2020 Colorado Science and Engineering Fair
Grand Awards Press Release

Junior Division
Animal Sciences

First Place
Deena Safiulla
The Mightiest Creatures of All
Challenge School

Second Place
Tatum Duvall
A Study on the Prevalence of Salmonella in the Saliva of Vizsla Dogs Fed Raw vs. Cooked Diet
Thomas MacLaren School

Third Place
Annette Bechtolt
Stifle Joint Replacement in Equines
St. Columba Catholic School

Honorable Mention
Bonnie Koehn
SandRid: Does It Really Rid Sand?
Cardinal Community Academy

Senior Division
Animal Sciences

First Place
Madison Miller
Whoa! You're Stressing Me Out! The Effects of Transportation on a Horse's Stress Levels
Monte Vista High School

Second Place
Anna Meunier
Drosophila melanogaster as a Model Organism for CBD Research as Indicated by Anxious Behavior
Rock Canyon High School

Third Place
Blaine Gillespie
Effect of Different Concentrations of Cannabidiol (CBD) on Terrestrial Snails
Monte Vista High School

Behavioral & Social Sciences

First Place
Julianne Vega
Who's Got the Upper Hand?
Dolores Elementary School

Second Place
Kelly Young
Multitasking in the Brain
Summit Middle Charter School

Third Place
Malaika Burkholder
Mental Music
St. John the Evangelist Catholic School

Honorable Mention
Daota Cheesman
Case of Mistaken Identity
Bromley East Charter School

Behavioral & Social Sciences

First Place
Sierra Zeller
Helena Harezlak
Stressmap: The Effect of a Coordinated Exam Schedule on Student Stress
Fairview High School

Second Place
Ethan Gavin
Analyzing the Effects of Micro-Sleep on Adolescent Brains Correlated to the Amount of Sleep Received
The Classical Academy

Third Place
Lilly Figueroa
Identifying the Most Prevalent Sources of Stress in Adolescent Teens at Rock Canyon High School
Rock Canyon High School

Chemistry & Biochemistry

First Place
Anjana Radha
Coffee: An Amylase Activator or Inhibitor?
Peak to Peak Charter School

Second Place
Bradin Gurule
Clean Cents
St. Columba Catholic School

Third Place
Moriah Ashley
Ethical Responsibilities in Relation to Human-Pig Chimeras
Mancos High School

Honorable Mention
Reese Titensor
Reagan Oates
Identifying the Most Prevalent Sources of Stress in Adolescent Teens at Rock Canyon High School
Rock Canyon High School

Junior Division
Behavioral & Social Sciences

First Place
Julianne Vega
Who's Got the Upper Hand?
Dolores Elementary School

Second Place
Kelly Young
Multitasking in the Brain
Summit Middle Charter School

Third Place
Malaika Burkholder
Mental Music
St. John the Evangelist Catholic School

Honorable Mention
Emma Sewell
The Heat Is On
Sargent Jr/Sr High School
### Senior Division
#### Chemistry & Biochemistry

<table>
<thead>
<tr>
<th>Place</th>
<th>Name</th>
<th>Grade</th>
<th>School</th>
<th>City</th>
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<tbody>
<tr>
<td>First</td>
<td>Charles Wang</td>
<td>11th</td>
<td>Fossil Ridge High School</td>
<td>Fort Collins</td>
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<tr>
<td></td>
<td><em>Making AI Smarter: A Novel Approach to Creating a New Generation of Smart Chemical Sensors</em></td>
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<td>Second</td>
<td>Kylie Guiles</td>
<td>11th</td>
<td>Mancos High School</td>
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<td></td>
<td><em>Creating Crosslinking Compounds to Cure Cancer</em></td>
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<td>Third</td>
<td>Ana Barovic</td>
<td>12th</td>
<td>Colorado Springs Early Colleges</td>
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<td></td>
<td><em>The Effect of Light on Black Tea</em></td>
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<tr>
<td>Honorable Mention</td>
<td>Sophia Westerkamp</td>
<td>12th</td>
<td>Monarch High School</td>
<td>Louisville</td>
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<td><em>Three Dimensional Surface Models: An Innovative Method of Thermodynamics Education</em></td>
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<td>Honorable Mention</td>
<td>Chinmay Jayanty</td>
<td>10th</td>
<td>Sargent Jr/Sr High School</td>
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<td><em>Pure or Impure: Rapid Test for Adulteration in Milk-Part 2</em></td>
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<td></td>
<td>Honorable Mention</td>
<td>Angelina Foutz</td>
<td>7th</td>
<td>St. Columba Catholic School</td>
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<td></td>
<td><em>Hemp Hemp Hooray</em></td>
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### Junior Division
#### Earth & Space Sciences

<table>
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<th>City</th>
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<tbody>
<tr>
<td>First</td>
<td>Samantha Schaefer</td>
<td>8th</td>
<td>The Classical Academy</td>
<td>Colorado Springs</td>
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<tr>
<td></td>
<td><em>Cactus, Tree, or Flower . . . Which Has More CO2 Reduction Power</em></td>
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<td>Second</td>
<td>Averi Ulibarri</td>
<td>8th</td>
<td>St. John the Evangelist Catholic School</td>
<td>Loveland</td>
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<td><em>Schoolyard Resistivity: What Lies Beneath?</em></td>
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<td>Third</td>
<td>Benjamin Sundheim</td>
<td>7th</td>
<td>St John the Evangelist Catholic School</td>
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<td><em>How Hot Are Your Rocks?</em></td>
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<td>Honorable Mention</td>
<td>Angelina Foutz</td>
<td>7th</td>
<td>St. Columba Catholic School</td>
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<td><em>Hemp Hemp Hooray</em></td>
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### Senior Division
#### Energy

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<tr>
<td>First</td>
<td>Julia Warnock</td>
<td>10th</td>
<td>PSD Global Academy</td>
<td>Fort Collins</td>
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<td></td>
<td><em>Biomimetic Screen-Printed Photoanodes in Dye-Sensitized Solar Cells</em></td>
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<td>Second</td>
<td>Rithwik Mylavarapu</td>
<td>12th</td>
<td>Fairview High School</td>
<td>Boulder</td>
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<td></td>
<td><em>Utilizing Deep Learning and Edge Cloud Computing for Efficient Road Surface Condition Classification</em></td>
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<td>Third</td>
<td>Jasmine Li</td>
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<td><em>Applying a Novel Hot-Casting Technique to Increase Perovskite Solar Cell Stability &amp; Efficiency</em></td>
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<tr>
<td>Honorable Mention</td>
<td>Mohamed Ibrahim</td>
<td>10th</td>
<td>Wiggins Jr/Sr High School</td>
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<td><em>Utilizing an Alkali Catalyst to Help Identify Alternative Feedstocks in Biodiesel Synthesis</em></td>
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</table>
Junior Division
Engineering

First Place
Rithvik Ijju 8th grade
Neuroplasticity: Enabling Stroke Patients to Repair Motor Skills by Imitating Motion Between Hands
Challenge School Denver

Second Place
Genevieve Carter 8th grade
Effect of Tool Path on Strength of 3D Printed Parts
Home School Lafayette

Third Place
Nathaniel Ellis 8th grade
Human Biomechatronics: Strength Augmentation and Improving Muscle Communication
Escalante Middle School Durango

Honorable Mention
Owen Doherty 8th grade
Brace Yourself: Pipe Fence Brace Design Stability Comparison
Brason School Branson

Honorable Mention
Oliver Knowles 6th grade
The Effects of Wing Camber on Air Turbulence
Frontier Academy Greeley

Senior Division
Engineering

First Place
Matthew Anderson 10th grade
Real-Time Seizure Forecasting for Epileptics on a Consumer Product
Cherry Creek High School Greenwood Village

Second Place
Siddharth Bharthulwar 11th grade
An Eye in the Fog: Development of a Novel Navigational and Visual Guidance System for Aircraft Operations in Low Visibility Conditions
Fairview High School Boulder

Third Place
Tate Schrock 10th grade
Autonomous Glider for Radiosonde Recovery
Arickaree School Anton

Honorable Mention
Max Witwer 11th grade
Alexander Grisak 11th grade
Designing an Affordable EKG Using Neural Networks for Computer Aided Diagnoses
Caprock Academy Grand Junction

Honorable Mention
Steven Lewis 10th grade
Cybersecurity Engineering for Aircraft
Pine Creek High School Colorado Springs

Junior Division
Environmental Sciences

First Place
Emily Hume 7th grade
Reduction of Nitrates in Drinking Water: What Works?
Walsh Jr/Sr High School Walsh

Second Place
Naomi Kruse 6th grade
I Speak for the Trees: The Use of Tree-Ring Analysis of Pinus ponderosa To Detect A Local Climate History
Schullandheim Colorado Springs

Third Place
Ezra Voth 8th grade
Measuring Water Flow Through Specific Placements of Rocks on Varying Slopes to Reduce Soil Attrition
The Classical Academy Colorado Springs

Honorable Mention
Cecelia Houseweart 8th grade
Temperatures Affect Microscopic Organisms
Hotchkiss K-8 School Hotchkiss

Honorable Mention
Liam Doherty 6th grade
Ice Ice Baby: A Comparison of Stock Tank Ice Formation Reduction Methods
Branson School Branson

Senior Division
Environmental Sciences

First Place
Andres Villa 11th grade
Analysis of Gambel's Oak Spread and Influence within Gunnison's Sage-grouse Habitat, Poncha Pass, CO
Monte Vista High School Monte Vista

Second Place
Mikailah Feinman 10th grade
Nathan Nash 10th grade
Shifting to a New Normal: A Statistical Analysis of Colorado’s Observed Climatological Variability from 1895 to the Present
Primero Jr/Sr High School Weston

Third Place
Alden Kruse 11th grade
Mysteries in the Mud: Tracking Human Impact and Environmental Change By Heat Pressure Extracted Pond Sediment Core
Schullandheim Colorado Springs

Honorable Mention
Katy Sun 12th grade
Source Apportionment Using 7-Wavelength Aethalometer Measurements
Monarch High School Louisville

Honorable Mention
Estelle Brewer 12th grade
Cody Martin 12th grade
Beef Cattle Methane Emissions in Feedlots: A Sequestration Plan Utilizing Pressure Swing Adsorption
Nederland Middle-Senior High School Nederland
Junior Division
Mathematics & Computer Sciences

First Place
Margaret Arthur 8th grade
Creating More Efficient Neural Networks Used to Find Exoplanets Using SVD and Compression Techniques
Summit Middle Charter School Boulder

Second Place
Sam Forsberg 8th grade
From Sadness to Gladness!
Good Shepherd Catholic School Denver

Third Place
Nathan Yang 8th grade
Prioritization of Type 2 Diabetes Genetic Risk Factors Based on Functional Relevance
Challenge School Denver

Honorable Mention
Kai Morton 8th grade
Chemical Problem? Chemical Solution.
The Classical Academy Colorado Springs

Honorable Mention
Shurya Hooda 7th grade
Abhinav Krishna 7th grade
You Sunk My Battleship! Examining Probability Density in Battleship
Challenge School Denver

Senior Division
Mathematics & Computer Sciences

First Place
Siddarth Ijju 12th grade
Predicting the Onset of Alzheimer's Disease Using Graph Neural Networks and Diffusion Tensor Imaging
Cherry Creek High School Greenwood Village

Second Place
Sara Nehring 11th grade
Predicting Geomagnetic Storms Using Artificial Intelligence
Monte Vista High School Monte Vista

Third Place
Austen Mazenko 12th grade
Feasibility of Determining Markov Model Dynamics from Equilibria
Cherry Creek High School Greenwood Village

Honorable Mention
Mikyla Bowen 12th grade
Applying Machine Learning Algorithms for Classification Using Breast Cancer Data Research Binder
Northridge High School Greeley

Honorable Mention
Edward Wawrzynek 10th grade
A Compiler Supporting the Differing Syntactic Representation of Programs
Fairview High School Boulder

Junior Division
Medicine & Health

First Place
Geo Raguraman 8th grade
RUN For Your LIFE
Discovery Canyon Campus Colorado Springs

Second Place
Cedar Wine 8th grade
Devin Farahani 7th grade
The Purr-fect Pet: The Relationship Between Pets and Human Blood Pressure
Friends Middle School Boulder

Third Place
Joshua Ho 8th grade
Here Comes the Sun Run!!!
Summit Middle Charter School Boulder

Honorable Mention
Asha Thompson 6th grade
Rub-a-Dub-Dub-Apple in the Tub
Limon Schools Limon

Honorable Mention
Christopher Wood 7th grade
Bug Off!
Flagstaff Academy Longmont

Senior Division
Medicine & Health

First Place
Cooper Hanley 11th grade
Liam Barnes 12th grade
Cosmo Mitchell 12th grade
Applying Gold Nanoparticles to Denature Proteins Characteristic of Alzheimer's Disease
Monarch High School Louisville

Second Place
Evelyn Bodoni 12th grade
Novel Preventative Strategies for Acute Kidney Injury & Chronic Kidney Disease
Cherry Creek High School Greenwood Village

Third Place
Kritik Ramesh 12th grade
Determining Gene Interactions in Congenital Heart Disease for Development of a Comprehensive Fetal Cardiac Diagnostics Platform
Cherry Creek High School Greenwood Village

Honorable Mention
Cora Schrock 9th grade
A CAE Case Study: EEG & ECG Correlation
Arickaree School Anton

Honorable Mention
Tyler Gregg 10th grade
Bos Taurus Protein Deterioration (Frozen vs. Refrigerated)
Miami-Yoder School Rush
Junior Division
Microbiology & Molecular Biology

First Place
Chloe Pennington 6th grade
Baffling Bacteria
Friends Middle School Boulder

Second Place
Daniel Strevett 8th grade
An Analysis on the Effect of Varied Tooth Disinfectants on Streptococcus Mutans
The Classical Academy Colorado Springs

Third Place
Autumn Schulz 6th grade
Can A D.I.Y. Filter Make River Water Safe To Drink?
Ignacio Middle School Ignacio

Honorable Mention
Garret Drullinger 7th grade
Does Treated Seed Corn Effect Soil Microbes?
Liberty School Joes

Honorable Mention
Armaan Gill 7th grade
Coliphage to the Rescue
Lamar Middle School Lamar

Senior Division
Microbiology & Molecular Biology

First Place
Gitanjali Rao 9th grade
A Novel Approach To Early Directional Diagnosis of Prescription Opioid Addiction
STEM School Highlands Ranch Highlands Ranch

Second Place
Chloe Henry 12th grade
Using Bioreactors to Eliminate Hazards to Coral Reefs
Golden High School Golden

Third Place
Harrison Whittemore 12th grade
Studying the Effects of Use of Chemically Synthesised crRNA on CRISPR-Cas12a Nucleic Acid Detection
Fairview High School Boulder

Honorable Mention
Sarah Bian 11th grade
Targeting Threonine Kinases in Enterobacteriaceae Using CRISPR cas9
Cherry Creek High School Greenwood Village

Honorable Mention
Riley England 12th grade
Camryn Allen 11th grade
Shellbie Johnson 12th grade
The Effect of Microplastic Water Contamination on Phagocytosis in Tetrahymena thermophila
Rock Canyon High School Highlands Ranch

Junior Division
Physics

First Place
Ayan Vaishnav 8th grade
What's Up Th-air? Utilizing a Simulation to Design the Impeccable Airfoil for a Commercial Airliner
Campus Middle School Greenwood Village

Second Place
Quinn Burns 8th grade
Tennis Ball Bounce
Peak to Peak Charter School Lafayette

Third Place
Bryan Williams 8th grade
Walking the Planck of Quantum Mechanics
Hoehne Jr/Sr High School Hoehne

Honorable Mention
Eastin Hastings 11th grade
Beyond the Weld
Liberty School Joes

Senior Division
Plant Sciences

First Place
Jordan Rockey 8th grade
Does Purple Skin Affect Greening In Potatoes?
Sargent Jr/Sr High School Monte Vista

Second Place
Kate Bachrach 8th grade
Algae and Nutrients: Bloom or Doom?
Summit Middle Charter School Boulder

Third Place
Karson Harbison 6th grade
Plant Senses: Exploring How Plants Sense Water
St. Columba Catholic School Durango

Honorable Mention
Grant Weaber 8th grade
Aiden Adams 8th grade
Fast and Furious Growth
Eaton Middle School Eaton
Senior Division
Plant Sciences

First Place
Derek Fearon 12th grade
Hope James 12th grade
Sage Wheeler 12th grade

Nitrogen Fixation Efficacy of Trifolium repens with Various Rhizobia Inoculant Treatments
Rock Canyon High School Highlands Ranch

Second Place
Carlos Ochoa-Marquez 9th grade

Growing Growing Gone!: Chemical Leaching and Its Effects on Plant Life
Monte Vista High School Monte Vista

Third Place
Peyton Leyendecker 12th grade
Hunter Leyendecker 12th grade

Enriched Cyanoacrylate as a Transdermal Nutrient Transfer and Attachment Method for Gracilaria sp.
SkyView Academy Highlands Ranch

Junior Division
Best of CSEF Project

First Place
Margaret Arthur 8th grade

Creating More Efficient Neural Networks Used to Find Exoplanets Using SVD and Compression Techniques
Summit Middle Charter School Boulder

Second Place
Rithvik Ijju 8th grade

Neuroplasticity: Enabling Stroke Patients to Repair Motor Skills by Imitating Motion Between Hands
Challenge School Denver

Third Place
Julianne Vega 6th grade

Who's Got the Upper Hand?
Dolores Elementary School Dolores

Senior Division
Best of CSEF Project

First Place
Matthew Anderson 10th grade

Real-Time Seizure Forecasting for Epileptics on a Consumer Product
Cherry Creek High School Greenwood Village

Second Place
Sarah Tang 12th grade

Orbit Determination and Projection of Potentially Hazardous Asteroid 12538 (1998 OH)
Fairview High School Boulder

Third Place
Derek Fearon 12th grade
Hope James 12th grade
Sage Wheeler 12th grade

Nitrogen Fixation Efficacy of Trifolium repens with Various Rhizobia Inoculant Treatments
Rock Canyon High School Highlands Ranch