

YEA NEWSLETTER



Newsletter produced by Young Engineers in Action

YEA Students Honored with President's Volunteer Service Award

Written by: Emily Ren



 A total of 13 students from YEA received President's Volunteer Service Awards for the year from September 2021 to August 2022. The left picture features YEA senior advisor Dr. Tim Fu and some award recipients, including Derrick Di, Emily Ren, Herrick Wang, and Shawn Wang. In the right picture, students are participating in the fun activities of the YEA Science Experiments workshop, hosted by YEA student volunteers, in December 2022.

(Photos by: YEA Newsletter Reporter (left), Grace Zhao (right))

A total of 13 students have recently been recognized with the President's Volunteer Service Award (PVSA) by Young Engineers in Action (YEA) for achieving the required number of volunteer hours and making positive impacts on local communities.

YEA, one of the certifying organizations of the PVSA, is authorized to recognize volunteers with the awards.

For the 12 months from September 1st, 2021 to August 31st, 2022, the following 12 students have received the President's Volunteer Service Gold Award: Reenie Cao, Alex Cheng, Derek Di, Jessica Li, Jayden Lin, Matthew Phan, Yiyan Qu, Emily Ren, Herrick Wang, Shawn Wang, Adora Yan, and Angelina Zhang. Bena Feng received the President's Volunteer Service Silver Award.

As one of the most prestigious national awards, the PVSA was founded by the President's Council on Service and Civil Participation in 2003 to recognize the important roles of volunteers in the country's strength and national identity.

IN THIS ISSUE:

YEA Student Moves onto AIME, Receives Distinction Award - Pg 2

YEA Math Circle Organizes In-Person "24" Challenge - Pg 2

Science Experiments Sparks Students' Interest in STEM - Pg 3

Science Newsletter Launched - Pg 3

Virtual Reality Creates Immersive Scientific Experience - Pg 4

Approaching the Global Deadline of Human Extinction? - Pg 5

Renewing Our Energy and Reversing Deforestation - Pg 6

Future of mRNA Vaccines - Pg 7

YEA Student Board - Pg 8

YEA Student Moves onto AIME, Receives Distinction Award

Written by: YEA Newsletter Reporter

YEA was excited to announce that two of its students, Emily Ren and Jaden Zhang, qualified for the American Invitational Mathematics Exam (AIME), by scoring high on the national American Mathematics Competition (AMC) 12 exam in November 2022.

Emily Ren's AMC 12 score was also high enough to earn her a Certificate of Distinction from the Mathematical Association of America (MAA).

The AMC 10 and AMC 12, organized by the MAA, are both 25-question, 75-minute, multiple-choice examinations in high school mathematics, designed to promote the development and enhancement of problem-solving skills.

Both Emily Ren and Jaden Zhang have taken Competition Math classes at YEA for years.

For the AMC 12 tests in 2022, about top 10% of all AMC 12 test-takers in the world qualify for AIME. Top 5% of all AMC 12 scorers receive a Certificate of Distinction.



Emily Ren qualified for AIME and received the Certificate of Distinction from MAA by scoring high in the AMC 12 test in November 2022. (Photo: YEA Newsletter Reporter)



Jonah Wang received the First Place in the recent YEA "24" Challenge competition. (Photo: YEA Newsletter Reporter)

YEA Math Circle Organizes In-Person "24" Challenge

Written by: Jessica Li

After several years of virtual activities, the YEA Math Circle finally welcomed back our first in-person math event since the pandemic started with our recent "24" Challenge.

Students from across elementary school and middle school levels came together for an afternoon of critical thinking and fun.

Given 4 numbers, participants strive to give the fastest solution to make 24 out of the given numbers using orders of operation. Each flip of cards meets a new challenge for attendees.

This is a classic game suitable for all ages, spiced up with competition, suspense, and pressure from the ticking time. All participants did exceptionally well, and it was a pleasure to host the event.

Special recognition for Jonah Wang as the first-place winner, Connor Osilla as the second-place winner, and Ivy Song as the third-place winner. Hope to see everyone at the next Math Circle Event!

Science Experiments Sparks Students' Interest in STEM

Written by: Grace Zhao

This school year, YEA is bringing back the Science Experiment Series. Throughout this series of classes, students of all ages are able to interactively experiment with their own science experiments while learning about new concepts related to the experiment and how the experiments happen. Students are able to learn about all different types of sciences such as biology and physics.

On December 4th, 2022, YEA held its first Science Experiment Series event of the 2022-23 school year, teaching young students the science behind making big bubbles and how to make them.

For one and a half hours, participants learned about concepts such as surface tension and density. They were able to process the information very quickly and answered all the review questions at the end of the lecture very quickly.

The young students learned how to make a bubble solution that allowed them to blow giant bubbles with plastic bottles cut in half. They mixed up their own bubble solution while learning about the purpose of every ingredient in the mixture. After mixing up everything, participants were able to go outside and have fun with their new concoction.

The experiment was a bit messy because of how many liquids were involved, but that problem was easily solved when the experiment was moved outside. Overall, the students have a good time learning about and playing with bubbles!



↑ Students are participating in the fun activities of the YEA Science Experiments workshop, hosted by YEA student volunteers, in December 2022. (Photo: Grace Zhao)

Science Newsletter Launched

Written by: Reenie Cao

Following the YEA Newsletter, several special edition newsletters have emerged, one being the Science Newsletter. Similar to the YEA Newsletter, the YEA Science Newsletter includes articles written by students; the only difference is that all the articles revolve around the topic of science.

This newsletter was created in order to better inform students about the wide range of science as well as its many uses in the world. Understanding the importance of science is essential, and the YEA Science Newsletter hopes to serve as a starting point for those interested in science. From environmental issues to the exploration of space, the YEA Science Newsletter covers a wide range of topics.

Articles from the first edition include: Covid in the Body, Plastic Waste, Invasive Species, Exploring Space: Good or Bad?, and What is Autism? Those who choose to write an article may also receive volunteer hours for their time.

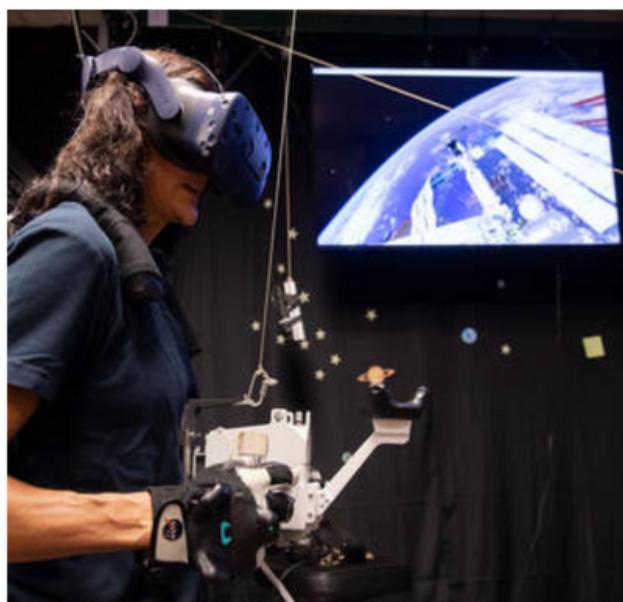
Virtual Reality Creates Immersive Scientific Experience

Written by: Rose Kong

Virtual Reality, also known as VR, is the use of computer technology to create a realistic 3-dimensional environment that users can immerse themselves in. In the current state of technology, a VR headset is required to facilitate immersion.

We all know that “reality” comes from people’s five senses: taste, touch, smell, sight, and hearing. With the VR headset, the computer allows you to explore different worlds such as language learning, gaming, communicating, etc. It stimulates the sensory inputs from our brain and makes people feel the rich flow of experience and information.

There are two types of VR: non-immersive and semi-immersive. An example of non-immersive VR is gaming. The computer only generates a visual environment while the user is in control of their physical environment.



NASA simulation and software engineers demonstrate how they create simulations for astronaut training at the Virtual Reality Training Lab at NASA's Johnson Space Center in Houston, Texas. (Photo: NASA)



↑ The Virtual Reality transport ride attracts visitors of all ages. (Photo: Museum of Aviation)

Flight training is an example of semi-immersive VR because the visual experience affects users' perception of their physical environment. Semi-immersive VR is commonly used for educational purposes.

The third type, fully-immersive VR, has not been invented yet. They provide the most realistic experiences that might affect users' multiple sensations such as olfactory, sound, sight, etc.



↑ NASA scientists and engineers use the virtual reality program, PointCloudsVR, to obtain a new perspective on the stars' motions. (Photo: NASA)

Approaching the Global Deadline of Human Extinction?

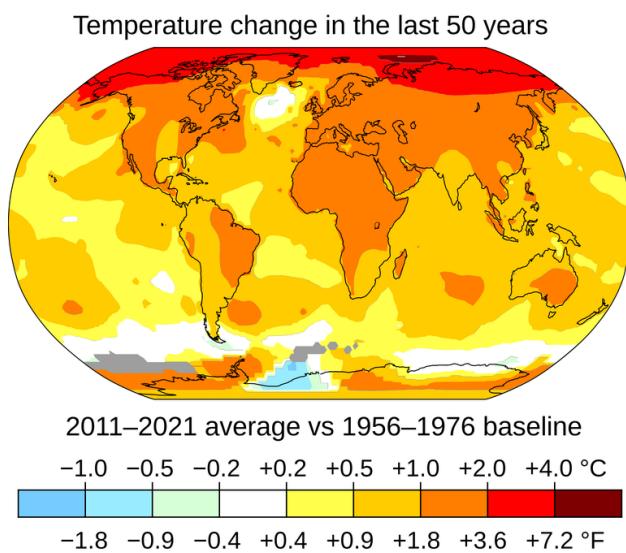
Written by: Ethan Chiang

The global average production of carbon dioxide from a single individual is approximately five metric tons per year. However, if everyone led the same lifestyle as the average American citizen, then we would need 270% of Earth's current resources to sustain life.

With that being said, the average American citizen produces almost three times as much carbon dioxide compared to the global average.

Realistically, there is almost no solution to prevent climate change or shortages in natural resources, as the global population will continue to increase.

Unless humans are able to find another planet to inhabit, our only chance is to slow down this endless cycle of pollution and overpopulation while also being mindful of our carbon footprint.



⌚ Average surface air temperatures from 2011 to 2021 compared to the 1956–1976 average.

(Photo: NASA)



⌚ Global warming and climate change pose a serious threat to the survival and development of human beings. (Photo: NASA)

Since Earth is merely a crumb of the Milky Way and beyond, it is highly unlikely that another planet sustainable for human life can be discovered on such short notice. The main picture should be focusing on the future of our planet and the generations to come.

Some may believe that it will take billions of years before the Earth is no more, but humans will become extinct way before that can occur, leaving a barren planet with minimal biodiversity.

As stated by astrophysical professor J. Richard Gott from Princeton University, there is a “95% likelihood that humanity will be dead and gone sometime between 5,100 years and 7.8 million years from now.”

We should expect the worst in order to prevent an earlier extinction, since humans were believed to have first appeared on Earth seven million years ago. This means that in the best-case scenario, humanity has already been through about half of its lifetime.

At this rate, humanity is certainly not in that best-case scenario. With widespread ignorance and unawareness, we could be gradually approaching the point where we only have 5,100 years or less remaining for human life.

Renewing Our Energy and Reversing Deforestation

Written by: Ethan Chiang

The United Nations hosts COP 27, an annual summit on climate change. Its 27th conference was held at Sharm el-Sheikh, Egypt, in November 2022.

Consistent progress has been achieved in minimizing climate change, necessitating new infrastructure, technology, and other factors, leading to the completed financial plan, which calls for investing 4-6 trillion dollars in renewable energy per year through 2030.

Even while COP 27 is a fantastic move in the right direction, improvements will take time to occur. The conference stuck with the same strategy as the previous year, gradually phasing out coal, rather than completely eliminating fossil fuels.

By the end of the century, the temperature is predicted to rise by 2.8 degrees Celsius, according to the UNEP Emissions Gap Report from 2022. The goals of 1.5 degrees Celsius are greatly exceeded by the measures that are now in place. To slow down the shift, there could be more punctual implementations at the following meeting. However, the work done in COP 27 is still one step towards the right direction.



▲ COP 27.

(Photo: COP 27)



▲ Deforestation affects the environment and threatens living species. (Photo: Earth.org)

More than 130 world leaders pledged to halt and reverse deforestation by 2030 at the previous United Nations Climate Summit in 2021.

This commitment included plans to implement actions that countries may use to slow down, mitigate, and reverse forest cover and carbon loss, as well as a dozen countries contributing \$12 billion to landscape restoration initiatives, fighting forest fires, and supporting the rights of indigenous communities to eliminate deforestation and its effects.

Although this is an incredible achievement, others question if we will actually be able to reach the 2030 objective or whether everything is merely contributing to false hope.

Similar, smaller-scale initiatives have been made in the past (2014, the New York Declaration on Forests), but they did not go as planned, which caused suspicion in the environmentalist organizations.

However, this may be a productive commitment to halt deforestation if the right steps are taken and there is a clearer structure and set of checkpoints to meet the goal of 2030.

Future of mRNA Vaccines

Written by: Bryan Ruizhi Zhang

The COVID-19 pandemic was abated by the introduction of COVID-19 vaccines that used novel mRNA vaccine technology. These vaccines allowed the world to return to some semblance of normalcy. Today, over 670 million doses have been delivered to Americans. Still, what are mRNA vaccines, and what potential do they hold for the future?

Most vaccines work by injecting a part of a virus into us, helping our bodies identify the virus and prompt an immune response. mRNA vaccines work differently.

mRNA, or messenger DNA, are portions of genetic code DNA uses to create proteins. mRNA vaccines inject viral mRNA into our bodies to train an immune response. The technology has been under research for decades, and clinical trials for mRNA vaccines began in the 1990s.

However, the extenuating circumstances created by the COVID-19 pandemic lead to the rapid creation and certification of COVID-19 vaccines using this technology.



▲ mRNA vaccine. (Photo: University of Pennsylvania)

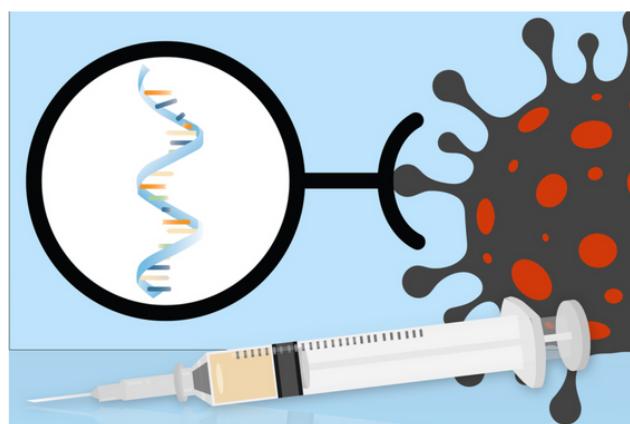


▲ The FDA encourages food facilities to support worker vaccinations. (Photo: US Food and Drug Administration)

One upside of mRNA vaccines? Turnaround of one-month, an advantage to curbing rapidly spreading viruses.

Moderna, the company behind one of the two approved mRNA COVID-19 vaccines currently in use, is currently developing vaccines for respiratory syncytial virus, HIV, Zika virus, Epstein-Barr virus, and other diseases.

BioNTech, the company that partnered with Pfizer for the other currently approved mRNA COVID-19 vaccine, is developing vaccines for tuberculosis, malaria, HIV, shingles, and flu. Aside from these two companies, many are exploring treatments for cancer. Safe to say, mRNA vaccines hold much promise for the future.



▲ mRNA vaccines encode segments of the spike protein. (Photo: MIT)

YEA Student Board 2022-23

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Thank you for your kind support!

YEA Student Board

YEA Volunteering Program

Are you Interested in volunteering? Do you love STEM? Then you should become a volunteer for Young Engineers In Action!

Reasons why you should volunteer:

- To give back to the community.
- To hone your leadership skills.
- To make everlasting bonds with other volunteers, the Student Board, as well as young students engaged at YEA!
- To fuel your passion for STEM.
- To gain volunteering hours since YEA is a certified organization to authorize and recognize dedicated volunteers with the President's Volunteer Service Award.

About US

YEA was founded by then high school students Nicholas Fu and Lia Tian in May 2016, and has grown into a non-profit organization with hundreds of participants actively involved in promoting STEM and bringing positive impact to local communities. YEA Newsletters are published for educational purposes only.

Contact US

contact@youngengineersinaction.org

(714) 808-2407

7002 Moody St. #217, La Palma, CA 90623

www.youngengineersinaction.org

YEA Programs:

<https://www.youngengineersinaction.org/programs.html>

YEA Events:

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