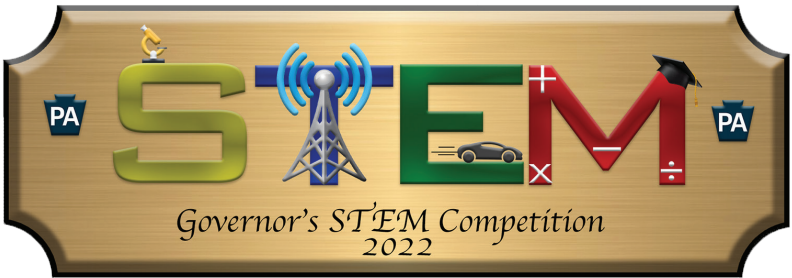


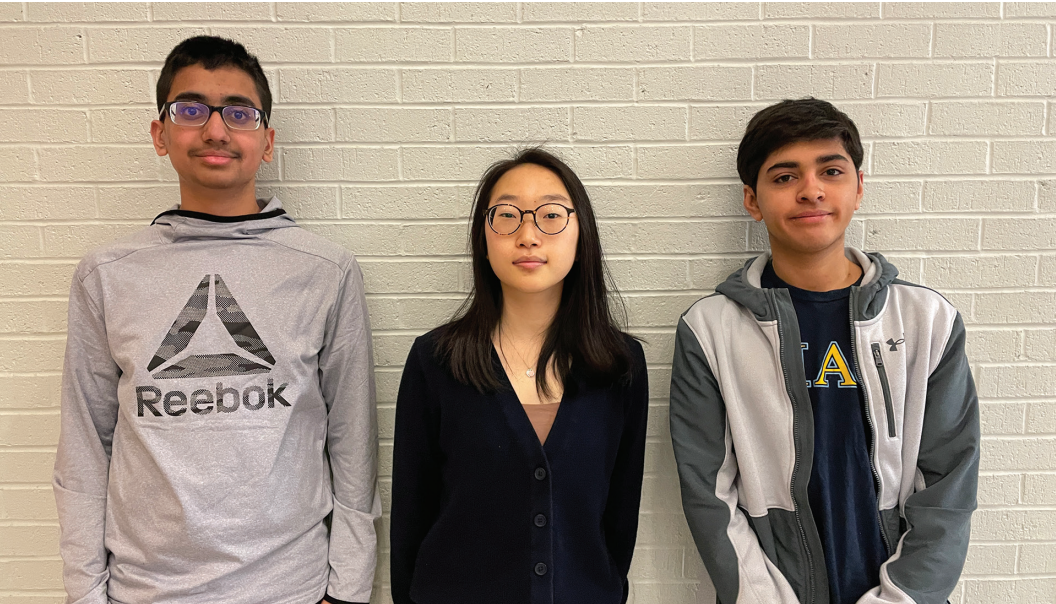
# The Governor's STEM Competition 2022



May 2022



The Governor's STEM Competition 2021 Division 1 Grand Champions – Wilson High School  
From left to right: Luke Kline, Sanchita Bhusari, McCord Peterson,  
Cole Chmielewski, Colby Snyder



The Governor's STEM Competition 2021 Division 2 Grand Champions – Fox Chapel High School  
From left to right: Prajval Sreenivas, Janise Kim, Arvind Seshan

The Pennsylvania Department of Education (PDE) defines STEM (science, technology, engineering, and math) as an integrated, interdisciplinary, and student-centered approach to learning that encourages curiosity, creativity, artistic expression, collaboration, communication, problem solving, critical thinking, and design thinking.

The top placing teams from last year's 2021 Governor's STEM competition were:

### Division 1

- Grand Champion: Wilson High School
- First Runner Up: Solanco High School
- Second Runner Up: Neshannock Junior/Senior High School
- Third Runner Up: Pottstown High School

### Division 2

- Grand Champion: Fox Chapel High School
- First Runner Up: Episcopal Academy
- Second Runner Up: Whitehall High School
- Third Runner Up: Warwick High School/IU13

The following teams received the environmental impact awards:

- Sustainability: Wilson High School
- Survivability: North Allegheny High School
- Medical: Episcopal Academy

# The Governor's STEM Competition 2022

The Governor's STEM Competition, held virtually in April and May, challenges student teams from across the state to research, design, and present a device or project.

Teams were required to partner with a member of their local community, business, or educational entity to develop a solution to a real problem rooted in the commonwealth. This helps create an authentic experience for the students and provides opportunities for them to learn more about career pathways and employment possibilities based in STEM.

This year teams prepared and submitted a video to present their findings to the state competition. The challenge tested the teams' communication, problem solving, and critical thinking skills while providing a unique opportunity to share their creativity with students from across the state.

The competition was open to students in grades 9 through 12 who attend a public, charter, or private school, a career and technical education center, or a student being homeschooled in Pennsylvania.

## Overview

There was no regional qualifying competition this school year. There was one competition (the state competition) held in April 2022.

Again this year there were two divisions for the 2021-2022 state competition:

- Division 1: Those who have a majority of team members who have competed in the STATE COMPETITION in the last 5 years
- Division 2: Those who have a majority of team members who have NOT competed in the STATE COMPETITION in the last 5 years

Identical awards were presented in each division.

	<b>Division 1 (Returning Team)</b>
	<b>Division 2 (New Team)</b>

## Teams Participating in the Governor's STEM Competition 2022

IU	School Name	School District Name	Advisor	Secondary Advisor
1	Bethlehem Center High School	Bethlehem Center School District	Dawn Logan	Walter Bothwell
1	Peters Township High School	Peters Township School District	Christopher Allen	
3	Baldwin High School	Baldwin-Whitehall School District	Jared Hoffman	
3	Fox Chapel Area High School	Fox Chapel Area School District	Lisa Gibson	
3	South Fayette High School	South Fayette Township School District	James Hausman III	
3	South Park High School	South Park School District	Eric Wisler	
4	Hickory High School	Hermitage School District	Jeannette Anderson	
4	Neshannock Jr/Sr High School	Neshannock Township School District	Gregg Micsky	
5	Fairview High School	Fairview School District	Drew Burt	
5	Fort LeBoeuf High School	Fort LeBoeuf School District	Mark Munsee	Cody Patton
8	Hollidaysburg Area Senior High School	Hollidaysburg Area School District	Benjamin Fogle	
8	Northern Cambria High School	Northern Cambria School District	Lauren Smith	Sarah Kline
9	Coudersport JR/SR High School	Coudersport Area School District	Laura Bryant	
11	Southern Huntingdon County HSMS	Southern Huntingdon County School District	Nicolee Christophel	
12	William Penn Senior High School	York City School District	Erica Schmuck Wilson	Roxanne Millan
13	Garden Spot Senior High School	Eastern Lancaster County School District	Joe Steinmacher	
13	Solanco High School	Solanco School District	Caley Roark	

	IU	School Name	School District Name	Advisor	Secondary Advisor
	14	Daniel Boone Area High School	Daniel Boone Area School District	John Oram	
	14	Exeter Township Senior High	Exeter Township School District	Zach Potter	
	14	Governor Mifflin High School	Governor Mifflin School District	John Skwarecki	
	14	Reading Senior High School	Reading School District	Joseph S. Andrieux	
	14	Wilson High School	Wilson School District	Beth Levan	
	14	Wyomissing Area Jr./Sr. High School	Wyomissing Area School District	Dr. Brian Liskey	
	15	Bishop McDevitt High School	Diocese of Harrisburg (Bishop McDevitt)	Susan Johnson	
	15	Carlisle High School	Carlisle Area School District	Matthew Freeman	
	15	Lower Dauphin High School	Lower Dauphin School District	Elizabeth Kirman	
	15	Reach Connections Academy	Reach Connections Academy	Colette Silvestri	Brian Uniacke Joshua Glunk
	15	Shippensburg Area High School	Shippensburg Area School District	Mylanda Fowler	
	15	The Pennsylvania Cyber Charter School	The Pennsylvania Cyber Charter School	Thomas Brambley	
	18	Pittston Area High School	Pittston Area School District	Tara Turkos Craig	
	18	Wyoming Area Secondary Center	Wyoming Area School District	Trudy Chapple McAndrew	
	19	Forest City Regional High School	Forest City Regional School District	William Graziano	
	19	PSCE – Wayne County (4-H Program)	Penn State University	Jessica Scull	Tony Komar
	19	Valley View High School	Valley View School District	Brandon Dodson	
	20	Delaware Valley High School	Delaware Valley School District	Robert Curtis	
	20	East Stroudsburg High School North	East Stroudsburg Area School District	Katherine Nute	Jacqueline Edelbaum
	20	Freedom High School	Bethlehem Area School District	John Harvey	

IU	School Name	School District Name	Advisor	Secondary Advisor
20	Monroe Career & Technical Institute	Monroe Career & Technical Institute	Ross Ruschman	
21	Parkland High School	Parkland School District	David Wacker	
21	Whitehall High School	Whitehall-Coplay School District	Justin Boandl	David Stauffer
22	Pennridge High School	Pennridge School District	Melissa O'Brien	Jim Rutkowski Dina Dormer
22	Quakertown Community High School	Quakertown Community School District	Kurt Amen	
23	Lower Moreland High School	Lower Moreland Township School District	Nick Solomon	
23	Pottstown High School	Pottstown School District	Andrew Bachman	
23	Spring-Ford Senior High School	Spring-Ford Area School District	Gabrielle Procario	
24	Bishop Shanahan High School	Archdiocese of Philadelphia	John Janasik	
24	Conestoga High School	Tredyffrin Easttown School District	Edward Sharick	
24	Downingtown STEM Academy	Downingtown Area School District	Eric Brown	
24	The Technical College High School at Pennock's Bridge	Chester County IU	Catherine Dignazio	
25	Haverford High School	School District of Haverford Township	Christopher Walter	
25	Marple Newtown High School	Marple Newtown School District	Anne Lanshe	Michael Pagliara
25	Penn Wood High School	William Penn School District	Benny Joseph	Susan Norton
25	Ridley High School	Ridley School District	Molly Quinn	
26	Philadelphia Academy Charter High School	Philadelphia Academy Charter High School	Robert Mottershead	Megan Simmons
29	Nativity BVM High School	Nativity BVM	Maureen Challenger	
29	North Schuylkill Jr/Sr High School	North Schuylkill School District	Kelly Stone	Gene Lapointe
29	Pottsville Area High School	Pottsville Area School District	Adrian Portland	

## Project Descriptions



### IU1

#### Bethlehem Center High School

Our team's project is named SpotHole. It is a sensorbased pothole detection and reporting system. The device's purpose is to minimize potential motor hazards and to reduce the annual loss of life due to poor roadway conditions found in Pennsylvania. The device functions via a measuring system that detects significant changes in depth in the roadway in both the x and y directions which when the distance between the sensor and pavement changes beyond acceptable limits a pothole report is generated and is reported to PennDOT or other service providers with a rough estimate of size and exact location so that the pothole may be efficiently repaired.

#### Peters Township High School

Due to physical safety concerns, students with visual impairments are limited in what they can do on a playground. In an effort to make the playground more inclusive and safe for all students who have visual impairments, our team designed a swing to alert students of their proximity to someone riding on a swing. Using a directed motion-activated sound generator, this swing will help students with visual impairments safely navigate around their swinging friends on any playground or home swing set.

### IU3

#### Baldwin High School



Our team is developing a technology for students with disabilities that lack the strength to raise their hands in class. The product allows students to push a button indicating that they have a question or have an answer. The device includes buttons for the operator to push that will in turn run a Raspberry Pi and have an automated arm that will raise a 3d printed hand with LED lights indicating the question/answer.

#### Fox Chapel Area High School

MOOD is a low-cost, artificial intelligence-driven psychotherapy assistant that addresses the unique, real-time needs of individuals struggling with mental health issues. MOOD bridges the gap between patients and medical professionals by remotely establishing a reliable path of communication. It consists of a wearable device that measures the user's health-related information and relays the data to care team via a mobile application; MOOD tracks anomalies in the user's health or behavior that may indicate potential triggers, episodes, and other hazards.



## South Fayette High School

Deer Clear helps drivers avoid the frustration of deer crashes and their resulting financial and health consequences while ensuring the safety of Pennsylvania's wildlife. This car-mounted device promotes driver safety by using an integrated infrared camera and speaker system to sense approaching deer before transmitting ultrasonic sound waves that guide them clear of a driver's path.

## South Park High School

Our project is a snow shovel that prevents back injuries. The shovel is stationed on a fulcrum that can be wheeled around to put less stress on the back.

## IU4



## Hickory High School

A product that includes a wearable device(s) which incorporates a sensor that detects the position of the rider(s) and a device that connects to a motorcycle which will detect its position. The product detects when a motorcycle accident occurs. It will beep to alert people near the accident and emergency workers of the location of the rider(s) and uses a bluetooth connected cell phone to alert family members and 911 of the accident.

## Neshannock Jr/Sr High School

FLTR is a filtration system for fertilizer runoff that can be implemented in a greenhouse environment. Plant runoff is moved through filter levels and collected at the end. A pH sensor is incorporated to verify the ability of the filtered water to be reused to water the plants.

## IU5



## Fairview High School

Waiting for a bus only to realize that all the seats are taken can be a frustrating endeavor. The Seat Tracker app will provide real-time data for riders looking for a bus through an app and on-bus notification. Combining visual tracking with a physical recognition system, the Seat Tracker will ease the mind of a worried commuter that they will indeed have a seat available for them.

## Fort LeBoeuf High School

Our STEM team is designing a facial recognition entry system that will allow coaches to give only their athletes access to the building for practice sessions. This system will remove the temptation to mechanically block the door open during weekend or evening practices.

## IU8

### Hollidaysburg Area Senior High School

Our project is a deadbolt lock assistor that can help people in need when in a rush, impaired, and those with Parkinson's or other neurological disorders. This mechanism guides the key through a funnel down into the key lob to make it easier to open a deadbolt lock without the need for fine motor skills.

### Northern Cambria High School

Poll-oop (Pollution Scoop): Our team has decided to construct a device to combat water pollution in our state. Our device would be employed under bridges, featuring a cylindrical scoop that acts using sensors to scoop trash and litter floating on top of the water. Sensors would be used to differentiate between trash and wildlife, as well as to direct the scoop's height to coincide with the water level.

## IU9

### Coudersport JR/SR High School

Remote controlled drone with a tank body capable of traversing rough terrain with obstacles. Attached is a 4 DOF arm that allows a wide range of movement for the payload. The payload is a portable fire extinguisher that in combination with the arm and body movements can help put out fires in difficult-to-reach places without risk of human life.



## IU11

### Southern Huntingdon County HSMS

Coffee has been around since the 15th century, becoming more popularized in 1773, and currently trending around the world as iced or hot. This means there are more businesses trying to profit from this new trend. What happens with all of the used coffee grounds? We decided to partner with a local coffee shop to keep the used grounds out of the trash and recycle them into a product to be used in the business—"Just Plates" was born.

## IU12

### William Penn Senior High School

The Digital Recycling Kiosk is recycling for the future! It encourages everyone of all ages to recycle properly and rewards them for helping make the planet a better place!

### **Garden Spot Senior High School**

Composting helps the environment and resolves the food waste issue, but many people and companies do not have the ability to easily compost due to cost, space, and effort. Our goal is to design, build, and test a solution that is cost effective, space efficient, and is easy to maintain.

### **Solanco High School**

Our project is an inexpensive portable shelter designed to reduce weather-related injuries and deaths amongst homeless Pennsylvanians. Additionally, use of the shelter will be beneficial during large-scale emergencies requiring temporary relocation of affected populations.

### **Daniel Boone Area High School**

Our product targets the issues surrounding fidgety behavior experienced within the special needs community. This adaptive selection of sanitary stress relieving writing utensils offers students a safe way to destress while working on a class assignment. While distractions present themselves more predominantly within a special education classroom, the Fidget Warrior writing tools eliminate this problem!

### **Exeter Township Senior High**

An Eye Movement Desensitization and Reprocessing (EMDR) therapy device for mental health patients with PTSD. This device will use readily available and inexpensive materials and Raspberry Pi microcomputing technology to create a device that makes this therapy more accessible to patients and providers, and more practical for tele-health applications.

### **Governor Mifflin High School**

The Spotted Lanternfly Insecticide Dripper consists of a towel encased in a long narrow tube, designed to slowly release insecticidal fluid by utilizing the force of gravity. The hope of this device is to provide a shield of protection around a tree, by slowly releasing drops of insecticide onto the bark of the tree. This product will not only help protect individual trees in Pennsylvania, but also protect backyard tree populations, and help reduce the number of spotted lantern flies.

### **Reading Senior High School**

College Readiness - How do we prepare and provide our urban students with the vital information on post-secondary education and training they need based on their unique personal requirements and family structure? Our students do not know what they need to know, so let's find out through a unique, interactive, and custom developed website for urban students.

## **Wilson High School**

Our product, Liquidlcer, is a propylene glycol-based anti-icing product that serves as a cost-effective and eco-friendly alternative to road salt. Recognized by the FDA as a food additive and by the EPA as “generally safe,” the main chemical in our product poses virtually no threat to the environment. The extremely low freezing point makes it a far more powerful de-icer than any salt/sand-based methods. By phasing out road salt in favor of Liquidlcer, we will eliminate a pressing environmental health issue while preserving government funds for use in similarly vital matters.

## **Wyomissing Area Jr./Sr. High School**

Our STEM project focuses on environmental factors that contribute to the health of our local water system. Our students are examining how the runoff of road salt affects the native trout in our stream, and thus, our overall ecosystem in Berks County.

## **IU15**



## **Bishop McDevitt High School**

This inexpensive, innovative design will melt snow and ice from sidewalks and pavements. This will reduce the number of injuries and deaths that result annually from slips and falls on ice.

## **Carlisle High School**

Headlights from oncoming traffic can cause injury to a driver's eyes at night and can also cause unsafe driving conditions. Our project should reduce the amount of harmful light a driver's eyes endure while night driving.

## **Lower Dauphin High School**

Our prototype was designed to combat storm water runoff. Storm water runoff carries many pollutants such as car oil, pesticides, and bacteria which are harmful for the aquatic ecosystems. Our prototype can be easily attached to storm drains to filter storm water before meeting surface water river systems.

## **Reach Connections Academy**

CCCNearMe is a locator app that will assist in locating the 209 historical sites of the Civilian Conservation Corps (CCC) camps in Pennsylvania from the 1930s which was the basis of our national environmental and infrastructure. Via a partnership with Penn State University and The National Environmental Education Foundation, this 'beta' app would provide (schools, community groups, etc.) with a digital map that identifies where and how projects relating to restoring and sustaining these sites. It is our hope that schools and organizations in other states will continue with this project, resulting in locating all 4,200 CCC camps and their historical accomplishments throughout the United States for future projects in their communities.

## Shippensburg Area High School

Our team is developing a new technology to tackle a disturbing trend in schools across the nation. Social media has encouraged students to vandalize bathrooms and we are developing a solution to catch the perpetrators in the act. The goal is to catch students in the act and allow for swift and fair punishment to be dealt to those students in order to curb this trend.

## The Pennsylvania Cyber Charter School

PAcyber students have created an organic pesticide dosing and dispersion device. This device is an inline mixing unit with applications through either a garden hose or a drip irrigation system. With a drip irrigation network and simple water timer, gardeners can have a hands-free and safe assurance of healthy garden produce!

IU18



## Pittston Area High School

Pittston Area's submission is a brine dispenser system. The invention takes an ice melting solution and uses an electric pump to dispense the solution on sidewalks and driveways. This invention seeks to increase the convince of clearing ice especially for physically challenged and elderly persons.

## Wyoming Area Secondary Center

The Environment Recognition Accessory, E.R.A., is a detective device that surveys one's surroundings to prevent accidents while cycling. E.R.A. alerts cyclists of their environment and when to reassess their route. This product is meant to restore the enjoyment of cycling while ensuring the safety of individuals.

IU19



## Forest City Regional High School

IDA, which stands for the Impaired Driving Assessment, is a solution for the problem of driving while impaired.

## PSCE – Wayne County (4-H Program)

We are designing a safety device that once programmed will be able to connect to a wireless network. It will allow farmers and other agriculture workers to remotely communicate to family members regardless of cell service relaying any emergency or other alert messages.

## Valley View High School

Our group is currently working on a device that will detect objects for and alert blind people. We are making a set that includes a headband and a belt. The headband will be used to detect elevated objects near the head, giving audio, vibration, and light feedback. The belt will be used for objects that may come in contact with the body, giving the same feedback from the head band.

## IU20



### Delaware Valley High School

Our project is a slash resistant backpack made from denim and aluminum plating. The main point of the project is to help prevent the loss of personal belongings in robberies where the bag is slashed in order to obtain personal items.

### East Stroudsburg High School North

The Limitless Leash System: Our leash is designed to assist Pennsylvania pet owners with mobility issues to attach a leash safely and securely to their animal and walk them in comfort and style.

### Freedom High School

Security.org stated that "49 million Americans have had at least one package stolen in the past 12 months" – our team proposes a solution to such a dilemma since this will only increase with online consumption endorsement caused by the pandemic. A revolutionary bench with a storage compartment at the bottom opens by clicking a button that allows delivery professionals to drop-in packages. It automatically locks itself, and the owner can retrieve the packages by inserting a code that will open the bench compartment. Our bench offers comfortable seating, but it can also add comfort to Americans' wallets by presenting a new way to combat package theft.

### Monroe Career & Technical Institute

PonicsFilter is a new hydroponics system that improves water quality while producing crops, medicinal plants, and more using the nutrients from eutrophic bodies of water. This method, which we have coined eutrophiponics, makes use of floating platforms in nutrient-enriched lakes and ponds and solar powered pumps to take advantage of the sunlight, water, and nutrients for photosynthesis and plant growth.

## IU21



### Parkland High School

Project Name: ATLAS (Advanced Truck Lighting Alert System) Description: Our project focuses on the safety of other automobiles that are sharing the roadway with the abundant amount of tractor trailers we experience in Pennsylvania. The ATLAS (Advanced Truck Lighting Alert System) is an external sensor used to alert surrounding vehicles that they are in a truck's blind spot in an effort to improve roadway safety.

### Whitehall High School

We are designing a device that will help Pennsylvanians remove snow from the roof of any car, SUV or truck. Removing snow from a vehicle's roof is easier and quicker with our product; furthermore, it is a convenience people desire and it will help prevent the potential hazard of snow turning to ice and then blowing off during commute, keeping fellow motorists safe.

## IU22



### **Penridge High School**

The Penridge Nerd Squad worked to develop 3-D printed prosthetic fingers for a member of our community. We partnered with a local engineering company to learn about machine safety and ways to mass produce affordable prosthetics.

### **Quakertown Community High School**

Project-JERB is a recycling system meant to take every day, one-time-use, plastics and instead of adding to global waste, project-JERB puts them to use. Our machine takes these plastics and compresses them into bricks and insulation. The prototype is intended for public use but will first be tested in smaller enclosed spaces like offices or schools. These final products would ideally be used to build temporary homes for the homeless. This benefits the environment and supports the less fortunate.

## IU23



### **Lower Moreland High School**

Lower Moreland's team is working on the applications of piezoelectric technology on railroads by harnessing the vibrational energy produced by trains to generate electricity.

### **Pottstown High School**

COVID-19 negatively affected many of Pottstown High School's programs, severing the connection between students and their engagement in the school community. The Trojan Recognition & Reconnection (Trojan R&R) process re-establishes relationships between peers and teachers by recognizing students for more than just athletics and academics. With these changes, students and teachers will connect with each other, and expand the feeling of belonging in the community.

### **Spring-Ford Senior High School**

A.I.R. (Automated Intake Respirator) We designed and created an increased airflow mask. We wanted to create something to help those that have trouble breathing and must wear a mask for protection. We wanted to help those who have medical conditions and have trouble wearing a mask, especially the elderly with breathing issues, and those who have trouble wearing masks.

## IU24



### **Bishop Shanahan High School**

CASS is the Computerized Autonomous Suppression System. CASS is a less destructive, easier to inspect and update fire suppression system that can be used in place of or in conjunction with modern sprinkler systems currently in use. CASS can be used in buildings, such as but not limited to school labs, computer centers, restaurant kitchens, and auto and museum repair and restoration shops. It can replace the modern-day sprinkler system in locations where containing the fire suppression to a customizable, localized area would be less destructive to the space. CASS uses a safe chemical powder suppressant to put out all types of fires.

### **Conestoga High School**

Our project utilizes character recognition to scan the ingredient labels of foods on the market and return the harmful effects they may have. The goal is to provide the citizens of PA with more informed decisions about what they put into their bodies.

### **Downingtown STEM Academy**

We aim to create a self-sustaining agricultural system powered by biophotovoltaics, which is the concept of using photosynthetic organisms, such as plants, to utilize the natural process of photosynthesis to produce electricity. Our system works by using the already existing plants on farmland to create sustainable electricity for farms. Not only will this reduce the electricity costs for farms without taking up any space, but it is also a clean way of harnessing electricity that can be further developed for other purposes.

### **The Technical College High School at Pennock's Bridge**

The STEM team at Technical College High School is prototyping a pair of gloves that will send vibrations through speakers, meant to help the hearing-impaired experience music. Gloves FM will allow hearing-impaired people to 'listen' to music through vibration.

## IU25



### **Haverford High School**

Our project is an American Sign Language to English dictionary where users may sign to a website and receive text for the English translation of the sign. The website will allow ASL learners to check the English definitions of ASL signs so they can improve their communication skills.

### **Marple Newtown High School**

VAX ✓ – Our project involves the development of a low-cost, fully digital COVID-19 vaccination card incorporating Near Field Communication (NFC). The emblazoned card ensures that residents have an electronic record to prove their vaccination status; the card will be monitored through



a complex database that keeps track of the vaccine recipient's name and photo, date of birth, and date, brand, and sequence of shot. Accurate and instant data accessibility provided by the card will significantly reduce the number of counterfeit COVID-19 vaccination cards in circulation.

### **Penn Wood High School**

We want to introduce a new heating eco-friendly system. This new station is not only solar powered but grants people a place of shelter to sit and charge their electronic devices. Most importantly it is designed to make unbearable weather bearable with its cold-preventing heating system.

**IU26**



### **Philadelphia Academy Charter High School**

Our device, MASK'D, is a cloth mask cleaning kit that disinfects one mask at a time. It is designed to be portable, fast, and effective by using UVC sanitizing lights. It is directed towards workplaces, school environments, and healthcare facilities.

**IU29**



### **Nativity BVM**

"PROWL" (P-pH, R-Rebalancer, O-Oriented, (to) W-Waterways, (with) L- Limestone): A device that counteracts acid mine drainage by detecting acidic pH levels followed using activated carbon filters and stabilizing limestone powder.

### **North Schuylkill Jr/Sr High School**

We developed a salt spraying irrigation system that uses a Bluetooth switch that connects to a phone app so that salt solution can cover the user's sidewalks with the press of a button, instead of having to go outside and spread salt manually. It has detachable and reattachable pieces that can be used to fit any sidewalk and rotatable sprinkler heads to reach any angle. The salt solution is stored inside a five-gallon bucket. The solution is fed through a pump to create pressure and leads to a release system that sends solution through the irrigation system and eventually onto the sidewalk.

### **Pottsville Area High School**

The Pottsville Area High School STEM Team will be creating a filter to reduce the carbon emissions in vehicles.

## **We would like to thank the following for their commitment to The Governor's STEM Competition 2022:**

We wish to thank the many individuals at the intermediate units across the commonwealth for their support of The Governor's STEM Competition and to all the students, advisors, and teams who met the challenge of this year's virtual edition.

### **Special Thanks to:**

Richard Askey, President of PSEA, and Partner for teacher awards



Pennsylvania Governor's School for the Sciences, Partner



## Many thanks to our judges who took time out of their daily schedules to participate:

Brittany Anderson	Jill Foys	Ethan Pan
Sarah Brambley	Sara Frey	Jason Reisinger
Earl Brown	Jeremy Gaborin	Lori Rodgers
Jared Campbell	Kenneth Gabel	Kendy Schiffert
Fred Cherny	James Gates	Joanne Shipe
Stacey Cherny	Judith Hawthorn	Glenn Singer
Scott Cicero	Tim Heffernan	Craig Stonaha
Katie Clever	Heather Heimer	Hartono Tjoe
Leann Cox	Karen Henrichs	Dan Tomaso
Sarah D'Urzo	Rich Mackrell	Brian Varnecky
Avni Dyer	Diane McGaffic	Jamal Wakeem

## Penn State Harrisburg Category Judges:

Reuben Asempapa	Ola Rashwan
Jesse Middaugh	R. Tyler Richardson

## The Pennsylvania Department of Education Designated Planning Team:

Angela Kirby	Corey Dickey
PaTTAN Central Director	Melissa Howell
Sergio Anaya	Michael Onofrey
Lauren Beal, IU13	Tara Russo
Nicole Bond, Lincoln IU12	PaTTAN Tech Team
Chris Cherny	

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### Front and Back Cover Logos designed by:

Nolan Dieffenbach (front cover) CATES High School, led by Jamie Royer Dintaman. CAIU Hill Top Academy.

Derrick Williams (back cover) Family Classroom, led by Caroline Owings. CAIU Hill Top Academy. Also assisted by Cathryn Myers, art teacher.



## The Governor's STEM Competition 2022

Tom Wolf, Governor

Eric Hagerty, Acting Secretary, Department of Education

Debora Carrera, Executive Deputy Secretary

David Volkman, Special Advisor to the Secretary



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DEPARTMENT OF EDUCATION