



# STEMBoost Newsletter

Issue X

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## **Kennedy Science Olympiad: Back-to-Back National Champions!**

**Joseph Lee**

On May 22, the Kennedy Gold team once again ranked 1st place in the National Science Olympiad Tournament hosted by Arizona State University. The team was announced as the National Champion for the second time in a row this year, which is an amazing accomplishment. At this year's competition, Jeffrey Trail came in second place, scoring just two points behind Kennedy. The teams were tense and uncertain all the way up until final rankings were announced.

The Division C National Champion this year was Mason High School from Ohio.

Our team performed extremely well. According to team coach Queen Lee Foo, we:

- Medalled in 20 out of 24 events
- Won 8 Gold medals in Anatomy and Physiology, Density Lab, Digital Structures, Disease Detectives, Heredity, Machines, Reach for the Stars, Write It Do It
- Won 5 Silver medals in Chiropterology, Circuit Lab, Elastic Launched Glider, Mousetrap Vehicle, Ornithology
- Won 2 third place medals in Experimental Design, Food Science; 3 fourth place medals in Crime Busters, Fossils, Mission Possible; 2 sixth place medals in Boomilever and Meteorology

Our team members are: Aaron Chan, Allen Li, Alyssa Yang, Andrew Zhou, Anish Bayyapu, Ashish Kashyap, Chinmay Raghvendra, Irene Tian, Ishanvi Kommula, Joanna Abraham, Joel Lee, Khedaar Kashyap, Michael Smith, Pragma Rama, Sunny Yao, Aletheia Ju, Alicia Xie, Rachael Jin, Sophia Dsa.

The coach also made an announcement to Kennedy Science Olympiad, District Board Members, and STEMBoost thanking everyone for their ongoing contributions and support.

Congratulations to the Kennedy Science Olympiad for their amazing effort and achievements. Hopefully, Kennedy will be able to continue its streak next year!

Editor in Chief: David Smith

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### Fun Fact

Which mountain peak is the farthest from the center of the Earth?

(See answer in the back)

## Editorial – The Power of Personal Choices in the Face of the Anti-vaccine Movement

Ryan Li

The COVID-19 pandemic has wreaked havoc on the daily lives of people worldwide. Ever since the first cases of the coronavirus were reported in the US in early 2020, there was a large effort from the scientific community to begin developing a vaccine, a treatment which gives an individual immunity against a pathogen. In a span of only a few months (compared to the average 10-15 years), vaccines for COVID-19 such as the Pfizer-BioNTech vaccine, Moderna vaccine, and Johnson & Johnson vaccine had been developed, and throughout the summer and fall of 2020 human trials for these vaccines were held as the number of cases of the coronavirus drastically increased across the country (1,2). However, along with the efforts of scientists that strived to remedy the pandemic came the resurgence of the anti-vaccine movement.

Advocating against the use of vaccines, the movement, which has roots stemming back to when Edward Jenner first discovered the concept of immunity for the smallpox virus, had garnered global attention in 1998 when Andrew Wakefield had published a scientific paper in the Lancet Journal claiming that there was a link between the MMR vaccine (which targeted the measles, mumps, and rubella viruses) and increased rates of autism within children. However, his statement was found to be fraudulent by subsequent epidemiological studies and eventually the paper was retracted from the journal (3). Despite the overall scientific consensus surrounding the validity of the paper, proponents of the anti-vaccine movement still continuously turn to this study as a means of scientifically justifying the movement's credibility.

The reemergence of the anti-vaccine movement in the wake of the COVID-19 pandemic carries with it far more baseless claims than just this one. Some of these include the false stories spread by many anti-vaccine individuals of people dying after taking a COVID-19 vaccine (when they were verified to be still alive), the message that the vaccine will cause many more people to perish (even though the whole purpose of the vaccine is to ensure people can be immune to the highly contagious COVID-19), and the narrative that the vaccine carries a 5G microchip which can be used to track individuals by people within the technology industry (even though those microchips are simply too large to fit within the needle of syringes used to administer the vaccine) (4,5).

Although most of these claims seem to be outlandish, one might wonder how exactly these ideas had spread so far in the first place, even with most main media sources being in favor of vaccines. A scientific study conducted on the presence of both pro-vaccination and anti-vaccination pages on Facebook during the global measles outbreak in 2019 may shed some light on the answer. The study found that although the number of anti-vaccination individuals were smaller than pro-vaccination individuals, there were a greater number of Facebook pages created by the anti-vaccination individuals than the pro-vaccination individuals, allowing for more engagement of anti-vaccination pages by Facebook users who were unsure about their stance on vaccines. In addition, the diversity in the claims being featured on the anti-vaccination Facebook pages were found to be larger than those on pro-vaccination pages, allowing the numerous anti-vaccination pages to impact a larger number of people (6). Given the fact that the COVID-19 pandemic has already affected many more people than the 2019 measles outbreak did, the results of the study are troubling.

However, there is still hope for remedying the increase in people being attracted to the anti-vaccine movement, as is evident with Lydia's (a former anti-vaccine individual) story. Being generally pro-vaccine prior to her having her first child, Lydia had become skeptical of vaccines after her first child had an unexplained fit shortly after getting the DTaP vaccine, as well as the fact that her concerns for the wellbeing of her child were dismissed by a nurse. She proceeded to seek help from others online, but fell

into an echo chamber within the anti-vaccine movement in which every concern she could think of surrounding the validity of vaccines were corroborated by anti-vaccine sources online. Lydia explains that this was done out of wanting to do what was best for her child, and that this was the main driving force turning parents towards the anti-vaccine movement should their child ever display unexplained symptoms following vaccination. However, once the COVID-19 pandemic arrived she had noticed that the great vulnerability of the US's economy as businesses and industries shut down across the nation could very likely trigger a collapse of the healthcare system, which would include people not being able to get vaccinated. Lydia further reasoned that this decrease in the number of people being vaccinated would result in the diseases that vaccines protect individuals against reemerging, ultimately pushing her out of the echo chamber set in place by the anti-vaccine movement and reverting back to a pro-vaccine stance (7).

From Lydia's story, one can observe that it was the effects of the COVID-19 pandemic itself which had reverted a former anti-vaccine individual back to a pro-vaccine viewpoint, and that her initial switch to an anti-vaccine viewpoint had been done for a reasonable cause. In addition, it can be reasoned that even with all of the pro-vaccine information available on the internet, the personal experiences and actions of an individual are the ultimate determining factor for whether that person believes in the science behind vaccines or the disinformation from the anti-vaccine movement, and that the anti-vaccine movement preys on people such as Lydia who are on the fence surrounding the topic of vaccines. This further exemplifies the power of personal choices on the overall eradication of misleading information as well as the advocacy of scientifically proven facts, and that we must all make the conscious decision to begin/continue trusting people who are knowledgeable in the field of epidemiology and those who have developed technology (vaccines) capable of eradicating deadly diseases entirely from the face of the earth, regardless of whether we are at the moment anti-vaccine or pro-vaccine.

#### Works Cited:

1. "Vaccine Development, Testing, and Regulation." The College of Physicians of Philadelphia, Last Updated: 17 Jan 2018, <https://www.historyofvaccines.org/index.php/content/articles/vaccine-development-testing-and-regulation>.
2. AJMC Staff. "A Timeline of COVID19 Developments in 2020." AJMC, 1 Jan 2020, <https://www.ajmc.com/view/a-timeline-of-covid19-developments-in-2020>.
3. Omer, Saad B.. "The discredited doctor hailed by the anti-vaccine movement." nature, 27 Nov 2020, <https://www.nature.com/articles/d41586-020-02989-9>.
4. Ball, Philip. "Anti-vaccine movement could undermine efforts to end the coronavirus pandemic, researchers warn." nature, 13 May 2020, <https://www.nature.com/articles/d41586-020-01423-4#ref-CR1>.
5. Heathers, James. "Putting Microchips in Vaccines Is a Terrible Idea, When You Think About It." The Atlantic, 3 June 2021, <https://www.theatlantic.com/technology/archive/2021/06/microchipped-vaccines-15-minute-investigation/619081/>.
6. Johnson, Neil F., et al. "The online competition between pro- and anti-vaccination views." nature, 13 May 2020, <https://www.nature.com/articles/s41586-020-2281-1>.
7. Martin, Rachel. "Former Anti-Vaccine Mom Explains How Movement Pulled Her In, And How She Left." npr, 18 Jan 2021, <https://www.npr.org/2021/01/18/957981974/how-anti-vaccine-movement-could-hurt-efforts-to-end-pandemic>.

Answer: The mountain peak that is farthest from the center of the Earth is Chimborazo, located on the equator in Ecuador. This is because the equator of Earth bulges outwards because of Earth's spin.