

UnEarthed

ISSUE N°7 SPRING 2021

dreams



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 are incredibly excited to bring you DREAMS, the seventh issue of UnEarthed. We chose this theme intending to present you with articles about the coolest and most interesting topics in the world. After reading this new edition, we sincerely hope that you are inspired to think big and chase your wildest dreams. We couldn’t be more thrilled to share this magazine with you.

One of our favorite parts of UnEarthed is that every theme always has multiple interpretations that allow us to deeply explore the topic and meet the diverse interests of our readers. When beginning our work on this edition, we quickly found that Dreams is no different. In this magazine, you will find articles about the dreams you experience when you are sleeping, why you may forget them, and what it means to lucid dream. Beyond this literal definition of dreams, there are also articles on some of the most important historical figures who had big dreams, the legend of the dreamcatcher, and how you can set yourself up to reach your dreams. Whether you are interested in reading about amazing space adventures, fascinating biographies, or riveting scientific explanations, you are sure to find an article that piques your interest!

It was a joy for us to put together this issue of UnEarthed for you, and we hope you enjoy reading these articles. 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.uneearthedpenn.com to explore digital-only articles, fun quizzes, and informative videos—all uniquely made by our amazing Digital team especially for you! All of our print magazines are also uploaded to our website, so you can read them online if you missed previous issues.

We encourage you to fill out the Suggestion Box on our website (<https://www.uneearthedpenn.com/suggestion-box>) with any recommendations to improve the publication or any article topics that you would like to see in future issues. And if you happen to be on social media, you can “Like” us on Facebook at “UnEarthed Penn” and follow us on Instagram @uneearthed.penn to stay up-to-date on all things UnEarthed.

Despite the craziness of last year where everything looked very different and far from normal, we hope this magazine reminds you that you can do anything that you put your mind to, and when times are tough, that you can always dream of a brighter tomorrow. We hope you enjoy this edition of UnEarthed, and we wish you a fun school year where all of your dreams come true!

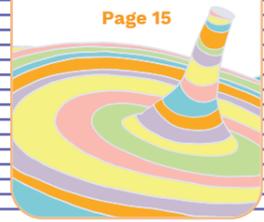
Grace Martens
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MANAGING EDITOR



Did you know Mary Shelley dreamed of the idea for Frankenstein while trying to write a ghost story?

READ MORE:
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What do you want to be when you grow up?

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Read about Walt Disney and his humble beginnings!

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Legend OF THE Dreamcatcher



Writing by RICHA PATEL

Editing by JANET LEE & SINAIA KEITH LANG

Once upon a time — back when North America was called Turtle Island and not even our grandparents' grandparents had been born yet — there lived Asibikaashi (ah-see-bih-KASH-ee), the Spider Woman, and Nimishoomis Giizis (nih-mih-SHOW-mis GEE-zis), the Grandfather Sun, who were helpers of the Ojibwe (oh-JEEB-way) tribe.

It was Spider Woman's responsibility to bring Grandfather Sun back to the sky every morning to spread light upon her people. She would also help Ojibwe mothers and grandmothers protect newborn children from the scary dreams that flew through the night air.

Dreams are a very important part of Ojibwe culture as they deliver predictions, hint to the names of unborn children, and even give spiritual advice. The Ojibwe also believe that dreams soar through the air and into sleeping people's heads.

This is where Spider Woman comes in: she helps children filter these dreams by spinning her webs to catch the nightmares and protect the children. However, as the Ojibwe (who live in modern-day Canada) began to spread across North America, it became increasingly difficult for her to protect all of the children at once. She had to come up with a solution.

She taught mothers, sisters, and grandmothers to weave webs and amulets using willow hoops. These creations were called *asabikeshiinh* (ah-SAH-bik-ay-sheen) — the Ojibwe word for spider — but today they are better known as dreamcatchers.

A typical dreamcatcher hoop had two webs connected at eight different points, in honor of the Spider Woman and her eight legs. The idea was that since bad dreams were big and clunky, they would get stuck between the webs, while the good dreams — which were small, fast, and light — could pass through the small hole in the center. As the Spider Woman brought the Grandfather Sun back into the sky, the bad dreams would fall apart at the sun's rays.

The Ojibwe tribe isn't the only tribe that uses dreamcatchers: the Lakota do as well. However, in Lakota legend, the dreamcatcher collects the good dreams and lets the bad ones slide through. By carrying the dreamcatcher with them, the Lakota capture the good dreams and



Ojibwe tribe members in traditional clothes (1875-1900)

keep them for the rest of their days.

Despite the difference, most dreamcatchers look pretty similar, with large circular or teardrop-shaped hoops. There are different theories about why the dreamcatcher is shaped this way. Some believe that it represents the circle of life. Others think it is meant to show the round shape of our world. Still others imagine that it demonstrates the circular paths of the sun and moon.

Since the 1960s, dream catchers have become much more common, and not just in Native American communities. The way they look has also changed. The middle weaving doesn't quite look like a spider web anymore. Additionally, rather than having feathers, which are meant to provide a ladder for good dreams to "climb" or to represent the breath of life, there are often loops, stars, beads, and other decorative additions meant to symbolize either the spider that made the web or the good dreams that the web caught. Some dream catchers even include gemstones or arrowheads for increased strength and protection.

Sadly, some people use dream catchers as decoration without understanding their true value to the Ojibwe, Lakota, and other indigenous tribes. This is called cultural appropriation. It is important to remember that for many First Nations peoples, the dreamcatcher is considered to be a link between all their different cultures.

No matter the form a dream catcher takes, it is meant to provide access to only the good dreams. It is a symbol of unity, reminding us of what we all have in common: dreams.

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The Most Influential Dreamers

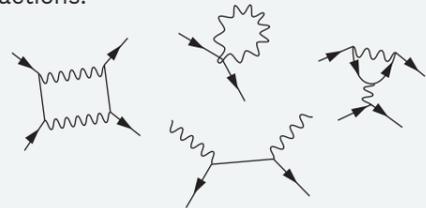
Writing by FERNANDO VILLEGAS NEGRETE | Editing by GRACE QIAN and LUKE ELEGANT | Design by MINJU KIM

Our dreams are our aspirations, our hopes, and our desires. Dreams can be as big as we want. Some people dream of discovering new things to help humanity understand the mysteries of the universe. Others dream of finding ways to reach unexplored places. In addition, some people dream for justice and equality and fight to make the world better for everyone. Here are some of the most influential dreamers of human history:

Richard Feynman



A master of physics, he had a passion for trying to uncover the fundamental mysteries of the universe. He is mostly known for his work on quantum electrodynamics, a theory that explains the interaction between light and charged particles among each other. He developed a series of drawings called Feynman diagrams that represent complex quantum phenomena! That is, if you were able to break down matter into very small pieces, these drawings would explain how all of these pieces fit together to make up everything we know! These diagrams look very simple, almost like doodles, but they represent mathematical equations related to complicated physical interactions.



Margaret Hamilton



We all know that we managed to send people to the moon during the Apollo 11 mission, but we do not always stop to think about all the people doing the hard work in the background. Margaret Hamilton is one of them, and her work was vital for the mission to be successful. As a software engineer and director of the team in charge of developing the software for the mission, she made great contributions to space exploration and computer science. During the Apollo 11 mission, as the astronauts were about to land on the moon, an error message popped up. There was an issue with the hardware (the physical parts of a computer), but the software (the digital programs of the computer) was trying to make up for it. While everyone was confused about the situation, Margaret soon realized what was happening. The software Margaret Hamilton and her team developed solved the issue and guaranteed the mission's success!

Angela Davis



A fighter for truth, justice, and equality, Angela Davis is a legendary activist, philosopher, professor, and author. Ever since she was young, she has always been an outspoken defender of civil rights, fighting for equal opportunity and equal protection under the law, regardless of race, gender, religion, etc. In the 1970s, she was a supporter of three inmates who were being used as easy marks for the internal racist and power politics of the prison they were in. Her influence on the case was so great that the authorities involved framed her for a crime, but it was soon shown she was innocent. Today, she is still involved in the fight against police brutality, and she is an advocate for civil, women's, and LGBTQ+ rights, and the Black Lives Matter movement. She not only argues that we as people have the power to make a better world for everybody, but we will be able to help each other build a better future.

Dreams are as real as dreamers make them. Believing in our own ability to achieve our dreams is critical. All of these people believed in themselves and fought for what they believed in. In the end, they achieved great things, showing that dreaming big and fighting to make your dreams come true is always worth it!

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Daydreaming

Writing by ROBIN HU
Editing by ALHENA ISLAM & JANET LEE

Have you ever caught yourself drifting off during class? Perhaps you were thinking about a recent conversation with a friend, drawing up hypothetical scenarios, or even imagining an alternative world in the future. Regardless, you were likely daydreaming!

Simply put, daydreaming refers to having a series of pleasant thoughts that distract attention from the present. Unlike when you dream at night, daydreaming occurs while awake and conscious. Daydreaming, also termed mind wandering, happens more frequently than you think. In fact, we do it every couple of minutes, adding up to 25-50% of our waking time, but there is no accepted consensus as to what the true breakdowns are. Some psychologists argue that there are goal-based and future-oriented daydreaming, which describe thoughts related to our goals and short-term or long-term plans. Others have found that a large portion of daydreaming actually pertains to everyday, simple planning. Conversely, there is also socially-oriented daydreaming, during which thoughts typically center around feelings and intentions. Another type is fantastical daydreaming, where our thoughts become more creative and unrestrained. In all instances, however, our minds wander into realms that may not have been imagined otherwise.

This brings up a key question: how does daydreaming even work? Unfortunately, there is no clear answer. Instead, there have been three proposed theories. The first is the distractibility account, which suggests that daydreaming is a failure to control distractions in the mind. The second theory is the executive-function account, which suggests that our minds fail to correctly process events and information. The last theory is the decoupling account, which suggests that attention is removed and instead paired with an internal mental process. If you find yourself tuning out your environment, you may be engaging with this decoupling process!

Furthermore, why do we daydream to begin with? Psychologists believe that daydreaming might be related to future thinking. This aligns with the goals and future daydreaming types previously described. For example, you might daydream about relevant goals or difficult tasks that involve preparation and planning. Another perspective shows how daydreaming might also be related to creative thinking; it may allow us to temporarily drift away from our

current tasks so that we can refocus with increased capability to finish difficult tasks. It may also allow us to switch attention as appropriate. Perhaps the most relatable reason, however, is tied to boredom! When we find something particularly boring, whether a tedious task or a long class, daydreaming allows us to detach and relieve that boredom.

Daydreaming is a natural part of everyday life. However, if daydreaming becomes compulsive and begins to interfere with daily functions, also called maladaptive daydreaming, it can become problematic. It becomes addictive and almost impossible to stop. Oftentimes, the thoughts become increasingly complex with characters and plots.

Even though a lot of our waking time is comprised of daydreaming, little is known about the functions, mechanisms, advantages, and drawbacks. Even less is known about how one crosses over into maladaptive daydreaming. There is much left to learn, so the next time you find yourself daydreaming, take a moment to think about all the information here. Maybe one day you'll become a psychologist or researcher cracking open all the secrets about daydreaming!"

Design by GRACE LEE

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7 Young Minds That Achieved **BIG DREAMS!**

Writing by MORGAN GILFOND • Editing by CLARISA YEE and JANET LEE • Design by ANGELA SONG



Malala Yousafzai dreams for every girl in Pakistan to have access to education and has spoken at the United Nations to present education as an international human right. She wrote *I Am Malala*, which became an international best seller, and she is the youngest ever Nobel Prize laureate.



Greta Thunberg is a student activist who began protesting against the Swedish government's failure to address climate change. In 2019, she was named Person of the Year by Time Magazine for her efforts in sparking environmental conservation.

Abigail Lupi witnessed the loneliness of many nursing home residents, and she dreamed of cheering them up. At just ten years old, she founded the Care-Girlz organization to support and comfort residents like her own grandmother!



Marley Dias, frustrated that many children's books lacked cultural diversity, launched a campaign on Twitter in 2015 called #1000Black-GirlBooks. She realized her dream of creating a space where black girls could feel seen and heard.



Jasilyn Charger grew up on a reservation for Native American communities in South Dakota, and she dreamed of a better support system for her and other struggling teenagers. She co-founded the One Mind Youth Movement to help indigenous youth in her area who are in crisis find support through community resources and educational workshops.



Kelvin Doe grew up in Sierra Leone where he had big dreams of becoming an inventor. At the young age of eleven, he began fixing local problems with recycled material. He even built his own radio station in Sierra Leone where he currently broadcasts music under the title "DJ Focus".

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Why Do We Forget Our Dreams?

Writing by ANIA ALBERSKI
Editing by PAIGE ORNER & MICHELE MELINE



Have you ever woken up after having a great dream, wanting to tell someone about it, but then realizing that you couldn't remember anything? You are not alone! Most people don't remember any of their dreams because of the chemical reactions that happen in our brains while we sleep.

Sleeping doesn't just mean that our eyes are closed for a few hours. During this time, our brains are working hard to move us through four stages of sleep, multiple times a night. First, when we get drowsy and fall asleep, we enter NREM1. This is a fancy term scientists use to describe sleep when our eyes do not move too much. The name means "non-REM," and the "REM" part stands for "rapid eye movements." Then, our body temperature drops and our heart beats a little slower. That's when we enter NREM2, or — you guessed it — step two of non-REM sleep. Next, there's NREM3 when our muscles relax and we get some deep sleep. Finally, we enter REM sleep. This is when most of our dreams occur, because our brain is really active. While you sleep, your brain generates mental "pictures" that you experience as dreams.

It takes a lot of energy to make those dreams! Scientists think that our brains actually throw out a lot of information while we are dreaming in the REM stage. This process is called synaptic pruning because our brain is cutting ties to unneeded information that lives in the small gaps between our neurons — synapses! It's kind of like a gardener who prunes, or cuts, trees and bushes so they can grow back healthier.

Since dreams don't last very long — only about five to 20 minutes — our brains sometimes decide that they aren't important. Once we come to the end of our dream experience, our brains will often deactivate the synapses that produced it. Then, the dream isn't able to enter our hippocampus, the tiny region of the brain that controls almost all of our memories. Imagine if someone told you to look for a toy in a giant basket, but they actually threw the toy out beforehand. You would never find it! That's how our brains feel when we try to search for information about the dreams that never made it to our hippocampus.

Brains don't always cut out all of our dreams though. Some of them might be really awesome or weird, and some people will even take notes on their dreams to help them remember them. Do you have a wild dream that you remember?

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SLEEP IN THE ANIMAL KINGDOM

Writing by LEAH LEVIN
Editing by SINAI KEITH LANG & MICHELE MELINE
Design by BRYNN LILLEY

As humans, we typically lay down to sleep for around 8 hours a day. Did you know that not all animals sleep this way? Let's explore some of the diverse sleeping habits found in the animal kingdom.

Sea Otters:

In the water, otters sleep floating on their backs with their feet up in the air. In order to prevent themselves from drifting away from their raft, or group, these friendly animals typically hold paws while they sleep. They also wrap themselves in blankets of kelp and seaweed to stay close to shore. Sometimes, they put their paws over their chest or eyes in order to block the sunlight from keeping them awake. Overall, these adorable animals sleep for about 11 hours per day.

Giraffes:

The tallest mammal on Earth, the average adult giraffe, gets only 30 minutes of deep sleep per day in the wild - the shortest amount in the entire animal kingdom! Giraffes also take very quick power naps throughout the day, just a few minutes at a time. Because of the threat of predators, giraffes in the wild usually nap standing up. Some researchers believe that giraffes must stay awake because they need time to eat lots of food to energize their big bodies.

Dolphins:

Humans sleep unconsciously, which means

we are not alert when we are sleeping. In contrast, dolphins need to stay conscious during sleep in order to actively control their breathing. This means they need to remember to come up to the water's surface for air, even while asleep. How do they do this? Dolphins sleep unihemispherically: only one side of their brain sleeps at a time. While one side rests, the other keeps track of breathing. As a result, dolphins sleep with only one of their eyes closed. After enough rest, the other side of the brain goes to sleep while the other wakes up. This process is called cat-napping. Overall, dolphins sleep for about 8 hours per day.

Walrus:

On average, walrus sleep for 20 hours a day - more time than we spend awake! However, they can go up to 84 hours, more than three days, without sleep. Walrus spend their lives on both land and water. They sleep longer on land, but prefer to rest underwater, only quickly coming above the surface for air before going back down. Others like to hook their tusks onto ice floes and float about as they sleep.

Birds:

Most birds sleep both bihemispherically and unihemispherically. This means that sometimes, only half of the birds' brains sleep at a time, while other times, both sides sleep. Birds may be able to control when each type of sleep occurs. For example, ducks sleep in rows. Ducks on the end typically sleep unihemispherically, keeping the eye that faces away from the other ducks open. This could be to watch out and protect their group from predators. Meanwhile, the other ducks have both eyes closed, showing bihemispheric sleep. What about the birds that spend most of their lives in the air? Frigatebirds can fly for two months without ever touching down on land or water. It turns out they can actually sleep around 40 minutes a day while in flight, for about 10 seconds at a time! On land, they can sleep for over 12 hours a day.

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The Power Couple That Lit Up the World

Writing by MOHAMAD HAZIM • Design by VANESSA LIEW
Editing by GRACE QIAN & SINAI KEITH LANG

Have you ever wondered how X-rays are able to see through our skin and muscle? Have you ever flipped on a switch and wondered how the lights turn on so fast? Have you ever wondered how the hands of old watches glow without electricity? All of these questions can be answered by learning about radiation and radioactive atoms. Atoms are the small units of matter that make up everything in the universe. Some atoms are radioactive, meaning they are unstable and release energy that we can use for all of the above items. We owe our understanding of radioactivity to Marie and Pierre Curie, one of the most important teams in science history!

Marie Curie was born in Poland in 1867 under the name Maria Sklodowska. In 1894, she met Pierre Curie at the Sorbonne in Paris where Pierre was a physics professor and Marie was continuing her studies. They got married in 1895. Instead of wearing a traditional white dress, Marie decided to wear a blue dress because she wanted to be able to wear it to the lab afterwards! On April 20, 1902, the team isolated the radioactive element radium. To do this, Marie and Pierre filtered a material called pitchblende. Marie and Pierre spent years and used multiple tons of pitchblende to get one-tenth of a gram of radium. That's less than one teaspoon! Although this was a very small amount of the powerful element, isolating radium had never been

done before and the couple's discovery shocked the world.

Pierre Curie was nominated for the 1903 Nobel Prize in physics for this incredible discovery, but Marie Curie did not receive credit at first. Pierre stood up for his wife and teammate, complaining that Marie also deserved to be awarded for her work. This led to Marie being added to the Nobel Prize nomination. The team went on to win the award which made Marie the first woman to win a Nobel Prize! After winning the prize, Marie and Pierre continued to work in their lab studying radioactivity. Unfortunately, three years later, Pierre was struck by a horse-drawn carriage and passed away. Marie vowed to honor her beloved husband and spent the rest of her life building on the discoveries the two had made. Marie took on Pierre's position as a Professor at the Sorbonne, making her the first female professor in the Sorbonne's history. In 1911, she went on to win a second Nobel Prize, this time in chemistry, for isolating metallic radium and studying the use of radium in cancer treatments. To this day, Marie Curie is the only woman to have won two Nobel Prizes!

Marie and Pierre Curie worked together to make some of the most life-changing discoveries in recent history. The team's discovery of radioactivity helped pave the way for modern technologies that are used in medicine, electricity, food, and even warfare! We swallow radioactive materials that make our organs glow in medical scans. Many places depend on nuclear power plants to get electricity. Many countries have nuclear weapons. All of these major technologies build on our understanding of radioactivity which Marie and Pierre Curie defined. It's true what they say, teamwork makes the dream work!

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WHEN HE WISHED UPON A STAR DISNEY'S DREAMS CAME TRUE



Have you ever wanted to escape reality to Cinderella's castle, the underwater realms of Nemo and Friends, or the future of Tomorrowland? If you have been to a Disney theme park, then you must have!

Walt Disney, the creator of the Disney parks franchise, was a cartoonist and animator inspired by the human ability to dream. Despite his humble beginnings as an ordinary boy, Walt Disney himself had big dreams. He developed an interest in sketching cartoons at a young age and took lessons at two different art institutes, eventually becoming a cartoon columnist for his school magazine. However, at the age of sixteen, he dropped out of school to enlist in the army during the First World War but was rejected for being underage. Instead, he decided to work overseas for the Red Cross as an ambulance driver before returning to pursue commercial art. His dreams started being realized in 1919 when he received a job at the Kansas City Film Ad Company where he could put his skills in animation to the test. Following this, he started his first animation company and created the Laugh-O-Gram short films. These contained humorous, animated entertainment that were typically screened as intermission fillers at local movie theaters. While these shorts were widely popular, the company went bankrupt in 1923.

The bankruptcy did not stop Walt Disney from chasing his dreams. He was even quoted saying, "Ask yourself if what you're doing today will get you to where you want to go tomorrow." It was his experience creating Laugh-O-Grams and his determination to never give up that inspired him in 1927 to create and voice Mickey Mouse! By 1928, the featured animated short Steamboat Willie starring Mickey Mouse was playing in theaters. The Disney franchise was officially a success, and it would only continue to grow in popularity for the next century through the production of other films including Alice in Wonderland (1951), Peter Pan (1953), The Lion King (1994), and Frozen (2013).

By the 1950s, Walt Disney wished to bring the magic of his feature films to life through an amusement park. After years of planning, Disneyland opened for those with special invitations in California on July 17, 1955. However, it had an unfortunate start. Thousands of counterfeit tickets were made for opening day, resulting in food and drinks running out and rides being overwhelmed by guests. The park was not done being built, so it was unprepared for the large number of guests. For instance, a woman's high heel shoe got trapped in the unfinished, wet asphalt on Main Street USA!

Despite the setbacks, Disneyland recovered and became a fixture of California entertainment. By 1965, the plans for Disney World in Orlando, Florida were already underway. Currently, Walt Disney World Orlando is composed of four separate theme parks: Magic Kingdom, Animal Kingdom, Epcot, and Hollywood Studios. In fact, the Disney World parks are the most visited theme parks globally!

The Disney parks are an inspiration for all ages. Beyond immersing their guests into the movies they have come to love, their rides have teachable moments too! The attractions at Disney inspire guests to follow in the footsteps of Disney himself in order to realize their own dreams! Let's explore three of these attractions located in Florida's Disney World:

Epcot Theme Park — This theme park takes guests on a journey around the World Showcase Lagoon to experience different countries including Germany, Japan, and Morocco all in one place! Walt Disney had originally pitched Epcot as a real, functioning city with mass transit and residential life. This idea was scaled down to a theme park following the death of Walt Disney in 1966, but it is amazing to see how one person's vision almost became reality!

The Carousel of Progress — This attraction is located in Tomorrowland at the Magic Kingdom in Walt Disney World. It takes its riders through a detailed history of the development of technology throughout much of the 20th century. Riders learn about gramophones, televisions, and the radio. The ride features the song "A Great Big Beautiful Tomorrow" and hints at many possibilities for how the future can bring us new innovations that began as dreams!

Wishes Nighttime Spectacular — Wishes was a firework show staged every night before the Magic Kingdom closed for the night. The show began in 2003 and featured a firework spectacle bursting with a variety of colors in the night sky. Narrated by Jiminy Cricket and the Blue Fairy from Pinocchio, it featured cameos from famous Disney characters and a shooting star firework that guests could wish upon. While the show ended and is now replaced with Happily Ever After, its legacy will live on as a reminder to follow your dreams!

Now it's your turn! Are you inspired by Walt Disney's story and his successful attempts at finding his calling? What do you dream of doing in the future? With some hard work and a wish upon a star, it will not be long before you achieve your dreams too!

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DREAMING OF A TRIP TO SPACE

Writing by SARAH ROOT

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Have you ever thought about what it takes to be an astronaut? Currently, there are only 46 Americans who are active astronauts, and they have all worked very hard to earn their spot. They've received advanced degrees in STEM, completed over 1,000 hours as jet aircraft pilots, and passed a difficult physical fitness exam. For most of us, the dream of becoming a real NASA astronaut seems like it'll remain just that: a dream.

But maybe there's another way. Recently, a number of bold companies have popped up with the mission of making space exploration possible for more and more people. Some of them, like SpaceX, may sound familiar. Others, like Blue Origin and Orion Span, may be less so. Each of these companies are working hard to kick-start space tourism which would allow people to travel to space for fun! They are making huge advancements in rocket science every day in an effort to make it easier for the average person to reach for the stars.

So what would space tourism actually look like? We've been sending astronauts to space since the 1960s, but sending tourists is still uncharted territory. There are three types of space tourism that people are envisioning. Let's take a look at each.

First, there's what's known as sub-orbital spaceflight. This would be the quickest, easiest, and likely the most accessible form of space tourism. This is because the spacecraft carrying passengers doesn't fully make it to space. Here, the spacecraft just touches the outer edge of the Earth's atmosphere, meaning that it never completes an orbit around the Earth. The craft is eventually pulled back down to Earth's surface

by the strength of gravity. But, for the human passengers, the effect of gravity is minimal. Sub-orbital space tours would likely be short, but, for a moment, passengers would be able to feel what it's like to be weightless.

Next, there's orbital space tourism. Orbital spaceflight is what the vast majority of astronauts undertake when they board the International Space Station, a large spacecraft that houses astronauts during their trips to space. In orbital spaceflight, the spacecraft leaves Earth's atmosphere entirely, but the effect of gravity is still strong enough for the spacecraft to be trapped in a revolving orbit around the planet. Because of this, tourists would be able to spend days, maybe weeks, up in space. Imagine being able to wake up on the first day of your vacation, look out your window, and see Earth drifting peacefully, thousands of miles below you.

Finally, space tourism could take place outside of Earth's orbit. There's a possibility of taking trips to both the moon (lunar travel) and other planets (extraplanetary travel). These options are by far the most complicated because of the extreme distance between Earth and the final destinations. Therefore, they are furthest away from being a reality. However, it's not impossible to think that in the future, people will be able to buy tickets for a trip to the moon or the surface of Mars. Only twelve people in history have set foot on the surface of the moon and none have ever set foot on Mars. In the next few decades, it's extremely likely that these numbers will increase. As the process to send people to space becomes more efficient, companies will be able to replicate it for tourists like us!

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Oh! the Places You'll Go!

Writing by MEGHANA IYER

Oh the places you'll go! Do you ever dream about what you want to be when you grow up? Do you like science and technology and ever think about building something or creating a cool app that can save people's lives? Or are you more interested in arts and humanities and like to use your creativity to solve problems? Here is a list of ideas that can help you think about possible future careers!

DOCTOR

Doctors work in hospitals and clinics to protect and improve people's health. The COVID-19 pandemic affected a lot of individuals, and doctors were some of the brave men and women at the frontlines who helped many sick people. If you like to think quickly on your feet and enjoy both science and thinking creatively, then being a doctor may be for you! On top of the thinking skills needed, doctors are incredibly kind and empathetic individuals who comfort patients and their families.

CHEF

Do you love food? Do you love to cook or bake? Did you pick up any new and fun recipes during quarantine? You can become a chef! While a traditional chef usually works in a cafe or restaurant, nowadays with the power of social media and technology, you can become a chef from the comfort of your own home! There are also so many recipes from around the world that you can try out as a chef. Bon appetit!

BUSINESS ENTREPRENEUR

Have an idea for a business or product that you are itching to share with others? Then, business entrepreneurship may be for you! Entrepreneurs are individuals who start their own businesses. They think of an idea for a business, look for sources of money to make that business come alive, hire other people who are interested in the business idea, and then run the business. If you like the idea of being your own boss (and bossing others around!), then entrepreneurship may be for you!

The world is full of opportunities and is waiting for all of you to change it! Continue to dream big; work hard, and seek the support of others, and you will all go on to do great things!

TEACHER

Teachers are so important because they educate and prepare us for the future. They teach us important skills and help us build up our knowledge so we are prepared to take on the world. If you enjoy working with people and want to make a difference in their lives, then think about a possible career in teaching!

ASTRONAUT

Do you ever dream about what life would be like beyond Earth? Have you ever thought about what it would be like to walk on the moon? Maybe you could become an astronaut! Astronauts fly into space to accomplish various missions and answer questions such as understanding how plants can grow in outer space, how the human body changes in space, and if there is life on other planets. If you are interested in solving the mysteries of deep space, then becoming an astronaut may be for you!

ARTIST/MUSICIAN

If you like to draw, paint, sing, dance, act, or play an instrument, then you could become an artist or musician. Artists and musicians are often self-employed, which means that they are their own bosses. They can make art and music whenever they want, wherever they want! There are so many opportunities to showcase your creativity as an artist and musician, whether it be a museum, professional orchestra, or music school (where you could teach music to others!).

Editing by ANJANA SRIKUMAR & GRACE QIAN

Design by AMY GUO

THANKS TO OUR READER, GIGI, FOR THE ARTICLE SUGGESTION ON SPACE!

AN ASTRONAUT'S BEDTIME ROUTINE

Have you ever dreamed of becoming an astronaut one day? Spending your days in outer space sounds pretty weird and wonderful, doesn't it? Turns out, it is weird and wonderful—but in ways you've probably never imagined. For instance, although astronauts sleep just like we do, their bedtime routines are very different from ours.

Imagine—you're an astronaut on the International Space Station. It's late and you're getting tired, so you put away your tools and clean up your work space, and now it's time to prepare for bed. On Earth, this would be a pretty simple routine because gravity holds everything down. When you jump, you fall back down to the ground. In space, when you jump, you bump your head on the ceiling instead. Now you're floating somewhere between the floor and the ceiling because even inside the spaceship, there's no gravity. It's a lot of fun, but it also makes daily life a lot more complicated. If you're floating, that means everything else is too!

Before you go to sleep, you need to use the bathroom. On Earth this is easy. But in space, with zero gravity, anything that would normally go in the toilet floats. If you try to sit on the toilet, you'll float away too! Luckily, your friends at NASA have found ways to deal with this: they've created leg restraints that strap you down onto the toilet. The toilet itself works a lot like a vacuum cleaner; there are fans that suck the waste you produce through a hose and eject it into a wastewater tank. And the best part: there is a water filtering system that turns all of your urine into drinking water!

Now it's time to brush your teeth. Unfortunately, there's no running water. In space, if you turned on a faucet, water would spray out all over the room, floating in perfect little droplets all around you. But everyone has to brush their teeth, even astronauts! So, with your toothbrush in one hand, you open a water bottle and let some water leak out. The ball of water grows bigger and bigger before your eyes, and once it's big enough, you close the water bottle and set it aside. (It floats somewhere beside your head.) Now you take your toothbrush and place it gently against the floating droplet, and you watch as the bristles slowly soak up the water. Then, you carefully smear a bit of toothpaste on top. And now you're ready to go! You brush your teeth, keeping your mouth closed so nothing floats away. Once you're done, though, you don't spit—spitting is another thing you can't do in space. Instead, you swallow the toothpaste. It's a little gross, but it won't hurt you.

And now, finally, it's time for bed. You float into your bedroom, and although it's a tiny cubicle, it's comfortable. There's a sleeping bag, but it's not for keeping warm—it's to keep you from floating away. You zip yourself up inside of it, and you decide to let your arms poke out through the arm holes. In space, there's no up or down, so you can sleep any way you want: right-side up, upside down, sideways, or diagonal! It takes you a bit of time to get comfortable. Your hair floats up around your face, your arms float out in front of you, and your body feels weightless, like you're on a cloud. As it turns out, outer space is a pretty great place for dreaming!

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THE SCIENCE OF

GLOW

IN THE

DARK

Have you ever slept inches away from the stars? No, not the stars in the sky! These are the glow in the dark stars on your ceiling as you are dreaming at night. So many things have the power to glow in the dark: glow sticks, pajamas, fireflies, and more. The amazing ability to glow is due to different forms of a process called luminescence! This means the emission, or release, of light from an object.

Luminescence is caused by chemical compounds, which give off the light that we see in the dark. There are two main types of luminescent materials in toys: chemiluminescent and phosphorescent.

Glow sticks have chemiluminescence, meaning that they glow because of a chemical reaction. When you hear the crunch of the glow stick, you are actually starting a chemical reaction! Glow sticks have chemical compounds such as hydrogen peroxide in them, which mix together when the stick is cracked and give off a characteristic glow. Over time, the fading of their glow shows that the reaction has completed. Chemiluminescence can also be natural, like fireflies that have a bright green glow.

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On the other hand, phosphorescence is what is responsible for the cool glow we see in the stars on our ceilings and other glow-in-the-dark toys. They contain phosphors, which are chemicals that give off visible light after being energized. This means that they often need to be "charged," or soak up sunlight, before giving off their characteristic glow. One strategy that is used to make glow-in-the-dark toys is to find phosphors that can glow for a long time. This means that while you are fast asleep and dreaming, they are wide awake and giving off beautiful colors of light.

The term "glow-in-the-dark" is commonly linked to the color green. However, glow-in-the-dark objects can be multiple colors, ranging the whole rainbow! This is because each type of phosphor can release a different wavelength of light, which is linked to the specific color that we see. This glow does not only happen in the dark though. If you wake up and turn on the lights in the middle of the night and take a look at the star stickers, they are still glowing, but it is hard to see. Next time you are playing with fireflies or glow-in-the-dark toys, remember how hard they are working to glow!

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DREAMS THAT MADE HISTORY



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History consists of great ideas that transformed the world. Many of these ideas seem so miraculous that many have wondered how they came to be. Dreams have been the source of inspiration for various historical creations. Let's learn more about some of these events and their impact.

Mary Shelley and her novel, Frankenstein

Mary Shelley, the author of what is thought to be the first science fiction novel, *Frankenstein*, originally pictured the iconic monster in a dream. In Switzerland during the summer of 1816, Shelley and a group of friends decided they would each write a ghost story. Shelley was having difficulty finding a truly scary and interesting idea, until one night she dreamed of a scientist kneeling beside a creature he had just brought to life. Shelley described waking up from this vision with absolute terror. She could not get this scene out of her mind, so she decided to base her ghost story on it. After sharing her tale with her friends, she was motivated to develop this story into the novel, *Frankenstein*. Since then, Mary Shelley's *Frankenstein* has become one of the most important fictional characters in our culture. Schools around the world continue to study her novel. Multiple movies, TV shows, and novels have retold or included the story of the man-made monster. Now about 200 years later, the ghost story inspired by a dream is just as popular as ever.

Albert Einstein and the Speed of Light

You may have heard of Albert Einstein, the man who is highly regarded as one of the most brilliant scientists to ever exist. How did this great mind think of some of his revolutionary scientific theories, such as that of the speed of light? He dreamed of them. Einstein had a dream that he was sledding down a high mountain so fast that he was approaching the speed of light. As he approached this speed, he saw that the stars' appearance began to change. Once he woke up, he began examining his dream, trying to understand what it meant, which eventually led to his development of the theory of the speed of light. This theory is

considered to be one of the most significant scientific discoveries of the last century.

Paul McCartney and the song "Let It Be"

Paul McCartney's former band, The Beatles, are widely regarded as one of the greatest musical artists of the last century. While they have put out many successful and critically-acclaimed songs and albums, one of their most beloved songs is "Let It Be." McCartney dreamed of the memorable lyrics and song title in the 1960s, years after he lost his mother to cancer. He described the dream in an interview with talk show host James Corden, stating, "I had a dream in the sixties, where my mum who died came to me in a dream and was reassuring me, saying: 'It's gonna be OK. Just let it be...'" This dream inspired the song, which has taken on a powerfully spiritual meaning and continues to be played and sung around the world to this day.

Niels Bohr and the Atomic Structure

The atom is the building block of everything that exists in the universe. Within the atom, there are smaller particles called electrons, protons, and neutrons. During the time of Niels Bohr, there was not a supported theory that explained how these small particles were positioned within the atom. Bohr set out to find an answer to this question, but each of his theories failed to be supported by his experiments. One night, he dreamt that the structure of the atom looked like our solar system. He saw the nucleus in the middle, like the sun, with the electrons revolving around it, like the planets. He proposed a similar model of the atom, now known as the Bohr model, and provided evidence through experimentation. The Bohr model helped lay the foundation for future atomic structure and quantum mechanics (the study of how atomic particles move) discoveries. For his work, Bohr was awarded the Nobel Prize for Physics.

The phrase "Inspiration can strike anywhere" rings true in these historical accounts. Dreams have been the source of some remarkable historical events and discoveries that have impacted all of us. Make sure you get your rest because your next dream could make history!

DREAMS IN SOUL

Writing By **ANDRES GARCIA-EPELBIOM**

Editing By **LUKE ELEGANT** and **ANJANA SRIKUMAR**

Soul is a Pixar movie about the meaning of life. It follows Joe Gardner, a middle-school music teacher who dreams of becoming a professional jazz musician. He finally gets a chance to play in a quartet, a group of four people playing music or singing together, with one of his favorite musicians, only to die by falling through a manhole the day he's supposed to go on stage. The rest of the movie is about Joe's journey to reunite his soul with his body in time to play and catch his big break. Soul can be interpreted in many ways. One of the most important messages is that while striving towards your dreams is great, obsessing over them can lead to missing out on the rest of what life has to offer.

Joe believes that a person's "spark" is their life's purpose. Joe's spark is playing the piano. He believes he was born to do it. He tries to force this belief onto 22, a soul he is in charge of mentoring in the Great Before. In the movie, souls in the Great Before try to find their spark with the help of mentors, people like Joe who have recently died, before making their way to Earth to start life. 22 has been in the Great Before for thousands of years; every mentor she

has had, from Abraham Lincoln to George Orwell, has failed to help her find her spark, in part due to her cynical attitude toward Earth. Joe's narrow-minded perspective of a person's spark being a person's sole purpose limits the joy one can feel from what the rest of life has to offer. It is not until 22 lives a day in Joe's body that she experiences the simple joys in life, such as the taste of pizza or meeting new people. They both realize that there is more to life than one's spark.

This is not to say that you shouldn't follow your dreams or try to find your passion. Doing what you love is one of the greatest things in life, but finding your spark is definitely not the only thing that gives life meaning. You may think that if you achieve your goals or your definition of success, you will find happiness. Happiness is not a destination, but rather a journey. Your dreams and passions should help fuel your happiness, but they should never be the only end goal. While you are chasing your dreams, do not forget to stop once in a while and enjoy the simple things in life, like the sound of the ocean as you lay on the warm sand or the joy of spending time with friends and family.

“Make a Wish!”

Writing by **CAROLYN WANG** • Design by **BRVNN LILLEY** • Editing by **MICHELE MELINE** and **PAIGE ORNER**

You probably hear this every year on your birthday, right as you are about to blow out your candles. Wishing on birthday candles is just one of the many superstitions we have weaved into our everyday lives. “When we say things like “Step on a crack, break your mother's back!” or “Knock on wood!” we are subscribing to widely held beliefs in supernatural causation. Supernatural causation is the idea that an act causes something else to happen without a clear scientific explanation. Superstitions come in all shapes and sizes, and there are many in the realm of wishes and dreams. We are all so familiar with them, but have you ever wondered where they came from?

Blowing out Birthday Candles

It is said that candles on cakes date back to the Ancient Greeks, who brought circle-shaped cakes stuffed with candles to the temple of Artemis, the goddess of the hunt and the moon. The Ancient Greeks lit candles around the round cakes to represent the moon and pay tribute to the goddess. During this time, candles were burned as offerings to many gods and goddesses, and it was commonly believed that smoke from the candles carried wishes and prayers to the heavenly beings.

Wishing on a Shooting Star

Some historians believe this tradition started with Greek astronomer Ptolemy. In the second century, Ptolemy wrote about gods who he thought were observing Earth from the heavens. He believed it was possible that they opened a portal between the heavens and Earth that would occasionally let objects slip through to Earth in the form of shooting stars. If the gods were looking down at the physical world, Ptolemy thought that maybe wishing on a shooting star would get the gods to notice people on Earth and grant them a wish or two.

Blowing Away Eyelashes

The association between good fortune and eyelashes dates back to 19th century Britain and Ireland. It was common folklore that one must place a fallen eyelash on the back of the hand, wish, and throw it over the shoulder. If the eyelash stuck to the hand, the wish was said to be dead, but if it left the hand, it was believed to come true. Another legend in this time among Cornish school girls claimed that if a fallen eyelash placed on the tip of the nose or the back of the hand successfully blows away, then the associated wish will come true.

Tossing Coins into Fountains

This tradition centers around the element of water, which sustains all human life. Many early European tribes believed that drinkable water was the ultimate gift from the gods, so they constructed wells and fountains to enshrine and honor them. Tossing a coin into the shrine was a way of presenting a gift to the gods, so people began to toss coins while sending a prayer with them.

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Lucid Dreams

Writing By **SHUNMEL SYAU**
Editing By **JANET LEE & CLARISA YEE**

You are a knight clad in shining armor, riding to defeat a dragon. It turns out to be a formidable foe, as dragons usually are, but all of a sudden, you decide to befriend it. This typically wouldn't be the best strategy to win — unless you have control over how the battle plays out. In other words, if you could lucid dream. Seems impossible, right?

A lucid dream is one in which you are aware of your dreaming state, allowing you to control the trajectory or your actions within it. Despite the research that has been done on this, it's still not fully understood. However, scientists have made some findings. The prefrontal cortex is believed to play a role in lucid dreaming. As its name suggests, this is the frontmost area of your brain and is responsible for primary tasks, such as decision making, amongst other things. A specific part of the prefrontal cortex, called the ventromedial prefrontal cortex (vmPFC), has been shown to reactivate (even after being turned off as you descend into sleep) during REM sleep, the last stage of a normal sleep cycle when you would typically experience dreaming. What's striking is that the vmPFC, in fact, shows activity levels that exceed that of when you're awake. And when lucid dreaming, that activity level is even higher. It's quite possible that this is a key factor in you remaining lucid during those lucid dreams.

There have long been debates over whether these dreams would give rise to beneficial or harmful consequences. For one, it's possible that having frequent lucid dreams can disrupt your normal sleep cycle and your quality of sleep. However, there is also the argument that lucid dreams may help you overcome your fears and achieve a sense of fulfillment or healing, since anything is possible in these dreams.



For example, research has shown that lucid dreaming can act as treatment for nightmares. Either way, lucid dreaming isn't something to fear; rather, it's quite a fascinating experience!

The idea of lucid dreaming is best illustrated by Peter Maich, a life-long lucid dreamer. In his interview with "The Cut," Maich details his own experience. He claims it's like he's "playing in a virtual reality where [he] has some control over aspects of the scene and setting." He speaks of how he enters this state: "you watch yourself go to sleep, and you are laying there relaxing — and while that's going on, you watch another part of your mind close down and go to sleep. Suddenly you are standing there fully formed in your dream, and you have not lost any awareness of who you are and what's going on."

After hearing about his experiences, don't you want to give it a try for yourself? It may be surprising to know that around 55% of adults have experienced a lucid dream during the course of their life, and 23% of people would fall under this concept of a life-long lucid dreamer — that is, they lucid dream monthly. Although these numbers seem higher than expected, studies have shown that some people are merely more predisposed to lucid dreaming. However, that doesn't mean that one can't try to lucid dream if they've never experienced it naturally. There's a few tips out there. One tip is to make your environment as ideal as possible; this includes: a comfortable temperature around 65 degrees Fahrenheit, a dark and quiet environment, and a healthy sleep schedule. Another suggestion is something known as the MILD method: go to bed, wake up after 5 hours of sleep, and before you go back to sleep, remind yourself that you're dreaming. But remember to take these ideas with a grain of salt — there's no guarantee that it'll work and it's best to be careful to not disrupt your normal sleeping schedule!

While experiences differ for every person, overall lucid dreaming is a fascinating occurrence. It's like falling asleep and waking up to the world being your oyster: you close your eyes, and open them to face the dragon. The wind brushes your hair as you soar past wisps of clouds, and sunlight glints off the dragon's scales beneath you. Here, in your dream, you can do anything.

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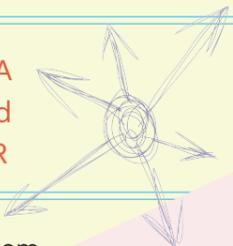


Design by **CHEAVLAY PHAT**

Daring to Dream but Achieving It Too

SMART Goals

Writing by ANUSHREE ANEJA
Editing by ALHENA ISLAM and
ANJANA SRIKUMAR



Sit back, close your eyes, and imagine yourself in the future. You're working your dream job, maybe floating through outer space as an astronaut, feeling the flashing lights of cameras on a movie set, or writing on a chalkboard for a room full of eager learners. Though your dreams may feel out of reach, if you put your mind towards them, you can accomplish anything!

It's a long journey from now until you settle down in your career. You will come across multiple milestones in your time, all of which will be important for your self-growth. The key is to break down your path into several steps, that way each seems more attainable and less intimidating. In fact, there is one particular method that multiple individuals have been utilizing: SMART goals. Goal making has always been a strategy people have used to accomplish their dreams, but SMART goals give specific outlines to help people better envision what they must do in order to reach where they want to be.

SMART is an acronym that stands for Specific, Measurable, Achievable, Relevant, and Timely. Each part of a SMART goal allows a person to detail different aspects of their goal so that they can better map out their timeline as well as prioritize what is most relevant towards achieving that goal.



Specific relates to asking all of the "W" questions about your goal: What, Why, Who, Where, and Which. Asking yourselves these types of questions can put you on the right track to planning out future steps and establishing a timeline for yourself. It helps to be more organized in the beginning and your future goal-achieving self will thank you later!

Measurable allows people to keep track of their advancements and see how far relative to the endpoint they are. For this part of the SMART goal, you may focus on periodically recording your progress with accomplishing that goal and setting deadlines for yourself.

Achievable makes sure people set realistic expectations for themselves. It ensures that the goal is not too far out of reach but also not so close within reach that it isn't a challenge at all.

Relevant helps you put the goal in a broader perspective. Though it is important to set goals for yourself, it is also important to determine if this is what will make you the most happy and what you want for yourself in both your daily life as well as your career. Accomplishing goals takes a significant amount of effort and it is important to determine if this is worth it to you.

Timely makes sure that you set a good timeline for yourself. SMART goals aren't accomplished quickly, but you also don't want to spend an infinite amount of time on them.

Next time you have something you want to accomplish, consider setting a SMART goal! With hard work and motivation, there's nothing stopping you from achieving your greatest hopes.

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Design by GRACE LEE



The Importance of Sleep

Writing by SRUTHI SRINIVAS | Editing by GRACE QIAN and LUKE ELEGANT | Design by MINJU KIM

We may not like it when our parents tell us to go to bed at night, but I've found that it's easier when one thinks of it as a chance to enter a new, exciting world (outside the world of video games you had to leave to sleep) instead of a chore. Fighting off deep sea dragons, taking a rocketship to Mars, even just enjoying a plate of chicken nuggets- sleeping can totally alter our reality for eight to ten hours. But why is it so important? Do we really need sleep?

To answer these questions, we must go back to the fundamentals—defining what sleep is. Sleep is the nightly shut-down we all experience. It's based on bodily circadian rhythms, or 24-hour cycles, that control when we feel tired and when we feel refreshed. When we're tired enough, our bodies undergo four stages of sleep, repeating every 90 to 120 minutes until we wake up:

Stages 1, 2, and 3: Muscles unclench, and heart rate and breathing speed gradually decrease. Brain waves, which are formed by electrical signals in one's head being sent to different parts of the body, slow down as well. Body temperature goes down and physical functions, like breathing and heart rate, slow down to reach the lowest they'll be. Blood is redirected from the brain to the muscles.

These stages are essential to function normally. For example, deep sleep, which occurs in Stage 3, is essential for physical restoration and hormone balance. Non-rapid-eye movement (another phrase for the first three stages) has been shown to improve memory and retention as well.

Stage 4: Also known as rapid-eye movement, or REM (since the eyes are darting back and forth behind the eyelids at high speeds during this stage), this is when the muscles are usually fully inactive. This is also when dreams occur.

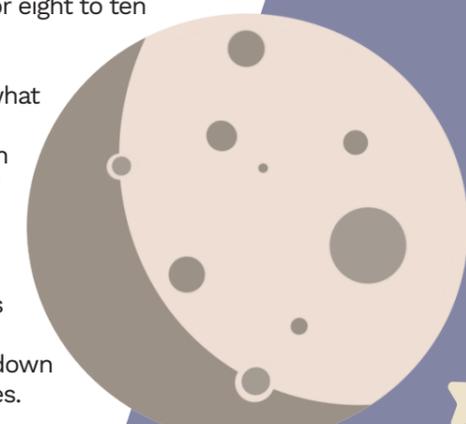
REM organizes our memories and emotions, right after they were improved in the previous stage, proving that studying for a test all night isn't going to ensure an A, but studying and then sleeping right afterwards just might. Even more important than grades, though, is one's health, and sleeping the right amount of hours makes us less likely to get sick during the day.

Learning what happens during sleep is important because it emphasizes how valuable sleep is for our minds and bodies. Research has shown that at least eight hours of sleep every night is important for adults to function and around 9 to 12 nightly hours are necessary for kids. When our bodies are sleep deprived due to a lack of rest, we're at a higher risk for a variety of physical health issues, including heart disease, diabetes, and stroke. We're also at a higher risk to fall into emotional distress and poor mental health habits. It's clear that the benefits we gain through sleep, and the potential harms of not sleeping, are definitely not worth playing that video game for five more minutes.

We put our body through a lot when the sun is out, so we need to let it rest for a sufficient amount of time at night. After all, that's the best way to make the most of the day and to make sure you feel ready to take on the world.

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DREAM

WITH US

This page is for YOU to fill out and explore!

What do you DREAM about being when you grow up?

Designed by Sydney Eavey

The average person spends 2 hours each night dreaming. How much do you think you dream?

What do you call a sleeping dinosaur?
A dino-snore!



ACROSS

DOWN

- 2. Sleeping occurs when we are in _____ sleep, or "rapid eye movement."
- 5. Otters sleep on their _____ with their feet up in the air.
- 6. SMART goals stand for specific, measurable, _____, relevant, and timely.
- 7. Greek astronomer Ptolemy believed that gods let objects slip from heaven to Earth as _____.
- 9. Glow sticks have _____ which means they glow because of a chemical reaction.

- 1. Birthday candles date back to the Ancient _____ who lit candles to pay tribute to the goddess Artemis.
- 2. Marie and Pierre Curie isolated radium and won Nobel Prizes for their discoveries in _____.
- 3. A _____ hoop has two webs connected at eight different points to honor Spider Woman.
- 4. Mary Shelley thought of her famous science fiction novel, _____, in a dream.
- 8. _____ only sleeps with one side of the brain at a time.

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