UnEarthed

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sense

UNIVERSITY OF PENNSYLVANIA

Letter from the Editors

Dear Readers of UnEarthed,

On behalf of UnEarthed's Executive Board and our student-led team of writers, editors, and designers, we welcome you to our ninth issue of UnEarthed. It is our pleasure to share with you, SENSE! In this issue, you will find articles across the fields of science, psychology, and pop culture that our team chose especially for you. After reading this edition, we hope you learn something new and are more curious about the world around you.

When we think about our senses, we first think about the five basic human senses: vision, hearing, touch, smell, and taste. But once you put on your thinking cap and think outside the box, there are many more senses! Here, at UnEarthed, we strive to build each issue on a general idea that can be interpreted in many different ways by each and every one of us. In this issue, you will find articles about why we laugh at jokes, why we crave sweets, and how we keep track of time. Beyond articles on the interesting characteristics of being human, you can read articles about a brief history of virtual reality, senses that animals have but humans lack, and the colorful Grand Prismatic Spring. With our team's broad interpretation of sense, we hope you discover something new and are inspired to learn more about one of these topics!

After reading the articles, we hope you spend some time testing your knowledge with our interactive pages. With crosswords, jokes, and puns all about the magazine, we hope you have some fun and test your sense of humor! It was a joy for us to put together this issue of UnEarthed for you. Be on the lookout for new editions of UnEarthed that are published twice every year, always with a new and exciting theme specifically chosen to spark the curiosity of our readers! And if that sounds like too long of a wait, UnEarthed has a digital edition, too! Visit www.unearthedpenn.com to explore digital-only articles, fun quizzes, and informative videos—all uniquely made by our amazing Digital team! All of our print magazines are also uploaded to our website, so you can read them online if you missed previous issues. Additionally, you can even listen to your favorite articles on our website read by our team members and follow along at home!

As always, please feel free to fill out the Suggestion Box on our website (https://www.unearthedpenn.com/suggestion-box) with any recommendations to improve the publication or any article topics that you would like to see in future issues. We welcome all suggestions from all our readers! And if you happen to be on social media, you can "Like" us on Facebook at "UnEarthed Penn" and follow us on Instagram @unearthed.penn to stay up-to-date on all things UnEarthed.

We hope you enjoy this edition of UnEarthed, and we wish you an amazing school year!

Emily Sheng
EDITOR IN CHIEF

Sam Hirschhorn
MANAGING EDITOR

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GRAND PRISMATIC SPRING

Nature's Full-Time Rainbow!

Writing by ANUSHREE ANEJA | Editing by SINAIA KEITH LANG & ZANE PASHA

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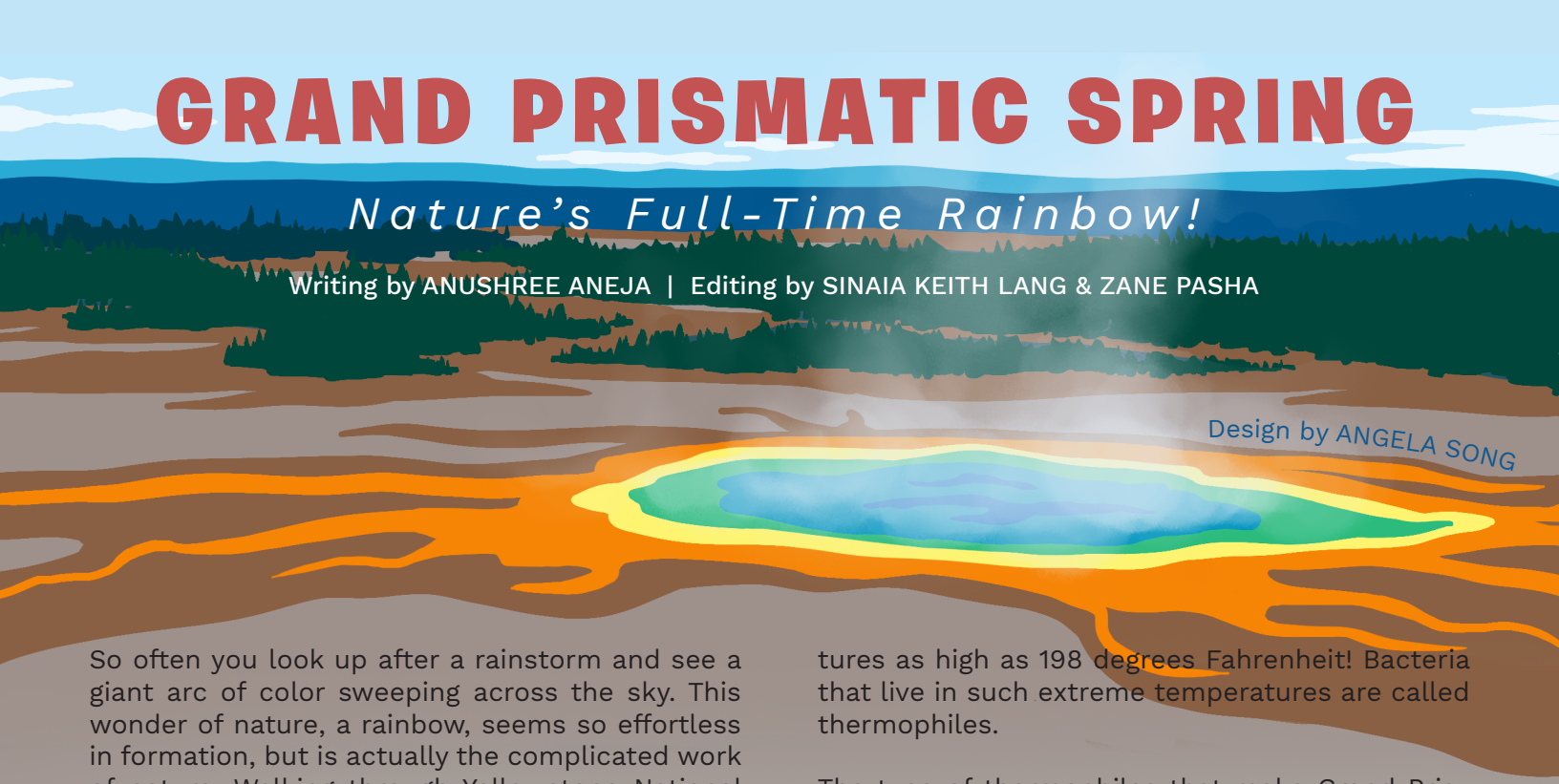

So often you look up after a rainstorm and see a giant arc of color sweeping across the sky. This wonder of nature, a rainbow, seems so effortless in formation, but is actually the complicated work of nature. Walking through Yellowstone National Park, you can see something that looks just like a rainbow, except you need to look below you to see it.

Yellowstone National Park is famous for its many hot springs, bodies of water on Earth's surface that are naturally heated to temperatures higher than that of the air by volcanic activity underground. Yellowstone has over 10,000 of these, which millions of tourists come to explore every year. One of these that draws particular attention is known as the Grand Prismatic Spring, the largest hot spring in Yellowstone with staggering measurements of 370 feet across (bigger than the length of a football field!) and 121 feet deep (bigger than a 10-floor building!). This makes it the third-largest spring in the world and the largest in North America. It is so large that it discharges over 560 gallons of water a minute — almost 450 Olympic-size swimming pools a year. It has an orange circle around the outside, with the colors changing from yellow to green to a dark blue in the center, just like nature's mood ring!

But why do these colors exist here? The reason is temperature. As the water bubbles out of the center of the spring and slowly moves outward, it cools, forming rings of different temperatures. These different temperatures provide homes for many kinds of bacteria that thrive in their own specific environments. You may be thinking about how you get too hot even from just a 100–degree Fahrenheit day in Philadelphia. These bacteria are truly wonders of nature and can enjoy temperatures as high as 198 degrees Fahrenheit! Bacteria that live in such extreme temperatures are called thermophiles.

The type of thermophiles that make Grand Prismatic so colorful are cyanobacteria, which make their own energy in a process called photosynthesis. The colors come from these different bacteria using different chemicals called pigments to capture light energy. These pigments then reflect certain colors back to our eyes. Bacteria within different temperature areas will have different pigments and will be different colors. This gives us the beautiful spectrum of colors that sweeps the floor of Grand Prismatic.

This hot spring is open to anyone who wants to see it. If you visit right now, there is a bridge built above the ground that lets you walk near the edge of the spring and get a gorgeous view of all of its colors. However, the wonderful colors of Grand Prismatic may not always stay this way. As visitors pass through, many throw belongings like coins, water bottles, and other forms of pollution that damage the environment of the organisms that live in the spring.

Grand Prismatic is currently one of the most photographed sights in Yellowstone. To make sure this hot spring - and all other natural wonders of the world - stays beautiful, be sure to leave nothing but footprints when you visit.

REFERENCES

1. Geiling, N. (2014, May 7). The science behind Yellowstone's rainbow hot spring. Smithsonian Magazine.
2. U.S. National Park Service. (2019, October 28). Grand prismatic overlook trail. NPS.gov.
3. U.S. National Park Service. (2021, August 3). Hydrothermal features - Yellowstone National Park. NPS.gov.
4. U.S. National Park Service. (n.d.). Grand prismatic spring - Old Faithful virtual visitor center. NPS.gov.
5. Yellowstone geysers - Midway geyser basin. (n.d.). Yellowstone National Park.com.

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SPICES
FROM AROUND THE WORLD

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1 Cinnamon

is native to Sri Lanka, a country off the southern coast of India. The spice comes from the bark of a tree and is used in so many of your favorite sweet treats including cookies, french toast, pies, and more!

Fun fact: During the Roman Empire, cinnamon was worth more than gold!

2 Rosemary

Is native to the Mediterranean region but is grown all throughout Europe. The rosemary plant can grow up to 6 feet tall! You can find rosemary in soups, stuffings, seafood, and much more.

Fun Fact: Rosemary has been scientifically proven to strengthen memory!

3 Vanilla

Is the fruit of orchid flowers. Vanilla is not found in many parts of the world. It is only produced in Madagascar, Mexico, and Tahiti. The process of making vanilla is very complicated and involves lots and lots of steps. The vanilla bean needs to be pollinated, harvested, and cured all by hand.

Fun Fact: Madagascar produces 80% of all the world's vanilla!

4 Nutmeg

Is the seed of a tropical evergreen tree. The tree is native to the Moluccas (also known as the Spice Islands) in Indonesia. Nutmeg is found in many baked goods, puddings, and drinks such as eggnog. Nutmeg trees can reach a height of 60 feet tall!

Fun Fact: In the early 1600s, nutmeg became very popular because it was thought to ward off the plague.

5 Saffron

Is picked from the center of a bright purple flower. Saffron can be used to dye foods and add a strong, bitter taste. The spice is known to be very expensive because the harvesting process is very difficult and takes a long time. You can find saffron in a lot of Mediterranean and Asian dishes.

Fun Fact: Saffron has been used to dye royal garments in several different cultures.

6 Sesame seeds

Come from the sesamum indicum plant which is indigenous to the Sunda Islands in Indonesia. The plant has been harvested for over 4,000 years, making it the oldest known oilseed plant in history!

Fun fact: According to Hindu mythology, sesame seeds were blessed by the god Yama and are known as the "seed of immortality."

7 Paprika

Is made from dried red bell peppers and can be found in tropical regions such as Mexico, Peru, and Spain. However, the finest paprika —known as rose paprika — comes from Hungary. Paprika can add a depth of flavor to many different dishes, ranging from mac and cheese and hummus to traditional Hungarian goulash and deviled eggs.

Fun fact: Paprika is so famous in Hungary that they have a whole paprika museum!

REFERENCES
1. Britannica, T. Editors of Encyclopaedia (2021, December 13). Cinnamon. Encyclopedia Britannica.
2. Britannica, T. Editors of Encyclopaedia (2021, May 7). Nutmeg. Encyclopedia Britannica.
3. Britannica, T. Editors of Encyclopaedia (2020, March 26). Paprika. Encyclopedia Britannica.
4. Britannica, T. Editors of Encyclopaedia (2021, July 25). Rosemary. Encyclopedia Britannica.
5. Britannica, T. Editors of Encyclopaedia (2021, August 26). Saffron. Encyclopedia Britannica.
6. Coughlan, S. (2017, May 4). Exam revision students 'should smell rosemary for memory'. BBC News.
7. Guardian News and Media. (2010, September 14). Consider nutmeg. The Guardian.
8. Stewart, M., Syndicate, N. Y. T., & 2001, C. (2021, August 20). True cinnamon can be a rare but fragrant find. Chicago Tribune.
9. Pacific Spice. (2020, July 7). Sesame seed: The facts and flavors of one of the most versatile crops. Pacific Spice Company.
10. Paprika Museum. (2019, December 16). PaprikaMolnar.
11. Pitru Paksha Shradh: Know why Black sesame or 'kala til' is offered to dead relatives. (2020, September 2). Times Now News.

Finding the Humor in Science

Writing by **SRUTHI SRINIVAS** • Design by **VANESSA LIEW**
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Picture this: two psychologists and a student walk into a classroom. These scientists have spent months, maybe years, studying the finest comedians to discover what makes a good joke. Finally, they think they've cracked the code! This joke, the ultimate joke, will surely make this student laugh, and the researchers' lives' work will be complete. With full confidence, they turn to the child, and proceed to tell ... a dad joke. The student groans in annoyance, leaving the scientists dumbfounded. What did they do wrong?

Turns out: it's hard to say. Most people understand when a joke is being told – the student recognizes what the psychologists were attempting to do after all – but not everyone finds the same jokes funny. Why they don't is a phenomenon that has been studied for millennia; as a result, there have been several theories developed as explanations. See if any of these makes you laugh, and you'll be well on your way to understanding your own sense of humor!

Let's start with the ancient Greek philosopher Plato and his superiority theory. According to Plato, people laugh at younger versions of themselves or at the misfortunes of others to feel better about themselves.

For instance, YouTube videos of dogs and babies accidentally falling down get millions of views and likes because, if you're thinking like Plato, it's funny to see something bad happen to someone that's not you. This theory doesn't explain, however, why we laugh when heroes in comedic movies escape doomed situations using physically impossible methods, like Charlie Chaplin's cartwheels on the side of a train. If we laugh at things even when we don't compare ourselves to the object of the joke or when we're rooting for the person we're laughing at, then it's safe to say that the superiority hypothesis doesn't fully stand the test of time.

Thus, to challenge Plato's superiority theory, philosophers introduced the incongruity theory, which remains the main theory behind humor expression in psychology. James Beattie and Immanuel Kant were 18th-century advocates: they stated that we find it humorous when contradictory concepts are introduced then turned on their head in the same breath. To put it simply, it's funny when our expectations don't match reality or when there's a hidden meaning behind a statement. Take a stand-up comedian, for instance, who tells a story that seems to be going in a particular direction (called the set-up) before dropping an unexpected end (the punchline) to that story. This feature is what incongruity means – a difference between what we expect and what we receive in a joke. And it makes us laugh.

That idea sounds about right, but there are, again, several things about humor that the incongruity theory doesn't explain. Why do some people laugh at unexpected punchlines in so-called 'dark humor' (making light of serious or taboo topics), for example, and why do other people react to such jokes with disgust or anger? Why do some people still find slapstick, or exaggerated physical comedy, funny when it doesn't rely on words?

Acknowledging these gaps, biologists David Sloan Wilson and Matthew Gervais attempted an evolutionary approach behind what causes spontaneous, uncontrollable laughter (Duchenne laughter). Duchenne laughter arises from the brainstem and the limbic system, which is responsible for our emotions. It is also the form of human laughter that evolved first. According to Wilson and Gervais, spontaneous laughter became necessary for group selection, or when the survival of a species is dependent on the fitness of the whole group. Genuine laughter between members of a group promoted safe social interaction, which increased mating and reproduction within that group. Thus, here, we find things funny mainly because we've been wired that way over time. We're getting somewhere: Wilson and Gervais's hypothesis does reiterate that laughter is contagious, since we're more likely to laugh with another person than by ourselves.

Still, there are many unanswered questions. Some people find it humorous when others are excluded from a group rather than included; humor can be used to destroy socialization rather than enforce it. Additionally, while it's less common, we do have the capacity to genuinely laugh at ourselves without there being another person around. And what about the clear difference between a sense of humor and laughter, like when we think a joke is funny but don't laugh out loud? Scientists are still figuring out these specifics, and since humans and our senses of humor constantly shift, they may never agree on a framework that explains humor fully. One thing we can agree on, though, is that whether you laugh at dad jokes, at someone with gum stuck in their hair, or at your favorite comedian, it's all good fun. And that's the most important thing of all.

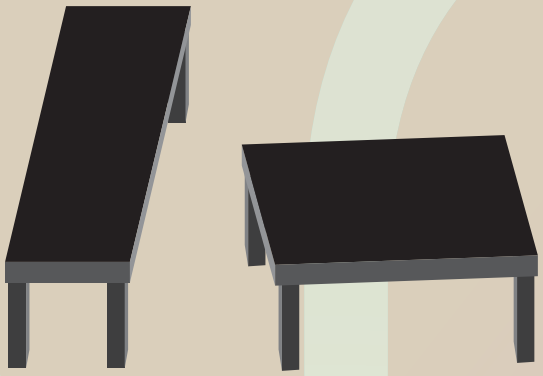
REFERENCES

1. Borgella, A. (2016, November 1). Science deconstructs humor: What makes some things funny? The Conversation.
2. Morreall, J. (2020, August 20). Philosophy of humor (Stanford encyclopedia of philosophy/Fall 2020 edition). Stanford Encyclopedia of Philosophy.
3. Sabato, G. (2019, June 26). What's so funny? The science of why we laugh. Scientific American.

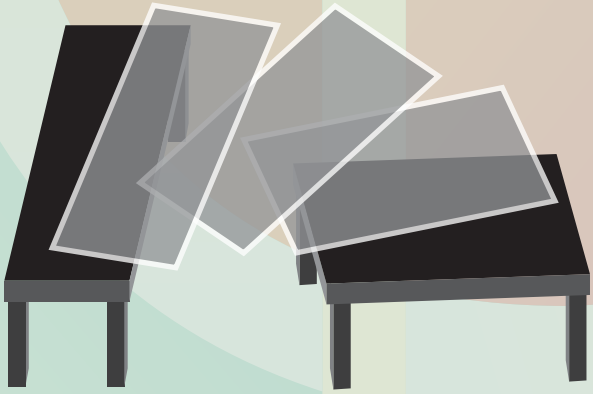
optical ILLUSIONS

Writing by **MIRANDA MENG** • Design by **ANGELA SONG**
Editing by **ANOUSHKA AMBAVANEKAR** & **LUKE ELEGANT**

Take a look at these two tables. Do you think the tops of the tables are the same size? Or is one table longer or wider than the other?



It may be surprising, but the two tabletops are exactly the same shape!



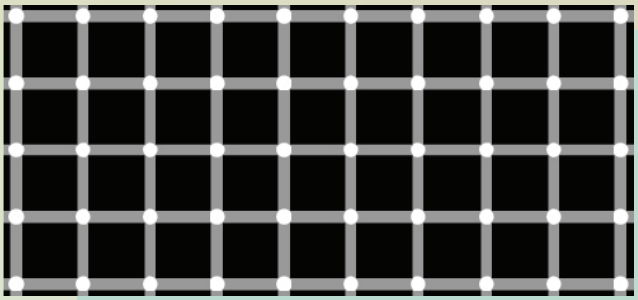
Your eyes and brain work together to help you see and understand the world around you. The eyes send information about colors, lights, and objects to the brain so that you can notice things like an apple in front of you. The brain then takes this information, breaks it down into simpler parts like shapes and curves, and compares it to your past memories and knowledge. By doing so, it can better understand the information the eyes are giving it, which is how you can recognize what an apple is.

However, sometimes the brain can get confused by the information coming from the eye, leading to optical illusions. "Optical" means something related to the eye or vision, and "illusion" describes something that is not what it seems to be, so optical illusions are images or videos that trick your eyes by making them see something that does not exist. The images were already drawn a certain way; you just see them wrong.

One skill our brains have developed since birth is called “size constancy,” which is how our brains know that identical objects are the same size even if one is closer or further away. For example, no matter how close or

far away you stand from a door, you know it is the same size even though the door looks bigger when you are closer to it. It also works the opposite way: if you had a tennis ball close to you and a basketball far away, then even if they look the same size, you know the basketball is bigger–it is just further away. This expectation is why this optical illusion confuses your brain: the table on the left looks like it is stretched further away, so it seems longer than the table on the right, which stays in the front.1

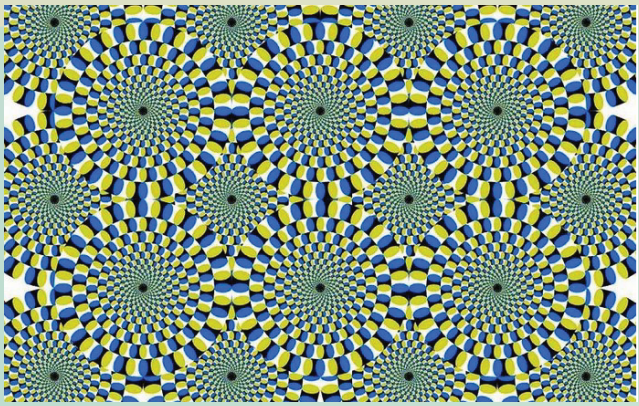
Here is another optical illusion you may have seen before called "The Scintillating Grid," meaning the sparkling grid. Do you see black dots in this image? How many?



You will notice that when you look directly at a white spot, there will not be any black dots there, but black dots show up in the white circles around whatever you are focusing on!

Scientists have a few explanations for why you see black dots that are not really there. One explanation is based on how your center vision–or what you see straight in front of you–is different from your peripheral vision, or side vision. There is a special part in the back of your eye that makes the center of your vision much clearer than the sides. Therefore, when you look directly at a white circle, you can see the white circles as they really are printed. However, when you are looking straight at something bright white, your brain makes your peripheral vision–the places you are not looking directly at–look slightly darker, so that your center vision can be even clearer. In this case, that causes the black circles to appear.

Here is one final illusion. Are the circles moving?



It looks like some circles are spinning, but they are not! Try staring at just one part of the picture–eventually all the circles stop spinning. You may also notice that the circles spin in the direction of this order of colors: black, blue, white, then yellow.

Scientists are still trying to explain this illusion! One idea is that black and white are colors that are more different from each other than yellow and blue are, so your eyes focus on the white and black parts first. Then, there is a very small delay until your eyes process the yellow and blue parts. This delay in processing tricks your brain into seeing motion where there is not any.

Another explanation is that your eyes jitter a little bit automatically when you are focused on looking at something. These tiny movements in random directions make the circles look like they are moving.

Optical illusions are fun to look at, and there are many more you can look up online. They also tell us a lot about how our eyes and brain work together so that we can see the world around us. These illusions take advantage of the methods your eyes and brain use to see the real world accurately, confusing your brain and making you see movements and dots that do not exist. Even now, scientists are not sure about how some optical illusions fool the brain, something you may be able to help figure out one day!

REFERENCES

Bach, M., & Poloschek, C. M. (2006). Optical Illusions. Advances in Clinical Neuroscience & Rehabilitation, 6(2), 20–21.
Lombrozo, T. (2014, March 24). The rotating snakes are all in your mind. NPR.org.
Sharpee, T., & Rowekamp, R. (2017, June 8). How the brain recognizes what the eye sees. Salk Institute for Biological Studies.
Thomson, G. and Macpherson, F. (June 2018), "Scintillating Grid" in F. Macpherson (ed.), The Illusions Index.

A HISTORY OF VIRTUAL REALITY

Writing by SHUNMEL SYAU | Editing by ZANE PASHA & GRACE QIAN | Design by ANGELA SONG

Virtual reality, or VR, is becoming more and more common in areas like video games and more. It is defined as a computer-generated simulation that lets you interact with objects, people, and places that appear to exist in the simulation but aren't actually there. It's hard to believe such amazing technology is still relatively new, yet we've made so much progress. Let's take a look at a general overview of the history of virtual reality.

1957: Sensorama, a theater cabinet that allowed people to have an interactive experience by engaging with their five senses, marks the beginning of what will later be known as virtual reality.

1966: Flight simulator, developed for the Air Force, generated interest over using such tools for training.

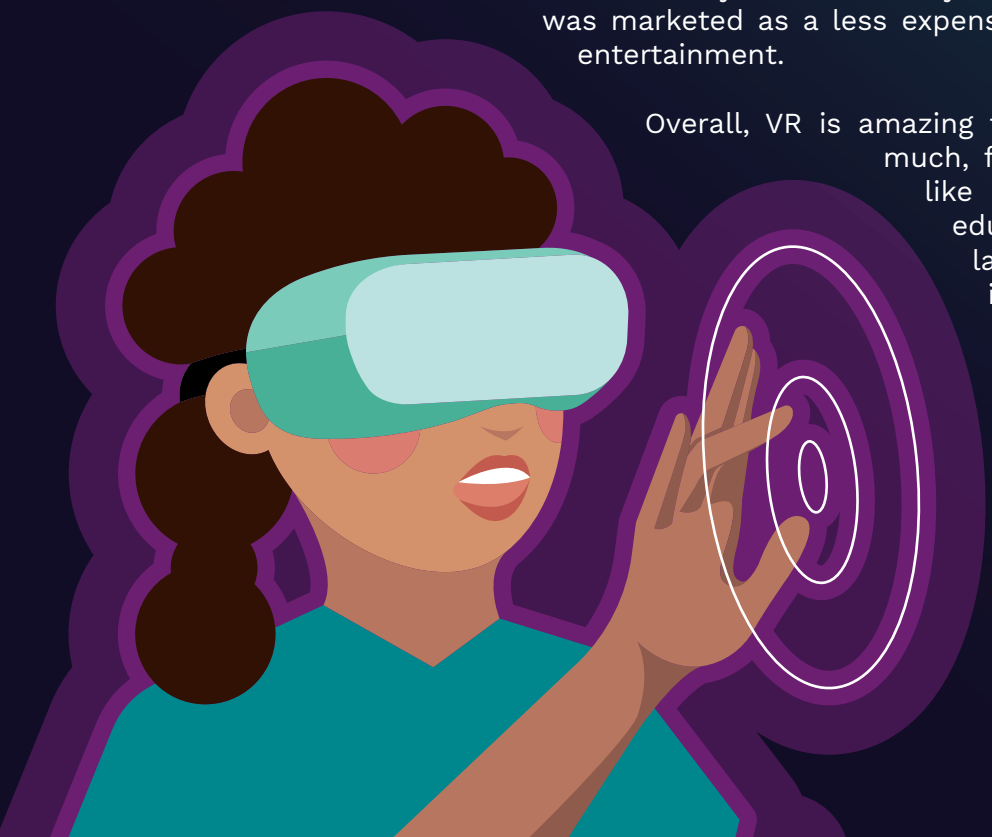
1989: Virtual Programming Lab, or VPL, was founded by John Lanier—the term "virtual reality" was coined and the VPL were the first to sell VR goggles.

1991: Virtuality Group raised interest in VR from the general public by introducing VR arcade games that allowed you to play in real time with VR goggles.

2007: Street View, by Google Maps, allowed people to get a 3D view of the world's streets, buildings, and more.

2010: The Oculus, or Oculus Rift, prototype was created and became an innovative VR headset known for its gaming experience. Some popular games include Beat Saber and Skyrim VR.

2015: Google Cardboard is a bit different from the rest of this list as it's, quite literally, cardboard—a cardboard box—that you can attach your phone to. Although discontinued, it was marketed as a less expensive and more accessible form of VR entertainment.



Overall, VR is amazing technology that can be used for so much, from games and training simulations like mentioned above, to medicine and education. Every item in this list was a landmark for us, whether it be the introduction of VR and the first usage of the word "virtual reality" to VR being used for specialized training or for entertainment for the general public—and we're still moving forward. Who knows what the future holds!

REFERENCES

1. Poetker, B. (2019, September 26). The Very Real History of Virtual Reality (+A Look Ahead). G2.
2. Virtual Reality: another world within sight. (n.d.). I berdrola.
3. Wise, D., & Palmer, A. (2017, September 21). Google cardboard review. GearLab.

How Do Our Bodies Make Sense of Time?

Writing by **WANGARI MBUTHIA**
Editing By **ANOUSHKA AMBAVANEKAR & LUKE ELEGANT**

Quick! Without looking at your watch, what time is it right now? Did you guess correctly? While many of our guesses may not have been quite right, believe it or not our bodies can sense time within 1 to 2 percent accuracy. This is because almost every cell in our bodies has a built-in biological clock that produces a sort of rhythm when our cells work together. This rhythm is known as a circadian rhythm, which in Latin translates to about a day (circa = about, dian = day). Every day this process keeps track of everything, from when we wake up, to when we sleep, to all the chemical reactions within our bodies, and without it our bodies would not be able to work properly.

With trillions of cells each equipped with their own ticking clocks, you may wonder how our bodies are able to make sense of it all? The answer lies in a network of nerve cells (neurons) in our brain known as the suprachiasmatic nucleus (SCN) which act as a master clock. The SCN is kind of like the conductor of the orchestra of cells in our bodies, making sure they maintain a good rhythm. To do this, our SCN conductor uses external cues or information, primarily light and darkness.

The SCN receives light signals from special receptors in our eyes and uses this information to adjust the rhythms in our bodies accordingly as the day changes to night. Our cells receive instructions from the SCN and use the proteins PER and TIM as tools to create circadians rhythms. Like two hands of a clock, PER and TIM work together to keep time. Our body creates a cycle of the production and destruction of PER and TIM which is influenced by changes in light and darkness during the day.

But what if we had no external cues? Is our orchestra of cells doomed to descend into madness? Not exactly. Research has shown that even in total darkness our bodily processes can maintain a cycle of approximately 24-hours. This is because external cues are like instruments in the orchestra that can help make great music but are not essential for our orchestra of cells to produce a rhythm.

Even though our body is a very effective time machine in the absence of external cues, it can still be disrupted by changes in these cues. For example, the reason we get jet lag is because our circadian rhythms are not in sync with the current time of our destination and it takes a bit of time for our bodies to adjust to a different light and dark cycle. Similarly, artificial blue light emitted from our screens also interrupts our circadian rhythms and prevents sleep hormones like melatonin from being produced, which makes it difficult for us to fall asleep. This is why it is best to avoid using devices just before you go to bed.

Continual disruptions to our circadian rhythms throw our body out of whack, and can weaken our immune system and even lead to increased risk of certain diseases. So, it is important for us to do our best to work with our bodies to maintain these rhythms. If you want to maintain a healthy circadian rhythm, make sure you are getting enough hours of sleep, eating regularly and spending time outdoors in the daylight!

REFERENCES

1. Washington University in St. Louis. (2013, May 5). Scientists map the wiring of the biological clock. ScienceDaily.
2. Manoogian, E. (2019, April 30). Circadian rhythms: What they are and why they matter. SRBR: Society for Research on Biological Rhythms.
3. Addison, K., & Harris, J. (2019, February 5). How do our cells tell time? Frontiers for Young Minds.
4. Panda, S. (2020, April 9). A healthy circadian rhythm may keep you sane and increase resilience to fight COVID-19. University of California.

Design By **CHEAVLAY PHAT**

Deafness and Hearing

Writing by JULIA VAN LARE | Editing by GRACE QIAN & TED DAVIS

How can you enjoy music without being able to hear it? What did Thomas Edison and the "Fastest Woman in the World" have in common?

To answer these questions, we can learn about deafness–a condition where a person can't hear. The ear is a sensitive organ; it creates sound from sound wave vibrations that move tiny bones in your inner ear, where even tinier hairs send signals to the brain. Once your brain gets ahold of the information your ear has collected, it pieces together the type and volume of the sound you heard.

The ear is sensitive and complicated, so while it is capable of amazing things, it's also not unusual for it to be damaged or to malfunction. People become deaf or experience hearing loss for several reasons, from a birth defect to an infection in the brain.

There are four types of hearing loss. The first type, conductive, means that something–earwax, for example–is blocking your ear from hearing. The second type, sensorineural, means that the inner ear and brain are disconnected. This issue can happen if the tiny hairs in your inner ear get damaged. When a person experiences both of these types, they have mixed hearing loss. Finally, with central hearing loss, the problem is in the brain.

Sometimes, blockages from conductive hearing loss can be removed or surgically fixed. If not, some Deaf people choose to use cochlear implants, which directly stimulate the auditory nerve to simulate sound.

Regardless of how their hearing loss develops, those who lose the ability to hear can adapt to understand the world in new ways. Deaf people often can use their other senses to understand spoken language; for example, some Deaf people are able to read lips to understand what others are saying. The Deaf community has a completely different way of interacting with the world because of their unique way of perceiving it. You may be wondering, for example, how Deaf people enjoy music. To listen to music, some people with hearing loss enjoy feeling the vibrations of the beat. Studies have even shown that a Deaf person feeling musical vibrations and a hearing person listening to music are using the same part of their brain.

Another important element of Deaf culture is American Sign Language (ASL). ASL is a language built from gestures and expressions, rather than speech. Experts aren't completely sure when sign language first came to be, but many think it originated in France 200 years ago. So while it's much younger than English, it's been around for a while. Additionally, French Sign Language (FSL) and ASL are now completely different.

Like English, ASL has distinct, word orders, grammatical structures, pronunciations, and even punctuation. There is a difference in the way these grammatical standards are shown, though. Try saying this sentence out loud: "When will dinner be ready?" See how you said some words in a higher pitch than the rest of the sentence? That's what indicates you're asking a question. In ASL, there are no "pitches" to show that you're asking instead of telling. Instead, you raise your eyebrows and widen your eyes to show you're asking a question.

There are other differences between ASL and English, too–for example, those who speak ASL have different names that can be signed with the hands instead of verbally, or sometimes people are called by the first letter of their name. Babies who learn sign language even babble with their hands instead of their mouths! Deaf culture also includes verbal or tactile cues to convey meaning, like turning the light on and off to get a room's attention or tapping someone on the shoulder to talk to them. When a hearing person speaks to a Deaf lip reader, they should be sure to face the person fully, so their words are clear.

Many people know about lip-reading and sign language from stories about famous Deaf people, like Helen Keller, a Deaf and blind woman who became an author and activist. But did you know that Thomas Edison, creator of the lightbulb, was mostly deaf? So is Derrick Coleman, a football fullback and the first legally Deaf NFL player. Plus, Kitty O'Neil, the so-called "fastest woman in the world," was a Deaf stunt woman in the 1970s.

Kitty O'Neil became deaf after getting the mumps and smallpox as a child. Her mother taught her how to read lips, and even had her place her hands on the throats of speaking people so she could feel the vibrations of words. She was an outstanding athlete and later became a daredevil, or stuntwoman. She became famous for her stunts, like riding a water ski at more than 100 miles per hour (mph). She earned her nickname from riding a rocket car 600 mph in a dried lake bed in Oregon! Think of how fast a car goes on a highway, and multiply that by ten–that's how fast she was riding.

Deafness isn't necessarily a barrier to the world. Instead, Deaf people have built completely unique communities, complete with their own culture, language, and customs.

REFERENCES

1. American Sign Language. (2019, March). National Institute of Deafness and Other Communication Disorders.
2. Berke, J. (2022, February 19). Name Signs in the Deaf Community. Verywell Health.
3. Gallaudet University and Clerc Center. (n.d.). American deaf culture. Laurent Clerc National Deaf Education Center.
4. Mayo Clinic Staff. (2021, April 16). Hearing loss - Diagnosis and treatment - Mayo Clinic. Mayo Clinic - Mayo Clinic.
5. Motluk, A. (2004, July 15). Babies babble in sign language too. New Scientist.
6. Neary, W. (2001, November 27). Brains of deaf people rewire to 'hear' music. UW News.
7. Smith, H. (2018, November 4). Kitty O'Neil, deaf daredevil who became 'world's fastest woman,' dies at 72. The Washington Post.
8. Thomas Edison. (2021, March 17). Gallaudet University.
9. What's hearing loss? (2021, August). Nemours KidsHealth.

The Loneliest Whale

Writing By **SHELBY ABAYIE**
Editing By **SINAIA KEITH LANG & ANOUSHKA AMBAVANEKAR**

A lonely, mysterious whale swims in the depths of the ocean. This whale has no friends, no partner, and no children. In 1989, researchers noticed the calls of the 52-Hertz whale on the U.S. Navy's underwater phones. At first, the U.S. Navy thought it was an enemy Soviet submarine. However, they soon discovered that it was the sound of a friendless whale - now called "Whale 52" - calling out across the ocean.

The most notable apset of Whale 52 is his high singing voice. Hertz is a measure of pitch. If a popstar hits a super high note, then they are singing with a very high pitch. In contrast, decibels are a measure of loudness. A popstar hitting a super high-pitched note into a microphone may be very loud and have a high amount of decibels. At the same time, a lion's low-pitched, deep roar is louder than a lawnmower and has a high amount of decibels.

Whale 52 is very loud. But no matter how hard he tries to call out, other whales can't understand him. Scientists eventually discovered that Whale 52 follows migratory patterns similar to both blue whales and fin whales, suggesting that Whale 52 is a hybrid of the two species. Unfortunately, both species of whale communicate at a pitch between 15 and 25 hertz. Even if blue whales and fin whales can hear Whale 52, they probably can't understand what he is trying to say because his voice is too high-pitched.

The human adult's ear can hear from 20 hertz to 20,000 hertz in laboratory conditions without any distractions. In most cases, however, 20 hertz is way below the human hearing range, meaning most people can't hear the calls of blue whales or fin whales. On the other hand, 52 hertz might sound like a very low bass note to humans.

Whale 52 might also belong to a new species or a near-extinct species of whale. There's no way to tell for sure until Whale 52 is found and studied. Unfortunately, finding a single specific whale in the huge ocean is very difficult. Even though Whale 52 hasn't received a response yet, he keeps calling out into the depths and someone, even if they aren't a whale, is listening!

REFERENCES

1. Duong, T. (2021, December 3). Could the 'loneliest whale' teach us about the need to connect? EcoWatch.
2. Mulvaney, K. (2021, July 13). The search for the loneliest whale in the world. The Guardian.
3. Perry, (2021, October 2). Human hearing range: Hearing testing frequency, pitch, and what's normal. Audiology Research.
4. Smithsonian Magazine. (2011, November 3). Secrets of a Lion's roar. Smithsonian.com.
5. Watkins, W. A., Daher, M. A., George, J. E., & Rodriguez, D. (2004, October 12). Twelve years of tracking 52-Hz whale calls from a unique source in the North Pacific. Deep Sea Research Part I: Oceanographic Research Papers.
6. Yarlagadda, T. (2021, July 8). Why the world's loneliest whale reflects humanity's "biggest fear". Inverse.

THE COCKTAIL PARTY EFFECT

Writing by AYLIN ERGIN

Imagine this: you're in a noisy lunchroom, your friend is telling you what they ate for breakfast, the girl sitting to your left is telling her friend about her birthday party, and a lunch lady nearby is asking a boy if he prefers a hotdog or a hamburger. As you shift your attention, you find yourself able to distinctly hear parts of each of those conversations. If you've ever wondered why you can tune out background noise and shift your attention to a single voice, a phenomenon called the cocktail party effect explains this.

The cocktail party effect was first described in the early 1950s by British scientist Colin Cherry through two important experiments. In the first, participants listened to two different messages at the same time and were asked to recall what only one of the voices had said, which proved to be quite difficult. In the second experiment, instead of playing the messages to both ears, one message was played to the left ear and the other, to the right. Suddenly, participants found it much easier to distinguish the two messages and could easily shift their attention back and forth. This is what happens to us, too. We take advantage of the various distances and locations we sense sound from! Now, recall the previous lunchroom setting. People were scattered at different locations all around the room, with their voices coming from many directions. This allowed for you to tune in and out of the multiple conversations!

Humans are really good at filtering auditory information, or selectively listening. You might wonder how our brain determines what to filter. Some characteristics that help distinguish importance include tone, volume, pitch, and the direction of sound. For example, it is easier for us to pick out and listen to voices that are much louder than the surrounding noise. Consistency in tone makes it easier for us to focus as well. It can also be easier if we are aided by visual cues, such as lip-reading, while someone talks.

The cocktail party effect is vital to socialization, but probably not something we pay much attention to. Next time you're in a loud room, try switching your attention between conversations and you'll witness the cocktail party effect for yourself!

REFERENCES

1. Hearing facts what is the cocktail party effect. (2016, July 25). Widex.
2. Pellegrino, N. (2022, March 13). Cocktail party effect. Practical Psychology.
3. The University of Melbourne. (2014, October 19). Amazing attention: The cocktail party effect. WordPress publishing service – simplified publishing.

Editing by JANET LEE & LUKE ELEGANT

Sweet Tooth

Cravings Explained

Writing by JULIET DEMPSEY | Editing by JANET LEE & SINAIA KEITH LANG

The rumbling and pangs in your stomach, the frustration in your head that boils over and gets under your skin, the swarming thoughts of fresh-baked desserts, Thanksgiving dinner, and loads upon loads of ice cream — all of this tells you one very important thing: It's time to eat!

We've all been "hangry" at some point or another — hungry and angry — it's not a good combination! Just like the catchy tagline for Snickers candy bars reminds us, "You're not you when you're hungry," we tend to act a little crazy when it's been a bit too long since our last meal.

Our bodies use physical and mental signals to tell us we are running low on energy and encourage us to eat our next meal. We need food because inside all of those fruits, vegetables, and candy bars are nutrients that keep us and our bodies healthy. These nutrients help us build and maintain energy, grow, keep warm, think clearly, and feel more concentrated. Physical hunger signals, like stomach rumbling and pangs, are an evolutionary survival tool: our bodies are doing everything they can to keep us alive! Hunger signals typically feel so uncomfortable and urgent because our bodies are built to avoid starvation at any cost.

Mental hunger in its simplest form is when you can't stop thinking about food or when you get frustrated all of a sudden and can't focus. When those pressing thoughts of your favorite foods start to rattle in your head, it seems like your concentration wants to be nowhere else but the mouthwatering center of that Snickers bar. You start to feel overwhelmed with all these thoughts about food, and before you know it, your head makes a sharp turn to frustration and irritation. Your appetite and cravings are the voices in your head that help you figure out what you want and need at that moment. Sometimes, that will be foods like fruit and vegetables which are packed with nutrients and vitamins. Other times, it will be salty snacks and sugary candies. Both of these craving types are fine! Cravings help us regulate our emotions. Snacks and comfort foods increase serotonin, a protein signal that encourages us

Did you know that the phrase "Sweet Tooth" itself dates back to the 14th Century? It comes from the old word "toothsome," meaning "delicious." From that word, "tooth" was often used in place of "taste" or "preference." Eventually "sweet tooth" was used to describe a person with a strong liking for sweets.

by
HANESSY MORRIS

to feel happy. Using food to support our brains and keep good mental health is just as important as using food to keep good physical health. Food is so much more than just a way to get nutrients — that's why we have so many delicious dishes and cuisines to choose from!

If we only relied on physical signals for hunger, ironically, we probably wouldn't eat enough. People forget to eat all the time — mostly out of distraction, such as when we are too busy or too overwhelmed to focus on our appetite. The nagging in our brain telling us to eat is doing a really important job of trying to redirect you to eating.

But why do children like sweets so much? Most evidence about why kids like sweets so much point to growth! When we are little, there is a lot of growth that we need to do in a short time. From ages six to 12, most children grow about 2.5 inches and gain 4-7 pounds per year. Then, they stop growing in their late teens. Sugary foods have the quickest source of carbohydrates, the energy-rich nutrients that support growth. Our bodies burn up those sugary carbohydrates pretty quickly, though, so they don't really do much in terms of helping us grow.

Even though we stop growing after our teen years, it's not just children who love sweets — adults do too! Scientists believe having a sweet tooth is a result of our ancestors' old survival habits. Poisonous foods are bitter and unpleasant to taste, unlike sugary foods which are sweet and cravable. Basically, evolution pushed humans to develop a preference for sweet foods. Next time someone asks why you like sweets so much you can tell them it's nature's fault!

REFERENCES

1. Eating well for mental health. (2021, September 8). Sutter Health | Doctors and Hospitals | Northern California.
2. Growth and your 6- to 12-Year-Old. (2019, June). Nemours KidsHealth - the Web's most visited site about children's health.
3. Staff. (2020, September 23). Hunger, fullness, and appetite signals. University of Michigan | Michigan Medicine.
4. Magee, E. (n.d.). The Facts About Food Cravings. WebMD.
5. Mennella, J. A., & Gidding, S. S. (2016, September 21). Why do kids love sweets so much? https://www.inquirer.com.
6. Sweet tooth - Definition, meaning & synonyms. (n.d.). Vocabulary.com.

AROMATIC COMPOUNDS

Writing by **SHIVANI PATEL** | Design by **BAYLEY EAVEY**
Editing by **ZANE PASHA & LEEYU ADDISU**

Whether it's the fruit that's a little too ripe on the table, or the pot of boiling soup on the stove, our noses pick up different smells from these types of foods. At the core of this phenomenon are billions of molecules in the world that have distinct smells. Food has lots of these molecules, which gives the aroma that your nose picks up. Here are some molecules that have smells you might recognize:

HEXANAL

This molecule gives fruits and vegetables like green apples and leafy greens the "fresh green" or underripe aromas. Interestingly, it has been shown that this odor decreases as fruits like nectarines ripen.

3-METHYL-1-PROPANOL

Contrary to hexanal, this molecule is associated with ripe or overripe fruits. It gives these fruits an earthy aroma, so your nose can distinguish them from under ripe fruits.

LACTONES

Rather than one molecule, this entire class of molecules will make you think you are on vacation. It compromises tropical flavors, which include peachy, creamy, and coconut aromas.

PYRROLES

This class of molecules would remind you of roasted, cooked, and burnt smells. Molecules in this family give the toasty notes to popcorn or meat and the cracker-like smell to bread.

ETHYL BUTANOATE

Beyond fruits and vegetables, we can also identify molecules in foods like cheese. Ethyl butanoate is a key molecule that gives cheeses like Parmigiano Reggiano and blue cheese that funky smell. Similar molecules can also be found in cured meats.

4-METHYLGUAIACOL

This molecule is in the family of compounds called phenols. It has many descriptors, which include vanilla, leather, spicy, and smoky. This can give bacon its meaty character or spices such as clove its distinctive smell.

DIMETHYL SULFIDE

Sulfur-containing compounds have distinctive aromas, contributing to the cooked smells that our nose picks up. In particular, this molecule gives corn and asparagus their predominant smell. Notably, it can also give an off-flavor to overcooked vegetables.

REFERENCES

1. Parker, J. K. (2015). Introduction to aroma compounds in foods.
2. Flavour Development, Analysis and Perception in Food and Beverages, 3–30. doi:10.1016/b978-1-78242-103-0.00001-1

Writing by DAVID TODARO

Editing by TED DAVIS & JANET LEE

THE MANDELA EFFECT

Did you know that Darth Vader in fact said, “No, I am your father” rather than “Luke, I am your father”? Have you ever quoted the Evil Queen from Snow White as saying, “Mirror, mirror on the wall,” when in reality she chants, “Magic mirror on the wall?” If you have fallen victim to these common misconceptions, then you have experienced the Mandela Effect.

The Mandela Effect occurs when a person or group of people have a false memory of something, whether it be a movie quote, song lyric, or brand logo. The term was coined by Fiona Bloome, who believed Nelson Mandela had passed away while imprisoned back in the 1980s. She came to realize that this belief was false, however, upon learning that he assumed the South African presidency in the 1990s and passed away only recently, in 2013. This error spawned the naming of the common Mandela Effect phenomenon. But what causes one to sense that something is different than it actually is?

The leading reason for the Mandela Effect is a false memory of past events. False memories may contain some factual elements that make the person more susceptible to believing the memory to be entirely true. Another cause of the Mandela Effect is confabulations, false retellings of events that can transfer misinformation from one person to another. This fake news spreads past the point of no return, particularly with the help of the Internet and social media. Finally, a much less plausible — but very popular — explanation for the Mandela Effect is a potential clash between our reality and parallel universes. A parallel universe is a separate reality from our own that can become twisted in our actual world! This idea comes from string theory, a scientific hypothesis that postulates our universe to be only one of infinite other universes.

How can we prevent the Mandela Effect from happening to us? While it is difficult to catch a false memory in action, we can avoid any falling victim to them by fact-checking with other reliable sources, including people and the Internet. These resources can help reduce instances of believing misinformation and prevent the onset of the Mandela Effect! Additionally, we should be cautious of leading questions. For example, instead of asking, “Is the Berenstain Bears spelled with an ‘e’ as the third to last letter in the word?”, the question should instead be, “How do you spell the Berenstain Bears?” This avoids the tendency to simply agree with the question, and encourages the generation of more thoughtful responses.

Have you ever had a run-in with the Mandela Effect yourself? If so, how would you sense it and work to avoid it?

REFERENCES

1. Cuncic, A. (2021, August 11). What is the mandela effect? Verywell Mind.

2. MediLexicon International. (n.d.). Mandela effect: How it works, causes, and more. Medical News Today. 1.

Design by SALLY HUANG

SENSES THAT ANIMALS HAVE BUT HUMANS LACK

Writing by **ALLAHA MOHIBY** | Design by **BAYLEY EAVEY**
Editing by **GRACE QIAN** & **LUKE ELEGANT**

MAGNETIC FIELD SENSING

Many organisms have magnetic field sensing that allows them to use the Earth's magnetic field to help guide their travels. This process happens differently in different types of organisms! In bacteria, magnetite crystals are created in the body, allowing them to further feel the magnetic pull of the earth! Researchers have also come to the conclusion that birds have these magnetite crystals in their beak; allowing them to migrate!

ELECTRICAL SIGNALING

Sharks use electric fields to navigate in murky waters and hunt for food. Their network of organs allow for this to occur as these organs are located around their head and are surrounded by a jelly-like substance. Other animals such as electric eels are able to produce electric fields which help them find their prey.

UV VISION

There are a lot of organisms that see color like humans, however there are some that can see even more than just color. These organisms have UV vision which is ultraviolet vision. Bees use UV Vision to collect pollen. Nocturnal animals such as bats and lizards are only able to view UV light which provides them with more visual sensitivity, giving them an advantage over other animals who can not see in the dark.

ECHOLOCATION

Animals such as whales, bats, and dolphins use echolocation to navigate in their habitats. They release very high pitched sounds and from the echoes of these sounds, create an image of their surroundings. The images created are three-dimensional and are made possible by the structure of the brain and the ear in these animals.

HYPERSENSITIVITY TO TOUCH

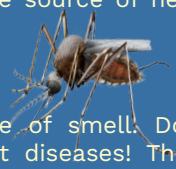
Spiders have an enhanced sensitivity to touch allowing them to be more aware of their surroundings. Many animals use their sense of touch to make up for their lack of vision. This is the case with spiders as most of them get their food in dim light. Spiders determine the distance between them and other organisms through the vibrations they feel, assisted by the many hairs they possess.

TETRACHROMACY

Some animals see the world differently than you and I. There are some awesome animals that use tetrachromacy to see even more colors than humans. Tetrachromacy is when animals have more structures in their eye, allowing them to perceive more colors. In reptiles, tetrachromacy is used for communication and food gathering.

HEAT SENSING

Thermoception is common in animals. These animals can see infrared light, which is not visible to humans. In snakes, there are holes or pits found on the face that act as temperature sensors. The infrared light is detected by the heat that is felt inside these pits. This sense allows the snake to see where the heat is coming from and the distance between the snake and the source of heat.



HYPEROSMIA

Many animals have a heightened sense of smell. Dogs can use their sense of smell to detect diseases! There have been numerous studies showing that trained dogs can detect cancer from just smelling the patient. While a dog's sense of smell may be smiled upon, a mosquitoes sense of smell is not as favored. One of the factors that mosquitoes use to find a source of food is by smelling carbon dioxide through their antennas.

NUTRIENT SENSING

White-Crowned Sparrows have the special skill of determining the nutrition value of a food before eating it. They look for foods their body needs and usually eat foods that contain substances their body needs but can not create on their own. They are able to create their own food labels!

ENHANCED TASTE

Many organisms have much more taste buds than humans. For example, catfish have over 100,000 taste buds while the most a human usually has is about 8,000. These taste buds are located all over the body of the catfish so the catfish is able to taste their prey from all around!

REFERENCES

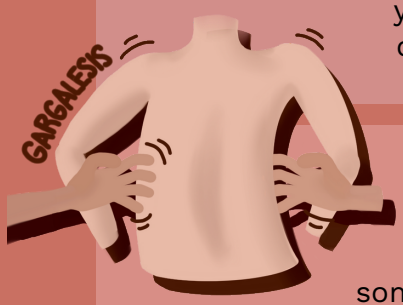
1. Bio Explorer. (2021, January 24). Top 11 animals with super sensors. BioExplorer.net.
2. Bui, H. (2014, June 24). Monarch butterflies use magnetic compass to migrate. USA Today.
3. BUZZ, J. (2020, January 20). 8 senses that animals possess but humans don't. Jeevoka.
4. Chandler, D. (2021, February 17). Toward a disease-sniffing device that rivals a dog's nose. MIT News | Massachusetts Institute of Technology.
5. Cole, B. (2016, June 10). The weirdest senses animals have that you don't. Wired.
6. Klappenbach, L. (2019, September 20). Discover 4 senses animals have, but human's don't. ThoughtCo.
7. Matsos, H. (2020, May 19). How animals sense earth's magnetic field. Phys.org.
8. Pisto, K. (2012, January 10). Ultra awesome: Ultraviolet eyesight in animals. Woodland Park Zoo Blog.
9. Thermoception in animals. (n.d.). Psychology Wiki. Retrieved August 10, 2022.

WHY ARE WE TICKLISH?

Writing by Leah Levin | Editing by LEEYU ADDISU & GRACE QIAN | Design by MINJU KIM

Maybe it's your feet. Or your belly. It could be your armpits or even your ears. While they may differ, most of us have spots on our body where we are ticklish. Some of us may enjoy being tickled, while others may find it unpleasant. Even when we can't stand it, a tickle can make us laugh uncontrollably. Why are we ticklish?

Let's start with the basics. There are two types of tickles. One type is called knismesis, which is known as a "moving itch." This feeling comes from light movement across the skin, like a feather moving across your arm or a bug crawling on your leg. It can occur anywhere on your body. This tickle is often unpleasant, and it rarely makes us laugh.



Another type of tickle is called gargalesis, and this is the feeling you get when you are tickled by someone else. This type involves a heavier touch and typically causes you to laugh. It only occurs at certain spots on our body, such as our armpits and belly.

Tickling is not just for humans; animals do it too! Chimpanzees, gorillas, and other great apes tickle each other when they play and respond with a human-like laugh. Rats make higher-pitched chirps when they are tickled and even jump for joy.

How does tickling work? In our bodies, we have cells that respond to touch and pain. When we are tickled, a combination of these cells is activated. However, we can't seem to tickle ourselves. Go on, try it right now. Impossible, right? This inability is due to a part of the brain known as the cerebellum, which can tell apart expected and unexpected sensations. The cerebellum can predict a self-tickle, which cancels the response of other brain areas. On the other hand, we feel a tickle when it is done by someone else, since this action is unexpected.

Often, we laugh when we are tickled. Have you ever laughed, even when the tickling was unpleasant? While we may enjoy being tickled, sometimes we continue to laugh even when it is uncomfortable. Tickling seems to be a strange mixture of pleasure and pain. As a result, laughing from tickling is much different from laughing from hearing something funny. Some scientists think you laugh because you view the experience as playful. However, we seem to laugh just as much when we think we are being tickled by a machine. This suggests ticklish laughter does not have to do with the situation but may instead be a reflex, like a jerk of the knee in response to a hammer.

You may be thinking, why are we ticklish in the first place? One explanation is that tickling serves a social purpose. When a parent tickles a child, often they both smile. This helps them bond and strengthens their connection. Another theory is that being ticklish is a form of protection. It is like our body's warning system. Since we are ticklish in places that are most likely to be harmed in an attack, the additional tickling feeling helps warn us when we are in danger.

Some questions about tickling still remain, such as why are some people more ticklish than others, and why are some spots more ticklish than others? For over 2000 years, figures like Plato, Aristotle, Galileo, and Darwin have studied this feeling, and researchers continue to investigate it today.

REFERENCES

1. Blakemore, S., Wolpert, D., & Frith, C. (2000). Why can t you Tickle yourself? NeuroReport, 11(11), R11-R16.
2. Harris, C. (1999). The mystery of ticklish Laughter. American Scientist, 87(4), 344.
3. Harris, C. (2012). Tickling. Encyclopedia of Human Behavior, 611-615.
4. Harris, C. R., & Christenfeld, N. (1997). Humour, Tickle, and the Darwin-Hecker hypothesis. Cognition & Emotion, 11(1), 103-110.
5. Ishiyama, S., & Brecht, M. (2016). Neural correlates of ticklishness in the rat somatosensory cortex. Science, 354(6313), 757-760.
6. Panksepp, J., & Burgdorf, J. (2003). "Laughing" rats and the evolutionary antecedents of human joy? Physiology & Behavior, 79(3), 533-547.
7. Selden, S. T. (2004). Tickle. Journal of the American Academy of Dermatology, 50(1), 93-97.

Writing by **ROBIN HU** | Editing by **ANOUSHKA AMBAVANEKAR & LEEYU ADDISU**

The Sixth Sense: OUR GUT FEELING

"Trust your gut!"

You may have heard this old saying, telling you to trust your gut. But what is this gut feeling? This gut feeling is intuition. We have all likely experienced it ourselves. It's a feeling we sometimes get, a sudden impulse towards a particular decision or thought. For example, you might get a nagging feeling telling you not to walk down that dark alley. You can't explain why or logically describe the source of the feeling, but you just know something is wrong. Sometimes you might feel the opposite, and you just know that it's right.

This is our sixth sense, also known as a hunch, intuition, and a gut feeling. For years, the sixth sense has remained a mystery. Some scientists have even debated whether it exists, and what it fundamentally is. Research shows common symptoms include a sudden "aha" moment, goosebumps, "butterflies" in your stomach, and sweaty palms. Science has actually found that this mysterious sixth sense can actually be a valuable tool. In other words, our gut feelings do count, and they can sometimes help us out.

Studies have identified a few potential explanations for this helpful sixth sense. The first is based on normal brain processes. Research has connected these gut feelings to certain brain processes that analyze emotional and other nonverbal cues. You can think of gut feelings as a type of prediction based on experiences. As you go about your day, your brain collects and processes sensory data from your environment. Even memories you don't fully recall, or information you aren't consciously aware of, can guide you and trigger these gut feelings.

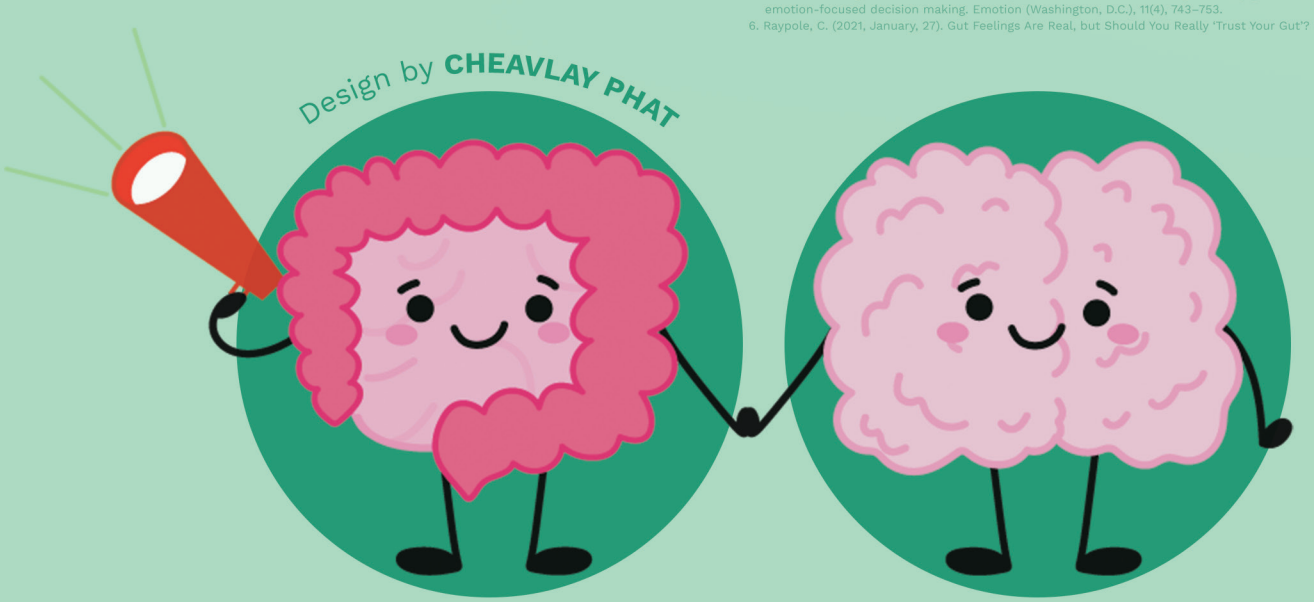
Yet, our sixth sense can also be wrong sometimes. We decide, within a few seconds of meeting someone, that we don't like them. This is because intuitions are generalizations based on past experience. No generalization can perfectly predict. And of course, intuition can be affected by change – either in ourselves, or the world around us.

So when should we trust our sixth sense? Researchers have outlined scenarios to guide decision making. When you need to make a quick decision, research suggests that the numerous experiences already stored in your brain can serve you well. Logic and reason cannot always compare with your intuitive knowledge of your needs. You know yourself best. Additionally, while gut feelings cannot replace scientific fact, you may not always have all or any facts to consider to guide you to an answer. In these moments, your gut can play an important role in decisions, so trust them. So, yes, trust your gut! However, be cautious of moments of high emotion.[4]

So, yes, trust your gut! Give your gut feelings the consideration they deserve, but also be aware that your gut might lead you in the wrong direction sometimes. The next time you get that nagging feeling, just remember all the complexities that go into this wondrous "sixth sense."

REFERENCES

1. Hooton, A. (2021, April 24). Sixth sense: the science behind intuition. The Sydney Morning Herald.
2. Lufityanto, G., Donkin, C., & Pearson, J. (2016). Measuring Intuition: Nonconscious Emotional Information Boosts Decision Accuracy and Confidence. Psychological science, 27(5), 622–634.
3. Maglio, S. J., & Reich, T. (2019). Feeling certain: Gut choice, the true self, and attitude certainty. Emotion (Washington, D.C.), 19(5), 876–888.
4. McCrea S. M. (2010). Intuition, insight, and the right hemisphere: Emergence of higher sociocognitive functions. Psychology research and behavior management, 3, 1–39.
5. Mikels, J. A., Maglio, S. J., Reed, A. E., & Kaplowitz, L. J. (2011). Should I go with my gut? Investigating the benefits of emotion-focused decision making. Emotion (Washington, D.C.), 11(4), 743–753.
6. Raypole, C. (2021, January, 27). Gut Feelings Are Real, but Should You Really 'Trust Your Gut'? Healthline.



COMMON CENTS

Writing by KATRIN GROSS Editing by LUKE ELEGANT and SINAIA KEITH LANG
Design by SALLY HUANG

We use money nearly every day, through credit cards, apps like Venmo, or physical dollar bills and coins. In fact, you're probably very familiar with the coins we use here in the United States: quarters, dimes, nickels and pennies. But where do these coins come from? Who makes money?

The answer is the U.S. Mint, a part of the U.S. Department of the Treasury (the department of the U.S. government that handles all things money-related).

The U.S. Mint was founded by the newly-formed U.S. government in 1792 to standardize money. Before that, the U.S. used a combination of coins from other countries as well as coins independently made by states. All of these different coins made commerce very difficult, especially between states. The U.S. Mint solved that problem.

The first U.S. Mint was built in Philadelphia, which was then the nation's capital. This Mint is still in use today, although it has since moved buildings. Additional coin-making facilities now exist across the country in San Francisco, Denver, and West Point. When the U.S. Mint was first established, the currency that it produced looked very different from the coins we use today. There were coins worth as little as half a cent and as much as $10! The metals that the coins were made out of were also different. U.S. coins were either made of copper, silver, or gold. These metals soon became too expensive to use, however, so coin production facilities started to use cheaper, more readily-available metals like zinc. Today, coins are often made from zinc and then covered with a thin layer of another metal like copper. They can also be made from an alloy (a mixture of metals) like cupro-nickel, which is a mixture of copper and nickel.

Today, the U.S. Mint prints four types of coins for common use: quarters, dimes, nickels, and pennies. It also prints special coins for people to collect, such as half-dollar and dollar coins. Some people travel all over the country searching for rare, valuable coins that were minted at different periods in U.S. history. This begs the question: will all U.S. coins soon become collectables? Tokens of the past?

With virtual money becoming more popular, coins are being used less and less. One reason for this is that U.S. coins aren't worth as much as they once were. Vending machines once charged less than a dime for a can of soda. Now they often charge a dollar or more. This decrease in the value of money is a process called inflation. The fact is, you just can't buy as much with coins today, especially not the penny. Can you think of anything that costs one cent? Probably not. For that reason, people have been advocating to stop the production of pennies, which cost more money to make than they are actually worth. A decision on that has yet to be made, but with the increasing popularity of contactless payments, it seems more and more likely that money and its production will look very different in the future.

REFERENCES

1. Learn. (n.d.). Official Site of the United States Mint.
2. Rosalsky, G. (2020, July 14). Is it time to kill the penny? NPR.org.

MAD LIBS!

Making Slime with Mom:

When I saw the instruction video on _____ [TV channel], all I knew was that it was my time to try making my own slime. I wrote down the list of ingredients and asked my mom to help me make it. _____[number] ingredients were needed. These ingredients included things like glue, baking soda, and _____ [liquid] !

With the ingredients in front of me, I handed my mom the _____ [noun] of glue to squeeze into the _____ [noun]. Then I saw her add a _____ [unit of measurement] of baking soda and some _____ [liquid] to mix in. So far, it looked like a big _____ [adjective] mess! I decided that I wanted my slime to be _____ [adjective] like a _____ [noun], so I chose to combine my favorite colors to mix in. _____ [color] glitter, silver sparkles, and gold _____ [noun] all went into the bowl. I mixed the colors together, but instead of looking like a galaxy, it looked like a _____ [noun]. I have never seen something so _____ [adjective]!

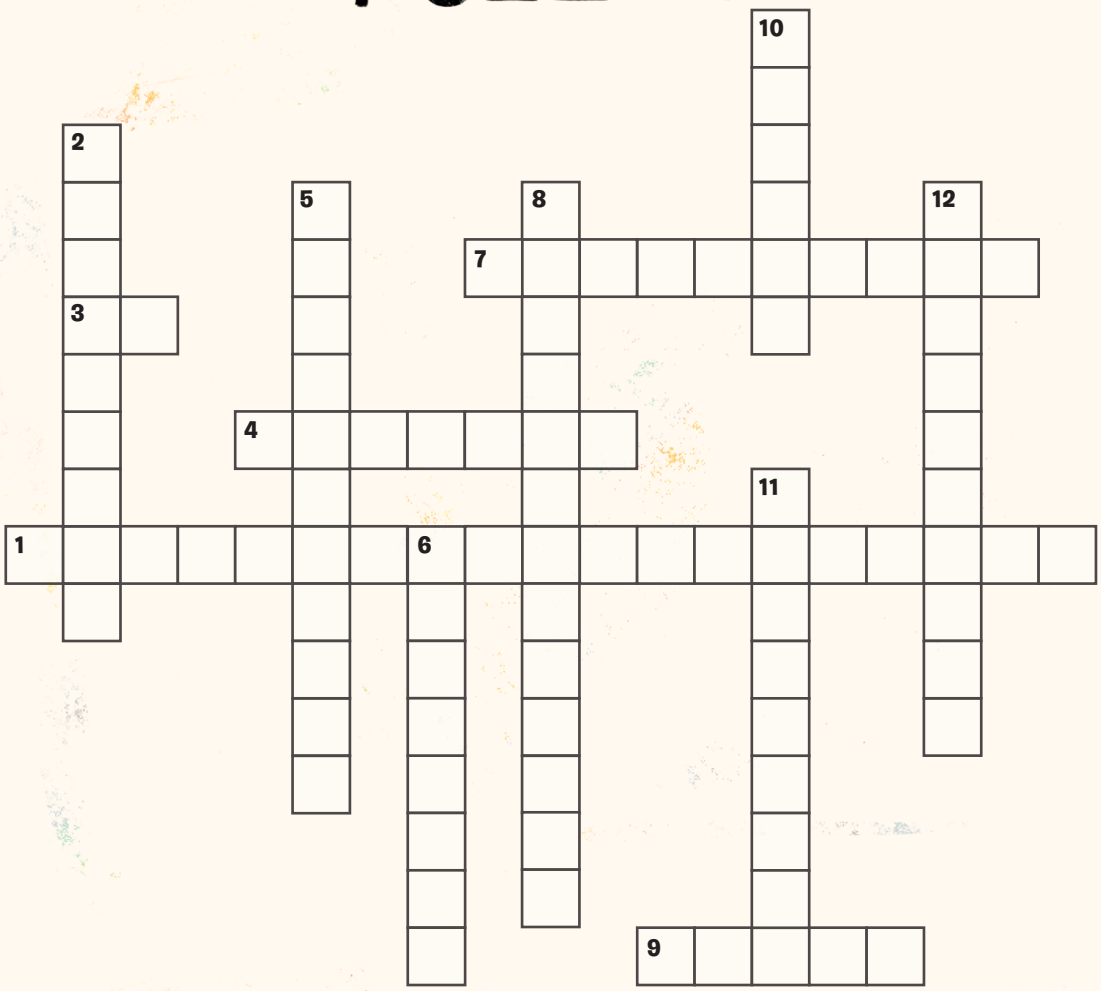
Slowly, I saw my mom add the contact lens solution. My mom let me drip the solution into the bowl, one _____ [noun] at a time. Finally, with all the ingredients in the bowl, the slime started to form. We kneaded it like _____ [food]. Back and forth, the slime stuck onto the table. It was so sticky and _____ [adjective]. We kept on kneading it and slowly it began to harden. It felt like a million _____ [unit of time] later before the slime felt like neither a liquid nor solid.

Slime is squishy, _____ [adjective], and stretchy all at the same time. The slime oozed through my _____ [body part] like a soft marshmallow when I squeezed it. Then it wobbled back and forth as it slipped through my hands and plopped onto the _____ [furniture]. This was such a cool science experiment!

REFERENCES

1. Science Buddies, & De Brabandere, S. (2017, June 8). Slime: Is it a solid, liquid--or both? Scientific American.
2. Weisberger, M. (2017, July 31). Sticky, gooey science! Why slime is awesome. livescience.com.

CROSSWORD PUZZLE



Across

1. Ability to focus on one friend's voice in a crowded lunchroom
3. Bees use this kind of light to find pollen in flowers
4. Unit for measuring loudness
7. Most of the world's vanilla is produced here
9. This coin costs more money to make than it is actually worth

Down

2. A synonym for gut feeling, hunch, the sixth sense
5. Grand Prismatic Spring's colors are a result of
6. Class of chemicals that remind you of coconuts and milk
8. False memories shared by a group
10. When our circadian rhythym is not in sync with the current time
11. Signal that encourages us to feel happy
12. When someone else tickles you

Answers: 1. Cocktail Party Effect 2. Intuition 3. UV 4. Decibel 5. Temperature 6. Lactones 7. Madagascar 8. Mandela Effect 9. Penny 10. Jet Lag 11. Serotonin 12. Gargalesis

Writing by EMILY SHENG | Design by ANGELA SONG

A Fun Recipe to Try

How to Make Vanilla Ice Cream at Home

Ingredients:
2 cups milk, ½ cup white sugar, 1 Tbsp vanilla extract, 10 cups ice, 8 Tbsp rock salt

Instructions:
Step 1: Combine milk, sugar, and vanilla in a large bowl. Stir well. Pour ½ cup into a resealable plastic bag and tightly seal it. Then put that bag into another plastic bag and seal it.

Step 2: Combine the ice and salt into a plastic food container. Place the sealed bags into the container and put the lid on. Shake the container for about 5 minutes or until the mixture looks like ice cream!

Step 3: Remove the inner bag to enjoy with friends and family!

To make different flavors, you can add your favorite ingredients to the mixture in step 1.

For chocolate ice cream, add 1 Tbsp unsweetened cocoa powder.

For strawberry ice cream, add 1 Tbsp chopped strawberries.

Can you think of any other combinations?

Tip: If your hands get cold, ask a friend or family member to help with the shaking.

REFERENCES
1. Food Network Kitchen. (2018). Ice Cream in a Bag. Food Network.

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UnEarthed

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