winners and four will be selected as first place winners). In addition, one student is selected as presenting an outstanding project from among all regions and category disciplines, and receives the senior division sweepstakes second runner-up award, a second student is selected as presenting an outstanding project from among all regions and category disciplines and receives the sweepstakes runner-up award. The student who presents the best project from among all regions and category disciplines in the senior division is named the senior division sweepstakes winner. Awards are as follows, ([Scholarships are subject to being enrolled in UND STEM majors]:

- Second-place winners: the 12 second-place winners receive a silver plaque, and they are named as alternates to attend the International Science and Engineering Fair (ISEF) in Atlanta, GA in May 2022.
- First-place winners: the 10 first-place winners receive a gold plaque and a hooded sweatshirt. They also compete as North Dakota representatives at the ISEF in Atlanta, GA.
- Sweepstakes Second Runner-Up: The Sweepstakes Second Runner-Up is judged as representing the third-best senior division project from all regions and from any discipline category. In addition to competing at ISEF, the winner receives a hooded sweatshirt, a North Dakota plaque, a one-year $1,000 scholarship from the University of North Dakota*, a monetary award of $200 UND College of Engineering and Mines.
- Sweepstakes Runner-Up: The Sweepstakes Runner-Up is judged as representing the second best-senior division project from all regions and from any discipline category. In addition to competing at ISEF, the winner receives a hooded sweatshirt, a silver North Dakota plaque, a one-year, $2,000 scholarship to the University of North Dakota*, plus a monetary award of $250 from the UND School of Medicine & Health Sciences.
- Sweepstakes Winner: The Sweepstakes Winner is judged as presenting the best senior division project from all regions and from any discipline category. In addition to competing at ISEF, the winner receives a hooded sweatshirt, a gold North Dakota plaque, a one-year, $2,500 scholarship to University of North Dakota*, plus a monetary award of $500 from the UND College of Arts and Sciences, and a monetary award of $200 from the Marcus J. Friskop Family.
- Marcus J. Friskop Traveling Trophy: the sweepstakes winner’s school receives the Marcus J. Friskop Traveling Trophy. Marcus was a longtime supporter of science education and his visions greatly impact science fairs in North Dakota.
The University of North Dakota – Awards

John D. Odegard School of Aerospace Sciences
Department of Atmospheric Sciences
$100 monetary award and a certificate for project in Atmospheric Sciences, Junior or Senior division

College of Arts and Sciences
Department of Biology
$100 monetary award, $500 UND Biology Scholarship, certificate for project in Biology, Senior division
$50 monetary award and a certificate for project in Biology, Junior division

Department of Chemistry
$100 monetary award and certificate for project in Chemistry, Senior division
$50 monetary award and certificate for project in Chemistry, Junior division

Department of Geography
$75 monetary award and a certificate for project the Geography, Senior division
$75 monetary award and a certificate for project in Geography, Junior division

Department of Mathematics
$100 monetary award, $500 UND Math scholarship, and a certificate for project in the Mathematics, Senior division
$50 monetary award and certificate for project in the Mathematics, Junior division

Department of Physics and Astrophysics
$100 monetary award, $500 UND Physics scholarship, and a certificate for project in Physics, Senior division
$100 monetary award and a certificate for best project in Physics, Junior division

Department of Psychology
$100 monetary award and a certificate for project in Psychology or Behavioral Science, Senior division: 2 winners, Monetary Award of $100 each
$100 monetary award and a certificate for project in the Psychology or Behavioral Science, Junior division: 2 winners, Monetary Award of $100 each

College of Engineering and Mines
$500 scholarship plus $100 monetary award for project in Engineering (female winner), Senior division
$100 monetary award and certificate for project in Engineering, Senior division
$50 monetary award and certificate for project in Engineering, Junior division
$100 monetary award and certificate for project in Energy/Environmental Science, Senior division

Department of Chemical Engineering
$50 monetary award and a certificate for project in Chemical Engineering, Senior division
$50 monetary award and a certificate for project in Chemical Engineering, Junior division

Department of Civil Engineering
$25 monetary award and a certificate for project in Civil Engineering, Senior division
$25 monetary award and a certificate for project in Civil Engineering, Junior division

Department of Computer Science
$100 monetary award and a certificate for project in Computer Science, Senior division
$100 monetary award and a certificate for project in Computer Science, Junior division

Department of Electrical Engineering
$50 monetary award and a certificate for project in Electrical Engineering, Senior division
$50 monetary award and a certificate for project in Electrical Engineering, Junior division

Department of Geology and Geological Engineering
$100 monetary award and certificate for project in Geology/Geological Engineering, Senior division
$100 monetary award and certificate for project in Geology/Geological Engineering, Junior division
The University of North Dakota – Awards

Department of Mechanical Engineering
$50 monetary award and a certificate for project in Mechanical Engineering, Senior division
$50 monetary award and a certificate for project in Mechanical Engineering, Junior division

Department of Petroleum Engineering
$50 monetary award and a certificate for project in Engineering, Senior division

School of Medicine and Health Sciences
$300 monetary award, and a certificate for project in Medical or Health Sciences, Senior division
$150 monetary award, and a certificate for project in Medical or Health Sciences, Senior division
$300 monetary award, and a certificate for project in Medical or Health Sciences, Junior division

Department of Biomedical Sciences
$100 monetary award and certificate for project in Pharmacology/Immunology, Senior division
$100 monetary award and certificate for project in Pharmacology/Immunology, Junior division
$50 monetary award and certificate for project in Life Sciences (Molecular Biology Emphasis), Senior division, 2 winners
$50 monetary award and certificate for project in Life Sciences (Molecular Biology Emphasis), Junior division, 2 winners
$100 monetary award and certificate for project in Microbiology/Infectious Disease, Senior division, 2 winners
$50 monetary award and certificate for project in Microbiology/Infectious Disease, Junior division, 2 winners
$100 monetary award and certificate for project in Medical or Health Sciences, Junior division
$100 monetary award and certificate for project in Medical or Health Sciences, Senior division

Virginia George Inheritance Fund
$50 monetary award for project in Social or Behavioral Science, Senior division
$25 monetary award for project in Social or Behavioral Science, Junior division
Other Organizations, Societies, and Agencies Sponsoring Awards

American Chemical Society, Red River Valley Section
$100 Barnes and Noble Gift Card, A Periodic Table Scroll Pen, and a Certificate

American Meteorological Society
A certificate for project related to Meteorology, Senior or Junior divisions, 2 winners

American Psychological Association
A certificate for project related to Psychology, Senior or Junior division

American Society for Clinical Laboratory Science – North Dakota
$50 monetary award and a certificate for project related to laboratory medicine, Senior division, 3 Winners
$50 monetary award and a certificate for project related to laboratory medicine, Junior division, 3 Winners

American Water Works Association
$75 monetary award and a certificate for project related to drinking water quality, Junior and Senior divisions

ASM Materials Foundation
A ribbon and a certificate for project in Materials Engineering, Senior or Junior division

Association for Women Geoscientists
A certificate for project related to Geosciences, Senior or Junior division (Must be a female exhibitor)

Auxiliary to the North Dakota Veterinary Medical Association
$50 monetary award and a certificate for project related to veterinary medicine, Junior division

Farmers Union Insurance—North Dakota
$50 monetary award and a Certificate for project related to agriculture, Senior division, 2 winners
$25 monetary award and a certificate for project related to agriculture, Junior division, 2 winners

Hot Cakes Café & Lodging
$25 monetary award, a t-shirt, and a certificate for project that has emphasis on food quality or food safety, Junior division
$25 monetary award, a t-shirt, and a certificate for project that has emphasis on food quality or food safety, Senior division

ISEF Alumni
$200 and a certificate for project determined by ISEF judges, Senior or Junior division
$100 and a certificate for project determined by ISEF judges, Senior or Junior division

Mu Alpha Theta
A certificate for project involving modern mathematics, Senior division

NPS Metals a Division of Owen Industries
$500 monetary award and certificate for project related to Manufacturing, Senior division

National Oceanic & Atmospheric Administration
A certificate and a medallion for project related to improved understanding of the earth’s processes, Junior division

North Dakota Academy of Family Physicians
$50 monetary award and certificate for project related to medicine, Senior division

North Dakota Dental Foundation
$50 monetary award and a certificate for project related to dentistry, Senior division, 2 winners
$50 monetary award and a certificate for project related to dentistry, Junior division, 2 winners

North Dakota Farm Bureau
$25 Monetary award and a Certificate for project related to agriculture, Senior Division, 2 winners
$25 Monetary award and a Certificate for project related to agriculture, Junior Division, 2 winners

North Dakota Geological Society
$50 monetary award and a certificate for project in the field of geology or earth science, Junior and Senior divisions

North Dakota Guaranty & Title Co.
$250 monetary award and a certificate for project in Computer Science (Emphasis in Artificial Intelligence), Junior division
$250 monetary award and a certificate for project in Computer Science (Emphasis in Artificial Intelligence), Senior division
Other Organizations, Societies, and Agencies Sponsoring Awards

North Dakota Pharmacists Association
$100 monetary award and a certificate for project in the field of pharmacology, Senior division
$75 monetary award and a certificate for project in the field of pharmacology, Junior division

North Dakota Rural Water Systems Association
$100 monetary award and a plaque for project related to water quality, Senior division

North Dakota Soil Conservation District/Auxiliary
$150 monetary award and a certificate for project related to soil conservation, Junior and Senior divisions
$50 monetary award and a certificate for project related to soil conservation, Junior and Senior divisions

North Dakota State Science and Engineering Fair Association
$50 monetary award and a certificate for project in the Biochemistry category, Senior division
$50 monetary award and a certificate for project in the Biochemistry category, Junior division
$50 monetary award and a certificate for project in the Botany category, Senior division
$50 monetary award and a certificate for project in the Botany category, Junior division
$50 monetary award and a certificate for project in the Environmental Science (pollution related) category, Senior division
$50 monetary award and a certificate for project in the Environmental Science (pollution related) category, Junior division

North Dakota Veterinary Medical Association
$300 monetary award and a certificate for project related to veterinary medicine, Senior division
$225 monetary award and a certificate for project related to veterinary medicine, Senior division
$75 monetary award and a certificate for project related to veterinary medicine, Junior division

North Dakota Water Environment Association
$75 monetary award and a plaque for project related to drinking water quality, Senior division
$75 monetary award and a plaque for project related to drinking water quality, Junior division

Ottertail Power Company
$50 monetary award and a certificate for project related to energy or electricity, Senior division, 3 winners
$50 monetary award and a certificate for project related to energy or electricity, Junior division, 2 winners

Regeneron Biomedical Science Award
$500 monetary award and a certificate for project related to biomedical science and research, Senior division

Ricoh Corporation
A certificate for project related to environmentally friendly businesses, Senior division

Society for In Vitro Biology
A certificate for project in the area of tissue culture, 11th-grader

Society of Automotive Engineers
$100 monetary award and a certificate for best project in mobility engineering, Junior and Senior division

United States Air Force
An Over-the-Shoulder Sling Pack, Power Bank Charger, Dog Tag USB Flash Drive, a Dual USB Car Charger, and a Certificate for a project that has applications useful to the Air Force, 4 winners, Junior or Senior Division

United States Metric Association
A certificate for project using metric system for measurements, Junior division, 5 winners

United States Navy
Educational recognition award valued at $75, a medallion and a certificate for project, all categories considered, Senior division, 3 winners
A medallion and a certificate for project, all categories considered, Junior division, 3 winners

Water Environment Federation
A certificate for project related to water quality or water conditions, Junior or Senior division

Xcel Energy
$25 monetary award and a certificate for project related to energy or electricity, Junior division, 3 winners
$25 monetary award and a certificate for project related to energy or electricity, Senior division, 3 winners

Yale Science and Engineering Association
A medallion and a certificate for project in areas of computer science, Senior division

All awards are subject to change.
Campus Map
University of North Dakota

https://und.edu/map/index.html
Thank You!

Thank you to each student for participating in this year’s North Dakota State Science and Engineering Fair! We also thank the parents, teachers, and all those who supported them along the way. For more information about the Fair, photos, videos, awards list, and this book in digital format go to:

http://und.edu/ndssef
CU nxt yr!