

# PURSUIT *for kids!*

FALL 2019

**SOLVE OUR  
BRAIN  
GAMES  
WITH SCIENCE!**  
PG. 10

**MAKE THE  
BEST  
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**WHAT MAKES  
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**HOW DID YOU  
GET YOUR  
COOL JOB  
WITH:**

**TABBY BOYAJIAN  
ASTROPHYSICIST**

**SCOTT BALDRIDGE  
MATHEMATICIAN**

**REVATI KUMAR  
CHEMIST**

**AND MORE!**

**PG. 4**



Illustration by Vecteezy

**SPIDERMAN**, Batman, Ironman, the Fantastic Four—the world is filled with fantastic stories of superheroes saving the world with acts that defy the natural laws of our world. We don't normally think that superheroes and scientists would be placed into the same category, but what is it that really makes someone "super"?

Superheroes are known for their

interesting and unique powers or skills that help them inspire the rest of us to do good for the world all around us. They defy the laws that govern how our universe works, sometimes even by manipulating nature's own limits beyond what we could ever imagine.

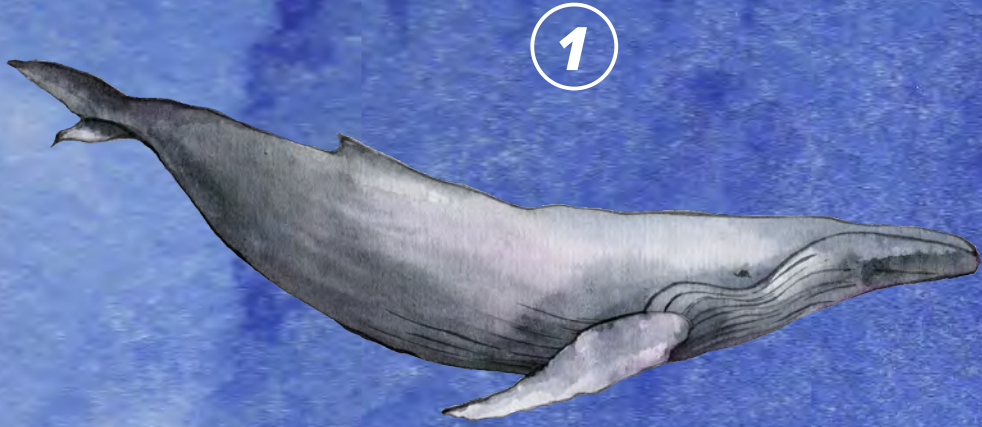
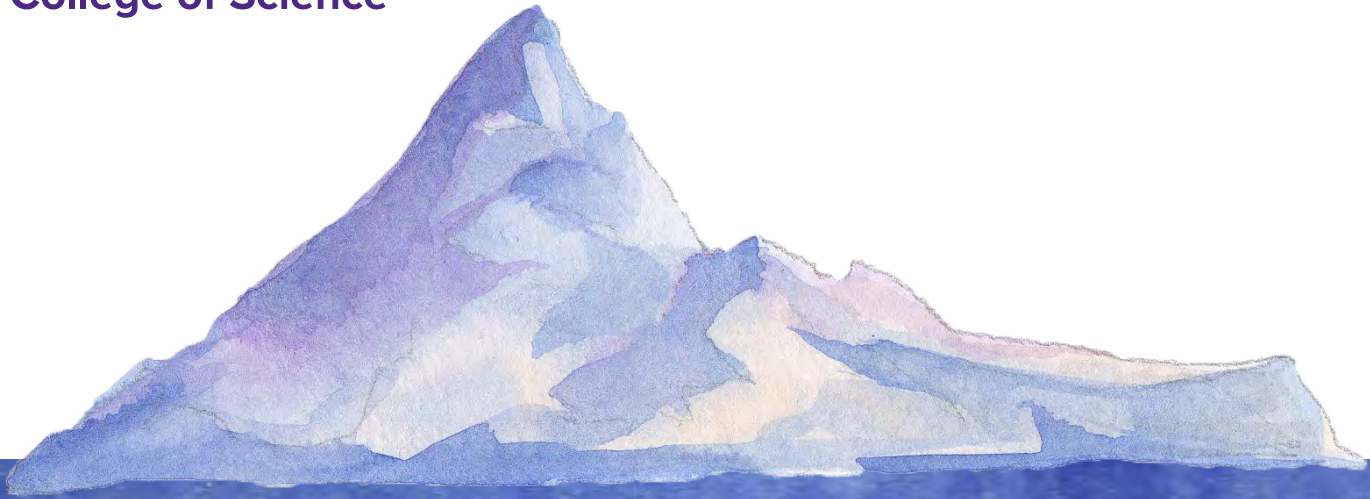
Superheroes can be super agile, twisting themselves into small nooks and crannies, or filling

spaces larger than themselves. Some of them can see beyond the boundaries of what we can see, looking into the dark depths of the oceans or far off into space, using the power of super vision.

Some superheroes have a level of intelligence that goes unmatched by their rivals. They then can post

**MORE ON PAGE 7**





### WHAT IS A VERTEBRATE?

A **vertebrate** is an animal that has a backbone or spinal column. Vertebrates can be mammals, birds, reptiles, amphibians, and fishes.

Whales are vertebrates, but they are also mammals. Even though they live in the ocean, they are classified as warm-blooded animals.

Challenge yourself. Can you name all six vertebrates seen here?

(No peeking!)

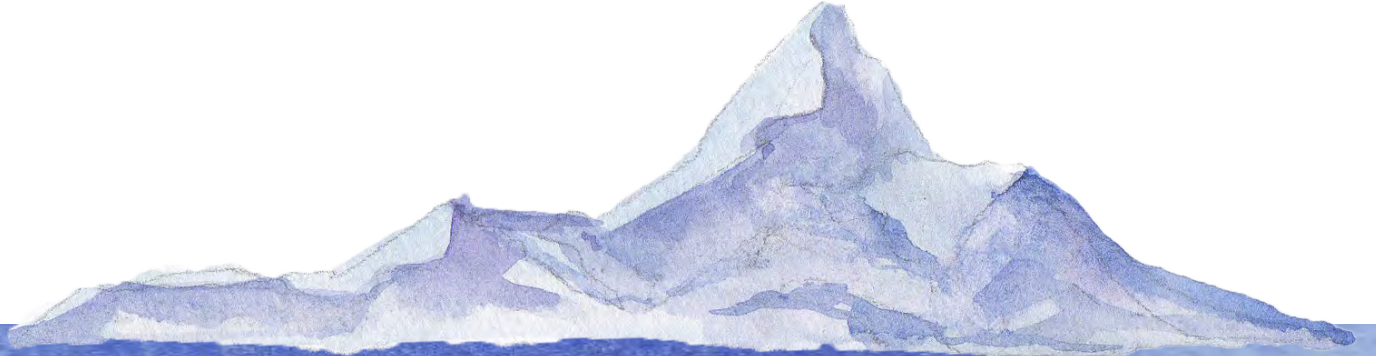
Speaking of the ocean, did you know there are more than 3.5 trillion fish currently living in all of the world's oceans? And the scientists who study those fish are called ichthyologists.

**Meet an LSU ichthyologist on page 5!**

Can you  
**NAME THAT**







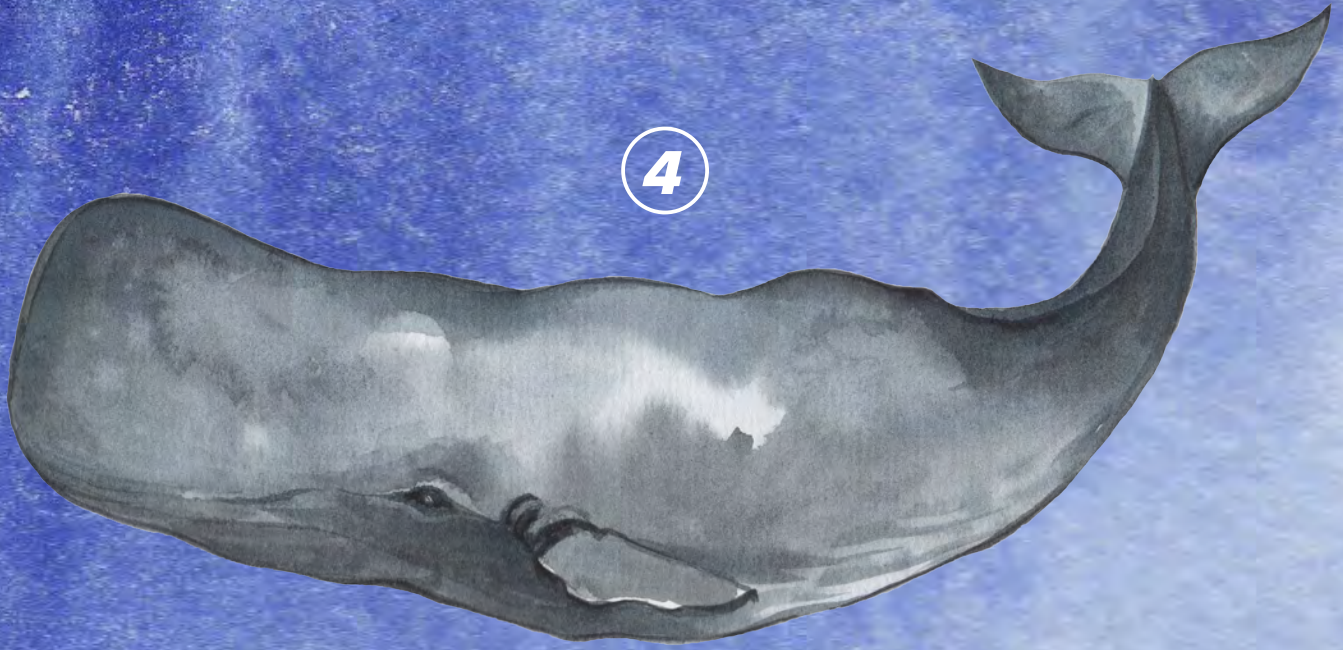
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3

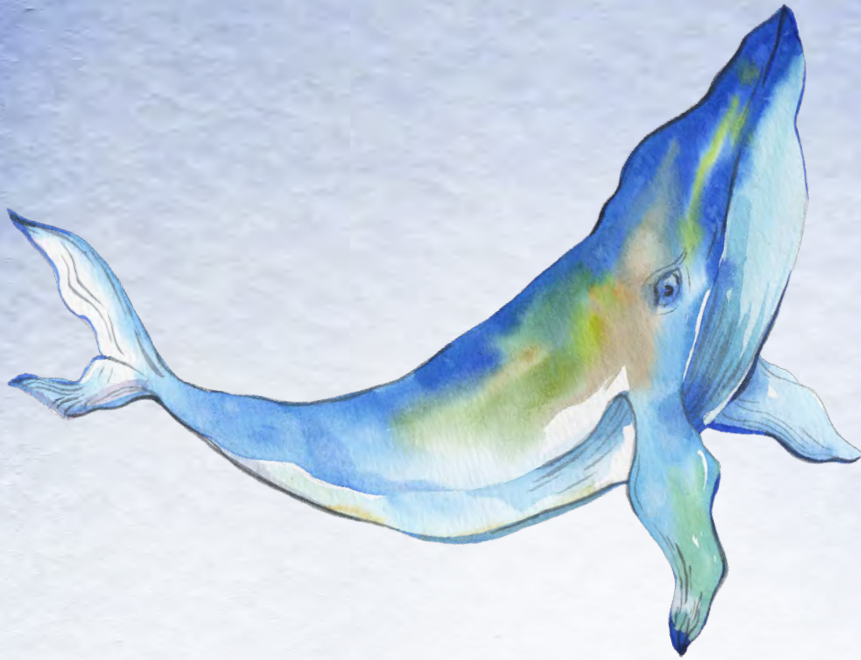


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**VERTEBRATE?**

6







# HOW DID YOU GET YOUR COOL JOB?

**LSU SCIENTISTS TELL US ABOUT THE HIGHLIGHTS OF THEIR UNIQUE, INTERESTING, OR OTHERWISE COOL JOBS.**

ILLUSTRATIONS BY LIZ CENTANNI



**"The Music of Science"** I am a scientist who absolutely loves music. For some, music and science are two totally different things. But for me, science operates a lot like a jazz band. Jazz musicians play different instruments that make unique sounds, but when you put these musicians together, the results are beats, rhythms, harmonies, and melodies that make me want to tap my feet and snap my fingers. Like a jazz band, scientists also work together. Though we study different subjects and use different tools, when we work together we can discover new species that teach about life on our planet and the planets beyond. We can create new medicines to help us live longer and healthier lives. We can even take on some of

the world's most difficult and complex questions. Most jazz bands have a band leader. The leader helps select the songs and makes sure that the band members have everything they need to make beautiful music. As the dean of the LSU College of Science, I can relate to the leader of a jazz band. I lead a college with hundreds of scientists and thousands of students. It is my responsibility to make sure that this community of scientists have the tools and support they need so that they can work together to imagine, create, and innovate. And just like the sounds of a good jazz band, the music of science is just as beautiful.

— Cynthia Peterson, biochemist and dean of the LSU College of Science

**"Curator of Fishes"** I'm often told that I have the coolest job title at LSU. Sometimes it makes people think I have an army of fish that I command—like Aquaman. Not exactly, I'm sad to say. What I actually do is curate fish specimens. My fishes are dead—long dead and stored in alcohol so that we can study their organs, muscles, nerves, and bones. Sounds a little gross, and maybe it is. For most of my childhood I thought fish were pretty disgusting, that is until I learned I can discover new species of fish, as I did when I described my first

one as a teenager working at a museum in New York with a mentor who was a fish curator and "ichthyologist"—you guessed it, that is someone who studies fishes. And yes, it is "fishes", not "fish", when you are talking about more than one kind of fish. After that first research project I was "hooked." Now I get to travel around the world collecting fishes (which is different from fishing—it really is!) and use their bodies and DNA to help me study evolution and the history of Earth.

— Prosanta Chakrabarty, ichthyologist



**"Tabby's Star"** As an astronomer, it is not possible to "touch" the data we analyze. Instead, we use a telescope as a tool to collect light from objects far, far away to learn about our universe. Fun fact: the farther away we look, the further back in time we see! In this way, a telescope is a time machine! To me, the Hubble Deep Field is perhaps one of the most profound examples of mind-blowing imagery. It was first conceived as a risky experiment: Astronomers picked a seemingly empty and boring point in space and had the most powerful telescope ever built stare

at it continuously for almost two weeks! Nobody knew what would come out of this, if anything. However, to our surprise, the resulting image revealed over 3,000 galaxies of all different shapes, colors, sizes, ages, and distances from us. Each one of these galaxies contain over 100,000,000,000 stars, all with the potential to host solar systems of their own, just like our Sun. I love my job because I get to explore this vast space to help understand the history, present, and future of our exotic universe.

— Tabettha Boyajian, astrophysicist





**"Bird Whisperer"** I am a graduate student studying to get my Ph.D. at the LSU Museum of Natural Science. For my job, I use DNA to study the evolution of birds. Just like how people are related to their family members through shared DNA, so are different species of animals. By comparing the DNA of different birds we can tell which species are more closely related to each other. To do my work, I first travel to South America and collect samples of bird DNA. Then I bring it back to the museum's genetic resources (DNA) collection, prepare the sample in the laboratory, and send it off for sequencing. This is where a big machine uses lasers to "read"

the DNA sequence. Lastly, I use different computer programs to analyze the sequences and figure out how different species are related. I was always interested in wildlife and nature but wasn't sure how to get involved in science until I went to college. There I started working at a natural history museum, similar to the museum we have at LSU. I learned to identify different species of birds and mammals, and how to prepare museum specimens. When I applied to graduate school, I immediately knew that I wanted to go to a university with a large and active museum collection.

— Anna Hiller, ornithologist & Ph.D. Student

**"Mars Rocks!"** I am a Martian geologist, which means I get to study rocks on the planet Mars—a planet that is about 140,000,000 miles away from Earth! I get to work with the incredible pictures and maps that NASA takes with their satellites orbiting Mars. Most of the time, I am trying to figure out how all the things that have happened on Mars—volcanoes, glaciers, dust storms, and maybe even oceans—are recorded in the rocks. One of the things that I do is look for big rocks on the surface of the planet. This sounds a little boring (and sometimes,

it is!), but I am writing a program so a computer can count for me and I don't have to. Knowing how many big rocks there are and where they are can tell us about all sorts of things happening on Mars! We use the information we get about the rocks to figure out if the ice buried on Mars is moving every winter, causing boulders to move around, as well. If they are moving, it tells us about the Martian climate, and it will help us when we start going to Mars and trying to build things on the moving ice.

— Don Hood, Martian geologist & Ph.D. Student



**"Molecular Movies"** Most people do not know that there is a whole area of research in chemistry where we use computers to carry out virtual experiments. All matter—everything around you—is made up of atoms and molecules, and the way they "communicate" with each other creates all the "stuff" we see in our everyday lives. We cannot directly see and "follow" the motion of atoms and molecules because these molecules are just too small for even the best microscopes to see clearly. Consider this: The length of an atom is 1,000,000th of the thickness of one sheet of paper! That's why we carry out these virtual experiments where we simulate

molecules interacting with each other, forming new molecules, and so on. In my work, I use computer simulations to better understand the inner workings of the electrolyte in batteries, so we can improve them. The molecular "movies" that capture these chemical reactions from our simulations show us where the action is! I can follow the charge transport, or electrical flow, in the battery electrolyte, including those molecules that help the process and those that block it. Fun fact: Sometimes I use the same types of computers that are there in your PlayStation.

— Revati Kumar, chemist

**"Mathemagician"** I love math! My math problems are a little different than your problems. They are about imagining new ways to represent our universe using numbers and equations and geometry. I think about questions like, "How does the shape of our universe effect how tiny particles smaller than atoms behave?" Einstein was one of the first to think about questions like this one, and many creative men and women have worked all their lives on this problem since. It involves extremely difficult mathematics and physics—far harder than any problem you have solved in your own math classes. But I didn't begin with this

problem. I started out just like you, sitting at a desk in a schoolroom just like yours, solving math problems no different than your problems. Even though the problems grew more and more complex over time, they didn't feel any tougher than the challenging problems from previous years. My teachers always prepared me for the next level. This means you, too, can become a mathematician or scientist. If I was like you at your age, then maybe you will be like me at my age: Maybe someday you will solve a problem that no other human has solved before.

— Scott Baldridge, mathematician





(That's what we call chemistry!)

# YOU'VE BEEN

# Slimed!

LEARN HOW TO MAKE THE  
OOIEST-GOOIEST SLIME  
THROUGH CHEMICAL REACTIONS!

Here's what you'll need:

- 2/3 Cup of Elmer's White Glue
- 1/2 Teaspoon of Baking Soda
- 1/4 Cup of Water
- 2-3 Cups of Shaving Cream (Do not use shave gel.)
- 1.5 Tablespoons of Contact Lens Solution\*

\*Important: your brand of contact lens solution must have boric acid and sodium borate in the ingredient list. This is what interacts with the glue to form the slime.

Step 1:

- Add your white glue to a bowl.
- Add your water and baking soda and then mix.
- Add your shaving cream and mix.
- Add your food coloring until you are satisfied with the color. Mix.
- Now slowly add in your contact solution.

We like to add in 1 tablespoon, knead for 5 minutes and then add in the 1/2 tablespoon after kneading for some time. The slime will be very sticky when you're kneading—and that's normal!

The first tablespoon you add will let you start to knead it. And the last 1/2 tablespoon will bring the stickiness down and it shouldn't be sticking as much to your hands.

If you find it still too sticky—add some baby oil or lotion to your hands. You can also add more contact solution if it's still too sticky, just a little bit at a time. If you add too much contact solution the slime may become too hard and won't be as stretchy to play with.

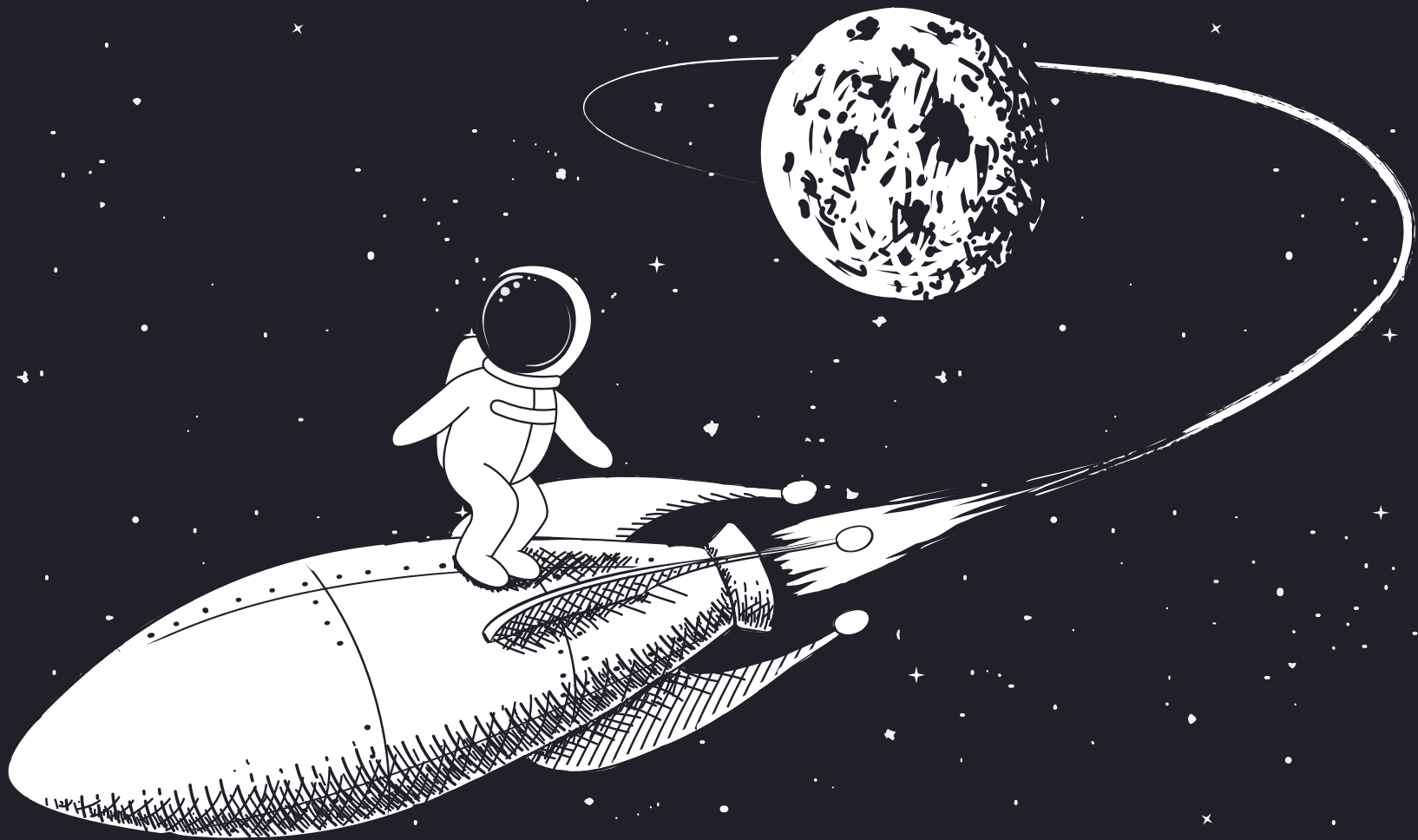
Step 2:

Now repeat the above recipe for each color you'd like to make.

Step 3:

Once you mix the colors together they will eventually mix into one color like play dough does. So you can keep them separately or mix and see what happens! If you make all three colors it may turn to gray, so if you want to end up with purple just mix the pink and purple together.





# SCIENTIST *OR* SUPERHERO?

**CONTINUED FROM COVER...**

researchable questions or decode hard-to-understand information quicker than light travels. Some can use their powers of observation to bring together information in new and unique ways to tackle the “wicked” problems we sometimes face.

Believe it or not, scientists can do those exact same things.

In LSU’s College of Science, we have researchers who study teleportation. Teleporting, or the act of moving from one point to another without moving through physical space, is popular in the realm of science fiction. While we may not be able to teleport humans—yet—LSU quantum physicist Dr. Jonathan Dowling is studying the smallest aspects of our universe—atoms, electrons, photons—to better understand quantum mechanics and to make teleportation a reality. Soon, with help from researchers like Dr. Dowling, we will all be able to “transport” information faster than the speed of

light by encoding, or concealing, data on entangled particles. And maybe in the future, this will be the foundation for modes of futuristic transportation.

In the College of Science, we also have scientists who have spent months in Antarctica, one of the coldest places on Earth. Dr. Philip Bart has traveled to the frozen landscape more than seven times since becoming a scientist. He studies what happens below the continent’s icy surface and lives on a boat for months at a time in the middle of Antarctica’s Ross Sea. We can’t necessarily see through the ice, but by using special research equipment, Dr. Bart can detect what changes are occurring underneath the ice.

And what about laser vision? Superheroes like Superman, Cyclops, and Supergirl all have the ability to fire powerful beams of various energy types from their eyes. Also studying laser energy is LSU chemist Dr. Louis Haber, who looks at how nanoparticles

interact with lasers. Nanoparticles are small objects that are as small as one nanometer, which is 100,000 times smaller than a strand of hair. And Dr. Haber’s discoveries can help doctors treat many diseases, including cancer, without damaging healthy cells and, as a result, saving millions of lives.

And have you heard of super bugs? Super bugs are bacteria that can spread infections even when antibiotics are present. So how can super bugs be stopped? Dr. Carol Taylor, an LSU chemist, is developing innovative approaches to create antibiotics that can combat super bugs and keep sickness at bay.

Science skills easily translate into the world of superheroes, and scientists do have incredible superpowers. It’s important to remember that sometimes things that may seem impossible, can actually be possible if you ask the right questions and work hard to solve the problems. Can you think of ways scientists are like superheroes?



# Geology ROCKS!

**WHY** do we study geology? Don't we already know so much about the *stuff* that makes up our planet?

Like all forms of science, we study geology to make new discoveries and learn more about the world around us because we are *still* detecting new information every day.

Geology is the study of the Earth's origin, structure, composition, and history—including the development of life—

**FUN FACT: There are 18 volcanoes in the U.S. with the potential to erupt again—all of them are in Alaska, Hawaii, and the West Coast states.**

and the nature of the processes which have helped to create the Earth as we know it today.

Researchers use geology to look at some of the most important issues in society, including energy sources and sustainability, climate change, the impacts of technological developments on the

environment, water management, mineral resources, and natural hazards.

By studying these issues, geologists, along with other scientists, can anticipate Earth's future and examine any changes that may need to be made.

A key example of how geology can affect our studies on issues, like climate change, is that if we switch from fuels, which are made from materials like coal or natural gas, to geothermal energy, like geysers or hot springs, and other renewable sources, like wind or hydropower, we can reduce

our carbon emissions and the effects of global warming.

But beginning with the basics, geology is essentially the study of rocks. What makes rocks so special? We see them everywhere along the street, on the playground, in the dirt. What can these rocks tell us?

Rocks are identifiers of Earth. In geology, rock is a naturally occurring mixture of minerals. Did you know the Earth's crust is made of rock? Even other planets are made of rock, but the composition of our rocks are different from those on, say, Mars.

They are important pieces that tell scientists about the geology of a certain region. Other pieces of information found in rocks include the abundance or absence of certain minerals. So what does that mean?

Picture walking along a riverbed, and you find a smooth, dark pebble. At first glance, it doesn't look like anything special. Maybe you've already picked up 10 of these same rocks. But a geologist could look at your discovery and immediately identify it as basalt!

How much do you know about basalt? Did you know that a basalt rock is an extrusive rock, meaning it formed when lava collected above the surface of the earth's crust? Or that the rock you picked up underlies more of Earth's surface than any other rock type? What about the other river rocks? You can find hundreds of rocks that vary in sizes, colors, and textures, and each of them can tell an individual story about our planet.

We challenge you to walk around outside, take a look at the pebbles or rocks, and find out more about what you've found!





A. \_\_\_\_\_  
The water on or at the surface of the Earth, including oceans, lakes, rivers, rain, and mist.

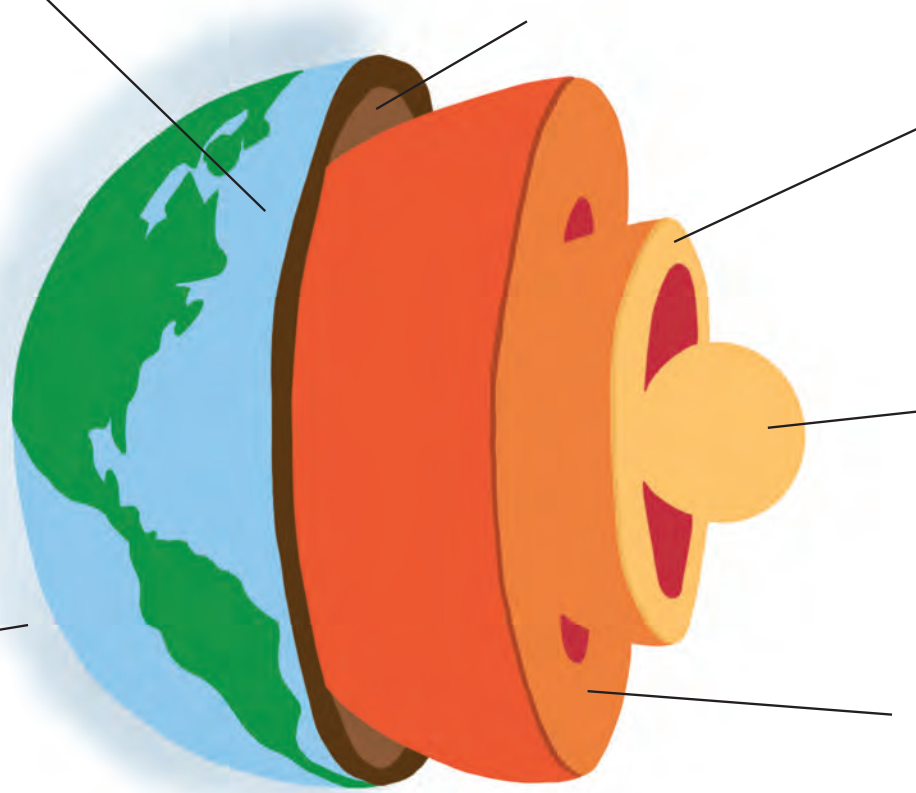
B. \_\_\_\_\_ Also known as lithosphere, this layer include landforms, rocks, and soil. It varies in thickness, from as little as 3 miles under the ocean to about 43 miles under mountain ranges.

C. \_\_\_\_\_  
Molten iron and nickel. Temperatures mostly between 7,952 degrees Fahrenheit and 10,800 degrees Fahrenheit.

D. \_\_\_\_\_  
Mostly iron. Solid owing to the extreme pressure. Temperatures can reach up to about 12,600 degrees Fahrenheit.

E. \_\_\_\_\_  
Mostly iron. Solid owing to the extreme pressure. Temperatures can reach up to about 12,600 degrees Fahrenheit.

**OUTER CORE**  
**ATMOSPHERE**  
**MANTLE**  
**INNER CORE**  
**CRUST**  
**HYDROSPHERE**



F. \_\_\_\_\_  
A blanket of gases that surrounds the Earth to a height of approximately 90 miles. Mostly made up of nitrogen and oxygen, which support life on Earth.

A) Hydrosphere, B) Crust, C) Outer Core, D) Inner Core, E) Mantle, F) Atmosphere

## Citizen SCIENTISTS

There's a whole big world of science out there, and sometimes trained scientists are not enough. Citizen scientists can help trained scientists gather data from all over the world—even from space. They can provide new ideas and new ways of thinking.

Kids often make great citizen scientists because they tend to be curious and good at following precise directions. Sometimes they're even better at these things than adults. Are you interested in being a scientist?

### Follow Your Passions

If you love butterflies, find a butterfly-based project. After you get the hang of participating in these scientific endeavors, then you can expand to exploring the cosmos or tracking birds across the continents.

### Get Your Friends Involved!

There's a lot to be said for forging ahead into the unknown alone. Ask your friends if they'd spend some time with you looking for hidden gems in nature. Go out to your local nature preserve and see what you can discover! Maybe even make a game out of it, like a scavenger hunt.

### Make Contributions

It might be a few years before you're in a lab working as a professional scientist, but you can still start your citizen science career today! Contribute to science by using programs, like iNaturalist.com. Track your wildlife encounters, record your encounters, and connect with experts.

## DISCOVERING Fossils!

Sometimes a rock is a rock, and sometimes it's a fossil!  
So how can you tell the difference?

A **fossil** is any evidence of past life preserved in a geological situation, such as within rock or sediment.

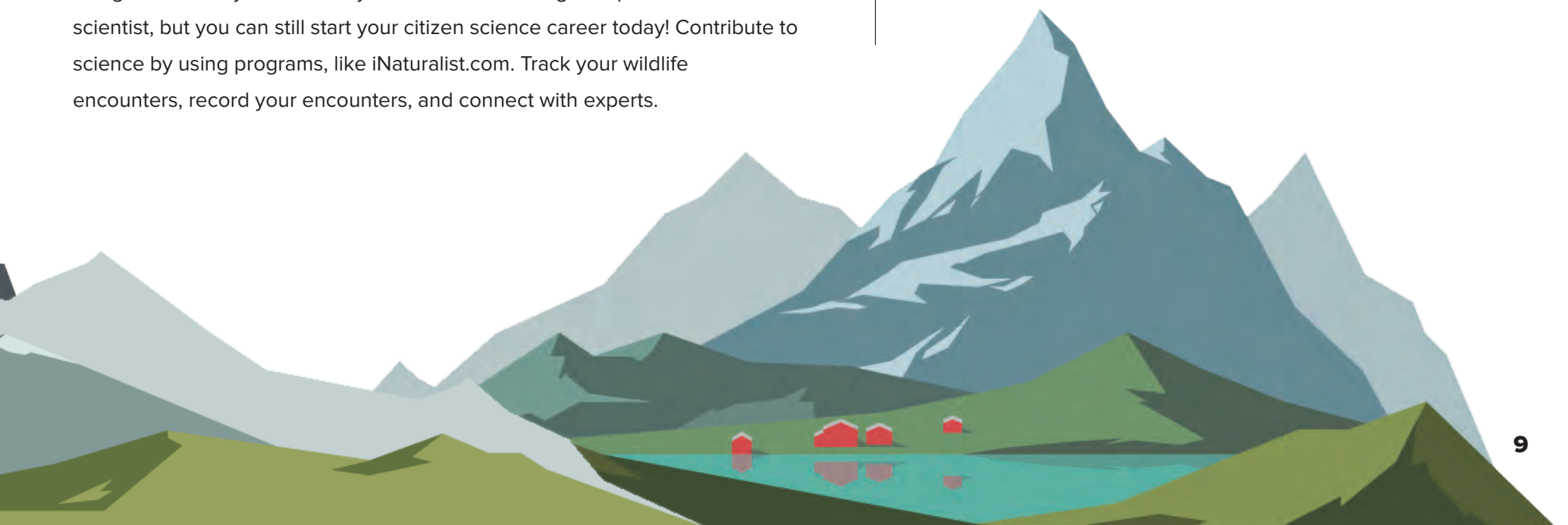
This activity allows you to explore the process used by paleontologists—scientists who study fossils to understand ancient landscapes, climate, and life on Earth—to find and identify fossils.

### Find the Right Kind of Rock

Fossils are found in sedimentary rocks, like sandstone, limestone, or shale. Sedimentary rocks look like layered pancakes! Check out stream cuts, bluffs, sea cliffs, road cuts, or any place where bedrock is wearing down or eroding away.

### Get Low

You'll see more fossils when you're on your hands and knees. Remember that most fossils are small sea animals, not rare dinosaur bones. Search for spirals or snail shapes!





# BRAIN

# Games

There's nothing more important than training your brain!

## SUDOKU

### Rules of the Game:

Fill the grid with the numbers 1 to 9 in such that each number is only used once in each row, column, and region (marked 3 by 3 block).

6	3				7		2	
	4	9		3				1
		7	2		9		6	
3	9			2			1	5
5	7	1	6			9	8	2
4	2				5	6	3	7
8	6		5				9	3
		4			2	5	7	
				6		2	4	8

## RIDDLE ME THIS!

(Answers found below)

- I am an odd number. Take away a letter, and I become even. What am I?
- What goes up but never comes back down?
- What does a scientist say when he found two atoms of helium?
- How can a leopard change its spots?
- Mary has four daughters, and each of her daughters has a brother. How many children does Mary have?
- Which is heavier? A pound of bricks or a pound of feathers?

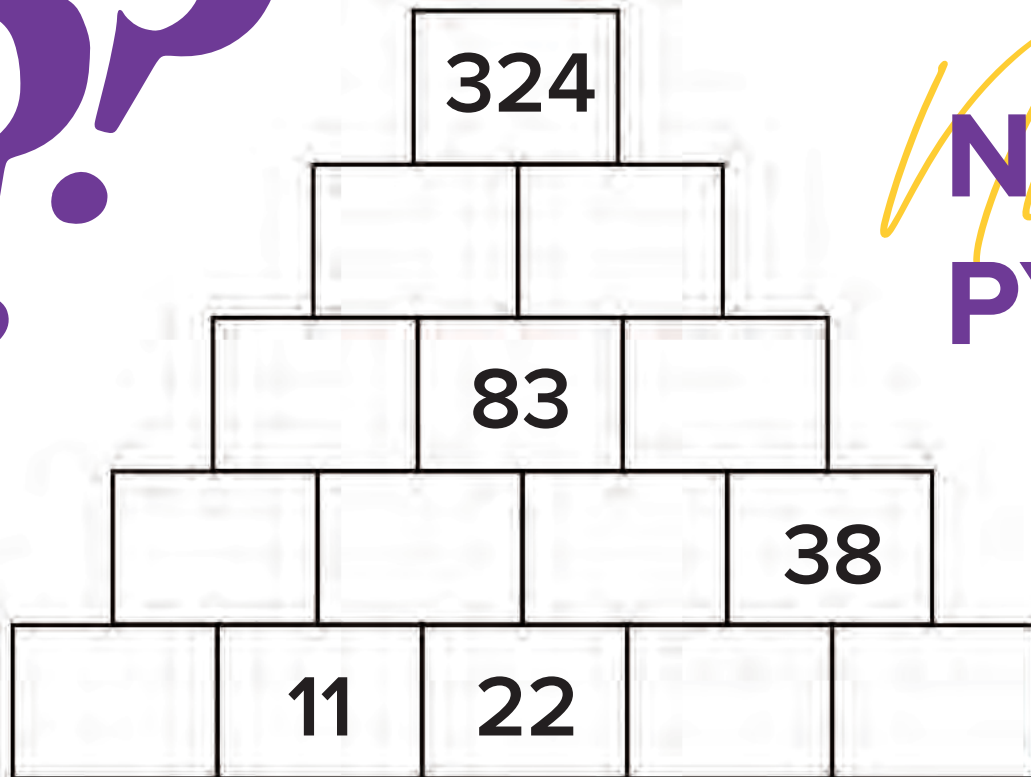
1) Seven, 2) Age, 3) HeHe, 4) By moving from one spot to another, 5) Five, each daughter has the same brother, 6) They both weigh one pound

## PHYSICS WORD SEARCH

- ACCELERATION
- CURRENT
- EINSTEIN
- ELECTRICITY
- FORCES
- FRICTION
- MAGNETISM
- MASS
- NEUTRONS
- NEWTON
- VACUUM
- VELOCITY

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



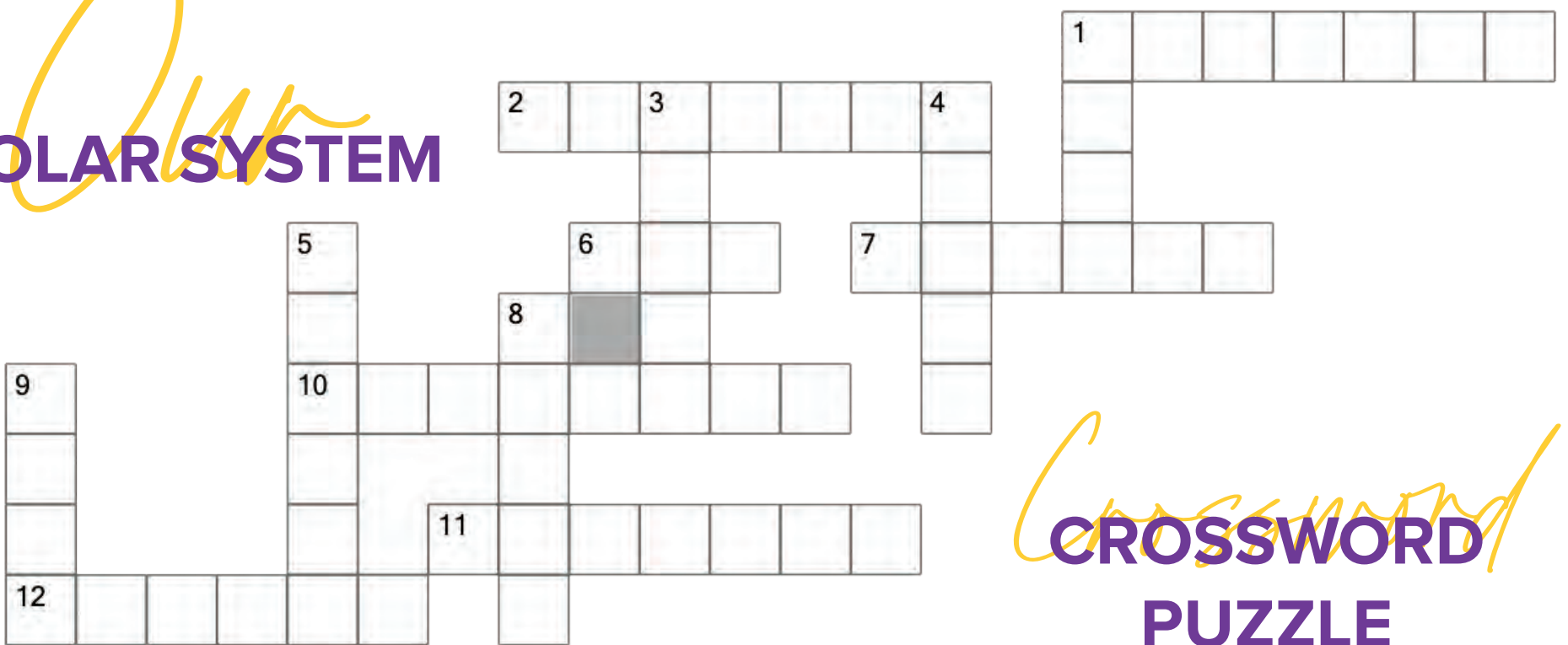


*Number*  
**NUMBER  
PYRAMID**

**Rules of the Game:**

The number of each square in the pyramid is the sum of the two squares directly under it. Can you complete the number pyramid?

*Solar*  
**SOLAR SYSTEM**



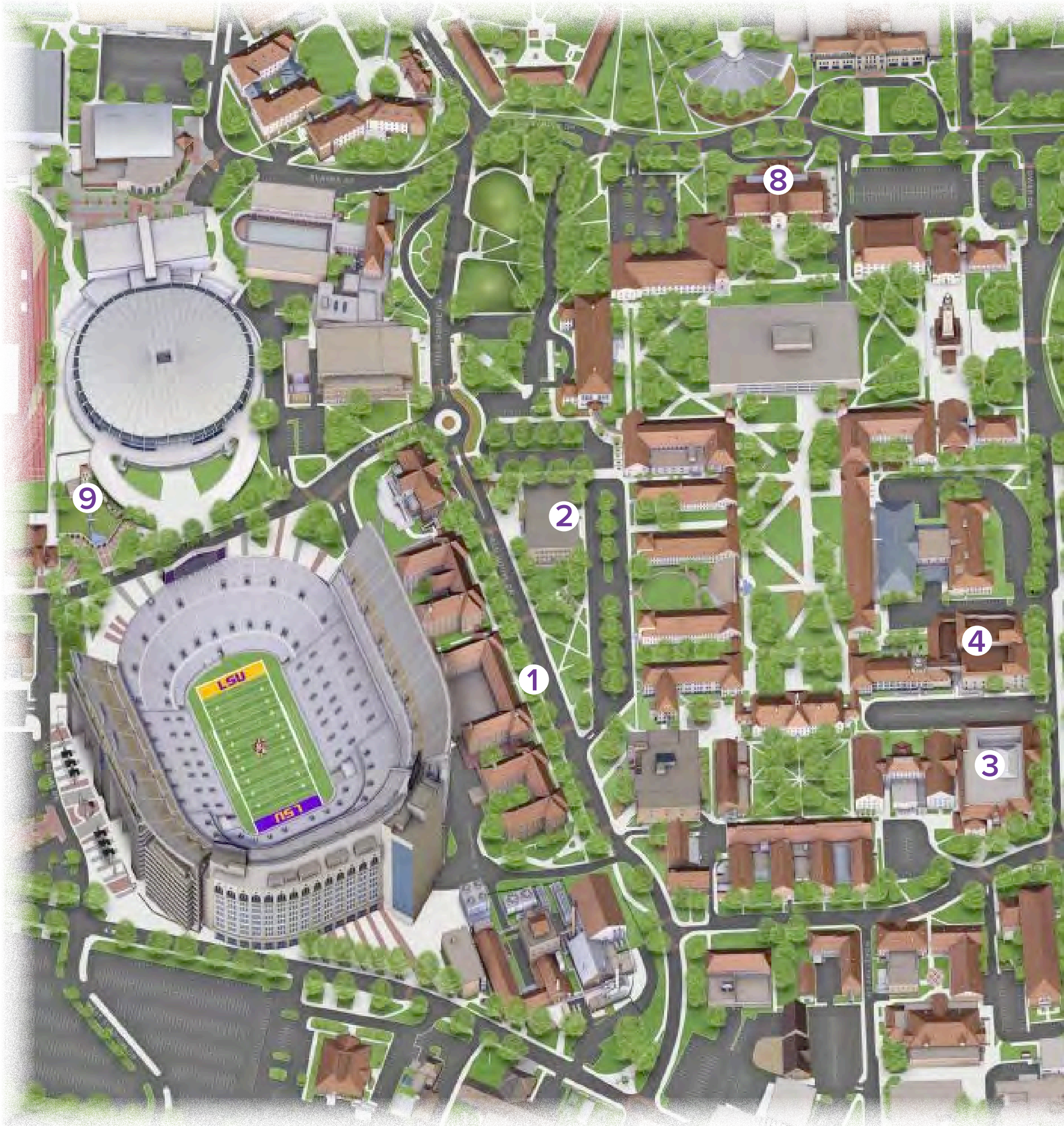
*Crossword*  
**CROSSWORD  
PUZZLE**

<p><b>ACROSS</b></p> <p>1. The closest planet to the Sun and the eighth largest</p> <p>2. Named after the Roman god of the sea</p> <p>6. The largest object in the solar system</p> <p>7. This planet's blue color is the result of absorption of red light by methane in the upper atmosphere</p> <p>10. A medium-sized rocky object orbiting the Sun</p> <p>11. This planet is more than twice as massive as all the other planets combined</p> <p>12. The second largest planet with many rings</p>	<p><b>DOWN</b></p> <p>1. The only natural satellite of Earth</p> <p>3. The smallest planet and farthest from the Sun</p> <p>4. The only planet whose English name does not derive from Greek/Roman mythology</p> <p>5. A bowl-shaped depression formed by the impact of a meteoroid</p> <p>8. It is the brightest object in the sky except for the Sun and the Moon</p> <p>9. This planet probably got this name due to its red color and is sometimes referred to as the Red Planet</p>
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Sun	Venus	Moon	Jupiter	Uranus	Mercury	Earth
Pluto	Asteroid	Crater	Neptune	Saturn	Mars	

**ANSWERS ON PAGE 15!**





# WHERE ARE WE NOW?

**1. Hatcher Hall** is where the LSU College of Science’s main offices are housed.

**2. Locket Hall** is home to the Department of Mathematics.

**3. Howe-Russell Geosciences Complex** houses the Department of Geology & Geophysics.

**4. Nicholson Hall** is home to the Department of Physics & Astronomy. On top of Nicholson Hall is the Arlo Landolt Astronomical Observatory.

**5. The Life Sciences Building** holds the Department of Biological Sciences. Life Sciences also houses the Herbarium.

**6. Choppin Hall and Choppin Annex** are home to the Department of Chemistry

**7. Evangeline Hall** is where the Science Residential College is located. This is a student living space that provides even more opportunities for science students.

**8. Foster Hall** houses the LSU Museum of Natural Sciences. Check out our events calendar for upcoming events at the Museum!

**9. Mike the Tiger’s Habitat** is home to the LSU mascot, Mike the Tiger. We love Mike!





# UPCOMING 2019-2020 EVENTS

## November

- Nov. 14 at 6 p.m. — Night at the Museum: Mammals  
 📍 LSU Museum of Natural Sciences, Foster Hall
- Nov. 16 at 10 a.m. — Museum Special Saturdays: Phylo-what?  
 📍 LSU Museum of Natural Sciences, Foster Hall

## December

- Dec. 14 at 10 a.m. — Museum Special Saturdays: Escape from Disaster  
 📍 LSU Museum of Natural Sciences, Foster Hall
- Dec. 7 at 10 a.m. — Science Academy (Every Saturday)  
 📍 Highland Road Park Observatory

## January

- Jan. 25 at 10 a.m. — Museum Special Saturdays: Bust A Move  
 📍 LSU Museum of Natural Sciences, Foster Hall

## February

- Feb. 1 at 10 a.m. — Geaux Science Explorers Story Time  
 📍 Goodwood Library, Eden Park Library, River Campus & (Library)
- Feb. 6 at 6 p.m. — Night at the Museum: LSU Herbarium  
 📍 Life Sciences Building - Annex
- Feb. 15 at 10 a.m. — Museum Special Saturdays: Fish, Fish, Fishes  
 📍 LSU Museum of Natural Sciences, Foster Hall

## March

- March 5 at 6 p.m. — Night at the Museum: Fish  
 📍 LSU Museum of Natural Sciences, Foster Hall
- March 7 at 10 a.m. — Museum Special Saturdays: Ancient Antarctic Pollen  
 📍 LSU Museum of Natural Sciences, Foster Hall

\*Subject to change



# Hey PARENTS!



**IS YOUR CHILD** always looking at the "how" or the "why"? That's a STEM mindset, and it can be the beginning of your child's internal drive to investigate and solve important challenges like protecting our environment or curing diseases.

Even if the questions seem relentless at times, embrace this curiosity. It's a great time to be curious, isn't it? With copious amounts of information at our fingertips these days, we can quickly learn more about anything that piques our interest, and we can satiate curiosity almost as quickly as it arises.

So how can you help your inquisitive child? Even if you don't feel a strong connection to STEM-related topics, you can support your child in their journey. After all...it's more about the process than it is about the success.

Take the time to explain the things you understand, and when your child poses a question that you don't have an answer to, look up the answer together (and model **good research practices** in the process). Scientists

actually consider cluelessness as an asset! Not having the answer is the perfect place to start when it comes to learning STEM. Who knows? It may spur some new interests for you, too!

Seeking out STEM exercises or after-school activities with your child can also motivate them. There are numerous science fairs, competitions, and child-friendly seminars hosted locally and nationally. (Check out our upcoming events calendar to see what's happening with the College of Science!)

Lastly, children are born scientists and need adult support to realize and expand their natural STEM capacities. Adults can encourage children's STEM engagement by noticing when it's already taking place, realizing that the child is not only capable of attaining the goal (getting the object) but also of meeting the challenge (solving the problem) with your support, and then taking advantage of that opportunity by engaging the child in an interaction that encourages their scientific inquiry.

## GOOD RESEARCH Practices

Helping your young science explorer embark on their scientific journey by engaging in exceptional research practices will not only help them immerse themselves in the world more deeply than before, but it will also help them to learn how to answer their own pressing questions.

Encourage your child to use these practices to solve problems and answer their inquiries.

### Practice #1: Ask Good Questions

First, ask good questions! The humble question is a crucial tool in research. It spurs learning and the exchange for ideas. Never discourage questions because these are the true treasure maps in our quest for knowledge.

### Practice #2: Check Your Sources

It's no secret that the market is saturated with information, whether it's factual or not. And while most kids know not to believe everything they read online, the majority also don't take the time to fully evaluate their sources.

Start with sites you know that can be trusted. If the site is new to you, dig deeper and make sure it has credible credentials.

Check the date! If an article was posted 10 years ago, the reliability of the information may be in question.

Don't always trust your first source. It's a good idea to double-check it against other sources.

### Practice #3: Peel Back the Layers

Be patient and peel back the layers of the research! Good research takes time, and time can produce compelling evidence. Often, questions we want to answer are more complex than we originally thought. Patience can be a big key to answering questions and solving problems.

## WHAT IS ALL THIS STEM STUFF?

**THESE DAYS**, you can't turn around without hearing something about STEM. Schools are adding more and more STEM courses, and STEM summer camps are popping up across the country.

A longitudinal study<sup>1</sup> of nearly 8,000 children indicated that large science achievement gaps can be found as early as the third grade. We know early interventions through hands-on experiential learning and access to role models can play an important role in providing a foundation for STEM interest and success.

STEM and its core thinking styles—design thinking and computational thinking—don't require a formal classroom setting. They can often be encouraged at home by approaching the world as a puzzle to be solved.

And most of us can agree that children are innately curious—in an environment where everything is brand new, how can they not be? Why is it so important to focus on a child's STEM education?

## DID YOU KNOW?

Careers in Science & Engineering are expected to grow at more than double the projected growth rate of all U.S. jobs.

Almost **50%** of economic growth in the past 50 years was due to advances in technology.

STEM degree holders enjoy high earnings regardless of whether they work in STEM or non-STEM occupations.

Source: DestinationScience.org



# BRAIN Games

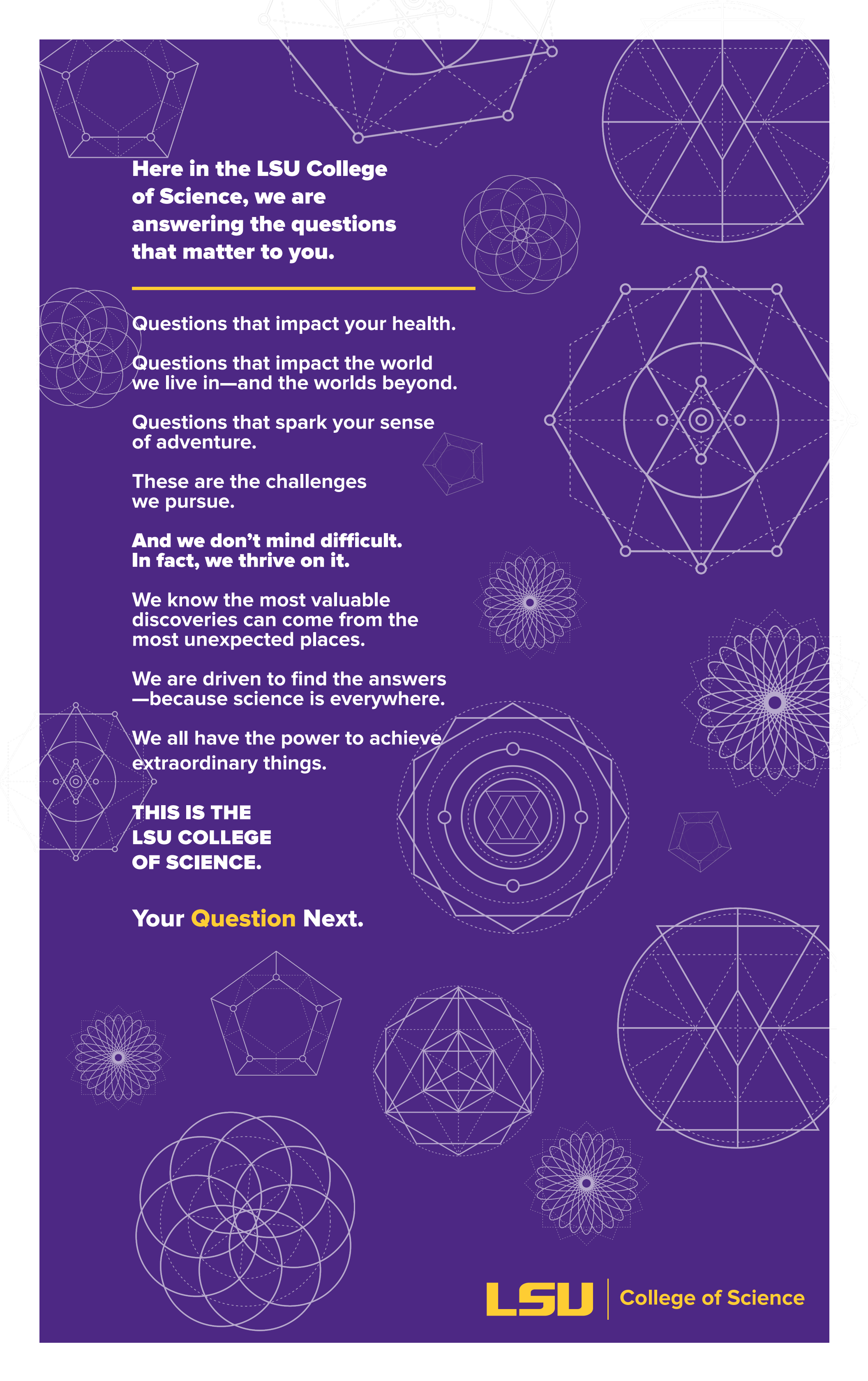
## ANSWERS

6	3	5	4	1	7	8	2	9
2	4	9	8	3	6	7	5	1
1	8	7	2	5	9	3	6	4
3	9	6	7	2	8	4	1	5
5	7	1	6	4	3	9	8	2
4	2	8	1	9	5	6	3	7
8	6	2	5	7	4	1	9	3
9	1	4	3	8	2	5	7	6
7	5	3	9	6	1	2	4	8

26	11	22	28	10
37	33	50	38	
70	83	88		
153	171			
324				

- ACCELERATION
- CURRENT
- EINSTEIN
- ELECTRICITY
- FORCES
- FRICTION
- MAGNETISM
- MASS
- NEUTRONS
- NEWTON
- VACUUM
- VELOCITY





**Here in the LSU College of Science, we are answering the questions that matter to you.**

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**Questions that impact your health.**

**Questions that impact the world we live in—and the worlds beyond.**

**Questions that spark your sense of adventure.**

**These are the challenges we pursue.**

**And we don't mind difficult. In fact, we thrive on it.**

**We know the most valuable discoveries can come from the most unexpected places.**

**We are driven to find the answers—because science is everywhere.**

**We all have the power to achieve extraordinary things.**

**THIS IS THE  
LSU COLLEGE  
OF SCIENCE.**

**Your Question Next.**