SEEKING SCIENCE

by STEM Action Teen Institution

A MONTHLY
STEM NEWSLETTER

AI GENERATED ART

CARBON SCAMS

TESLA COMPETITORS

and more...

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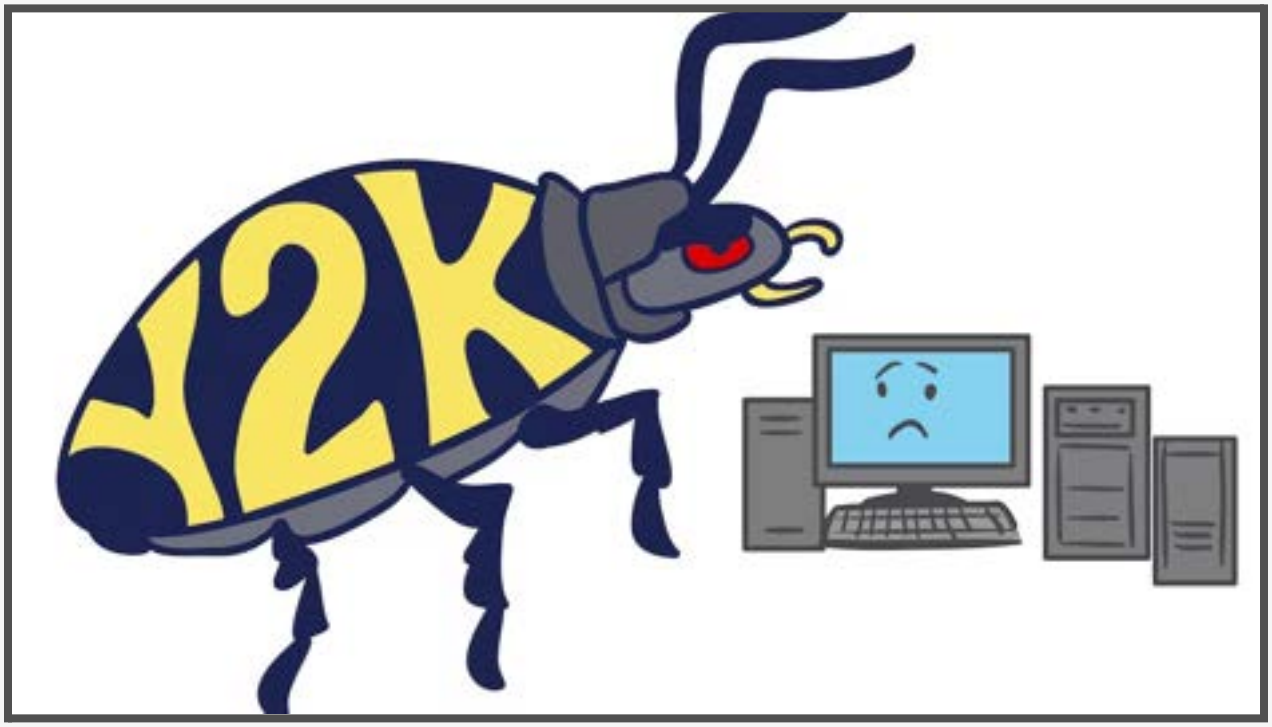
The Threat of the Y2K Bug

Wilson Zhu

During the 20th century, the Y2K bug was a flaw in computers that could cause problems with dates past December 31, 1999. This bug challenged many different computer programmers and users. Although many people thought it was a consequential bug, some people were skeptical of the threat.



Many of the first computer programs used two-digit codes for the year. Programmers shortened the date for more storage on computers. As the 21st century approached, programmers realized doing this might cause errors since computers might not interpret the year 2000. Many people were working together to create a solution to the bug. Countries like the United States were helping to solve the issue. They passed the Year 2000 Information and Readiness Disclosure Act in 1998 which promoted the

idea to work together with many different programmers to find the solution to the problem. Many people internationally were working immensely to solve the problem.

Banks, power plants, and transportation rely on computers for certain elements. Banks that can calculate the interest rates daily face a problem. The rate of interest could have an error where the computer could calculate the rate of interest of negative 100 years which could have a major effect on the economy. Power plants depend on computers for routine safety checks for water pressure, radiation levels, etc. Being unable to check the date for maintenance, could cause a threat to the residents nearby the power plant and could inflict many injuries to the residents. Transportation methods, like airplanes which used computers to record the dates for flights, could cause many flights to be disorganized.

Although there were many threats to computers, many different programmers raced to fix the bug. The solution was to expand the date to a four-digit number. Since many people worked excruciatingly long hours to get the solution there were a few problems that occurred when it was finally January 1, 2000. Subsequently, many people believed that this event was just a hoax since few problems occurred.

What Is Radioactivity?

Edward Huang

Radioactive substances surround us, but what exactly do they do? What makes an element radioactive? And, although they are so important, why do we tend to stay away from them?

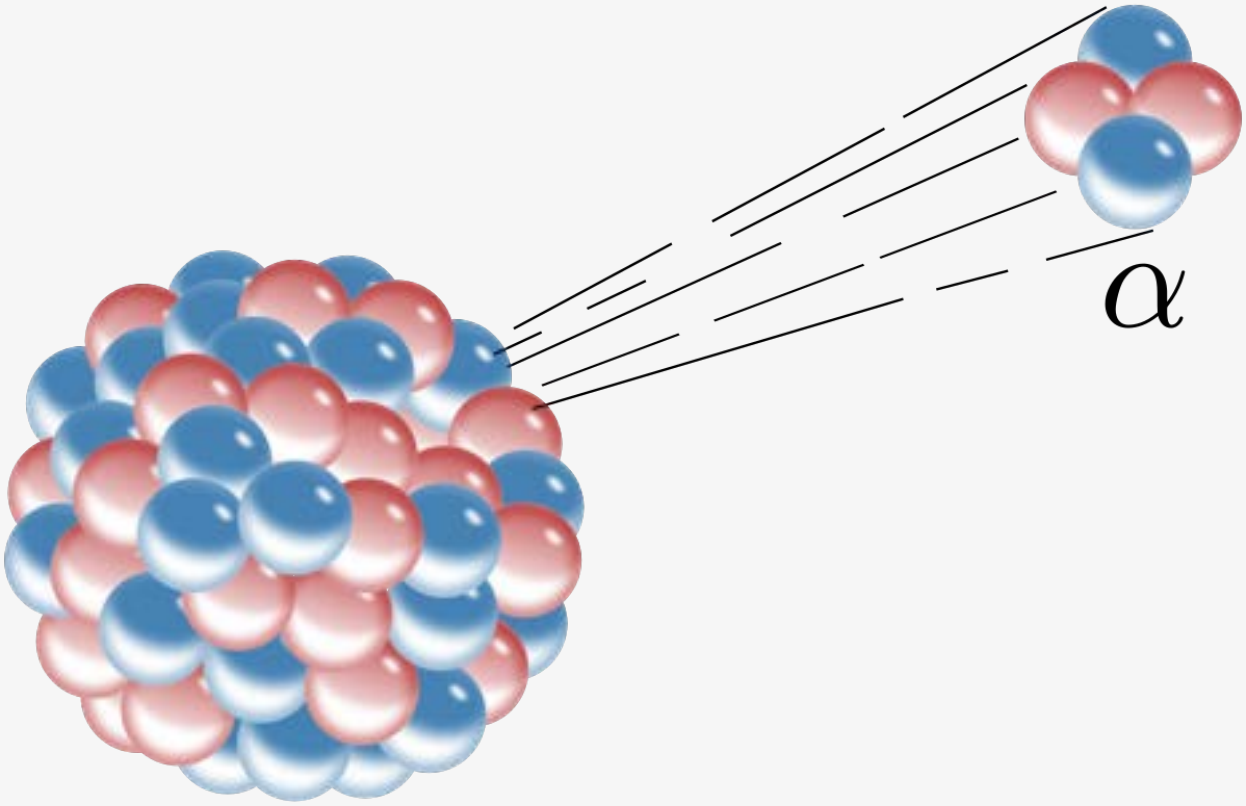
In short, radioactivity is an element's ability to release energy in the form of radiation, making it very useful, but also possibly very dangerous. It is important to note that not all radioactivity is dangerous, though. There are many different radioactive elements. One example is potassium-40, an isotope of potassium that is common in bananas. But, if bananas are radioactive, why are they still safe for us to eat? The answer is that radioactivity can vary greatly in its strength. Additionally, there are different categories of radioactivity, with some being more dangerous than others. In the case of bananas, potassium-40 is very slightly radioactive and causes no harm to humans. On the other hand, uranium is much more radioactive. Long-term exposure to high concentrations of uranium can cause major health problems, like lung cancer or kidney damage.

There are many kinds of radiation, but radioactivity often falls into 3 categories: alpha, beta, and gamma. Alpha radiation is the emission of alpha particles, which are particles consisting of 2 protons and 2 neutrons. Heavy elements like uranium are radioactive in this way. They do not have the energy to penetrate the skin by themselves, but when they enter the body in other ways, such as being ingested or going through a cut in the skin, they can wreak havoc on cells and damage DNA.

The second type of radiation is beta radiation, the emission of beta particles. Beta particles are either a single electron or positron, and they are much lighter than alpha particles. Because of this, they are less damaging to cells, but are more penetrating and can be spread through further distances. There are a few elements that are radioactive in this way, including hydrogen-3 and carbon-14.

The third main type of radiation is gamma radiation. Gamma radiation is the emission of gamma rays, or photons, the same particles that make up light. Gamma rays are the smallest out of the three and are the most hazardous. They have the most

penetrating by far, even being able to pass through multiple feet of concrete. They contain very high amounts of energy, and as they pass through the body, they can cause major damage to DNA and tissues.



Atoms become radioactive when they acquire the wrong amount of protons or neutrons in the nucleus. When this happens, they become unstable and start to emit radiation. Although radiation can be dangerous, it is one very important property that can be used for beneficial purposes. Radiation is used in nuclear power plants, where radioactive uranium atoms are split apart to generate large amounts of energy. A small amount of alpha radiation is used in smoke detectors to complete an electrical circuit by ionizing nearby air molecules. Smoke can interfere with this process, which is how smoke detectors can detect when smoke is present. Radioactivity can even be used to find the age of organic material, by examining the properties of the carbon-14 isotope.

Radioactive elements are elements that emit alpha, beta, or gamma particles into the air. These particles can damage tissues and DNA, making them hazardous to humans. When controlled, however, they can become very useful, generating power and saving lives. Radioactivity, although dangerous, is an essential chemical property that plays a role in many different functions.

Biopsychology

Owen Chen

Biopsychology is the study of human behaviors influenced by the nervous system. The subject is also referred to as the study of brain development and functions. Biopsychology had been existing for as long as the 18th century, and because of recent advanced technology, biopsychology can be studied in many ways, such as through neuro-surgeons. The existence of biopsychology was founded to explain the behaviors of organisms by a philosopher named “Rene Descartes".

During his lifetime, Rene introduced new connections between the brain and your body, such as muscle reflexes which are the decision your muscle processes without the control of your brain but using your spinal cord. The fundamentals of biopsychologists started with the approach to observing people who concentrate on conscious thoughts. Today, with the help of technology, biopsychologists can conduct

research more efficiently, using brain scanners and other tools, but the objectives of these actions are still the same.

The average annual salary is about $91,000 and the job has been increasing by 19% throughout the years. Today, to be a biopsychologist, people would first need a bachelor's degree in psychology which consumes 4 years of your life. In the program, students are taught different perspectives of looking at a brain's behavior.

After that, students will need to pass the "Doctor of Philosophy in Psychology " program (2 years), followed by a PH.D. Biopsychology can make a major impact on human lives. It can change the way people are influenced or make more precautions for future situations, such as creating new laws that prevent car accidents.

Non-Native Types of Species

Eddie Zhang

Many species we have heard about in the United States, for example, Zebra mussels, Common starlings, and Wild boar did not originate from the country. They were brought in from other regions, either naturally or through human influence. We call these species, "non-native species."

There are two types of non-native species, invasive and non-invasive. An invasive species is able to rapidly adapt and reproduce in a new environment, causing native species to lose land and resources, which may lead to their extinction. On the contrary, a non-invasive is not rapid and does not impede on the native environment.

A common example of an invasive species is the Formosan Termite. These were brought into the United States from Formosa, or Taiwan, via crates made from Formosan wood. These termites feed on wood, which is why they were inside the wood of the crates. When they arrived in the U.S, instead of the dense forests in Formosa, they were met with massive industrial cities. But, since they still needed wood for survival, they began searching around for available wood, which they found in the foundations of housing. As they chewed their way through the wood, the houses would weaken and collapse. Worse yet, they out-competed native termites, quickly becoming the dominant species in the area.

Considering this danger, what can we do to control these invasive species? Well, once an invasive species is able to establish itself, it can be extremely difficult to control and eradicate them. Thus, the most effective way is to prevent their introduction into new regions, which is what experts are currently working on.

Types of Screen Technology

Aidan Hong

Most technological devices use a display to show data on a graphical level. However, there are different types of displays in each device. There are many types of displays, some being cheap to make, and others requiring more money to make. Different displays also have different levels of quality. However, the three most common types of displays are LCD, OLED, and Mini-LED.

Liquid Crystal Display, also known as LCD, is perhaps the most common type of display. Low-end and budget phones consist of an LCD display, as their quality is decent

and their production costs are low. LCDs work using a combination of red, green, and blue filters, combined with a backlight to light up the pixels. When the pixel gets a signal to change its color, the filter quickly moves into the position. Also, one of the biggest advantages is the lack of burn-in, a phenomenon in which an image is permanently burned. Other displays suffer from this. Although LCDs display good-quality colors, it is not as precise as other display technologies.

Organic Light-Emitting Diode, better known as OLED, is a slightly more expensive, but better quality type of display compared to LCD. Unlike LCD, each pixel is able to control itself and has its own backlight. As a result, color contrast is better, and there are darker blacks and brighter whites. Most smartphones deploy this type of display, for example, the latest iPhones, TVs, and most high-end Android phones.

When people use their devices outdoors, one common issue is the display is too dim to see anything. Fortunately, Mini-LED seeks to solve that. Mini-LED is an LCD display, but has the same color accuracy as OLED. Despite this, its per-pixel lighting isn't as sharp as OLED, as all pixels are controlled by the same backlight. However, the backlight is more precise than LCD, improving some shortcomings of LCD. This hasn't stopped some devices from using these displays, and they are present in some TVs, laptops, and tablets.

LCD, OLED, and Mini-LED are different types of displays. All of them have their pros and cons in color accuracy, brightness, burn-in, and cost. In the end, it is up to the consumer to choose which one they wish to use.

The New Face of EVs

Denise Lee

For several years, Tesla, a luxury automotive company has been the face of electric vehicles. A major problem Tesla has is its quality. In an interview on CNN Business, Elon musk, CEO of Tesla, admits that they've been lacking quality control and had been having many quality problems. Many electric cars have been made such as the Rivian R1T, Rivian R1S, and the Lucid Air. It has been said that the Lucid Air is the 'Next Tesla', but is Lucid Motors better than Tesla, and could it be the new face of electric vehicles?

The CEO of Lucid Motors is Peter Rawlinson who is the former Vice President and former Chief Engineer of Tesla. He designed the Tesla Model S and the Lucid Air. Engineers always try to improve their designs. Rawlinson's design for the Tesla Model S was very successful, so we can conclude his design for the Lucid Air was even more successful. According to many studies such as USN, AP News, and Eccost Savings, Rawlinson managed to improve the range, seat comfort, interior quality and features, acceleration, and ride.

The Lucid Air can reach 520 miles, while the Tesla Model S can only reach 406 miles. The Model S seats 5 with synthetic leather upholstery, heated and ventilated front seats, heated rear seats, and a heated steering wheel. The Lucid Air seats 5 with luxurious full grain leather upholstery, heated and ventilated front seats with massaging

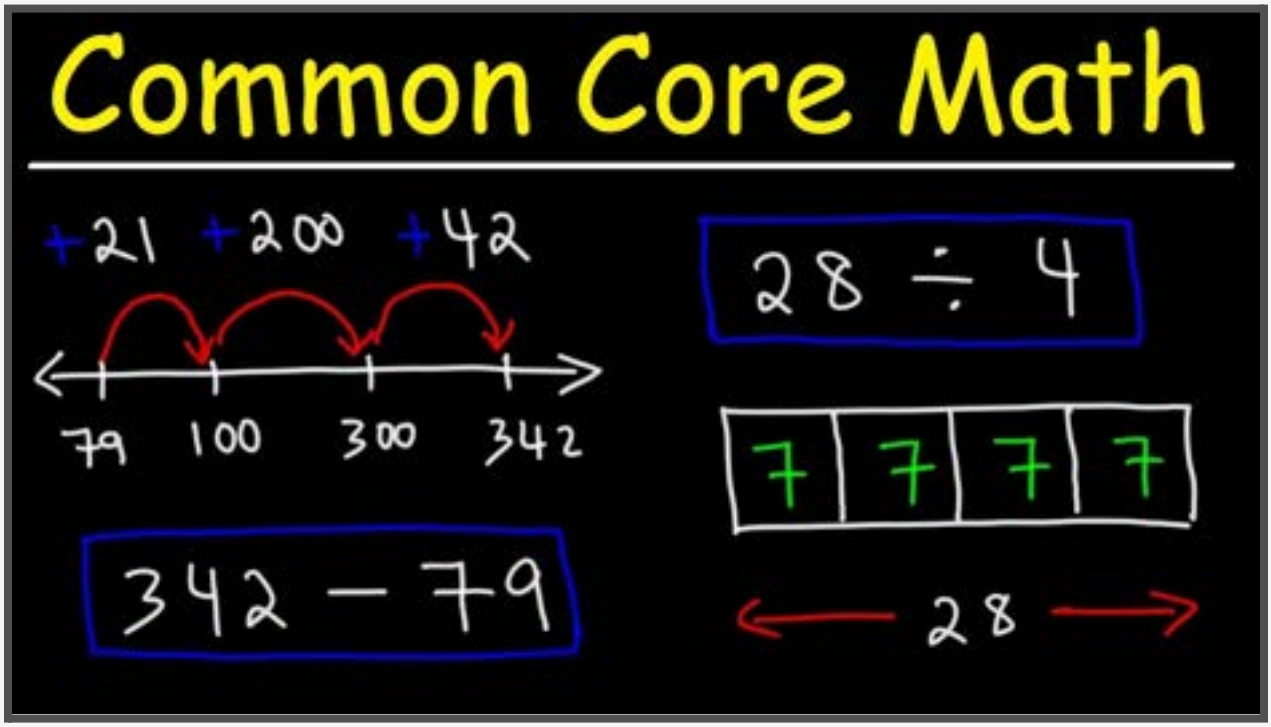
functions, heated and ventilated rear seats, and a heated steering wheel. The Lucid Air's interior is made with superior materials and texture than the Tesla Models. Like Tesla, the Lucid Air also has autopilot. Lucid Air has more legroom and headroom than a Tesla Model S. Lucid Air glides and moves smoother than Tesla Models. Rawlinson has made the Lucid Air better than the Tesla Model S.

"Quality over quantity" is a very common and vital saying. Elon Musk responded to Lucid saying, "I had more kids in Q2 than they made cars," yet Lucid's quality is significantly better than Tesla's quality. Even though Tesla has a greater quantity, quality is more important. Lucid Motors has exceeded Tesla's problems with quality and has made a better vehicle than Tesla. Therefore, Lucid Motors could be the new face of electric vehicles and ultimately the new Tesla 2.0.

The Failing Standard

Cody Duan

The common core standard is a very well-known education standard. It was created to help students graduate with the skills needed for college and the workforce. However, it is no secret that the common core standard is failing.



According to the California Department of Education, CDE, the state minimum requires two years of math, which includes Algebra 1. As the world desires to improve technology, STEM-related jobs will increase. Consequently, even more than the standard of Algebra 2 will be required. However, students will take upon the idea that they do not need more than two years, thus skipping higher-level education that will better prepare them for the future. For example, Algebra 1 includes creating equations and using properties of rational and irrational numbers, while a STEM-related job may need calculus. In such cases, those with only Algebra 1 education will not be able to keep up with the rising demands.

Two countries with high rigor in math and science are Singapore and China. They like to start with a strong focus on math, while the common core standards are often said

to be “a mile wide and an inch deep.” The standards cover a wide variety of topics that are often repeated through the years, putting the students' education behind those of another nation. A better standard can be helpful, for it increases consistency between the curriculum and the teachers’ training. Overlap between grades will decrease, and students will not be lagging behind those of another nation.

The common core standard should be more rigorous or changed with a different standard. In this day and age, STEM is becoming more popular, and common core standards can not keep up with this demand.

Carbon Offsets Are Worse Than Useless

Ethan Chen

Carbon offsets have become one of the most popular ways for individuals and organizations to pay off their carbon emissions. Here’s how they work: you go up to a carbon offset company, give them your money, and they’ll promise to remove the equivalent of that much carbon from the air by either planting trees, preserving them, or carbon sequestration. There’s a problem with this model, however, which is that much of the time, they don’t actually offset carbon.

The most immediate problem is the lack of accountability on how these companies actually offset carbon emissions. Oftentimes, they will claim to preserve entire tracts of forest from being cut down, thus saving the world from a certain amount of carbon being emitted. However, these claims of forest preservation are often made on land that is either publicly owned and preserved already, or privately owned and were never going to be cut down at all. Thus, all the carbon offset company is doing is paying

landowners to *not* cut down trees that were already *not* going to be cut down, which doesn't reduce any potential emissions at all.

A more devious problem lurking behind the lack of accountability is the problem of large companies using these non-effective "offsets" as an excuse to emit much more carbon into the air than they otherwise would've been able to. If a company can claim to spend millions offsetting their carbon emissions, while in reality, they haven't done a thing to actually curb them in practice, then they practically have free reign to pollute the air all they want without backlash or reputational consequence. This is a net loss on the fight against climate change, which is why carbon offsets are creating more problems than they ever solve.

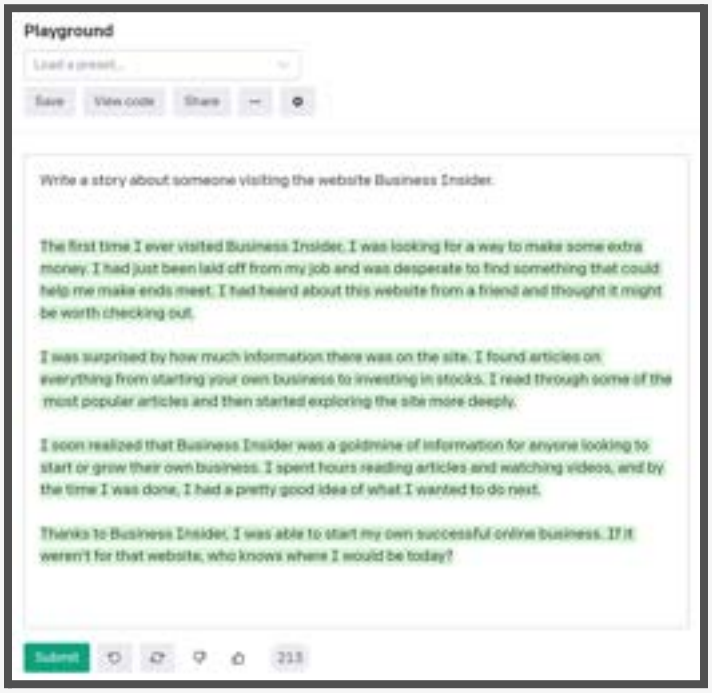
OpenAI: Descendant Creation

Brian Wang

When did the idea of replacing human work with artificial intelligence become popular? This belief system dates back to the beginning of time, but it has really achieved its zenith and iceberg because of dangerously realistic technology that picks up lessons from mistakes. Numerous disciplines of AI have been developed to mimic this

learning curve, which is akin to how living things and people learn and develop. In 2018, the first branch on this subject was developed using pre-training on lengthy text passages, which revealed a generative model of language.

The Transformer language model with the Generative Pre-trained Transformer libraries known as GTP-1, GTP-2, and GTP-3, are all versions of one another. These are the products of years of programming, employing neural networks with over 175 billion parameters and ideas like meta-learning, which generalizes input-output pairs. From different angles, these were some of the earliest significant AI developments that were able to establish the typical model of learning and developing through trial and error.



In fact, several more branches of OpenAI were born from these, with OpenAI Codex being one of the more well-known ones. This model was developed by OpenAI, a non-profit research facility frequently cited as Deepmind's rival in the field of AI research. The fact that OpenAI, one of the most well-known add-ons in the programming industry,

was the library that underpinned GitHub Copilot, a tool for autocompletion in Visual Studio Code is extremely intriguing. When you add comments to your program, Copilot will be able to automatically complete the requested information, whether it is close to being completed or not. About 70.2% of the prompts in 100 test scenarios carried out by the OpenAI researchers were successful.

This isn't the only branch, though, there are several others, such as OpenAI's Jukebox for making music, DALL-E 2 for converting text into images, RoboSum for automatically learning methods under meta-learning, and many more. Some people might even think that this is the ocean's surface. The globe might encounter dangerously realistic virtuality when the underwater is ultimately made known to the public from its treading.

Pineapple Plates

Eason Fan

According to Statista, "In 2020, the global production of pineapples amounted to approximately 27.82 million metric tons." This means about 10 billion pineapple crowns go to waste. This small company named "Lifepack" is putting it to good use.

Lifepack is a company based in Columbia and is promoting the concept of "Circular Economies". It was founded 12 years ago by a couple with the goal of keeping the lowest possible carbon

footprint. The couple noticed the pollution that people were causing. And they wanted to fix that.

First, the company gets the fruits from a local source, then they shred the top of the pineapple and mix it with paper to be naturally dried. Next, the sheet is pressed and packed to be shipped to local stores.

If plates are added to some water and seeds then thrown into nature, they would biodegrade in just a couple of days. The seeds that we put in there would start growing in 2 days. "We were not just designing a biodegradable plate. We wanted to go further and create a plate that generates life," - says the co-founder's husband.

In one day, the workers can crank out more than 1,000 plates. "When we started out a decade ago, people told us we were crazy," Barona said. Now, the company is selling out and is faced with many positive responses from the community. With the demand and support on the rise, they are planning to expand and make the process more efficient. Now, the products can be found in multiple big supermarket chains. They can also be brought from online websites and shipped around the globe.

Should Government Enforce Green Policies?

Stephen Hung

A growing significant problem worldwide is environmental change, such as global warming, deforestation, climate change, etc. However, solving such a problem requires a great collective effort, which begs the question: should the government be responsible for fostering green practices? Although green practices can be inconvenient and

troublesome, governments worldwide should fully enforce their citizens to participate in green practices. In doing so, it provides many benefits environmentally and economically.

The government should enforce citizens to partake in greener practices, as it is the most ideal way to achieve our goals environmentally. People worldwide recognize that “natural resources do not exist in limitless supplies,” and due to this, there must be extreme urgency regarding the protection of nonrenewable resources such as coal, gas, and petroleum. Therefore, governments should focus on helping people realize that a green lifestyle will benefit future generations. Enforcing a system where citizens must go green will be responded to with backlash due to its inconveniences at first.

This lifestyle entails many new responsibilities, and an example of this is seen in Chino Hills, where residents are now required to dispose of food waste in a specific compost bin instead of the regular trash bin because doing so reduces carbon and methane emissions at landfills. However, it will eventually implement a mindset in the

public that green practices should be a critical part of their lifestyle rather than a hassle, making these practices a much easier pill to swallow for them. The growing scarcity of natural resources that leads to global warming also brings up larger and more glaring issues.

A need for green practices is seen in a book by Thomas Friedman that discusses the need for a green revolution, where it is stated that the Earth is getting “hot, flat, and crowded,” which is “tightening energy supplies, intensifying the extinction of plants and animals,” and more. Without the passing of new legislation that places regulations on energy resources, people will continue to consume Earth’s precious and limited natural resources, which could even lead to the extinction of humanity.

There is already evidence suggesting that our environmentally harmful practices have led to the extinction of several species of plants and animals, and if things do not change, humanity itself will be at risk. If the government acts against pollution and other environmental issues through strict enforcement, it will allow its citizens to live more environmentally sustainable lives and, in the grand scheme of things, protect humanity’s livelihoods.

A Narrowed Search for Alien Life

Arthur Liang

A recent discovery of an Earth-like planet orbiting a red dwarf star revealed that the planet had nearly no atmosphere at all. Red dwarfs are the most common type of star in the universe, meaning we could rule out the planets that orbit these stars as possible locations of life.

The no-atmosphere planet in question is GJ 1252B. Its close proximity to the star means that it is immensely hot and inhospitable. The radiation from the red dwarf is so strong that it completely blows the atmosphere away. This is similar to Mercury in our solar system, whose atmosphere has almost been completely blasted off into space by our sun. Red dwarfs are also much more unstable than stars like our sun, having more solar flares and solar activity. The condition of GJ 1252B is a bad sign even for planets that are farther away from the red dwarf.

The lack of atmosphere was determined by measuring infrared radiation when its light was obscured during an eclipse. The radiation revealed that the planet's daytime temperatures reached 2,242 degrees Fahrenheit. This heat, along with low surface pressure on the planet, led scientists to believe that the planet possesses no atmosphere.

Of the 5000 stars in Earth's solar neighborhood, most are red dwarfs. If planets orbiting them can be ruled out entirely, it could reduce that number to around 1000 inhabitable stars. Though this means we will have fewer stars to search for to find alien

life, it does also mean that there are fewer stars for us to move and explore later on. However, it is still inconclusive whether all planets around red dwarfs get reduced to GJ 1252B's fate, and more research still needs to be done.

California Proposition 3

Cathie Zhu

California Proposition 3 is a California Water Infrastructure and Watershed Conservation Bond Initiative. On November 6, 2018, it was an initiated state statute placed on the ballot in California. Voting "yes" would have supported the measure that authorizes $8.877 billion for environmental projects and water-related infrastructure. The measure was ultimately defeated.

How would the $8.88 billion bond measure have been spent? The bond would have generated approximately $8.4 billion in interest alone over a 40-year period, leaving the bond with an ending cost of $17.3 billion for the state. Conservancies, state

park restorations, watershed lands protection, nonprofits, and local sustainability agencies would have been the receivers of the largest amount of bond revenue- $2.36 billion. Groundwater sustainability agencies would have $640 million allocated to them in order to implement their plans. For public water system infrastructure improvements, there would be $500 million to ensure safe and affordable drinking water, plus the treatment of contaminants.

It was required by the ballot initiative that $1.4 billion would be spent on improving and benefiting what the state believes to be disadvantaged communities and $2.64 billion to be stressed on disadvantaged communities. Communities with an annual median household income less than 80 percent of the statewide annual median household income would be considered a disadvantaged community by the state of California. In 2017, the median household income was $63,783, therefore 80 percent was $51,026.

$4.94 million was raised by the committees supporting Proposition 3, with $495,000 from California Waterfowl Association, $415,000 from Ducks Unlimited, and $275,000 from Western Growers.

Dangerous Behind Tobacco

Kenny Wu

Could you believe that doctors could be advertising to the community to smoke tobacco? During the 1930s - 1950s, nearly everyone was superstitious for a significant power that could cure all wounds, tobaccos. Smoking started to become a trend. However, the bad decisions eventually caught up to society. People started to realize the danger of this “cure for all”, but not many could quit it. Tobacco was an irreplaceable medicine for mankind, even knowing that the cost is your life could not restrain these

decadent smokers from having their daily dose. What is it that seduced and corrupted humanity for so long?

First things first, the allurement of tobacco has a lot to do with what tobacco accommodates. Tobacco is processed by drying the leaves of Genus Nicotiana from the Solanaceae family. These tobacco leaves consist of heavy nicotine, hydrogen cyanide, formaldehyde, PAHs, Benzene, TSNAs, and tons of other toxic compounds. Nicotine is the one chemical that most people are familiar with, it is tremendously toxic and addictive which explains the irresistible charm from these stacks of tobacco leaves. Many chemicals in tobacco act like stimulants or depressants, and there is by no means possible to be healthy while abusing tobacco or any other stimulants.

Furthermore, the consequences of tobacco on the human body is another long list. According to the Centers for Disease Control and Prevention, “Smoking causes cancer, heart disease, stroke, lung diseases, diabetes, and chronic obstructive pulmonary disease (COPD), which includes emphysema and chronic bronchitis.” Smoking can also increase your risk factors which is the increased chance of catching a disease. In addition, average smokers are cursed with terrible oral health. Chemicals inside of

tobacco leave off a layer of plaque on your teeth and eventually harden to become tars, therefore causing dense cavities and tooth decay. Eventually, smokers would face gum disease and tooth loss. Smokers possess another symptom called smoker's cough, brought on by the need of cleaning out chemicals from your lungs and airways. Another thing to note is that damage that tobacco causes to your body, especially your brain could be permanent, which implies that regardless of how long a smoker has become smoke-free, he would be taking that vandalism to his grave.

All in all, smoking is immensely unrecommended. The best way to prevent all these worries from entering your precious life is simply to reject them, and think about all the consequences that one would face for a momentary relief. Another way that can help out with your stress levels without any risk is going outdoors, taking a long and peaceful breath of the fresh air, and trying out for sports or hanging out with your friends. There is no need to be so alert, but if it really comes to it, you know what to do.

Is EV Really Greener than Gas Cars?

Riley Lee

For many years people have wondered if electric vehicles are greener than gas cars. This question was formed because no one knew what power an electric vehicle may hold and the possibilities of it. Some people believe having electric vehicles will improve our world, but some people wasn't having a liking towards electric cars.

It is proven from experts that electric vehicles create a lower carbon footprint over the course of their lifetime than do cars and trucks that use internal combustion engines. Electric vehicles are a great solution to fight climate change as climate change damages the environment of animals. Electric vehicles can also be problematic from its raw

materials like cobalt, lithium, nickel, and some other rare earth elements. Electric vehicles have problems occurring at a higher rate than with gas cars. Most people don't like electric vehicles because they have range anxiety, fear of too few charging stations, and long charge time.

There are currently about over 5.6 million electric vehicles worldwide and the International Energy Agency believes that the number of electric cars, buses, vans, and heavy trucks on the roads is predicted to hit at least 145 million electric vehicles by 2030. If we keep the progress of having electric cars, it is said that climate change will stop no later than 2050. As the number of electric vehicles on the road increases the demand for millions of barrels of oil reduces. Electric cars are efficient, quiet, and torque-rich. Therefore, electric vehicles are greener than gas cars.

CONSCIOUSNESS

Ryan Zhu

Consciousness is defined as the awareness that we have of ourselves, our intended Cons, and the environment. A state of consciousness enables us to evalue sale environment and to filter information from the environment through the mind, while being aware of the occurrence of this complex process.

One state of consciousness is that of being alert. Alertness and the associated state of arousal involve the ability to remain attentive to our surroundings. It is something that we often take for granted; however, many patients who arrive in an emergency room are not alert for various reasons, arriving in a so-called altered state of consciousness This can be due to head injuries, toxins, or other medical conditions. The ability to be

alert is impaired in a variety of disorders,including narcolepsy, attention-deficit disorder, depression, and chronic fatigue syndrome. Even without these disorders, it is not possible to maintain a heightened state of alertness indefinitely, and alertness varies over a 24-hour cycle. Alertness and arousal are controlled by structures within the brainstem. These structures are known as the reticular formation (also known as the reticular activating system, or RAS).

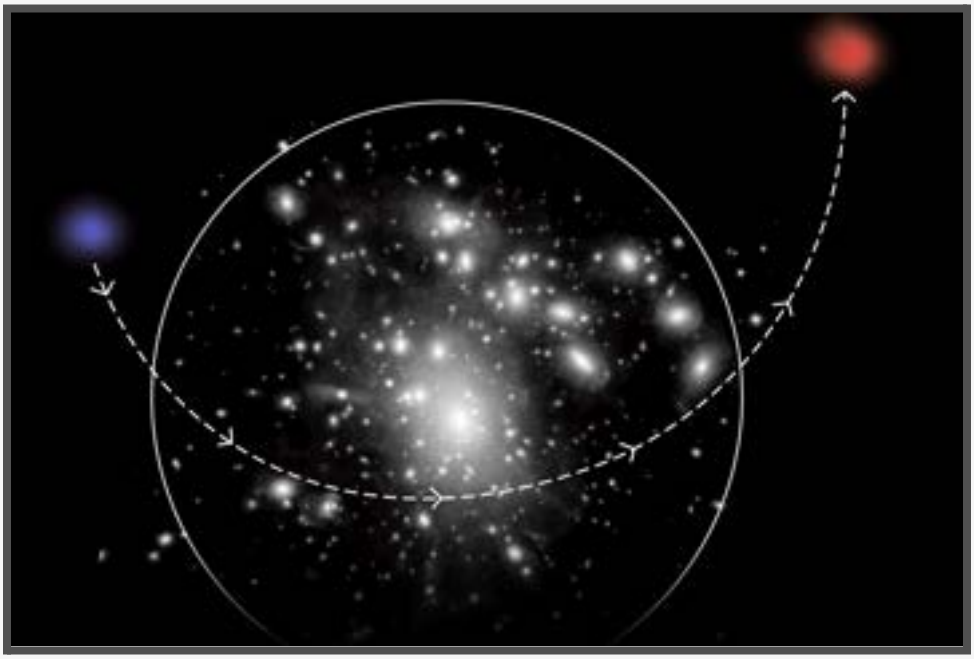
Consciousness serves two important functions. First, consciousness is responsible for keeping track of ourselves, our environment, and our relationship with the environment. Additionally, consciousness serves a controlling role, planning our responses to the information gathered by this monitoring. We typically think of ourselves as fully conscious, but there are lower levels of consciousness, specifically the preconscious and unconscious levels.The preconscious level contains information that is available to consciousness but is not always in consciousness. It can be retrieved when needed. This is where directions to frequently visited places might be stored. The preconsciousness is also where many automatic behaviors are stored. You use these behaviors in tasks that you can do nearly without thought, such as riding a bicycle.

Dwarf Galaxies

Donia Cao

Compared to other galaxies which are home to billions of stars, a dwarf galaxy is a home to only a few billion stars. Dwarf galaxies are the most abundant type of galaxy in the universe. However, due to their low luminosity, mass, and size, they are difficult to detect. Currently, more than 20 known dwarf galaxies orbit the Milky Way. Dwarf galaxies are usually found in galaxy clusters. They can be separated into three main types of

dwarf galaxies: dwarf elliptical galaxies, dwarf spheroidal galaxies, and dwarf irregular galaxies.



First, the dwarf elliptical galaxies are dim, have low surface brightness, and are gas-poor dwarf galaxies. They are quite common in galaxy groups and clusters. Dwarf ellipticals are not fainter versions of true elliptical galaxies, just structurally different. They contain little to no gas.

Next, dwarf spheroidal galaxies are the most common galaxies in the universe. Despite their low luminosity, they contain a large amount of dark matte. Dwarf spheroidals do not contain gas on the outer limits.

Finally, irregular galaxies have become increasingly important in understanding the evolution of galaxies. Dwarf irregulars are extremely late-type spirals, at least as concerns the rotation curve and the associated dark matter. They have a low level of evolution because of their metallicity and high gas content.

週六下午就是數學大本營時間

科嶺數理電腦學院
CODING STEM ACADEMY

AI 人工智能教育 *最佳推手*

系統學習 基礎紮實 省時省力 卓越超群

AI人工智能資優兒童班
6-9歲 MIT Scatch, Virtual Robotics

AI人工智能進階班
10-14歲MIT Inventor ,Virtual Robotics

VEX 機器人隊
最有效益的課外活動
學術競賽與領導才能最大加分

Maker Portfolio
展現實作能力申請一級名校

AP Computer Principle
由編程及網路基礎觀念教起
全面建立堅實AI能力

AP Computer Science
* JAVA 程式語言編寫訓練 *
邏輯與電腦實務並重

AP Physics 1,2, C
著重公式練習與演算運用,同時準備SATII應考

AP Calculus BC, AB
講解清淅海量試題練習 同年應試二科省時省力

數學加強班
Algebra 1,2 Geometry

物理榮譽班
7-11年級・Honors課程・
為AP物理作充足準備

電腦編程基礎班 Java C++ Python

4-12年級為AP Computer 課程準備
並可參加全國及各項國際AI競賽

SAT 英文寫作班
4-12年級,閱讀,文法,寫作
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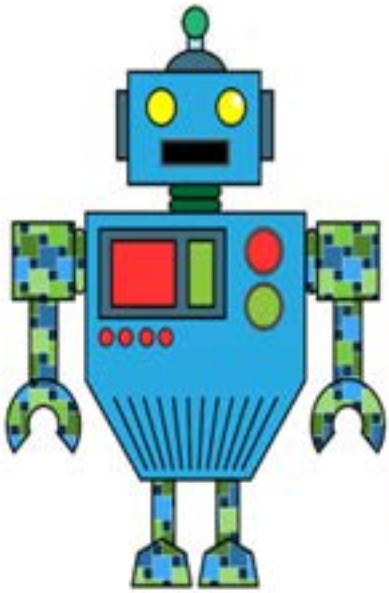

2022年賽季將結束，每個小朋友都忙著完成自己的機器人組裝和編程