

UnEarthed

ISSUE N°11 SPRING 2023

arise



UNIVERSITY OF
PENNSYLVANIA



Letter from the Editors

Dear Readers of UnEarthed,

UnEarthed's executive board and our student-led team of writers, editors, and designers are so excited to bring you our eleventh issue of UnEarthed! Welcome to ARISE, where you can find 23 pages of articles; if you're interested in anything, including history, science, or sports, there's an article for you in Arise.

Arise is our theme for this magazine because we wanted to tell origin stories – from Disney Movies, to vaccines, to cheesesteaks. As young readers, we hope this will help you understand the world around you. Have you ever looked at the colors in the sunrise and asked yourself where they come from? Have you ever watched Tom Brady on TV and wondered how he developed his football skills? We hope Arise will answer these questions for you.

We created UnEarthed because we, too, are curious people. When our writers pitch articles, they ask questions they have about the universe, and answer them through their writing and research. When you read our articles, you're learning right alongside us. In Arise, we thought about the things we see (sometimes daily!) in our world, and asked ourselves where they really came from. The questions don't end with the subjects we chose, though – we hope we can inspire you to keep thinking about how everything in your life arose.

The fun doesn't end with our articles; make sure to look at the end of the issue to find puzzles and games! The signature page is for you to be creative with Arise – make a painting, record observations from science experiments, or get your friend's signatures like a yearbook.

Creating Arise was so much fun, and we are already working on our next issue. We publish a new magazine twice a year and distribute it to Philadelphia schools. We're always coming up with new themes and articles, so we hope we can have an article for everyone. If you have any suggestions, like ideas for articles or interactive pages, please let us know using the suggestion box on our website. (<https://www.uneearthedpenn.com/suggestion-box>)

Our website has a lot more than just a suggestion box, though! At www.uneearthedpenn.com, you can find exclusive digital-only articles, interactive quizzes, videos, and read-along audio for articles. We love coming out with new content, so stay tuned and make sure to leave us feedback in the suggestion box!

We hope ARISE will give you the tools you need to stay curious. Whether it's about a tornado, K-Pop, or the universe itself, keep asking questions, and most importantly, enjoy!

Faizah Saadmim
EDITOR IN CHIEF

Julia Van Lare
MANAGING EDITOR

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WONDERING WHAT TO READ?

Our articles are now ranked by difficulty!

- EASY
- MEDIUM
- DIFFICULT



THE ORIGIN OF THE UNIVERSE

Exploring the BIG BANG THEORY

Everything has a beginning, but have you ever wondered about the beginning of everything? For thousands of years, humans have sought to understand the origin of the universe — through lenses of mythology, astronomy, philosophy, and science!

In ancient times, many cultures developed creation stories to explain the wonders of the universe's origin. According to Hindu mythology, the god Brahma, who arose from a golden egg, created the universe. The ancient Chinese believed that two opposing forces, Yin and Yang, gave rise to all elements of the world.

There were many other religious and philosophical beliefs about the origins of the universe, many of which involved the idea of a divine force. However, as human knowledge of science advanced, theories on the origin of the universe grew to be more complex. Today, the most widely accepted explanation of the origin of the universe is the Big Bang theory.

What is the Big Bang Theory?

The Big Bang Theory describes the early history of the universe that began approximately 13.8 billion years ago. At which time, the universe was merely a bubble-like point in time and space called a singularity. This unbelievably hot, dense point encompassed all the

matter and energy that would come to form everything we observe today. When the singularity exploded due to changes in energy, the universe began to expand rapidly—and it has been expanding ever since!

As the universe expanded, it also began cooling. Only seconds after the Big Bang, the first particles begin forming: matter and antimatter. These particles began destroying each other, but some matter survived. As the universe cooled, for instance, it gave rise to particles we call protons and neutrons—which formed when the universe was only one second old! Protons and neutrons joined together to create other chemical elements, such as hydrogen and helium.

Over time, matter and energy released from the explosion, through the force of gravity, began clumping together to form the first stars and galaxies.

What about Earth?

You may have heard the expression that we live on a rock. Well, this saying is scientifically true! The origin of our home, Earth, can be traced back to numerous rocks rushing through space and colliding with one another. With time, these rocks fused together, forming a single big rock, which we now inhabit. As for humans, we formed from the very atoms that were made inside stars!

The Unknown

Many have wondered what came before the point—the singularity that consisted of the universe in a bubble-like state. The answer to that question is nothing. Before that point, there were no stars, galaxies, and certainly no universe.

Many questions on the origin of the universe still remain, like why the universe is expanding more quickly than ever before. Our level of progress in science limits the depth of our understanding. However, we are making breakthroughs and uncovering solutions to many of these challenging questions with each passing day.

Hundreds of scientists have devoted their lives to studying the details of the cosmos and its creation. Why? Through studying how everything came to be, we can solve other mysteries and make predictions for our future! The Big Bang set in motion processes that eventually led to the formation of life as we know it. It was the beginning of everything.

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Writing by AKSA CHOUDRY

Editing by TED DAVIS &

ALBERTINA LEE

Design by ANGELA WU

How Tree Rings Give Us a Different Glimpse Into the Past

Writing by ERICA EDMAN
Editing by LEEYU ADDISU
and JOYCE LEE

When you look at a tree, you can see immediately what season you are in. In autumn, the leaves change into all sorts of colors – from yellow to red and purple. As winter approaches, the leaves fall and leave the branches bare. Once the sun starts to come out more and the air warms up, the trees turn a vibrant green and can grow all sorts of flowers and fruits.

While the outside of a tree can tell you about the seasons, it is actually the inside of a tree that can give you information about years and years into the past. Trees live for hundreds, or sometimes thousands, of years. Over this long period of time, trees survive many changes in environmental conditions: hot years, cold years, earthquakes, floods, forest fires, early frosts, and more! Scientists can find evidence of these environmental changes by looking at the tree rings.

Every year, trees get a little bit wider. The added thickness that the tree gains each year is called a tree ring. The oldest rings are in the center of the tree, and the youngest rings are on the outside edges of the tree. Plus, you can tell how old a tree is by counting the number of rings!

Different qualities of the tree ring tell scientists about the weather patterns of the year the ring was created. Trees produce wider rings during wetter and hotter years than in cooler and drier years. This means that if there was a drought, which is a lack of rain, or a severe winter hundreds of years ago, scientists can tell just by looking at the tree ring! If the rings tend to stay the same width, this means that the climate is very stable. On the other hand, if there are big changes in the width of the tree rings, that means the climate varies a lot from year to year.

Tree rings are incredibly helpful for scientists because they tell us about climate patterns that occurred way before we had the technology to measure the climate. While the United States started collecting weather data in 1891, trees can tell us about weather patterns from thousands of years before that. Fun fact: the oldest living trees in the world are known as Methuselah Trees. The Methuselah Tree can be found in White Mountain, California and is thought to be almost 5,000 years old!

So the next time you find a tree stump, embrace your inner scientist and count the number of tree rings to find out how old it is!

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Design by DORA WU

Hawaii, The Growing Island

Writing by LAYLA SAYED | Editing by ANTONIO MELONI and TED DAVIS

When people think of Hawaii, they often think of hot weather and beautiful beaches. People forget that the Hawaiian Islands have much more intense features as well, including massive geological structures that spew hot lava. These geological structures are called volcanoes, and Hawaii has over 100 of them, both above and below sea level. These volcanoes are the reason why Hawaii looks the way it does. But how so?

Moving tectonic plates formed Hawaii's six largest islands in a chain-like system. Tectonic plates are massive pieces of Earth's crust that move slowly across the surface. There are around 15-20 tectonic plates, and Hawaii sits above the Pacific Plate, which moves seven centimeters per year. This reality causes magma to upwell or rise, creating the many volcanoes on the island.

When these volcanoes spew lava, the emissions eventually harden to form new land. In other words, Hawaii is growing every day! Scientists say that this process will, one day, create a new island, already named Loihi.

Currently, Loihi is still 1,000 meters below sea level, but as nearby volcanoes continue to deposit lava, this underwater landmass will rise up and eventually form a new island. However, we'll have to wait another 10,000 years to be able to see it above the water.

Studying the ever-growing Hawaii is important since it can explain other structures outside of our solar system. For example, Loihi is thought to resemble the surface of Saturn's moon, Enceladus. Scientists, looking for life outside of our planet, are turning to Hawaii's young island for help. NASA has even begun an expedition called SUBSEA to collect bacteria living in places like Loihi so that we can better understand how life might exist in harsh climates across our universe.

Not only is the ever-growing island of Hawaii a geologic marvel on Earth, but it is also a place that can help us discover life in space! Volcanoes are often described as violent and scary, but, in Hawaii's case, they build new islands which allows space for new life to thrive.

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Design by DORA WU

SOUND THE ALARM!

How Natural Disasters Arise

Introduction

Have you ever heard about the tornadoes that occur in the Midwest? What about the earthquakes caused by the San Andreas fault line in California? Natural disasters are the result of weather or environmental events that have destructive capabilities. Natural disasters can be seasonal, meaning that they occur more at certain times of year. For instance, you can expect to see more snow avalanches during colder periods and more droughts or wildfires in the summer when the temperatures are warmer. Let's take a closer look at some common natural disasters and explore how they arise!

Earthquakes

Earthquakes occur as a result of two pieces of the Earth, known as tectonic plates, sliding past one another. These slabs of rock have jagged edges that can get caught on one another and create friction, or resistance as two objects pass each other. Friction creates energy that can be stored up, which is then released from the space between the tectonic plates, referred to as the fault line. As a result, a shock is sent in all directions in what is termed as seismic waves. Similar to dropping a stone in a pond to produce ripples, these seismic waves will cause the Earth to shake. Earthquakes can happen at varying intensities that are rated on a Richter scale from 0 to 9 as magnitudes. Earthquakes with lower readings from 0 to 5 generally cause minimal damage like broken windows and fallen items, whereas earthquakes at a magnitude of 7 or above are considered severe and can cause the collapse of entire cities.

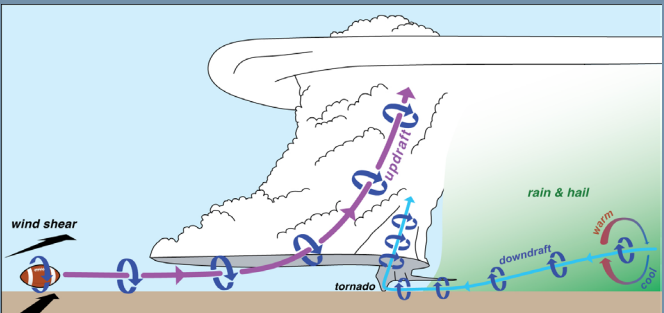
Tsunamis

Tsunamis are disturbances to the ocean causing long waves and fast displacement of the water. In fact, tsunamis generally follow an earthquake that takes place on the ocean floor. As the earthquake occurs, water in the ocean is displaced in all directions as a result of the seismic waves. As the tsunami approaches land where the water is more shallow, the wave can grow 100 feet tall or greater! The large amount of water within a tsunami can cause flooding, which makes them dangerous for people on the shoreline. Sometimes, nature has a natural warning system that a tsunami is coming — some examples include sounds resembling a freight train, or the water lowers more than normal. People in the path of a tsunami must get to higher ground and move as far away from the shoreline as possible.

Tornadoes

Have you heard of tornado alley in the Midwest of the United States? Tornado alley includes states such as Oklahoma, Nebraska, and Kansas, where they commonly occur. Tornadoes are funnel-shaped storms that

can destroy entire towns and cause flying debris. They arise during a special type of rotating thunderstorm called a supercell, which can bring damaging winds, hail, lightning strikes, and downpours. Supercells are caused by winds traveling in opposing directions at higher and lower altitudes, best defined as wind shear.



This tube of air can become a full tornado if it's hit by warm air moving up toward the sky. If the funnel cloud touches the Earth's surface, it becomes an active tornado. Tornadoes can approach speeds of up to 300 mph in some cases, and like earthquakes, they can be rated based on intensity. The Enhanced Fujita Scale, or EF scale for short, can classify tornadoes as weak as "EF1" or as strong as "EF5" based on wind speed.

Avalanches

Avalanches are a unique natural disaster characterized by a mass of snow and ice breaking away from a slope and tumbling down a mountainside. They do not have to be composed of snow, as soil and rocks can produce similar results (although these are identified as landslides). Avalanches can have a variety of causes including high winds, vibrations from earthquakes or skier activity, or heavy snowfall on top of existing snow that has already iced over. These events can trigger unpredictable and catastrophic shifting of snow that can pick up speed as it descends down the mountain. In the U.S. alone, there are about 100,000 avalanches that occur annually, and people most vulnerable are those engaging in winter sports such as skiing and snowboarding. They are dangerous due to the risks of becoming trapped under the snow, which can be deadly if rescue teams do not arrive quickly.

Conclusion

Natural disasters are everywhere, and oftentimes it is important to understand their root cause in order to best predict them. Knowledge of natural disasters can save lives, and studies are ongoing today by meteorologists, geologists, and environmental scientists alike to determine their precise cause. For example, with the progression of climate change, increasing global surface temperatures have the potential to increase frequencies of storms that cause tornadoes. Therefore, the future of natural disaster prevention may also lie in our ability to slow climate change!

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Billion-Year-Old Beauty: How the Grand Canyon was Formed

Writing by MYKA SALVACION | Editing by ANTONIO MELONI & GRACE QIAN
Design by HARLEY HAAS

Vibrant red and orange layers of rock cut through the earth. Beneath you, thousands of feet below, there is a glint of water shimmering underneath a clear blue sky. An astonishing feat of mother nature, the Grand Canyon is an iconic symbol of Arizona, a southwestern U.S. State. How was such a striking sight formed?

A canyon is a deep, narrow valley with steep, towering sides. Up to 277 miles long and 6,000 feet deep, the Grand Canyon is the largest canyon in the United States. It's longer than the distance between New York City and Washington, D.C., and almost as tall as 5 Empire State buildings stacked on top of each other! This iconic canyon is not only beautiful but also historic: it is estimated to be between 5 million and 70 million (70,000,000) years old. It's possible that the Grand Canyon is as old as some dinosaurs! What's even more unbelievable is that the surrounding rocks are even older than the canyon itself—the oldest rocks are 1.8 billion (1,800,000,000!) years old.

Billions of years ago, the top layer of the Grand Canyon was located at the bottom of the ocean. Over time, this land was lifted by the movement of tectonic plates, which are huge pieces of Earth's surface that lie far, far below us. This land was originally flat, but over time, the movement of the Colorado River wore down the rock into the ginormous canyon we see today. This process of a strong force of water breaking down rock is called erosion, and it is still ongoing— a million years from now, the Grand Canyon will look different from how we see it today!

What would it look like if you were to visit the Grand Canyon today? That depends on what time of the year you visit! Despite being thought of as a dry, arid area, the Grand Canyon actually experiences snow in the winter. If you visit in November through April, you might see blankets of white snow instead of the orange and brown colors of desert rock.

If you're brave enough, you might walk along the Grand Canyon's famous skywalk, a clear glass bridge spanning across the canyon that lets you see straight down to the bottom. If you want to actually see what the bottom looks like, you can hike one of the many trails scaling the sides of the canyon, or even ride on a donkey all the way down. Wherever you are in the Grand Canyon, you are guaranteed an amazing view!

More than 6 million people visit the Grand Canyon every year to witness its incredible beauty and history. However, due to air pollution from nearby power plants, the construction of dams, and other human activity, the natural resources of the Grand Canyon are under threat. It is incredibly important to protect amazing works of mother nature like the Grand Canyon so that generations to come can also experience these wonders of the earth.

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What is: Daylight Savings Time?

Writing by AMALYA KNAPP | Editing by GRACE QIAN and ANOUSHKA AMBAVANEKAR

Do you ever wonder why your clocks suddenly seem to jump an hour forward or backward, seemingly on their own? Don't worry, it's not magic! It's actually a thing called Daylight Savings Time (DST).

Let's start with the basics. The Earth rotates around the Sun, and as it does, the amount of daylight we get changes throughout the year. During summer, we get more hours of daylight than in the winter. So, in order to make better use of the sunlight, Philly's very own Ben Franklin suggested adjusting the clocks to better align with the sun's schedule. And that's how DST was born!

Twice a year, in March and November, we adjust our clocks by an hour. In March, we move the clocks forward by an hour, so we lose an hour of sleep that night, but gain an extra hour of daylight in the evenings that follow. In November, we move them back by an hour, so the days become shorter and darker. This way, we can have more daylight during the fun summer months!

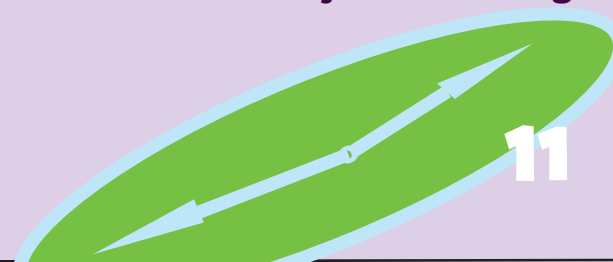
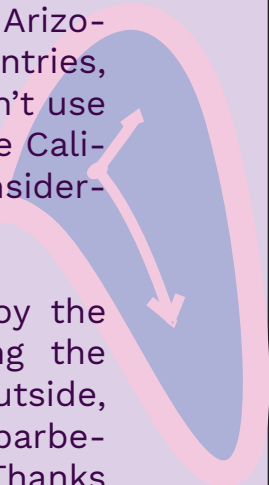
**So, don't be afraid of the mysterious hour-jumping clocks.
It's just DST doing its thing!**

But not everyone is a fan of DST. Some scientists say it interrupts our sleep schedules, which can affect our performance in school and how much energy we have during the day. That's why some states in the US, like Arizona and Hawaii, and some countries, like Japan, India, and China, don't use DST. And some other states, like California, Florida, and Ohio, are considering getting rid of it too.

But for now, we can still enjoy the extra hours of sunlight during the summer months by playing outside, visiting the beach, or having barbecues with friends and family. Thanks to DST, with the longer days and warmer weather, we have more time to enjoy all the fun activities that summer has to offer. And here's a fun way to remember when we change our clocks: "Fall back, spring forward." In the fall, we move the clocks back an hour, and in the spring, we move them forward an hour. See, it's easy!

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The Surprising Origins of Disney Movies

Writing by KRISTINE ENEMUO | Editing by JOYCE LEE & GRACE QIAN | Design by EJUN HONG

Disney movies are well known all around the world.

But do you know the origin behind these movies? You're in for a surprise!

Mulan

Mulan is based on a Chinese folk song called “The Ballad of Mulan,” written sometime around the sixth century. In the tale, Mulan disguises herself as a man and takes her elderly father’s place in battle. After fighting for 12 years, Mulan becomes a skilled and celebrated warrior in the Chinese army. When the emperor tries to offer her rewards, Mulan only asks for a donkey and returns home to her family. During times of hardship in China, this legend has been adapted into plays and films to give hope and strength to the public.

Frozen

Elsa’s character in Frozen was inspired by “The Snow Queen,” a fairytale written by Danish author Hans Christian Andersen in 1845. In the fairytale, a young girl named Gerda sets out to find her friend Kai who was taken by the evil Snow Queen to her icy palace after getting struck in his heart and eyes with a broken piece of a magical mirror. With the help of a reindeer, Gerda finds Kai and gives him a kiss which thaws his frozen heart and frees him from the queen. In Frozen, Elsa was supposed to be an evil supervillain (just like the Snow Queen), but the script was rewritten into the iconic movie we are familiar with today!

Tangled

Disney’s Tangled is based on the German fairytale “Rapunzel” published by the Grimm Brothers in 1812. In the story, Rapunzel is locked in a tower by a witch. She meets a prince who climbs into the tower using Rapunzel’s long hair and the two fall in love. When the witch finds out, she shaves Rapunzel’s hair and casts her into the wilderness. After being tricked by the witch, the prince falls out of the tower and is blinded by the thorns below. He blindly wanders around the wilderness where he reunites with Rapunzel whose tears restore his sight. They travel back to his kingdom where they live happily ever after!

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Pocahontas

Pocahontas was the daughter of Chief Powhatan — the powerful ruler of the Powhatan people in Virginia. Historical accounts suggest that Pocahontas was kidnapped by English colonists and was released after she agreed to change her name to ‘Rebecca’ and marry a wealthy businessman named John Rolfe. Pocahontas and John traveled to England where they toured the country. Unfortunately, on her way back to North America, Pocahontas became very ill and died shortly after. A very tragic story indeed.

Cinderella

There are more than 500 versions of Cinderella all around the world — including the version written by the Grimm Brothers, which inspired Disney’s Cinderella. However, the earliest known version was said to have originated in ancient Egypt. In the tale, an eagle snatches the beautiful sandal of a slave girl named Rhodopis and places it on the lap of the Egyptian king. The king, seeing this as a sign from heaven, travels around his kingdom to find the owner of the sandal. When he finds Rhodopis, he marries her and makes her his queen.

Beauty and the Beast

Disney’s version of Beauty and the Beast is based on a true story! The Disney version was adapted from a French fairytale (also called “Beauty and the Beast”) that was published in 1740. The author, Gabrielle-Suzanne Barbot de Villeneuve (vil:nuv), was said to be inspired by the true story of a man named Petrus Gonsalvus who had a rare condition called ‘Werewolf Syndrome,’ which caused thick hair to grow all over his face and body. Petrus was sent to live with the royal family of France where he met and married a lady named Catherine. This unusual but touching love story sparked inspiration in Villeneuve, who finished the tale of the Beauty and the Beast many years later.

Sports Figures and Their Childhoods

Writing by JAMIE LEE | Editing by ANTONIO MELONI and TED DAVIS | Design by JHAUGHANESSY MORRIS

Wondering what it takes to be the next best in your favorite sport? Here’s what Tom Brady, Naomi Osaka, Kobe Bryant, and Alina Zagitova were doing when they were your age!

Tom Brady

National Football League Quarterback, 2000-2023

Notable Achievements: 7x Super Bowl Champion, 5x Super Bowl MVP, 8 NFL Records

Tom Brady grew up in San Mateo, California. Everyone who played ball with him as a kid remembers him as the most competitive and talented kid on the block. His immense admiration for Joe Montana drove him to attend a football camp where NFL quarterback Tony Graziani taught him how to throw a ball properly. Despite

being selected as the 199th overall pick by the New England Patriots, he put in hours of hard work to become the starting quarterback of his team. While the world saw him as an underdog who rose to the top, everyone who knew Brady back home believed he had it in him all along.

Naomi Osaka

Women’s Tennis Association Singles Player, 2013-Present

Notable Achievements: First Asian World #1 rank holder, 4x Grand Slam Champion, 2x US Open Champion, 2x Australia Open Champion

Naomi Osaka is a Japanese-Haitian woman who learned to play tennis at just the age of three from her father who used Richard Williams’ training plan for his own daughters (who have won many Grand Slam titles in their careers). Soon, Osaka’s flair for the game became evident through her solid serves and tremendous

returns. She enrolled in several tennis academies and went pro just before her 16th birthday. Three years later, she was named Newcomer of the Year as she entered the Top 50 in the WTA rankings. She not only inspires women and Asians in sports but also fights social injustice.

Kobe Bryant

National Basketball Association Shooting Guard, 1996-2016

Notable Achievements: 5x NBA Champion, 2x NBA Finals MVP, 18x NBA All-Star, 2x NBA Scoring Champion

Born in Philadelphia, Pennsylvania to former NBA forward Joe Bryant, Kobe picked up basketball when he was only three. Beyond his undeniable talent on the court, Bryant was firmly grounded in his Mamba Mentality—conquer your fears and become your best self. Kobe didn’t just train his skills as a kid; he trained his mind. When he was eight, he boldly challenged his dad’s teammates to a 1-on-1. And won. At 13, he went to the gym every morning at 5 AM before going to classes,

then returned once the bell rang, and stayed all the way until 7 PM. That dedication paid off with his outstanding performance in high school, where he averaged over 30 points per game and became Southeastern Pennsylvania’s all-time leading scorer by the end of his high school career. From there, Bryant skipped college to go pro, ultimately leading to a fulfilling 20-year career with the Los Angeles Lakers.

What do all these athletes have in common?

They know that the key to greatness is to start early. No matter the circumstances, they keep working hard. They also look past the goal of winning and focus on maximizing their potential. Then, the championships just fall into place.

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MISTAKES THAT WORKED!

Writing by **SRISHTI BANSAL** | Editing by **ALBERTINA LEE & ANOUSKA AMBAVANEKAR**

Spelling a word wrong on a test. Spilling a whole glass of water on a just-cleaned carpet. Forgetting an entire backpack at home. We all make mistakes, and the ones you just read are all ones that I've made (yes, even that last one). While, in general, mistakes are something to be avoided, sometimes, what we might think of as accidents lead to places that we don't expect.

There are many ideas and objects around us that we take for granted, but many of these didn't always start out in the most ordinary ways. In fact, many of them initially were thought of as mistakes! Keep reading to discover common things that you might not know arose from accidents.

The Leaning Tower of Pisa

You may have heard about this famous tower in Italy, which is currently leaning at an angle of 3.99 degrees (180 degrees would be flat on the ground). This might seem like a small number, but it looks like a lot on such a tall building! However, the tower was actually not originally designed to be leaning. Architect Bonnano Pisano began building the tower in the year 1173, but it didn't start leaning until 1178. After this, a variety of methods were tried to straighten out the tower as it was being built, such as making the columns on one side a slightly larger, and building some floors a little bit off the side so that some of the weight would balance out. However, these methods usually ended up making the

tower lean more! Eventually, modern technology and concrete was used to make the base of the tower stable, and it is now safe for anyone to visit. In fact, it's now one of the seven wonders of the world!

Tea

Though you might not drink it yourself, you've probably met someone who drinks tea. Although there are many different ways to make tea now, the most common way involves putting tea leaves in boiling water, and the drink was actually discovered this way in China in 2737 BCE. A man had left a pot of water on a fire outside to boil, but accidentally left it near a bush that was shedding some of its leaves, which fell into the water. Luckily, these leaves were some of what we now call tea leaves, and when the man tried the brewed combination he discovered it was delicious!

South Dakota Border

If you live in the United States, you have probably seen a map of the US before. Some states, especially in the west, look like their borders are completely straight, such as the borders of Utah, for example. However, in the case of South Dakota, this is not true! Land Surveyors (the people who determined borders) in the 1800s received news of a battle taking place between the Sioux Indigenous Nation and Europeans and retreated for safety. They returned later, but were unable to locate their equipment, and it was later discovered that for the rest of the western border they were 7/8 of a mile off from the straight line they had originally been following. If you zoom in on a digital map, you can see this and realize that even things as important as state boundaries sometimes arise by accident!

Cinderella's Slippers

You've probably heard the story. On the night of the ball, Cinderella's godmother gave her a pair of glass slippers to dance in, and these slippers reunited her and the prince. You also might have wondered, "Why were these slippers made of glass? Wouldn't they be hard to dance in?" Actually, many historians believe the slippers weren't made of glass at all, but of fur. The version of Cinderella-

la that most of us know was initially written by Charles Perrault in French, and a mistranslation most likely changed vair, which means "fur" to verre, which means "glass." The original version sounds a lot more comfortable, doesn't it?

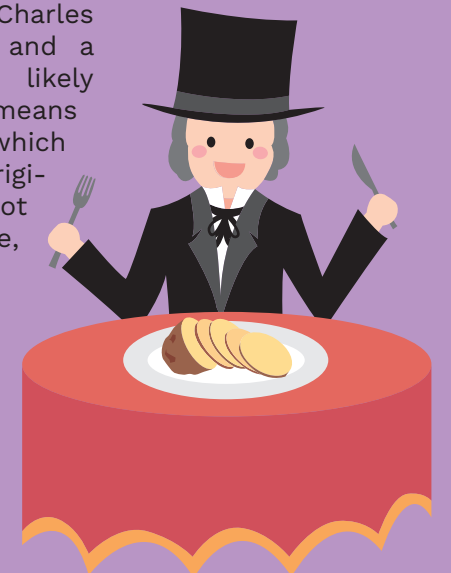
Potato Chips

Whether your favorites are Nacho Cheese Doritos, Original Pringles, or Sour Cream and Onion Lay's (my personal favorites), people really love chips! However, these crispy treats weren't actually meant to exist in the form that we have them today. A rich man named Cornelius Vanderbilt liked to eat at a fancy hotel in Upstate New York where, one day, he ordered some Fried Potatoes. However, he decided that the potatoes were too soggy, and sent them back to the kitchen four separate times. Eventually George Crum, an indigenous chef, sliced the potatoes extremely thin, fried them to a crisp, and oversalted them to prevent any chance of them being called soggy or weak. To his surprise, however, Vanderbilt loved the potatoes, and America's favorite snack was born.

As you've seen, many of the things we might take for granted in our everyday lives and the world around us never would have existed if things went exactly to plan. While you shouldn't plan for accidents on purpose, you also should not be afraid to try something new just because you think you might make a mistake. As long as you are being safe, exploring and taking risks can be really exciting! And you never know, you just might end up with something that will be known about for years to come.

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RECENTLY DISCOVERED MARINE LIFE

Writing by MIRANDA MENG | Editing by ANOUSHKA AMBAVANEKAR & LUKE ELEGANT

Every year, new species are found — especially marine life, which shows the variety and diversity of animals that live underwater! Below are some that we just discovered recently.

Pyrolycus jaco: Eelpout

Despite the eelpout's name, it isn't considered an eel — it's part of the family of ray-finned fish, which includes seahorses and anglerfish! The eelpout is small, only 6 inches, and pink in color. The fish is named after the city of Jacó, Costa Rica, where it was discovered this year. Don't expect to see it yourself anytime soon, though — it lives 5,700 feet deep, and only near "hydrothermal vents," which are like hot springs at the bottom of the ocean.

Duobrachium sparksae: Comb jelly

Comb jellies, also known as Ctenophores, are small round jellyfish that look like hot air balloons! Their body is around 6-8 cm and its tentacles are 3 times as long. As it moves, Comb jellies keep its tentacles close to the seafloor. It was discovered in Puerto Rico using the Deep Discoverer robot that can go deep underwater and record high quality videos.

Psychropotes longicauda: Gummy squirrel

Gummy squirrels are sea cucumbers shaped like a banana. Despite their name, sea cucumbers are not vegetables, but a kind of animal in the same family as starfish! It was discovered in 2022 on the seafloor of the Pacific Ocean. It has a long limb on the back, which might be used like a sail to help it move.

Magnapinnidae: Bigfin squid

In December of 2021, this squid was seen 6,200 meters under the surface of the water, and is the deepest-dwelling bigfin squid ever discovered. Sightings of this family of squid are very rare, possibly because of how deep underwater they live. Scientists are still trying to figure out how these squids live at such deep depths.

Stylobates calcifer: Sea anemone

This is a species of sea anemone discovered in 2022, and similar to the anemone that Nemo lives in. It was found near Japan, and only lives in the back of hermit crabs, since they need each other to survive! This is called a symbiotic relationship. The crab brings the anemone to places with food, and the anemone protects the crab. When the hermit crab moves to a new shell, it can spend over 40 hours dragging the anemone to come with it.

Cirrhilabrus finifenmaa: Rose-veiled fairy wrasse

This reef fish discovered in 2022 in the Maldives is colored like a rainbow. It was named after the local word meaning "rose." There is another fish discovered in 1990 called the rosy-scales fairy wrasse, but they are different species and colors!

Leptarma biju

This is a purple and yellow tree-spider crab discovered in Kerala, India. It was found in a mangrove, which is a type of tidal swamp. These areas have not been explored much at night before, which is when the crab is most active—explaining why the crab was only recently discovered.

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Stylobates calcifer

Discover How Diamonds are Made!

Writing by WANGARI MBUTHIA | Editing by LUKE ELEGANT & ALBERTINA LEE | Design by JHAUGHANESSY MORRIS

If you asked someone where diamonds come from, chances are their answer would be coal, a black rock that is burned to generate heat. However, this popular answer is actually incorrect. Read on to uncover the truth about how diamonds are made!

Pure diamonds are transparent, colorless crystals made from the element carbon bonding to four other carbon atoms repeatedly. This type of bonding is very strong and is why diamonds are very hard. The confusion about the source of diamonds likely is because coal is also made from carbon. However, coal is not bonded in a pattern like diamonds. Another reason for the confusion is because scientists don't fully understand where the carbon atoms in diamonds come from but coal is a very unlikely option.

Both coal and diamonds are made within the Earth and take millions of years to form under the influence of high enough temperatures and pressures for chemical reactions with carbon. However, diamonds need much higher temperatures and much higher pressures than coal. As a result, diamonds are formed much deeper in the Earth, about 90 miles below the surface in a layer known as the upper mantle, while coal is found at about 32 miles below the

Earth's surface. The high temperature and pressure needed to create diamonds means that diamonds can only be found in parts of the world such as in Canada, Botswana and South Africa. Scientists recreate these high temperatures and pressures to grow diamonds in a lab.

Under the correct conditions, carbon atoms can crystallize (form crystals) by locking with four other carbon atoms to form strong bonds. The crystals grow by creating more bonds with nearby carbon atoms and can become colored when combined with other elements. For example, nitrogen, sulfur, and boron color diamonds yellow, green, and blue. All diamonds were brought to the Earth's surface through deep, rapid, and violent volcanic eruptions that occurred millions of years ago. The eruptions brought up magma (lava within the Earth) that carries rocks containing diamonds to the surface. The magma cools forming two main types of rock, a kimberlite and a lamproite, which contain diamonds.

Although both diamonds and coal are made from carbon, coal under high pressures and temperatures will not turn into a diamond. So next time someone says that diamonds are made from coal, tell them the true story!

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K-Everything

A Rise of Korean Culture in America

Writing by NATALIE YANG | Design by VANESSA LIEW
Editing by TED DAVIS & ANOUSHKA AMBAVANEKAR



Have you heard of the groups BTS or Blackpink? Maybe you've watched Squid Game. Or you might have even eaten kimchi or tteokbokki. All of these popular but diverse phenomena actually come from the same place: Korea, specifically South Korea. In the past couple of years, the spread of Korean culture among American citizens has been very noticeable, but this rise in interest didn't originate recently. Following the mid-1950s—when

South Korea was caught in the middle of the Korean War—Beijing journalists first coined the term “hallyu” (or Korean wave) upon noticing a rise in popularity for all Korean culture.

While South Korea's global success is partially due to a rapid rise in technology and social media, the country's government has also played a significant role. After a large financial crisis in 1997, South Korea began imple-

menting restrictions on Japanese cultural goods and created its mission to strengthen its own culture. In doing so, the government created over 300 cultural departments throughout the country to encourage citizens to learn more about Korean culture.

Because of this effort, the number of films and television produced by Korean directors and starring Korean actors, including Korea's first large-budget film Shiri, grew dramatically. In 2019, South Korea's “Parasite” became the first non-English film to win the Oscars Academy Award for Best Picture. Similarly, the world-renowned 2021 film Squid Game, directed by Hwang Dong-hyuk, was released on Netflix. In one month, if you were to tally the hours people spent watching the movie on Netflix, you'd get 1.65 million hours! This success was because of the contributions from famous Korean businesses, like Samsung and Hyundai, which are phone and car companies.

Simultaneously, Korean music, specifically Korean popular music (otherwise known as K-pop) has received attention both locally and globally. Five-member boy band H.O.T., created by SM Entertainment in 1996, was among the first generation of the hallyu as the first K-pop artist to hold tours in the United States with concerts in New York, Washington, Hawaii, and Los Angeles. Soon, the development and advancements of social media, YouTube, and other digital media enabled the Korean wave to grow rapidly and gain an international fanbase. In just one year (2010–2011), the Korean music industry more than doubled in value, jumping from 83 million to 196 million dollars.

In America, the most distinctive moment of the hallyu came in 2012 when South Korean musician Psy dropped his song “Gangnam Style” which quickly went viral. Psy began performing in Madison Square Garden alongside Madonna and broke three Guinness World records within a few months after the song's release. Following in his footsteps, several entertainment companies and artists began

releasing K-pop groups and songs that gained popularity.

To date, there are roughly 208 K-pop groups in total, including some soloists and sub-units (smaller groups within bands) targeting different audiences by exploring new genres of music. One of these groups is BTS (Bangtan Sonyeondan), a seven-member boy band which has entered the Guinness World Records 2022 Hall of Fame with 23 records and counting. Some of these records include the fastest account to gain 1 million followers on TikTok, the most viewed YouTube video in 24 hours, and the most followed group on Instagram.

As these forms of media continue to grow in popularity throughout the United States, the popularity of Korean cuisine has been rising as well. Many people have started to go to Korean barbecue restaurants to try kimchi, kimbap, and other Korean cuisine. The beauty of the spread of different cultures lies in experiencing firsthand how cultures bring tangy, salty, sweet, and spicy ingredients together in a variety of unique dishes. The exciting harmony of flavor and curiosity is precisely the reason why many Americans decide to try Korean food.

In all of these ways, South Korea provides a world of wonders across borders via technology and exploration. The hallyu wave has grown to be understood and experienced by many. So the next time you spot a Korean film while scrolling through Netflix or drive by a Korean restaurant on your way to school, try to stop by and learn more about Korea and why the Korean wave is here today—and to stay.

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HOW WE LEVEL UP OUR IMMUNE SYSTEM

Design by SALLY HUANG

Even though it may not seem like it, our human body is capable of fighting against a variety of diseases. Thanks to our immune system, a complex series of mechanisms in our body that fights against infections and unsafe foreign substances, we are able to continue living after having a mild cold and fever.

However, there are times when the immune system is not able to handle these infections. Like a tsunami, these foreign invaders, such as bacteria and viruses, can overwhelm the immune system, making individuals very sick, and potentially causing some people to be rushed to hospitals or urgent care.

One prominent virus that overwhelms the immune system is the coronavirus disease of 2019. COVID-19 is a particularly strange virus that humans were not used to. Through the spreading of respiratory droplets, such as through coughing, sneezing, and even by talking, the virus would enter the nose or mouth and make its way into the respiratory system, especially the lungs. What makes COVID-19 unique is its 'keys' (proteins on the virus) that are able to enter human cells without permission. Scientifically, the virus breaks into the cell by attaching to the ACE2 receptor of the cell; the receptors could be thought of as the door of the cells. By directly attaching itself to the outside of the cell, the virus can enter the cell, and hijack the host cell's machinery to make more viruses. COVID-19 is an RNA-based virus, meaning that it is easy to fool the cell by showing the RNA molecules, which are used as a blueprint for making more of the virus. Unfortunately, the internal cellular machines do as they are told. By making more, the overpopulation of the virus can eventually 'pop' and kill the cell in the process. OH NO!

So how do we combat these viruses? Can we even fight them in the first place? Yes! ARISE VACCINES! Science and technology have advanced so far to the point that scientists are able to make a vaccine, a substance that strengthens the human immune system, in a relatively short period of time in order to help the human population.

The most popular vaccines against COVID-19 are the vaccines created by Pfizer-BioTech and Moderna, that use mRNA in order to train our immune system; it's almost like a power-up potion for the cell. While using mRNA to help the immune system has been theoretically known to work, the actual implementation of mRNA vaccines during the COVID-19 pandemic shows a huge promise in this mRNA technology. YAY!

mRNA can be thought of as a series of instructors sent to the cell to directly make proteins, called antigens. These antigens help train our immune system by fighting against these pseudo-COVID infections, so that whenever the real COVID-19 does infect the human body, the immune system will have

have an easier time recognizing the virus and will act promptly to prevent the viral infection.

mRNA vaccines have a tremendous amount of potential and can even be thought to help bolster cancer treatments. Similar to how the Pfizer-BioTech and Moderna vaccines work against COVID-19, cancer vaccines that utilize mRNA can teach the immune system to differentiate between cancer cells and healthy cells.

Of course, mRNA vaccines aren't the only way to fight against infections. Unlike the mRNA vaccine, which is usually temporary and has to be taken again every year or so, other vaccines can provide life-long immunity against a virus. For example, live-attenuated vaccines provide a weakened form of the infection to the body. Since these infections are so similar to the real infection, after the immune system receives its 'training' from the vaccine, the immune system can provide a lifetime of protection. These include smallpox, chickenpox, and even measles. Unfortunately, these vaccines can't work on influenza virus (commonly known as the flu virus) or even coronavirus, because of the high mutations that these viruses go through. In other words, these viruses can take on several different disguises rapidly, making the cell think that it is a different virus that the cells haven't been trained to fight against.

Science and technology are evolving and provide ways to help our immune system combat harmful viruses and foreign invaders that are harmful to the human body. Whether it be mRNA or weakened viruses, all these tools help our immune system recognize and destroy threats from foreign invaders, giving our bodies the confidence to take immediate action and keep us healthy.

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What is Groundhog Day?

Writing by AYLIN ERGIN
Editing by ALBERTINA LEE & JOYCE LEE

Have you ever opened the weather app and wondered if you should bring a raincoat or if it would be hot enough to wear shorts? Well, this is all thanks to meteorologists, scientists that can accurately predict weather! On the day of February 2nd, a special meteorologist called Punxsutawney Phil predicts the arrival of spring. This might come as a surprise, but Phil is actually a groundhog who comes from a tradition known as Groundhog Day! Legend has it that on February 2nd, if the groundhog comes out and sees its shadow, it'll get scared and run back to its burrow, predicting at least another 6 weeks of winter. If there is no shadow seen, it means that spring will come early! While this tradition of predicting weather may sound crazy to some, others have become invested in this fun tradition which has an interesting history behind it.

The first Groundhog day can be traced back to February 2nd, 1887 in a small town in Pennsylvania called Punxsutawney. However, the tradition's origins actually come from the ancient Christian tradition known as Candlemas, which used candles to predict how long the winter would be. An old proverb said that if it was rainy and cloudy on Candlemas, winter would not come again. But if Candlemas day was sunny and clear, then the winter would return. While this logic seems backwards at first, the idea was that if the weather was gloomy that day, then the worst had already happened and the future weather would be good and vice versa for a sunny day on Candlemas. The tradition was then slightly changed by the Germans who chose the badger to predict the weather. The use of shadows to predict the arrival of spring is based on the same logic used in Candlemas. Sunny weather would cause the badger to see its shadow, predicting more winter, while German settlers arrived in Pennsylvania they continued the tradition, but switched to groundhogs, which were more common in the area, eventually leading to the Groundhog Day as we know it now.

Every February 2nd in Gobbler's Knob in Punxsutawney, thousands gather to wait for Phil's predictions, even though he is only right 40% of the time! What do you think about Groundhog Day? Is it all a myth or is Punxsutawney Phil actually able to predict the weather?

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Design by KAYLA KIM

The King Of Philly

Writing by SHELBY ABAYIE
Design by HARLEY HAAS

Editing by JOYCE LEE & LEEYU ADDISU

CHEESESTEAKS!

Nothing screams Philadelphia more than one iconic sandwich: The Philly Cheesesteak. To make this tasty sandwich, you need a toasted Italian bread roll, tenderly cooked steak, onions, and more cheese than you could ever imagine—most take their pick of Cheese Wiz, provolone, or American cheese.

The creation of this sandwich begins in the 1930s, at a humble hotdog stand near the Italian Market in South Philly. The hotdog stand was run by two brothers—Pat and Harry Olivieri. During a busy day of selling hotdogs, Pat wanted a quick lunch before getting back to work. After hours at the hotdog stand, Pat did not want to eat another hotdog! Instead, he sent his brother, Harry, to a local butchery to get some beef scraps. Pat cooked up the beef scraps on the grill, placed the meat into a toasted hotdog bun, and added some onions as dressing. The sandwich looked so good that a cab driver stopped and asked for the sandwich! Since Pat only had enough meat for one sandwich, he kindly split his own with the driver. Both men scarfed down the surprisingly tasty sandwich.

Before the cab driver left, he gave Pat life-changing advice: "That's terrific. You should stop selling hot dogs and sell these things!" Soon, the entire neighborhood was lining up for Pat's new sandwich. The tavern across the street from Pat's hot dog stand happily partnered with Pat to sell his sandwich during the winter. The popularity of the sandwich continued to skyrocket and Pat took over the whole building.

The tavern became known as the legendary Pat's King Of Steaks restaurant. Business was booming,

and Pat's promotional antics kept interest high. When famous celebrities visited Philly for movie premiers, Pat would head downtown with steak sandwiches and offer them a bite. Eventually, Pat had built a collection of famous celebrities trying his food. Pat's restaurant even made an appearance in the movie Rocky for a dinner scene!

Over 10 years after the birth of the steak sandwich, Joey Lorenzo, a manager at Pat's, made an incredible change—he put the cheese in the cheesesteak, thus creating the Philly Cheesesteak we know and love today! This small change moved Pat's sandwich from great to simply unforgettable!

Although everything seemed to be in Pat's favor, trouble was brewing, and its name was Geno. In the 60s, a man named Joey Vento opened the restaurant Geno's Steaks ... directly across the street from Pat's! At first, the restaurants were friendly with each other, but over time, an intense rivalry evolved. Who had the better cheesesteak? Pat's or Geno's? This debate still rages on today. Vento claims his cheesesteaks are better because Geno's uses thinly sliced rib-eye beef while Pat's cubes their beef.

Both restaurants are Philly cultural icons and prove that with enough hard work and creativity, anything is possible! If you've got the time, visit 9th and Passyunk and taste for yourself which legendary cheesesteak is the best!

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SUNRISES

Writing by ALY KERRIGAN | Editing by LEEYU ADDISU & LUKE ELEGANT | Design by EJUN HONG

Looking at sunrises and sunsets, you might assume that the sun is circling around the Earth. However, the appearance of the sun's rotation is an illusion. In fact, while the sun stays in its position at the center of our solar system, it is the Earth that's doing the rotating. Sunsets are a result of Earth's rotation on its axis, with one full rotation taking 24 hours, or a full day. As the Earth spins around the sun, different parts of the Earth's surface face the sun, causing daytime in those areas, while the opposite side of Earth's surface faces away from the sun, causing nighttime. The moment in Earth's rotation when a certain place begins to face the sun marks the switch from night to day and creates a sunrise.

You might have noticed that the sun rises at different times throughout the year. In the winter, getting up for school might be really tough because the sun has not come up yet, but at the same time on a summer day the sun is already shining brightly. The reason the sun rises at different times depending on the season is because of two factors: the shape of the Earth's orbit and the tilt of the Earth's axis. For one, the Earth does not spin around the sun in a circle. Instead, it follows an oval shape, which means that during some parts of Earth's orbit the Earth is closer to the sun (summer), while other times the Earth is more far away from the sun (winter). The other factor is that the Earth spins at an angle (23.4 degrees, to be exact), meaning that its North Pole does not lie directly above the South Pole. Sometimes during the year, the Earth's North Pole is tilted towards the sun, while

other parts of the year the North Pole is tilted away from the sun. When the North Pole is tilted towards the sun, the Northern Hemisphere is exposed to the sun for a longer amount of time during the day, meaning that the sun rises earlier and sets later during the summer months.

The most notable thing about sunrises is, of course, their beauty. But what causes these gorgeous displays of colors in the morning sky? The phenomenon is called scattering. During the daytime, the sky is blue because light waves produced by the sun enter the atmosphere and scatter in all directions as molecules collide. Scattering creates shorter wavelengths of light which translate into blue and violet light in the visible light spectrum. During sunrise and sunset, however, the sun has to travel across more of the atmosphere than it does during the day. This causes more scattering of molecules to occur, resulting in the atmosphere favoring longer wavelengths that create yellow, orange, and red.

Try it at home!

You can model the Earth's rotation around the sun at home with an orange (or a ball, or any small circular object) and a flashlight. If you mark a spot on the orange and spin the orange around, you will see that the spot you created spends some time under the light of the flashlight (which represents the sun's rays) and some time in the dark.

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Writing by FAIZAH SAADMIM | Design by ANGELA SONG

WORD SEARCH

G S S H C A N Y O N H I O R
N L E R A S O E H M H D V G
A G Y O O E P N W C Y I L O
G S I E N N E O D H T A B I
R I N G S I V M T E I M A A
O F O I B C I E H E N O O I
U I S S P C U N G S U N L A
N U U S R A S A I E M D L H
D H N E E V H S L S M C A K
H N R C S S A S Y T I E B O
O R I N S N W I A E A A T R
G O S I U I A S D A V C O E
U N E R R N I M S K C A O A
A K E P E I I I S A O A F N

Canyon
Diamond
Daylight

Football
Korean
Rings

Cheesesteak
Sunrise
Princess

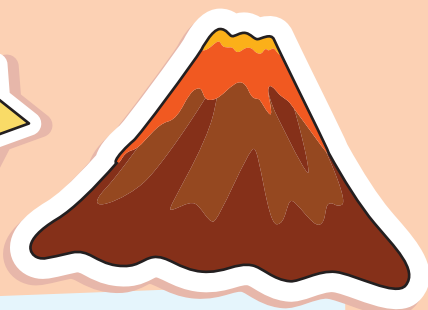
Pressure
Groundhog
Immunity

Vaccines
Hawaii
Anemone

Sign This Page!



MAKE A CHEMICAL VOLCANO!



MATERIALS

6 cups flour
2 cups salt
4 tablespoons cooking oil
warm water
plastic soda bottle
dishwashing detergent
food coloring
vinegar
baking dish or another pan
2 tablespoons baking soda
dropper (optional)

1. Start by making the cone (dough) of your baking soda volcano by mixing 6 cups flour, 2 cups salt, 4 tablespoons cooking oil, and 2 cups of water. The resulting mixture should be smooth and firm (add more water if needed).
2. Stand the soda bottle in the baking pan and mold the dough around it to form a volcano shape. Do not to cover the hole or put dough inside the bottle.
3. Fill the bottle most of the way full with warm water and a bit of red food coloring.
4. Add 6 drops of detergent to the contents of the bottle. The detergent helps trap bubbles produced by the chemical reaction so you get better lava.
5. Add 2 tablespoons baking soda to the liquid in the bottle.
6. Slowly pour vinegar into the bottle (with a dropper if you have one), and then watch out...it's eruption time!

Remember Use caution perform with an adult!

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