

UnEarthed

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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 fifteenth issue of UnEarthed! Welcome to SPLASH, where you can find articles on everything from basketball players and extreme water sports, to movie sets and cultural food, to so much more!

We chose the theme SPLASH this year to celebrate bold ideas, curious minds, and moments that made a SPLASH. Whether it’s a scientist changing the way we see color, a filmmaker crafting the perfect storm, or a kid who invented the popsicle, each story in this issue is about people, places, and ideas that stand out—that surprise and inspire us. SPLASH is about creativity, discovery, and the ripple effects we make in the world when we dive into something new. We hope these articles can inspire YOU to make a SPLASH one day as well! So turn the page, take the plunge, and get ready to make a SPLASH with our amazing stories full of surprises!

UnEarthed was created because we believe that everyone has the potential to make an impact—whether that be on the people around us, a certain field of study, or the way we see and understand the world. For this issue, SPLASH, we wanted to showcase a sliver of the ripples made historically and continuously around us. We hope you can see through SPLASH that all ripples, big or small, deserve to be shared. Throughout this issue, our writers explored the many ways people have made a splash in science, culture, history, and more.

But the fun doesn’t stop with the articles—at the end of this issue, you can find games like a word search and a maze to test your brain and creativity. Oh, and don’t forget about the signature page for you to decorate, draw, or share with friends!

We all had an amazing time putting SPLASH together, and we’re excited to work on our next issue very soon. We publish a new magazine twice a year and distribute them to students across Philadelphia, just like you! We’re always looking for new ideas and topics, so if there’s something you want to read about—or even suggest for a game or activity—let us know through our suggestion box on our website: <https://www.uneearthedpenn.com/suggestion-box>.

You can also visit our website at www.uneearthedpenn.com to check out our digital-only articles, interactive quizzes, videos, and read-along audio for several of our magazines. We’re always adding new content, so keep an eye out!

We hope SPLASH reminds you that discovery can start from anywhere—even with a single pebble in the pond. Stay curious, keep asking questions, and don’t be afraid to make your own SPLASH! Enjoy!

Kayla Kim
EDITOR IN CHIEF

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MANAGING EDITOR

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- EASY
- MEDIUM
- DIFFICULT





Coral Reefs: Vibrant Cities Beneath The Sea

Writing by **PHONG NGUYEN**
Editing by **ANTONIO MELONI & MARIN AGRIS**

Picture this: a bustling city beneath the waves, where skyscrapers are alive, traffic jams are schools of fish, and the nightlife never sleeps. Welcome to coral reefs—the ultimate underwater megacities. These colorful ecosystems are like a mashup of Times Square and the Amazon rainforest, but with more clownfish and fewer pigeons.

First things first: corals are not plants. They're not rocks either. Surprise—**corals are animals**—tiny, tentacle-waving creatures called **polyps**, cousins to jellyfish and sea anemones. Each polyp builds a hard calcium carbonate skeleton, and over time, these structures stack on top of each other, forming the reefs we see today. Most polyps stay inside their protective skeletons during the day, but at night, they extend their tentacles to feed on zooplankton—tiny marine animals that drift in the water—and small fish. Some of the world's largest reefs, like Australia's Great Barrier Reef, are the result of thousands of years of coral growth. Parts of the Great Barrier Reef are estimated to be up to **20 million years old!**

But here's the twist: corals are also roommates with **algae**. Not the slimy green stuff in your fish tank, but a type called **zooxanthellae** (try saying that five times fast). These algae live inside coral tissues, throwing shade—literally.

Through photosynthesis—the process plants use to make sunlight into food—algae provide corals with up to **90% of their food** in exchange for shelter. This relationship is what allows corals to thrive in the nutrient-poor waters of tropical seas. Without these algae, corals would struggle to get the energy they need to grow. It's the ultimate symbiotic relationship: a penthouse for the algae, and an all-you-can-eat buffet for the corals.

This magical relationship gives coral reefs their dazzling colors. The pigments in the algae create those stunning hues of blue, green, yellow, pink, and purple. When corals become stressed—due to rising ocean temperatures, pollution, or disease—they expel their algae, losing their color in a phenomenon known as **coral bleaching**. If the algae don't return, the corals can eventually starve and die, leading to massive losses in reef ecosystems.

Coral reefs are among the most diverse ecosystems on Earth, often referred to as the **"rainforests of the sea."** Similar to rainforests, these underwater structures support an astonishing variety of life. Although

they cover less than 1% of the ocean floor, coral reefs are home to approximately **25% of all marine species**. From tiny, colorful fish like clownfish and wrasses to majestic sea turtles and stealthy reef sharks, the reef is a dynamic and ever-active environment.

What makes these underwater cities so special? A major factor is their complex three-dimensional structure. Unlike the open ocean, reefs offer numerous corners and gaps where creatures can hide from predators, seek shelter, and hunt for food. This rich habitat attracts a wide range of marine life, making coral reefs a vibrant and crucial part of the ocean ecosystem.

Coral reefs, much like rainforests on land, are vital ecosystems. They serve as nurseries for fish, **provide food for millions of people**, and help **protect coastlines** from storms and erosion by acting as natural barriers. Since coral reefs extend tens of meters into the ocean, they effectively absorb elements from the water and help reduce coastal erosion, minimizing the devastating effects of natural disasters like cyclones, hurricanes, and typhoons.

But coral reefs are in **danger**. They're disappearing even faster than rainforests. And the villains? Climate change, pollution, and overfishing. When the ocean gets too warm, corals lose the tiny algae that keep them healthy—a process called bleaching. Without these algae, corals turn white and weak, making them more susceptible to disease or death. Humans play a role, too. Overfishing removes the fish that keep reefs clean, while pollution from trash, chemicals, and sewage harms this fragile underwater world.

The good news is that there is still hope! In Australia, scientists at the Great Barrier Reef are collecting healthy baby corals, raising them in underwater nurseries, and planting them on damaged reefs to help them recover. Over in the Philippines, local groups are working hard to clean up beaches and oceans, preventing plastic from harming coral reefs and marine animals.

These efforts are helping coral reefs little by little—but you don't have to live near the ocean to make a difference! You can be a reef hero too! Here's how:

- 1. Reduce plastic waste** – Use reusable water bottles and food containers instead of plastic. Less plastic means less waste ending up in the ocean!
- 2. Pick up trash** – At school, in the park, or at the beach, every piece of trash you throw away helps protect marine life.
- 3. Spread the word** – Tell your friends and family why reefs are important. Share this article, post about corals, or surprise someone with a fun fact. The more people know the more we can work together to protect them!

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Design by **HAOWEI LI**



SPLASH in SPACE

Writing by MALIHA RAHMAN | Editing by MARIN AGRIS & MADELINE LACH

Have you ever looked up at the night sky and wondered if there's water on other planets? Water is essential because every living thing on Earth needs it to survive. But what about other planets? Could there be lakes, rivers, or even oceans far, far away? Could there be life?

Water in Space

Scientists have discovered that water does exist beyond Earth! But it doesn't always look like the water we drink or swim in. In some places, it's frozen solid, and in others, it might be hidden under thick layers of rock or ice. Water in space can be found in three forms:

- **Liquid Water:** Like the water in Earth's lakes and oceans.
- **Ice:** Frozen water, like the ice at the North and South Poles.
- **Water Vapor:** A gas that forms when water is heated.

Which Planets Have Water?

Some planets and moons in our solar system do have water, but not all of them! Let's take a look:

- **Mars:** Scientists believe Mars once had rivers and lakes, but today, most of its water is frozen underground and at the planet's poles.
- **Europa (a moon of Jupiter):** Europa has a thick layer of ice on its surface, but underneath, there might be a giant ocean of liquid water!
- **Enceladus (a moon of Saturn):** This icy moon shoots out water vapor from cracks in its surface, suggesting there is water below the ice.

What Would Water Look Like on Other Planets?

Water doesn't look the same everywhere! The way water behaves depends on a planet's gravity and temperature. Gravity is an invisible force that pulls everything toward the ground, including you. It's what keeps you

and everything else on Earth from floating away. Let's explore the different ways water behaves in space:

- **Low Gravity:** If a planet has low gravity, like the Moon, water would float and form tiny spherical droplets instead of flowing into lakes or rivers.
- **Extreme Cold:** On very cold planets, water would stay frozen all the time, never melting into liquid.
- **Extreme Heat:** On scorching planets like Venus, any water would turn into steam. While it would still exist in the atmosphere, it would disappear from our sight.

Why Does Water Matter?

Water is super important because life, as we know it, needs it to survive. Water is needed for cells to work. It helps bring energy in and waste out. Which is why most living things hold a lot of water in them. For example, humans are made up of 60% of water!3 Scientists think that if we find liquid water on another planet, we might also find tiny living things, like bacteria or microbes! That's why space missions keep searching for water—it could help us find life beyond Earth.

The Search for Water Continues!

NASA and other space agencies send robots and satellites to explore different planets and moons, looking for water. One day, astronauts might even travel to places like Mars or Europa to study water up close!

So, next time you take a sip of water, think about how special it is—not just for us, but for the possibility of life beyond Earth! Who knows? Maybe one day, you could be a scientist discovering water in a distant world!

Our world is filled with beautiful colors—reds, greens, blues... But did you know that humans can see a million different colors?! This magic is made possible through the human eye and brain working together to interpret the light around us. To understand how we see color, we first need to understand light. The sun gives off light in the form of repeating waves that reach the earth. These waves occur on a large spectrum or range, of which our eyes can only process a very small section. The group of these waves that we can see is called light waves which includes all the colors of the rainbow: red, orange, yellow, green, blue, indigo and violet. Different waves of light appear as different colors because they have different lengths. This means that some of the light emitted has longer waves while others are shorter, impacting how our eyes perceive them. Longer waves look red or orange, while shorter waves appear indigo or violet.

When a light wave hits an object, some of the light is absorbed and some of it is reflected. When a light wave is reflected, it bounces off the object and goes in the opposite direction. The color we see comes from the light wave that is reflected off of the object. For example, if you look at an apple, the reason it is red is that it absorbs all the other colors and reflects the wavelength of light that is red (which has the longest wavelength of any light wave we can see). Through surfaces absorbing and reflecting different amounts of light, we can see a wide range of colors. This is true for how we see all colors, except for black and white. Objects appear white when they reflect all colors, and appear black when they absorb all colors. This is why light appears so bright and why the absence of light appears black.



Now that we understand how color comes from light, how are we able to see it? Well, to understand this, we must delve into the components of the human eye. The light reflected off objects travels to the back of our eyes, to an area known as the retina. The retina is covered in millions of cells called cones and rods, which detect this light. Rods help us see in dim light, and alone, only allow us to see shades of gray. Cones help us see color in bright conditions. They come in three types, allowing us to see reds, blues and greens. These cells work together, allowing us to see a spectrum of colors like the rainbow and beyond. When rods and cones activate, they send electrical signals to the brain, which interprets the number of cells that were activated and the strength of the signal that was sent. Through understanding these signals, the brain is able to create a colored image, all within a few milliseconds!

While this process happens for everyone, in reality, the colors we see may not be exactly the same. People with color blindness are missing a certain type of cone cell. For some, this can make it difficult to distinguish between red and green. On the other end of the spectrum, some people have four cone cells instead of three, making them even more sensitive to color differences.

Seeing in color is truly a fascinating and beautiful thing. It comes from both the biology of our eyes and the remarkable physics of the waves. So next time you see a beautiful sunset or flowers blossoming in spring, remember you have your brain to thank.

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Design by MELODY ZHANG

SIZZLING FOOD with STEAM

Writing by CARINE MEDELLUS | Editing by JOY LIN & GLADYS SMITH

While you can't see water in its gaseous form, its effects on cooking some of your favorite foods—hot dogs, dumplings—are unmissable. If you've ever looked at the surface of a boiling pot of water, you may have noticed a few clear spaces without mist. That space is **steam**—a term used to refer to hot water molecules in the air.

At a temperature of 212 degrees Fahrenheit, water changes from **liquid** to **water vapor**. This steam holds more heat than boiling water due to the additional energy required for the phase transition. In a closed pot, where air has difficulty escaping, steam rises and remains confined. When it comes into contact with food, it condenses back into a liquid, releasing heat onto the food. **Heat transfer** is what allows the food to cook.

One popular food known for its steaming process is **bao buns**. Baos are made from white dough stuffed with fillings—typically meat or vegetables. They were originally considered a filled version of **mantou**, a plain steamed bun. Their origin is traced back to a 3rd-century battle in the Sichuan province of China: **Zhuge Liang**, a military strategist, needed to cross a river with his army.

Legend said that the river was guarded by a deity who would not allow safe passage unless 50 human heads were sacrificed. Instead, Zhuge Liang offered 50 baos shaped like human heads, securing safe passage for his army.

If you're ever looking to escape a **deity**, here are a few steps in the steaming process. To prepare dumplings, first form the dough by mixing flour with hot water. Then, a filling—either sweet or savory—is chosen. Next, the dough is wrapped around the filling and shaped into a small pouch. Finally, the dumplings are placed into a steamer, creating its pillowy texture.

However, if you're not interested in escaping a deity, steaming can be used for various other reasons. For example, steam has been used for sterilization in **autoclaves**, machines that use steam under pressure to kill bacteria on medical equipment. But here, we've learned about steam for cooking. This process helps dumplings retain moisture and flavor using moist heat. It's also considered a healthier cooking method, since it does not require certain fats, such as oils. Steaming is, however, best for cooking food gently and evenly, preventing one side from burning while another remains undercooked. **Next time, consider this interesting method to make your favorite foods!**

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Design by MELODY ZHANG

DEFINITIONS

Deity: A god or goddess
Gaseous: In the form of gas
Molecules: Two or more atoms joined together
Vapor: Gas made from something that's usually liquid or solid

JELLYFISH OF THE SEA

Writing by MIRANDA MENG

Editing by ANTONIO MELONI & IVY LO

If you have been near the beach, you may have seen these somewhat clear, almost jelly-like little creatures known as jellyfish. However, so many kinds of these jellyfish look a lot different from what you might expect! They come in a variety of different shapes and colors, and not all of them have a sharp sting.

FRIED EGG

If you've ever cracked an egg onto a pan, you'll notice this jellyfish has a striking resemblance to it. Their purple stingers, while vivid in color, do not have much of an effect on humans. Meanwhile, the yellow "yolk" of this jellyfish's egg can grow up to 13 inches in diameter. Due to its harmlessness, small fish and crabs can sometimes be found inside this yolk!

UPSIDE-DOWN

This family of jellyfish can be found resting upside-down, with the bell side on the ground and the tentacles waving up toward the sky. They are usually found living in shallow water that is less than 3 feet deep.

IMMORTAL

A young jellyfish, like a kid, is known as a "polyp." When a polyp grows older and becomes like an adult, it is known as a "medusa." For the immortal jellyfish, instead of dying after this medusa stage, it shrinks in on itself—absorbing its tentacles back into its body—and becomes what looks like a blob. Then, this blob grows back into a polyp, and it starts this cycle of life all over again!

CRYSTAL

These jellyfish have thin, small tentacles that might take a bit of effort to see. However, in the dark, you might also see them give off a green-blue glow! The glowing part of this jellyfish is sometimes collected and used in science experiments that study which parts of the brain are active when we do different things.

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Design by DOAA ADAM

Pioneer Kids who have made a SPLASH!

Writing by CARMELA JENCKES • Editing by YIFAN WEI

Have you ever had a **GREAT** idea? I'm willing to bet the answer is yes. Whether it was a title for a short story, a **hypothesis** for a science experiment, or a brand new funky snack combination, you've probably been brainstorming new schemes for years.

Other kids, just like you, have made many contributions to the world we know today. Some of our favorite snacks, activities, and most useful tools are products dreamt up by children.

Imagine this: it's a hot summer day and you're wishing you had an ice cold treat to cool you off. What would you turn to? Maybe the frozen fruit-flavored treat that you might know as a popsicle?

During a San Francisco winter when he was just eleven years old, **Frank Epperson** accidentally invented what would later be known as an ice pop or popsicle. After making himself a drink with soda water and flavored powder, he left the mixture out on his porch overnight with the stirring stick still in it. The next morning, he found his mixture had frozen into a shape resembling today's popsicle and shared his product with his friends. Eighteen years later, Epperson applied for a patent for his invention, naming it the "Eppsicle" ice pop.

Maybe instead of an icy treat to cool you down, you'd prefer to take a dip in a pool. If you're planning on racing a friend, you might find yourself better off with a pair of swimming flippers.

At age eleven, much like Frank Epperson, **Benjamin Franklin** began to look for ways to bring his ideas to life. As a longtime swimmer, Franklin was looking for ways to more easily glide through the water. So, he got to work creating two oval shaped **paddles**. These paddles were similar to what we now know as swimming flippers or fins, but instead of wearing them on his feet, he wore them on his hands. Like any great inventor, Franklin put his new paddles to the test and noted that they allowed him to swim faster, but tired out his wrists more quickly. He also tested a pair of swimming sandals with his paddles, but noted that they did not allow him to swim faster.

If you haven't already imagined a hot summer day with popsicles and swimming, here's one more invention that might complete the picture.

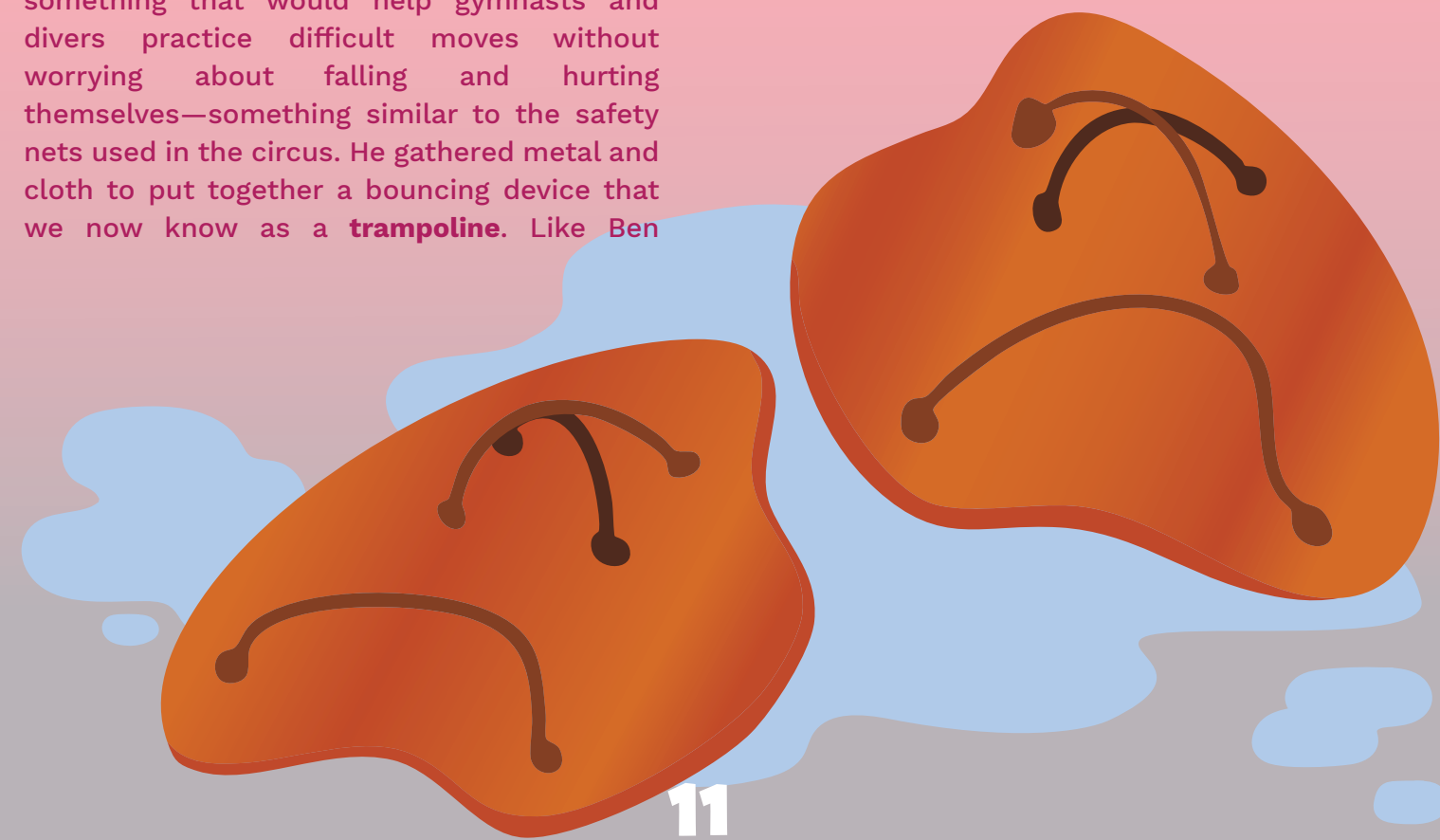
From a young age, **George Nissen** was involved in gymnastics and diving. He would visit the circus with his family and loved to watch the trapeze artists who would do complex tricks before jumping down into safety nets below. When he was sixteen, Nissen wanted to create something that would help gymnasts and divers practice difficult moves without worrying about falling and hurting themselves—something similar to the safety nets used in the circus. He gathered metal and cloth to put together a bouncing device that we now know as a **trampoline**. Like Ben

Franklin, Nissen had to put his product to the test to see if it worked and if he could make it better. So, Nissen brought the product to a summer camp for the campers to test. When his device was a success with the campers, he began to share it with more and more people. Eventually, he named it trampoline after the Spanish word for diving board—el trampolin.

A popsicle, a pair of swimming flippers, and a trampoline all make for a pretty fun summer day and the best part? They were all invented by kids just like you. These kids noticed something cool and wanted to make something that would make their lives (or hobbies!) easier. They each put their products to the test with friends, themselves, or even summer camp campers and noted ways to improve what they had made. If you have an idea for something new, you might as well put it to the test because you never know what might come from an idea (or even an accident)!

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The Magic of Wishing Wells

Writing by DAYLIA LIAN
Editing by MIA HAIL

Have you ever closed your eyes, tossed a coin into a fountain, and made a wish? If so, you have taken part in the ages-long tradition associated with wishing wells. The practice of wishing wells has fascinated people for generations, but where did they even come from?

Wishing wells have an interesting history that dates back to ancient practices and European folklore. People believed that saying your wish towards a well would help grant that wish—hence the name “wishing well.” This practice can be traced back to three different beliefs from ancient time periods. One of these beliefs traces back to ancient times when people thought that wishing wells had supernatural powers to help grant wishes, as the fresh water from wells that people drank was believed to be a special gift from the gods. Another belief from the Middle Ages was that water was associated with healing powers, so many people made wishes to wells for good health. Finally, wishing wells were thought to help give people the ability to control fate through their wishes being granted, and the concept of wishing wells even appears in Norse mythology in the tale of Odin sacrificing his eye to a well in exchange for wisdom.

People began throwing coins or small objects into the wells believing that the local spirits or deities that lived in the wells would help their wishes come true. Today, wishing wells remain popular as a form of hope for various cultures and countries and people continue making wishes by throwing coins into fountains, with coins acting as an offering to the water spirits to help that wish come true.

One of the most famous wishing wells today is the **Trevi Fountain** in Rome, Italy, with thousands of people tossing in a coin to make a

wish. As legend has it, if you toss a coin into the Trevi fountain, you will return to Rome one day. People now use it to wish for love, health, and more. There are also other famous wishing wells including the Upwey Wishing Well in England, Qianqiu Pavilion Wishing Well in China’s Forbidden City, and the Cinderella Wishing Well in Disneyland. Wishing wells are so popular that they appear often in TV shows and movies, including the wishing well in Sofia the First.

The next time you’re near a fountain or well, throw in a coin, make a wish, and see whether your wish comes true!



Design by
SYDNEY LIU

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How Movie Makers Create the Perfect Storm

Writing by ALLIE FRYDRYCH
Editing by GLADYS SMITH & MELODY TIAN

Movies wouldn’t be realistic without weather scenes—an argument in a thunderstorm, a romantic walk in the snow. But like most movie magic, the rain and snow you see on screen often aren’t real. The reasons for this might surprise you: real rain and snow don’t always show up well on camera. Raindrops can be too small or disappear into the background, while snow might look blotchy or uneven. Plus, filming in bad weather can be risky—no one wants expensive cameras to get wet! So, how do filmmakers make it work?

The easiest way to make rain is with a rain machine. These machines allow filmmakers to control when and how much rain falls, making it easier to film a scene. Unlike real rain, which can be unpredictable, artificial rain can be turned on and off whenever needed. Special rain machines can even spray water from multiple angles to make the raindrops more visible on camera. To make the rain stand out even more, filmmakers use bright backlights, which help raindrops catch the light and appear larger. Set designers sometimes build drains under the moviesets to avoid flooding the filming area.

Creating fake snow takes a bit more creativity. In the early 1900s, filmmakers used cornflakes painted white to create a snowy effect, but they quickly realized that walking on them was way too loud! Over time, different materials were used, including soap flakes, cotton, and even salt. In the 1978 movie *Superman*, filmmakers covered the Fortress of Solitude in tons of salt to make it look like an icy Arctic landscape.

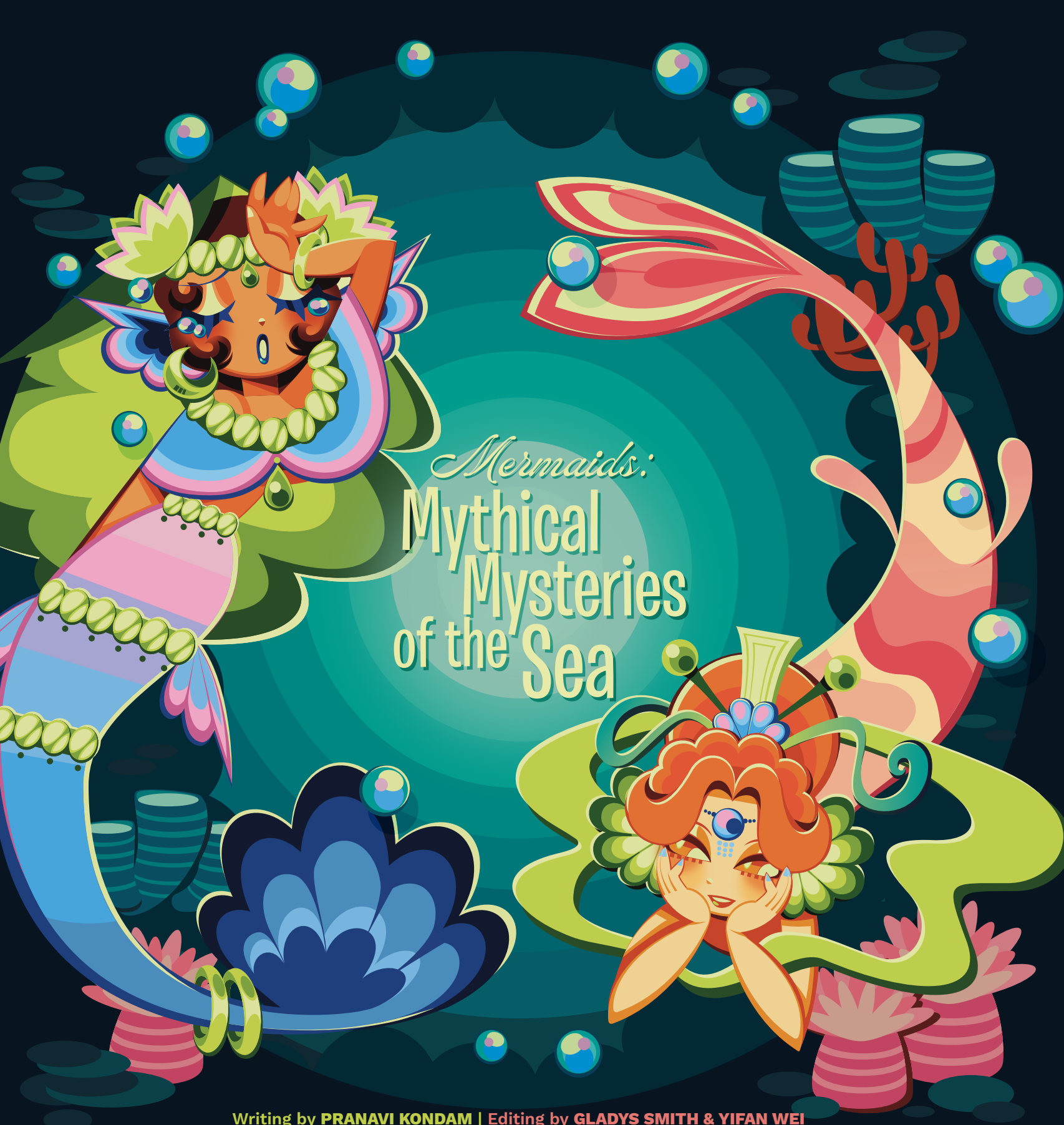
Today, filmmakers often blow tiny pieces of paper or plastic through the set with large fans to create falling snow. This method is still popular because it looks real and can easily be cleaned up. In modern films, computer-generated imagery—CGI, which means special pictures and effects made by computers—is also used to help snow scenes look even more enchanting and realistic.

Whether it’s rain or snow, filmmakers have plenty of tricks to bring weather to life on screen. From early Hollywood’s painted cornflakes to today’s high-tech CGI, movie magic keeps evolving. So next time you watch a rain-soaked chase scene or a snowy holiday movie, you’ll know just how much work went into making the weather look just right!

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Mermaids: Mythical Mysteries of the Sea

Writing by **PRANAVI KONDAM** | Editing by **GLADYS SMITH & YIFAN WEI**

The first stories of **mermaid-like creatures** can be traced back to **Assyria**, an ancient Mesopotamian kingdom, as far back as 1000 BC. In one Assyrian tale, a goddess named **Atargatis** falls in love with a human shepherd. Soon after the birth of their daughter, the shepherd dies, leaving Atargatis alone to grieve his loss. After placing their daughter in the care of doves, Atargatis flees to a lake, where she transforms into a beautiful mermaid and communicates with humans through fish, wanting to help the people and city of those who worshipped her.

However, instead of bedtime stories of mermaids, kids in **Ancient Greece** were probably told stories about **sirens**. Sirens are similar to mermaids as they were often portrayed as fishlike, but sometimes, they were also described as **birdlike**. When heroes would go on perilous, or dangerous, sea voyages, they would occasionally encounter sirens with captivating voices who sang them **songs about the future**. In the Odyssey, the main character, **Odysseus**, saves the rest of his crewmen from being enchanted by the sirens and leaving the ship, thereby ending the voyage.

Across the world, in **Korea**, a country that is surrounded by water on three sides, there are tales of mermaids as well! One of the most popular stories is that of **Sinjike**, a mermaid who is thought to live on Geomundo Island, a group of islands off the southern coast of the Korean peninsula. Sinjike is said to warn fishermen of imminent storms by throwing stones at cliffs. Sinjike was once a queen, but after following a man she loved to Geomundo, they both died and Sinjike was **reborn as a mermaid**. This story is so well-known that a giant, bronze statue of Sinjike sitting on the moon was constructed on Geomundo Island in 2010.

The story, **Pania of the Reef**, originated in **New Zealand**. In this tale, a mermaid named **Pania** lived on the coast of Napier, a New Zealand city. During the day, Pania would swim about with other merfolks, but at night, she would travel to the bay to see **Karitoki**, the young son of a Maori chief. Pania, being a mermaid, could only see Karitoki in the evenings as she had to spend her mornings with other merfolk on the coast. The village refused to believe Karitoki's marriage because they had never seen Pania, as she would only visit Napier at night when they were all asleep. As a result, Karitoki consults a Maori elder who tells him that if Pania is fed **cooked food**, she would become fully human and be unable to return to the sea. Later that night, when Pania is asleep, Karitoki tries to feed her the cooked food, but Pania suddenly wakes up. Saddened that Karitoki would try to remove her powers, Pania **runs away to the sea** where her family of merfolks guide her to safety. It is said that sometimes, if you look closely enough in deep water, you can see Pania, far away from Karitoki's trickery. In the town of Napier, there is a statue of Pania that was unveiled in 1954.

Just like there are stories of merfolk around the world, there are sightings of them as well!

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One of the oldest pieces mentioning merman sightings is by **Pliny the Elder**, an Ancient Roman writer famous for Naturalis Historia. In this book, he writes how off the coast of **Portugal**, he saw mermen that were similar to the half-fish, half-humans he had heard about in popular myths and stories. However, their upper bodies were completely covered in the **same skin as the bottom half**. He writes about how the mermen he saw were **wailing** and not singing like he had expected. A lot of the tales he had heard likely said that mermaids were mysterious and beautiful young maidens with stunning voices. Based on what we now know about marine animals, we can conclude that what he saw was actually not mermen, but likely **seals**. Seals are aquatic animals that come in a variety of colors and primarily eat seafood. They have tails that look similar to what we think a mermaid would have!

Christopher Columbus is famous for possibly being one of the first European explorers to discover the "New World," but lesser mentioned was his run-in with mermaids on his journey to the Americas from Spain. In his writings, he remarks that he was disappointed about how the mermaids looked and that they were **not as beautiful as he'd had imagined**. Based on the location of his alleged sighting and other texts, we can assume that what he saw were **manatees**. Manatees are large sea animals that are herbivores, so they primarily eat grasses and plants that grow in water. They are also gentle and curious, and often come to sailors for belly rubs. While Columbus might not agree, manatees are extremely cute, even being referred to as **sea cows**!

While there has been no scientific documentation of mermaids, there have been many stories and writings about seeing them. In fact, a fisherman is even said to have seen mermaids here in **Pennsylvania** in 1881! While merfolk probably do not exist because of how unlikely it would be for humans to be able to breathe underwater, it is fun to imagine what they would be like.

What do you think? Do you think you could be the first to find a real mermaid?



Living on the Edge

Writing by MARILEE HERNANDEZ

Editing by MELODY TIAN & MARIN AGRIS

Are you a daredevil? Do you like living on the edge? Does danger thrill you? Well, extreme water sports may be just what you are looking for. Incoming warning: the following sports push your body to the limit, so if you're ready, let's explore surfing, cliff diving, and wakeboarding.

Let's Ride the Wild Waves Together!

After winter, the best feeling is heading to the beach and laying on the hot sand as the sun shines on your skin. When you grow tired of staring at the sky and listening to the ocean waves, here are some thrilling and exciting activities to do instead.

I hereby introduce to you **surfboarding**, a sport where you stand on water. How, you may ask? With a board, silly! Imagine rushing towards a gigantic wave, ready to show all your friends what a pro you are. After spending a long time perfecting your balance, timing, and reading the waves, you are able to do flips, spins, and other super crazy tricks. However, this excitement may not be enough, which is why you may be glad to hear that some waves can be as tall as twice the height of basketball hoops. This sport requires a lot of mobility and bravery. Do you have the guts?

Ready to Live on the Edge?

What do you know about **cliff diving**? Well, this sport is not for the weak. Essentially, it is when you climb to the top of a cliff and jump off into the ocean below. Now, be cautious because this requires excellent control over the body—specifically regarding your form—along with lots of practice. Before you hit the water, your back must be perfectly straight with your body and your arms to your sides. Not just anyone can jump off a cliff that is over 100 feet high—it requires someone both daring and well practiced to perform such a task.

You might tell yourself, “it's only scary for a few seconds, I can do it!” However, from the moment you get near the peak and jump off, those few seconds feel like an eternity. But if you're a thrill seeker, this will definitely amount to your wildest dreams.

String Along the Boat...

If you desire speed and enjoy performing air tricks, **wakeboarding** may be just the sport for you. Basically, you are tied by a string to the back of the boat as it zooms through the ocean. The boat at high speeds will make some of the largest waves, and then at that moment, you can make your greatest dreams come true. All of your problems seem to evaporate when you're in the middle of the ocean far away from the city. With speed and huge waves, you can make huge springs, land gigantic flips, and jump as high as you want. The salty smell and sound of waves will ensure a blissful time. Can you imagine what it is like to be an acrobat in the ocean? Give wakeboarding a try to find out!

If learning about these water sports excites you; if you gained some sort of hunger for this thrill and have what it takes, then go for it! Seek a trained professional who can teach you how to live life at the edge—safely. This is your moment. Become a water sport pro!

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History of the Schuylkill: The River that Built Philadelphia

Writing by SRISHTI BANSAL
Editing by JOY LIN

If you live in Philadelphia, you've probably visited **the Schuylkill River** before! The Schuylkill flows through Fairmount Park and divides our city in two, with West Philadelphia on one side and most of North Philadelphia, South Philadelphia, and Center City on the other, before flowing into the Delaware, the river forming Philadelphia's western boundary.

The name “**Schuylkill**” comes from the old Dutch words *schuilen*, which means “to hide” and *kil*, which means “creek.” Together, the name means “hidden river,” because the river was much more hidden by plants than the Delaware. Before Dutch settlers arrived, it had been known as *Ganshowahanna* meaning “Falling water” or *Manayunk*, meaning “where we drink,” by the Lenape people who resided in the area.

The Schuylkill is a regular part of life for many Philly residents, however, it isn't only a geographical feature. This river was a crucial part of our city's past, and helped become the place that made such a big splash in history!

When William Penn founded Philadelphia in 1682, the river was a primary source of fresh drinking water for Philadelphia residents, it was a common location for fishing, and goods were regularly transported across its waters. The Schuylkill was also immensely important during the Revolutionary War. You may have seen the famous painting of Washington crossing the Delaware River. However, his multiple crossings of the Schuylkill were possibly just as important. In fact, Washington needed to cross the Schuylkill to get to the Delaware!

Since wastewater was often dumped directly into the river, it eventually became too unhealthy to drink directly. **By 1815**, the Fairmount Water Works had been built on the river to provide clean drinking water. This was the country's first public water system, and actually became a tourist attraction for people around the world, including European royalty!

By 1820, the Schuylkill Canal was completed, which allowed for a new era of industrialization* in Philly. The canal allowed boats to have a route for transporting coal from Pennsylvania's mining regions to Philadelphia factories.

The banks of the Schuylkill began hosting mills, oil refineries, and even shipyards! There were also many coal, textile, and steel factories. While this was an exciting time, these industries dumped much of their waste into the river, which had some unintended consequences.

By the early 20th century, Schuylkill's role had drastically changed. Far from the source of drinking water that it had once been, the river was so polluted that fish couldn't survive in it, and parts of the river turned black from waste. Philadelphia Department of Public Health officials warned residents not to touch the water, and there were even fires on the surface due to oil spills.

In 1945, Philadelphia launched the Schuylkill River Desilting Act, and alongside federal laws like the Purity of Water Act and the Clean Stream Law, this initiative caused more than 16.5 million cubic yards of sediment* to be removed from the river. The Clean Water Act of 1972 later stopped industries from dumping even more waste into the river.

By the 2000s, wildlife returned to the Schuylkill, and today the area has once again become an area of enjoyment and recreation. The Schuylkill River trail is even ranked one of the best riverwalks in the United States today!

Schuylkill built Philadelphia up from a colonial town, to an industrial center, to a modern city, and made a comeback from a very difficult period of pollution. The next time you visit the Schuylkill, think about the history of our amazing waterway!

* **Industrialization**: the process of using machines in factories to make goods more quickly and in larger amounts

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Sunken Secrets: Famous Shipwrecks

Writing by LAYLA SAYED

Editing by YIFAN WEI & ANTONIO MELONI

Design by BRENDA CHAN

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From the shores of Greece to the depths of the Atlantic Ocean, shipwrecks are scattered across the world. While you may have heard of the Titanic, there are others that are ancient and have offered us fascinating glimpses into the past. Let's dive in and discover some of these remarkable underwater treasures together!

1 Titanic - North Atlantic Ocean (41.7269° N, 49.9483° W)

When talking about famous shipwrecks, the Titanic is the most famous of them all! You may have seen the famous movie starring Leonardo DiCaprio or read books about this giant ship. The Titanic was a luxury passenger ship that set sail on its very first trip from Southampton, England, to New York in 1912. Sadly, crew members saw an iceberg too late; the ship swerved and crashed against the mountain of ice, a massive slash alongside watertight compartments on the vessel. Many experts believe that if the ship had hit the iceberg head on it could have survived. It was one of the biggest and most tragic shipwrecks in history, but today, people still remember the Titanic through movies, museums, and stories!

2 Lusitania - Off the coast of County Cork, Ireland (51.25° N, 8.33° W)

The Lusitania was a giant passenger ship, like the Titanic, that carried people across the Atlantic Ocean. In 1915, during World War I, the ship was sailing from New York to England when a German submarine fired a torpedo at it! The German military found out that the Lusitania was carrying ammunition for Britain, which was their justification for the attack. In the end, however, the ship sank very quickly off the coast of Ireland. Sadly, many people didn't survive, but this event helped bring the United States closer to joining the war. Today, the Lusitania remains deep underwater, but its story is still remembered in history.

3 Andrea Doria - Atlantic Ocean, near Nantucket, Massachusetts, USA (40.5000° N, 69.8500° W)

The Andrea Doria was a fancy Italian cruise ship that sailed the ocean, taking passengers on exciting trips across the Atlantic Ocean. However, in 1956, while traveling near Nantucket, Massachusetts, a thick fog made it hard to see. Another ship accidentally crashed into it, causing the Andrea Doria to sink. Luckily, most of the people on board were rescued! Even though the ship is now at the bottom of the ocean, divers still explore its remains today.

4 Antikythera Shipwreck - Off the coast of Antikythera, Greece (35.8794° N, 23.3078° E)

Over 2,000 years ago, a Greek ship sank near the island of Antikythera in Greece. It stayed hidden under the sea until Greek sponge divers found it in 1900. However, that isn't what makes this shipwreck unique. The most amazing discovery was a mysterious object called the Antikythera Mechanism. Scientists believe it was an ancient computer used to track the stars and planets in order to plan important events like the Olympics! This shipwreck is one of the oldest ever found, and people are still uncovering its secrets today.

5 Cape Gelidonya Shipwreck - Off the coast of Turkey (36.1600° N, 30.4000° E)

Over 3,000 years ago, a small Bronze Age trading ship sailed across the Mediterranean Sea carrying shiny copper and tin to make metal tools. However, near the coast of Turkey, the ship hit underwater rocks and sank! It stayed hidden for thousands of years until divers found it in 1960. This was one of the first ancient shipwrecks ever explored by archaeologists, and it helped them learn a lot about early trade and how people built ships long ago!

Although these shipwrecks rest at the bottom of the sea, their stories have come to the surface and so have many of the secrets they hold. Who knows what other secrets are hidden beneath the waves?

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Writing by HEEJON SHIN | Editing by YIFAN WEI & IVY LO

Filtering Toxic Metals Through Plants

Water is essential for sustaining life. Plants need water to make food through a process called **photosynthesis**, and humans need water to perform daily functions such as walking and breathing. However, many studies revealed that there are **toxic heavy metals** in our water system. These include **lead, copper, mercury, and arsenic**—doesn't that just sound scary? Originating from industrial waste, coal mining, and domestic waste, these metals can have negative effects on the human body. For instance, **lead and copper** can poison our liver and cause **renal dysfunction, brain damage, higher risk of cancer, and nerve development issues** in children. Major instances of lead poisoning occurred in Flint Michigan due to lead pipes, as well as the Vietnamese village of Dong Mai due to improper disposal of batteries.

It's important to prevent these events from ever happening again, so scientists are working on new methods of extracting, or taking out, toxic metals out of water sources. From nanotechnologies (very small technologies) to cool chemistries that clump these metals to filter out easily, scientists are looking for new, effective methods to filter out these metal ions with low costs.

One of these interesting methods is called "**biosorption**," where metal ions, or very small pieces of metal, stick to dead (and even living) plant materials. Many ions have positive charge, meaning **lead (Pd)** can lose a few electrons and become **Pd²⁺** or **Pd⁴⁺**. On the other hand, plant surfaces have a lot of different molecules that make them negatively charged. When positively charged objects attract negatively charged objects, many of these metal ions are able to '**stick**' to the surfaces of these plants. There are also other cool chemistries that occur during this process. For instance, some molecules can form a '**cage**' around the positively charged metal ions so that the or cluster of molecules can be extracted easily.

While implementing the entire biosorption process is fairly complicated, the main idea is very simple. **Agricultural waste**, such as expired vegetables, are great plant-based starting materials. These plant wastes are chemically modified so that the surface area is bigger and more negatively charged to be able to remove as many metal ions as possible. Then, these sheets of plant material are placed in critical points in the water system where lots of metal contamination is found to help filter the water.

Overall, the biosorption process is an eco-friendly method of extracting dangerous metals from water sources. By enhancing and optimizing this filtration method, many scientists are hopeful that unfortunate metal contamination events can be prevented in the future.

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THE SPLASH BROTHERS



Writing by ANJALI SHANKAR
Edited by MELODY TIAN & JOY LIN

The game of basketball has changed a lot since the creation of the National Basketball Association (NBA). Even the "**three-pointer**," where a player shoots behind a curved line to score three points instead of two, was not always a part of the game. The American Basketball Association (ABA) first introduced it in 1967, but the NBA did not adopt it until 1979. Players did not shoot many threes in the 80s and 90s; they thought a shot from 23 feet away was not worth the extra point. Now, it has become an essential skill that every young basketball player strives to master thanks to a duo known as the "**Splash Brothers**." The Splash Brothers, **Stephen Curry** and **Klay Thompson**, have changed NBA basketball forever with the Golden State Warriors.

Stephen Curry was selected by the Warriors in the 2009 NBA draft after his impressive basketball play at Davidson University. People doubted Curry's ability to thrive in the professional league with concerns about his short height (at least for a basketball player) and tendency to shoot "too many threes." They believed that despite the shot being three points instead of two, it was too difficult and always more favorable to shoot closer to the basket. However, he proved all the doubters wrong by becoming a superstar for the Warriors and a household name by shooting the ball at a high level. Curry has two Most Valuable Player (MVP) awards, eleven All-Star appearances, ten All-NBA appearances, one Finals MVP award, two 3-point contest wins, and has scored the most points in a season twice.

He has scored the most three-pointers of all time at an extremely high rate of 42.3%. For context, the

current average three-point rate for an NBA player is around 35%. After sixteen years of being in the league and still playing at a high level in 2025, Stephen Curry is sure to be a hall-of-fame player.

The Splash Brothers would not be an iconic duo without the other half. Klay Thompson was selected by the Warriors in 2011 and has become known for his defense and excellent explosive 3-point shooting with a rate of 41.2% in his career. Thompson has the record for most points in a 12-minute NBA quarter (37!) and most three-pointers in a game (14!). He has five All-Star appearances, two All-NBA appearances, a 3-point contest win, and an All-Defensive appearance. Now, Thompson plays for the Dallas Mavericks but is beloved by Warriors fans for his thirteen years in California.

Together, the Splash Brothers have dominated basketball. The duo won four NBA championships in seven years and set the record for most wins in a season (73 wins in 82 games). Their success has encouraged other players to perfect their three-point shots at longer and longer distances. For example, players like **James Harden** and **Damian Lillard** have also become stars with a great three-point shot in their skill set.

Thanks to the Splash Brothers, basketball fans can watch exciting, long-distance shots and see how players adapt to different play styles.

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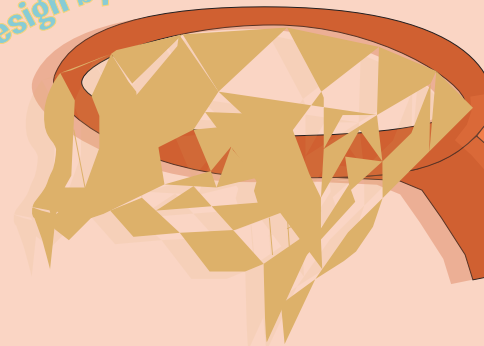
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PERIOD

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Design by DOAA ADAM



Design by MELODY ZHANG



Nature's Canvas: Why Animals Burst with Color

Writing by **ALLAHA MOHIBY**
Editing by **MADELINE LACH & ANTONIO MELONI**

Imagine walking into a rainforest, not a dull, monochromatic world, but a colorful explosion. Scarlet macaws overhead, their feathers a symphony of red, blue, and yellow. Tiny poison dart frogs, gemstones brought to life, carpet the forest floor in their electric blues and oranges. Or, imagine a coral reef, a rainbow of fish in every hue darting through the brightly colored corals. Why so much color? Why does nature paint its animals with such splashes of shades?

Some animals wear their shades and hues as a blatant and immediate threat signal. Think of the poison dart frog. Its vivid coloration is not just for show; it's a strong threat signal to predators. These frogs secrete strong poisons in their skin, and their bright colors are a signal: "Danger! Proceed at your own risk!" This strategy, **aposematism**, is a very effective deterrent. Predators come to associate the bright color with a stinging or even deadly experience, and soon avoid these colorful creatures. The brightness of the color is linked with the strength of the poison and thus is an excellent mechanism for discouraging predators. Different caterpillars, insects, and snakes all employ the same tactic, promoting themselves by virtue of being extremely brightly colored when poisonous.

Color has an important role in mate attraction and selection in most animals. Think of the peacock male and his showy exhibition of multicolored feathers. This display is not an arbitrary **assemblage** of colors; it's an extremely choreographed visual symphony designed to impress potential mates. The same is true for most other animals, from the garish plumage of birds of paradise to the shimmering scales of tropical fish. These colors are visual cues that refer to how healthy the bodies of these animals are.

While some animals use color to advertise conspicuousness, others use it to **camouflage**. This is camouflage, the art of using colors to blend in with the environment and remain unseen. Take the chameleon, for example, a true master of disguise. These reptiles have the ability to change the color of their skin to blend in with their surroundings, from leaves, to bark, to rocks.

This is important for hunting as well as evading predators. One species, the *Trioceros laterispinis* chameleon from Tanzania, can blend almost perfectly to a lichen patch. Most insects, such as moths and butterflies, have evolved intricate patterns and colors that mimic the colors and textures of their surroundings, making them almost invisible to the naked eye. Even in very colored **ecosystems** such as coral reefs, animals use color to create a form of camouflage. The very colored patterns of reef fish can break up their outlines, making them difficult to spot among the colorful corals and algae.

Animal coloration is not just for the purpose of being beautiful or camouflage. It also serves several functional purposes. Some colors are developed with pigments that act as natural sunscreens to protect animals against harmful ultraviolet radiation. Such pigments can also aid in **thermoregulation**, enabling the animal to absorb or reflect heat as needed. Color can even indicate an animal's health state in some species. For example, the bright red coloring of some birds is typically due to diet and health. Less intense color might be an indication of illness or starvation.

The world of animal coloration is a testament to the incredible variety and adaptability of life on our planet. Scientists are continually trying to understand the mysteries of how animals produce and use color, learning more about the complex interplay among genetics, environment, and behavior. All that brilliant color, all those intricate patterns, bear witness to survival, reproduction, and adaptation. From the bald threats of poisonous frogs to the cunning deceptions of secretive insects, the hues of the world of animals are a constant inspiration and source of wonder.

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Design by **KENZIE MACDONALD**

Got Water?

Writing by MARCELLA SOEWIGNJO | Editing by MADELINE LACH and GLADYS SMITH

Three Awesome Science Experiments You Can Do at Home With Water

Microscopes! Petri dishes! Test tubes! Magnifying glasses! These are the tools we often tend to think about when discussing science experiments. But what if I told you that you didn't need all this fancy equipment to start your own at-home science investigations? What if I told you all you needed was a little bit of water and a few things you may be able to find in your kitchen? Here are three epic experiments you can do at home!

1. Pepper and Water Trick: This experiment is simple – all you need is a little bit of pepper, water, a plate, and some soap. Start off by pouring some water onto a shallow plate, then sprinkle pepper to cover the entire surface of the water. Then, dip your finger in some dish soap and proceed to dip your finger into the center of your water and pepper solution. Watch as the pepper magically floats away from your finger! This is because of something called surface tension. Water molecules like to stick together, which allow for the pepper flakes to float on the surface. When you dip your finger covered with dish soap into the solution, the water molecules no longer are able to stick together as much – you have broken the surface tension, or the protective tarp, created by water molecules. This causes the pepper flakes to move away with the surrounding water molecules.

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2. Water Xylophone Experiment: For this experiment, all you need are a few jars, a pair of wooden chopsticks, and some water. Find three identical jars, and make sure the lids of these jars are open. Tap the sides of the jars. Do they all produce the same sound? Fill each jar with varying amounts of water (one jar a quarter full, the other halfway full, and the other three-quarters of the way full). Tap the jars again. Do they still produce the same sound? Because sound travels differently through different mediums (such as water), the more water you add to the jar, the lower the sound pitch will be.

3. Rainbow in a Jar: Fill three cups with water. Then, add a few drops of different colored food coloring to each cup. You should have three cups with different colored water. In the first cup, add one spoon of sugar. In the second cup, add two spoons of sugar. In the third cup, add three spoons of sugar. Stir the water until the sugar in each cup dissolves. Pour some of the water from the first cup into a clear jar until the jar is about 1/3 full. Then add the water from the second cup until the jar is about 2/3 full. Finally, add the water from the third cup to fill up the rest of the jar. You should notice that the different colors of water separate from one another. Why? The colors stay separated in the jar because each layer of water has a different density. The more sugar that's dissolved, the heavier (more dense) the water becomes.

WORD SEARCH!

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

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Splash
Diving

Water
Titanic

Wish
Popsicle

Coral
Metal

Mermaid
Basketball

Design by AMANDA LO

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