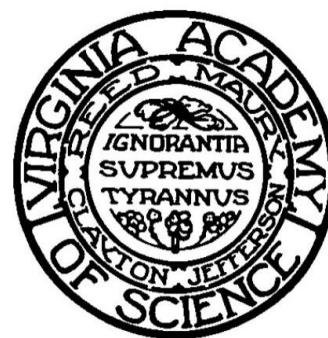
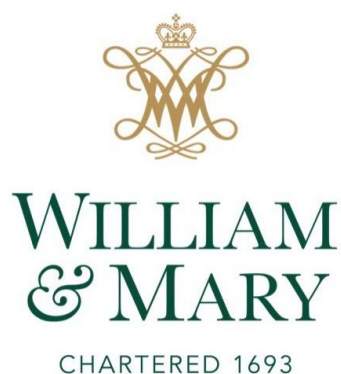


Virginia Junior Academy of Science Research Symposium and 80th Annual Meeting

May 14, 2021 - General Session
May 15, 2021 - Student Presentations
May 22, 2021 - Awards Ceremony



A Program of **The Virginia Academy of Science**

Virtual Research Symposium, hosted by
The College of William & Mary
Williamsburg, Virginia

Program is available on the VJAS website www.vjas.org

The Virginia Academy of Science

The **Virginia Academy of Science (VAS)** is the fifth largest state, region, or city academy of science in the U.S.; it was founded in 1923 to promote the civic, academic, agricultural, industrial, and commercial welfare of the people of Virginia. Exemplary programs have included Flora of Richmond and Vicinity, Published, 1930, the first comprehensive multidisciplinary studies of the James River Basin and the Great Dismal Swamp, volunteer research assistance to Virginia in the instance of the kepone pollution disaster, and leadership in establishing the Science Museum of Virginia.

Fall Undergraduate Research Meeting:

The focus of this meeting is support of undergraduate student research. Specific details about the 2021 Fall Undergraduate Research Meeting, including the location and date will be made available on the VAS website (www.vacadsci.org) during the summer.

The Virginia Junior Academy of Science

VJAS is a national model for the new and renewing state junior academies and has been ranked among the top three in the nation for over two decades. Through VJAS and other programs, VAS annually reaches over 40,000 Virginia middle and high school students. Hundreds of volunteers make it possible for Virginia secondary students to experience these activities.

The College of William & Mary

The Virginia Academy of Science and the Virginia Junior Academy of Science express their sincere appreciation to The College of William & Mary for the generous support in providing web conferencing meeting rooms and services.

A Tradition of Excellence, A Commitment to Action

Join the Virginia Academy of Science

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VJAS Committee Chair's Welcome



May 14, 2021

Dear Virginia Junior Academy of Science participants,

On behalf of the Virginia Junior Academy of Science Team and Committee, I would like to extend the warmest welcome to each and every one to the 80th Virginia Junior Academy of Science (VJAS) Annual Meeting and Research Symposium. Although we are not able to meet in person, The College of William & Mary in Williamsburg, Virginia, is hosting our Research Symposium virtually this year.

First, I would like to congratulate our student finalists. Despite the challenges, each one of you strived to conduct the best possible scientific research experiments in a variety of different settings and circumstances. Your valiant and resilient efforts shine through brightly – as a VJAS student finalist, your research papers have been read thoroughly and were selected by a rigorous panel of evaluators from across the state. This is a great accomplishment and you should be proud of your research and academic success!

As we commence our virtual Annual Meeting and Research Symposium, I would like to share some thoughts with you. This past year, more so than any others, we have seen a raise in the stake – the importance – of the role science and research plays in our society. Scientists from all corners of the Earth joined together and responded to meet a daunting challenge. We have acted as one to address a global crisis that discriminates against none.

This atmosphere of cooperation and working together as collaborators, and not necessarily viewing each other as competitors all the time, is something we scientists need to continue promoting. Yes, there is a balance – but our society will greatly benefit and the frontiers of knowledge further breached into new territories faster if we work together more often. Therefore, I would encourage you to view each other during this virtual Research Symposium as future collaborators and colleagues, partners of the future, rather than as competitors.

I would also like to highlight a critical point for you to remember – a consistent and sustained investment in science, research, technology, and infrastructure will always be the better solution than a more reactionary response to different short- and long-term crises. We must not stay complacent and stagnate progress when in reality, we should be re-doubling our efforts. Scientific advancement does not happen overnight and we need to have systemic investments to continue the pipeline of innovation and new ideas.

As you move onward into your collegiate and professional careers, I understand that some of you will continue the path of a scientist, but just as many will choose different routes in medicine, teaching, politics, and so on. What we hope to convey at this year's Annual Meeting is that no matter which career route you choose, your fundamental understanding of science and how research is conducted to bring progress, will be invaluable and become a lifelong foundation. And remember, you can always be an advocate in promoting science and research, wherever you are.

In closing, I hope the 80th VJAS virtual Annual Meeting and Research Symposium is an enriching and engaging experience for everyone. I was one of you, a VJAS participant, not too long ago. So trust me when I say this: If I can make a difference, so can you. I look forward to meeting you virtually and learning about your work at the 2021 VJAS Research Symposium. Once again, welcome and congratulations on your accomplishments.

Sincerely,

Se W. Jeong

Chairman, VJAS Committee

SCHEDULE OF EVENTS

Virginia Junior Academy of Science 2021 Research Symposium

Friday, May 14		
6 PM - 8 PM	VJAS General Session and Jeffers Memorial Lecture	Live Zoom Webinar: https://cwm.zoom.us/j/95391150859 (overflow YouTube Live link will be provided on the website at 5:45 PM)

Saturday, May 15		
9 AM - 4 PM	VJAS Student Paper Presentations	30 Concurrent Live Zoom Presentation Sessions - See next page for all links
Specific Student Paper Presentation schedule starts on Page 9		

Saturday, May 22		
10 AM - Noon	VJAS Awards Ceremony	Live Zoom Webinar: https://cwm.zoom.us/j/94637985316 (overflow YouTube Live link will be provided on the website at 5:45 PM)

Animal & Human Sciences (MS AH)

Zoom link <https://cwm.zoom.us/j/93928391044?pwd=SnoxcEtzUTF5TGEyd1JEV245QnBtQT09>

Chemical Science (MS CS)

Zoom link <https://cwm.zoom.us/j/94371619008?pwd=enVKeEk1VXQ4VUhjRllxa1dnYTgxUT09>

Ecology & Earth Sciences (MS EE)

Zoom link <https://cwm.zoom.us/j/93784449762?pwd=WlpOai9HeTNDs0xnM0FQSVRzbVRIZz09>

Engineering & Technology (MS ET)

Zoom link <https://cwm.zoom.us/j/96515083419?pwd=VDVMWEx0SG5MRmtQR09OeXQvU0pJUT09>

Physical Science & Astronomy (MS PA)

Zoom link <https://cwm.zoom.us/j/92089160402?pwd=WUQyMW84dGRqb0tREMwLy9wenFXQT09>

Plant Science & Microbiology (MS PM)

Zoom link <https://cwm.zoom.us/j/92971857992?pwd=Ukl5b0FaM2g0U1VnakYyMjZBZG1Odz09>

Botany A (HS BOT-A)

Zoom link <https://cwm.zoom.us/j/94532348485?pwd=MG1uV0VtSVh2TFJFV9jakZiaXpQdz09>

Botany B (HS BOT-B)

Zoom link <https://cwm.zoom.us/j/91471855686?pwd=aUxxWnlnoHoxUkVnTmVYLzRGL004dz09>

Chemistry A (HS CHM-A)

Zoom link <https://cwm.zoom.us/j/99827039061?pwd=OUNHUDE2c2tvY1BDYmNkNiILNEFrQT09>

Chemistry B (HS CHM-B)

Zoom link <https://cwm.zoom.us/j/96730373654?pwd=RINPMFBFN3VITEFXVIZYnAxd1FyQT09>

Engineering A (HS EGR-A)

Zoom link <https://cwm.zoom.us/j/94102685518?pwd=UytRdWNtUFFaTEhudEdwcGI4dXFpQT09>

Engineering B (HS EGR-B)

Zoom link <https://cwm.zoom.us/j/91056555906?pwd=cGhhTmdMdGJvdzgwL3JrMTNiTnladz09>

Engineering C (HS EGR-C)

Zoom link <https://cwm.zoom.us/j/99893288257?pwd=TG5ldmZLZGUzMEpzbIN4bCtaSjdMUT09>

Environmental & Earth Science A (HS ENV-A)

Zoom link <https://cwm.zoom.us/j/96011351682?pwd=cW1vOC9YdkxDVEEdSLzJYd2JBaFZSQT09>

Environmental & Earth Science B (HS ENV-B)

Zoom link <https://cwm.zoom.us/j/96816916200?pwd=TE1iNk10Q0VXLzI0eIE5dWJvTIJUUT09>

Environmental & Earth Science C (HS ENV-C)

Zoom link <https://cwm.zoom.us/j/94798761628?pwd=Vm9iNllaSWFoRFJUdCt4VSs2Qk43QT09>

Environmental & Earth Science D (HS ENV-D)

Zoom link <https://cwm.zoom.us/j/99869984709?pwd=OXJjeEJ4UmR1bGRRUzdYODZMV3BNUT09>

Environmental & Earth Science E (HS ENV-E)

Zoom link <https://cwm.zoom.us/j/97217053767?pwd=eUY4eEE4NzFzRVdVUFFhNkVFc3p1dz09>

Math: Patterns & Relationships (MS MP) & Math: Theoretical & Modeling (HS MTM)

Zoom link <https://cwm.zoom.us/j/92926570100?pwd=N2ZZckluZm5uWFZpRjRVU2Q4eDNkdz09>

Medicine & Health A (HS MDH-A)

Zoom link <https://cwm.zoom.us/j/95330832329?pwd=VTIFeXM0b0svMU54cjEydUVQSVlQdz09>

Medicine & Health B (HS MDH-B)

Zoom link <https://cwm.zoom.us/j/99835452059?pwd=aUF6eG1xb0hHMIYvVVBsT1ZoMFJKdz09>

Medicine & Health C (HS MDH-C)

Zoom link <https://cwm.zoom.us/j/91378344855?pwd=YTU4Q3VpNm1ycTNJaEUxbTE3dDJHQz09>

Medicine & Health D (HS MDH-D)

Zoom link <https://cwm.zoom.us/j/99821859302?pwd=QkZua2wwWUFLMnF5SFJkN0lrRnN0Zz09>

Microbiology & Cell Biology A (HS MCB-A)

Zoom link <https://cwm.zoom.us/j/99715818632?pwd=b0U0WU1YMGNIWWF5MW9DMzZUK0FmQT09>

Microbiology & Cell Biology B (HS MCB-B)

Zoom link <https://cwm.zoom.us/j/98554354745?pwd=RWttcmpNaTJDaTE1L1dpKzRLeFliQT09>

Physics & Astronomy (HS PHY)

Zoom link <https://cwm.zoom.us/j/94368835476?pwd=YWtwSjZoK0NHbWFRbXcyNGNwN3JCUT09>

Human Behavior (MS HB) & Psychology A (HS PSY-A)

Zoom link <https://cwm.zoom.us/j/94015796034?pwd=OUhncLpoYXpqdDlvZ1Rna0N3Vk9LUT09>

Psychology B (HS PSY-B)

Zoom link <https://cwm.zoom.us/j/96479536873?pwd=SGZ4R0NacnUwK1JSa0hETUhFb2hJdz09>

Statistical Analysis & Inferences (HS SAI)

Zoom link <https://cwm.zoom.us/j/95308843911?pwd=bUt0QjFEbGhIVG9lRjF6YU4zenRIUT09>

Zoology (HS ZOO)

Zoom link <https://cwm.zoom.us/j/95229531456?pwd=K3pwMUdxNURralRRMGx3RUVBcVB4Zz09>

George W. Jeffers Memorial Lecture
Friday Evening VJAS General Session

From Perseverance to Humans: The Exploration of Mars



Dr. Joel S. Levine

Research Professor, Department of Applied Science
The College of William and Mary

Earlier this year, on February 18, the world watched in awe as the NASA Mars Rover 2020 Perseverance made a flawless landing on the surface of Mars. Perseverance is a step to the ultimate mission to Mars—a human mission to the Red Planet, tentatively scheduled for the mid to late 2030's. To gain additional experience about living on and exploring another world, NASA will send humans back to the Moon under the Artemis Program, with the first human landing on the Moon as early as 2024, more than 50 years after the first human landing on the Moon by the Apollo 11 astronauts Neil Armstrong and Buzz Aldrin on July 20, 1969. Humans will explore Mars to address some important scientific questions that cannot be addressed unambiguously by robotic missions, e.g., a search for past and/or present life on Mars and why Mars evolved from an Earth-like planet in its early history with abundant surface liquid water in the forms of a planetary-scale ocean several miles deep, rivers and lakes with a relatively thick atmosphere to present-day Mars, an inhospitable planet devoid of surface liquid water with a very thin atmosphere.

Levine retired from NASA in 2011, after a 41-year career as Senior Research Scientist, Science Directorate, NASA Langley Research Center and Mars Scout Program Scientist, Mars Exploration Program, NASA Headquarters. Since 2011, he serves as a Research Professor in Applied Science at the College of William and Mary and a consultant to the NASA Engineering and Safety Center (NESC). Levine was hired by NASA to develop models of the upper atmosphere of Mars for the Viking Project, which achieved the world's first two successful soft landings on Mars in 1976. His teaching career at the College began in 1990 as Adjunct Professor and head of the atmospheric and planetary science track in the Applied Science Program. Levine co-chaired NASA's panel on the Human Exploration of Mars: Science Analysis Group (HEM-SAG) and edited the 974-page book, *The Human Mission to Mars: Colonizing the Red Planet* (2010) and *Dust in Atmosphere of Mars and Its Impact on Human Exploration* (2018) and *The Impact of Lunar Dust on Human Exploration* (2021).

Animal & Human Sciences (MS AH)

Zoom link

<https://cwm.zoom.us/j/93928391044?pwd=SnoxctzUTF5TGEyd1JEV245QnBtQT09>

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	Do dogs 10-15 lbs. prefer a certain type of bed?	Patrick Jiminez	Gunston Middle School
9:20-9:40 AM	The Effect of Color on Attraction to Food on <i>Vanessa cardui</i>	Addison Kofron	George Moody Middle School
9:40-10 AM	Opening Up a Can Of Worms	Rania Lateef	Louise A. Benton Middle School
10-10:20 AM	Effect of Liquid Fertilizer on <i>Lumbricus terrestris</i> Growth	Samantha Lionberger	George Moody Middle School
10:20-10:40 AM	The Effect of Therapeutic Hypothermia and Whole-Body Vibration on the Behavioral Response of <i>Drosophila</i> Following Traumatic Brain Injury (TBI)	Aahana Puri	George Moody Middle School
10:40-11 AM	The Effect of Sugar Substitute and Glucose Concentrations on HepG2 Human Liver Cancer Cells	Nishorgo Sarkar	George Moody Middle School

Judges - Please Keep to Schedule. Complete & Submit All Scores on Reviewr by 5 PM.

Chemical Science (MS CS)

Zoom link

<https://cwm.zoom.us/j/94371619008?pwd=enVKeEk1VXQ4VUhjRllxa1dnYTgxUT09>

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	The Effect of Material of Container on The pH of Water	Shriya Bandla	George Moody Middle School
9:20-9:40 AM	The Effect of Different Cleaning Agents on the Removal of Purple Acrylic Paint	Sonvi Chawla	George Moody Middle School
9:40-10 AM	The Effect of the Temperature on the pH of Orange Juice	Myra Clark	Williamsburg Middle School
10-10:20 AM	The Effects of Different Solvents on Permanent Marker Ink	Adam Islam	Kenmore Middle School
10:20-10:40 AM		BREAK	
10:40-11 AM	The effect of types of metals on corrosion rate	Richard John	George Moody Middle School
11-11:20 AM	The Effect of Temperature on an Enzyme Catalyzed Reaction	Neel Joshi	George Moody Middle School
11:20-11:40 AM	The Effect of Heat on the Time it Takes Grease to Solidify	Logan Krohl	Kenmore Middle School
11:40-12 PM	The effect of the type of browning prevention method on Julie Daisy & the brownness of Red Delicious apples after 24 hours	Marco Maxwell	Swanson Middle School
12-12:40 PM		LUNCH BREAK	
12:40-1 PM	The effect of various forms of analgesic medications on its solubility in simulated gastric acid	Ira Prakash	George Moody Middle School

1-1:20 PM	The effect of bases on Staurolite	Daniel Simon	Louise A. Benton Middle School
1:20-1:40 PM	The Effect of SPF on Ultraviolet Exposure	Alexander Thomas	Swanson Middle School
1:40-2 PM	The Effect of the Type of Salt on the Amount of Corrosion of Steel Wires	Ophelia Tulchinsky	Dorothy Hamm Middle School

Judges - Please Keep to Schedule. Complete & Submit All Scores on Reviewr by 5 PM.

Ecology & Earth Sciences (MS EE)

Zoom link

<https://cwm.zoom.us/j/93784449762?pwd=WlpOai9HeTNDs0xnM0FQSVRzbVRIZz09>

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	The effect of different concentrations of Sucralose on the heart rate of a Daphnia Magna	Aditya Badhryan	George Moody Middle School
9:20-9:40 AM	The Effect of Oxybenzone and Zinc-oxide based Sunscreen on Juncus Inflexus in a Simulated Marsh Environment	Renn Clark	George Moody Middle School
9:40-10 AM	The Effect of Public Transportation Use on Carbon Footprint per Capita	Emma Hensch	Dorothy Hamm Middle School
10-10:20 AM	The Effect of Water Filter Design on Water Clarity	Nadia Lach-Hab	Dorothy Hamm Middle School
10:20-10:40 AM	What is the Effect of the Type of Soil and Contamination of Soil (Styrofoam) on the Survival of Eisenia fetida?	Eloise Minnigh	Williamsburg Middle School
10:40-11 AM	BREAK		
11-11:20 AM	What is the Effect of Green Roofs on Building Temperature?	Charlotte Minnigh	Williamsburg Middle School
11:20-11:40 AM	The Effect of Electromagnetic Field Density on the Biomass of Chlorella vulgaris	Anna Mohanty	Williamsburg Middle School
11:40-12 PM	The Effect of Salinity on Soybean Growth	Dylan Tallis	Thomas Jefferson Middle School
12-12:20 PM	The Effect Of Silver Nanoparticles On The Death Rate Of Adult Daphnia Magna	Annabelle Van Saun	George Moody Middle School

Judges - Please Keep to Schedule. Complete & Submit All Scores on Reviewr by 5 PM.

Engineering & Technology (MS ET)

Zoom link

<https://cwm.zoom.us/j/96515083419?pwd=VDVMWEx0SG5MRmtQR09OeXQvU0pJUT09>

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	Effect of paper boat design on time and mass recorded	Shangwen Cheng	Kenmore Middle School
9:20-9:40 AM	How a Do-It-Yourself Mindset Became the Impetus for a Homemade Smart Mirror	Jarin Earle	Thomas Jefferson Middle School
9:40-10 AM	Herbal Low-cost Water Filters	Krish Gupta	Swanson Middle School
10-10:20 AM	The Effect of Different Sport Helmets on Melon Splatter	London Hart	George Moody Middle School
10:20-10:40 AM	BREAK		
10:40-11 AM	The Effect of Rotational Speed on the Light Reflected by Parabolic Reflectors	Soumya Khadye	George Moody Middle School
11-11:20 AM	How to optimize parameters that would affect the speed of an electromagnetic train	Lucy Lu	Ronald Reagan Middle School
11:20-11:40 AM	The Effect of Various Types of Cancers on the Severity of Covid-19 Infection	Arjun Majety	George Moody Middle School
11:40-12 PM	The Effect of Different Bicycle Gear Ratio on Speed	Tanvi Nareddy	George Moody Middle School
12-12:40 PM	LUNCH BREAK		
12:40-1 PM	The Effect of the Launch Angle on Flight Time and Flight Distance	Amogh Saunshimath	Short Pump Middle School

1-1:20 PM	The Effect of Machine Learning Algorithms on Counting the Fish Population	Camellia Sharma	George Moody Middle School
1:20-1:40 PM	The Effect of the Type of Stormwater Filtration Method on Collecting Litter	Isla Wearmouth	Kenmore Middle School
1:40-2 PM	The Effect of Different Back-To-School Plans on the Spread of SARS-CoV-2	Annie Yuan	George Moody Middle School

Judges - Please Keep to Schedule. Complete & Submit All Scores on Reviewr by 5 PM.

Human Behavior (MS HB)

Shared Room/Judges with High School Psychology Section A - see HS PSY-A Schedule

Mathematics: Patterns & Relationships (MS MP)

Shared Room/Judges with High School Math Section - see HS MTM Schedule

Physical Science & Astronomy (MS PA)

Zoom link

<https://cwm.zoom.us/j/92089160402?pwd=WUQyMW84dGRqb0tIREMwLy9wenFXQT09>

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	The Effect of Different Materials on the Absorption of Sound	Sanaya Bothra	George Moody Middle School
9:20-9:40 AM	The Effect of Resistance of Different Types of Metals on Electrical Conductivity	Abhinav Gitta	George Moody Middle School
9:40-10 AM	The Effect of Different Types of Masks on Airborne Particles	Alina Hashimee	Ronald Reagan Middle School
10-10:20 AM	How Does the Type of Current at Different Voltages Affect Electromagnetic Force?	Theodore Hwang & Dorothy Hwang	Gunston Middle School
10:20-10:40 AM	BREAK		
10:40-11 AM	The Effect of Different Materials on the Volume of Sound	Livia Kouts	Ronald Reagan Middle School
11-11:20 AM	Multiphonics on Euphonium: Solving the Mystery of the Third Note	Aleksander Kurgan	George Moody Middle School
11:20-11:40 AM	The Effect of Surface Shape on Wakes	Colton Moore	Swanson Middle School
11:40-12 PM	The Effect of Different Materials on Reduction of EMF Radiation	Tess Vithoulkas	George Moody Middle School

Judges - Please Keep to Schedule. Complete & Submit All Scores on Reviewr by 5 PM.

Plant Science & Microbiology (MS PM)

Zoom link

<https://cwm.zoom.us/j/92971857992?pwd=Ukl5b0FaM2g0U1VnakYyMjZBZG1Odz09>

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	The Effect of Different Disinfectants on the Growth of E. coli	Nikki Alemzadeh	Louise A. Benton Middle School
9:20-9:40 AM	The Effect Of Houseplants On Indoor Air Quality	Aditya Banerjee	George Moody Middle School
9:40-10 AM	The Effect of Different Types of Sugars on The Growth Rate of Yeast	Sriram Darsi	George Moody Middle School
10-10:20 AM	The Effect of Radiofrequency Radiation During Phaseolus vulgaris Seed Germination on Subsequent Plant Growth	Cameron Joyce	George Moody Middle School
10:20-10:40 AM	The Effect of Tea Leaves (Camellia Sinensis) on Pea Plant (Pisum Sativum) Germination Time.	Deepanshi Kumar	George Moody Middle School
10:40-11 AM	BREAK		
11-11:20 AM	The Effect Of Pollutants on a Native Plant	Mia Moret	Kenmore Middle School
11:20-11:40 AM	The Effect of Legumes on the Germination of Lactuca Sativa	Jaya Shah	Williamsburg Middle School
11:40-12 PM	The effect of different instruments on the amount of bacterial growth and how fast it grows	Dalia Singer	Swanson Middle School
12-12:20 PM	The Effect of the different types of water on the different types of bean plants	Michelle Telmuun	Swanson Middle School

12:20-12:40 PM	The Effect of Continuous Light on Helianthus Annuus	Lucy Yoder	Sabot at Stony Point
12:40-1 PM	The inhibitive effect of Palmolive dish soap concentration on bacteria growth	Alice Zhang	George Moody Middle School

Judges - Please Keep to Schedule. Complete & Submit All Scores on Reviewr by 5 PM.

Botany A (HS BOT-A)

Zoom link

<https://cwm.zoom.us/j/94532348485?pwd=MG1uV0VtSVh2TFJFVy9jakZiaXpQdz09>

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	The Effect of Various Allelopathic Plants on the Suppression of Taraxacum officinale	Bhavana Adhikari	Mills E. Godwin High School
9:20-9:40 AM	The Effect of Smoke Exposure on the Transpiration Rate of Ocimum basilicum	Veda Akula	Mills E. Godwin High School
9:40-10 AM	The effect of lipid second messenger Phosphatidic Acid (PA) on Spinach (Spinacia oleracea) under salt stress.	Maria Angel Zamora	Mills E. Godwin High School
10-10:20 AM	The Effect of Natural Fertilizers on Nutrition of Beta vulgaris.	Riya Chawla	Mills E. Godwin High School
10:20-10:40 AM	BREAK		
10:40-11 AM	The Effect of Dextrose Solutions on Raphanus sativus	Joey Chen	Mills E. Godwin High School
11-11:20 AM	The Effect of Different Worms on the Growth of Tagetes Patula	Nachaal Chidambaram	Mills E. Godwin High School
11:20-11:40 AM	The Effect of Various NPK fertilizers on Spinach Plant Growth	Pranav Chintkuntlawar	Mills E. Godwin High School
11:40-12 PM	The Effect of Vitamin C on Raphanus sativus Plants	Julia Hudgins	Mills E. Godwin High School
12-12:40 PM	LUNCH BREAK		
12:40-1 PM	The Effect of Added Polyamines on Glycine max Responses to Drought	Beverly Eborn	Central Virginia Governor's School.

1-1:20 PM	The effect of different brands of sunscreen on elodea canadensis	Sydney Fairchild	Central Virginia Governor's School.
1:20-1:40 PM	The Effect of Different Amounts of Greywater Filtration on the Growth Rate of Radishes	Sassan Fiske & Estee Ruiz	Washington-Liberty High School
1:40-2 PM	The Effect of Mangroves and Limestone Powder on the pH of Water	Estelle He	Mills E. Godwin High School
2-2:20 PM	BREAK		
2:20-2:40 PM	Effects of plastic micro-particles on Helianthus annuus growth	Lily Doebler	Central Virginia Governor's School.
2:40-3 PM	The Allelopathic Effect of Allelochemicals such as Juglone in Juglans Nigra On Zea Mays and Glyphosate Resistant Weed Amaranthus Retroflexus	Matthew Huson	Washington-Liberty High School
3-3:20 PM	The Impact of Invasive species English ivy (Hedera helix) on the Nitrogen, Phosphorous, Potassium level and pH Balance of Native Soil	Maya Lennon & Elyse Lanquaye	Governor's School@Innovation Park
3:20-3:40 PM	The Effect of the Contaminant on the Growth of the Radish Plant	Noor Long	Washington-Liberty High School

Judges - Please Keep to Schedule. Complete & Submit All Scores on Reviewr by 5 PM.

Botany B (HS BOT-B)

Zoom link

<https://cwm.zoom.us/j/91471855686?pwd=aUxxWnlnOHoxUkVnTmVYLzRGL004dz09>

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	Lichen Abundance and Diversity in Cemetery Environments	Abby Madson	Chesapeake Bay Governor's School
9:20-9:40 AM	Investigating Sound on the Effect of Music Genres on Growth of <i>Vigna radiata</i> and <i>Solanum lycopersicum</i> .	Anika Makarla	Mills E. Godwin High School
9:40-10 AM	The Effectiveness of Natural Medicinal Essential Oils as Cleaning Products	Ankita Mandal	Mills E. Godwin High School
10-10:20 AM	The Effect of Different Pesticides Containing Heavy Metals on the Transpiration Rate of <i>Vigna unguiculata</i>	Nishaanth Mulpuru	Mills E. Godwin High School
10:20-10:40 AM	BREAK		
10:40-11 AM	The effect of different antioxidants on the protection of free radicals in <i>Vigna radiata</i> seed germination	Angela Nguyen	Mills E. Godwin High School
11-11:20 AM	The Effect of Temperature of Water on Capillarity	Hemanth Nimmagadda	Mills E. Godwin High School
11:20-11:40 AM	The Synergistic Allelopathic Effects of Extracts from Two Invasive Species on Germination and Growth of <i>R. sativus</i>	Carson Ray & Daniel Han	Roanoke Valley Governor's School
11:40-12 PM	The Effect of Different Soil and Bean Combinations on Electricity Production	Sriharsha Sambangi	Mills E. Godwin High School
12-12:40 PM	LUNCH BREAK		

12:40-1 PM	The Effect of Using Black Soldier Fly Larvae in Composting on Resulting Plant Height	Benjamin Schneider	Clover Hill High School
1-1:20 PM	The Effect of Climate Change on Seed Germination	Meyyammai Subramanian Periyakaruppan	Mills E. Godwin High School
1:20-1:40 PM	The effects of electricity at different voltages on growth of Ambrosia Hybrid corn plant (Zea mays var. rugosa)	Imaan Syed	Central Virginia Governor's School.
1:40-2 PM	The Effect of Various Hygroscopic Humectants on Seed Germination Day	Aquib Syed	Mills E. Godwin High School
2-2:20 PM	BREAK		
2:20-2:40 PM	The Effect of Aqueous Calcium Concentrations on the Germination of Pisum sativum	Ryan Taylor	Mills E. Godwin High School
2:40-3 PM	The Effect of Magnetism on Crop Survival During a Simulated Drought	Diana Trutia	Mills E. Godwin High School
3-3:20 PM	The Effect of Magnesium Sulfate on Epipremnum Aureum, Radicle Growth	Nivriti Vanga	Mills E. Godwin High School
3:20-3:40 PM	The Effect of UV-B Intensity on the Floral Pigmentation of Brassica rapa	Arleigh Wagoner	Central Virginia Governor's School.

Judges - Please Keep to Schedule. Complete & Submit All Scores on Reviewr by 5 PM.

Chemistry A (HS CHM-A)

Zoom link

<https://cwm.zoom.us/j/99827039061?pwd=OUNHUDF2c2tvY1BDYmNkNIILNEFrQT09>

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	The Effect of Mordant on the Weight of Yarn	Haley Baasansukh	Washington-Liberty High School
9:20-9:40 AM	The Effect of pH on the Solubility of Acetaminophen	Olivia Bartrum	Wakefield High School
9:40-10 AM	The Effect of Different Types of Wood on Maximum Temperature Yield	Raneem Basir	Clover Hill High School
10-10:20 AM	The Effect of Different Levels of Ammonia on Absorption of Hair Color During the Dyeing Process	Cherish Bland	Clover Hill High School
10:20-10:40 AM		BREAK	
10:40-11 AM	Optimization of an Electrocoagulation System for the Removal of Polyatomic Ions from Water	Julia Brodsky	H.B. Woodlawn
11-11:20 AM	The Effect of Active Ingredient on Ultraviolet Radiation Protection	Victoria Bui	Mills E. Godwin High School
11:20-11:40 AM	The Effects of Antifungal Agents on the CO ₂ Production of Baker's Yeast	Richard Chen	Washington-Liberty High School
11:40-12 PM	The Effect of Cleaning Solution on Rust on Nails	Misthi Choksi	Mills E. Godwin High School
12-12:40 PM		LUNCH BREAK	
12:40-1 PM	The Effect of Genetic Pool Testing on Result Reliability	Sydney Coffman	Mills E. Godwin High School

1-1:20 PM	Optimizing Direct Air Capture Through Using Infrared-Promoted Vibrational Behaviors of Greenhouse Gases: A Computationally-assisted Analysis	Zaid Contractor	Mills E. Godwin High School
1:20-1:40 PM	The effect of Fruit on the Alcohol level of Kombucha	Ramon Dayan	Washington-Liberty High School
1:40-2 PM	THE ILLUMINATION OF DIFFERENT CHEMICAL ADDITIVES ON ROAD MARKINGS	Logan Dwyer, Jack Pierce & Rajitha Anbu	Governor's School@Innovation Park

Judges - Please Keep to Schedule. Complete & Submit All Scores on Reviewr by 5 PM.

Chemistry B (HS CHM-B)

Zoom link

<https://cwm.zoom.us/j/96730373654?pwd=RINPMFBFN3VITEFXVIZYnAxd1FyQT09>

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	The Effect of Ripening on Ascorbic Acid in Capsicum annum	Laken Evans	Mills E. Godwin High School
9:20-9:40 AM	The Effect of Color on Levels of Vitamin C in Bell Peppers	Heera Rajiv	Mills E. Godwin High School
9:40-10 AM	The Effect of Making Ice Cream with Dairy Products of Various Butterfat Percentages on the Melting Time of Ice Cream	Macy Kin	Clover Hill High School
10-10:20 AM	The Effect of Different Types of Sugar on the Vitamin C Concentration of Fresh-Squeezed Orange Juice	Naomi Lindsay	Wakefield High School
10:20-10:40 AM	BREAK		
10:40-11 AM	The Effect of Different Pill Capsules on Capsule Opening Time	Abhilash Mangamuri	Mills E. Godwin High School
11-11:20 AM	The Effect of Various Household Remedies on Neutralizing Stomach Acid	Arjun Modi	Mills E. Godwin High School
11:20-11:40 AM	The Effect of the Form of Heat Resistant Product on the Heat Damage of the Hair.	Thanvi Parupati	Mills E. Godwin High School
11:40-12 PM	The Effect of Type of Catalyst on Efficiency of Water-Splitting with an Application Towards Solar Energy	Daniel Philip	Mills E. Godwin High School
12-12:40 PM	LUNCH BREAK		

12:40-1 PM	The Effect of Cooking on Vitamin C Concentration	Hannah Kim	Central Virginia Governor's School.
1-1:20 PM	A New Treatment? An Analysis of the Effect of Known Phytochemicals on SARS-CoV-2 Pathogenesis	Aatish Sethi & Jasmine Agyepong	Governor's School@Innovation Park
1:20-1:40 PM	The Effect of Different Levels of Oxygen on the Exothermic Oxidation of Iron Powder	Trisha Taparia	Mills E. Godwin High School
1:40-2 PM	The Effect of Water pH on Copper Oxidization Using Pennies	Christina Wen	Mills E. Godwin High School

Judges - Please Keep to Schedule. Complete & Submit All Scores on Reviewr by 5 PM.

Engineering A (HS EGR-A)

Zoom link

<https://cwm.zoom.us/j/94102685518?pwd=UytRdWNtUFFaTEhudEdwcGI4dXFpQT09>

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	An Indoor Farm Scouter Through Time-Based Imaging	Naman Agarwal	Patriot High School
9:20-9:40 AM	Validation of semi-automatic computational methods for the assessment of stiffness and deformation of the thoracic aorta from magnetic resonance imaging	Joshua Alexander	Deep Run High School
9:40-10 AM	The Effect of 3D Printing Material on 3D Print Strength	Eyuel Berhanu	Washington-Liberty High School
10-10:20 AM	The Effect of Varying the Thickness-to-Chord Ratio of an Airfoil and the Pitch of the Blades on a Wind Turbine on the Turbine,Âs Electrical Output	Zachary Burgess	Clover Hill High School
10:20-10:40 AM		BREAK	
10:40-11 AM	Small Scale Vertical Farming	Mia Constantin & Elizabeth Quimby	Harrisonburg High School
11-11:20 AM	Simulating the Feasibility of a Chlorophyll-Based Photovoltaic Cell Design	Samuel Cutler	Ocean Lakes High School Mathematics and Science Academy
11:20-11:40 AM	Whitewater Helmet STAR: Evaluating the Biomechanical Performance and Risk of Head Injury for Whitewater Helmets	Brock Duma	Blacksburg High School

11:40-12 PM	IntelliCure: A Novel Deep Learning Platform to Distinguish Morphological Features from Malignant and Benign Endometrial Carcinoma	Khushi Garg	Thomas Jefferson High School for Science and Technology
12-12:40 PM	LUNCH BREAK		
12:40-1 PM	Using AI to Detect and Deter Telemarketers	Max Gordon	T C Williams High School
1-1:20 PM	The Effect of Parabolic Reflectors Constructed of Household Materials on the Signal Strength of a Router	Will Gregory	Central Virginia Governor's School.
1:20-1:40 PM	Effect of Varying Temperatures on The Performance of a Passive Suspension System with a Nonlinear Air Spring in a Seismic System	Grant Helm	Central Virginia Governor's School.
1:40-2 PM	The Effect of the Front Angle of a Carbon Dioxide Powered Car (degrees) on the Speed of the Car(m/s)	Michael Hunter	Clover Hill High School
2-2:20 PM	BREAK		
2:20-2:40 PM	The Effect of Wingspan Length on Distance a Balsa Wood Glider Travels	John Jensen	Clover Hill High School
2:40-3 PM	The Effect of Anti-aliasing Method Used on Speed of Video Output	Richard Jones	Clover Hill High School
3-3:20 PM	Trainable WEKA Segmentation Tool Machine Learning-Enabled Segmentation on Features of Orthopantomograms	Nitin Kanuri	Mills E. Godwin High School

Judges - Please Keep to Schedule. Complete & Submit All Scores on Reviewr by 5 PM.

Engineering B (HS EGR-B)

Zoom link

<https://cwm.zoom.us/j/91056555906?pwd=cGhhTmdMdGJvdzgwL3JrMTNiTnladz09>

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	A Novel Integrative WSI-Based Framework For Breast Cancer Molecular Classification	Laasya Konidala	Mills E. Godwin High School
9:20-9:40 AM	The Effect of Different Sorting Algorithms on Program Runtime	Devesh Kumar	Maggie L. Walker Governor's School
9:40-10 AM	Cost Effective Setup For Testing Mask Efficacy	Teddy Liu	Central Virginia Governor's School.
10-10:20 AM	Non-Invasive Enhancement of Bionic Vision for Patients of Photoreceptor Degeneration through Computer Vision Techniques	Gwyneth Liu	Mills E. Godwin High School
10:20-10:40 AM		BREAK	
10:40-11 AM	Automobile Window Tinting on the Transmission of Ultraviolet-A Radiation and Laterality of Skin Cancer Analysis	Grace Loos	Mills E. Godwin High School
11-11:20 AM	Comparing Sustainable Materials as Filters for Aqueous Dye Solution	Ina Lynch	Central Virginia Governor's School.
11:20-11:40 AM	A comparison of different percents of ethanol mixed with different octanes on small combustion engine run times.	Hunter Maul	Chesapeake Bay Governor's School
11:40-12 PM	The Effect of Different Wavelengths on the Photovoltaic Electricity Produced	Ella McNally	Washington-Liberty High School

12-12:40 PM

LUNCH BREAK

12:40-1 PM	The Effect of Hair Conditioner on Cheerleading Bow Dimensions and Rate of Color Fading Based on UV Index	Katelynn Menjivar	Clover Hill High School
1-1:20 PM	Finding a Correlation Between Temperature and Melt Pool Size in Laser Additive Manufacturing	Victoria Midkiff	Blacksburg High School
1:20-1:40 PM	The Effect of Car Seat Safety Devices on Body Pressure	Namit Nallapaneni	Mills E. Godwin High School
1:40-2 PM	The Effect of Fiber Orientation on the Flexural Properties of Carbon Fiber Reinforced Polymer	Jarred Newcomb	Central Virginia Governor's School.

2-2:20 PM

BREAK

2:20-2:40 PM	The Effect of Rat Brain Phantom Construction on Mimicry of the True Brain Model	Chirayu Nimonkar	Mills E. Godwin High School
2:40-3 PM	Effect of Aspect Ratio of Aerofoil on Downforce Produced by Aerofoil	Andrew Orndorff	Clover Hill High School
3-3:20 PM	The Effect of Various Earthquake Resistance Methods on Reducing Movement of a Wooden Structure During a Simulated Earthquake	Ishita Patel	Clover Hill High School
3:20-3:40 PM	The Effect of Lining a Sound Box with Various Materials on the Intensity and Duration of the Sound Created	Caleb Peake	Clover Hill High School

Judges - Please Keep to Schedule. Complete & Submit All Scores on Reviewr by 5 PM.

Engineering C (HS EGR-C)

Zoom link

<https://cwm.zoom.us/j/99893288257?pwd=TG5ldmZLZGUzMEpzbIN4bCtaSjdMUT09>

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	Using Piezoelectricity to Create a Self-Powered Calculator.	Jade Personna	Central Virginia Governor's School.
9:20-9:40 AM	The Effect of Ultraviolet Light on Thermoplastic Tensile Strength	Annabel Puritz	Mills E. Godwin High School
9:40-10 AM	DORC: Dynamic Operating Room Companion for Surgical Workflow Recognition	Pravalika Putalapattu	Thomas Jefferson High School for Science and Technology
10-10:20 AM	The Effect of Various Concrete Additives on the Structural Integrity of Concrete	Carter Ramkey	Clover Hill High School
10:20-10:40 AM	BREAK		
10:40-11 AM	The Effect of Different Cooling Systems on the Voltage Generated of a Fixed Angle Solar Panel	Taryk Saidou	Central Virginia Governor's School.
11-11:20 AM	Effect of number of symptoms on the accuracy of the Naïve Bayes classifier for diagnosis of Heart Disease	Roshan Sarangi	Mills E. Godwin High School
11:20-11:40 AM	The Effect of CPU and GPU Based Parallel Processing on the Execution Time of Different Types of Computational Workloads	Rishav Sen	Mills E. Godwin High School
11:40-12 PM	People Spotter	Sejal Sharma, Jennine Faruque & Kalea Wen	Governor's School@Innovation Park

12-12:40 PM

LUNCH BREAK

12:40-1 PM	Investigation of the Tumoricidal Effects of Sonodynamic Therapy in Malignant Glioblastoma Brain Tumors	Kimball Sheehan & Darrah Sheehan	Western Albemarle High School
1-1:20 PM	ELMOPP: An Application of Graph Theory and Machine Learning to Traffic Light Coordination	Fareed Sherif	Mills E. Godwin High School
1:20-1:40 PM	The Effect of Flaps on Aircraft Landing Distance	Ardenne Sklavos	Mills E. Godwin High School
1:40-2 PM	The Effect of Various Sleeve Materials on the Force Exerted and Percent Contraction of Pneumatic Artificial Muscles	Andrew Tabor	Central Virginia Governor's School.

2-2:20 PM

BREAK

2:20-2:40 PM	Modeling the Effect of Environment on Collision Detection Runtime	Josh Tomiak	Southwest Virginia Governor's School
2:40-3 PM	Risk-Adjusted Return Analysis of Asset Allocation Strategies for Retirement Savings	Carson Wang	Maggie L. Walker Governor's School
3-3:20 PM	The Effect of Various Existing Algorithms on Success at Correctly Identifying Emotions by Facial Expressions	Sarah Wilms	Clover Hill High School
3:20-3:40 PM	Effect of Pelletized Plastic On Asphalt Compressive Strength	Frank Wright	Central Virginia Governor's School.

Judges - Please Keep to Schedule. Complete & Submit All Scores on Reviewr by 5 PM.

Environmental & Earth Science A (HS ENV-A)

Zoom link

<https://cwm.zoom.us/j/96011351682?pwd=cW1vOC9YdkxDVEEdSLzJYd2JBaFZSQ09>

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	Modeling Oncorhynchus nerka Populations Near Pebble Mine, Alaska	Thomas Ackleson	Washington-Liberty High School
9:20-9:40 AM	The Effect of Crumb Rubber on the Height of Tall Fescue Grass	Elizabeth Adams	Washington-Liberty High School
9:40-10 AM	The Effect of Different Types of Fertilizers on the Regeneration of Lumbriculus Variegatus	Sujhan Alwin	Clover Hill High School
10-10:20 AM	The Effect of Aquatic Plants on Nitrate Reduction in Ecosystems.	Nikhil Amin	Mills E. Godwin High School
10:20-10:40 AM	BREAK		
10:40-11 AM	Baby Got Leatherback! Anthropogenic Effects on Sea Turtle Nesting and Reproduction in North Carolina	Sydney Bakir	Chesapeake Bay Governor's School
11-11:20 AM	Atlantic, Caribbean and Great Barrier Reef Coral Bleaching as a Function of SST	Isaac Barber	Chesapeake Bay Governor's School
11:20-11:40 AM	The Effect of Water Source on the Number of Microplastic Particles in the Water	Anita Bennett	Clover Hill High School
11:40-12 PM	Can 3D Printed Substrates Provide a Suitable Substrate for Fouling Organisms in the Lower Chesapeake Bay Estuary?	Kylie Berry	Chesapeake Bay Governor's School
12-12:40 PM	LUNCH BREAK		

12:40-1 PM	A Preliminary Assessment of the Recovery of Stony Creek from Pollution Using Aquatic Macroinvertebrates	Jenna Beville	Dinwiddie High School
1-1:20 PM	The Effect of Weather Patterns on the Spread of Airborne Plastic	Kathryn Boerckel & Allison Grove	Washington-Liberty High School
1:20-1:40 PM	The Effect of Water Turbulence on Microalgae Growth	Nelson Bonilla	Chesapeake Bay Governor's School
1:40-2 PM	An Analysis of Fire Call Frequencies During Severe Storm Events in a Rural Area	Olivia Brocklebank	Chesapeake Bay Governor's School
2-2:20 PM	BREAK		
2:20-2:40 PM	Salinity and Temperature Effects on the Growth of Diploid Oysters in the Lower Rappahannock River	Katherine Brooke	Chesapeake Bay Governor's School
2:40-3 PM	The Effect of Air Pollution on the Efficiency of Solar Panels	Isla Carlson	Wakefield High School
3-3:20 PM	A Study on the Changes in Pollution and Turbidity Affected by Riparian Buffers of Local Lakes after Three Years	Amulya Chowdhory	Mills E. Godwin High School
3:20-3:40 PM	A Comparison of Littoraria Irrorata Populations Along the Rappahannock River	Margaret Collins	Chesapeake Bay Governor's School

Judges - Please Keep to Schedule. Complete & Submit All Scores on Reviewr by 5 PM.

Environmental & Earth Science B (HS ENV-B)

Zoom link

<https://cwm.zoom.us/j/96816916200?pwd=TE1iNk10Q0VXLzI0eIE5dWJvTIJUUT09>

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	The Effect of Different Plants on the Amount of Soil Eroded	Caroline Colucia & Tessa Muldowney	Washington-Liberty High School
9:20-9:40 AM	The Effect of Fertilizer on Algae and How it Impacts Dissolved Oxygen in Freshwater	Elina Coutlakis-Hixson	Washington-Liberty High School
9:40-10 AM	The Production of Fabric from Pleurotus eryngii and Ganoderma lingzhi Mycelia	Reesa Taylor Devers Frazier	Roanoke Valley Governor's School
10-10:20 AM	Stress Levels of Mummichogs in Response to Noise	Amar Dunham	Chesapeake Bay Governor's School
10:20-10:40 AM		BREAK	
10:40-11 AM	The Effect of Conflict on Air Pollution	Andrew Edmondson	Washington-Liberty High School
11-11:20 AM	The Effect of Acidity Level on Paper Degradation	Sarah Eichorn	Washington-Liberty High School
11:20-11:40 AM	The effect of soil quality on the viability of earthworms.	Tamas Gal	Mills E. Godwin High School
11:40-12 PM	Does Our Bay and Surrounding Water Areas Produce Enough Wind Energy that Building Wind Turbines Would be Efficient in Our Area?	Clayton Garrett	Chesapeake Bay Governor's School
12-12:40 PM		LUNCH BREAK	

12:40-1 PM	A Solution to Plastic Pollution: An Investigation into Microplastic Removal from Water Using Ferrofluid	Madison Goeke	Washington-Liberty High School
1-1:20 PM	The Effect of Waxworms on Plastic Decomposition	Vaidehi Goyal	Mills E. Godwin High School
1:20-1:40 PM	The Effect of Biodiversity on Water and Pollution Retention	Serena Grant	Mills E. Godwin High School
1:40-2 PM	The Effect of Human Activity on Biodiversity in a Freshwater Marsh	Cassy Hixson	Chesapeake Bay Governor's School
2-2:20 PM	BREAK		
2:20-2:40 PM	The Effects of Naturally Occurring Acids on Scenedesmus sp. Population Growth	Sara Holt	Central Virginia Governor's School.
2:40-3 PM	Eastern Skunk Cabbages: A Natural and Sustainable Solution for Combating Bank Erosion	Chelsea Hu	BASIS Independent McLean
3-3:20 PM	The Effect of Organic Compost Tea vs. Chemical Fertilizer on Growth and Fruit Production of Tomatoes	Abigail Hudgins	Chesapeake Bay Governor's School
3:20-3:40 PM	The Effect of Conditional Processing on Atlantic Hurricane Prediction Accuracy	Ojas Joshi	Mills E. Godwin High School

Judges - Please Keep to Schedule. Complete & Submit All Scores on Reviewr by 5 PM.

Environmental & Earth Science C (HS ENV-C)

Zoom link

<https://cwm.zoom.us/j/94798761628?pwd=Vm9iNllhSWFoRFJlUdCt4VSs2Qk43QT09>

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	The Effect of Different Locations on Background Radiation	Ishan Joshi	Mills E. Godwin High School
9:20-9:40 AM	The Effect of Population Density on Soil Quality	Erin Leland	Washington-Liberty High School
9:40-10 AM	The Effect of Different Nutrients on Plant Growth	Maya Kent	Washington-Liberty High School
10-10:20 AM	The Effect of Plastic on the Growth of Raphanus sativus	Ella Lewis	Central Virginia Governor's School.
10:20-10:40 AM	BREAK		
10:40-11 AM	The Effect of Microplastics in the Form of Glitter on Freshwater Chlorella Algae Growth and pH Levels	Eujine Kim	Central Virginia Governor's School.
11-11:20 AM	The Effect of Different Oil Spill Cleanup Methods on the Survival Rate of Brine Shrimp	Rohan Kurup	Mills E. Godwin High School
11:20-11:40 AM	A Machine Learning Approach to Wildfire Spread Prediction and Risk Assessment	Ethan Ky & Santiago Campos-Merida	Governor's School@Innovation Park
11:40-12 PM	The Effect of the pH of Simulated Acid Rain on Radish Seed Germination	Ava Lansbury	Washington-Liberty High School
12-12:40 PM	LUNCH BREAK		
12:40-1 PM	Effect of Drift of the Herbicide Dicamba on the Health of SAV in the Estuarine Environment	Madelyn Junker	Chesapeake Bay Governor's School

1-1:20 PM	The Effect of Different Filtration Methods on the Consistency and Reduction of Water TDS	Fahad Khan	Mills E. Godwin High School
1:20-1:40 PM	Analysis of Microbial Diversity in PCB-Contaminated Environments	Eleanor Little	Roanoke Valley Governor's School
1:40-2 PM	The Effect of Different Bio-compatible Coagulants on Microplastic Extraction from Water	Aryan Mhaskar	Mills E. Godwin High School
2-2:20 PM	BREAK		
2:20-2:40 PM	The Effect of Materials in Compost on Compost Temperature	Lillian Moo	Washington-Liberty High School
2:40-3 PM	Effect of Glycerol on the Reproduction Rate of Daphnia magna	Lauren Noel	Central Virginia Governor's School.
3-3:20 PM	Sequencing Analysis of Micobial Abundance and Diversity of Different Shorelines in the Lower Chesapeake Bay	Kathryn Parnell	Chesapeake Bay Governor's School
3:20-3:40 PM	Effect of Soil Acidity on Rate of Decomposition of Paper	Ellie Potts	Washington-Liberty High School

Judges - Please Keep to Schedule. Complete & Submit All Scores on Reviewr by 5 PM.

Environmental & Earth Science D (HS ENV-D)

Zoom link

<https://cwm.zoom.us/j/99869984709?pwd=OXJjeEJ4UmR1bGRRUzdYODZMV3BNUT09>

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	The Effect of Soil Location on pH	Siddhant Prakash	Mills E. Godwin High School
9:20-9:40 AM	Catch of the Century!	Lauren Rahn	Chesapeake Bay Governor's School
9:40-10 AM	The study of microplastic concentrations of soil and water from Northern Virginia's freshwater bodies and their effect on the growth of <i>Persicaria punctata</i>	Pearl Raichura, Vinay Bhakthan & Mehreen Rahman	Governor's School@Innovation Park
10-10:20 AM	The Effect of Concentrations of Herb Mixtures on Memory Retention in <i>Dugesia Tigrina</i>	Arvind Rajesh	Mills E. Godwin High School
10:20-10:40 AM		BREAK	
10:40-11 AM	The Effect of Various Colloidal Metals on Nymphaeaceae Phytoextraction Performance	Snehitha Ravilla	Mills E. Godwin High School
11-11:20 AM	The Effect of Limonene from Different Extracts of Citrus Fruits on the dissolving Styrofoam	Rithvik Rayala	Mills E. Godwin High School
11:20-11:40 AM	The Effect of Rising Water Temperature on the Respiration Rate of <i>Mummichogs</i> , <i>Fundulus heteroclitus</i>	Taylor Rice	Chesapeake Bay Governor's School
11:40-12 PM	Ash in Alexandria	Reid Ridenhour	T C Williams High School
12-12:40 PM		LUNCH BREAK	

12:40-1 PM	Corrosion of Different Fish Hook Coatings Under Estuarine Saltwater Conditions	John Robins	Chesapeake Bay Governor's School
1-1:20 PM	The effect of different fertilizers on plant height	Zachary Roman	Washington-Liberty High School
1:20-1:40 PM	Can Man-Made Ponds Serve All of the Ecological Functions of Naturally Formed Ponds?	Kayla Schill	Chesapeake Bay Governor's School
1:40-2 PM	The Effect of Plant Type of a Green Roof on Internal Building Temperature	Harriet Shapiro	Washington-Liberty High School
2-2:20 PM	BREAK		
2:20-2:40 PM	The Effect of Surface Dynamics on Atmospheric Water Harvesting	Cameron Sharma	Mills E. Godwin High School
2:40-3 PM	The Effect of Water Temperature on the Amount of Dissolved Oxygen in Water	Maya Sherlick	Arlington Tech
3-3:20 PM	The Effect Of Additives on Melting Ice	Ananya Sinha	Arlington Tech
3:20-3:40 PM	Lunar Effect on Fish Catch Rate	Jeremey Smith	Chesapeake Bay Governor's School

Judges - Please Keep to Schedule. Complete & Submit All Scores on Reviewr by 5 PM.

Environmental & Earth Science E (HS ENV-E)

Zoom link

<https://cwm.zoom.us/j/97217053767?pwd=eUY4eEE4NzFzRVdVUFFhNkVFc3p1dz09>

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	Budgetary Investment in Environmental Preservation and how it relates to Monetary Damage caused by Natural Disasters from 1988-2019	Seonbin Song	Blacksburg High School
9:20-9:40 AM	The Effect of Distance from I-95 on Prevalence of Epiphytic Lichen	Adam Stievater	Washington-Liberty High School
9:40-10 AM	The Effect of Ventilation Method on Level of Indoor Carbon Dioxide	Lanyi Stroud	Yorktown High School
10-10:20 AM	The Effect of Impervious Surfaces on Steam Health: a Study of Machine Learning and Multivariate Statistical Analyses	Lynn Tao	Thomas Jefferson High School
10:20-10:40 AM	BREAK		
10:40-11 AM	The Effect of Time on Surgical Mask Degradation	Benjamin Tsai	Washington-Liberty High School
11-11:20 AM	The effect of Carbon Dioxide on the heat absorption and heat retention of an artificial atmosphere.	Evan Tuckley	Mills E. Godwin High School
11:20-11:40 AM	Evaluation of Four Materials for Growing Aquatic Algae to Produce Biofuel	Eleanor Veazey	Chesapeake Bay Governor's School
11:40-12 PM	It's Not Easy Being Green: Examining Factors for the Growth Rate of Chlorella Vulgaris	Lydia Wallace	Chesapeake Bay Governor's School
12-12:40 PM	LUNCH BREAK		

12:40-1 PM	How Important is the Shallow Water Refuge for Small Prey Species in the Chesapeake Bay Food Web	Laura Walton	Chesapeake Bay Governor's School
1-1:20 PM	The Effect of Firework Display Length and Frequency on Amount of Particulate Matter 2.5 in the Air	Ivy Watson	Washington-Liberty High School
1:20-1:40 PM	How the Increasing Microplastic Presence in the Oceans Poses a Threat to Vital Phytoplankton	Bay Wiggins	Chesapeake Bay Governor's School
1:40-2 PM	The Effect Of Various Locations In The Greater Richmond Metro Area On Rainwater Quality	Hanna Wirtu	Mills E. Godwin High School
2-2:20 PM	BREAK		
2:20-2:40 PM	Comparing the Effectiveness of Various Sorbents at Remediating Oil Pollution	Jeffrey Wooters	Central Virginia Governor's School.
2:40-3 PM	The Effect of Fuel Octane on Carbon Monoxide Emissions	Marshall Wright	Mills E. Godwin High School
3-3:20 PM	The Effect of COVID-19 Quarantine Measures on AQI of 100 US Cities	Rose Yang	Mills E. Godwin High School
3:20-3:40 PM	The Effect of Different Heating Methods on Vitamin C Concentrations in Capsicum annuum	Aaron Yuan	Mills E. Godwin High School

Judges - Please Keep to Schedule. Complete & Submit All Scores on Reviewr by 5 PM.

Math: Theoretical & Modeling (HS MTM)

Zoom link

<https://cwm.zoom.us/j/92926570100?pwd=N2ZZckluZm5uWFZpRjRVU2Q4eDNkdz09>

Shared Room/Judges with Middle School Math Section (First 3 papers are MS Math)

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	The Effect of Poverty Percentages on Voter Turnout	Sattwik Nath	George Moody Middle School
9:20-9:40 AM	The Effect Of Mail-in Voting Fraud On a Battleground State's Election Result	Zareef Said	Ronald Reagan Middle School
9:40-10 AM	The Effect of School Size, Per-Pupil Expenditure, and Percent of Teachers with Advanced Degrees on SOL Pass Rates	Henry Stievater	Swanson Middle School
10-10:20 AM	BREAK		
10:20-10:40 AM	Using Transit Light Curves for Ground-Truthing the Orbital Radius and Planet Radius of Exoplanets Examined by the K2 Campaign 10 Mission	Mahin Atturu	Mills E. Godwin High School
10:40-11 AM	The Effect of Model Type on the Accuracy of Predicted Values	Pranav Bandla	Mills E. Godwin High School
11-11:20 AM	Using Energy Conservation to Estimate Bullet Penetration into Differing Materials	Christopher Behre	Chesapeake Bay Governor's School
11:20-11:40 AM	SeizureSeeker: A Novel Approach to Epileptic Seizure Detection Using Machine Learning	Tony Bright, Hamza Lateef & Gabriel Ralston	Charles J. Colgan High School

11:40-12 PM	Investigation in Microbiota Dysbiosis of E-cigarette Users and Smokers	Nina Dao	Ocean Lakes High School Mathematics and Science Academy
12-12:40 PM	LUNCH BREAK		
12:40-1 PM	Predicting Ideal Group Sizes for COVID-19 Pooled Testing Using Mathematics	Rose Haron	Washington-Liberty High School
1-1:20 PM	Momentum-Based Interaction Networks for Modeling Rigid Body Dynamics	Junho Lee	Thomas Jefferson High School for Science and Technology
1:20-1:40 PM	The Effect of Various Software on Protein Structure Prediction	Abhinav Mara	Mills E. Godwin High School
1:40-2 PM	Algorithmic Simulations of Hydrocortisone-Induced Degeneration	Philip Naveen	Mills E. Godwin High School
2-2:20 PM	BREAK		
2:20-2:40 PM	De Novo Prediction of RNA-Protein Interactions for Discovery of Tissue-Specific Binding Sites	Lillian Sun	Thomas Jefferson High School for Science and Technology
2:40-3 PM	Assessing the Efficacy of Various NOX Enzyme Inhibitors as Potential Treatments for Ischemic Stroke in Silico	Samhita Vinay & Keertana Yalamanchili	Thomas Jefferson High School for Science and Technology
3-3:20 PM	Investigating Trends in the Multiple Ligand Activation of PPAR Gamma	Jacqueline Wang	Blacksburg High School

Judges - Please Keep to Schedule. Complete & Submit All Scores on Reviewr by 5 PM.

Medicine & Health A (HS MDH-A)

Zoom link

<https://cwm.zoom.us/j/95330832329?pwd=VTIFeXM0b0svMUUs4cjEydUVQSUVlQdz09>

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	The Effect of Hand Sanitizer Composition and Brand on Antimicrobial Efficacy	Emma Almassy	Chesapeake Bay Governor's School
9:20-9:40 AM	Identification of Fluoxetine as a direct NLRP3 inhibitor to treat atrophic macular degeneration: Molecular modeling, mechanism, morphometry, and meta-analysis (Year 2)	Meenakshi Ambati	Albemarle High School
9:40-10 AM	The Effect of Tissue Thickness on Temperature Change Induced by Cellular Radiation	Lina Aniss	Washington-Liberty High School
10-10:20 AM	The Effect of Different Suturing Techniques on Skin Closure	Shreyas Arcot	Mills E. Godwin High School
10:20-10:40 AM	BREAK		
10:40-11 AM	Discovery of Novel Extracellular Vesicle Plasma and Tumor miRNAs As Biomarkers For Lung Cancer via Next Generation Sequencing, Bioinformatics, and In-Vitro Analyses	Perisa Ashar	Maggie L. Walker Governor's School for Government and International Studies
11-11:20 AM	The Effects of Tap Water CaCO ₃ on Kidney Health	Emily Atkins	Chesapeake Bay Governor's School
11:20-11:40 AM	The effect of comorbidities on COVID - 19 mortality rate	Jacob Bayer	Washington-Liberty High School
11:40-12 PM	The Relationship Between Exposure to Fine Particulate Matter During Pregnancy and Preterm Births.	Malek Ben Hammouda	Washington-Liberty High School
12-12:40 PM	LUNCH BREAK		

12:40-1 PM	The Effect of Mask Type on Ability to Block Droplets from Passing Through	Jonah Bierman	Washington-Liberty High School
1-1:20 PM	The Effect of Homeopathic Antifungals on Yeast CO2 Production	Sarah Bolles & Lucy Anderson	Washington-Liberty High School
1:20-1:40 PM	Analyzing Custom DNA Oligo Synthesis Using a Polymerase Chain Reaction to Target TGFR- α 1	Madison Brown & Dhruvi Patel	Roanoke Valley Governor's School
1:40-2 PM	The Effect of the Type of Cardiovascular Exercise on the Number of Calories Burned	Natalie Cecil	Washington-Liberty High School
2-2:20 PM	BREAK		
2:20-2:40 PM	The Effect of Hairbrush Design on Amount of Hair Collected	Allison Chen	Clover Hill High School
2:40-3 PM	The Effect of Elapsed Time on the Thickness Level of Commercial Kefir as Measured by the IDDSI Flow Test and Framework	Charlotte Cunningham	Washington-Liberty High School
3-3:20 PM	Left vs. Right Handedness: The Effect of Handedness on Aspect Chosen to Order Objects	Morgan Dalton	Southwest Virginia Governor's School
3:20-3:40 PM	The Effect of Public Health Policy on COVID-19 Mortality	Maryam Elgindy	Washington-Liberty High School

Judges - Please Keep to Schedule. Complete & Submit All Scores on Review by 5 PM.

Medicine & Health B (HS MDH-B)

Zoom link

<https://cwm.zoom.us/j/99835452059?pwd=aUF6eG1xb0hHMIYvVVBsT1ZoMFJKdz09>

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	The effect of antipsychotic drugs on patients diagnosed with schizophrenia	Skylar Farrar	Central Virginia Governor's School.
9:20-9:40 AM	The Effect of the Occurrence of CD226 Gene Variants on the Death Rate of COVID-19	Kara Felker	Washington-Liberty High School
9:40-10 AM	The Effect of Cellular Device Type on the Amount of Electromagnetic Radiation	Caroline Fern & Caleigh Sleeth	Washington-Liberty High School
10-10:20 AM	The Effect of Different Drinks on Electrolyte Content	Reagan Goodwyn	Mills E. Godwin High School
10:20-10:40 AM	BREAK		
10:40-11 AM	Using a Computational Model to Determine the Binding Ability of Selected Estrogen Derivatives to $\alpha\pm$ - AND $\alpha\leq$ - Type Estrogen Receptors to Prevent Amyloid- $\alpha\leq$ Aggregations	Keren Czyra Gonzaga, Iqra Ahmad & Thu Luong	Governor's School@Innovation Park
11-11:20 AM	The Effect of Suture Material on Dissolution Rate	Yasmine Groener	Mills E. Godwin High School
11:20-11:40 AM	The Genetic Correlation Between Multiple Sclerosis and Various Autoimmune and Neurodegenerative Diseases	Holly Hinchy & Ella Bryant	Roanoke Valley Governor's School
11:40-12 PM	The Effect of Increasing Indoor Ventilation on Artificially Generated Aerosol Particle Counts	Ashwin Johri	Collegiate School
12-12:40 PM	LUNCH BREAK		

12:40-1 PM	The Correlation Between a Country's Development, Unclean Fuel Use, and Prevalence of Respiratory Disease	Pranav Jothi	Central Virginia Governor's School.
1-1:20 PM	The Effect of Acidic Substances on Dental Erosion	Harleen Kaur	Mills E. Godwin High School
1:20-1:40 PM	The Effect of Different Lenses on Blue-Light Filtration	John Mario Kiely	Mills E. Godwin High School
1:40-2 PM	The Effect of Soluble Factors on turning Stem Cells into Kidney Cells	Sricharan Lankalapalli	Mills E. Godwin High School
2-2:20 PM	BREAK		
2:20-2:40 PM	Differential expression of genes associated with innate immune cell function in individuals with and without alpha-gal syndrome	Katerina Leedy	Blacksburg High School
2:40-3 PM	The Effect of Proximity and Particles Exhaled Based on Breath Rate on the Number of COVID-19 Virus Particles Accumulated	Anne Licato	Washington-Liberty High School
3-3:20 PM	NeuroSense: A Quantitative, Cost-Effective, and Portable Device for Early Detection and Nonpharmacologic Treatment of Diabetic Neuropathy	Alan Mach	Ocean Lakes High School Mathematics and Science Academy
3:20-3:40 PM	The Effect of Chemically Active Skincare Products on the Zones of Inhibition of Propionibacterium acnes	Lantz Martin	Central Virginia Governor's School.

Judges - Please Keep to Schedule. Complete & Submit All Scores on Reviewr by 5 PM.

Medicine & Health C (HS MDH-C)

Zoom link

<https://cwm.zoom.us/j/91378344855?pwd=YTU4Q3VpNm1ycTNJaEUxbTE3dDJHQQT09>

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	Examining Potential for Prognostic Predictions by ALS Biomarkers using Neural Networks	Vaibhavreddy Maru	Mills E. Godwin High School
9:20-9:40 AM	The Effect of Third-Hand Smoke (min) on the heart rate of Daphnia magna (bpm)	Maggie Matzen	Clover Hill High School
9:40-10 AM	The Effect of Obesity on Drosophila Reproduction	Jessica Medlin	Chesapeake Bay Governor's School
10-10:20 AM	Comprehensive Computational Genomic Analysis of 1,134 Samples to Understand Genomic Alterations and Their Influence on Outcome in Colorectal Cancer: A Retrospective Study	Anju Natarajan	Collegiate School
10:20-10:40 AM		BREAK	
10:40-11 AM	The Effects of Information Source on Acceptance of COVID-19 Vaccine	Kimayah Nelson	Portsmouth STEM@I.C. Norcom High School
11-11:20 AM	The Effect of Different Liquids on Dissolving Time of Iron Supplements	Manushi Nepal	Mills E. Godwin High School
11:20-11:40 AM	Using Raman Spectroscopy to Identify Bladder Cancer Biomarkers	Lacey Ngo	Roanoke Valley Governor's School
11:40-12 PM	Investigating Alternatives to Conventional Chronic Kidney Disease Treatment Through Analysis of Differential Gene Expression	London Paige	Roanoke Valley Governor's School

12-12:40 PM

LUNCH BREAK

12:40-1 PM The Effect of Virgin Coconut Oil on Regeneration Rate of *Dugesia tigrina* Ponnarasi Rajakumaran Mills E. Godwin High School

1-1:20 PM The Effect of Plant-Based Metabolites on the Binding Affinity between the ACE2 Receptor and the Prefusion Spike Glycoprotein Divya Ramakrishnan, Soneha Datta & Hermela Tadesse Governor's School@Innovation Park

1:20-1:40 PM Effects of Supplemental Oxygen on the Regeneration of Planaria Leanne Ranger Central Virginia Governor's School.

1:40-2 PM The Effect of Breast Cancer Medications on Various Body Tissues of Patients Elina Rastegar Mills E. Godwin High School

2-2:20 PM

BREAK

2:20-2:40 PM RayGAN: Employing Generative Adversarial Networks for 3D Human Anatomy Reconstructions from Planar 2D X-Rays Pranav Ravella & Swesik Ramineni Thomas Jefferson High School for Science and Technology

2:40-3 PM The Effect of Children's Helmet Cost Variance (USD) on Mass Deviation (g) from Simulated Skull Impact Charles Redding Clover Hill High School

3-3:20 PM The Effect of Different Types/Brands of Water on Avocado Root Length Ryann Remias Clover Hill High School

3:20-3:40 PM The effect of different types of tinted sunscreens on how much light goes through a solar panel measured in kilowatts Sofia Reyes Washington-Liberty High School

Judges - Please Keep to Schedule. Complete & Submit All Scores on Reviewr by 5 PM.

Medicine & Health D (HS MDH-D)

Zoom link

<https://cwm.zoom.us/j/99821859302?pwd=QkZua2wwWUFLMnF5SFJkN0lrRnN0Zz09>

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	The Right Mask for the Task: The effect of different face masks on the expelled droplets or particles	Zahra Rizvi	York High School
9:20-9:40 AM	Comparing the Antimicrobial Efficacy of Hand Sanitizers on Staphylococcus epidermidis and Escherichia coli	Avery Roark	Central Virginia Governor's School.
9:40-10 AM	Knowledge of Tissue Donation Survey Project	Lauren Rylander	Washington-Liberty High School
10-10:20 AM	The Effect of the Storage Temperature on the Tomatoes' Nutritious Value	Veronica Samaan	Mills E. Godwin High School
10:20-10:40 AM	BREAK		
10:40-11 AM	The Effect of vitamin supplements on the pH of stomach acid	Saniya Sangle	Mills E. Godwin High School
11-11:20 AM	The Effect of Using Multiple Languages on Parkinson's Disease Detection with Machine Learning	Yash Saxena	Maggie L Walker Governor's School
11:20-11:40 AM	The Effect of Early Monocyte Reconstitution on CD4+ and CD8+ T Cell Populations after Allogeneic Stem Cell Transplantation	Aashka Shah	Maggie L. Walker Governor's School
11:40-12 PM	The Effect of the Type of Toothpaste on Enamel Damage	Yousif Shakroo	Mills E. Godwin High School
12-12:40 PM	LUNCH BREAK		
12:40-1 PM	Analyzing Different Socio-economic Factors and its Effects on Pandemic Response	Ameya Sinha	Yorktown High School

1-1:20 PM	Testing Food Formulas for Glucose Concentrations Before and After Invertase	Tanvee Sunkari	Mills E. Godwin High School
1:20-1:40 PM	Correlation of the National Institute of Health Stroke Scale (NIHSS) with Emergent Large Vessel Occlusion (ELVO) in Stroke Alert Patients ,Äi A Single-Center Experience	Annabel Tang	Maggie L. Walker Governor's School
1:40-2 PM	Race vs. the amount of Confirmed Covid-19 Cases in the US	Abby Welker	Washington-Liberty High School
2-2:20 PM	BREAK		
2:20-2:40 PM	The Effect of Fermentation Time on Sugar Content of Kombucha	Tuong Vo	Mills E. Godwin High School
2:40-3 PM	The Effect of Building Age on the Amount of Lead in Water	Lewis Wearmouth & Brady Krohl	Washington-Liberty High School
3-3:20 PM	The Effect of a Musical Composition on Stress Levels in the Listener	Owen Tucker	Ocean Lakes High School Mathematics and Science Academy

Judges - Please Keep to Schedule. Complete & Submit All Scores on Reviewr by 5 PM.

Microbiology & Cell Biology A (HS MCB-A)

Zoom link

<https://cwm.zoom.us/j/99715818632?pwd=b0U0WU1YMGNIWWF5MW9DMzZUK0FmQT09>

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	The Effect of Antiseptics on Bacterial Growth	Anika Agarwal	Mills E. Godwin High School
9:20-9:40 AM	An Analysis of Cleaning Method Efficacy on Shared Surfaces in a Gym	Lane Anderson	Chesapeake Bay Governor's School
9:40-10 AM	Effects of 5G Compatible Broadband Waves on Average Change in Color of <i>Saccharomyces cerevisiae</i>	Ryan Beck	Central Virginia Governor's School.
10-10:20 AM	Analyzing the PETase enzyme activity in <i>Bacillus cereus</i> and its effect on plastic degradation	Kallena Branham	Central Virginia Governor's School.
10:20-10:40 AM	BREAK		
10:40-11 AM	The Effect of Different Hand Drying Techniques on Quantity of Microbes	Sumiyya Butt	Mills E. Godwin High School
11-11:20 AM	The Effect of Temperature on Concentration of Sugar After 10 Days in the <i>Musa acuminata</i>	Ella Cohen	Washington-Liberty High School
11:20-11:40 AM	The Comparison Between Different Straw Materials to Determine Which Material Grows the Most Bacterial Colonies	Brooke Coleman	Central Virginia Governor's School.
11:40-12 PM	Diversity of Arctic Ice Bacteria in Relation to Position and Distance From the Shore	Katelyn Collett	Southwest Virginia Governor's School
12-12:40 PM	LUNCH BREAK		

12:40-1 PM	The Analysis of the Viral Transmission between the HIV-1 Envelope Glycoprotein and the Lymphocyte Receptor Integrin $\alpha 4 \beta 7$	Harrish Ganesh	Thomas Jefferson School for Science and Technology
1-1:20 PM	The Effect of Supplements on the Regeneration of Planaria	Matthew Gavin	Mills E. Godwin High School
1:20-1:40 PM	Analyzing the Cell Viability and Cell Signaling Activity of an Alginate-based Synthetic Extracellular Matrix Scaffold, "A"	Caroline Grant, Vineel Kavuru & Catherine Chen	Roanoke Valley Governor's School
1:40-2 PM	Analysis of Bacteria Presence After High Pressure Hand Dryer Use	Katelynn Headley	Chesapeake Bay Governor's School
2-2:20 PM	BREAK		
2:20-2:40 PM	The Effects of Natural Antifungal Remedies on Baker's Yeast	Diya Johar	Mills E. Godwin High School
2:40-3 PM	The Effect of Container Material on Lactobacillus Count in Yogurt	Anika Kashyap	Mills E. Godwin High School
3-3:20 PM	Testing the Effectiveness of Different Supplements on the Breaking Down of Lactose in Whole Milk	Diana Kirilov	Mills E. Godwin High School
3:20-3:40 PM	The Effect of Hand-washing vs Hand Sanitizer on Hand Bacteria	Nitya Kumar	Douglas S. Freeman High School

Judges - Please Keep to Schedule. Complete & Submit All Scores on Reviewr by 5 PM.

Microbiology & Cell Biology B (HS MCB-B)

Zoom link

<https://cwm.zoom.us/j/98554354745?pwd=RWttcmpNaTJDaTE1L1dpKzRLeFliQT09>

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	The Effect of Medicinal Plant Concentrates on <i>Saccharomyces cerevisiae</i>	Hannah Loos	Mills E. Godwin High School
9:20-9:40 AM	The Effect of Water pH On Bioluminescence of Dinoflagellates	Akul Miriyala	Mills E. Godwin High School
9:40-10 AM	The Effect of Transition Metals on Gram-negative and Gram-positive Bacterial Growth	Reagan Morford	Central Virginia Governor's School.
10-10:20 AM	Your Shoes are More than Smelly	Grace Oren	Chesapeake Bay Governor's School
10:20-10:40 AM		BREAK	
10:40-11 AM	The Effect of <i>Trametes versicolor</i> Infused Bandages on <i>Staphylococcus epidermidis</i>	Jennie Pham, Cynthia Lin & Emma Greer	Roanoke Valley Governor's School
11-11:20 AM	The Effect of Lyophilization on Rates of <i>Saccharomyces cerevisiae</i> Proliferation	Mihir Pokhriyal	Mills E. Godwin High School
11:20-11:40 AM	The Effect of Time Spent in Contact Lens Solution on Number of Bacterial Colonies Plated From the Lenses	Swetha Poluri	Clover Hill High School
11:40-12 PM	The Effect of Water-Soluble Vitamins on <i>Saccharomyces Cerevisiae</i> Survival Rate	Avirat Raj	Mills E. Godwin High School

12-12:40 PM

LUNCH BREAK

12:40-1 PM	The Effect of Children,Ãs Toothpastes on S. cerevisiae Growth	Shreya Rajkumar	Mills E. Godwin High School
1-1:20 PM	The dependence of milk type on the shelf life beyond the "best by date"	Netra Shah	Mills E. Godwin High School
1:20-1:40 PM	The Effect of Different Materials on Purity of Water	Sudarshan Sriniaiyer	Mills E. Godwin High School
1:40-2 PM	The Effect of Turbidity on the Reproduction of Culex pipien Mosquitos	Leem Taha	Mills E. Godwin High School

2-2:20 PM

BREAK

2:20-2:40 PM	The Effect of Streptococcus Thermophilus on Average Bread Crumb Grain	Raymond Wen	Mills E. Godwin High School
2:40-3 PM	Finding the Least Harmful Aircraft Runway De-Icing Chemicals On Nitrifying Bacteria in Water Masses	Noor Zakriya	Southwest Virginia Governor's School
3-3:20 PM	The Effect of Coronavirus Species on the Binding Strength to a Neutralizing Antibody	Monona Zhou	Mills E. Godwin High School

Judges - Please Keep to Schedule. Complete & Submit All Scores on Reviewr by 5 PM.

Physics & Astronomy (HS PHY)

Zoom link

<https://cwm.zoom.us/j/94368835476?pwd=YWtwSjZoK0NHbWFRbXcyNGNwN3JCUT09>

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	The Effect of Different Blue Light Mitigation Techniques on LED Blue Light Irradiance	Angelica Bain	Washington-Liberty High School
9:20-9:40 AM	Spectral Signatures of Simulated Black Hole Accretion	Brian Cate	Central Virginia Governor's School.
9:40-10 AM	The Effect of Different Parts of the Foot On Distance a Soccer Ball Travels	Madeline Cheatham	Clover Hill High School
10-10:20 AM	Kinematic Analysis: Transition Skateboarding on Force Components	Brandon Chung	Mills E. Godwin High School
10:20-10:40 AM	BREAK		
10:40-11 AM	Analyzing Dust Grain Sizes in the Protoplanetary Disk HD 163296 Through Different Electromagnetic Wavelengths	Landon Epperson	Central Virginia Governor's School.
11-11:20 AM	The effect of different shin guards on force reflected	Mohnish Gopalan	Mills E. Godwin High School
11:20-11:40 AM	Is the Solar System an Outlier? Exoplanetary Orbital Eccentricity and Its Relation to Mass and the Count of Planets	William Graf	Thomas Jefferson High School for Science and Technology
11:40-12 PM	The Effect of Location on the Amount of Skyglow Detected By a Digital Camera	Ian Hooks	Clover Hill High School
12-12:40 PM	LUNCH BREAK		

12:40-1 PM	The Effect of Coronal Mass Ejection Acceleration (km/s ²) In Relevance of Earth's Orbital Position on Gamma Ray Dose Equivalent Rate (nSv/H) in Virginia	Anvita Korrapati	Mills E. Godwin High School
1-1:20 PM	The Effect of Artificial Lighting on the Ability to View the Night Sky	Maya Kaminski	Washington-Liberty High School
1:20-1:40 PM	Quantum Dot Supercapacitors - The Impact of Variation of Supercapacitor Electrolyte Base Material on Capacitance and Supercapacitor Discharge Time	Anika Mukul & Aditi Mukul	Battlefield High School
1:40-2 PM	The Effect of Grain Size on Temperature in the Protoplanetary Disk IM Lup	Jillian Nylund	Central Virginia Governor's School.
2-2:20 PM	BREAK		
2:20-2:40 PM	The Connection Between Spiral Galaxies and Asymmetry: Analyzing Quadrupole Multipole Asymmetry in Spiral Galaxies and its Relation to other Galactic Characteristics	Simran Patibanda, Kaylyn Nguyen & Trent Schuyler	Governor's School@Innovation Park
2:40-3 PM	The Effect of Type of Carbohydrate on a Solution, Å's Refractive Index	Ryan Poquis	Mills E. Godwin High School
3-3:20 PM	Let, Å's Play Ball: A Study on How the Material of A Softball Bat Affects the Distance of a Ball Hit	Kelly Taylor	Chesapeake Bay Governor's School
3:20-3:40 PM	The Effect of Various Wavelengths on the Detection of Point Sources in the Galactic Center	Erum Vohra	Mills E. Godwin High School
3:40-4 PM	The Effect of Constellation on Radio Signal Received at 21cm	Sam Watchman	Arlington Tech

Judges - Please Keep to Schedule. Complete & Submit All Scores on Reviewr by 5 PM.

Psychology A (HS PSY-A)

Zoom link

<https://cwm.zoom.us/j/94015796034?pwd=OUhnc1poYXpqdDlvZ1Rna0N3Vk9LUT09>

Shared Room/Judges with Middle School Human Behavior Section (First paper is the MS HB Paper)

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	The Effect of Traffic Level on Number of Stress Responses	Zara Musa	Williamsburg Middle School
9:20-9:40 AM	The Effect of Visual Messaging on Hand Sanitizer Use	Isabel Baggette	Chesapeake Bay Governor's School
9:40-10 AM	The Effects of Classroom Environment on Average Student Participation in a Group Discussion	Sarah Blair	Central Virginia Governor's School.
10-10:20 AM	Emotional Trauma Caused By The Lack Of Sports Due To The Covid-19 Pandemic	Wyatt Brown	Chesapeake Bay Governor's School
10:20-10:40 AM		BREAK	
10:40-11 AM	How does the media influence perception of law enforcement?	Johannah Caudill	Southwest Virginia Governor's School
11-11:20 AM	The Comparison of Online Learning Strategies on Information Retention	Kate Devitt	Mills E. Godwin High School
11:20-11:40 AM	Active Versus Passive Virtual Education	Peter Garrison	Central Virginia Governor's School.
11:40-12 PM	Cameron Gilmore	Cameron Gilmore	Blacksburg High School
12-12:40 PM		LUNCH BREAK	

12:40-1 PM	The Correlation Between Dominant/Submissive Personality Traits and the Tendency to Socially Conform	Caitlin Grant	Chesapeake Bay Governor's School
1-1:20 PM	The Relationship Between ABO Blood Groups and Certain Personality Types	Sofia Harrison	Chesapeake Bay Governor's School
1:20-1:40 PM	Ethnicity and Education: Do Gifted Programs Get a Passing Grade?	Kelsey Henry	Chesapeake Bay Governor's School
1:40-2 PM	The Effect of Socioeconomic Status on an Individual's Ability to Swim	Nathan Karnes	Central Virginia Governor's School.
2-2:20 PM	BREAK		
2:20-2:40 PM	Effect of Social Isolation During the COVID-19 Quarantine on General Mental Health	Eric Kauppi	Central Virginia Governor's School.
2:40-3 PM	Evaluating Loneliness Scales to Assess Loneliness During the COVID-19 Pandemic	Dasol Lee	Blacksburg High School
3-3:20 PM	Influence of Virginia State Sentencing Guidelines on Jury Recommended Maximum Sentences	Madison Lilly	Southwest Virginia Governor's School
3:20-3:40 PM	The Effect of Academic Reconditioning on Perception of Connotation	Kylie Maupin	Central Virginia Governor's School.
3:40-4 PM	How Lifestyle Affects Fast Food Consumption	Benjamin McGuire	Central Virginia Governor's School.

Judges - Please Keep to Schedule. Complete & Submit All Scores on Reviewr by 5 PM.

Psychology B (HS PSY-B)

Zoom link

<https://cwm.zoom.us/j/96479536873?pwd=SGZ4R0NacnUwK1JSa0hETUhFb2hJdz09>

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	Is There a Correlation between Anxiety and Trypophobia?	Eleanor McPhatter	Central Virginia Governor's School.
9:20-9:40 AM	The Effects of Political Advertisements on Voter Response	Sara Murray	Chesapeake Bay Governor's School
9:40-10 AM	Studying Demographic Trends in Life Quality Based on Maslow's Hierarchy	Alaysia Oakes	Central Virginia Governor's School.
10-10:20 AM	The Effect of Hours of Sleep on Creativity Test Scores	Amanda Powell	Central Virginia Governor's School.
10:20-10:40 AM		BREAK	
10:40-11 AM	The effect of weekly practice time on a violinist's ability to sight read	Elliott Putnam	Central Virginia Governor's School.
11-11:20 AM	Generational Differences in the Perception of Diabetes Mellitus	Jade Riddle	Southwest Virginia Governor's School
11:20-11:40 AM	The Effect of Meal Planning and Grocery Lists on the Amount of Food Waste in Households	Leilani Rucker	Central Virginia Governor's School.
11:40-12 PM	The Correlation between Perceiving Faces in Optical Illusions and the Ability to Read Emotional Expressions in Faces	Lindsey Shortt	Chesapeake Bay Governor's School

12-12:40 PM**LUNCH BREAK**

12:40-1 PM	The Effect of Knowing Yourself Better Through the Enneagram on Mental Health	Anna Sloan	Central Virginia Governor's School.
1-1:20 PM	How Background Music Affects Concentration and Cognitive Processing	Jonah Snyder	Chesapeake Bay Governor's School
1:20-1:40 PM	The Effects of Reading, Listening, and Dual-Modalities on the Comprehension of Different Passages Among High School Students	Alex Taylor	Central Virginia Governor's School.
1:40-2 PM	The Effect of Relaxation Techniques on Chronic Pain	Hannah Taylor	Central Virginia Governor's School.

2-2:20 PM**BREAK**

2:20-2:40 PM	The Effect of Increased Blue Light Exposure on Sleep Quality	Lauren Vossen	Central Virginia Governor's School.
2:40-3 PM	Relationships Between Screen Time and Anxiety and Depression in High School Students	Ella Wesolowski	Central Virginia Governor's School.
3-3:20 PM	Gender Morality Differences	Jacob Williams	Central Virginia Governor's School.
3:20-3:40 PM	COVID-19 and Mental Health	Lauren Wilson	Ocean Lakes High School Mathematics and Science Academy

Judges - Please Keep to Schedule. Complete & Submit All Scores on Reviewr by 5 PM.

Statistical Analysis & Inferences (HS SAI)

Zoom link

<https://cwm.zoom.us/j/95308843911?pwd=bUt0QjFEbGhIVG9IRjF6YU4zenRIUT09>

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	The Impact of Penalties, Population Density, and Partisanship on Compliance with Stay-at-Home Orders During COVID-19	Colin Berry	Yorktown High School
9:20-9:40 AM	The Effect of the Type of Instruction Received on High School Math Test Scores	Isaiah Bradner	Central Virginia Governor's School.
9:40-10 AM	The Effect of Natural Disasters on the Severity of Cholera in Africa	Natalia Chahil	Washington-Liberty High School
10-10:20 AM	The Effect of Aircraft Type on Irregular Operation Rate	Alex Coffman	Mills E. Godwin High School
10:20-10:40 AM		BREAK	
10:40-11 AM	The Effect of Virginia State Budget Allocation on Rates of Incarceration and Recidivism	Bethany Duncan	Central Virginia Governor's School.
11-11:20 AM	Use It or Lose It: An Analysis of Unnecessary Spending in Flexible Spending Accounts	Diego Elias	Blacksburg High School
11:20-11:40 AM	The Effect of a student attending Governor's School on College Acceptance	Camden Good	Central Virginia Governor's School.
11:40-12 PM	Access to High Quality Child Care Centers in Rural Countries in Different Virginian Regions	Ellen Habteyonas	Blacksburg High School
12-12:40 PM		LUNCH BREAK	

12:40-1 PM	Multiple Regression Modeling to Predict Changes in US GDP Using Stock Market Volatility and Unemployment Rates.	Sania Jain	Maggie L. Walker Governors School
1-1:20 PM	The Effect of the Occupation on the Difference in Pay Between Males and Females	Rory McAndrew	Washington-Liberty High School
1:20-1:40 PM	The relationship between gun law strength and homicide rates	Chandler O'Rourke	Central Virginia Governor's School.
1:40-2 PM	The Effect of Sex, Age, and Geographic Location on Allergy and Asthma Frequency	Jordyn Rollins-Williams	Chesapeake Bay Governor's School
2-2:20 PM	BREAK		
2:20-2:40 PM	The Effect of Algorithm Based Neural Network Machine Learning on the Projection of the Basis and Progression of Alzheimer's Disease	Ambica Sharma	Washington-Liberty High School
2:40-3 PM	Correlations Between the Traditional Diets of Different Cultures and the Human Genome,Âs Disease Allele Frequency	Kayli Smith	Chesapeake Bay Governor's School
3-3:20 PM	Data Analysis and Evaluation of an Area,Âs Median Household Income on Varying Success in Hospice	Nate Stevenson	Mills E. Godwin High School
3:20-3:40 PM	Development of a Machine Learning Algorithm to Detect Amyotrophic Lateral Sclerosis(ALS) in Patients	Ashwitha Surabhi	Thomas Jefferson High School for Science and Technology
3:40-4 PM	Classification of Neurons by Activation Stages using an Artificial Neural Network	Eric Xie	Blacksburg High School

Judges - Please Keep to Schedule. Complete & Submit All Scores on Reviewr by 5 PM.

Zoology (HS ZOO)

Zoom link

<https://cwm.zoom.us/j/95229531456?pwd=K3pwMUdxNURralRRMGx3RUVBcVB4Zz09>

Please convene by 8:55 AM for Announcements

	Paper Title	Student Name	School
9-9:20 AM	The Effect of the Type of Recyclable Waste on Vermicompost pH Levels	Elora Burchette	Central Virginia Governor's School.
9:20-9:40 AM	Prevalence of Mixed Species Herding with Giraffe Calves	Rachel Dickerson	Washington-Liberty High School
9:40-10 AM	The Effect of Colored Feeding Stations on Honeybee Attraction	Jackson Drewry	Clover Hill High School
10-10:20 AM	The Effect of Water pH on the Heart Rate of Daphnia magna	Anujin Enkhee	Washington-Liberty High School
10:20-10:40 AM	BREAK		
10:40-11 AM	The Effect of Ultraviolet Radiation on the Survival and Hatch Rates of Artemia salina	Julie Fitzgerald	Central Virginia Governor's School.
11-11:20 AM	The Effect of Agricultural Pesticides on Daphnia magna.	Shreel Golwala	Mills E. Godwin High School
11:20-11:40 AM	Analyzing Blue Light on Dugesia tigrina Regeneration to Model Human Epidermal Growth Processes	Mrunal Kute	Mills E. Godwin High School
11:40-12 PM	What's All the Buzz? Drosophila melanogaster as a Unique Model for Addiction Disorders and Physiology after Traumatic Brain Injury (TBI)	Shan Lateef	Thomas Jefferson High School for Science and Technology
12-12:40 PM	LUNCH BREAK		
12:40-1 PM	The Effect of Oxygenator Design on the Survival Rate of Culex tarsalis Larvae	Emily Lionberger	Mills E. Godwin High School

1-1:20 PM	The Effect of Nitrate Levels on Daphnia Magna's Heart rate	Olivia Nguyen	Mills E. Godwin High School
1:20-1:40 PM	Determining Relatedness of L. Kempii Nesting Sites Using Bioinformatics	Anooshka Pendyal	Deep Run High School
1:40-2 PM	Nectar Feeding Preferences of Ruby-Throated Hummingbirds in the Middle Peninsula	Paula Perez	Chesapeake Bay Governor's School
2-2:20 PM	BREAK		
2:20-2:40 PM	Investigation of Bio-printed Hydrogels for Purification of Danio rerio Habitats During Embryonic Development	Liala Sofi & Alicia Carvalho	Roanoke Valley Governor's School
2:40-3 PM	Using the Embryonic \rightarrow Danio rerio \rightarrow Stress Response System to Investigate the Toxicity of Metal Oxide Nanoparticles	Uyen Nhi Tran	Roanoke Valley Governor's School
3-3:20 PM	The Effect of Different Foods on Fruit Fly Preference	Varun Yeri	Mills E. Godwin High School
3:20-3:40 PM	The Effect of Silver Nanoparticles on the Heart Rate of Daphnia magna	Paul Yang	Mills E. Godwin High School
3:40-4 PM	The Effect of Monosodium Glutamate on the Reproduction Rates of Daphnia magna	Virginia Trost	Central Virginia Governor's School.

Judges - Please Keep to Schedule. Complete & Submit All Scores on Reviewr by 5 PM.

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For additional information, contact Susan P. Booth at director@vjas.org.

Fall Undergraduate Research Meeting: In Fall 2001 VAS held the first Fall Undergraduate Research Meeting which focused on support of undergraduate student research. Subsequently this meeting has been held on an annual basis. Awards of \$500 are given to each of the five top student proposals chosen by judges. The awardees selected at the Fall Undergraduate Research Meeting will present the results of their research projects at the following year's VAS Annual Meeting. Guidelines for the Fall Meeting will be announced on the Academy website www.vacadsci.org.

To obtain additional information about the Fall Undergraduate Research Meeting, contact Carolyn M. Conway, Associate Executive Officer, Virginia Academy of Science at vasoffice@vacadsci.org or 804-864- 1450.

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