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Sustainable Energy, the Future of Our Planet

Eddie Zhang

Ever since the Industrial Revolution, which began in the late 1700s, our society has been polluting the environment. The wastes produced by factories were, and still are (to a much lesser degree) disposed of incorrectly, polluting the land and water. However, the most dramatic outcome of industrialization is the burning of fossil fuels, a non-renewable resource.

Fossil fuels were created throughout Earth's history, long before we were here. They are composed of decaying plants and animals, which contain carbon. When we burn these for electricity and power, we release these carbon compounds into the atmosphere, contributing to global warming. The rise of global temperature can and will have many devastating consequences including, but not limited to, rising sea levels, habitat destruction, and more severe natural disasters.



In order to combat this, scientists have been working on new sources of energy, most prominently, renewable energy. These include solar, wind, and hydro, electricity. Solar power is derived through solar panels. These absorb sunlight using PV cells and convert it into electric charges, which can be stored and used for electricity.

Wind power is derived from windmills. These huge structures are designed with propellers, which are turned by the wind, powering a generator one the inside, creating electricity. Finally, hydro power is derived through dams. These dams, which are



constructed on waterways, allow for controlled flow through pipes, turning a large turbine inside the plant, which generates electricity.

Unlike fossil fuels, these sources of energy are naturally replenished by the environment.

Furthermore, they do not pollute the landscape nor emit greenhouse gasses. Thus, at first glance, switching to renewable energy seems like the obvious thing to do. However, efforts to develop these infrastructures are often hindered by economic and logistic factors.

New technologies that harness renewable energy are expensive to develop and maintain. They are also less reliable than fossil fuels. For example, solar energy may become unavailable during cloudy/rainy days, where clouds block the sunlight. In other words, we can not control how much energy we receive through renewable sources like we can with non-renewable sources.



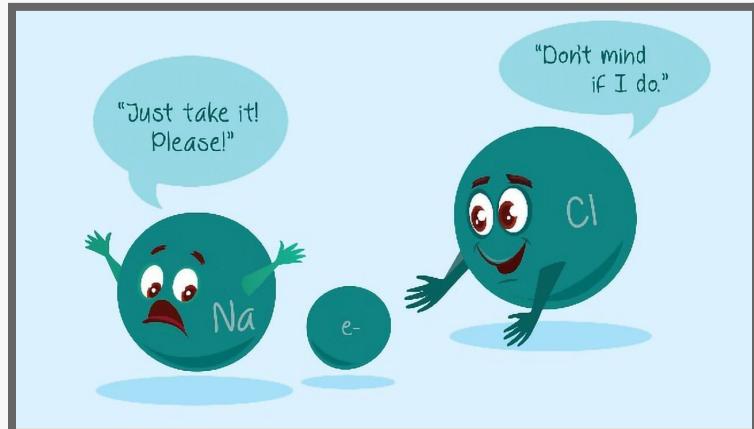
However, since non-renewable resources cannot be replenished and have such detrimental effects on Earth, our best hope for the future seems to be embracing renewable energy.

Cations vs Anions

Cathie Zhu

If atoms are balanced in their number of electrons and protons, they are neutral overall. Electrons are subatomic particles with a negative charge, while protons have a positive charge. However, they may not always have the same number of electrons and protons. Instead, they will be charged atoms that are called ions.

What are cations and anions? Cations are positively charged ions, while anions are negatively charged ions. In order for a cation to form, a neutral atom must lose valence electrons, or electrons in its outer shell. This causes the atom to become unbalanced, with a higher number of protons compared to electrons to ultimately give it a positive charge. However, an atom will not lose protons to change its charge. Changing the number of protons in an electron changes the atom's atomic number making it a different element altogether. Anions are negatively charged ions which are formed from the addition of new electrons to an atom's valence shell. This causes the net charge of the atom to become negative, as the amount of electrons now outweighs the amount of protons.



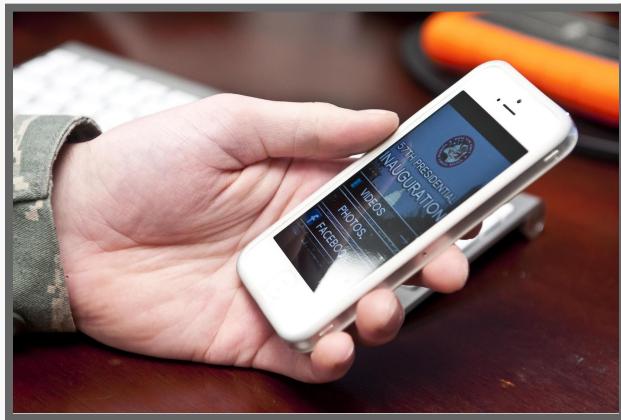
Metallic atoms, typically found left of the line resembling a staircase on a periodic table, hold some of their electrons loosely. Consequently, electrons are more likely to be lost, forming cations. Conversely, most nonmetallic atoms attract electrons more strongly than metallic atoms, causing them to gain electrons and form anions. Due to this, metallic

and nonmetallic elements that combine tend to draw one or more electrons from metallic atoms and transfer them to nonmetallic atoms. The difference in charges causes these oppositely charged ions to attract one another, forming ionic bonds and creating ionic compounds with no overall net charge.

How Cell Phones Endanger Gorillas

Edward Huang

Cell phones: more than a majority of people in the world have them, and for some, they are just as vital as food and water. Phones are incredibly useful; they can make calls,



track your position, provide entertainment, remind you of important tasks, and connect you to the rest of the world. But at what cost? These handy devices contribute to habitat destruction in the Congo Basin, one of the leading causes of gorilla endangerment in the area. If we keep distracting ourselves

with our cell phones and become unaware of the path that led to them in the first place, we may soon face the extinction of our beloved gorillas.

It is important to look at how exactly phones are able to cause so much damage to gorillas. Phones require many resources to create, including gold, tin, coltan, cobalt, and much more. Coltan, one of the key ingredients for making a phone, is primarily found in one place: The Democratic Republic of the Congo. Found in many different electronics,

these resources are mined, causing destruction to the local habitat. Unfortunately, many of the coltan miners also hunt gorillas illegally for food, making matters even worse.

The effects of habitat destruction caused by resource mining in the Congo Basin affects a variety of wildlife. Species like the Grauer's gorilla, are especially in danger, as they have dwindled to about 20% of their original population within the past 20 years. If we do nothing to stop this, the Grauer's gorilla may soon become extinct. Other animals, like chimpanzees are also threatened by coltan mining in the Congo Basin.



Fortunately, there are some ways that the average consumer can slow down this destruction of habitat, giving more time for various organizations to protect and save these primates. One way is to recycle old phones. Recycling unwanted cell phones has proven to be effective on a small scale. Although this will not be enough to completely solve the problem, it will definitely help if more people start doing this. Perhaps the best way to save the gorillas is to spread awareness to more people. We can then force big companies to make eco-friendly reforms in the cell phone manufacturing process. If we can push for more ethical ways to create cell phones, the gorillas can be saved.

The habitat destruction of gorillas due to cell phone manufacturing reflects humanity's greed. When big companies care more about raking in profits rather than the harm they are doing to nature, massive problems can ensue. Always remember what your phones are made of and how they endanger animals in the Congo Basin. Remember to spread awareness and make smart, eco-friendly decisions.

How Tesla Autopilot Works

Cody Duan

The first Tesla car was invented in 2008, the Roadster. The company has grown and was ranked as the most valuable automotive brand in 2021. The same year, Tesla had a tremendous growth rate of 157 percent.

The first Tesla to include autopilot is the Tesla Model S. In October of 2015, Tesla's version 7.0 software was released, which allowed Tesla Model S users to enable auto-pilot.

A Tesla has 8 cameras. Three of them are on the windshield. One is a general camera and can see up to 150 meters. A wide-eyed camera can see up to 60 meters, and a narrow field camera can see up to 250 meters. A front-facing radar can detect objects up to 160 meters by bouncing radio waves off of objects. A Tesla also has 12 dots, 6 in the front, and 6 in the back. These dots have a sensory input up to about 8 meters using ultrasound. These dots form a protective barrier around the car that will tell if an object is too close to the car.



Elon Musk, CEO of Tesla claims that the processor on the Tesla is the best chip in the world. The chip has an area of 260 mm^2 and is made of prime Samsung silicone, and is said to have no less than 6 billion transistors. There are two chips, to ensure there are

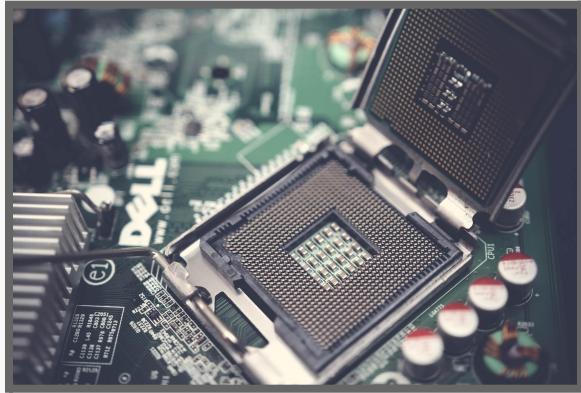
no redundancies, that are capable of making 26 trillion operations a second. This allows the car to adapt to real-time situations picked up by the sensory system.

Every part of the Tesla works together to create the autopilot we see. The Tesla autopilot is still learning. The silicon brain takes in detailed information about the environment and sends it back to Tesla headquarters for the people to make use of.

The Relationship Between Software & Hardware

Aidan Hong

Every day we rely on computers for our daily lives. Despite their simple design, the underlying technology consists of numerous complicated works. Computers typically consist of two parts, hardware, and software. Beneath both sections are numerous, small, complicated technologies.



Hardware is used to describe the physical component of a computer. This typically consists of parts that we can see, for example, trackpads, mice, screens, cameras, and many more. However, there are also many parts that are concealed behind the

metal casing. The main part that makes the computer run is called the Central Processing Unit, more commonly known as the CPU. Major CPU companies are Intel and AMD. To process graphics, computers rely on a graphics card, also known as a GPU. This part controls literally everything the computer does. Random Access Memory, also known as

RAM, is used to store and access data quickly. Since this data is volatile, turning off your computer means that data stored in RAM is usually cleared out. This is why it is necessary to save your files. When you save your files, it is usually stored on a hard drive or a solid-state drive commonly referred to as an SSD. The main difference between a hard drive and a solid-state drive is while hard drives are cheaper, SSDs are faster. Most newer computers rely on SSDs. I/O ports also enable you to access external data. These ports allow you to plug in USB drives, headphones, and many more.

Without software, the hardware inside the computer would not work at all! Software is used to describe the code that gives the CPU data to process. Most computers rely on three operating systems - macOS, Windows, and Linux. Mile operating systems consist of iOS and Android. Inside the operating system, there are apps. These apps enable you to perform specific tasks, for example, coding. These apps give the CPU instructions on how to process data, in which the CPU instructs the computer on what to do. Without software, the hardware would be useless.



The parts of the computer consist of two categories, hardware, and software. Hardware defines the physical components of a computer, whereas software describes the non-physical parts of a computer. Hardware and software work together to give you the seamless experience we all rely on to complete our daily tasks.

New UC Berkeley Initiative uses AI Research to Solve Climate Problems

Annabella Luo

UC Berkeley has a new initiative that uses artificial intelligence to solve climate problems. For years, UC Berkeley climate researchers have combined disparate remote sensing datasets from satellites into models to understand, for example, snow as a water resource. A recent rapid expansion of available observations from space makes a large amount of data available for research to unlock important insights. However, integrating a large amount of data into researchers' existing models is difficult. That's when the new initiative is proposed to utilize artificial intelligence to train and improve the climate models.



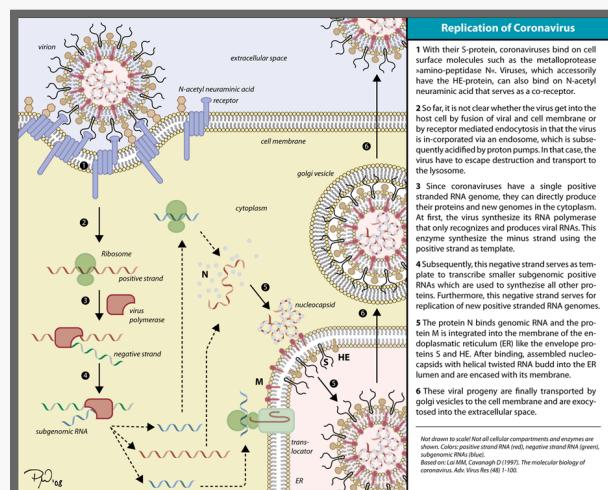
Several scientists from Berkeley's Department of Environmental Science, Policy, and Management are working with artificial intelligence researchers as part of the new Berkeley AI Research Climate Initiative. The hub aims to build partnerships and conduct groundbreaking artificial intelligence research in service of solving one of society's most intractable problems: climate change.

"Climate researchers have very hard jobs. There's only so many of them, and there's a lot of climate out there to look at," said Ritwik Gupta, an organizer of the initiative and computer science doctoral student. "We can take all of this really complicated data the climate researchers work with where they're limited by manpower and scale it up using AI. Our real goal is to have a lasting impact on the world." The climate initiative includes three organizers, eight faculty members, and scientists, and 13 researchers and students. The student-led hub is part of the Berkeley AI Research Lab's BAIR Open Research Commons.

UCLA Study Indicates Potential for Future Universal Vaccine Against SARS-CoV-2

Annabella Luo

A UCLA study suggests certain immune cells can be used to eventually create a universal vaccine effective against new variants of SARS-CoV-2. The study, which was published on Dec. 28, 2021, showed that there is a component of SARS-CoV-2 that is consistent among all variants: its viral polymerase. According to the study, by targeting that portion of the virus with T-cells, a longer lasting immunity can be achieved.



Similar to COVID-19, measles is caused by a virus with an RNA genome rather than one with a DNA genome, said Dr. Timothy Brewer, a professor of medicine and epidemiology. The current measles vaccine targets an unchangeable part of the virus and, as such, is both effective and long-lasting. Applying a similar technique to a COVID-19 vaccine could create a vaccine that protects people from all variants, he said.

Therefore, a universal vaccine must target viral polymerase, the part of the virus that replicates its genetic information and allows it to multiply, which is a highly stable and conserved element of the virus. Creating an immune response against COVID-19 viral polymerase is the key to the development of a universal COVID vaccine.

Dr. Marcus Horwitz, a professor of medicine and microbiology, immunology, and molecular genetics, said in an emailed statement that current COVID-19 vaccines are not fully protected against new variants because they target the virus's rapidly mutating spike proteins. While they are still the most effective protection available against COVID-19, scientists are constantly having to reengineer the current vaccines to increase resistance against new variants.

Horwitz said in an emailed statement that a universal vaccine could be used to combat future pandemics. "Such a vaccine would be anticipated to protect against new pandemic viruses that emerge, such as a future SARS-CoV-3 or MERS-CoV-2, or a more severe version of a seasonal coronavirus," he said in an emailed statement.

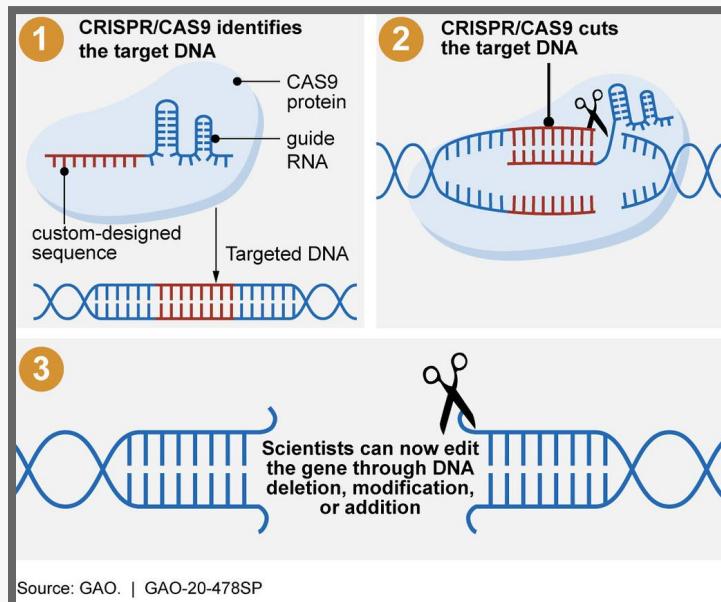


CRISPR-Cas9 and Genome Editing

Annabella Luo

In 2020, the creators of CRISPR-Cas9, Jennifer Doudna and Emmanuelle Charpentier, were awarded the Nobel Prize in Chemistry. CRISPR-Cas9 stands for clustered regularly interspaced short palindromic repeats and CRISPR-associated protein 9. The CRISPR-Cas9 system has generated a lot of excitement in the scientific community because it is faster, cheaper, more accurate, and more efficient than other genome editing methods. This system can be programmed to target specific stretches of genetic code and to edit DNA at precise locations, as well as for other purposes, like for new diagnostic tools.

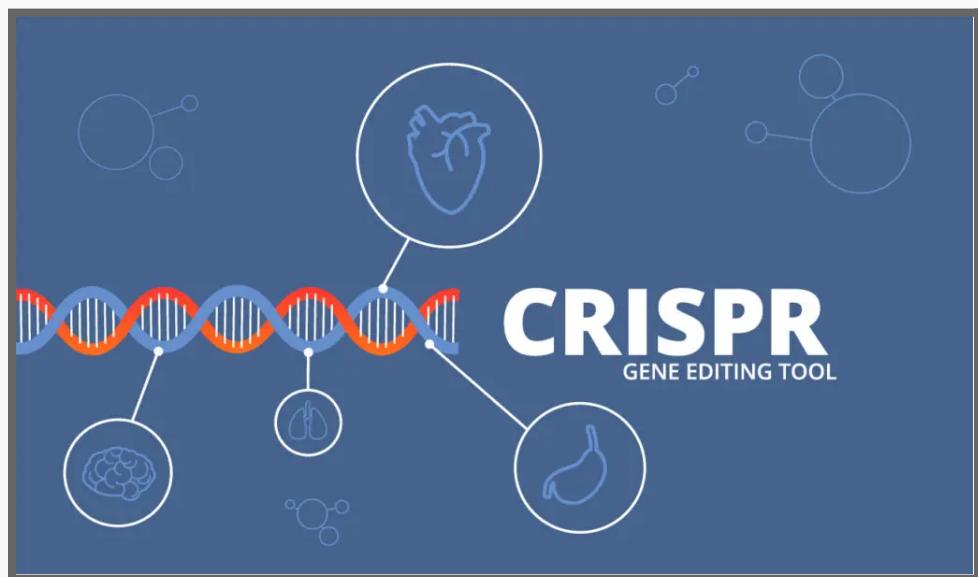
CRISPR-Cas9 was adapted from a naturally occurring genome editing system that bacteria use as an immune defense mechanism. When infected with viruses, bacteria capture small pieces of the viruses' DNA and insert them into their own DNA in a particular pattern to create segments known as CRISPR arrays. The CRISPR arrays allow the bacteria to "remember" the viruses, so if the viruses attack again, the bacteria produce RNA segments from the CRISPR arrays that recognize and attach to specific regions of the



viruses' DNA. The bacteria then use Cas9 or a similar enzyme to cut the DNA apart, which disables the virus.

In CRISPR-Cas9, researchers use this mechanism to edit DNA. First, they create a small piece of RNA, which can read the genetic information in DNA, that has a short "guide" sequence that attaches to a specific target sequence in a cell's DNA, much like the RNA segments bacteria produce from the CRISPR array. This guide RNA also attaches to the Cas9 enzyme. When introduced into cells, the guide RNA recognizes the intended DNA sequence, and the Cas9 enzyme cuts the DNA at the targeted location. Once the DNA is cut, researchers use the cell's own DNA repair machinery to add or delete pieces of genetic material, or to make changes to the DNA by replacing an existing segment with a customized DNA sequence.

Currently, genome editing is used in cells and animal models in research labs to understand diseases. Scientists are still working to determine whether this approach is safe and effective for use in people. It has been explored in research and clinical trials for a wide variety of diseases, including single-gene disorders such as cystic fibrosis, hemophilia, and sickle cell disease. It also holds promise for the treatment and prevention of more complex diseases, such as cancer, heart disease, mental illness, and human immunodeficiency virus (HIV) infection.

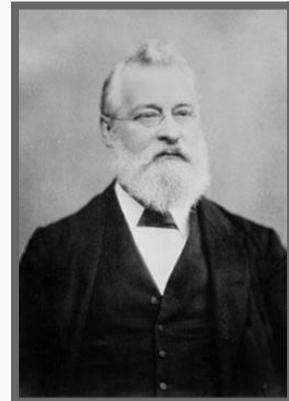


The History of the Periodic Table

Anna Dai

A poster with a rectangular chart of symbols and numbers that is frequently spotted in classrooms is called the periodic table. Not only does it contain a bunch of chemical symbols it helps scientists understand chemical reactions, patterns in the table, and elements to be discovered. The most recent version of the periodic table is full and still has more room, but take a look at the first periodic table when half was barely discovered.

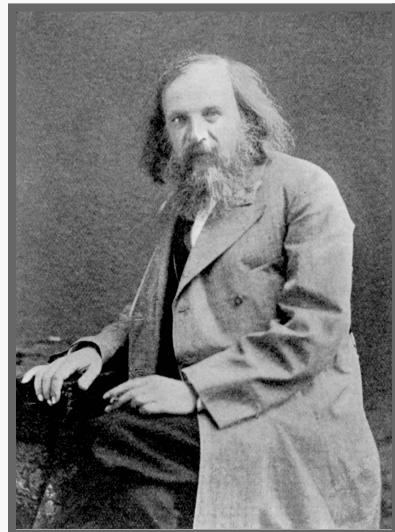
Many chemists such as Antoine Lavoisier, John Newlands, Johann Wolfgang Döbereiner, and Lothar Meyer helped create the table of elements. Individually, these chemists worked with the group and arrange the elements. John Newlands was a British chemist, who was the first to arrange the elements in a specific way. He organized this using increasing order of the elements' atomic masses and left no empty spaces for unknown elements.



After Newlands, in 1869, a Russian chemist, Dmitri Mendeleev, created the famous structure of the table, which is what the modern periodic table uses. Unlike John Newlands, he left gaps for elements yet to be found and predicted where they would be placed according to their properties. Sometimes, the position of some elements could not be explained.

In 1913, English physicist Henry Moseley rearranged the elements with atomic numbers, the numbers shown in each element's box. Moseley used X-rays to find the wavelengths and matched them up with atomic numbers. His work of atomic numbers provided answers to the inaccuracy of previous versions.

Now, the table consists of 118 elements total, each representing a box. There are rows and columns, called periods and groups, that have meanings behind them. Elements in the same period have the same amount of electron shells and elements in the same group have the same amount of electrons in the outermost shell. The periodic table is organized perfectly and is one of the most important publications in chemistry.



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Aurora Borealis - Northern “Sight”

Kenny Wu

Aurora, also known as the Northern Lights, is a spectacular sight that's both beautiful and glorious. The Northern Lights are known for their natural shimmering display of Lights in the shades of green and scatters everywhere in the empty sky.

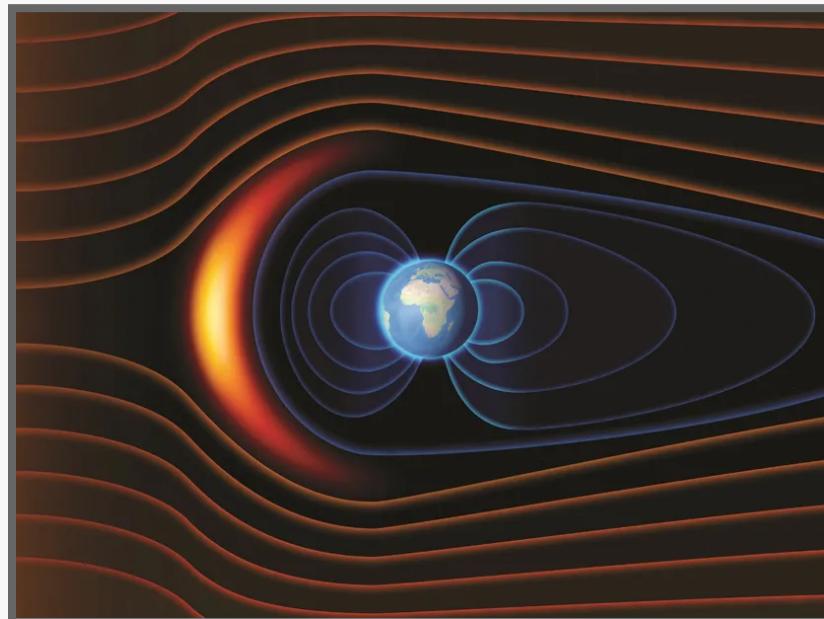


Unfortunately, Aurora only exists on high-latitude areas, which explains the low rates of people that have seen them. However, the good news is Aurora occurs daily at random moments, and they are quite big to not be seen. The frequency may be quite shocking, but the science behind it will clear the mist.

First thing first, the Earth's magnetic field has a major role when it comes to aurora. The Earth's magnetic field is formed by the constant motion of the molten core that consists of iron, nickel, cobalt and other ferromagnetic metals. This magnetic field is looped to the north and south poles and acts upon charged particles. Do know that Earth is not the only planet that has a magnetic field, similar to the Earth, many other planets are capable of fast rotation and a molten core can also form this magnetic field.

Furthermore, the Earth's magnetic field forms a shield that wraps around the Earth known as the magnetosphere. This shield forbids electric particles from passing and leads them to loop around the magnetosphere. Moving on, another major aspect is the solar wind. Electrons and protons emerge from the Sun's atmosphere that makes up the solar wind, which then spreads to the Earth's magnetic field due to coronal mass ejections. This state of solar wind is known as plasma.

Consequently, the solar wind collides with the Earth's magnetic field. This collision leads to the protons and electrons being trapped



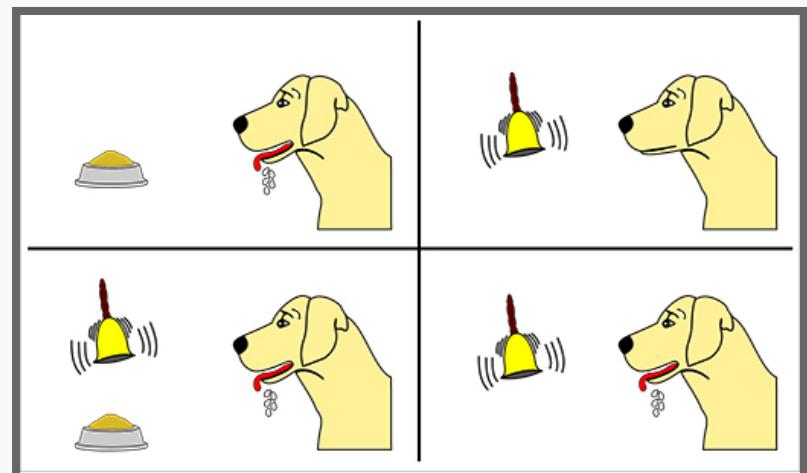
within the Earth's magnetosphere, which then collides with the atoms of O₂ and N₂ and ionizes. The conclusion of multi-collision is this astonishing sight of a view that spirals around the north and south pole. Depending on the altitude of the aurora that can be seen, it can form in various colors. And that concludes the magic of Aurora Borealis.'

Types of Psychological Conditioning

Ethan Chen

In the long history of psychology, some of the most sought tricks and techniques involved manipulating others into acting differently based on something that was taught to them. This process is called conditioning, where a subject is given some neutral stimulus (in which they don't have any strong reaction one way or the other) and are simultaneously given another stimulus that they have a positive or negative reaction to.

The most well-known kind of conditioning, classical conditioning, was first described by Ivan Pavlov. His experiments involved manipulating animals, such as dogs and fish, into acting outside of normal expected behavior. In his famous experiment, Pavlov's Dog, a person would ring a bell in front of a dog right as they bring food to the dog. After repeating this multiple times, the dog would eventually have a strong positive reaction (salivation) to just the bell being rung, with or



without food being presented. The dog in the experiment was conditioned to associate the bell ringing with the food being brought, thus changing its behavior.

Another popular type of conditioning is called operant conditioning, studied exhaustively by B.F Skinner. Much like classical conditioning, a neutral stimulus is incrementally associated with a positive or negative stimulus. However, it is more comprehensive as it involves multiple kinds of stimuli and responses.

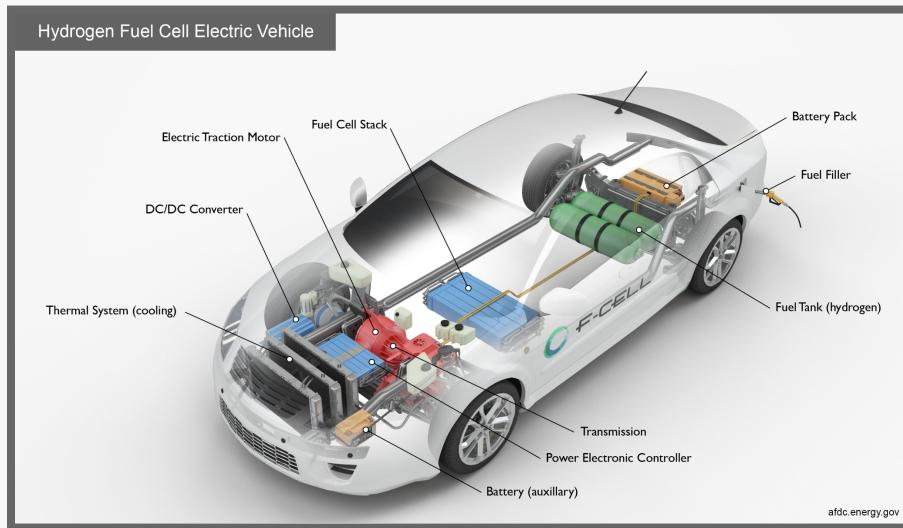
	Reinforcement (Increase / maintain behavior)	Punishment (Decrease behavior)
Positive (add stimulus)	Add pleasant stimulus to Increase / maintain behavior	Add aversive stimulus to Decrease behavior
Negative (remove stimulus)	Remove aversive stimulus to Increase / maintain behavior	Remove pleasant stimulus to Decrease behavior

Operant conditioning is based on reinforcement and punishment, both of which can be performed positively and negatively. Positive reinforcement or punishment involves adding a reward or undesirable component to the subject, while negative reinforcement or punishment involves taking away something unwanted or desired respectively. For instance, a toddler can be bribed to stop crying by being given ice cream. This would be positive punishment as it's adding a reward to the toddler in exchange for the lessening of the crying.

Can Water Power Cars?

Nick Li

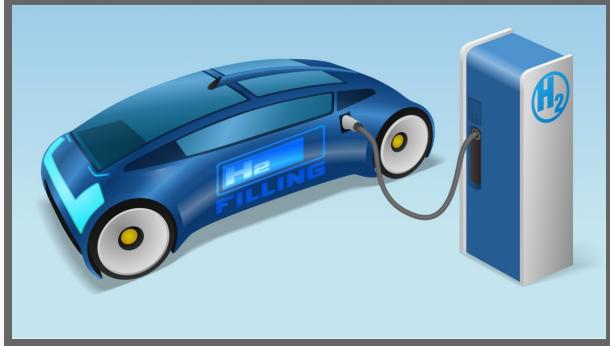
When people think of vehicles, the most common types of vehicles are gasoline-fueled, diesel-fueled, hydrogen-fueled, and electrically powered. However, a type of fuel that has been talked about a few decades ago, has become more surfaced, the talk about water-fueled cars. In 1975, Stanley Meyer attempted to bring his idea to make a car supported by his “water-fueled cell”. The water fuel cell was designed to pass an electric current through water which causes the water to split into the two elements hydrogen (H) and oxygen (O). This process is called electrolysis. When the water is divided into their respective elements hydrogen and oxygen, the hydrogen atoms would be burned creating energy, followed by a release in clean emissions.



This is similar to the hydrogen-fueled cell, although instead of using straight pumped hydrogen, the “water-fueled cell” would divide water into hydrogen and oxygen using a more abundant resource. Additionally, it was also claimed that the “water-fueled cell” could recombine the hydrogen and oxygen atoms back into water molecules and recycle them back into the “water-fueled cell”. This aspect of the cell was however

claimed impossible and no one knows if it is possible or not, because in 1998, during a business meeting, Stanley Meyer was met with an untimely demise. During the business meeting, Stanley started to vomit, and his brother claimed his last words were, “They poisoned me”. The coroner’s report stated that it was caused by Meyer’s cerebral

aneurysm, however, there are those who still believe that Meyer was poisoned.



Throughout the next years after Meyer’s death in 1998, other people and companies have tried to show the world about their “water-fueled cars”. However, all of their claims were false ultimately leaving most of them arrested or imprisoned for fraud. For the past few years, people have tried to use the water fuel cell method to create energy for generators. Instead of using fuel-powered generators, they would replace the intake of fuel with the intake of water. This causes the generators to have no emissions and by using an abundant resource, it is cheaper than buying gallons of fuel like gasoline or hydrogen. Additionally, with the rise in gasoline prices, using water as fuel helps save money. People are now experimenting more with water-fueled cells, creating water-powered generators and using water to power their daily electronics. Within a few years or decades, a water-powered car may arise into the market.

Eating Disorders

Arthur Liang

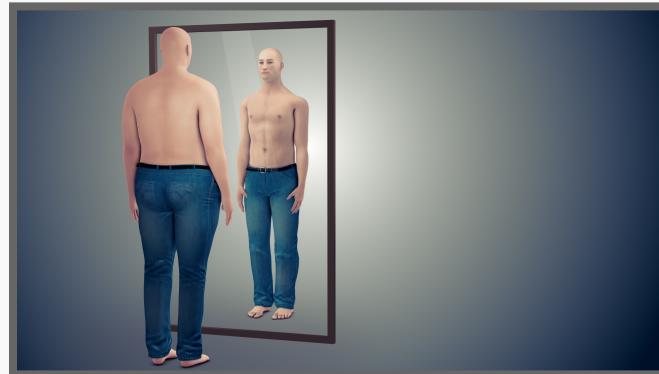
Some common eating disorders you may have heard of include names like anorexia nervosa, bulimia nervosa, and binge eating disorder. However, these disorders are a lot more complex than people realize.

Some people believe these disorders just affect young women, but that is not the case. First, let us define each of these disorders.

Anorexia nervosa is an unwillingness to keep a healthy body mass index.

Bulimia nervosa is an obsessive desire to lose weight by overeating

and then vomiting, purging, or fasting. Binge eating disorder is when a person recurrently eats huge quantities of food and feels discomfort, guilt, shame, and distress afterward. So what causes these disorders? For a while, the cause was believed to be body-image



dissatisfaction. However, all people feel some level of body-image dissatisfaction, but not all people have eating disorders.

One factor that could contribute to the development of eating disorders is emotional regulation. Over-eating and under-eating could both be ways to cope with stresses in life. In fact, the human brain



is wired to give us emotional rewards when we eat food. These rewards encourage us to keep eating and maintain the needed amounts of nutrients, protein, carbohydrates, and fat. However, these rewards can become problematic. Fat is a result of this positive feedback loop where you want to keep eating even after eating a heavy meal. In the wild, this is good, since fat is hard to come by, but in our society, fat becomes abundant.

Food's ability to alter our emotional state is a major reason why eating disorders begin. The biological origins of eating disorders appear to be in the limbic system, which is involved with the emotions of feeding and eating. However, this does not mean there is one clear path to treatment for those suffering from eating disorders. Treatment can only start when one realizes they have an eating disorder.

Photosynthesis Without Sunlight

Arthur Liang

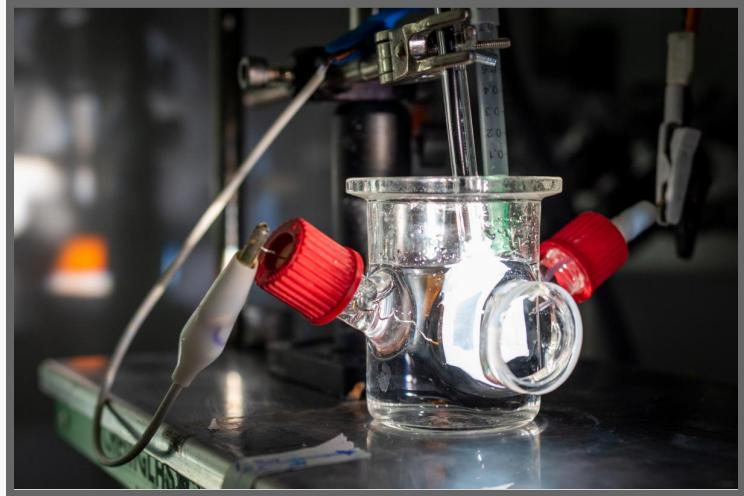
For millions of years, photosynthesis has been turning carbon dioxide, water, and sunlight into the foods we eat. However, this process is very inefficient, only around 1% of sunlight energy ends up in the plant. Scientists at UC Riverside and the University of Delaware have found a way to create food independent of sunlight, a sort of artificial photosynthesis.

The process uses a two-step electrocatalytic process to convert carbon dioxide, water, and electricity into acetate, a main component of vinegar. An electrolyzer, a device that uses electricity



to turn carbon dioxide into useful molecules, was optimized and used to create a high level of acetate. Plants can then consume this acetate in the dark to grow. By using solar

panels to provide the electricity needed, this process could increase the efficiency of photosynthesis by up to 18 times in certain plants. A wide range of organisms can be grown directly from this acetate, including green algae, yeast, and mushrooms. Crop plants such as cowpea, tomato, tobacco, rice, canola, and



green pea were all able to use the acetate in the dark as well.

By eliminating some plants' dependence on the sun, humans are able to continue to grow foods even under harsh conditions. Climate change and natural disasters would pose less of a threat to global food sources if crops could be grown in less resource-intensive and controlled environments. Increased efficiency could lead to less land use and subsequently less agricultural impact on the environment. This process could even be used to grow crops on other planets!

Using Plant Stress to Detect Pesticides

Arthur Liang

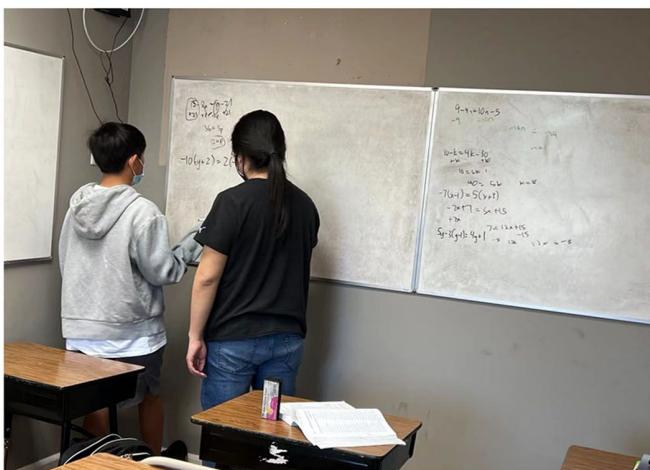
Recently, scientists have been able to modify a plant's natural response to stress, allowing them to detect and test multiple chemicals, including banned pesticides and deadly cannabinoids. During drought, plants produce a hormone called ABA which helps them hold on to water. Researchers showed that ABA can be modified to quickly detect the presence of many different molecules.

There exist all kinds of molecules out there that can harm people or the environment.

However, detecting these molecules is complicated and expensive. This new process could provide a cheap and rapid way of detecting dangerous chemicals, such as cannabinoids. The testing system can also identify organophosphates, which include many banned pesticides that are dangerous to humans.



In a project, researchers modified molecules in yeast cells. In the future, they hope to put these molecules back into plants and have them serve almost like sensors. For example, if a chemical is present, the plant could change colors. This ability to simply, inexpensively, and quickly detect chemicals is a huge breakthrough that could help protect humans and the environment around the world.



週六下午就是數學大本營時間

科嶺數理電腦學院 CODING STEM ACADEMY 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 Scratch, 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

講解清浙海量試題練習 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

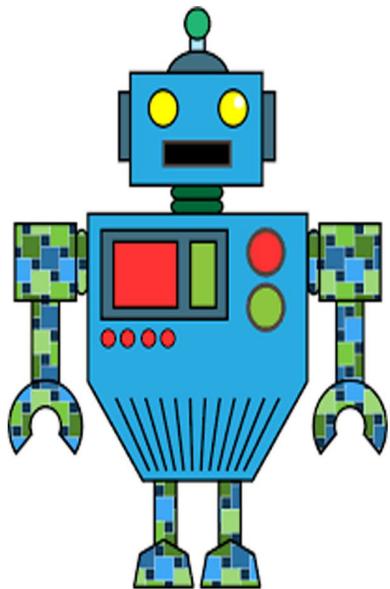
電腦編程基礎班 Java C++ Python

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
** 因才施教 突破盲點 **

教室:核桃市, 羅蘭崗, 鑽石吧 626-510-0458



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

