

Metro Richmond  
**SCIENCE FAIR**



*Express to Atlanta*



March 15, 2008  
Mills E. Godwin  
High School

**MSIC**  
MathScience  
Innovation Center

# Welcome to the 2008 Metro Richmond **SCIENCE FAIR**

The 16<sup>th</sup> Annual Metro Richmond Science Fair is open to 7<sup>th</sup> – 12<sup>th</sup> graders in the Central Virginia area. Students work with their science and math teachers on research projects using scientific methods to investigate their hypotheses. It is a double-juried fair. Students submit their project papers in February which are then blind screened by a panel of judges. Based on this screening, the best projects are selected to be displayed at the March 15, 2008 Metro Richmond Science Fair. At the Fair the students present their written projects and display boards and are also interviewed by a panel of judges from the community. Last year more than 85 companies provided sponsorship, volunteer judges, in-kind donations and volunteer hours. Their combined efforts made the following student success stories possible:

- 19 Senior Division winners advanced to the Virginia State Science and Engineering Fair, earning 7 placements.
- Sohini Sircar from Maggie Walker Governor's School was recognized as our Grand Prize Winner and represented Central Virginia at the Intel International Science and Engineering Fair in Albuquerque, N.M. in May.
- 28 Junior Division winners were nominated to the Discovery Channel Young Scientist Challenge. Teresa Maria Dula, representing Harry F. Byrd Middle School in Henrico County, was chosen as a National Semifinalist in the competition in August.

This event continues to grow. We have been an affiliate of the Intel International Science and Engineering Fair for 6 years. In 2008, for the first time, the Metro Richmond Science Fair will select **two students** to represent Central Virginia at the 2008 Intel International Science & Engineering Fair in Atlanta.



MathScience Innovation Center  
*Imagine. Create. Lead.*

# Junior Division

## 2008 Fair Day Schedule

### for

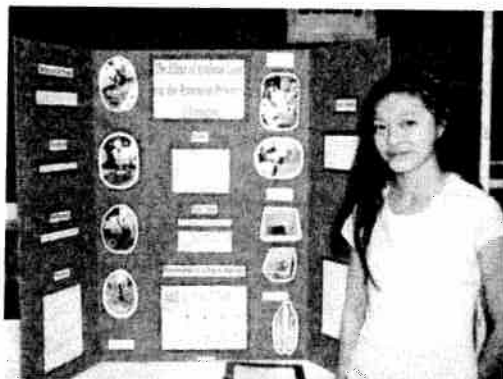
## Students, Teachers & Guests

8:15 – 8:45 am	9:00 a.m. Judging Group Arrive & Register	Auditorium
9:30 – 9:45 am	10:00 Judging Group arrive, Arrive & Register	Auditorium
10:30 - 10:45 am	11:00 Judging Group Arrive & Register	Auditorium
9:00 am - 12:00 pm	Student Interviews & Evaluation of Exhibits Group 1: 9:00 - 10:00 Group 2: 10:00 - 11:00 Group 3: 11:00 - 12:00	Gym

***While the interviews are being conducted, the exhibit area is closed to all except the judges and the students being judged.***

**Lunch will not be available at the Fair site.**

1:00 pm - 3:30 pm	Exhibits Open to the Public	Gym/Commons
3:30 pm - 5:00 pm	Presentation of Awards	Auditorium



# Senior Division

## 2008 Fair Day Schedule for Students, Teachers & Guests

8:15 – 8:45 am	Students Arrive & Register	Auditorium
9:00 –12:00 pm	Student Interviews and Evaluation of Exhibits	Commons
12:10 pm	Announcement of ISEF Finalists Arrive & Register	Auditorium
12:30 pm	Lunch available for Finalists	
1:00 – 3:00 pm	Judging of ISEF Finalists	Commons

***While the interviews are being conducted before noon,  
the exhibit area is closed to all except the judges and the  
students being judged.***

**Lunch will not be available at the Fair site.**

3:30 pm - 5:00 pm	Presentation of Awards	Auditorium
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**THANK YOU TO OUR**  
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# Junior Division Exhibits

# Former Top 40 National Finalists in the Discovery Channel Young Scientist Challenge

**2006**



Anthony Hennig, Powhatan Junior High School, Powhatan, VA

**2002**



Trevor Corbin, Byrd Middle School, Henrico County, VA

# Junior

## Behavioral & Social Sciences

- 08-2910 Mind Game: The Effect of Age on Reaction Time Tested by the Stroop Effect  
Eleni Agapis • Manchester Middle School • Chesterfield
- 08-3151 The Effect of Time Limits on the Performance of a Person on a Test  
Kaixin Chen • Moody Middle School • Henrico
- 08-2778 The Effect of Different Kinds of Repetitive Spelling Practice Methods on a Second Grader's Spelling Test Scores  
Ryan Densley • Moody Middle School • Henrico
- 08-3266 The Effect of Different Shapes Placed Around Different Sets of Numbers on a Middle School Student's Memory  
Adam Ernst • Moody Middle School • Henrico
- 08-3153 The Effect of Type of Music Played on an Adolescent's Heart Rate  
Annie Hulcher • Moody Middle School • Henrico
- 08-3110 The Effect of Aging on How Long a Person Can Balance  
Tiffany Hwang • Moody Middle School • Henrico
- 08-3220 The Effect of Listening or Answering Questions on a Cell Phone or Bluetooth on a Human's Reaction Time to a Ruler Drop  
Emily Irwin • Moody Middle School • Henrico
- 08-3207 The Effect of a Cell Phone Conversation on Reaction Time  
John Irwin • Moody Middle School • Henrico
- 08-3223 The Effect of Age on a Person's Pulse When a Slug is Placed on Their Forearm  
Kourtnee Jones • Moody Middle School • Henrico
- 08-2853 The Effect of School Level (Age) on Ability to Navigate Particular School Crosswalks  
Hailey Lane • Manchester Middle School • Chesterfield
- 08-3010 The Effect of Different Types of Sweeteners on a Blind Sugar Cookie Taste Test  
Talie Lerner • Moody Middle School • Henrico
- 08-2770 The Effect of Consuming Different Flavored Candy on the Test Scores  
Samantha Rafalowski • Moody Middle School • Henrico
- 08-3051 The Effect of Preschool Education on the Mean Length of Utterance of a Two-Year-Old  
Rachel Wright • Moody Middle School • Henrico
- 08-3150 The Effect of Bloom's Revised Taxonomy on Recalling Numerical Information  
Andrea Yeh • Moody Middle School • Henrico

## Biochemistry

- 08-2835 The Effect of Different Concentrations of Malate on the Reaction Time with Malate Dehydrogenase and a Mutant (H90Q) of Malate Dehydrogenase  
Samuel Bell • Manchester Middle School • Chesterfield
- 08-2841 The Effect of Temperature on Fruits with Enzymes  
Minh Chau • Manchester Middle School • Chesterfield
- 08-3084 The Effect of Different Levels of Enzyme Concentration on the Amount of Juice an Apple Will Produce  
Jodie Ehlers • Moody Middle School • Henrico

- 08-2756 The Effect of Temperature on the Reaction Between Hydrogen Peroxide and the Catalase Enzyme  
Mitchell Ford • Manchester Middle School • Chesterfield
- 08-2797 The Effect of Different Fruits on How Much Gelatin Jells  
Laura Palombella • Manchester Middle School • Chesterfield
- 08-3208 The Effect of Various Antioxidants on the Quenching of Superoxide Free Radicals  
Sameer Sarkar • Moody Middle School • Henrico
- 08-3018 The Effect of Different Acidic Fruit Juices on How Long It Takes an Apple to Brown  
Meghan Simpson • Moody Middle School • Henrico

## Botany

- 08-3058 The Effect of Water Temperature on the Growth of Grass in Centimeters  
Melissa Bresko • Liberty Middle School • Hanover
- 08-3132 The Effect of High Nitrogen Fertilizer on Snow Pea Morphology  
Rosie Easter • Oak Knoll Middle School • Hanover
- 08-3068 The Effect of Light Intensity on Growth and Coloration of *Brassica rapa*  
Lauren Kesler • Oak Knoll Middle School • Hanover
- 08-3059 The Effect of Hydroponic Nutrient Solution vs. Water on Plant Health and Growth  
Tyler Kittel • Liberty Middle School • Hanover
- 08-2860 The Effect of Different Concentrations of Hydrogen Peroxide on Mung Bean Seed Germination  
Sarah Murphy • Moody Middle School • Henrico
- 08-2781 The Effect of Soil Type on Germination  
Katherine Peachee • Manchester Middle School • Chesterfield
- 08-3315 The Effect of Different Water Types on Grass Growth  
Jacob Pope • Moody Middle School • Henrico
- 08-2957 The Effect of Vitamins Added to Water on Plant Growth  
Renee Ritchie • Moody Middle School • Henrico
- 08-3031 The Effect of Different Doses of Radiation from a Medical Linear Accelerator on the Germination of Lentil Seeds  
Molly Robinson • Moody Middle School • Henrico
- 08-3296 The Effect of Fertilizer on the Fractal Dimension of an AstroPlant Leaf  
Petra Shaffer-Gottschalk • Colonial Heights Middle School • Colonial Heights
- 08-3301 The Effect of the pH of Soil on the Fractal Dimension of the Cell of an AstroPlant Leaf  
Natasha Sheybani • Colonial Heights Middle School • Colonial Heights
- 08-3157 Dehydration Showdown: Plant vs. Fungus; The Effect of Calcium Chloride on the Dehydration Rate of Plants vs. Fungi Cells  
Sara Surface • Lucille Brown Middle School • Richmond
- 08-2926 The Effect of Plant Mazes on Plants Reaching Sunlight  
Dorothy Willis • Powhatan Jr. High School • Powhatan

## Chemistry A *Sponsored by: Arista Laboratories*

- 08-3072 The Effect of Four Different Solutions on the Amount of Time for the Bubble Produced to Pop  
Nikita Amin • Moody Middle School • Henrico

- 08-3003    **The Effect of the Type of Soap on How Long Fat Reacts**  
                  Pete Berinato • Moody Middle School • Henrico
- 08-3105    **The Effect of Different Types of Fruits and Vegetables on the Amount of Voltage that a Battery Can Produce**  
                  Shyam Bhat • Moody Middle School • Henrico
- 08-3218    **Mentos and Soda Explosion!**  
                  Sydni Brawley • Powhatan Jr. High School • Powhatan
- 08-3190    **The Effect of Brand on the Adhesion of Medical Adhesive Strips in an Aqueous Environment**  
                  Hayden Breedlove • Moody Middle School • Henrico
- 08-2714    **The Effect of the Color of an Ice Cube on Melting Time**  
                  Sarah Cornett • Matoaca Middle School (East) • Chesterfield
- 08-3056    **The Effect of Temperature on Viscosity**  
                  Joshua Donohue • Oak Knoll Middle School • Hanover
- 08-3023    **The Effect of Soda Type on Time Taken for an Eggshell to Deteriorate**  
                  Neelam Jhurani • Moody Middle School • Henrico
- 08-3194    **The Effect of Different Juices on the Amount of Ascorbic Acid**  
                  Roshni Malik • Moody Middle School • Henrico
- 08-2951    **The Effect of Different Preservatives on the Spoiling Time of Mangos**  
                  Nguyen Tuyetson • Manchester Middle School • Chesterfield

## **Chemistry B**      *Sponsored by: Arista Laboratories*

- 08-2763    **The Effect of Different Types of Orange Juice on the Number of Drops It Takes for Vitamin C Indicator Solution to Change Color**  
                  Sathya Areti • Moody Middle School • Henrico
- 08-3225    **The Effect of Battery Brand on the Number of Pictures a Digital Camera Can Take**  
                  Kelsey Jenkins • Moody Middle School • Henrico
- 08-2715    **The Effect of Polar and Non-Polar Amino Acids to Inhibit Ice Recrystallization**  
                  Prasanna Joshi • Moody Middle School • Henrico
- 08-2921    **The Effect of Changing Size of the Tablets of an Alka-Seltzer on the Rate of the Chemical Change**  
                  Harley King • Powhatan Jr. High School • Powhatan
- 08-2907    **The Effect of Different Types of Flour on Muffin Density**  
                  Aaron Minnick • Manchester Middle School • Chesterfield
- 08-3064    **The Effect of Different Types of Plant Material on Ethanol Production**  
                  Nathan Nayda • Liberty Middle School • Hanover
- 08-3131    **The Effect of Metal Electrode Resistances on the Voltage-Current Relationship**  
                  Rohan Pidaparti • Moody Middle School • Henrico
- 08-2987    **The Effect of Different Conditions of String Beans on the Amount of Gas Released By Each Type of String Beans**  
                  Garrick Sin • Moody Middle School • Henrico
- 08-3243    **The Promise of Power**  
                  Christina Stephens • Oak Knoll Middle School • Hanover
- 08-3161    **Will Salt Form or Bust Rust?: The Effect of Salt on Rust**  
                  Kate Webb • Lucille Brown Middle School • Richmond

## Earth & Space Sciences

- 08-3095 The Effect of a Coronal Mass Ejection's Position in Relation to the Sun on Its Velocity  
Layla Abi-Falah • Moody Middle School • Henrico
- 08-2755 The Effect of the Gravitational Pull From the Moon on Ocean Tides  
Taylor Bassett • Powhatan Jr. High School • Powhatan
- 08-3412 The Effect of Radiant Heat on the Temperature of Heteronuclear and Homonuclear Gases  
Jack Booth • Moody Middle School • Henrico
- 08-3274 Reconstructing the Lake Nyos Disaster  
Madelyn Clark • Oak Knoll Middle School • Hanover
- 08-3164 Rain, Rain, Go Away, Wash My Soil Away Some Other Day: The Relation of Farming Techniques and Soil Erosion  
Lewis Lawrence • Lucille Brown Middle School • Richmond
- 08-3219 The Effect of *Eisenia foetida* on the Nitrate Content Found in Composted Coffee Grounds and Soil  
Raleigh Matteo • Moody Middle School • Henrico
- 08-3236 The Effect of Different Mixtures of Soil on the Time It Takes a Lego Brick to Fall Over During Soil Liquefaction  
Taylor Petersen • Moody Middle School • Henrico
- 08-2788 The Effect of Tsunami Type vs. the Speed and Height of Waves  
Rachael Seiler • Manchester Middle School • Chesterfield
- 08-2869 The Effect of Pressure on Cloud Formation  
William Welch • Moody Middle School • Henrico
- 08-3160 Smoking Away the Environment: The Effect of Cigarette Smoke on Climate Change  
Sean Youngstone • Lucille Brown Middle School • Richmond

## Engineering A

- 08-3293 Turn, Windmill, Turn  
Madison Clark • Lucille Brown Middle School • Richmond
- 08-2851 The Effect of Ventilation on Humidity  
Anna-Leigh Dale • Manchester Middle School • Chesterfield
- 08-2727 The Effect of Different Types of Bridges of the Amount of Weight They Can Hold  
Cole Jaconski • Powhatan Jr. High School • Powhatan
- 08-2861 The Effects of the Bridge Design on the Weight Limit of the Bridge  
Ryan Katona • Moody Middle School • Henrico
- 08-3158 The Effects of Aerodynamic Design on Flight Distance  
Yousef Shami • Lucille Brown Middle School • Richmond
- 08-3030 The Effect of Different Construction Aggregate Materials on Their Ability to be Penetrated by a Constantly Applied Weight  
Reed Smith • Moody Middle School • Henrico
- 08-2826 The Effect of Amount of Weight Added to a Geodesic Dome on the Distance from the Floor  
Sammy Spott • Powhatan Jr. High School • Powhatan

- 08-3202     The Effect of the Number of Sides on the Length of Time a Structure Can Resist  
Constant Wind  
              Andrew Vitkus • Moody Middle School • Henrico
- 08-3205     The Impact of Environmental Variables on the Performance of Different Solar Devices  
              Lena Vogel • Moody Middle School • Henrico
- 08-2828     Finding the Energy Solution: The Effect of Enclosing a Windmill in a Tunnel on the  
Energy Produced at Different Speeds  
              Sam Wojcicki • Powhatan Jr. High School • Powhatan

## Engineering B

- 08-3238     The Effect of Column Design on the Weight It Can Support  
              Thomas Belvin • Moody Middle School • Henrico
- 08-2885     The Effect of Different Bridge Types on the Strength of Bridges  
              James Brothers • Manchester Middle School • Chesterfield
- 08-2964     Can a Laser Measure Object Length and if so, How Accurately?  
              Adam Davis • Manchester Middle School • Chesterfield
- 08-3107     The Effect of the Shape of the Arch Keystone on the Weight Supported  
              Katharine Graham • Moody Middle School • Henrico
- 08-3022     The Effect of Grades of Gasoline on the Run Time of a 16.5 HP Engine  
              Dhruv Sethi • Manchester Middle School • Chesterfield
- 08-3159     "Beyond Bernoulli": The Effect of Wing Shape on Amount of Lift Wings Can Get  
              Rachel Shannon • Lucille Brown Middle School • Richmond
- 08-2904     The Effect of Weight Applied on Paper Geodesic Domes  
              Davis Testin • Manchester Middle School • Chesterfield
- 08-3163     The Effect of Different Foundation Materials on a Building's Resistance to an Earthquake  
              Daniel Wagner • Lucille Brown Middle School • Richmond
- 08-3112     The Effect of Type of Wood on the Distance a Plastic Ball Can Be Thrown by an Einarm  
Catapult  
              Christian Wheeler • Moody Middle School • Henrico

## Environmental Science

- 08-3211     The Effect of Different Types of Gases on the Amount of Carbon Dioxide the Gas  
Contains and its Impact on Global Warming  
              Mounika Abbareddy • Moody Middle School • Henrico
- 08-3136     The Effect of Fertilizer on the Amount of Algae in Water  
              Aileen Bi • Moody Middle School • Henrico
- 08-3094     The Effect of Earthworms on Plant Growth  
              Delaney Brown • Moody Middle School • Henrico
- 08-3200     The Effect of Air Pollutants on the Redness of the Sky  
              Marina Girgis • Moody Middle School • Henrico
- 08-2803     The Effect of Various Plastic Sorting Methods on the Separation of Chopped Plastic  
              Lydia Guay • Manchester Middle School • Chesterfield
- 08-3083     The Effect of Different Natural Absorbent Materials on the Absorption of Motor Oil  
              Apollo Jain • Moody Middle School • Henrico

- 08-3100 The Effect of the Particulate Matters, Coal Dust, Silt, Wood Ashes, and Sand on the Albedo Impact of the Melting Rate of Ice  
Stephanie Lugbill • Moody Middle School • Henrico
- 08-2849 The Effect of Water During Its Different Stages of Purification on Its pH Level  
Kara McGaughey • Manchester Middle School • Chesterfield
- 08-3101 The Effect of Fertilizers on the pH of Water  
Ian Sutherland • Moody Middle School • Henrico
- 08-2942 The Effect of the Quantity of Ice on the Temperature of the Water When It Melts  
James Sylvester • Moody Middle School • Henrico
- 08-2776 The Effect of Different Dune Structures on Erosion Due to Wind  
Elly Weber • Moody Middle School • Henrico
- 08-3140 The Effect of Location Around a Richmond Suburb on the Amount of Airborne Particles in the Air  
Stephanie Zhang • Moody Middle School • Henrico

## Math and Computer Science

- 08-3224 The Effect of Devices That Emit Radio Waves on Wireless Bandwidth  
Shannon Salzman • Moody Middle School • Henrico
- 08-3088 The Effect of Dosage on a Thoroughbred's Race Time  
Sarah Stratton • Moody Middle School • Henrico
- 08-2764 The Effect of Differing Types of Port Scans on How Long a Sniffer Takes to Detect Them  
William Thomason • Manchester Middle School • Chesterfield
- 08-3187 The Effect of Temperature on CD-R's Memory  
Andrew Toms-lucy • Oak Knoll Middle School • Hanover

## Medicine & Health

- 08-3214 The Effect of Heredity on the Similarities Between Two People's Fingerprints  
Brittany Anderson • Moody Middle School • Henrico
- 08-2940 The Effect of Knowledge of and Experience with Sun Damage on the Frequency of Sunscreen Usage in Middle Schoolers  
Katherine Baumann • Moody Middle School • Henrico
- 08-2857 Super Size or Serving Size?  
Eric Bianchi • Manchester Middle School • Chesterfield
- 08-3262 The Effects of Bleach on Different Types of Mammalian Hair  
Bryna Butt • Lucille Brown Middle School • Richmond
- 08-3155 The Effect of a Magnetic Field on a Person's Sense of Direction  
Daniel Jagdmann • Moody Middle School • Henrico
- 08-2966 The Effect of Different Activities on Carbon Dioxide Output  
Johnny Oliver • Manchester Middle School • Chesterfield
- 08-2769 The Effect of Time Spent Exercising on Reflex Test Score  
Alia Prasad • Moody Middle School • Henrico
- 08-3192 The Effect of Different Sports on the Lung Capacity of a Middle School Student  
Rhianna Ross • Moody Middle School • Henrico

- 08-3235 The Effect of Different Exercises on One's Heart Rate  
Jesse Shaffer • Moody Middle School • Henrico
- 08-3249 The Effect of Petting a *Canis domesticus* on Human Blood Pressure  
Claire Tito • Moody Middle School • Henrico
- 08-2884 The Effect of Musical Instruments on Lung Capacity  
Brian Walter • Manchester Middle School • Chesterfield
- 08-3042 The Effect of Sugar on Heart Rate  
Annie Weidhaas • Moody Middle School • Henrico
- 08-3032 The Effect of the Consumption of Glucose on Human Heart Rate After Engaging in a Physical Activity  
Anum Zafarullah • Moody Middle School • Henrico

## Microbiology

- 08-2760 The Effect of Different Biocides on the Rate of Kill of *Bacillus subtilis*  
Saumil Bandyopadhyay • Moody Middle School • Henrico
- 08-2859 The Effect of Hydrogen Peroxide on the Bacterial Growth on Kitchen Sponges  
Lauren Bennett • Moody Middle School • Henrico
- 08-2758 The Effect of the Amount of Time an Apple Touches the Ground on the Harmfulness of the Bacteria  
Leon Jia • Manchester Middle School • Chesterfield
- 08-3228 The Effect of Elapsed Time on the Growth of Bacteria in Water Bottles  
Kathryn Marqueen • Moody Middle School • Henrico
- 08-2981 The Effect of Area of a Car Swabbed on the Number of Bacterial Colonies Grown in a Petri Dish  
Robert Omberg • Moody Middle School • Henrico
- 08-3066 A Comparison Between the Bacteria Count and the Antibacterial Properties of the Saliva in a Dog's Mouth and a Human's Mouth  
Caitlin Paisley • Moody Middle School • Henrico
- 08-3237 The Effect of Organic vs. Non-Organic Bread on the Rate of Decomposition  
Sydney Petersen • Moody Middle School • Henrico
- 08-3244 The Effect of Sugar Substitutes on Yeast Reproduction  
Stephen Self • Moody Middle School • Henrico
- 08-3093 The Effect of Post-Drinking Duration on the Amount of Bacteria in a Bottle of Water  
Cindy Song • Moody Middle School • Henrico
- 08-3021 The Effect of Different Levels of Saturated Fat on the Number of Days It Takes for Mold to Appear on a Muffin  
Anna Wong • Moody Middle School • Henrico
- 08-3040 The Effect of Different Concentrations of Sodium Hypochlorite on the Amount of Sodium Hypochlorite Resistance in *Staphylococcus aureus*  
Conan Zhao • Moody Middle School • Henrico

## Physics A

- 08-2899 The Effect of Parachute Material on Time Taken for Landing  
Gurjas Bajaj • Manchester Middle School • Chesterfield
- 08-3129 The Effect of Surface Area of Ice on Melting Time  
Erin Brunelle • Manchester Middle School • Chesterfield

- 08-3012 The Effect of the Pitch of the Sound on the Distance from the Source of the Sound that the Sound Can Still Be Heard  
Brandon Buncher • Moody Middle School • Henrico
- 08-2784 The Effect of Different Types of Insulation on How Much Heat is Conducted Between Two Wooden Boards  
Karthik Chetty • Moody Middle School • Henrico
- 08-3145 Different Loop Circumferences vs. Amount of Height Needed From Hill  
Jenna Dickerson • Manchester Middle School • Chesterfield
- 08-2881 The Effect of Barrel Length on the Accuracy of a Paintball Marker  
Josh Dvorak • Manchester Middle School • Chesterfield
- 08-3212 The Effect of Different Angles of Attack on the Associated Amount of Lift  
Matthew Gerschick • Moody Middle School • Henrico
- 08-3229 Come Sail Away With Me?  
Ellis Kessler • Oak Knoll Middle School • Hanover
- 08-2968 The Effect of Different Kinds of Parachute Fabrics on the Splatter of a Tomato  
Eric Murphy • Manchester Middle School • Chesterfield
- 08-2780 The Effect of Velocity on the Circular Area of a Dropped Liquid Stain  
Erin Rieck • Manchester Middle School • Chesterfield
- 08-3052 The Effect of Different Types of Containers on the Temperature of Coffee  
Vivian Tang • Moody Middle School • Henrico
- 08-3017 The Effect of Surface Area on Parachute Drop Time  
Andrew Tynes • Moody Middle School • Henrico
- 08-2804 The Effect of the Type of Flooring on Dance Turns Per Ten Seconds  
Emma Wolf • Powhatan Jr. High School • Powhatan

## Physics B

- 08-2930 The Effect of Running Starts on Jumping Distance  
Coleman Adams • Powhatan Jr. High School • Powhatan
- 08-3027 Turbulence and Wing Shape  
Arius Aibara • Manchester Middle School • Chesterfield
- 08-3028 The Effect of Variation of Mass on the Levitation Strength of Magnetic Repulsion  
Tarun Ganesh • Manchester Middle School • Chesterfield
- 08-3015 The Effect of Different Angles to the Backboard on How Many Shots Someone Can Make  
Michael Lewis • Moody Middle School • Henrico
- 08-2791 The Effect of Temperature on How Far a Rubber Band Can Stretch  
Catherine Liptak • Manchester Middle School • Chesterfield
- 08-2989 The Effect of Delaying the Addition of Milk to Coffee on the Final Drinking Temperature  
Jonathan Morrissey • Moody Middle School • Henrico
- 08-3079 The Effect of Increasing Amounts of Salt Dissolved in Water on the Buoyancy of an Object  
Michela Nardi • Moody Middle School • Henrico
- 08-2880 The Effect of Different Parachute Materials on the Time of the Descent  
Kieran Raphael • Manchester Middle School • Chesterfield
- 08-2722 The Effect of Humidity on the Drying Time of Paint  
Eli Schellenberg • Powhatan Jr. High School • Powhatan

- 08-3114 The Effect of Projectile Trajectory on Wave Amplitude  
Jake Shaw • Moody Middle School • Henrico
- 08-3144 The Effect of the Angular Orientation of the Solar Cell on the Voltage Generated  
Azeb Yirga • Moody Middle School • Henrico
- 08-2872 Smoke Ring Physics  
Connor Yoke • Manchester Middle School • Chesterfield

## Zoology

- 08-2847 The Effect of Substances on *Daphnia's* Heart Rate  
Keith Bahm • Manchester Middle School • Chesterfield
- 08-3029 The Effect of Being Tacked Up on the Pulse Rate of *Equus caballus*  
Allie Bing • Moody Middle School • Henrico
- 08-2766 The Effect of Different Types of Food Given to Crickets on How Many are Still Alive after a Certain Number of Days  
Bradley Bittmann • Moody Middle School • Henrico
- 08-3657 The Effect of Cut Placement on the Regeneration of *Planaria*  
Thomas Hunold • Byrd Middle School • Henrico
- 08-3176 The Effects of Repetitive Observations by Dogs on How Long It Takes Them to React to Stimuli  
Bailey Lambert • Oak Knoll Middle School • Hanover
- 08-2795 The Effect of Different Liquids on the Heart Rate of *Daphnia*  
Megan Morris • Manchester Middle School • Chesterfield
- 08-3099 The Effect of Canine Intelligence of Multiple Breeds on the Number of Sequences Taken to Learn an Assigned Task  
Mary Melissa O'Neill • Moody Middle School • Henrico
- 08-3152 The Effect of Color of a Birdfeeder on How Much Birdseed is Consumed  
Danielle Stephens • Moody Middle School • Henrico
- 08-2867 The Effect of Different Types of Food on the Growth Rate of Striped Bass  
Sara Taylor • Moody Middle School • Henrico
- 08-3111 The Effect of Bird Calls on the Reactions of Cats  
Elisabeth Virak • Manchester Middle School • Chesterfield

# Senior Division Exhibits

# Former Grand Prize Winners

**2007**



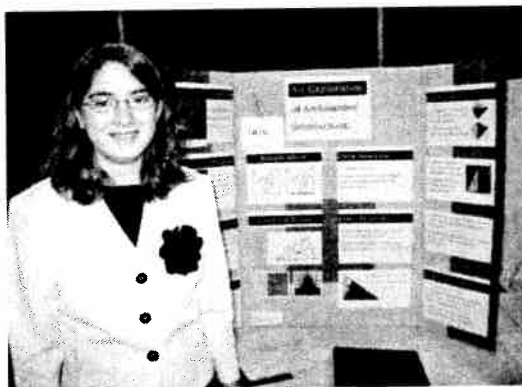
Sohini Sircar, Senior Medicine & Health Entry, Maggie L. Walker Governor's School for Government & International Studies

**2006**



Sohini Sircar, Senior Medicine & Health Entry, Maggie L. Walker Governor's School for Government & International Studies

**2005**



Kaitlyn Tuley, Senior Mathematics Entry, Math & Science High School at Clover Hill, Chesterfield County

**2004**



Jordan Wilson, Senior Computer Science Entry, Math & Science High School at Clover Hill, Chesterfield County

**2003**



Marissa Kessler, Senior Biochemistry Entry, Godwin High School, Henrico County

# Senior

## Behavioral & Social Sciences *Sponsored by: Colony Management Company*

- 08-3373 The Effect of Frequency of Texting on Typing Speed  
Jessica Arndt • Deep Run High School • Henrico
- 08-3384 The Effect of Warping the Colored Color Words During the Administration of a Classic Stroop Task on Stroop Interference  
Leah Carlson • Deep Run High School • Henrico
- 08-3514 The Effect of Mirror Visual Feedback on Drawing Time with A Non-Dominant Hand  
Ruth Chen • Hanover High School • Hanover
- 08-3466 The Effect of Senses Used on Reaction Time(s)  
Ryan Eckart • Deep Run High School • Henrico
- 08-3564 The Effect of Gender on the Short-Term Memory Retention of 15-16-Year-Olds  
Chelsea Jackson • Godwin High School • Henrico
- 08-3379 The Effect of Gender on Directional Orientation  
Andreas Keller • Godwin High School • Henrico
- 08-3596 The Effect of Music Amplitude on a Person's Reaction Time  
Chelsea Mills • Deep Run High School • Henrico
- 08-3436 The Effect of Absolute Poverty on Crime  
Caroline Newcomb • Maggie Walker Governor's School •
- 08-3336 The Effect of IQ on Learning Style  
Kay Rodriguez • Godwin High School • Henrico
- 08-2995 Gender Bender: Which Parent Are You More Like? The Effect of Gender on the Number of Exact Matches on a Bem's Sex Role Inventory Between Parents and Self  
Daniel Rosenfeld • Freeman High School • Henrico
- 08-3549 The Effect of Communication Device on Concentration  
Matthew Rowe • Godwin High School • Henrico
- 08-3353 The Effect of Subliminal Messages on the Inclination of a Customer to Buy a Product  
Ariel Spagnolo • Deep Run High School • Henrico
- 08-3216 The Effect of Cell Phone Use on Foot Reaction Time  
Shannon Wheeler • Godwin High School • Henrico

## Biochemistry

- 08-3082 The Effect of Different Types of Sweeteners on Cake Height  
Jeff Davis • Patrick Henry High School • Hanover
- 08-3089 The Effect of Microwave Heating on the Degradation of Fatty Acids  
Nidhi Desai • Godwin High School • Henrico
- 08-3309 The Effect of Various Edible Coatings on the Inhibition of Enzymatic Browning of Apples  
Arielle Efron • Godwin High School • Henrico
- 08-3441 The Effect of Adding Biosolve to Different Chemicals and How Pure the Water Becomes  
Cory Glembot • Patrick Henry High School • Hanover
- 08-3361 Engineering of *Staphylococcus aureus* Sortase (SrtA) by Directed Evolution  
Erin Kim • Math & Science High School at Clover Hill • Chesterfield

- 08-3371 Metagenomics: Environmental Genome Sequencing of the James River Estuary  
Grace Lee • Math & Science High School at Clover Hill • Chesterfield
- 08-3583 The Effect of pH on Hydrogen Production in Sulfur-Deprived *Chlamydomonas reinhardtii*  
Matthew Magnusson • Math & Science High School at Clover Hill • Chesterfield
- 08-3581 The Effect of Resveratrol on Adipose Stem Cell Growth, Differentiation, Survival, and Genomic Stability  
Suraj Mishra • Godwin High School • Henrico
- 08-3473 The Effects of Ethanol on the Behavior and Ethanol Concentration in *Drosophila* Lacking the Myospheroid Gene  
Aditya Mothadaka • Godwin High School • Henrico
- 08-3276 The Effect of Aeration on Yeast Metabolism  
Will Mullin • Deep Run High School • Henrico
- 08-3519 The Effect of Cyclooxygenase-2 Inhibition and Radiation on the Growth of Head and Neck Cancer Cells  
Carolyn Song • Godwin High School • Henrico
- 08-3201 Will Different Types of Oranges Affect Their Levels of Vitamin C?  
Nathan Thomson • Freeman High School • Henrico
- 08-3318 To Freeze or Not to Freeze: Chemical Cryoprotectants on Plant Tissue  
Melanie Wu • Math & Science High School at Clover Hill • Chesterfield

## Botany

- 08-3521 The Effects of Glyphosate and Diquat on the Health of *Lemna minor* and *Elodea densa*  
Quinn Brogan • Godwin High School • Henrico
- 08-3443 The Effect of Spice Solutions on Weed Control  
James Fang • Godwin High School • Henrico
- 08-3377 The Effect of Different Light Spectrums on Plant Growth  
Stephanie Harris • Deep Run High School • Henrico
- 08-3449 The Effect of Different Quantities of Fertilizer on the Growth of Grass  
Thomas Jordan • Hanover High School • Hanover
- 08-3430 The Effect of Recycled Water on the Growth of *Tulipa clusiana*  
Edward Kong • Math & Science High School at Clover Hill • Chesterfield
- 08-3501 The Effect of the Light Color on the Growth of Daffodils  
Andrew Kowal • Deep Run High School • Henrico
- 08-3007 The Effect of Phosphorus on the Growth of *Raphanus sativus* (Radish) Bulbs  
William Nayda • Patrick Henry High School • Hanover
- 08-2856 The Effect of Urban Environments on *Poa pratensis* Height  
D. Lee Reid III • Patrick Henry High School • Hanover
- 08-2980 The Effect of Sunlight on *Pisum sativum*  
Virginia Roach • Patrick Henry High School • Hanover
- 08-3347 The Effect of Different Types of Soil on Plant Height  
Cody Taylor • Hanover High School • Hanover
- 08-3009 The Effect of Spacing on *Phaseolus limensis* Plant Height  
Samuel Wallingford • Patrick Henry High School • Hanover

## Chemistry

*Sponsored by: Evonik Goldschmidt Corporation*

- 08-3226    **Nanometer-Scale Teflon Coatings**  
              Max Anderson • Patrick Henry High School • Hanover
- 08-3528    **The Effect of Water Content on Phase Separation in an Ethanol-Gasoline (E10) Fuel Mixture**  
              Matthew Boegner • Godwin High School • Henrico
- 08-3365    **The Effect of the Amount of Baking Soda on the Burning Time of a Potassium Nitrate Smoke Mixture**  
              Philip Bytchkov • Deep Run High School • Henrico
- 08-3584    **The Effect of Snow and Ice Melting Agents on the Amount of Steel Corrosion Due to Acid Rain**  
              Erica Cousins • Maggie Walker Governor's School •
- 08-3420    **The Effect of Photographic Paper Developer Temperature on the Light Density of the Print**  
              Virginia Cross • Maggie Walker Governor's School •
- 08-3098    **The Effect of Different Materials on the Strength of Recycled Paper**  
              Amelia Earnest • Patrick Henry High School • Hanover
- 08-3363    **The Effect of Environmental Temperature on Fuel Cell Efficiency**  
              Clayton Geipel • Godwin High School • Henrico
- 08-2979    **The Effect of Different Household Solutions on the Enzymatic Browning of Apple Slices**  
              Daniel Gonet • Patrick Henry High School • Hanover
- 08-3316    **The Effect of Different Flame-Retardants on the Burn Time of Cotton**  
              Carter King • Math & Science High School at Clover Hill • Chesterfield
- 08-3197    **The Effect of Different Food Groups on the Amount of Calories Stored**  
              Virginia Mathurin • Patrick Henry High School • Hanover
- 08-3470    **The Effect of the Type of Candle Wax on the Candle's Burning Time**  
              Carina Mohammed • Math & Science High School at Clover Hill • Chesterfield
- 08-3658    **The Effect of Different Solutions on Corrosion Rate**  
              Scott Radford • Math & Science High School at Clover Hill • Chesterfield
- 08-3170    **The Effect of Length of Time and Storage Environment on the Amount of Vitamin C in Fruit**  
              Alexis Samloff • Deep Run High School • Henrico

## Computer Science

- 08-3440    **Natural Language Programming**  
              Mukarram Ahmad • Math & Science High School at Clover Hill • Chesterfield
- 08-3432    **The Effect of the Type of Materials a Wireless Signal Must Pass Through on its Strength**  
              Gabrielle Badura • Math & Science High School at Clover Hill • Chesterfield
- 08-3343    **The Effects of Type of Environment on Signal Strength**  
              Chase Bleyl • Godwin High School • Henrico
- 08-3317    **The Effect of the DMA Controller on Linux Kernel Random Number Generator Output Entropy**  
              Thomas Delgado • Math & Science High School at Clover Hill • Chesterfield
- 08-3531    **Design Questions Involved with an Adjustable Interval Marking System**  
              Benjamin Spence • Godwin High School • Henrico

## Earth & Space Sciences

*Sponsored by: Luck Stone Corporation*

- 08-3013 The Effect of Weathering on the Breakdown of Road Surface Materials  
Quinn Gomola Mullin • Patrick Henry High School • Hanover
- 08-3174 The Effect of the Amount of Sky Glow in an Area on the Number of Night Features Observed in the Sky  
Allison Hammond • Deep Run High School • Henrico
- 08-3348 The Effect of Astral Energy and Synthetic Magnetic Materials Have on Earth's Localized Magnetic Field  
Eric Johnston • Math & Science High School at Clover Hill • Chesterfield
- 08-3522 The Effects of Atmospheric Condition Combinations on the Prevalence of Severe Weather Phenomena During Outbreaks  
Branden Katona • Godwin High School • Henrico
- 08-3633 An Analysis of Climate Change Using Lagged Time Series Regression Models  
Adarsh Ramakrishnan • Godwin High School • Henrico
- 08-3569 Elastic Rebound Theory  
Cole Stinchfield • Deep Run High School • Henrico
- 08-3603 The Effect of El Niño (ENSO Index) on the Occurrence of Atlantic Hurricanes  
Stewart Walker • Godwin High School • Henrico
- 08-3399 The Effect of Increased Temperature on the Evaporation of Fresh and Salt Water  
Krystal Xu • Deep Run High School • Henrico

## Engineering

*Sponsored by: Thomas & Betts Power Solutions*

- 08-3593 Characterization of Ionic Polymer Metal Composite (IPMC) Forces and Movement  
Robert Brik • Godwin High School • Henrico
- 08-3427 Which "Props" Deserve the Props: The Effect of Number and Angle of Blades on a Propeller on RPM and Electricity Output  
Jenny Carlson • Math & Science High School at Clover Hill • Chesterfield
- 08-3472 The Effect of Wire Amount on the Number of Decibels Produced From a Loudspeaker  
Andrew Chau • Math & Science High School at Clover Hill • Chesterfield
- 08-3500 The Effect of Sand to Cement Ratios on the Strength of Concrete  
John Crenshaw • Godwin High School • Henrico
- 08-3402 The Effect of Different Hull Designs on the Stability of Boats  
Anthony D'Alessandro • Deep Run High School • Henrico
- 08-3555 Can Renewable Vegetable-Based Oils Play a Role in Reducing Friction?  
Jonathan Guinther • Godwin High School • Henrico
- 08-3621 The Effect of Different Capacitor Circuit Shapes on the Division of Current and Voltage  
David Newill-Smith • Math & Science High School at Clover Hill • Chesterfield
- 08-3478 The Effects of the Production of Electrorheological Fluid-driven Technologies on the Recovery Rates of Hydro-Carbons: Optimizing Oil Industries  
Srihitha Pesaru • Godwin High School • Henrico
- 08-3359 The Effect of the Installation of Different Aircraft Winglets on the Aerodynamic Drag of the Wingtip  
Nicolas Ruiz • Math & Science High School at Clover Hill • Chesterfield

08-3184 The Effect of Various Wing Shapes on the Flight Time Reached by a Balsa Wood Catapult Glider

George Varghese • Deep Run High School • Henrico

08-3543 The Effect of the Design of a Wing on the Amount of Lift Produced

Alex Yachanin • Godwin High School • Henrico

## Environmental Science

08-3589 The Effect of *Pseudomonas aeruginosa* (ml) on the Decomposition of Complex Hydrocarbon to Carbon Dioxide Gas (ppm)

Amrita Banerjee • Godwin High School • Henrico

08-3467 The Effect of Plant Life on the Percolation of Water

Ryan Bram • Deep Run High School • Henrico

08-3573 The Effect of Different Radiation Intervals on the Number of Offspring Produced by Fruit Flies (*D. melanogaster*)

David Caravati • Godwin High School • Henrico

08-3482 The Effect of UVA and UVB Rays on Brown *Planaria* Regeneration

Olivia Cavalieri • Godwin High School • Henrico

08-3048 The Effect of Different Sealants on the Change in Mass of Limestone by Acid Rain in Virginia

Victoria Johann • Godwin High School • Henrico

08-3335 The Effectiveness of a Photovoltaic Module to Generate Heat During a Virginia Winter

Dean Katsaros • Math & Science High School at Clover Hill • Chesterfield

08-3368 The Effect of Alternagel on the Reduction of Phosphorus Runoff

Stephanie Marqueen • Freeman High School • Henrico

08-2962 The Effect of Dissolved Oxygen Levels on the Severity of Fish Kills

Stephanie McDonnell • Godwin High School • Henrico

08-3458 The Effect of Erosion Control Methods on the Amount of Erosion

Rebecca Stoneman • Godwin High School • Henrico

08-3513 The Effect of Sodium Azide on Oxygen Reduction

Shanna Su • Godwin High School • Henrico

08-3511 The Effect of Antacids on the Plant Growth (mm) of Plants Recovering from Acid Rain

Scott Swanson • Deep Run High School • Henrico

08-3413 The Effect of Types of Pesticide on the Number of EPA Water Health Violations

Natalie Wong • Maggie Walker Governor's School •

## Mathematics

*Sponsored by: Virginia Credit Union*

08-3568 Smoking is Bad For You?: A Statistical Analysis of Tobacco Trends in the U.S., Adverse Health Effects of Tobacco, and Gender Differences in Health Effects

Rishabh Bajekal • Godwin High School • Henrico

08-3378 The Effect of Earned Run Average on a Baseball Team's Winning Percentage

Nick Childress • Deep Run High School • Henrico

08-3636 The Effect of Game Statistics on the Outcome of Football Games

David Morton • Deep Run High School • Henrico

08-3646 The Effect of Free Throw Shooting Percentage on Winning Percentage

Nick Pericle • Deep Run High School • Henrico

- 08-3586 World Heritage Sites and their Impact on Tourism  
Amit Shukla • Math & Science High School at Clover Hill • Chesterfield
- 08-3495 An Investigation into the Intricacies of the Polynomial  $n^2 + n + 41$   
Zachary Turner • Godwin High School • Henrico

## Medicine & Health

- 08-3118 The Effect of Cooking Different Types of Fruits and Vegetables on their Vitamin C Content  
Hunter August • Deep Run High School • Henrico
- 08-3437 The Effect of Allowing Smoking in a Restaurant on Air Quality  
Susan Ballentine • Maggie Walker Governor's School •
- 08-3352 The Effect of Droplet Infection Prevention Technique on the Location and Concentration of Mucus Droplet Dispersion  
William Farmer • Maggie Walker Governor's School •
- 08-3453 The Effect of Exercise Intensity on the Carbon Dioxide Levels in Exhaled Breath  
Andrew Headley • Deep Run High School • Henrico
- 08-3653 The Correlation Between the Average Intake of High-Fructose Corn Syrup Per Person and the Percentage of the Population that was Obese Between the Early 1960s and 2000  
Martha Kahlson • Godwin High School • Henrico
- 08-3518 The Effect of the Amount of Shaking of a Ventolin HFA Metered-Dose Inhaler on the Amount of Drug Dispensed by the Inhaler  
Jessica Lau • Godwin High School • Henrico
- 08-3354 The Effect of Wearing Protective Eyewear While Playing Field Hockey on the Severity of Injury When Impacted With the Ball  
Kaylee Lucas • Deep Run High School • Henrico
- 08-3654 A Wound with No Scar: Perfecting the Wound Healing Process  
Hannah Meredith • Math & Science High School at Clover Hill • Chesterfield
- 08-3419 The Effect of Different Cleaning Methods on Bacterial Growth on Computer Keyboards  
Adrianna ScheerCook • Maggie Walker Governor's School •
- 08-3545 The Effect of SPF Value on the Effectiveness of a Sunscreen  
Michael Scipione • Godwin High School • Henrico
- 08-3364 The Effect of the Amount of Yoga on Flexibility, Strength, and Balance  
Aly Walker • Deep Run High School • Henrico
- 08-3563 The Effect of a High Calorie Diet on the Occurrence of Hepatic Steatosis in the Liver of Mice  
Xiaoxiao (Lynda) Zhang • Godwin High School • Henrico

## Microbiology

- 08-3476 The Effect of Magnet Strength on the Growth of Yeast Colonies  
Hasan Afzal • Deep Run High School • Henrico
- 08-3434 Optimizing Viral Amplification in the Baculovirus Expression Vector System  
Hussain Aly • Math & Science High School at Clover Hill • Chesterfield
- 08-3559 Can *E. coli* HB101 Cause Internal Contamination of Spinach Plants?  
Alexis Bennett • Henrico High School • Henrico

- 08-3527 Understanding the Relationship Between Helper Phage Interference and the Transduction of Super-Antigen Pathogenicity Islands of *Staphylococcus aureus*  
Sathish Deevi • Math & Science High School at Clover Hill • Chesterfield
- 08-3456 The Effect of Disinfectants on the Number of CFU's Killed from Samples Taken from High School Tables/Desks  
Merideth Fayman • Godwin High School • Henrico
- 08-3435 Examination of the Clonality of Relapsing Fever Infectious Agent *Borrelia parkeri*  
Hanting Feng • Math & Science High School at Clover Hill • Chesterfield
- 08-3418 The Effect of Different Locker Rooms on the Growth of Bacteria  
David Godschalk • Freeman High School • Henrico
- 08-3594 Effect of Antiplaque Agents on Plaque Conductive Biofilms and Acid Decay of Model Tooth Enamel  
Seana Hedayatnia • Godwin High School • Henrico
- 08-3396 The Presence of the Transferrin Binding Protein A Gene in Commensal *Neisseria* Strains in Correlation with Growth on Human Transferrin as a Sole Iron Source  
Alice Kim • Math & Science High School at Clover Hill • Chesterfield
- 08-3398 The Effect of Different Cleaning Methods on the Amount of Bacteria Growth in Sponges  
Dylan Kolhoff • Maggie Walker Governor's School •
- 08-3499 The Effect of Food Preservatives and Their Concentrations on the Inhibition of *Escherichia coli*  
Meher Malik • Godwin High School • Henrico
- 08-3529 The Effect of Erythromycin and Rifampin on Biofilm Formation of *Staphylococcus epidermidis* on Catheter Tubes  
Angela Christine Menna • Godwin High School • Henrico
- 08-2761 Detection of Haemosporidia in *Protonotaria citrea*  
Carolyn Pelnik • Henrico High School • Henrico
- 08-3415 The Effect of Different Anti-Bacterial Solutions on the Prevention of *E. coli* Non-Pathogenic Strain 12 Growth (as measured by a Spectrometer 20+)  
Elizabeth Pickering • Maggie Walker Governor's School •
- 08-3554 The Effect of Ultraviolet Light on Milk Preservation  
Samuel Rubin • Godwin High School • Henrico

## Physics

- 08-3612 The Effect of Percent Concentration of Sawdust on the Melting Time of Pykrete  
Benjamin Armuth • Godwin High School • Henrico
- 08-3442 The Effect of the Position of a Vertical Axis Wind Turbine Placed on an Automobile on the Electricity Generated by the Aforementioned Turbine  
Chaitanya Bhawe • Maggie Walker Governor's School •
- 08-3590 Reducing Heat Introduced Through Home Windows  
Kirsten Bischof • Godwin High School • Henrico
- 08-3592 The Effect of Different Equipment on the Speed of Swimming  
Clara Chan • Deep Run High School • Henrico
- 08-3183 The Effect of Different Wood Protectants on the Resistance to Scratching by a Laminate Floor  
Joseph Davis • Patrick Henry High School • Hanover
- 08-3356 The Physics of Insect Flight as Applied to Wing Design for Micro Air Vehicles  
Vijay Govindarajan • Godwin High School • Henrico

- 08-3046 The Effect of Swim Cap Material on the Speed of Swimmers  
Ashley Hedberg • Godwin High School • Henrico
- 08-3641 The Effect of Water Temperature on Sinking Rate  
Kevin Hunt • Deep Run High School • Henrico
- 08-3391 The Effect of Basketball Inflation Pressure on a Player's Shooting Percentage  
Scott Palmer • Deep Run High School • Henrico
- 08-3505 The Effect of Height of the Leading Edge of a Wing Airfoil on the Force of Lift Generated  
Daniel Reynolds • Maggie Walker Governor's School •
- 08-3648 The Effect of Spin on the Trajectory of a Kicked Soccer Ball  
Conner Schmitz • Deep Run High School • Henrico
- 08-3125 The Effect of Baseball Bat Composition on the Force of the Ball  
Will Snyder • Deep Run High School • Henrico
- 08-3182 The Effect of Soccer Ball Placement on the Amount of Goals Scored  
Seth Taylor • Deep Run High School • Henrico
- 08-3487 The Effect of Wavelength of Light on the Power Output of a Solar Cell  
Ian Teune • Math & Science High School at Clover Hill • Chesterfield

## **Team Projects** *Sponsored by: The MathScience Innovation Center's Foundation Board Members*

- 08-3455 The Effect of Music on Memorization  
Sarah Cole and Kelly Brubaker • Deep Run High School • Henrico
- 08-3561 The Effect of Primary Instrument on Speed and Accuracy in Determining Relative Pitch  
Brian Condit and Brian Fitzsimmons • Deep Run High School • Henrico
- 08-3553 The Correlation Between Water Levels and the Prevalence of Diseases  
Julia Dangtran and Leigh Tenore • Godwin High School • Henrico
- 08-3417 Corrosion of Surfaces by Liquids  
Ryan Devlin and Chris Barnett • Deep Run High School • Henrico
- 08-3445 The Effect of the Amount of Shopping Bags Carried on the Amount of Time It Takes to  
Receive Customer Service  
Alexis Exum and Morgan Rabalais • Deep Run High School • Henrico
- 08-3599 The Effect of Pollutants on Seed Germination  
Shoma Ghosh and Maryum Ijaz • Deep Run High School • Henrico
- 08-3582 The Effect of the Quadrant of the Hurricane on Damage Caused by the Hurricane  
Sarah Jackson and Melissa de Nijs • Godwin High School • Henrico
- 08-3625 Effective Fire Safety: A Mathematical Study  
Niyant Jain and Nick Shutterly • Godwin High School • Henrico
- 08-3566 The Effect of Different Types of Running Shoes on the Degree of Ankle Pronation  
Sarah Janicek and Nichole Pinkleton • Math & Science High School at Clover Hill • Chesterfield
- 08-3509 The Effect of Group Size on the Memorization of a Random Set of Numbers  
Phoebe Lin and Jennifer Lee • Deep Run High School • Henrico
- 08-3642 Site Directed Adduct Formation in DNA Using Different Mutagens  
Inesha Premaratne, Nilufar Mirshahi and Sarah Booth • Henrico High School • Henrico
- 08-3459 The Effect of Different Brands of Fertilizers on the Growth of Scallions  
Chamoun Saoma and Austin Baragar • Deep Run High School • Henrico
- 08-3628 The Effect of Various Types of Diets on the Rate of Metabolic Reaction  
Jessica Wang and Jing Yuan • Godwin High School • Henrico

## Zoology

- 08-3339 The Effect of Temperature on Butterfly Metamorphosis  
Tawany Almeida • Godwin High School • Henrico
- 08-3480 The Effect of Caffeine on the Heart Rate of *Daphnia*  
Rachael Brennan • Godwin High School • Henrico
- 08-3431 The Effect of the Type of Organic Material Added to Water on the Total Number of Egg Rafts Laid by *Culex pipiens* and *Cx. restuans* Mosquitoes  
Staige Davis • Maggie Walker Governor's School •
- 08-3350 The Effect of Pollution on the Regeneration of *Planaria*  
Brian Eadeh • Godwin High School • Henrico
- 08-3562 The Effect of Artificial Sweetener Molarity on the Heart Rate of Mice  
Katherine Hunold • Godwin High School • Henrico
- 08-3634 The Effect of Environmental Acidity on the Calcification Rate of *Mytilus edulis*  
Alex Lombardi • Math & Science High School at Clover Hill • Chesterfield
- 08-3598 The Effect of the Amount of Light on the Regeneration Rate of *Planaria*  
Dallen McNerney • Maggie Walker Governor's School •
- 08-3479 The Effect of *Allium sativum L.* on the Regeneration of *Planaria*  
Andrew Sylvester • Godwin High School • Henrico
- 08-3486 The Effects of Contradictory Positively Associated and Negatively Associated Visual Cues on the Choice Behavior of *Drosophila melanogaster*  
Benjamin Turner • Godwin High School • Henrico
- 08-3542 The Effect of Green Tea on the Regeneration of *Planaria*  
Katie Vasco • Godwin High School • Henrico
- 08-3358 The Effect of Surface Type on Equine Hock Angle  
Brooke Weedon • Deep Run High School • Henrico
- 08-3291 The Effect of Colored Light on the Hatch Rate and Hatchability of Chicken Eggs  
Olivia Ytterberg • Deep Run High School • Henrico

# Summer Student Programs



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**Dates**  
Session 1  
July 14-18  
Session 2  
July 21-25  
Session 3  
July 28-Aug. 1

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Rising 4th - 8th Graders  
Cost is \$85 per session.  
Morning and afternoon  
sessions available.  
For registration information  
(available in mid March)  
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Information**  
MathScience  
Innovation Center  
2401 Hartman Street  
Richmond, VA 23223  
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# Participating Schools and Teachers

## Chesterfield County Public Schools

### **James River High School**

Timothy Couillard

### **Manchester Middle School**

Pam Adkins

Eric Koontz

Teresa Summers

### **Math & Science High School at Clover Hill**

Gisela Ramsdell

Ryan Templeton

Christopher Uhrain

### **Matoaca Middle School**

Walter Brown

## Colonial Heights County Public Schools

### **Colonial Heights Middle School**

Kate Kelley

Melinda Kelley

## Hanover County Public Schools

### **Hanover High School**

Carole Forkey

Jessica Orth

### **Liberty Middle School**

Lisa Atkins

### **Oak Knoll Middle School**

Rebecca Kazio

Amber Miller

David Smail

### **Patrick Henry High School**

Charlotte Embrey

Elizabeth Moore

Peggy Whitlock

## Henrico County Public Schools

### **Byrd Middle School**

Matthew Lehman

### **Deep Run High School**

Amy Earle

Charles Gallagher

Erin Liss

Amy Moore

Grant Odell

### **Freeman High School**

Carol Campfield

Suzanne Kaminski

### **Godwin High School**

Mary Cirillo

Samantha Cope

Dana Delano

Denise Green

Jim Lehman

Todd Phillips

Denise Williams

### **Henrico High School**

Julie Scott

### **Moody Middle School**

Marivic Mitchell

Timothy Nye

Nancy Smith

### **Wilder Middle School**

Sarah Morris

## Powhatan County Public Schools

### **Powhatan Junior High School**

Stephanie Basl

Melissa Clayton

Donia Spott

## Regional Consortium

### **Maggie Walker Governor's School**

Jeremy Clark

## Richmond Public Schools

### **Lucille Brown Middle School**

Asantewa Roberson

LaTonya Waller



## 2008 Project Screeners

Dr. David Anderson	Lyotropic Therapeutics, Inc.
Dr. Genara Andrade	DuPont
Ms. Kristina Anthony	VCU
Ms. Lisa Atkins	Hanover County Public Schools
Dr. Suzanne E. Barbour	VCU/MCV
Ms. Diane Barbour	Rochester Institute of Technology, ret.
Dr. Thomas Bednarz	DuPont, Ret.
Ms. Emily Boone	University of Richmond
Mrs. Robin Brockenbrough	Dr. Kathy's Mobile Pet Care
Ms. Tanya Bumstead	Earth Tech
Mrs. Robin Curtis	Virginia Commonwealth University
Mr. Rob Davidson	Afton Chemical Corporation
Mrs. Barbara A. Deets	John Tyler Community College
Dr. Mark Devlin	Afton Chemical Corporation
Mr. Robert A. Donovan	Virginia Department of Transportation
Ms. Amy Ducut	DuPont
Mr. Bhanu Evani	Philip Morris USA
Dr. Renuka Evani	Richmond Behavioral Health Authority
Mr. Eric Fleming	Virginia Commonwealth University
Ms. Kristen Gladysz	Lyotropics
Ms. Susan Greene	Ethyl Corporation, ret.
Ms. Vickie Haller	VCU/MCV Dept. of Pharmacology/Toxicology
Mr. Phil Harvatine	Earth Tech
Dr. John Hayden	University of Richmond
Mrs. Wanita Hlavaty	DuPont
Mr. Thomas P. John	Dominion
Mrs. Beth Kappus	MathScience Innovation Center
Mr. David Kappus	United Network for Organ Sharing
Dr. Bharati Khopkar	
Dr. Bruce King	Randolph-Macon College
Mr. Deepak Koirala	VA Department of Transportation
Dr. Paula Lessem	University of Richmond

## 2008 Project Screeners

Mr. Bion Ludwig	Genworth Financial
Mr. Rick Marshall	Weidmuller
Dr. Robert Matheson	DuPont
Mr. Bill McCoy	Qimonda
Dr. Munmaya K. Mishra	Philip Morris USA
Mr. Duncan Morhardt	Virginia Commonwealth University
Dr. Leonard Morrow	Self-employed
Dr. Gerry Nixon	Philip Morris USA
Dr. Bradley Norwood	Arista Labs
Mrs. Tiffany C. Owens	Qimonda
Ms. Yenni Phan	Virginia Commonwealth University
Mrs. Maren Reiner	University of Richmond
Mr. Alan Rodger	DuPont
Dr. Charles Rosenbaum	Retired Physician
Mrs. Anna Shore	Maggie Walker Governor's School
Mr. Wes Skaperdas	Phipps & Bird/Intelitool
Mr. J. Davidson Smith	Luck Stone Corporation
Ms. Susan Tafur	Philip Morris USA, ret.
Mr. Ryan Templeton	Chesterfield County Public Schools
Mr. Dennis Timmerman	Wyeth Consumer Healthcare
Mrs. Donna Timmerman	Ethyl PET
Ms. Niru Tiwari	VA Department of Transportation
Ms. Kelly Tomson	Division of Consolidated Lab Services
Dr. Deborah Trainer	
Mr. Kurt Vogel	Pegasus Elite Aviation
Mrs. LaTonya Waller	Richmond Public Schools
Ms. Sylvia Whaley	Division of Consolidated Lab Services
Ms. Lorin Wharton	MathScience Innovation Center
Mr. Roy Yamamoto	Ethyl Corporation, ret.

## 2008 Exhibit Judges

### Junior Behavioral & Social Sciences

Mrs. Jennifer Allen	Caroline County Schools
Dr. Joseph M. Santarsieri	Commonwealth Chiropractic & Acupuncture
Miss Rebecca Vogel	Federal Reserve Bank of Richmond

### Junior Biochemistry

Dr. Munmaya K. Mishra	Philip Morris USA
Mr. Ryan Templeton	Chesterfield County Public Schools
Dr. Aaron Winston	Winston Chiropractic Care, P.C

### Junior Botany

Ms. Mary Greenlee	The Steward School
Mr. Lou Weissbecker	Henrico County, retired

### Junior Chemistry A

Ms. Kristen Gladysz	Lytropic Therapeutics, Inc.
Ms. Stephanie Montgomery	Lytropic Therapeutics, Inc.
Mr. Robert D. Potts	Division of Consolidated Lab Services

### Junior Chemistry B

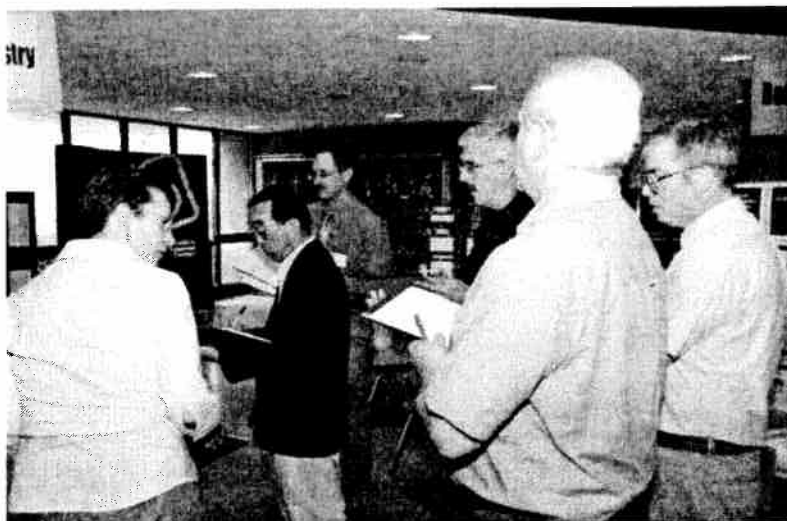
Dr. Genara Andrade	DuPont
Mr. Greg Fawley	Qimonda
Mr. Calvin Lee	Defense Supply Center Richmond

### Junior Earth & Space Sciences

Mr. Terry Barker	SunTrust Bank
Mr. Oscra Ruiz	Albemarle Corporation
Ms. Lorin Wharton	MathScience Innovation Center

### Junior Engineering A

Mr. David Barlow	Clough Harbour & Associates LLP
Mr. Ed Shore	Dominion/Surry Power Station
Mrs. Camille Ward	Qimonda



## 2008 Exhibit Judges

### Junior Engineering B

Mr. Tim Beavers  
Mr. Robert Ward

Whitman, Requardt, & Associates  
Northrop Grumman

### Junior Environmental Science

Mrs. Robin Curtis  
Ms. Laura Ruiz  
Ms. Beth Sykes

Virginia Commonwealth University  
Albemarle Corporation  
Chesterfield County Planning Department

### Junior Math & Computer Science

Mr. Brett Kliner  
Mr. Joel McPherson  
Mr. Rick Zaronas

Wyeth Pharmaceuticals  
Virginia Department of Social Services  
Enterprise Technology Solutions

### Junior Medicine & Health

Mr. Edward Campbell  
Mrs. Barbara A. Deets  
Ms. Carolyn Halbert

CJW Johnston-Willis Hospital  
John Tyler Community College  
Virginia Department of Health

### Junior Microbiology

Dr. Rupa Bandy  
Mrs. Smita Jain  
Ms. Kelly Tomson

Chesterfield Public Schools  
Division of Consolidated Lab Services  
Division of Consolidated Lab Services

### Junior Physics A

Dr. Mark Devlin  
Mr. David Leebrick  
Mrs. Tiffany C. Owens

Afton Chemical Corporation  
Qimonda  
Qimonda

### Junior Physics B

Ms. Ellen Lundevall  
Ms. Hafsah K. Navarro  
Mr. Hashim Zein

Virginia Department of Transportation  
Virginia Department of Transportation  
Qimonda

### Junior Zoology

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Mrs. Anna Shore

Philip Morris USA  
Maggie Walker Governor's School



## 2008 Exhibit Judges

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Ms. Gloria Aleixo-Hall	
Ms. Vickie Haller	VCU/MCV Dept. of Pharmacology/Toxicology
Mr. Bion Ludwig	Genworth Financial

### Senior Biochemistry

Ms. Susan Greene	Ethyl Corporation, ret.
Mr. Brian Kelley	VCU/MCV
Dr. Joyce Lloyd	VCU/MCV Department of Human Genetics

### Senior Botany

Mrs. Kathryn Brock	Hanover County Public Schools
Ms. Brenda Burke	Philip Morris USA
Dr. Wan-Ling Chiu	Virginia Commonwealth University

### Senior Chemistry

Dr. Gajanan S Joshi	VCU Department of Medicinal Chemistry
Dr. Bharati Khopkar	
Dr. Susan Plunkett	Philip Morris USA
Dr. Joseph M. Pompano	Boehringer Ingelheim Chemicals, Inc.

### Senior Earth & Space Sciences

Mrs. Sara Dydak	Jamestown-Yorktown Foundation
Mr. Carroll H. Ellis	Richmond Public Schools
Mr. J. Davidson Smith	Luck Stone Corporation

### Senior Engineering

Mr. Joseph Internicola	DuPont
Mr. Nathan Partin	Qimonda
Mr. Gene Smith	Dominion
Mr. William Wu	Carpenter Co.

### Senior Environmental Science

Mr. Brian Hasty	US Geological Survey
Dr. Brian Moores	Randolph-Macon College, Prof. Emeritus
Mr. Steven J. Yob	Henrico County

### Senior Mathematics

Mr. David Hartfield	Carpenter Co.
Dr. James E. Mays	Virginia Commonwealth University
Mr. Adam Powers	Capital One Services, Inc.

### Senior Medicine & Health

Dr. Irma Adams	Adams Consulting
Dr. Lynne Elmore	VCU Department of Pathology
Ms. Caitlin Muse	VCU Graduate Student
Dr. Charles Rosenbaum	Retired Physician

## 2008 Exhibit Judges

### Senior Microbiology

Mr. Eric Fleming  
Dr. Joseph V. Formica  
Dr. Michael McVoy  
Mr. John T. Peddy, Jr.

Virginia Commonwealth University  
MCV/VCU School of Medicine, ret.  
VCU School of Medicine  
McGuire Medical Center

### Senior Physics

Mr. Bhanu Evani  
Mr. David Gomez  
Dr. Joseph King

Philip Morris USA  
Qimonda  
DuPont

### Senior Team Projects

Dr. David Anderson  
Mrs. Robin Brockenbrough  
Dr. Ryan Burnette

Lyotropic Therapeutics, Inc.  
Dr. Kathy's Mobile Pet Care  
Alliance Engineering, Inc.

### Senior Zoology

Mr. Mark Rich

Maymont Nature Center



## 2008 Exhibit Judges

### Intel ISEF Finalist Judges

Dr. Suzanne E. Barbour  
Ms. Tanya Bumstead  
Dr. Carolyn Conway  
Dr. Bradley Norwood  
Mr. Alan Rodger

VCU/MCV  
Earth Tech  
VCU Department of Biology  
Arista Labs  
DuPont



Good luck to all our competitors today!

From the Faculty  
Of the  
MathScience Innovation Center

# *Special Thanks!*

## **Photography**

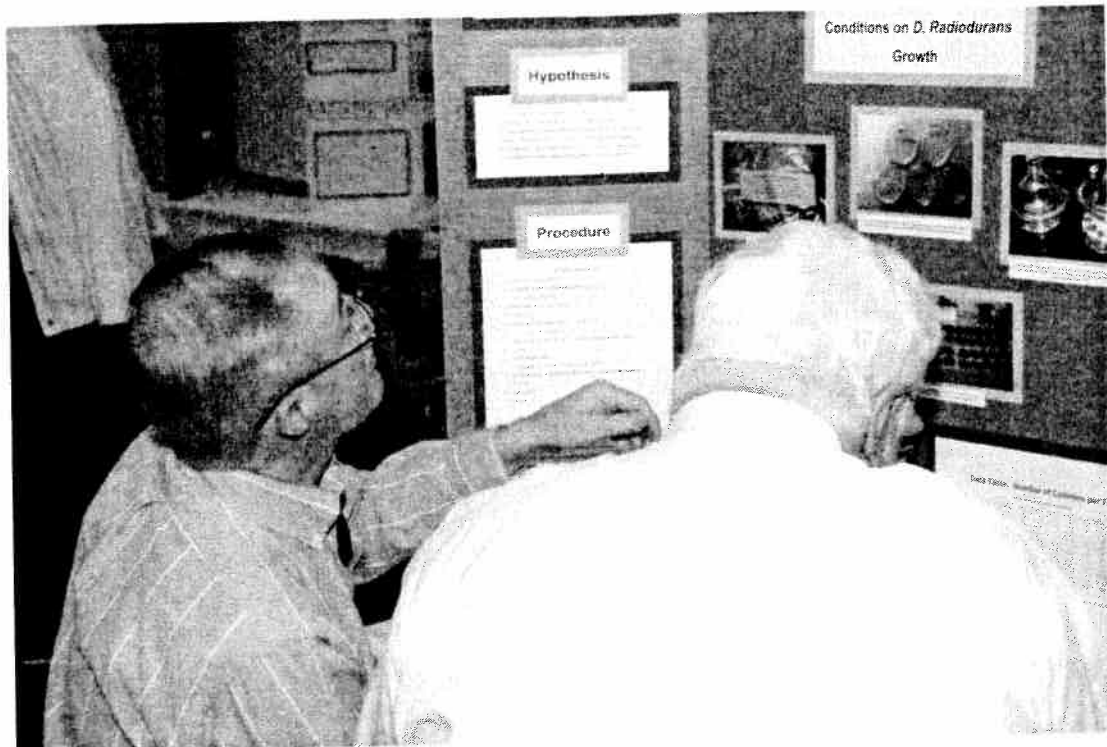
William A. Harrison, DuPont, retired

## **Cover Design**

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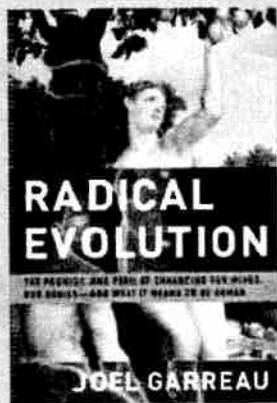




MathScience Innovation Center  
Imagine. Create. Lead.

## Future Forward with Joel Garreau *Technology's Impact on Culture*

The Foundation Board invites you to  
join us on June 11th  
for cocktails, a silent auction, dinner  
and what will surely prove to be a captivating evening  
on what it means to be human.



For hundreds of millennia, our technologies have been aimed outward at altering our environment in the fashion of fire, agriculture, or space travel. Now, **for the first time, we are increasingly aiming inward at modifying our minds, memories, metabolisms, personalities, progeny and possibly our immortal souls.** Joel's latest book, *Radical Evolution: The Promise and Peril of Enhancing Our Minds, Our Bodies, and What It Means to Be Human*, takes an **unprecedented, spellbinding and sometimes alarming look at the hinge in history** at which we have arrived. *Radical Evolution* is about altering human nature -- not in some distant tomorrow, but in the next 10 or 20 years.

Captivating...brilliant...  
enthraling...dazzling.  
—The New York Times Book  
Review

Joel is also well known for his two previous books, *Edge City: Life on the New Frontier* and *The Nine Nations of North America*. Joel is a reporter and editor at **The Washington Post** and principal of **The Garreau Group**, the network of his best sources committed to understanding who we are, how we got that way, and where we're headed, worldwide. He has served as a senior fellow at the **University of California** at Berkeley and **George Mason University**, and is an affiliate of the **James Martin Institute for Science and Civilization at Oxford**. He is a member of **Global Business Network**, the pioneering scenario-planning organization, and is the troll of a small forest in the foothills of Virginia's Blue Ridge.

The focus of Garreau's book ... is  
not on the nuts and bolts of the  
technology itself but rather on what  
it will all mean for us humans....  
Garreau is constantly on the  
lookout for the human story behind  
the ideas.  
—Scientific American

Joel's reputation and commitment to understanding who we are, how we got that way, and where we're headed will surely make for a fascinating evening. For more information on tickets and sponsorship opportunities, **please visit our website at [www.msinnovation.info](http://www.msinnovation.info) or contact us at 804.343.6525.**

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compelling and important and  
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There's no one better than Joel  
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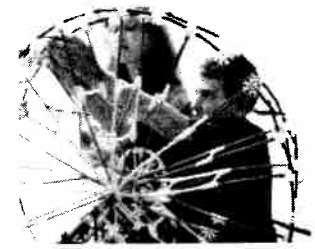
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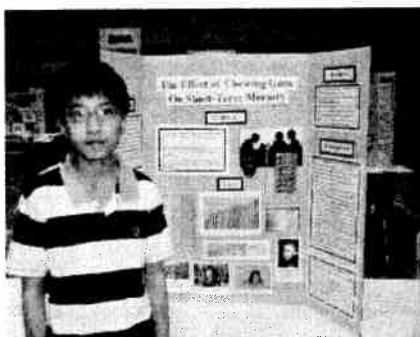
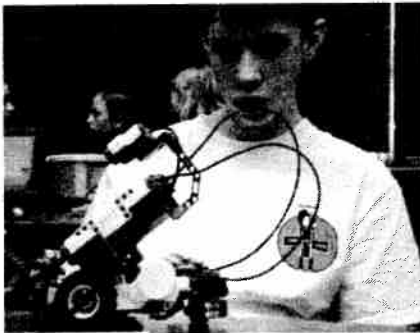
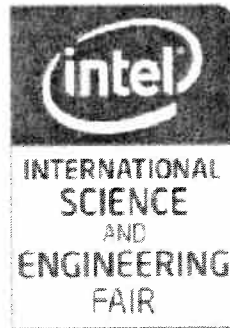
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