The 57th annual

CoorsTek Denver Metro Regional Science and Engineering Fair

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FEBRUARY 28TH, 2020

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DMRSEF DENVER METRO **REGIONAL** SCIENCE AND ENGINEERING **FAIR**

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DMRSEF DENVER METRO REGIONAL SCIENCE AND ENGINEERING FAIR

The 57th Annual Denver Metro Regional Science & Engineering Fair

February 28th and March 1st, 2020

University of Colorado Denver

GENERAL INFORMATION

The Denver metro region includes Adams, Arapahoe, Broomfield, Clear Creek, Denver, Douglas, Jefferson, and Summit counties. The DMRSEF is open to students in 6th through 12th grade who are enrolled in public, charter, private or parochial schools, or who are home schooled within the fair territory. In general, the DMRSEF follows the same rules as the Colorado Science & Engineering Fair (CSEF) established by the International Science & Engineering Fair (ISEF). These universal rules are published by the Society for Science and the Public, Washington, D.C. in the **Regeneron International Science and Engineering Fair Rules & Guidelines.**

The top projects in the Junior and Senior Divisions from this regional fair will advance to compete at the state level on April 2nd-4th, 2020 in Fort Collins, CO. Our top three Senior Division projects will advance with a sponsored trip to compete at the Regeneron International Science and Engineering Fair in Anaheim, California from May 10th – 15th, 2020.

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WELCOME

On behalf of our primary sponsors, CoorsTek and the University of Colorado Denver, I would like to welcome all of you to the Auraria Campus for the 57th Annual Denver Metro Regional Science and Engineering Fair (DMRSEF).

As many of you know, the DMRSEF's affiliation with the International Science and Engineering Fair (ISEF) allows this competition to send students from our area to the Colorado state competition as well as ISEF, to compete with students from all over the world. Last year we had a huge showing at ISEF, with DMRSEF students taking home top category awards, special awards, as well as the competition's grand prize (the Gordon E. Moore Award). We know that our student scientists can compete with the best young minds from our state and well beyond, and I am excited to see what they have in store for this year's competition.

Beyond a scholarly competition, DMRSEF is an opportunity to celebrate the passion and ingenuity of our area's young scientists and welcome them into the research community. This year we have nearly 200 scientific and business professionals who have volunteered to serve as judges, and over 100 dedicated STEM supporters working as volunteers. We personally thank each of you for lending your time and expertise to the fair. I'd also like to thank the dedicated Denver-area teachers and mentors who have helped lead these students on their scientific journeys. All of you deserve a round of applause! Finally, I would like to thank DMRSEF Associate Director, Kayla Ahr, and our entire planning committee for making my first season with the fair an absolute joy.

Reflecting on his own journey in science, Sir Isaac Newton said, "I seem to have been only like a boy playing on the seashore, and diverting myself in now and then finding a smoother pebble or a prettier shell than ordinary, whilst the great ocean of truth lay all undiscovered before me." I hope today encourages all of our participants to look deeper into the great ocean of truth that remains undiscovered all around us.

Erin J. Golden, PhD

Director, Denver Metro Regional Science and Engineering Fair

2020 FAIR SCHEDULE

FRIDAY, FEBRUARY 28TH | Student Wellness Center & Student Commons Buildings

8:30–9:30 a.m. — **STUDENT ARRIVALS | PROJECT SET-UP**
- Student Wellness Center 2nd Floor Gymnasium

8:30–12:00 p.m. — **DISPLAY & SAFETY REVIEW**
- Projects reviewed for Display & Safety compliance

SRC INTERVIEW
- If an SRC Interview is required, there will be a "STOP" flyer at your assigned location detailing what to do next.

STEM OUTREACH & ACTIVITIES FAIR
- Student Commons Building 2nd Floor

12:00–1:00 p.m. — **LUNCH** (provided for students, teachers/chaperones, volunteers, judges)

STUDENTS | TEACHERS | CHAPERONES
- Ticket required
- Students must remain in the lunch area or with a chaperone
  - Junior Participants (6th-8th Grade) – Student Commons, Room 2600
  - Senior Participants (9th-12th Grade) – Student Commons, Room 1500
- STUDENTS ARE NOT ALLOWED NEAR PROJECTS AT THIS TIME
- Student are not allowed near the streets surrounding campus for safety purposes.

JUDGES
- Judges will preview projects without students, parents, teachers, or chaperones present

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1:00–5:00 p.m. — **PROJECT INTERVIEWS**
- Students at projects for interviews with category and special awards judges.

3:30–4:30 p.m. — **TEACHER & CHAPERONE INFORMAL PROJECT EVALUATION**
- Teachers and chaperones are welcome to visit and informally evaluate student projects at this time.
- Be mindful that judging will still be taking place and step aside if a fair judge needs to interview the student you are speaking with.
- Please do not visit your student's project or projects from your student's school.
- Please do not visit projects in large groups as to not overwhelm students.

5:00 p.m. — **ADJOURN**
- We do our best to adjourn the fair at 5 p.m.; however, we will continue until judging is complete.
- If you choose to leave early, your students will be ineligible for category awards.

SUNDAY, MARCH 1ST | Lola & Rob Salazar Student Wellness Center

6:30–8:30 p.m. — **AWARDS CEREMONY**
- Doors at 6 p.m.
- Light refreshments will be served following the awards presentation.

2020 EVENT PARTNERS

SIR ISAAC NEWTON PARTNERS

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College of Liberal Arts and Sciences
UNIVERSITY OF COLORADO **DENVER**

SALLY RIDE PARTNERS

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SCHOOL OF MEDICINE
UNIVERSITY OF COLORADO
ANSCHUTZ MEDICAL CAMPUS

Additional thanks to those who anonymously contributed to the DMRSEF Parents Fund for your support of our year-round programs.

2020 FAIR VOLUNTEERS

The Denver Metro Regional Science & Engineering Fair is a huge undertaking and its success relies on the time and talents of our dedicated planning committee, volunteers, and CU Denver personnel. Thank you for your commitment to supporting the Denver Metro Region's talented young scientists.

FAIR PERSONNEL

Erin Golden PhD, Director

Kayla Ahr, Associate Director

STUDENT WORKERS

Ian Hernandez-Campos
Hailey Dennis
Jeremy Goldman
Muhammad Hussain
Christina Tegrotenhuis
Mikhail Kaminer

PLANNING COMMITTEE

Tricia Ahr
Kirsten DeKoster
Alison Fernandez
Michael Ferrara
Mitch Fittro
Lindsey Hamilton
Mallory Hiss
Jesse Hinckley
Pamela Jansma
Mike Kawai
Tracy Kohm
Jojo La
Zach Richards
Samantha Sands
Gabriela Santos
Lary Speakman
Zack Strober
Meredith Tennis
Courtney Wilson

STEM OUTREACH & ACTIVITIES

Presenters, Partners, and Speakers

- Dr. Aimee Bernard
- Assistive Technology Partners
- CoorsTek
- CU Anschutz Modern Human Anatomy Program
- CU Anschutz Neuroscience Outreach Group
- CU Pre-Health Scholars
- CU Denver Biology Club
- CU Denver College of Engineering, Design, and Computing
- CU Denver STEAM Team
- CU Denver ESIL Program
- CU Denver Dept. of Mathematical & Statistical Sciences
- CU Denver AWM Student Chapter
- CU Denver SIAM Student Chapter
- CU Denver STEM Collaboratory
- Denver Data to Policy Project
- Donor Alliance
- Lake Region Optics
- National Renewable Energy Laboratory
- NSA Colorado
- Shea Swauger
- Think Like a Scientist
- Young Hands in Science

VOLUNTEERS

Jamie Altholz
Aaron Anglin
Ethan Bacurio
Narmada Balaji
Noah Balsmeyer
Berlin Barnett
Mikayla Barr
Anne Beard
Willis Begaye
Aimee Bernard
Spencer Bollacker
Carter Brand
Kathleen Brown
Sammy Bumann
Courtney Butler
Colleen Campbell
Chelsea Charley-Suarez
Kathleen Chaten
Laura Clayton
Ashley Clutter
Gregory James Cocks
Anna Crawford
Jesse Credit
Megan Cullinan
Hillary Dendy
Hailey B. Dennis
Michelle Dennis
Julia Deyanova
Samantha Eichel
Peter Eide
Adrienne Ellett
Jon Fahey
Ali Fernandez
Mitchell Fittro
Marisa Flores
Anthony Fontana
David Gao
Mahexabel Garcia Nunez
Henok Ghebrechristos
Kristen Ghiazza
Zaituna Gishu
Alex Goke
Jeremy Goldman
Nathan Graber
Kathryn Gray
Melissa Grove
Rebecca Guess
Cynthia Hammond
Dan Heieren
Ian Hernández Campos
Patrice Hettinger Haven
Himmighoefer
Amy Hopkins
Muhammad Hussain
Mikhail Kaminer
Melanie Keerins
Jennifer Kemp
Tracy Kohm
Ashley Kozlowski
Xenia Laguarda
Jingsheng Li
Xia Li
Sarah Lombardi
Rob Lucernoni
Tiffany Lui
Owen Lystrup
Megan Maguire
Sabine Manske
Tyson Martz
Paul Marynowski
Kayla Mash
Kelly Mason
Amy Matonak
Jack Moore
Pamela Nagafuji
Shreya Naik
Nadine Nehme
Michael Nguyen
Alice Nguyen
Jimmy Nolin
Alexander O'Neill
Kristina Oddo
Deb Parker
Rajesh Patel
John Pauly
Meghan Pearson
Lauren Pfefferle
Gavin Philips
Jen Piche
Taylor Pini
Camila Plana
Rashida Pryce
Laura Pyne
Audrey Rager
Steve Ralston
Jeremiah Ramos
Chuck Reid
Brittany Reyes
Madison Ricco
Zachary Richards
Joseph Romani
Noelle Romero
Carra Roth
Annelise Rue-Johns
Nicole Rumian
Saba Sadaqat
Samantha Sands
Mia Santistevan
Gabriela Santos
Bain Sara
Madi Savio
Marissa Segal
Daniel Sehl
Evan Shapiro
Nikita Solodukhin
Kate Souders
Emily Speakman
Alasyn Stowers
Zack Strober
Huseen Sufi
Christopher Swanson
Christina Tegrotenhuis
Molly Thompson
Lauren Thompson
Jon Tomasello
Alex Tran
Monila Unni
Noelle Vance
Ana Claudia Ventilari
Taylor Wagner
Sara Walcott
Nicholas Weaver
Shelby Westerfeld
Laura Wheeler
Rhonda Wilburn-Curtis
Olivia Wilson
Zixuan Zhang
Rui Zhang
Ruiheng Zhang
Amy Zhang

SCIENTIFIC REVIEW COMMITTEE

The Scientific Review Committee (SRC) reviews all student projects for safe and appropriate scientific procedures. They make certain that students follow the rules for pre-college scientific research, as defined in the ***2019-2020 International Rules for Pre-College Science Research: Guidelines for Science and Engineering Fairs***, published by Society for Science and the Public, Washington D.C. and used by the Regeneron International Science and Engineering Fair. The SRC checks student paperwork for appropriateness, signatures, and dates. The SRC also reviews and approves science projects prior to experimentation in the use of human subjects; use of animals; pathogenic agents; recombinant DNA; controlled substances, and tissues. In that capacity, the SRC operates 12 months of the year and has the responsibility of determining if projects qualify for the fair. A project can fail to qualify for violation of any rule. The decision of the SRC is final. If you have questions before starting your project, please call the DMRSEF at (303) 315-1730.

SRC Members

Ed Ahr, BS
Heather Bender, PhD
Mike Ferrara, PhD
Farnoush Forghani-Arani, PhD
Dany Gaillard, PhD
Erin Golden, PhD
Jesse Hinckley, MD, PhD
Brian Jackson, MD
Hannah Jones, BS
Nancy Lorenzon, PhD
Jennifer Major, PhD
Anthony Mangan, PhD
Andrew McDivitt, PhD
Madison Ricco, BS
Steve Smith, MA
Bethany Veo, PhD
Jennifer Hellier, PhD

DISPLAY & SAFETY INSPECTORS

Display and Safety Inspectors review project exhibits to ensure they are safe for judges, fellow students, parents, teachers, and visitors. They also confirm that students have followed the International Science and Engineering Fair (ISEF) rules regarding the project display, required forms, and student notebook. The Display and Safety Committee is responsible for approving project displays for exhibition at the fair. A display can fail to qualify due to violation of any rule. The decision of the Display & Safety Inspectors is final.

JUDGES

Andras A Bodoni
Lukas Acanfora
Jacqueline Adkins
Ryan Adler
Jamie Albin
Kaitlin Alemany
Gary Anderson
Ryther Anderson
Kartheek Anekella
Benjamin Appleby
Lauralee Arnold
Baris Aydintug
Sunanda Babu
Sunil Baidar
Ilango Balakrishnan
Aleezah Balolia
Jim Baron
Mark Basham
Smita Bhavikatti
Kim Bjugstad
Andrew Bonham
Dawn Brady
Stephen Brindley
Brian Brown
Kirsten Brown
Nora Buggy
Keith Campbell
James Cape
Melanie Carlton
Brent Carrillo
Nicole Castelblanco
Joshua Chun
Tara Churney
Greg Cocks
Shana Colcleasure
Rodney Corlin
Kelly Crandall
James Crawford
Daniel Croce
Charmion Cruickshank-Quinn
Karen Daily
Casey Davenhill
Naja Davis
Robyn De Dios
Deva Deangelis
Julia Derk
Jennifer Dewoody
Steven Di Lisio
Courtney Dobrott
Katrina Doenges
Justin Douglas
Melanie Dufva
Kiran Dyamenahalli
Steve Eddy
Benjamin Efaw
Serena Eley
Christina Elling
Tracey Ferrara
Ryan Festag
Elissa Flaumenhaft
Darcy Flora
Catharine Flowers
Thayne Fort
Sarah Fredrick
Kelsey Funkhouser
Hanmant Gaikwad
Henry Geerlings
Yves Geniaux
Laura Gillespie
Alycia Gilliland
Lizzay Godoy
Meredith Goertz
Beau Grande
Clark Grose
Melissa Grove
Jordan "Dan" Grover
Lauren Habenicht
Elise Harrison
Matthew Hartenstein
Kristi Hatakka
Leshaye Hernandez
Ricardo Hernandez Pineda
Joe Herrud
Rachel Hill
Mallory Hiss
Chris Holm-Denoma
David Hook
Brian Hostetler
Grant Hudish
Sridevi Ilango
Robert Ingram
Kristen Jackson
Karin Jackson
Jeffrey Jacot
Jennifer Jewell
Jessy John
Tirone Johnson
Robert Jolly
Hannah Jones
Erin Jordheim
Mike Kawai
Hailey Kinsland
Lara Kirkbride- Romeo
Henry Klaiman
Nadene Klein
Stephen Klein
Zeena Kohr
Lakshmi Divya Kolora
Jojo La
Samuel Lai
Salim Lakhani
David Leach
David Lechner
Simon Levinson
Joi Lin
Chad Linse
Joe Lohmann
Isaac Lopez
Isaac Lopez
Dongdong Lu
Laurie Lyon
Kelsey Lyons
Ward Mahanke
Kenneth Mahrer
Jennifer Major
Jared Mann
Steven Manning
Marta Maron
Marcella Martin
Julie Martinez
Joel Mazza
Maxwell Mccabe
Kenneth Mccarthy
Scott Mcintyre
Randel Mercer
Caitlin Mercier
Jon Metherd
Emily Miller
Sarah Miller
Lloyd Mills
Laura Mitzner
Radu Moldovan
Lauren Moment
Kevin Monaweck
Jenifer Monks
Hannah Moran
Amy Morrissey
Emily Murphy
Ben Nathan
Balachandar Nedumaran
Ralph Nelms
Catherine Nicholas
Jamie Niesz
Caleb Owen
Deb Parker
Priscilla Prem
Lisa Provost
Kevin Quinn
Audrey Rager
Hal Rager
Balasubramanian Rangaswamy
Elizabeth Ribble
Ian Ridley
Justin Romero
Hunter Rose
Madison Rose
Donny Roush
Teisha Rowland
Bob Rowland
Adele Rucker
Nicole Rumian
Lana Salah
Anna Schroeder
David Schubert
Glenda Schumann
Davis Scott
Alexandra Seglias
Krupali Shah
Lauren Shechtman
Angela Sims-Ceja
Alex Smith
Hema Sridhar
V A Sridhar
Shalini Srinivasan
Michael Stager
Alan Stepneski
Brandon Stetler
Stephanie Stout-Oswald
Brian Straight
Alexandra Theis
Andy Thomas
Tammy Trudeau
James Vance
Rebecca Vareed
Victoria Vorwald
Leo Walker
Jessica Warns
Bill Wemmert
Katie White
Stephanie White
Eric Wilson
Julie Wolfson
Xiaoqiao Xie
Sara Walcott

PARTICIPATING SCHOOLS & TEACHERS

MIDDLE SCHOOLS

Academy Charter School
Mary Martinelli

Bradford Intermediate School
Jerilyn Suster

Bromley East Charter School
Noah Albrecht

Campus Middle School
Jaime Murray-Flores

Challenge School
Dan King
John Wiley

Christ the King Catholic School
Michael Warszalek

Crescent View Academy
Amal Atwah
Eiman Elsadig

Crown Pointe Academy
Marcia Roe

Escuela de Guadalupe
Linda Mallory

Foundations Academy
Emily Hickman

Frassati Catholic Academy
Katy Glennon

Free Horizon Montessori
Derek Sinex

Friends Middle School
Kevin Nugent

Girls Athletic Leadership School
Alfredo Cervantes

Good Shepherd Catholic School
Annette Humphrey

Heritage Heights Academy
Kris Hinman
Jenna Mandelbaum

Hope Academy
Terry Johns

John E. Flynn Academy
Jenna Gundy

Liberty Middle School
Lorry Getz

Notre Dame Catholic School
Kristen Cunningham

Omar D. Blair Charter School
Lindsay Schultz

Skinner Middle School
Christopher Martin
Amy Winter

SkyView Academy
Timothy Smith

St. Catherine of Siena
Trang Nguyen

West Middle School
Justin Cantrell

Woodrow Wilson Academy
Jessica Miller

HIGH SCHOOLS

Cherry Creek High School
Ethan Dusto
Timothy Donahue
Stephen Smith

CO Early Colleges Parker
Steve Deus

Evergreen Senior High School
Cheryl Manning

DSST: Montview High School
Hannah Hathaway

Golden High School
Jesse Swift

Jefferson Academy Secondary
Leslie Thimsen

Lakewood High School
James Megrdichian

North High School
Jennifer Popham

Rock Canyon High School
Shawndra Fordham
Susanne Petri
Jenny Sickle

SkyView Academy
Mathew Justice
Timothy Smith

STEM School Highlands Ranch
Neely Clapp

SPECIAL AWARDS

American Meteorological Society
American Psychological Association
American Statistical Association CO/WY Chapter
ASM Materials Education Foundation
Association for Women Geoscientists
Aurora Water
Colorado Association of Science Teachers
CBS4 (KCND-TV Denver)
Cherry Creek Basin Water Quality Authority
Colorado Chapter of the Soil and Water Conservation Society
CoorsTek
CU Anschutz Neuroscience Graduate Program
CU Science Discovery Anschutz
CU Denver Mathematics and Statistical Sciences
Denver Mensa
Denver Museum of Nature and Science
Denver Water Quality Team
Lemelson Foundation
Leyendecker & Lemire, LLC
Mu Alpha Theta
NASA EARTH System Science
National Oceanic and Atmospheric Administration
National Security Agency Colorado
Office of Naval Research
Ricoh USA, Inc.
Rocky Mountain Section of the American Water Works Association
Rocky Mountain Water Environment Federation
Society for In Vitro Biology
Stormwater Permittees for Local Awareness of Stream Health
U.S. Agency for International Development
U.S. Air Force
U.S. Metric Association
U.S. Stockholm Junior Water Prize
Yale Science and Engineering Association

CATEGORY AWARDS

Junior Division 6th – 8th Grades

Animal Sciences
Behavioral Sciences
Biological Sciences
Chemistry
Computer Sciences & Mathematics
Earth & Environmental Sciences
Energy: Chemical & Physical
Engineering
Materials Science
Medicine & Health Science
Microbiology
Physics & Astronomy
Plant Sciences
Social Sciences

Senior Division 9th – 12th Grades

Animal Sciences
Behavioral Sciences
Biological Sciences
Chemistry
Computer Sciences & Mathematics
Earth & Environmental Sciences
Energy: Chemical & Physical
Engineering
Materials Science
Medicine & Health Science
Microbiology
Physics & Astronomy
Plant Sciences
Social Sciences

COLORADO STATE SCIENCE & ENGINEERING FAIR NOMINATIONS

Top student projects from both the Junior and Senior Divisions will be nominated to represent the CoorsTek Denver Metro Regional Science and Engineering Fair at the Colorado State Science and Engineering Fair in Fort Collins, CO on April 2nd-4th, 2020.

DMRSEF GRAND AWARDS

The three students judged to have the top science or engineering projects in the Senior Division of the CoorsTek DMRSEF will be awarded a sponsored trip to Anaheim, California to compete in the Regeneron International Science and Engineering Fair, May 10th – 15th, 2020

BROADCOM MASTERS

Junior category winners will receive an invitation to apply for the national competition. Thirty of the 300 National semifinalists will win an all-expenses-paid trip to Washington, DC.

JUNIOR PROJECTS

Animal Sciences (ANM)

J-ANM-01-T-a **Open wide! The relationship between diet of animal and bacterial growth of saliva**
Harper MacKenzie | Friends Middle School | 8th Grade

J-ANM-01-T-b **Open wide! The relationship between diet of animal and bacterial growth of saliva**
Emmett Shell | Friends Middle School | 8th Grade

J-ANM-02-I **The Mightiest Creatures of All**
Deena Safiulla | Challenge Middle School | 8th Grade

J-ANM-03-I **Correlation of bat and insect abundance in a contaminated prairie environment**
Ismoil Nosirov | SkyView Academy | 8th Grade

Behavioral Sciences (BHV)

J-BHV-01-T-a **Do Video Games Cause Violence?**
Anthony Sandoval | Foundations Academy | 7th Grade

J-BHV-01-T-b **Do Video Games Cause Violence?**
Noah MacElroy | Foundations Academy | 7th Grade

J-BHV-02-T-a **Taste Buds**
Alexis Delgadillo | Foundations Academy | 7th Grade

J-BHV-02-T-b **Taste Buds**
Betsy Miramontes | Foundations Academy | 7th Grade

J-BHV-03-T-a **Group vs. Individual Morality**
Kanshita Dam | Challenge Middle School | 7th Grade

J-BHV-03-T-b **Group Vs. Individual Morality**
Caitlyn Chin | Challenge Middle School | 7th Grade

J-BHV-03-T-c **Group Vs. Individual Morality**
Mila Vigil-Schreder | Challenge Middle School | 7th Grade

J-BHV-04-T-a **Constant Caffeine**
Marley Firsenbaum | Friends Middle School | 6th Grade

J-BHV-04-T-b **Constant Caffeine**
Katja Solter | Friends Middle School | 7th Grade

J-BHV-05-T-a **The Misinformation Effect (True Or False?)**
Carson McCardle | Friends Middle School | 8th Grade

J-BHV-05-T-b **The Misinformation Effect (True Or False?)**
Rowan Risner | Friends Middle School | 8th Grade

J-BHV-06-T-a **Is Beauty Only Skin Deep? The Relationship Between Facial Symmetry And Human Attraction**
Keira Benjamin | Friends Middle School | 8th Grade

J-BHV-06-T-b **Is Beauty Only Skin Deep? The relationship between facial symmetry and human attraction.**
Zora Eckert | Friends Middle School | 8th Grade

J-BHV-07-I **Case of Mistaken Identity**
Dakota Cheesman | Bromley East Charter School | 8th Grade

J-BHV-08-I **Don't Touch Me!**
Elizabeth Clement | Bromley East Charter School | 8th Grade

J-BHV-09-I **Authority**
Alex Elfering | Frassati Catholic Academy | 8th Grade

J-BHV-10-T-a **What is Your Dominant Side?**
Helina Bradford | Free Horizon Montessori | 6th Grade

J-BHV-10-T-b **What is Your Dominant Side?**
Sadie Rose | Free Horizon Montessori | 6th Grade

J-BHV-11-I **Does Color Affect Memory?**
Lily Allio | Free Horizon Montessori | 7th Grade

J-BHV-12-I **Call Me Maybe?**
Grace Farrell | Good Shepherd Catholic School | 8th Grade

Biological Sciences (BIO)

J-BIO-01-T-a **Is there a difference between microbiomes of a person with eczema and a person without eczema?**
Elizabeth Carrigan | Girls Athletic Leadership School | 7th Grade

J-BIO-01-T-b **Is there a difference in microbiomes of a person with eczema compared to a person without eczema?**
Maya Herman | Girls Athletic Leadership School | 7th Grade

J-BIO-02-I **Testing SPF of Sunscreen with UV Sensitive Paper**
Ryan Calabrese | Christ the King Roman Catholic School | 8th Grade

J-BIO-03-I **The Calcium and the Brine Shrimp**
Natalia Manjarrez | Crown Pointe Academy | 8th Grade

J-BIO-04-I **Baffling Bacteria**
Chloe Pennington | Friends Middle School | 6th Grade

J-BIO-05-I **The Effect of Different Wavelengths of Light on Bacterial Colonies**
Elizabeth Vossler | Skinner Midddle School | 7th Grade

J-BIO-06-I **CHANGES IN GENE EXPRESSION DUE TO DIET VARIATION**
Neil Bhavikatti | West Middle School | 8th Grade

Chemistry (CHM)

J-CHM-01-T-a **To C Or Not To C: The Relationship Between Organic And Conventional Oranges**
Phoebe Donovan | Friends Middle School | 6th Grade

J-CHM-01-T-b **To C Or Not To C: The Relationship Between Organic And Conventional Oranges**
Francesesca Catanese | Friends Middle School | 6th Grade

J-CHM-02-T-a **Comparing Acids**
Sohalia Belagh | Omar D Blair Charter School | 7th Grade

J-CHM-02-T-b **Comparing Acids**
Ximena Avila- Reyes | Omar D Blair Charter School | 7th Grade

J-CHM-03-I **How Crystals Form**
Abigail Denler | Christ the King Roman Catholic School | 7th Grade

J-CHM-04-I **Penny Project**
Sawyer Dana | Christ the King Roman Catholic School | 8th Grade

J-CHM-05-I **Do Laundry Pretreatments Really Work ?**
Annie Kozlevchar | Christ the King Roman Catholic School | 8th Grade

J-CHM-06-I **Measuring the Effect of Exercise on Carbon Dioxide Production**
Abigail Houlihan | Christ the King Roman Catholic School | 8th Grade

J-CHM-07-I **Do You Have To Use The Amount Of Soap Instructed On The Laundry Detergent Container?**
Ally Carrier | Christ the King Roman Catholic School | 8th Grade

J-CHM-08-I **An Alternative To Road Salt**
Aleena Modak | Crescent View Academy | 6th Grade

J-CHM-09-I **The Effects of Oxygen on Copper**
imran horton | Crescent View Academy | 8th Grade

J-CHM-10-I **What's your pH?**
Erin Shoemaker | Crown Pointe Academy | 8th Grade

J-CHM-11-I **Rapunzel Rapunzel What Grows Your Hair?**
Vivian Clemente | Frassati Catholic Academy | 6th Grade

J-CHM-12-I **Pen vs. Temperature**
Caitlyn Garza | Frassati Catholic Academy | 7th Grade

J-CHM-13-I **Re-Think Your Drinking Cup**
Abigail Garza | Frassati Catholic Academy | 7th Grade

J-CHM-14-I **Biggest Cookies**
Sara Wandishin | Frassati Catholic Academy | 8th Grade

J-CHM-15-I **The Seebeck Effect**
Elijah Castro | Free Horizon Montessori | 6th Grade

J-CHM-16-I **Is my Grandmother's water safe to consume?**
Dylan Edwards | Free Horizon Montessori | 7th Grade

J-CHM-17-I **How Does Temperature Affect Solubility?**
Roier Shelton | Free Horizon Montessori | 7th Grade

J-CHM-18-I	**Ice Pop!**		
	Zahara Bacal	Friends Middle School	7th Grade
J-CHM-19-I	**Rainbow Flames**		
	Addysen Carlson	Heritage Heights Academy	6th Grade
J-CHM-20-I	**Acids and Bases**		
	Mikiyas Bereket	Omar D Blair Charter School	8th Grade
J-CHM-21-I	**Rock Candy**		
	Abbie-Rae Camacho-Greigo	Omar D Blair Charter School	8th Grade

Computer Sciences & Mathematics (CMP)

J-CMP-01-T-a	**You Sunk My Battleship! Examining Probability Density in Battleship**		
	Shourya Hooda	Challenge Middle School	7th Grade
J-CMP-01-T-b	**You Sunk My Battleship! Taking Battleship To The Next Level**		
	Abhinav Krishna	Challenge Middle School	7th Grade
J-CMP-02-I	**Real-time News Reader Web Application**		
	Rishi Rai	Challenge Middle School	8th Grade
J-CMP-03-I	**Prioritization of Type 2 Diabetes Genetic Risk Factors Based on Functional Relevance**		
	Nathan Yang	Challenge Middle School	8th Grade
J-CMP-04-I	**Is it ripe yet? A circuit to determine ripeness.**		
	Sean Nagy	Free Horizon Montessori	7th Grade
J-CMP-05-I	**Modeling the Cure**		
	Jack Larkin	Good Shepherd Catholic School	7th Grade
J-CMP-06-I	**Overclocking**		
	Nicolas Pineiro	Good Shepherd Catholic School	8th Grade
J-CMP-07-I	**The Study of Fractals**		
	Claire Rasmussen	Woodrow Wilson Academy	8th Grade

Earth & Environmental Sciences (EEV)

J-EEV-01-T-a	**Plants, Our Heros?**		
	Katrina Stallings	Girls Athletic Leadership School	8th Grade
J-EEV-01-T-b	**Plants, Our Heros?**		
	Lena Ward	Girls Athletic Leadership School	8th Grade
J-EEV-01-T-c	**Plants, Our Heros?**		
	Alina Lambertson	Girls Athletic Leadership School	8th Grade
J-EEV-02-T-a	**Pollution Solution**		
	Angel Gallardo-Oun	Omar D Blair Charter School	7th Grade
J-EEV-02-T-b	**Pollution Solution**		
	Tracey Luu	Omar D Blair Charter School	7th Grade
J-EEV-03-T-a	**Effects of Illicit Substances on Zebra Danio Fish**		
	Ella Barrett	Challenge Middle School	8th Grade
J-EEV-03-T-b	**Effects of Illicit Substances on Zebra Danio Fish**		
	Angela Wong	Challenge Middle School	8th Grade
J-EEV-04-T-a	**Less is More**		
	Dylan Shields	Bradford Intermediate	7th Grade
J-EEV-04-T-b	**Less is More**		
	Callan Wilkes	Bradford Intermediate	7th Grade
J-EEV-05-I	**Less Waste More Taste**		
	James Gillies	Academy Charter School	6th Grade
J-EEV-06-I	**Got Water? H20 Distillation Purification For The Win!**		
	Keilyn Dixon	Academy Charter School	6th Grade
J-EEV-07-I	**Culprits in the Wash**		
	Lauren Kempf	Challenge Middle School	8th Grade
J-EEV-08-I	**Keepin' it Fresh**		
	Lina Belaissaoui	Challenge Middle School	8th Grade

J-EEV-09-I **Comparing Lead Removal by Hydroxide Precipitation vs Fruit Waste Adsorption**
Amanda Castillo-Lopez | Challenge Middle School | 8th Grade

J-EEV-10-I **Oil Spill**
Zaina Abouyoussef | Crescent View Academy | 6th Grade

J-EEV-11-I **Are There Dangerous Levels of Lead in Local Soil?**
Fatimah Hirbo | Crescent View Academy | 6th Grade

J-EEV-12-I **What Low-E Windows Are Best For Different Climates**
Selma Youssef | Crescent View Academy | 7th Grade

J-EEV-13-I **Dissolved Oxygen vs Temperature**
Asiya Mansur | Crescent View Academy | 7th Grade

J-EEV-14-I **Tremendous Tenebrio Molitors**
Jamisyn Stacy | Crown Pointe Academy | 8th Grade

J-EEV-15-I **Surviving Pollution; A Java Fern Story**
Rachael Woodard | Foundations Academy | 6th Grade

J-EEV-16-I **Water Quality of Bottled Water**
Zane Hobson | Free Horizon Montessori | 6th Grade

J-EEV-17-I **Suck It Up! The Relationship Between the City and the Amount of Carbon Monoxide in the Air**
Aiyana Villacorta | Friends Middle School | 7th Grade

J-EEV-18-I **Tip of the Iceberg**
Brigid Morin | Good Shepherd Catholic School | 6th Grade

J-EEV-19-I **Radiation Station**
Tatum Busch | Good Shepherd Catholic School | 8th Grade

Energy (EGY)

J-EGY-01-T-a **The relationship between color of light and amount of power generated by solar panel**
Zoli Brady | Friends Middle School | 8th Grade

J-EGY-01-T-b **Will affect the amount of energy generated by a solar panel?**
Agi Willis | Friends Middle School | 8th Grade

J-EGY-02-I **Is Colorado Ready To Only Use Renewable Energy?**
Victoria DeWitt | Academy Charter School | 6th Grade

J-EGY-03-I **Geothermal Electricty: Clean Power for the Future**
Thomas Kaduk | Academy Charter School | 6th Grade

J-EGY-04-I **Drink Up!**
Amanda Nikolai | Bromley East Charter School | 8th Grade

J-EGY-05-I **Electromagnetic Induction**
Ryan Chapman | Challenge Middle School | 8th Grade

J-EGY-06-I **What Citrus Fruit Gives Off the Most DC Voltage**
Mira Wilkinson | Christ the King Roman Catholic School | 8th Grade

J-EGY-07-I **SOLAR POWERED WATER DESALINATION**
Reda Essebar | Crescent View Academy | 6th Grade

J-EGY-08-I **Turning Heat into Electricity**
Diego Gutierrez-Raghunath | Escuela de Guadalupe | 7th Grade

J-EGY-09-I **I Have the Power**
Clarey Larson | Frassati Catholic Academy | 7th Grade

J-EGY-10-I **What Materials Conduct Electricity the Best?**
Kieran Curtin | Frassati Catholic Academy | 7th Grade

J-EGY-11-I **How long does it take to fully charge a battery on a wind turbine?**
Caitlyn Mason | Free Horizon Montessori | 8th Grade

J-EGY-12-I **Wind Powerplant**
Haley Meyers | Heritage Heights Academy | 8th Grade

J-EGY-13-I **Electrifying Sound**
Sebastian Galeano | Heritage Heights Academy | 8th Grade

Engineering (ENG)

J-ENG-01-T-a **Better Bots**
Charlotte Miller | Bradford Intermediate | 7th Grade

J-ENG-01-T-b **Better Bots**
Catie Watkins | Bradford Intermediate | 7th Grade

J-ENG-02-T-a **The Strongest Wall**

Antonio Ruiz — Escuela de Guadalupe — 8th Grade

J-ENG-02-T-b **The Strongest Wall**

Ethan Brin — Escuela de Guadalupe — 8th Grade

J-ENG-03-T-a **The Effect of the Bridge Type on the Weight it Can Hold**

Jacob Fogle — Skinner Midddle School — 7th Grade

J-ENG-03-T-b **The Effect of the Bridge Type on the Weight it Can Hold**

Sean Scanlon — Skinner Midddle School — 7th Grade

J-ENG-04-T-a **Up a Creek Without a Paddle**

Myla Clemetsen — Hope Academy — 6th Grade

J-ENG-04-T-b **Up a Creek Without a Paddle**

Max Clemetsen — Hope Academy — 7th Grade

J-ENG-04-T-c **Up a Creek Without a Paddle**

Ryan McCabe — Hope Academy — 7th Grade

J-ENG-05-I **Waste To Wealth**

Ethan Eliason — Challenge Middle School — 8th Grade

J-ENG-06-I **Smart Bandage**

Mihika Devireddy — Challenge Middle School — 8th Grade

J-ENG-07-I **Neuroplasticity: Enabling Stroke Patients to Repair Motor Skills by Imitating Motion Between Hands**

Rithvik Ijju — Challenge Middle School — 8th Grade

J-ENG-08-I **Does The Design And/Or Material Affect The Survival Rate Of An Egg**

Henry Samuelson — Christ the King Roman Catholic School — 8th Grade

J-ENG-09-I **Magnetic energy**

Ignacio Castejon — Christ the King Roman Catholic School — 8th Grade

J-ENG-10-I **Hydropower Solutions in Rivers and Streams**

Mohammad Bathhef — Crescent View Academy — 8th Grade

J-ENG-11-I **The Best Parachute**

Giovanni Garrett — Free Horizon Montessori — 6th Grade

J-ENG-12-I **See O Too**

Carson Cherveny — Good Shepherd Catholic School — 6th Grade

J-ENG-13-I **The Flip Side**

Katie Mylott — Good Shepherd Catholic School — 6th Grade

J-ENG-14-I **Marshmallow Seat**

Luke Stevenson — Good Shepherd Catholic School — 7th Grade

J-ENG-15-I **From Sadness to Gladness**

sam forsberg — Good Shepherd Catholic School — 8th Grade

J-ENG-16-I **Don't Wrangle with the Tangles : An insert in a dryer to prevent two sheets from tangling together.**

Trinity Doyle — Good Shepherd Catholic School — 8th Grade

J-ENG-17-I **The Stirling Engine**

Jonathan Stewart — John E. Flynn Academy — 6th Grade

J-ENG-18-I **Oilphylic Hydrophobic (OPHP) Sponges Improve Effectiveness of Oil Grit Separator Units/Storm Drains**

Louis Calkin — Skinner Midddle School — 7th Grade

Materials Science (MAT)

J-MAT-01-T-a **The Effects of Various Materials on the Durability of Paper**

Taryn Limke — Skinner Midddle School — 7th Grade

J-MAT-01-T-b **Effects of Various Materials on the Durability of Paper**

Ellery McDaniel — Skinner Midddle School — 7th Grade

J-MAT-02-T-a **Electroscope**

Zaria Gamble — Omar D Blair Charter School — 6th Grade

J-MAT-02-T-b **Electroscope**

Jade Hibbler — Omar D Blair Charter School — 6th Grade

J-MAT-02-T-c **Electroscope**

Yasir Dickey — Omar D Blair Charter School — 6th Grade

J-MAT-03-T-aT **emperature and Magnets**

James Bradford — Foundations Academy — 6th Grade

J-MAT-03-T-b **Temperature and Magnets**

Elijah Diaz | Foundations Academy | 6th Grade

J-MAT-04-I **Which foundation is stronger?**

Rohan Wadhwa | Christ the King Roman Catholic School | 7th Grade

J-MAT-05-I **Prescription bottles protecting pills from UV rays**

Ryan Palmeiro | Christ the King Roman Catholic School | 8th Grade

J-MAT-06-I **Amount of Voltage vs. the Speed of a "Battery Train"**

Alexis Mendlik | Christ the King Roman Catholic School | 8th Grade

J-MAT-07-I **Conductivity of Metals**

Ethan Bjork | Christ the King Roman Catholic School | 8th Grade

J-MAT-08-I **Curve of a Hockey Stick**

Max Horvath | Christ the King Roman Catholic School | 8th Grade

J-MAT-09-I **does cost matter in sport cloth brands**

Hamza Ageel | Crescent View Academy | 6th Grade

J-MAT-10-I **Effect of Fabric Softener on the Flammability of Different Fabrics**

Selsabela Alsane | Crescent View Academy | 8th Grade

J-MAT-11-I **How Can Nanotechnology Clean Up Oil Spills Faster?**

Marianna O'Connor | Escuela de Guadalupe | 6th Grade

J-MAT-12-I **The "Reel" Truth**

Lucas Dunn | Good Shepherd Catholic School | 7th Grade

J-MAT-13-I **The Effects Of Changing Air Pressure**

Tyler Barton | Heritage Heights Academy | 6th Grade

J-MAT-14-I **Fire Extinguishers**

Bryce Snogren | Heritage Heights Academy | 8th Grade

J-MAT-15-I **How Air Currents Influence Fire**

Becky Barton | Heritage Heights Academy | 8th Grade

Microbiology (MCB)

J-MCB-01-I **Hydrogen Peroxide for Prevention of Bacteria on Polymer Biomaterials**

Nishita Kotlapati | Challenge Middle School | 8th Grade

J-MCB-02-I **Natural or Cultured?**

Akshita Upadhyay | Challenge Middle School | 8th Grade

J-MCB-03-I **The Affects of UV Light on Bacteria**

Kamryn Villalobos | Foundations Academy | 7th Grade

J-MCB-04-I **Mold Vs. Preservatives: How do Preservatives Affect Mold Growth?**

Sage Scalzi | Frassati Catholic Academy | 7th Grade

J-MCB-05-I **How Much Bacteria After Filtration?**

Sarah Ketchel | Frassati Catholic Academy | 8th Grade

J-MCB-06-I **Essential Oils Vs. Medicine**

Maliyah Peters | Girls Athletic Leadership School | 8th Grade

J-MCB-07-I **UV Killin' Me!**

Madeline Penning | Good Shepherd Catholic School | 8th Grade

J-MCB-08-I **It's Alive! Can Slime Molds Overcome Adverse Conditions?**

Finn Egan | Good Shepherd Catholic School | 8th Grade

J-MCB-09-I **Effect Of Source Of Water On Bacteria Growth**

Lily Fisher | Skinner Midddle School | 8th Grade

J-MCB-10-I **The Effect of Salt on the Amount of Dissolved Oxygen Produced by Phytoplankton**

Liliana Echevarria | Skinner Midddle School | 8th Grade

Medicine & Health Sciences (MED)

J-MED-01-T-a **The Purr-fect Pet; The Relationship Between Pet and Human Blood Pressure**

Devin Farahani | Friends Middle School | 7th Grade

J-MED-01-T-b **The Purr-fect Pet; The Relationship Between Pet and Human Blood Pressure**

Cedar Wine | Friends Middle School | 8th Grade

J-MED-02-T-a **How Much Fat is in your Next Cheeseburger Meal?**

Elena Medina | Escuela de Guadalupe | 8th Grade

J-MED-02-T-b **How Much Fat is in your Next Cheeseburger Meal?**

Michelle Grado | Escuela de Guadalupe | 8th Grade

J-MED-03-I **Medical Imaging in Preoperative Surgical Planning and Automated Brain Tumor Detection**

Ethan Singleton | Challenge Middle School | 8th Grade

J-MED-04-I **Taste and Smell - How do they correnspond**

Amelia Rockers | Christ the King Roman Catholic School | 8th Grade

J-MED-05-I **How Sugar Contents Change in Ripening Fruit**

Noor Kassir | Crescent View Academy | 6th Grade

J-MED-06-I **The Effect of Sour Candy on Oral Ph**

Osama Mohammed | Crescent View Academy | 6th Grade

J-MED-07-I **Blind Spot In Vision**

Seif Abouyoussef | Crescent View Academy | 7th Grade

J-MED-08-I **Lightening V.S Hair**

Aseel Sayed | Crescent View Academy | 8th Grade

J-MED-09-I **The Rate of Aging**

Cianna Sexton | Crown Pointe Academy | 7th Grade

J-MED-10-I **Ultra Violet Impact!**

Paige Brown | Frassati Catholic Academy | 6th Grade

J-MED-11-I **Which Filtration Material Leads to the Cleanest Drinking Water?**

Emma Kostelecky | Frassati Catholic Academy | 7th Grade

J-MED-12-I **Beyond the Neutral Zone**

Julian Kramer | Good Shepherd Catholic School | 7th Grade

J-MED-13-I **Teeth Stain "It's No Yolk"**

Matthew Wilkenson | Heritage Heights Academy | 6th Grade

J-MED-14-I **Deep Breathing vs. Stress Balls to Reduce Heart Rate when Stressed**

Sofia Leone | Skinner Midddle School | 7th Grade

J-MED-15-I **Identification of a new drug to defeat DIPG, the most aggressive brain tumor in children**

Aditi Avinash | SkyView Academy | 8th Grade

Physics & Astronomy (PHY)

J-PHY-01-I **What's Up Th-air? Utilizing a Simulation to Design the Impeccable Airfoil for a Commercial Airliner**

Ayan Vaishnav | Campus Middle School | 8th Grade

J-PHY-02-I **Is There Anything That Can Escape a Black Hole?**

Syler Ford | Foundations Academy | 6th Grade

J-PHY-03-I **Which Lacrosse Stick Has the Most Accurate Shot?**

Charles Zuhoski | Frassati Catholic Academy | 6th Grade

J-PHY-04-I **Which Bow Type is Most Accurate?**

Joe Martinez | Frassati Catholic Academy | 7th Grade

J-PHY-05-I **Accuracy Test**

Michael Gambrill | Good Shepherd Catholic School | 6th Grade

J-PHY-06-I **Polarized Perception**

Stefan Zehnacker | Good Shepherd Catholic School | 7th Grade

J-PHY-07-I **Antenna Theory and Design as Shown by Weather Satellites**

Morgan Cragin | Liberty Middle School | 8th Grade

J-PHY-08-I **A kinetic Catastrophe**

Dominic Moser | Notre Dame Catholic School | 7th Grade

J-PHY-09-I **Sonoluminescence**

Elijah Zappe | St Catherine of Siena | 6th Grade

Plant Sciences (PLT)

J-PLT-01-T-a **The Effects of Albuterol Sulfate and Famotidine on the Growth of a Spathiphyllum Plant**

Abigail Stelman | Skinner Midddle School | 7th Grade

J-PLT-01-T-b **The Effects of Albuterol Sulfate and Famotidine on the Growth of a Spathiphyllum Plant.**

Lola Goldman | Skinner Midddle School | 7th Grade

J-PLT-02-T-a **Does Sound Affect the Rotting & Growth of Potato?**

Trystan Cochrane | Foundations Academy | 7th Grade

J-PLT-02-T-b **Does Sound Affect the Rotting & Growth of a Potato?**

Gavin Stanley | Foundations Academy | 7th Grade

J-PLT-03-T-a **Which Liquid Can Help a Plant Grow the Best?**

Braelyn Maze | Foundations Academy | 7th Grade

J-PLT-03-T-b **Which Liquid Can Help a Plant Grow the Best?**

Jaedyn Symons | Foundations Academy | 7th Grade

J-PLT-04-I **Effects Of Orsythia On Plants**

Hiba Aryan | Crescent View Academy | 7th Grade

J-PLT-05-I **Elodea in the Light**

Giovanni Pando | Crown Pointe Academy | 7th Grade

J-PLT-06-I **Does Flavoring or Carbonation Affect Plant Growth?**

Ella Labra | Heritage Heights Academy | 7th Grade

J-PLT-07-I **Efficiently Go Organic**

Elizabeth Grewal | Heritage Heights Academy | 7th Grade

Social Sciences (SSC)

J-SSC-01-T-a **Heterogeneous Pedagogies for Pursuers of Knowledge**

Manishasri Kaliaperumal | Challenge Middle School | 7th Grade

J-SSC-01-T-b **Heterogeneous Pedagogies For Pursuers Of Knowledge**

Shrreya Sethuramalingam | Challenge Middle School | 7th Grade

SENIOR PROJECTS

Animal Sciences (ANM)

S-ANM-01-T-a **Does Thermal Niche Partitioning Reduce Competition Between Tetramorium sp.E& Camponotus Herculeanus?**

Alexander Bieniek | SkyView Academy | 9th Grade

S-ANM-01-T-b **Does Thermal Niche Partitioning Reduce Competition Between Tetramorium sp.E & Camponotus Herculeanus**

Mariah Stine | SkyView Academy | 10th Grade

S-ANM-02-T-a **Drosophila melanogaster as a Model Organism for CBD Research Indicated by Anxious Research**

Olivia Gibson | Rock Canyon High School | 11th Grade

S-ANM-02-T-b **Drosophila melanogaster as a Model Organism for CBD Research Indicated by Anxious Behavior**

Anna Meunier | Rock Canyon High School | 11th Grade

S-ANM-03-T-a **Effect of Ethanol on Heart Morphology and Brain Malformation in Danio rerio in Embryonic Period**

Charleton LeMieux | Rock Canyon High School | 11th Grade

S-ANM-03-T-b **Effect of ethanol on heart morphology and brain malformation in Danio rerio in embryonic period.**

Sarah Lombardi | Rock Canyon High School | 11th Grade

S-ANM-03-T-c **Effect of Ethanol on Heart Morphology and Brain Malformations in Danio rerio in the Embryonic Period**

Srishti Jerath | Rock Canyon High School | 11th Grade

S-ANM-04-I **An Analysis of Differences in Greenhouse Gas Emissions of Cow's Milk and Almond Milk Product Systems**

Allison Brookhart | Cherry Creek High School | 10th Grade

S-ANM-05-I **The Future of Corals: Genetically Modified and Stronger**

Remi Gucker | Evergreen Senior High School | 12th Grade

S-ANM-06-I **Habitat selection by American pika: Analysis of existing data**

Sophie Scholl | North High School | 10th Grade

Behavioral Sciences (BHV)

S-BHV-01-T-a **Stress responses on virtual, visual, and auditory responses**

Garrett Neujahr | SkyView Academy | 10th Grade

S-BHV-01-T-b **Stress response due to Virtual Visual and Auditory responses**

Joseph Hafenbredl | SkyView Academy | 10th Grade

S-BHV-02-I **Creating Meaningful Gene Networks in Mice to Predict Behavioral Anxiety Traits**

Aryan Roy | Cherry Creek High School | 10th Grade

Biological Sciences (BIO)

S-BIO-01-I **Genetic Etiology of Sporadic Microtia**

Abbas Shaikh | Cherry Creek High School | 10th Grade

S-BIO-02-I **Effects of β-tubulin Mutations in Microtubules**

Maya Hunter | Cherry Creek High School | 11th Grade

S-BIO-03-I **Targeting Theonine Kinases in Branhamella Catarrhalis and Serratia Marscenas Using CRISPRcas9**

Sarah Bian | Cherry Creek High School | 11th Grade

S-BIO-04-I **Variation in p53 folding due to external factors such as carcinogens**

Anurag Ranjan | Cherry Creek High School | 12th Grade

S-BIO-05-I **The Alternative to Fingerprints**

Tanishqa Puhan | Cherry Creek High School | 9th Grade

S-BIO-06-I **Fluorescent Gene Expression in Neuroglial Cells Used for Localization of A Protein Complex**

Elizabeth Vermeulen | Evergreen Senior High School | 12th Grade

S-BIO-07-I **Efficiency of Various Algae for Bio-fuel Production**

Tia Abraham | Rock Canyon High School | 10th Grade

S-BIO-08-I **Replications Mechanics of the Lotus Effect on Plexiglass**

Akhniyet Makhsat | STEM School Highlands Ranch | 11th Grade

S-BIO-09-I **A novel approach to early directional diagnosis of prescription opioid addiction**

Gitanjali Rao | STEM School Highlands Ranch | 9th Grade

Chemistry (CHM)

S-CHM-01-I **Carbon Capture Through Amine Solvents**

Colin Phoebe | Evergreen Senior High School | 12th Grade

Computer Sciences & Mathematics (CMP)

S-CMP-01-T-a **Genus Russula Identification and Phylogenetic Delimitation by Means of DNA Barcoding**

Andrew Hines | Rock Canyon High School | 11th Grade

S-CMP-01-T-b **Genus Russula Identification and Phylogenetic Delimitation by Means of DNA Barcoding**

Jason McDonald | Rock Canyon High School | 11th Grade

S-CMP-01-T-c **Genus Russula Identification and Phylogenetic Delimitation by Means of DNA Barcoding**

Camden Meyer | Rock Canyon High School | 12th Grade

S-CMP-02-T-a **Motor Imagery Classification with Neural Networks for Application in Assistive Technology**

Ibrahim Mohammed | Cherry Creek High School | 11th Grade

S-CMP-02-T-b **Motor Imagery Classification with Neural Networks for Application in Assistive Technology**

Roshan Kern | Cherry Creek High School | 11th Grade

S-CMP-03-I **Exploration and Optimization of Deep Learning Mechanisms for Protein Folding Utilizing an RCNN**

Rahul Thomas | Cherry Creek High School | 11th Grade

S-CMP-04-I **Using multidimensional scaling to evaluate dimensions of the House**

Brandon Dong | Cherry Creek High School | 11th Grade

S-CMP-05-I **Predicting the Progression of Alzheimer's Disease using Graph Neural Networks and Diffusion MRI**

Siddarth Ijju | Cherry Creek High School | 12th Grade

S-CMP-06-I **Feasibility of Determining Markov Model Dynamics from Equilibria**

Austen Mazenko | Cherry Creek High School | 12th Grade

S-CMP-07-I **Using Deep learning to find road damage in Drone imagery.**

Alex Frachetti | Cherry Creek High School | 12th Grade

S-CMP-08-I **How Safe Is Your Password?**

Victoria Donoho | Evergreen Senior High School | 12th Grade

S-CMP-09-I **Reducing Private Data Collection Through Smart Devices**

Cailean Albert | Golden High School | 11th Grade

S-CMP-10-I **A Numerical Investigation of the Minimum Width of a Neural Network**

Ibrohim Nosirov | SkyView Academy | 12th Grade

S-CMP-11-I **The Interchangeable Modular Testing Apparatus I.M.T.A.**

Joseph Vahle | SkyView Academy | 12th Grade

Earth & Environmental Sciences (EEV)

S-EEV-01-T-a **Examing Gradients of N15 and C13 Abundance as an Indicator of Pollution along a low order stream.**

Abigail Allums | SkyView Academy | 9th Grade

S-EEV-01-T-b **Examining gradients of N15 and C14 abundance as an indicator of pollution along a low order stream**

Hannah Butler | SkyView Academy | 10th Grade

S-EEV-02-T-a **The Effects of Goat Browsing on Fire Mitigation**

Emma Carillion | Rock Canyon High School | 12th Grade

S-EEV-02-T-b **The Effects of Goat Browsing on Fire Mitigation**

Sam Isert | Rock Canyon High School | 12th Grade

S-EEV-02-T-c **The Effects of Goat Browsing on Fire Mitigation**

Roshni Philip | Rock Canyon High School | 12th Grade

S-EEV-03-I **What caused the air degradation in the late summer of 2018 and early fall of 2017 in Colorado?**

Melissa Chu | Cherry Creek High School | 11th Grade

S-EEV-04-I **A Novel Approach to Runoff Toxins Utilizing Lentinus edodes**

Xiaomeng Gong | Cherry Creek High School | 12th Grade

S-EEV-05-I **Climate is Changing & Permafrost is Thawing**

Leah Clayton | Evergreen Senior High School | 12th Grade

S-EEV-06-I **Using Machine Learning to Analyze Imagery of Mangroves to Measure The Impact of Climate Change**

Gabriel Lorenz | SkyView Academy | 11th Grade

S-EEV-07-I **Use of microplastics for ammonia removal**

Samuel Lewis | SkyView Academy | 9th Grade

S-EEV-08-I **Heat Shock Protein (HSP70) Induction in Aquatic Macroinvertebrates**

Dylan Jones | SkyView Academy | 9th Grade

Energy (EGY)

S-EGY-01-I **High Schools: Reducing Energy & Saving Money**

Ryan Stone | Evergreen Senior High School | 12th Grade

S-EGY-02-I **How Household and Natural Water Supplies can be used to access new Energy**

Daniel Collins | SkyView Academy | 10th Grade

S-EGY-03-I **Using Historical and Current Data to Predict the Effects of Converting Nuclear Weapons into Energy**

Prachi Shah | SkyView Academy | 11th Grade

Engineering (ENG)

S-ENG-01-I **Real-Time Seizure Forecasting for Epileptics on a Consumer Product**

Matthew Anderson | Cherry Creek High School | 10th Grade

S-ENG-02-I **Creation of a Portable Human-Powered Refrigerator for Cold Chain Transportation of Vaccines**

Zachary Chapman | Cherry Creek High School | 12th Grade

S-ENG-03-I **Optimizing Metal Detection Capabilities in a Pulse Induction Circuit**

Nicole Hankovszky | Cherry Creek High School | 12th Grade

S-ENG-04-I **Using EEG to Detect Childhood Trauma in Teenagers Concentrating on Behavioral and Educational Factor**

Jeeva Senthilnathan | Colorado Early Colleges Parker | 12th Grade

S-ENG-05-I **Flight by Light**

James (JC) Appleton | Evergreen Senior High School | 12th Grade

Materials Science (MAT)

S-MAT-01-T-a **Protein Based Biodegradable Plastic**

Faith Li | Cherry Creek High School | 10th Grade

S-MAT-01-T-b **Protein-based Biodegradability Plastic**

Jane Li | Cherry Creek High School | 10th Grade

S-MAT-02-T-a **Enriched Cyanoacrylate as a Transdermal Nutrient Transfer and Attachment Method for Gracilaria sp.**

Peyton Leyendecker | SkyView Academy | 12th Grade

S-MAT-02-T-b **Enriched Cyanoacrylate as a Transdermal Nutrient Transfer and Attachment Method for Gracilaria sp.**

Hunter Leyendecker | SkyView Academy | 12th Grade

Microbiology (MCB)

S-MCB-01-T-a **Effects of Erythromycin Dosages and Duration on Antibiotic Resistance in E. coli**

Analisa Amat-Cooley | SkyView Academy | 9th Grade

S-MCB-01-T-b **Effects of Erythromycin Dosages and Duration on Antibiotic Resistance in E. coli**

Annika Johnson | SkyView Academy | 9th Grade

S-MCB-01-T-c **Effects of Erythromycin Dosages and Duration on Antibiotic Resistance in E.coli**

Monal Sharma | SkyView Academy | 9th Grade

S-MCB-02-T-a **The Effects of Polystyrene on the India Ink Uptake of Tetrahymena thermophila**

Riley England | Rock Canyon High School | 12th Grade

S-MCB-02-T-b **The Effects of Polystyrene on the India Ink Uptake of Tetrahymena thermophila**

Camryn Allen | Rock Canyon High School | 11th Grade

S-MCB-02-T-c **The Effects of Polystyrene on the India Ink Uptake of Tetrahymena Thermophila**

Shelbie Johnson | Rock Canyon High School | 12th Grade

S-MCB-03-I **The Hidden Secret of Soap: An Investigation into SLS and SLES Present in a Manufactured Soap.**

Christie Tran | Cherry Creek High School | 10th Grade

S-MCB-04-I **Fluctuation of Iodine Effectiveness Based on Seasonal Temperature Change**

Bryne Knowles | Cherry Creek High School | 11th Grade

S-MCB-05-I **Using Bioreactors to Eliminate Hazards to Coral Reefs**

Chloe Henry | Golden High School | 12th Grade

S-MCB-06-I **A Comparative Study of the Probiotic Effects of Kefir versus Yogurt**

Nikhila Narayana | Rock Canyon High School | 10th Grade

S-MCB-07-I **Antibiotic Resistance and How it is Influenced by Bacterial Diversity**

Ethan Wright | SkyView Academy | 10th Grade

S-MCB-08-I **Do Evolutionary Tradeoffs Affect Antibiotic Resistance in E. Coli?**

Drew Whitney | SkyView Academy | 9th Grade

Medicine & Health Sciences (MED)

S-MED-01-T-a **The Effect of Aspartame on Rat Beta Cell Insulin Secretion**

Ian Fleming | Rock Canyon High School | 12th Grade

S-MED-01-T-b **The Effect of Aspartame on Rat Beta Cell Insulin Secretion**

Kaylee Kabza | Rock Canyon High School | 11th Grade

S-MED-01-T-c **The Effect of Aspartame on Islet Beta Cell Insulin Secretion**

Alana Graves | Rock Canyon High School | 12th Grade

S-MED-02-I **In-Depth Analysis of the Ineffective Treatment Methods of RVO in Patients Younger than 50**

Priya Bhavikatti | Cherry Creek High School | 10th Grade

S-MED-03-I **Novel Small Molecule Nanoimmunotherapy Treatment for NSCLC**

Akber Shaikh | Cherry Creek High School | 11th Grade

S-MED-04-I **The Role of Lamin C in the Pathogenesis of Dilated Cardiomyopathy**

Akshati Vaishnav | Cherry Creek High School | 11th Grade

S-MED-05-I **Novel Preventative Strategies for Acute Kidney Injury & Chronic Kidney Disease**

Evelyn Bodoni | Cherry Creek High School | 12th Grade

S-MED-06-I **Determining Gene Interactions in Congenital Heart Disease as a Diagnostic Aid for Fetal Surgery**

Krithik Ramesh | Cherry Creek High School | 12th Grade

S-MED-07-I	**Prediction of Anti-seizure Drug Levels in the Brain**		
	Rohini Kompella	Cherry Creek High School	9th Grade
S-MED-08-I	**FAF Imaging of Pigmented RPE Cells with AMD**		
	Ethan James	DSST: Montview High School	11th Grade
S-MED-09-I	**CBD: Science or Scam**		
	Sierra Haberman	Jefferson Academy Secondary	10th Grade

Physics & Astronomy (PHY)

S-PHY-01-I	**Inertia**		
	Wilson Moyer	Lakewood High School	9th Grade

Plant Sciences (PLT)

S-PLT-01-T-a	**Nitrogen Fixation Efficacy of Trifolium repens with Various Rhizobia Inoculant Treatments**		
	Derek Fearon	Rock Canyon High School	12th Grade
S-PLT-01-T-b	**Nitrogen Fixation Efficacy of Trifolium repens with Various Rhizobia Inoculant Treatments**		
	Sage Wheeler	Rock Canyon High School	12th Grade
S-PLT-01-T-c	**Nitrogen Fixation Efficacy of Trifolium repens with Various Rhizobia Inoculant Treatments**		
	Hope James	Rock Canyon High School	12th Grade
S-PLT-02-I	**Plastics vs Bioplastics: A Study of the Effects of Microplastics on the Growth of Spirulina Algae**		
	Santiago Castillo	Cherry Creek High School	11th Grade
S-PLT-03-I	**Using Isotopes to Track Fixed Nitrogen Transfer by Invasive/Native Species in a Prairie Habitat**		
	Natalie Young	SkyView Academy	10th Grade

Social Sciences (SSC)

S-SSC-01-T-a	**Identifying Stress Indicators in Adolescent Teens**		
	Reese Titensor	Rock Canyon High School	11th Grade

S-SSC-01-T-b	**Identifying Stress Indicators in Adolescent Teens**		
	Reagan Oates	Rock Canyon High School	11th Grade
S-SSC-02-I	**Bias in Machine Learning Algorithms**		
	Jackson Kent	SkyView Academy	10th Grade

CoorsTek

ABOUT COORSTEK

A POWERHOUSE OF ADVANCED MATERIALS

For over a century, CoorsTek has been at the forefront of developing advanced ceramic materials for key markets across the globe. CoorsTek has grown into a multinational company with over 30 facilities across three continents. With over 400 advanced ceramic formulations, 6,000 employees, unparalleled ceramics expertise and a commitment to researching and developing innovative products, CoorsTek partners with our customers to make the world measurably better.

Industry leaders in Semiconductor, Medical, Automotive, Energy, and Aerospace and Defense turn to CoorsTek for advanced engineering and manufacturing solutions. Our scientists and ceramic engineers meet these complex challenges by combining knowledge in materials engineering, R&D, and operational excellence. Our commitment to building reliable, collaborative partnerships has made CoorsTek the partner of choice for companies around the world that require the unique, high-performance properties of engineered ceramics. We offer materials that address specific engineering issues related to chemical, electrical, mechanical and thermal environments, and provide solutions to complex applications that other materials cannot match.

At CoorsTek, we are committed to investing in the future and in our communities – and STEM education is a primary focus. The company has made two significant investments in Colorado that have firmly established the CoorsTek legacy and contributed to the future of the science and engineering community. In 2014 the company formed a signature partnership with the Colorado School of Mines – providing $27M in funding for the CoorsTek Center for Advanced Science & Engineering. The investment was a significant milestone in the multi-generational partnership between CoorsTek and Mines and a nod towards the importance of science education for future generations.

In 2016, the company created the CoorsTek Center for Advanced Materials, known as CCAM, our new research and development center and manufacturing facility. This $130 million investment replaced our aged Advanced Materials Processing and R&D facilities with a state-of-the-art center, positioning us to be successful for decades to come.

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61/118
Utilizing Over 1/2 of Earth's Known Elements

30+
Manufacturing Sites Worldwide

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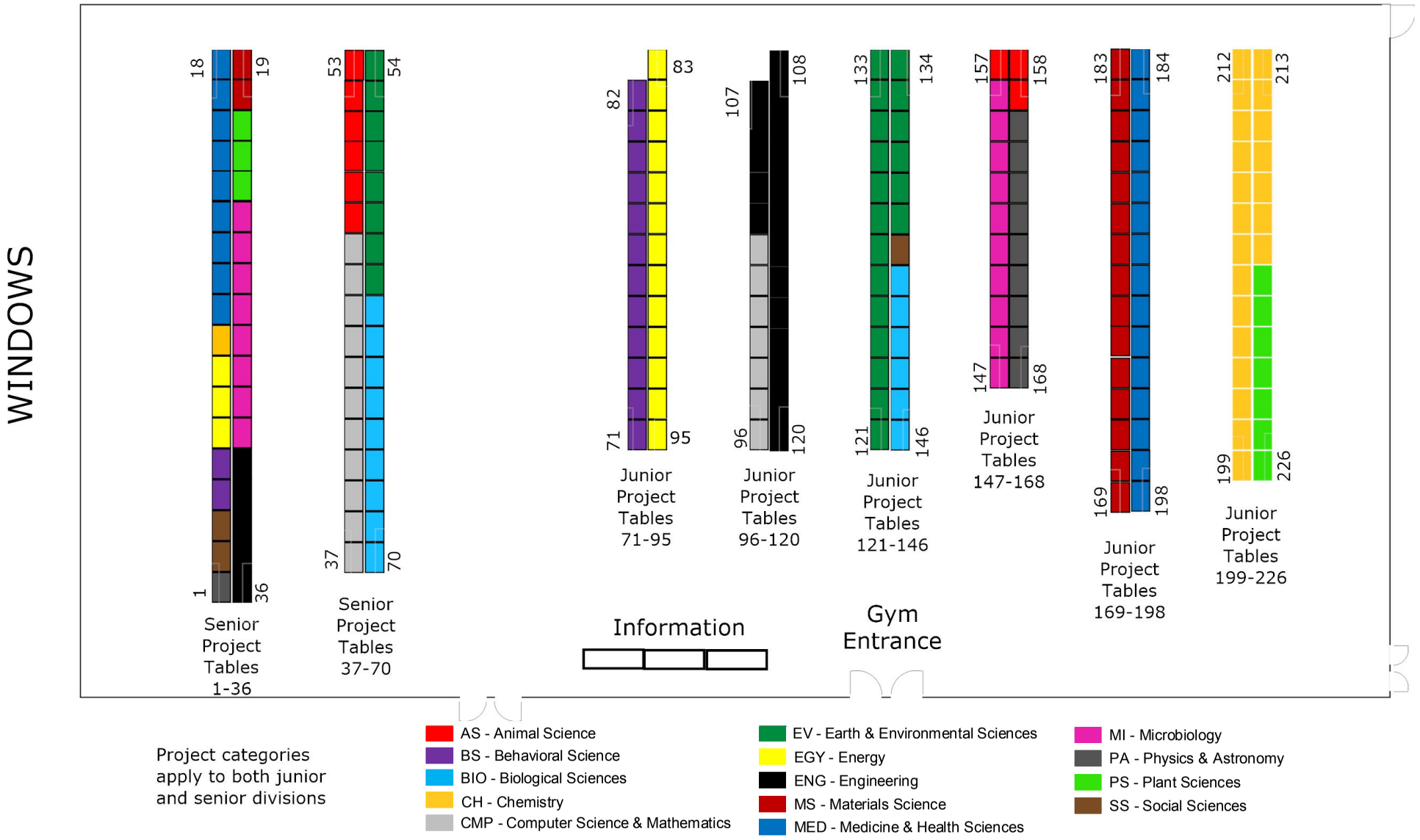
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Information
Gym Entrance
Project categories apply to both junior and senior divisions
AS - Animal Science
BS - Behavioral Science
BIO - Biological Sciences
CH - Chemistry
CMP - Computer Science & Mathematics
EV - Earth & Environmental Sciences
EGY - Energy
ENG - Engineering
MS - Materials Science
MED - Medicine & Health Sciences
MI - Microbiology
PA - Physics & Astronomy
PS - Plant Sciences
SS - Social Sciences