

# PURSUIT *for kids!*

SPRING 2021

**SOLVE OUR  
BRAIN  
GAMES  
WITH SCIENCE!**  
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**EGGS  
WITH NO  
SHELLS  
AND MORE!**  
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POLLEN SOLVE  
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**WHEN DID YOU  
KNOW YOU  
WANTED TO BE  
A SCIENTIST?**  
WITH:

**MICHELLE LOLLIE  
PHYSICIST**

**PETER CLIFT  
GEOLOGIST**

**FATIMA RIVAS  
CHEMIST**

**AND MORE!**

PG. 4



## SOLVING CRIME *with* POLLEN

**DO YOU HAVE ALLERGIES?** It's probably because of something called *pollen*.

During the spring, summer and fall seasons, pollen—the powdery bits made by certain plants—is released into the air and picked up by the wind, which brings it to other

plants to fertilize them. And inside of these pollen grains are proteins that commonly cause allergic reactions (such as sneezing, runny nose, and itchy eyes) when we breath them in.

Like minature, silent witnesses, pollen and spores (spores are the

single cells that grow into pollen grains) are too small to be seen by the naked eye, and criminals don't often realize that they have collected them from a crime scene.

They can attach to almost any surface, like clothing, and become

...MORE ON PAGE 7

# LSU SCIENTISTS

**COLORADO:** Every summer, LSU geology students and scientists visit the LSU Charles Barney Geology Field Camp near Colorado Springs. The field camp sits at the foothills of the Rocky Mountains and is a space for students to go explore and learn outside the classroom!



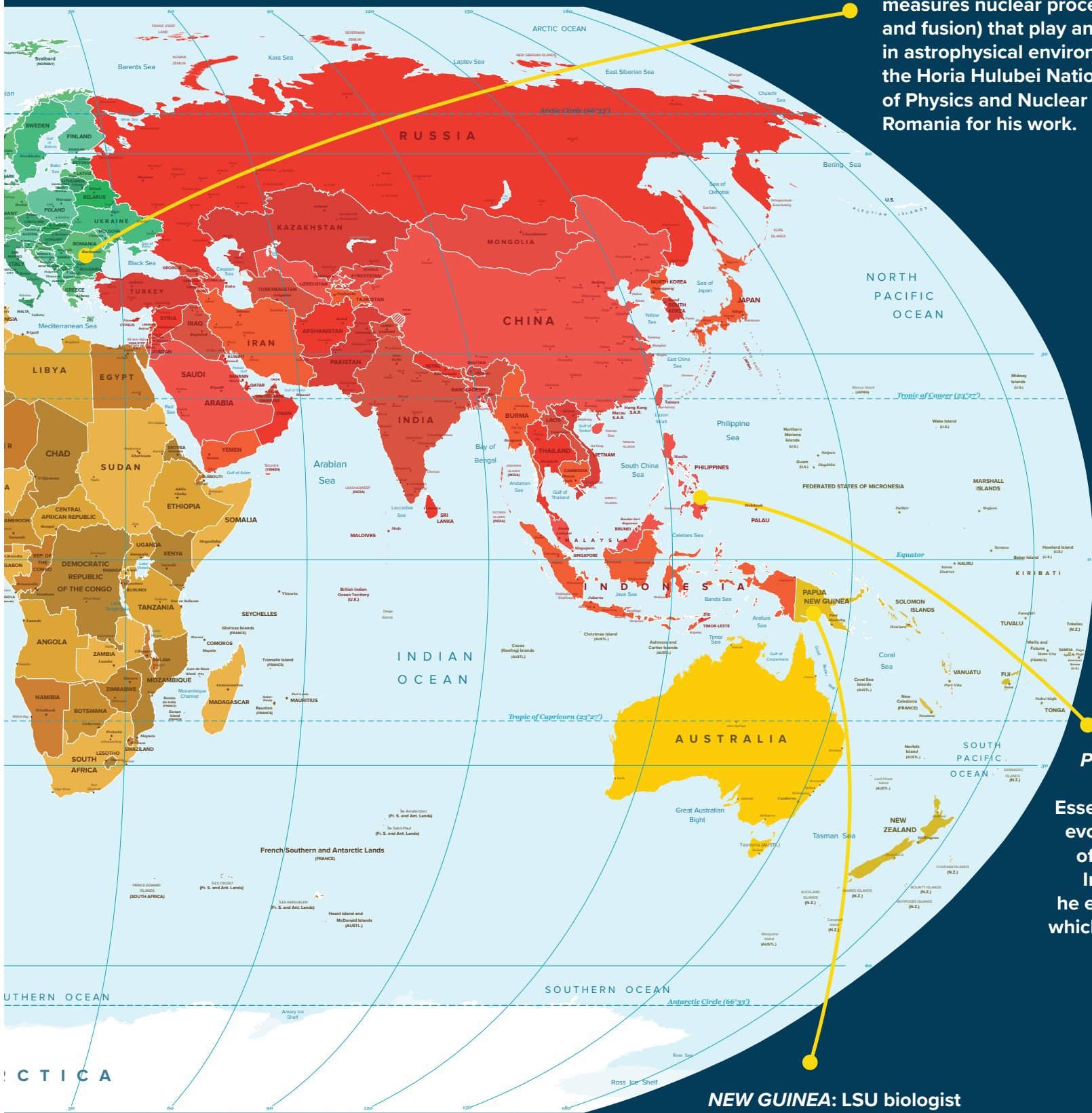
**BOLIVIA:** LSU ornithologist J.V. Remsen has studied birds in Bolivia for years! He has even co-authored the book, *Birds of Bolivia*. And did you know that the LSU Museum of Natural Science has the world's largest collection of Bolivian birds!

**ANTARCTICA:** At least five LSU College of Science researchers work in the frozen landscape of Earth's highest, driest, and most uninhabitable continent! These researchers are housed at McMurdo Station, a United States Antarctic research station on the south tip of Ross Island.

**You can find LSU College of Science researchers *all over the globe!***

From conducting research in the foothills of the Rocky Mountains to the icy environment of Antarctica to the cloud forests of New Guinea, our scientists fearlessly go into the unknown—driven to find the answers because science is *everywhere*.

# ARE WHERE...?



**ROMANIA:** LSU physicist Jeff Blackmon measures nuclear processes (like fission and fusion) that play an important role in astrophysical environments. He visits the Horia Hulubei National Institute of Physics and Nuclear Engineering in Romania for his work.

**PHILIPPINES:** LSU biologist Jake Esselstyn studies the evolutionary history of small mammals. In the Philippines, he examines shrews, which are small mole-like mammals.

**NEW GUINEA:** LSU biologist Christopher Austin traveled all the way to New Guinea, where he discovered a lizard with green blood!

## ARE YOU UP FOR A CHALLENGE?

**Become an explorer at home!** Using programs, like Google Earth, you can explore the world around you without having to leave your home. There are some interesting places you can find on Google Earth that show *exactly* where our LSU College of Science researchers are around the world. Plug in the following places where LSU scientists work into Google Earth and see where it takes you! **Can you find them all?**

1 McMurdo Station, Antarctica

2 LSU Charles Barney Geology Field Camp, Colorado

3 Cerro Tololo Inter-American Observatory, Chile



# WHEN DID YOU KNOW YOU WANTED TO BE A SCIENTIST?

**LSU SCIENTISTS TELL US ABOUT THE MOMENT—OR MOMENTS—THEY KNEW THAT BEING A SCIENTIST WAS THEIR DESTINY.**

ILLUSTRATIONS BY LIZ CENTANNI



**“Explorer of Light”** I didn't really know until I was older than you are now. I already had a different degree from college and had to get another one in science, *but* I've always been an explorer! I loved learning about dinosaurs, using cool lenses to be able to see the effects of a solar eclipse (without looking at it, of course), and going to local museums in my city to see much more! So if you're an explorer like me, and you like to learn more about everything, then you'll make a great scientist! Remember those lenses that I talked about? They're actually really fancy pieces of plastic. If you wear glasses, then you already have lenses in your glasses (*how cool is that?!).* I try

to see how different types of light change when passed through different things. Light from the sun is different from a laser. I also use something called quantum mechanics. Don't know what quantum mechanics is? Don't worry—no one fully knows what it is! But there are people who know a little bit about it, and I'm one of them. I use what I know to learn more about how and why light does what it does. So there you have it—I've always been a scientist. It just took me a while to find out! I think of myself as an explorer of light. What would you like to explore in this big world? Whatever it is—have fun and tell your family and friends all about it! Happy exploring!

— Michelle Lollie, PhD student and physicist

**“Colors of the Rainbow”** When I turned five years old, I was intrigued by the purple and red hues of flowers. I became infatuated with finding out the origins of their colors. My grandmother saw me pulling the flowers into small pieces, as a Native American she explained to me colors like life came from within. That day I found my craft. I started doing extractions to study the constituents of terrestrial plants known collectively as natural products. My laboratory uses natural products

as molecular probes or molecular reporters to tease out the secrets of human disease and potentially treat it. We study specific cellular pathways with our molecular probes to investigate the state of the cell, and their fate after stimuli. My main objective is to improve our understanding of specific pathways that regulate cellular growth and death so we can potentially fix them when they breakdown due to genetics or environmental factors.

— Fatima Rivas, chemist



**“History of the Earth”** I grew up in a suburban area quite close to the countryside, but we never saw any rocks—just the rolling fields of crops and animals. I remember going on vacation with my aunt and uncle into the hills of Wales, where they used to do coal mining. I was excited to be out in the countryside and seeing all these big mountains, and then I found a beautiful leaf fossil along the side of the road

near a coal mine. I thought it was so perfect, and I took it home and put in my bedroom. I always liked history, so geology for me was like the history of the earth but something that I could explore for myself, especially walking around outside and going on adventures close to home and far away too. I liked that excitement of meeting new people and seeing different things.

— Peter Clift, geologist



**“The Summer That Changed It All”** I grew up in small rural towns in Mississippi. While there were not always a lot of resources for teaching kids about science, my mom was very diligent about making sure that we (my siblings and I) were able to participate in as many enrichment activities as possible. One experience that I was able to do was to spend the summer between my junior and senior years in high school on a college campus in a science program. I was always good at math and science, but I didn’t really know how I would use any of it for a career. During that summer on the

college campus, I discovered a love for chemistry and had exposure to role models. This inspired me to enter college as a chemistry major. In college, I had a lot of opportunities to conduct research, and this gave me a chance to *do* science, instead of just reading about it or learning about it. I am where I am right now because of that summer program, and I am passionate about outreach and science education because of the role that it played in helping me to select my career path.

— Zakiya Wilson-Kennedy, chemist and assistant dean for diversity and inclusion

**“Patterns of Plants”** I have been fascinated by biology ever since I was a kid! At first, I did not know the many job options that were available to me. That was just fine. I simply knew that I was passionately interested in animals, nature, science, and being outdoors. I grew up on a farm in Iowa, so I was familiar with cats and dogs, chickens, pigs and cows, but I was especially drawn toward stories about dolphins, wolves, penguins, and lots of others in books from the library. Later, I thought maybe I would become a veterinarian—to take care of sick and injured animals—or perhaps a medical doctor. Those would have been good choices, too. However, in college, I had the chance to participate on a professor’s research project in Patagonia

(in southern South America). While I was helping study the lives and habits of pumas (also known as mountain lions) and guanacos (the wild relatives of llamas and alpacas), it occurred to me that I could become a professor and design my own scientific research projects out in the wild. My horizons have broadened ever since. I now study all sorts of organisms—not just animals, and especially plants. Plants tend to stay put, so unlike the pumas I only rarely and briefly got to see in Patagonia, I can go back day-after-day or year-after-year and see how my plants have changed and try to figure out why. That’s my special area of science—patterns and the processes that cause those patterns out in nature.

— Kyle Harms, ecologist



**“The Creativity of Numbers”** As a kid, I never thought I’d grow up to be a mathematician. I liked games and puzzles, like Sudoku or a Rubik’s Cube. I liked to count and sort, and math and science were my favorite subjects in school. But it was hard to see what life mathematics had outside of school. Then I learned more math, and as it built on itself (from adding to multiplying, to algebra, to geometry, and so on), I started to see how *creative*

you could be in mathematics. When I was in college, I started to explore math outside of the classroom, and eventually I was having so much fun that I never wanted to stop. To me, the heart of mathematics is creative problem solving. The kinds of puzzles and counting that I do is more complex and abstract, often related to features of geometric objects, but I have as much fun as I did when I was a kid solving a Sudoku puzzle.

— Christin Bibby, mathematician

**“Guided by Curiosity”** Until I was 20 years old, I wanted to be a doctor. Using science to figure out what was making someone hurt and helping them was my motivation. However, I also enjoyed being outdoors and asking questions about animals and plants instead of just humans.

In my research now, I attempt to use mathematics to understand interactions between species, such as hosts and their parasite species. Now as a professor at LSU, I get to let my curiosity guide what organisms I study and what questions I ask.

— Tad Dallas, disease ecologist



# Science @ Home

with Dr. Christine Lattin

## Bugs WITH BIG FEET

Have you ever seen bugs like water striders that walk on top of the water? They are able to do this because water has a lot of surface tension, which means that the surface of the water is very strong and elastic. In this experiment you will make your own “water strider” that will be able to glide on top of the water.

### WHAT YOU'LL NEED:

Index cards or sturdy pieces of cardstock

(NOTE: this won't work with normal paper!)

Scissors

Crayons

Scotch tape

A basin, sink, or tub full of water



### The Experiment:

**STEP ONE:** Fold your card or cardstock in half and draw a shape on it. Make sure your bug has big feet, like a real water strider!

**STEP TWO:** Carefully cut out your bug with the scissors. Fold the feet out. Decorate it if you'd like with the crayons!

**STEP THREE:** Go to your basin or tub full of water. Carefully place your water strider on the surface of the water. It should be “walking” on the water just like a real water strider! You might even see little dimples in the water where the weight of your bug pushes against the water's surface.

**STEP FOUR BONUS:** Many water striders have feet with special hairs that repel the water. If you want to make your water strider have “water repelling” feet, you can coat them with a layer of butter. Water and oils like butter repel each other!

### The Follow-up:

You've made a basic water strider with big feet, and part of the reason it stays on top of the water is because the weight of the bug is distributed over a large area of water underneath the bug's big foot. This is the same reason you can walk on top of snow using large snowshoes, or big feet like a snowshoe hare! What happens if you make another bug with small feet? Because the weight of the bug is pushing down over a smaller area, a smaller bug is more likely to sink. Another way to make a bug more likely to sink is by making it heavier, by taping pennies to it. If the weight of the bug is too heavy, the surface tension of the water isn't strong enough to support it and it will sink.

### Get to know!

**Dr. Christine Lattin** is an assistant professor of biological sciences at LSU! Dr. Lattin studies hormones, the brain, and behavior in wild songbirds to understand how to help animals successfully choose mates, raise their young, escape from predators, and survive harsh winters and other challenging conditions.

## AN EGG... with no shell!

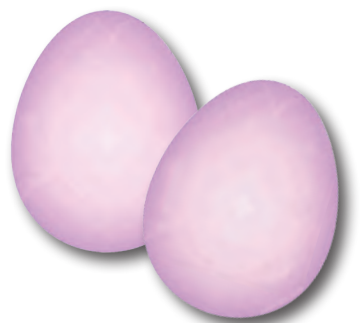
Have you ever seen an egg without a shell? You can make one using the three simple ingredients listed above. This is because eggshells are mostly made of a substance called calcium carbonate, which is also found in coral reefs, seashells, and even pearls! Strong acids like white vinegar can easily dissolve calcium carbonate, as you will see.

### WHAT YOU'LL NEED:

A raw egg

A clear cup or jar

White vinegar (at least 16 ounces)



### The Experiment:

**STEP ONE:** Carefully place the egg in the cup or jar.

**STEP TWO:** Pour the vinegar into the glass or jar. Make sure the egg is covered with liquid!

**STEP THREE:** Observe! Check your egg after an hour or so. Do you see little bubbles on the outside of the egg? Those are carbon dioxide bubbles, a byproduct of the reaction between the vinegar and eggshell. Science is happening!

**STEP FOUR:** After a day or so, check your egg again. Try removing it from the jar by (very carefully!) pouring off the vinegar and (very carefully!) catching the egg in your hand. Is the shell gone yet? You might be able to rub off the last of it as a white powder with your fingers. If your eggshell still feels pretty strong, put it back in your cup or jar, pour in some fresh vinegar, and check it again in a day.

**STEP FIVE:** Enjoy your “naked” egg!

### The Follow-up:

You might notice a few things about your egg. First of all, it's still in an egg shape! That's because bird eggs have strong, stretchy membranes on the inside of the shell that help to hold everything in place. These membranes are “semipermeable,” which means some very tiny things (like water molecules) can pass through them. If you put your naked egg into a glass of pure water colored with food coloring, the egg will swell up with water and turn the color of the food coloring! Another fun thing to do with your naked egg is to bounce it in the sink from higher and higher heights until it breaks!



# SOLVING CRIME WITH POLLEN, ONE TINY GRAIN AT A TIME...

CONTINUED FROM COVER...

stuck like glue, which means doing laundry doesn't remove all the little bits of grains.

But in order to really understand pollen and how they can be used to track down criminals and solve crimes, we have to study them.

**Palynologists** are scientists who study plant pollen, spores and certain microscopic plankton organisms (in both living and fossil form!), and the scientists who use pollen and spores to solve criminal cases are known as **forensic palynologists**.

At LSU, palynologist Sophie Warny and her students conduct palynological research. Dr. Warny specifically likes to study pollen to solve mysteries of the past, and her research has taken her all over the world! She has studied pollen nearby in the Gulf of Mexico, in Columbia, North Africa, and even all the way in

Antarctica! You can see some of her work from Antarctica on display in the LSU Museum of Natural Science.

One of Dr. Warny's former students, who also studied palynology, used her skills and understanding to do something *a little different*. While a student at LSU, Shannon Ferguson interned with the Department of Homeland Security, or DHS, in Houston, where she worked with head palynologist Dr. Andrew Laurence.

Shannon helped with an investigation that led to solving the mystery of missing Bella Bond, a young girl from Boston, Massachusetts.

As part of her internship, Shannon assisted in looking at the pollen that was found at the crime scene. What she discovered gave investigators their first clue in the case.

Shannon used tiny vacuum cleaners to suck up the pollen grains through a filter. After that,

the samples underwent chemical processing to separate the pollen grains, and this is what Shannon and a team of scientists examined.

The pollen that Shannon found told investigators a story.

Because the pollen grains were so specific, the scientist was able to pinpoint a very specific geographical location where that pollen's plants grew in abundance.

Shannon was able to tell police to check out this location, which helped solve the crime!

Pollen can tell us so much by helping us solve plenty of mysteries (not just the criminal kind). Some scientists have used pollen to discover that flowers may have bloomed before dinosaurs walked the Earth! Pollen can even show us what different climates were like during our planet's different ages.

So it goes to show you—even something as teeny, tiny as a flower's pollen grain can help us solve *gigantic* problems.

# Mapping THE SKY

**Nature** is ripe with opportunities to investigate wildlife, to critically think through problems, and to contribute to big scientific discoveries.

Do you know your own backyard? Do you know the types of insects that live in the grass, or the birds that find shelter in the trees? What about the kinds of rocks or woods used in the landscaping?

Living in South Louisiana, we are surrounded by a number of natural habitats. Chances are there's a pond, stream, or river near you. Start with curiosity. Ask yourself: What am I curious about?

**FUN FACT: LSU astronomer Tabetha Boyajian has a star named after her! Her star is known as Tabby's Star after her discovery of it.**

Sometimes we are curious about things we can't always see—and no, we're not talking about the teeny, tiny things. We are talking BIG. Like stars! And planets! And nebulas, which are giant, round clouds of dust and gas in space.

Even though all of that is millions (or more!) miles away, we can study them *right here* in Baton Rouge, Louisiana.

Some of our very own scientists at LSU work hard to understand the mysteries that space holds and to discover new pieces to the giant galactic puzzle.

LSU researcher Matthew Penny works alongside NASA

to discover possible rogue planets in our universe/galaxy. What are rogue planets? Unlike the planets of our own solar system, a rogue planet does not orbit, or circle around, a star.

A group of LSU astronomers and physicists contributed to Nobel-prize winning work in 2015 when gravitational waves were discovered. The

discovery made headlines across the world, not only because gravitational waves happen when two black holes collide into each other, but also because it proved Albert Einstein's theory of general relativity.

LSU physicist Jeffery Chancellor's research looks to help answer questions about astronauts' health and performances during future space missions that go beyond low-Earth orbit for a long period of time.

And studying the elements of space is not just for physicists and astronomers. Geologists, who are often known for studying the rocks and minerals of our own planet, can study the rocks and minerals of other planets, too! LSU geologist Suniti Karunatillake has spent years studying our neighboring planet, Mars. He wants to find answers to the big questions, like, "Has there ever been life on Mars?" To start, he's been searching for evidence of water on the planet, which could be a good indication that it has been sustainable to life at some point in the planet's history.

Studying our skies and everything beyond what our own eyes can see is something that anyone can do!





# DO YOU KNOW YOUR

# Constellations?

Connect the dots for each constellation in the night sky! Then, on a clear night, go outside and see if you can spot them!

ORION  
URSA MAJOR  
LYRA  
ORION'S BELT  
URSA MINOR

A. \_\_\_\_\_  
or "Big Dipper"

B. \_\_\_\_\_  
or "Little Dipper"

C. \_\_\_\_\_  
*Bonus points!*  
Do you know what  
this cluster of three  
stars is called?

D. \_\_\_\_\_

E. \_\_\_\_\_

F. \_\_\_\_\_

A) Ursa Major, B) Ursa Minor, C) Orion, D) Orion's Belt, E) Lyra, F) Leo

## Is it a STAR OR...?

**Twinkle, twinkle, little star.** We all know the nursery rhyme—but did you know that there is some truth to it? Not all points of light you see at night are stars. Airplanes, satellites, and meteors (or “shooting stars”) move fast across the sky, so they’re easy to tell from stars. But what about planets?

Planets look a lot like bright stars, so telling them and stars apart can be tricky. One way to tell the difference quickly is that planets don't twinkle like stars, although it's sometimes hard to see the difference. Look up at the sky. Can you see a bit of a shimmer coming from the bright dot? If you can, then it's a star! As light from a star races through our atmosphere, it bounces and bumps through the different layers, bending the light before you see it.

There are other ways you can also tell the difference without a super powerful telescope. While not all planets are colorful, many of the most prominent planets in our night sky appear to have some type of coloration. Mars can have a pinkish-red color, and Neptune can look a little blue. One other way to tell the difference is that planets can be a bit brighter than stars. Planets reflect the bright light of our solar system's sun, which is relatively close to the earth. Stars, by contrast, emit their own light.

## A KID'S GUIDE TO Stargazing!

The night sky is like a giant puzzle. Hidden among the thousands of stars you can find dozens of constellations. You can also search for individual stars and planets. Here are some **Stargazing Do's & Don'ts**:

### Get Out in the Right Conditions

Stargaze when there is little or no moonlight and the sky isn't cloudy. Find an area away from street lamps, neon signs, and headlights. And give your eyes a half hour to adjust to the darkness.

### Bring Some Tools

Borrow binoculars or a telescope to see these celestial sights more clearly and closer up.

Use an app! There are plenty of free phone apps that help you map out the sky so you know what you're looking at.

Bring a flashlight to help you find your way and to see your notebook, compass or sky map.

### And Most Importantly...

Stay safe! Bring a friend or parent along to help search the night sky. Don't ever go out at night without your parents' permission.



# 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).

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

## RIDDLE ME THIS!

(Answers found below)

1. What is the most uninteresting of all the periodic elements?
2. What is neither water nor land, and is always soaking wet?
3. I was once an old massive star and soon I will be a brightly colored gas cloud, but for now I am a massive explosion. What am I called?
4. Give it food and it will live; give it water and it will die. What is it?
5. What period of time has the least weight?
6. Did you hear the one about a chemist who was reading a book about helium?

1) Boron, 2) Wetlands, 3) Supernova, 4) Fire 5) A light year, 6) He couldn't put it down

## MATHEMATICS WORD SEARCH

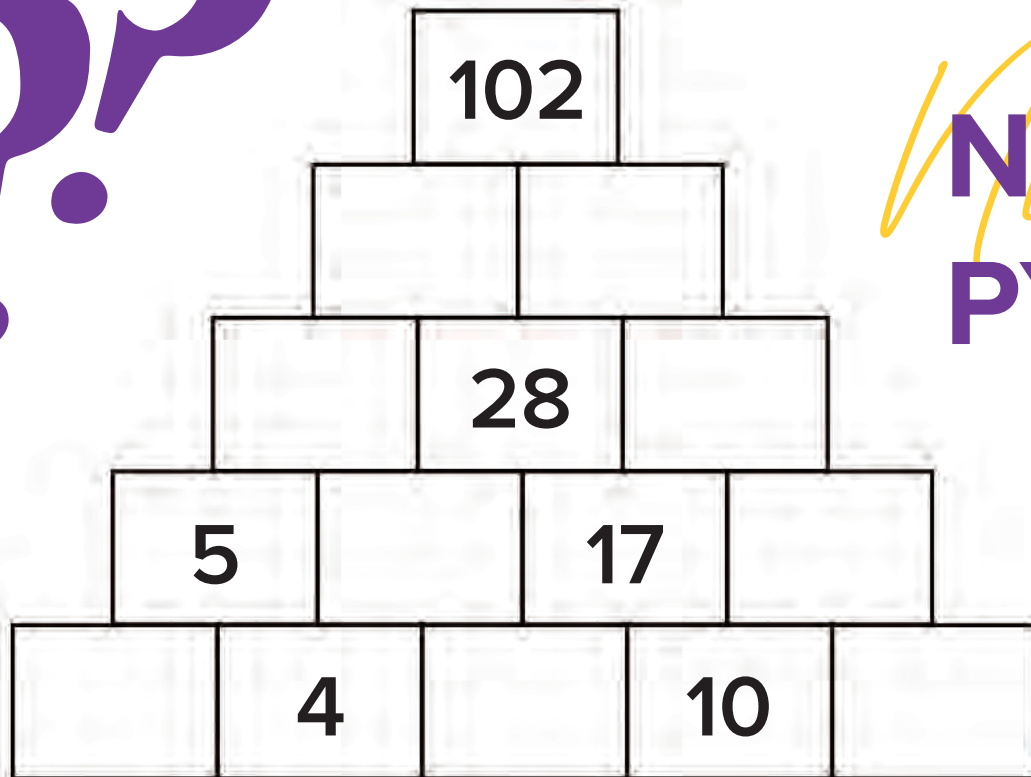
A X M F J C S Z J O F O J U D K G O G Z R A  
 N P O T W C O M P A R E H R D P J D J F D N  
 G E N G S P L O R M L H N L J L X G L T E U  
 L R F A C E I Q U A D R I L A T E R A L C M  
 E I A G B V D I A M E T E R C E O V P K I B  
 M M C P B J F M D E C V I R B P C R Q N M E  
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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

ACUTE ANGLE  
 COMPOSE  
 DECOMPOSE  
 EDGE  
 GRAPH

PRODUCT  
 UNLIKE DENOMINATORS  
 ANGLE MEASURE  
 DECIMAL FRACTION  
 DEGREE

FACE  
 NUMBER LINE  
 QUADRILATERAL  
 VERTICAL  
 COMPARE

DECIMAL POINT  
 DIAMETER  
 FACTOR  
 PERIMETER  
 SOLID FIGURE

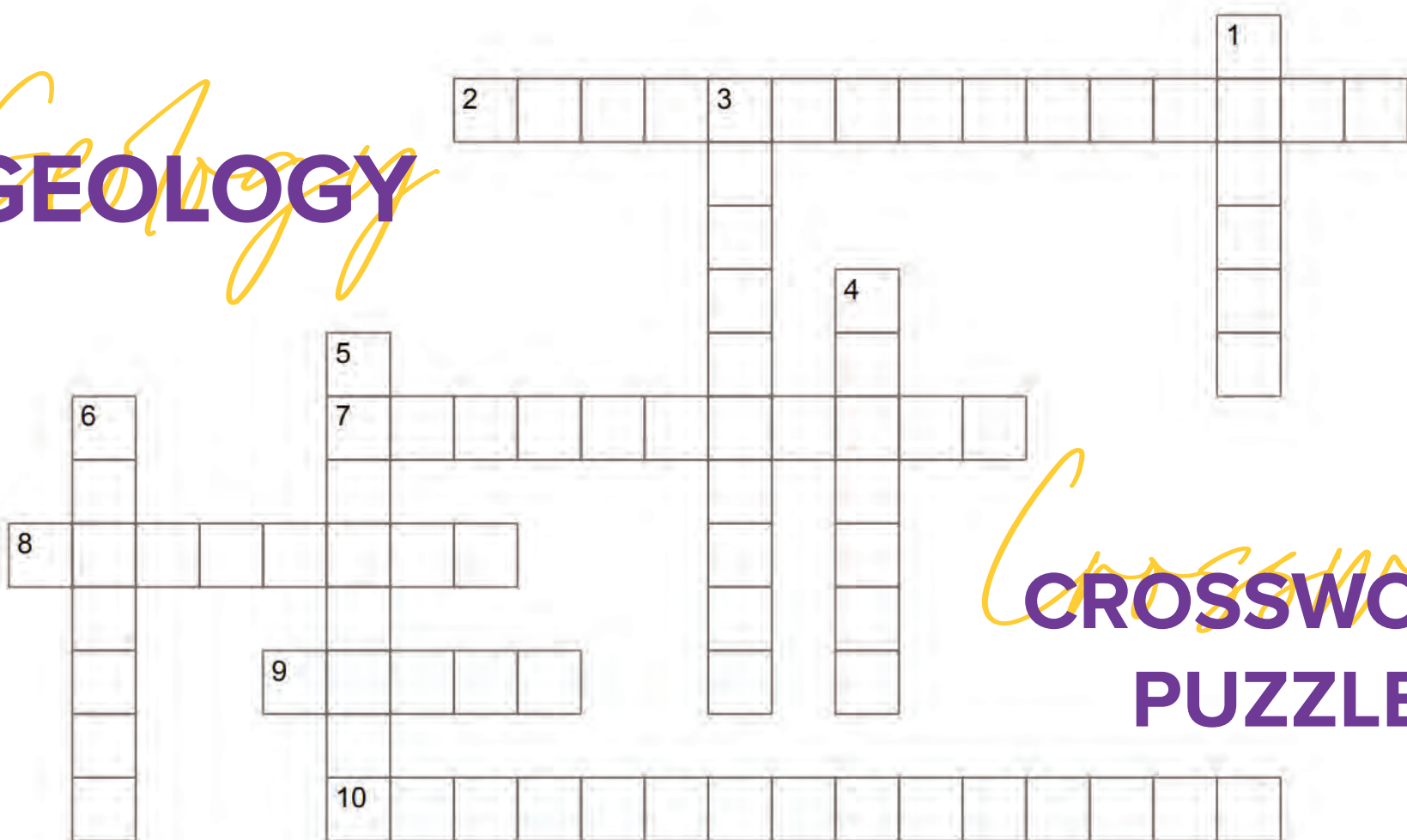


*Number*  
**NUMBER  
PYRAMID**

**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?

*Geology*  
**GEOLOGY**



*Crossword*  
**CROSSWORD  
PUZZLE**

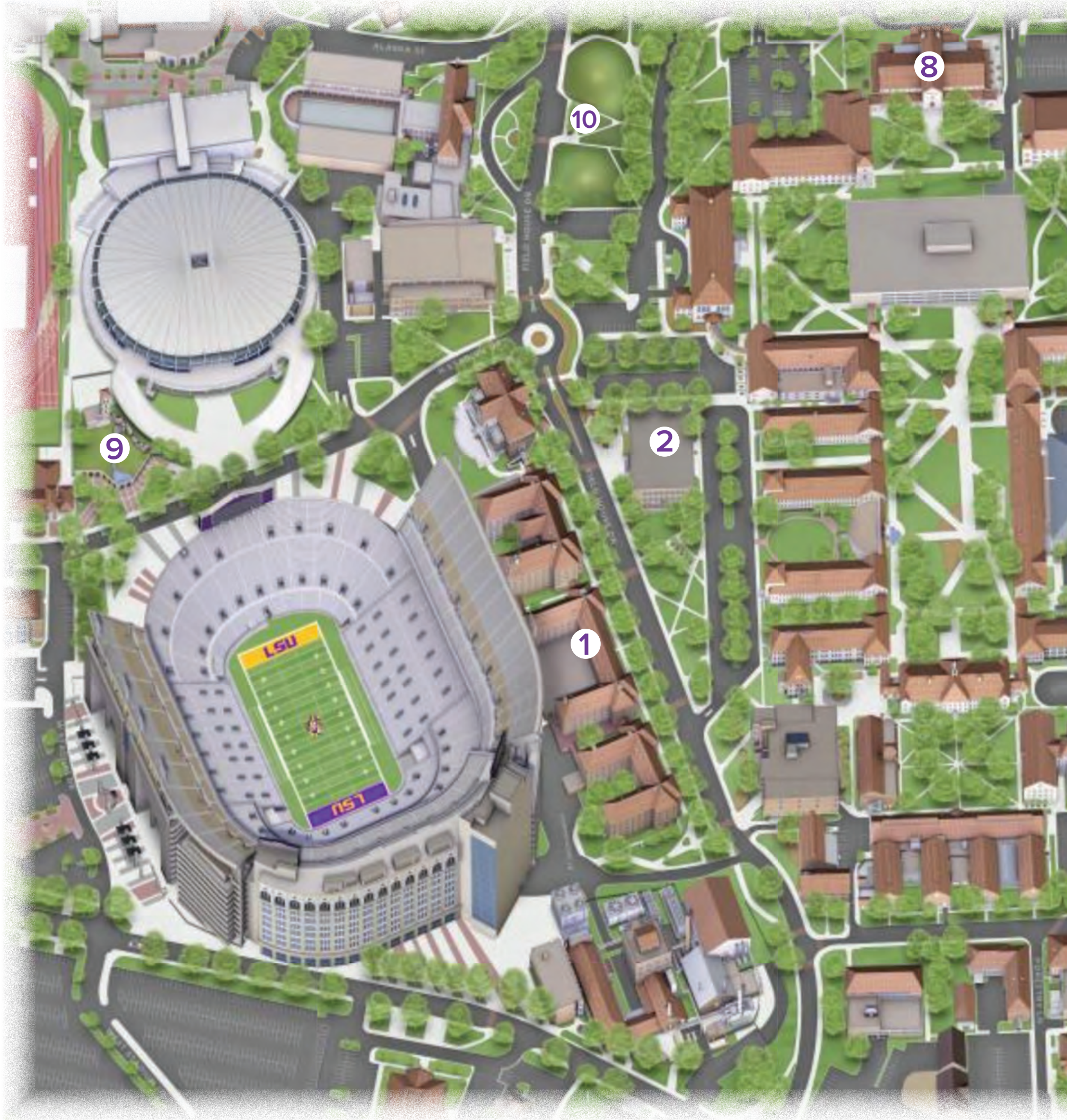
**ACROSS**

- 2. Rock altered by pressure and heat
- 7. Rock formed by the solidification of molten magma
- 8. The property of being rigid and resistant to pressure; not easily scratched; measured on Mohs scale
- 9. Molten rock in the earth's crust
- 10. Rock formed from consolidated clay sediments

**DOWN**

- 1. The remains (or an impression) of a plant or animal that existed in a past geological age and that has been excavated from the soil
- 3. Geologists use this to study different minerals that make up a rock's composition
- 4. A science that deals with the history of the earth as recorded in rocks
- 5. Solid homogeneous inorganic substances occurring in nature having a definite chemical composition
- 6. Very hard native crystalline carbon valued as a gem; can cut glass

**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. The Horeshoe** is where the Science Residential College is located. Evangeline and Highland Halls are student living spaces that provide more opportunities for science students.

**8. Foster Hall** houses the LSU Museum of Natural Sciences. Visit [museum.lsu.edu](http://museum.lsu.edu) for upcoming events at the museum!

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

**10. The LSU Campus Mounds**, or LSU Indian Mounds, are two Native American mounds, likely from the Archaic Period.



# On-Campus Scavenger Hunt!

*Can you find?*

**1** The First Mike the Tiger's Loud ROAR  
*Hint: Where can you find other animals on display?*

**2** Oak Leaves as BIG as a Building  
*Hint: Biologists often study plants, like oak trees, among other life sciences!*

**3** Where Dinosaurs Still Roam  
*Hint: Rocks, like dinosaur fossils, are often studied by who?*

**4** Possibly the oldest man-made structures in the Western Hemisphere  
*Hint: There's two of them!*

1. LSU Museum of Natural Science (Foster Hall); 2. Across from Life Sciences Building & Howe-Russell Geosciences Complex; 3. Howe-Russell Geosciences Complex; 4. LSU Campus Mounds

# Hey PARENTS!



**SO YOUR CHILD IS INTO STEM.** What does that mean? It could mean that you have a little one whose constantly exploring the natural world around them or one who bubbles with questions at every opportunity.

Humans have a naturally occurring internal drive to investigate and answer important questions, and fostering an environment that encourages taking on the challenges they will face is vital in seeing them flourish in areas even beyond the scientific realm.

And while the curiosity comes naturally to all of us, the applications of what STEM (**Science, Technology, Engineering, and Mathematics**) subjects require...may not.

Even if you aren't STEM-minded yourself, or you feel a little clueless on how to support your child in their scientific endeavors at school or at home, just remember you're not alone—and there are ways you can help your child succeed!

Here's a little secret that should be general

knowledge: *Not* having the answer is the perfect place to start when it comes to learning STEM. That cluelessness you feel? It's actually an asset.

As your child's parent and role model, the best thing you can do for them is to embrace the fact that you don't know the answer and be willing to say that to your child. There's no shame in not knowing the answer—in fact, that's where we all start when it comes to learning anything new. That's an important message to send because it empowers children by focusing on the fact that they have the ability to learn.

The other important concept to model is that it's always a good idea to double check your knowledge. You can do that by saying, "Even though I think I know the answer, let's check." It's an especially smart strategy since there's a good chance that new evidence, and possibly new understandings, have been discovered since you were in school.

## BRAIN Breaks

**WITH KIDS AT HOME**, it's important to build time into schedules for focused brain breaks. But what exactly are brain breaks? And why is it so important to incorporate them into your child's daily schedule?

Brain breaks are mental breaks designed to help a student take a break and re-energize the brain to begin focusing again. According to research from the Watson Institute, many students can focus for a length of time that equals their age plus two minutes.

Here are some brain break exercises to try at home:

### 1. The Skipping Worksheets:

Tape your child's school worksheets to a wall nearby. When they finish one worksheet, require them to skip to grab the next! Incorporating movement is a quick way to get some energy out.

**2. Go with the Flow:** Similar for adults, yoga poses are one way to relax the mind. Consider including a routine of yoga-like stretching after each lesson. Print some poses on cards and have your child pull 3-4 to practice each time. This will keep things from feeling too monotonous, while also teaching some mindfulness!

**3. Stir the (Gumbo) Pot:** Have your child visualize they are standing in front of an enormous gumbo pot! Take hold of a large stirrer and slowly begin to stir in a clockwise direction. Have them use their whole body to help get a full range of motion in their elbows and shoulders. Instruct them to throw their hips into the action. Want to make it interesting? At random intervals, blow a whistle and tell them to change direction!

## HOW TO FOSTER PRODUCTIVE STEM TALK?

**TALKING IS INTEGRAL** to human learning, and "STEM Talk" provides a foundation for students to think in ways that can be engaged with, interpreted, built upon, and refined.

Giving your child the beginning of an academic response, *or sentence starter*, is an effective tool in engaging their STEM mind. Sentence starters help to focus attention on content-specific vocabulary and provide young minds with the language support they need to engage in discussions in more effective ways. Sentence starters help students communicate what they are thinking about, help many students with special needs, and provide focus for the lesson at hand.

If your students can talk about their thinking in mathematics or any other STEM subject, can you imagine what type of learning opportunities you are fostering outside of the classroom and in your own homes?

### COMMUNICATING IN SCIENTIFIC WAYS

#### Ask why and how questions, like...

*How come ...?*  
*I wonder ...*  
*Why ...?*  
*How do they know that ...?*

#### Think of an idea, claim, or prediction, to explain your data and observations

*My idea is ...*  
*I think that ...*  
*We could draw a picture to show ...*  
*I think it looks like this ...*

#### Give evidence for your idea or claim

*My evidence is ...*  
*The reason I think that is ...*  
*I think it's true because ...*

#### Let your ideas change and grow

*I think I'm changing my idea.*  
*I have something to add to my idea.*

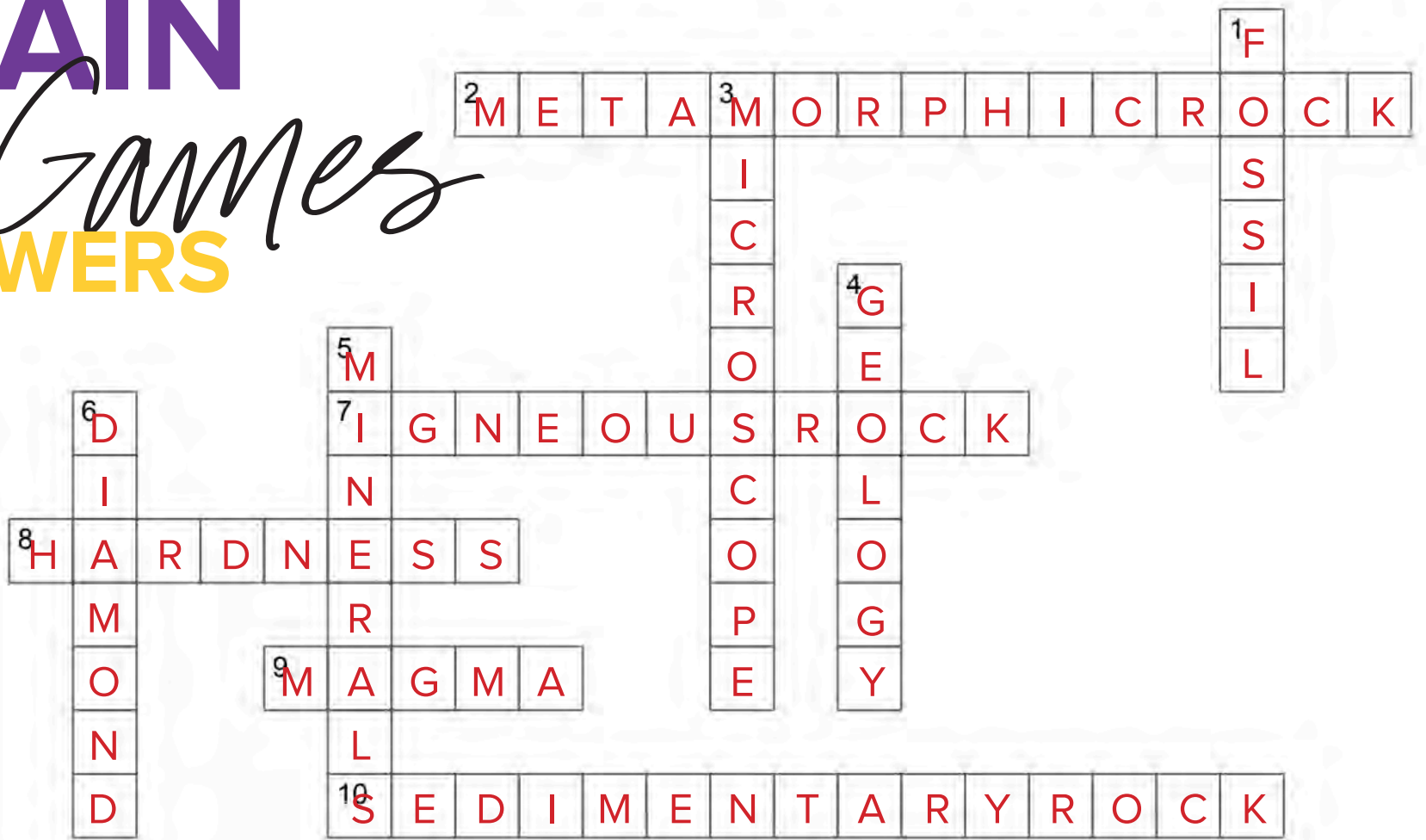
Resource: OpenSciEd

### Need some more activities?

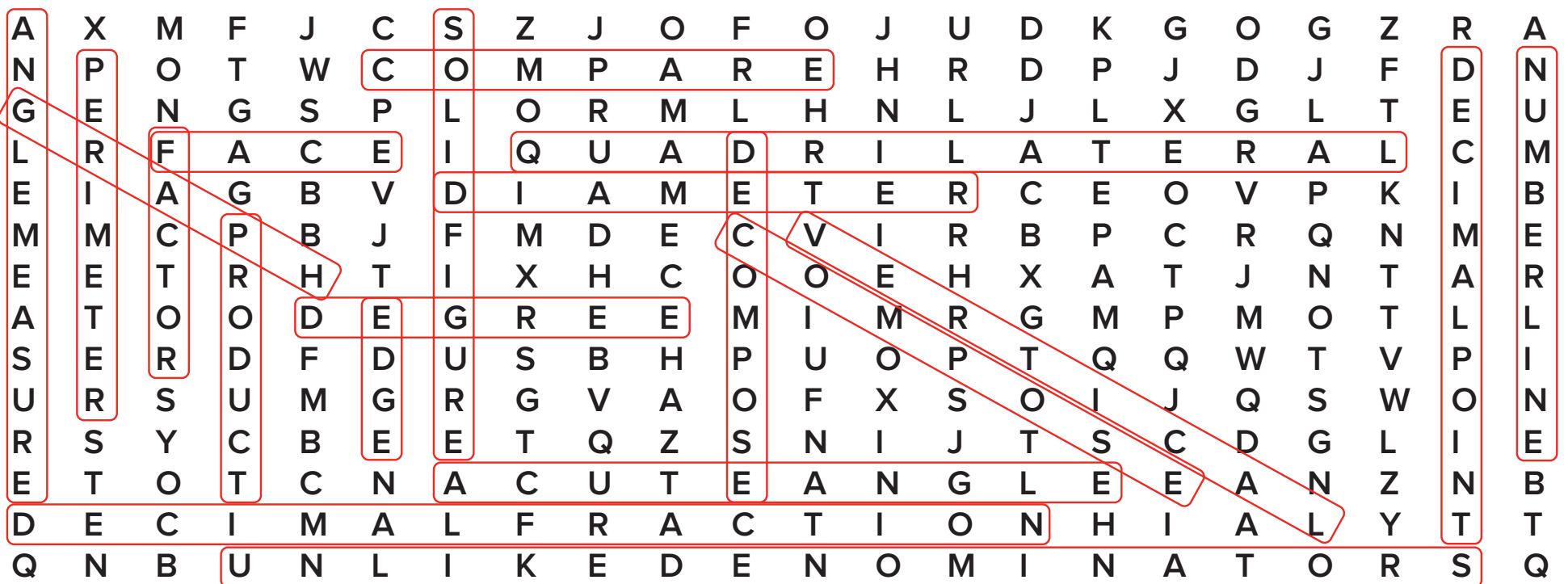
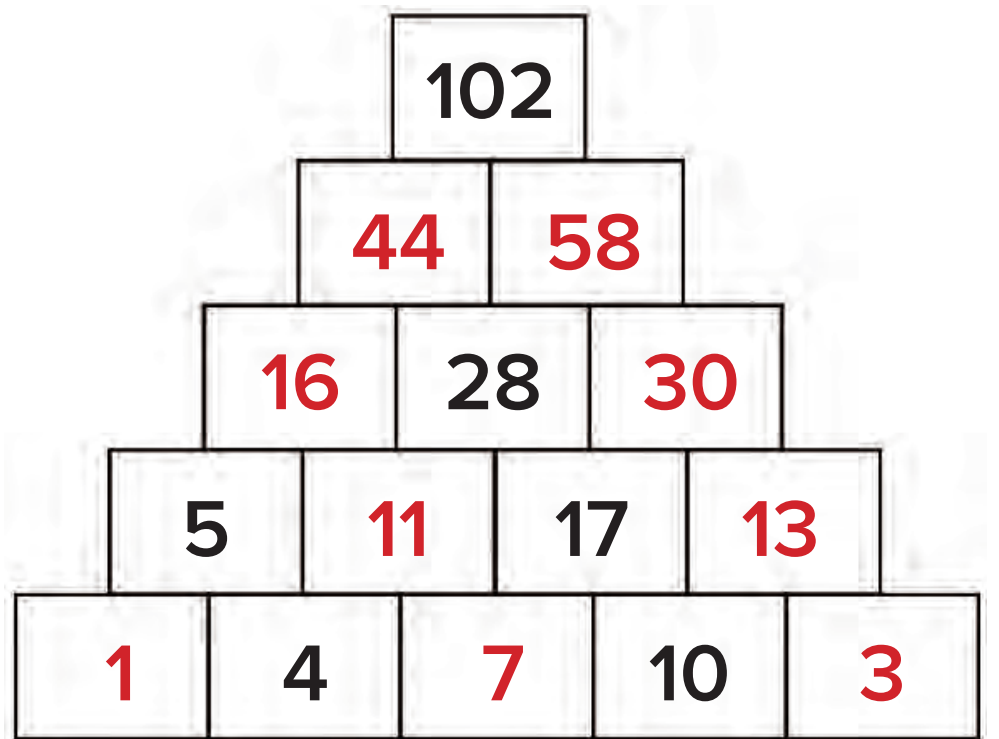
Check out our College of Science coloring pages at [lsu.edu/colorscience](http://lsu.edu/colorscience)

# BRAIN Games

## ANSWERS



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



ANSWER KEY			
ACUTE ANGLE	PRODUCT	FACE	DECIMAL POINT
COMPOSE	UNLIKE DENOMINATORS	NUMBER LINE	DIAMETER
DECOMPOSE	ANGLE MEASURE	QUADRILATERAL	FACTOR
EDGE	DECIMAL FRACTION	VERTICAL	PERIMETER
GRAPH	DEGREE	COMPARE	SOLID FIGURE

**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.

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# PURSUIT

*for kids!*

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