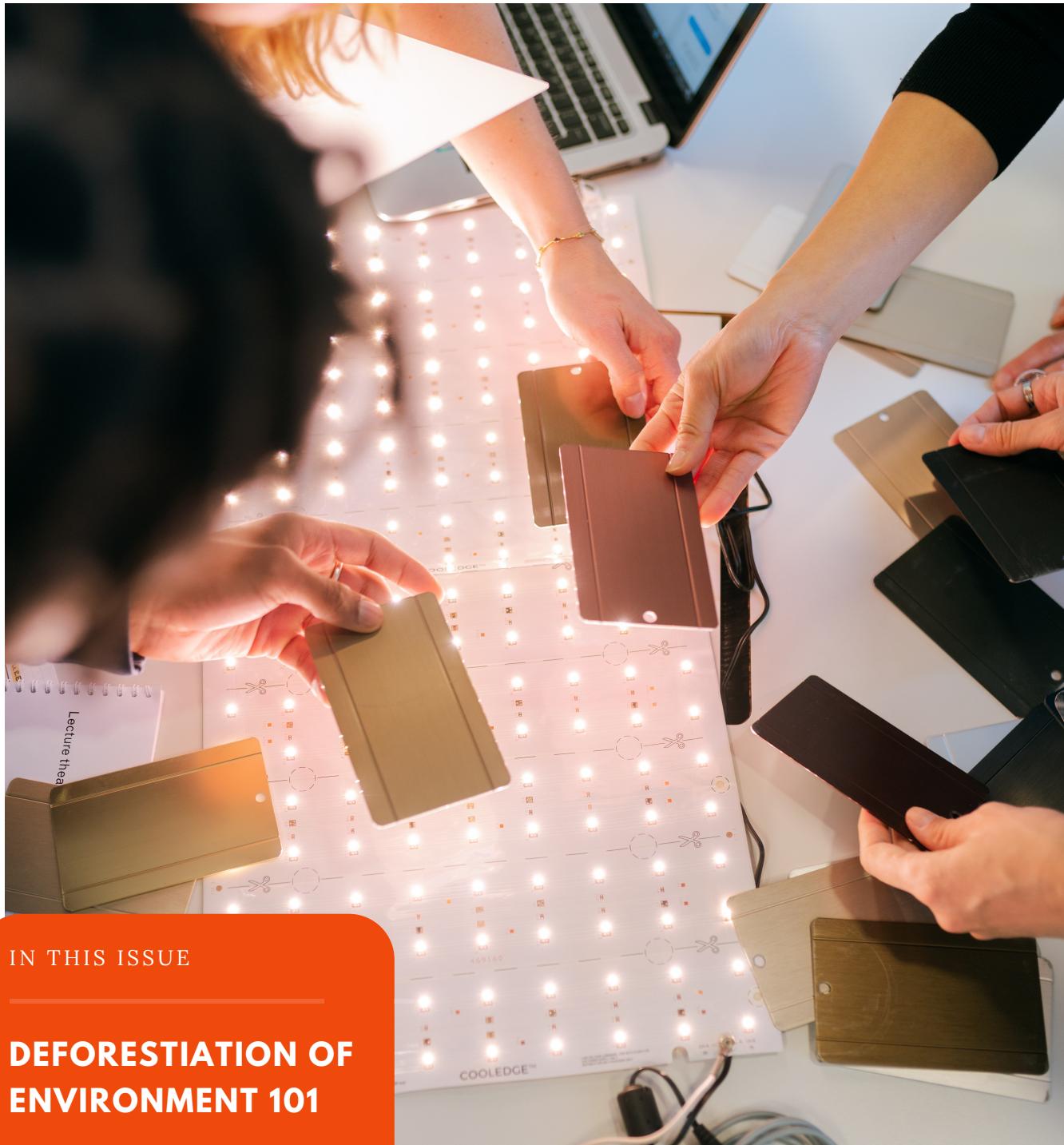


SEEKING SCIENCE

by STEM Action Teen Institution



IN THIS ISSUE

**DEFORESTATION OF
ENVIRONMENT 101**

**BRIDGES AND
ARCHIRECTURE**

ASTRONOMY

AND MORE...

A MONTHLY NEWSLETTER
ON ALL THINGS STEM

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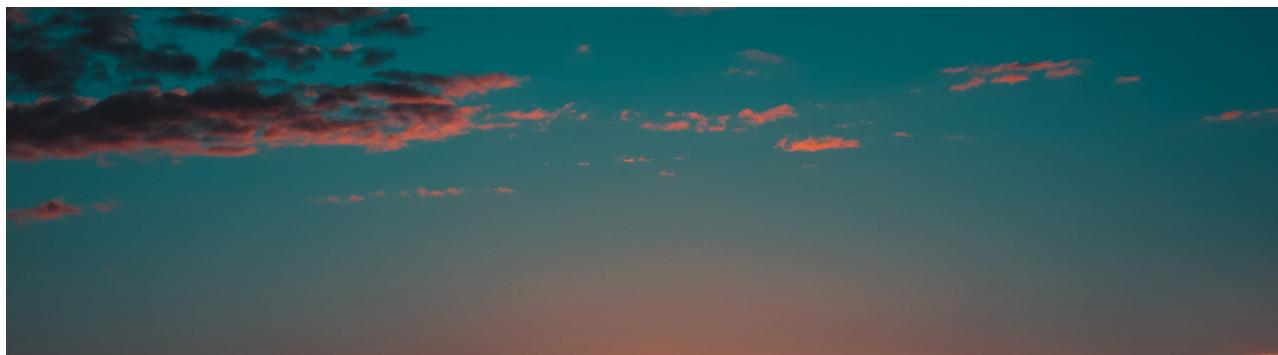
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Astronomy

by Ocean Y.

Astronomy is the science of the celestial bodies. Examples of celestial bodies are the sun, moon, planets, stars, galaxies, and all other objects in the universe. Astronomy may be the oldest recorded science. An instrument that people use for astronomy is a telescope. A telescope is an optical instrument for making distant objects appear larger and brighter by use of a combination of lenses (refracting telescope) or lenses and curved mirrors (reflecting telescope). See also terrestrial telescope, astronomical telescope, Cassegrain telescope, Galilean telescope, Newtonian telescope.



Astronomy is a natural science that studies celestial objects and phenomena. It uses mathematics, physics, and chemistry in order to explain their origin and evolution. Objects of interest include planets, moons, stars, nebulae, galaxies, and comets. Astronomy is one of the oldest natural sciences. The early civilizations in recorded history made methodical observations of the night sky. These include the Babylonians, Greeks, Indians, Egyptians, Chinese, Maya, and many ancient indigenous peoples of the Americas.



In the past, astronomy included disciplines as diverse as astrometry, celestial navigation, observational astronomy, and the making of calendars. Nowadays, professional astronomy is often said to be the same as astrophysics. Professional astronomy is split into observational and theoretical branches. Observational astronomy is focused on acquiring data from observations of astronomical objects. This data is then analyzed using basic principles of physics. Theoretical astronomy is oriented toward the development of computer or analytical models to describe astronomical objects and phenomena. These two fields complement each other. Theoretical astronomy seeks to explain observational results and observations are used to confirm theoretical results.

Software Engineering

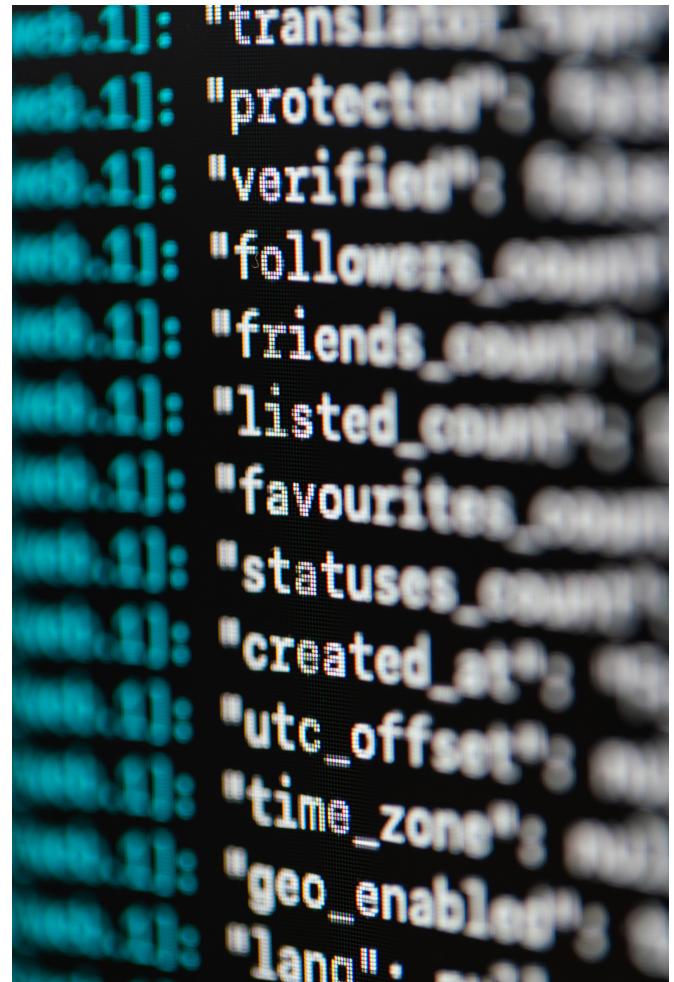
by Joshua H

Software Engineers is one of the highest paying jobs in the computer science industry and it is not easier to master this job. A software engineer is someone that codes the software of a program. Throughout this essay, I will be talking about the role of software engineers, how the job works, and the payment of the job and how to apply and the requirements.

To begin with, Software engineers are the people that are responsible for coding/programming the software of a computer or device. A software is a program or other operating information used by a computer. Software engineers hold very important roles. Without software engineers, people wouldn't be able to use software because there would be no code to operate the system. Because their job is so important, the engineers get paid really well, about 70k-220k.

The world would be very different without software engineers. Lots of computers and programs wouldn't function properly without software engineers because there is no code that would help run the program. So, what is a software engineer and what do they do? A software engineer is someone that designs, develops, maintains, tests, and evaluates software. Even though software engineers don't do coding, they need a strong background in coding to communicate with programmers.

To become a software engineer, the qualifications are having a bachelor's degree in computer science, programming, and mathematics. These people hold a very important role in computer science. Software engineers solve coding problems and design new software systems to help run a program.



Bridges and Architecture

by Celina P.

Do you know what a bridge is? Like, do you know, know, what it is? You may have seen a bridge before, you might have not. You may have even crossed a bridge before! But have you ever wondered what type of bridge you're stepping on, what type of bridge you're driving across, what type of bridge you're looking at? Many people walk past a bridge or drive across one without giving a single thought about what they're driving through. Many people walk on a bridge without realizing that walking to the left about a foot would tilt the entire bridge. Lots and lots of people walk and drive through bridges as if they were nothing but inanimate objects.

Not knowing that what they are walking through is a huge part of our architectural advancement, an important piece of our world. A problem with bridges is gravity. Gravity constantly pulls things down. Gravity is what keeps us on the ground so we don't float all over the place. But with bridges, it makes them fall.



Unlike buildings, which are built on solid ground, bridges hover over bodies of water and are not touching the ground. Buildings have the ground holding its ground (get it?) and gravity pushing down on it. Buildings don't fall easily like this. Bridges do. So let's take a look at some bridge structures and how they solve this problem.

A beam bridge has the beam (the road part) in tension and compression. It has two sides, squeezing it together to stop the bridge from falling, as well as using gravity and the ground pushing against each other. A small experiment you can try at home is putting a pencil between your two palms and pressing against each other. You can hold it horizontal or vertical to show how tension and compression work.

An arch bridge supports loads by distributing the compression across and down the arch. If you look at the arch bridge (left) you would see that right beside the two lands, the bridge reaches down to touch the ground. That's how the compression shoots down to the water and across the arch as well.

The towers/piers of the suspension bridge hold compression, as the towers stick all the way through the water into the ground. The deck/road hangs from the cables, which you see in the picture (left), that are in tension. The cables hang from left to right and push against each other. The deck/road itself, though, is both in tension and compression.

The cable-stayed bridge is actually really similar to the suspension bridge, except that the cable-stayed bridge deck is actually directly connected to the piers. Just like the suspension bridge, the cable-stayed bridge gets its compression from the piers and gets tension from the cables.

A truss bridge uses beams to build the bridge. The deck is in tension. The trusses use both tension and compression. The diagonal beams are in tension and the vertical beams are in compression. You can see this in the picture below

A cantilever bridge is really quite simple to understand. It uses the tension above the bridge deck and the compression from the bottom of the bridge.



There are some really famous bridges out there that work the same way! Do you think you know them? Below are the 3 most famous bridges out there!

Ponte Vecchio is the most famous bridge there is! It is located in Florence and is a Medieval bridge. It was the only Florentine bridge to survive WW2 and is most famous for the shops built along the side of the bridge! Did you know it is actually an arch bridge?!

The golden gate bridge is the second most famous bridge, and many people know about it and want to visit. There are over 10 million people who visit the golden gate bridge each year!! Can you guess what type of bridge this is? It's a suspension bridge!

The third most famous bridge out there! It is the tallest bridge in the world, placed in France, with the highest peak (343 meters) a little taller than the Eiffel Tower! The speed limit on the bridge was reduced to 110 km/h so tourists could take pictures from the car. This is a cable-stayed bridge.

Bridges are all over the world! One day you might run into a bridge, or even create one yourself! Whether you're in Florida, or China, or even Alaska! It doesn't matter if you create a suspension bridge or a cable-stayed bridge, bridges are all over the world. In fact, maybe in the future, you might see a completely different bridge out there! I've only stated 6 out of all the bridges and there are many weird and quirky ones out there. Bridges are curious things, and if you used to wonder how bridges seemed to float above the water, now you know.

Importance of Science & Technology

by Hison Z.

Plants have you ever wondered about plants. You may think that they are just trees that grow leaves. But actually there are trees that do a bunch of stuff. They grow fruit for holding seeds.

There is a comprehensive first they grow flowers then fruit but they are green then after a few day's they have red then you can have it.

Another benefit of growing more trees is the fact that they purify the air and they contribute to the process of recycling the air. This means they are converting carbon dioxide to oxygen. However, nowadays trees are being cleared in order to make more land available for industrial processes. This is not good, because trees are a necessity in making our air cleaner. In addition, places such as the Amazon forest trap a lot of carbon dioxide with foliage and trees. However, since the Amazon forest is being cleared, whether that be because of human activity or wildfire,

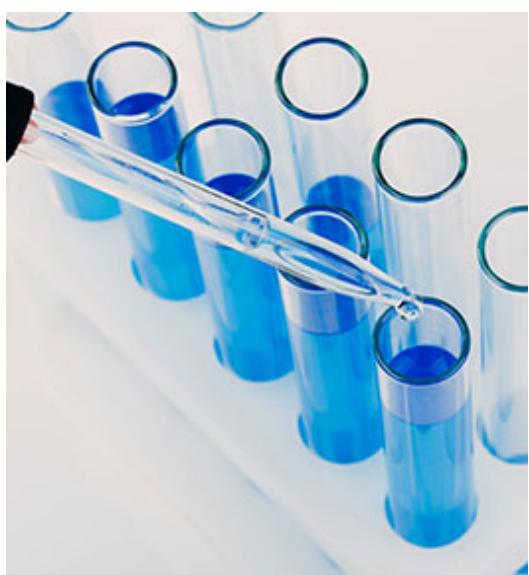


COVID-19 Vaccine

by Angelina C.

Many people have been wondering, when can the quarantine be over? When can we return to our normal lives? This article can help you answer some of your questions, because James Gallagher in the article "Coronavirus Vaccine: When Will We Have One?" mentions how and vaccines will be complete.

A vaccine usually takes about 12-18 months to complete and it has plenty of steps to go through before it gets released to all people. The vaccine is the key of ending this quarantine because it gives us protection from the virus.

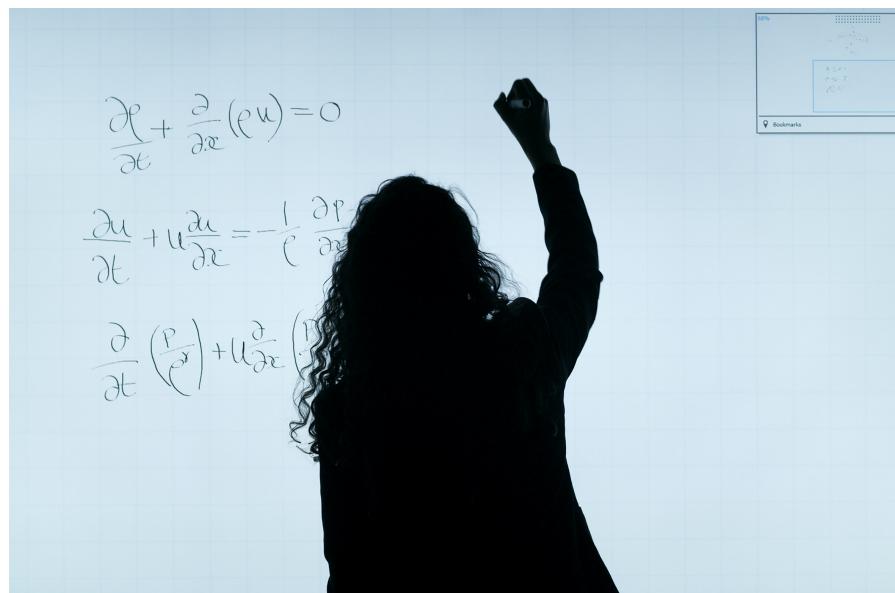


The US and China had made some progress with the vaccine by testing on a small group of people. Their vaccine was safe for people to use. Unfortunately they still need to make some adjustments to improve the vaccine, and also run controlled trials to verify the potency of the vaccine. Thus, it will still take quite a bit of time before the vaccine can be released to the general public.

The Impact of Science and Its Positive Influence

by Bingchen L.

Science can change the world. It has many abilities that we haven't discovered. In my opinion, the ways that science can change the world are vast. First, science can be helpful in the lab, as it can provide facts and guidance. Second, discoveries that lay around are waiting to be discovered.



These discoveries can bring meaningful change to humanity. Science can mean a lot to scientists. Everyday, new innovations and inventions are made with the help of science. Science can change the world in many different ways. It has many abilities we haven't discovered. As we can conclude, science has many different applications that can be used to improve society, and the future for science is very bright.



Black Hole Found Shredding a Star

by Mr. Jimmy



A black hole was found in a galaxy not too far from Earth "shredding" a star as if it was a noodle. Astronomers managed to watch this event closely and monitor all activity associated with them. The "unfortunate star" was found orbiting in the dense nucleus of a galaxy with the unwieldy name 2MASX J04463790-1013349 about 214 million years ago, and this occurred with it found itself on an unfortunate path.

This star had gone too close to the galaxy's central, supermassive black hole. That black hole stretched the star out like a noodle and then swallowed it very quickly. Light from this stellar cannibalism reached Earth in 2019. Researchers have detected events like this in the past, but they have never seen the destruction so up close and personal. The black hole mentioned is just 214 million light-years from Earth.

The Status of Old Faithful

by Ms. Z

Droughts once shut down Old Faithful, and may do it again. The geyser, which is in Wyoming's Yellowstone National Park, is famous because it consistently ejects hot water tens of meters into the air at regular intervals. Usually, these intervals occur around 90 to 94 minutes.

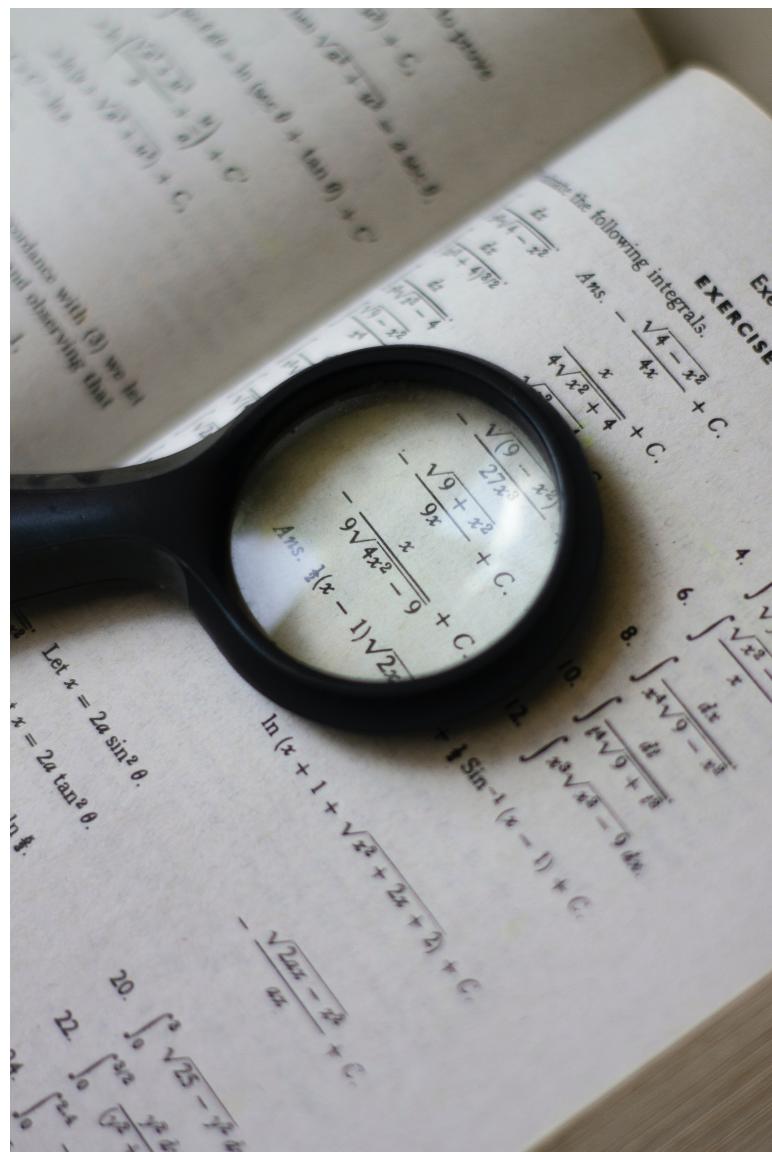
Geologists examined petrified wood from the park have found evidence that 800 years ago, Old Faithful stopped erupting entirely for several decades, in response to a severe drought. With climate change making drought more common across the western United States, the researchers say a similar shut down might happen again.

Math PEMDAS Operations

by Ocean Y.

Would you like to learn about pemdas in math? It will make your life way easier, when doing a math problem. If you want to know let's get started. First of all, the P in pemdas means parentheses, parentheses is these guys: () . Whenever you see parentheses in a math problem you will have to calculate them first, Like $(1 \times 34) + 193$ you will have to calculate 1×34 first. Then, the E in means exponent. Exponent is these things: 3^5 , the arrowed 5 is the exponent and it means that 3 is repeating five times like: $3 \times 3 \times 3 \times 3 \times 3$. The process to 3^5 is $3 \times 3 = 9$ and $9 \times 3 = 27$ and 27×3 is 81 and $81 \times 3 = 243$ and that is the answer to 3^5 .

On the other hand, the M in the pemdas is multiplication. The multiplication sign is just an x on your keyboard. That is the third thing you do in a math problem (or equations) like $548 \times 7882 = 4,319,336$. The d in pemdas is division if you see multiplication and division in the same math problem you do multiplication and division left to right. You don't do multiplication first if the is division you have to see which comes first division or multiplication. The A in pemdas is addition and addition and subtraction is the same as multiplication and division you have to see which comes first addition or subtraction. Addition is + and this is how you use + in an expression: $45 + 98 = 143$. Subtraction is - and this is how you use - in an expression: $45 - 5 = 40$. Hope you had fun learning with me and now you know everything about pemdas and this easy operation, pemdas is: parentheses and exponent and multiplication and division and addition and subtraction.



Power Plants and Its Benefits

by Ms. Jenny

Power plants is a great deal in our daily lives because they generate energy without them we will not have electricity. Here is some reasons that power plants are important.

Power plants are made of steel and metal. Some power plants are really secure. The power plant generator is uranium. Uranium is the substance that is making the power. Nuclear weapons are made by uranium. Uranium is a biochemicals used to make energy in a power plant. Uranium is really hot when put in the power plant.

The systems is made of a lot of cooling systems if a nuclear power plant does not have a cooling system then the whole thing is going to explode, which may release harmful chemicals into nature that are dangerous to humans. This would cause cities all around the area to be highly radioactive.

In the nuclear power plant gallons upon gallongs of water are being used there to make energy. It is really rare for a nuclear power plants to blow up because the nuclear power plant is made out of of stainless steel and a lot of other materials. The uranium inside the power plant is reproducing every second. Nuclear power plants heat water to make electricity.



The Variety and Kinds of Machines

by Steve L.



There are a lot of different kinds of machines that can do things that a human can't do. For example, a car is one kind of machine that can help you go to places very fast. Next, a sewing machine is a machine that can save your energy. For example, if you try to sew clothes or other things with your hand you will waste your energy and you will get very tired but if you use a sewing machine you will be able to sew clothes very quickly and you won't waste your energy. In addition, if you put a vending machine you can get a lot of money and a vending machine is a machine where you can buy snacks to get energy if the place you're at doesn't have a restaurant. For example, sometimes when you're driving or when you're walking you will get tired but if there is a vending machine near you, you can buy drinks and snacks to gain back energy. Last, the lightbulb is a machine that we see everyday. For example, a lightbulb can help you see where you're going and where you are. In conclusion, There are a lot of different machines that can help you to do something you can't do.

The Genetic Scissors

by Ms. Susie

this year's Nobel Prize in Chemistry has been honored to two female scientists. They transformed a bacterial immune mechanism, which is known as CRISPR, into a tool that can edit the genomes of everything in the most simple and inexpensive way possible.

The award was given jointly to Emmanuelle Charpentier of the Max Planck Unit for the Science of Pathogens and Jennifer Doudna of the University of California, Berkeley, "for the development of a method for genome editing."

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