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The Quest for the Golden Fleas



Welcome to the Mount Olympus Pet Center in Athens (Georgia), where Zeus the Mighty (a hamster) leads his critter companions (all named after Greek gods and goddesses) on a dangerous quest across the kingdom. Will they triumph? Find out in this fun and funny new book, inspired by Greek mythology!

Watch the video, take a personality quiz, and discover more at ZeusTheMighty.com

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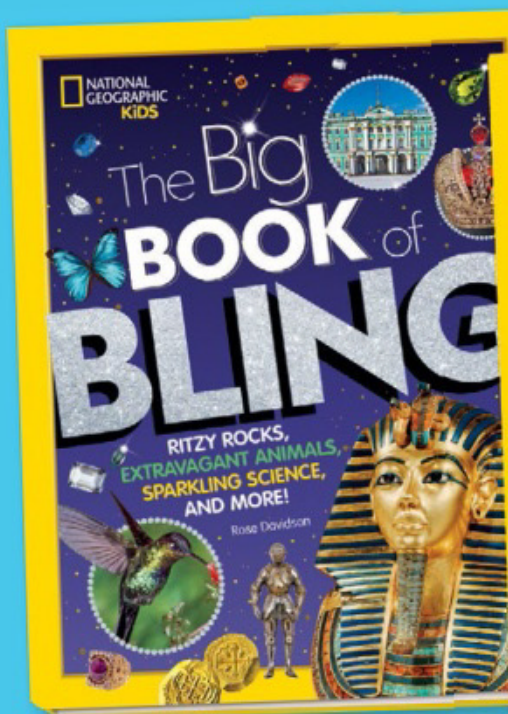
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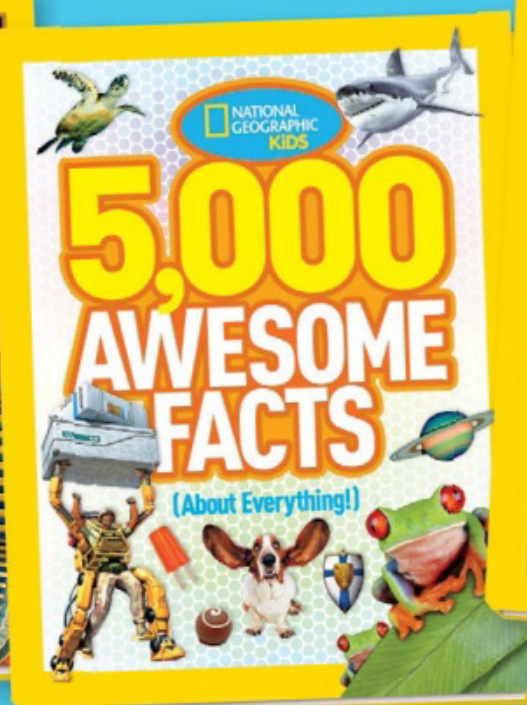
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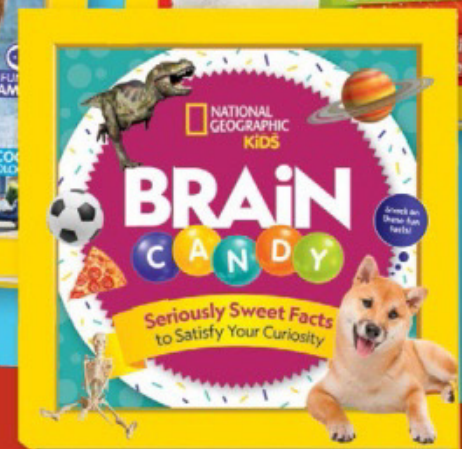
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PUBLISHED BY NATIONAL GEOGRAPHIC PARTNERS, LLC

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NATIONAL GEOGRAPHIC KIDS (ISSN 1542-3042) is published ten times a year
by National Geographic Partners, LLC, Washington, DC 20036. For more
information contact natgeo.com/info.

Periodical postage paid at Washington, DC, and additional mailing
offices. POSTMASTER: Send address changes to NATIONAL GEOGRAPHIC
KIDS, P.O. Box 37545, Boone, IA 50037. Subscriptions: United States,
\$25.00; Canada, \$29.95; elsewhere, \$34.95; all in U.S. funds. Single copy:
United States, \$4.99; Canada, \$6.99 in Canadian funds or \$5.75 in U.S.
funds; elsewhere, \$5.99 in U.S. funds or equivalent (includes postage). In
Canada, Agreement number 1000010298, return undeliverable Canadian
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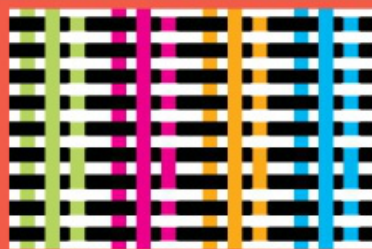
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IMAGES (POLAR BEAR CUBS); GARETH MOORE
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weird but true!

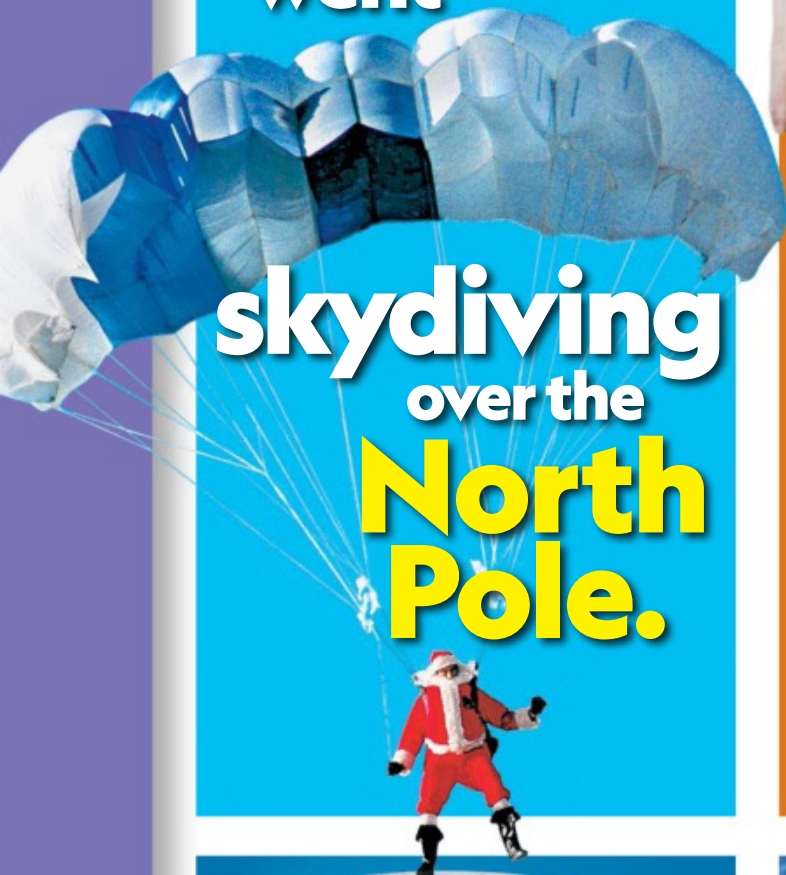
Check out these
outrageous facts.

BY MICHELLE HARRIS



WIN THE GAME!
TRY ONLINE
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/deceember

A man
dressed as
Santa Claus
went



skydiving
over the
North Pole.

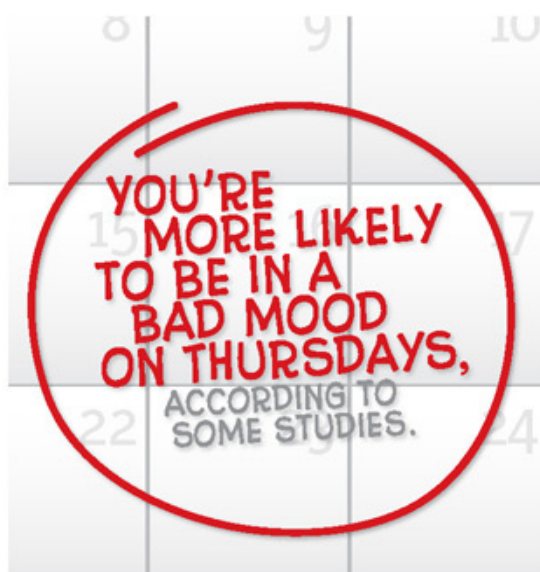


Some
pigs
are afraid
of
mud.

Babies' **cries**
can **sound different** in
various **languages.**



There was
a **hotel**
made of
garbage
in Rome, Italy.



**YOU'RE
MORE LIKELY
TO BE IN A
BAD MOOD
ON THURSDAYS,
ACCORDING TO
SOME STUDIES.**



The world's
population
grew by
about
3 billion people
between 1975 and 2011.

The largest known
hailstone
in the United States
was about the size of a
soccer ball.



A **river** in
Canada
once turned
red.

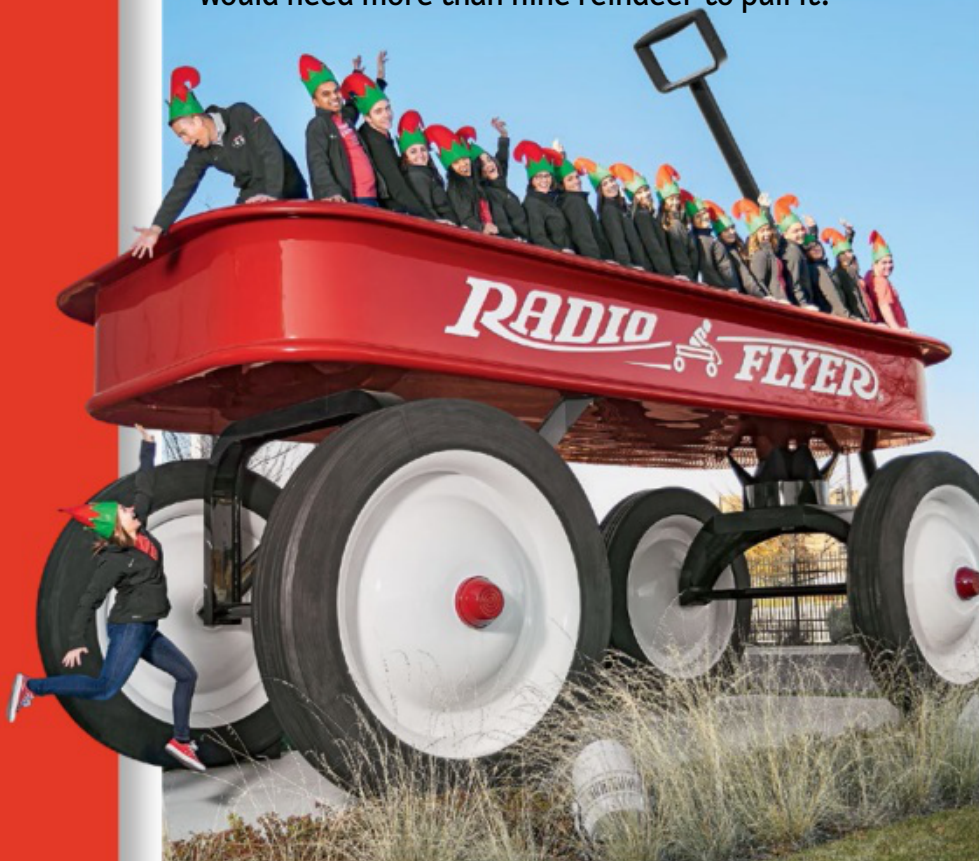
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GUINNESS WORLD RECORDS

BY ALLI DICKEY

GIANT WAGON

Santa would need *a lot* of elves to fill this wagon with presents. At 26 feet long and 11 feet tall, this whopper of a wagon weighs 15,000 pounds—the world's largest toy wagon. (That's about the weight of 15 grand pianos.) It can carry 75 kids—and we're guessing it would need more than nine reindeer to pull it!



VERY IMPORTANT SHEEP

This soldier preferred to graze in the gardens instead of eating in the mess hall. Derby XXX the ram is the highest-ranking sheep ever. In addition to being promoted to a lance corporal in the British Army, Derby XXX served as the official mascot of the force. He was even awarded a service medal for his part in a peacekeeping tour in the Middle East. Derby XXX, we salute you.

COOL CAR FLIP!

THIS IMAGE WAS CREATED USING SIX SEPARATE SHOTS OF THE VEHICLE AT EACH PHASE OF THE 1.5-SECOND-LONG BARREL ROLL.



Buckle up: Stunt driver Terry Grant holds the record for farthest barrel roll in a car, flipping his vehicle 270 degrees off a ramp to land safely 50 feet from where he started. Grant practiced the jaw-dropping trick for six months before performing in front of an audience at a convention center in London, England. That's quite a road show.

ALL ABOUT MONEY

BY KRISTIN BAIRD RATTINI



A machine called a jogger vibrates and blows air to **separate U.S. banknotes** that stick together after printing.

Bricks of **compressed tea leaves** were once used as **currency** in **Siberia, Mongolia, and China.**



In Argentina, **mango** is slang for peso, which is like the U.S. dollar.



One king celebrated a **horse-racing victory** in 356 B.C. by **minting a coin** with an image of his horse and its rider.



Norway **doesn't issue change.** Purchases are **rounded up or down** to the nearest krone (like the U.S. dollar).

The phrase "**bring home the bacon**" started after a **12th-century priest** rewarded a **married couple** with bacon.



The Inca called gold "**the sweat of the sun**" and silver "**the tears of the moon.**"



A nearly 230-year-old penny once sold for **\$1.38 million.**



In 2002, a man **opened a fake bank** and took in **\$650,000** before **he was caught.**



MONEY TIP!

.....
KEEP A MONEY DIARY. WRITING DOWN WHAT YOU SPEND WILL HELP YOU SEE WHAT YOUR SPENDING HABITS ARE—AND SHOW YOU WHERE YOU MIGHT BE ABLE TO SAVE.



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Bet You Didn't Know!

8 facts to light up your world

BY MEG WEAVER

1

A New Year's Eve celebration in Portugal included more than **65,000** fireworks.

2

A Ferris wheel in California runs on **solar power**.

3

The first **lighthouse** was three times **taller** than most of the ones today.

4

Lightning flashes more than **a hundred times each second** all over the world.

6

Some **jellyfish** give off **light** to scare away predators.

5

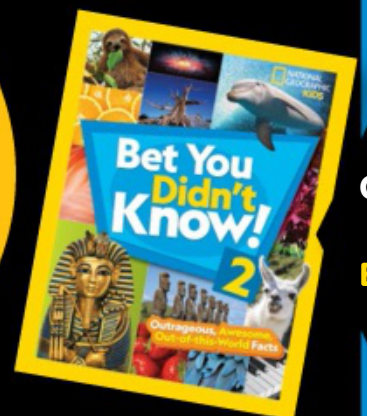
Light from the **sun** reaches Earth in **8.32 minutes**.

7

Antarctica can have **24 hours of daylight** in the summer.

8

Lemons can **power** light bulbs.



CHECK OUT THE BOOK!

BY the NUMBERS

COUNTING SNOWFLAKES

After you've gone sledding, had a snowball fight, and built a snowperson, peel off your mittens and grab these frozen facts about snow.

The U.S. record for most snowfall in 24 hours is

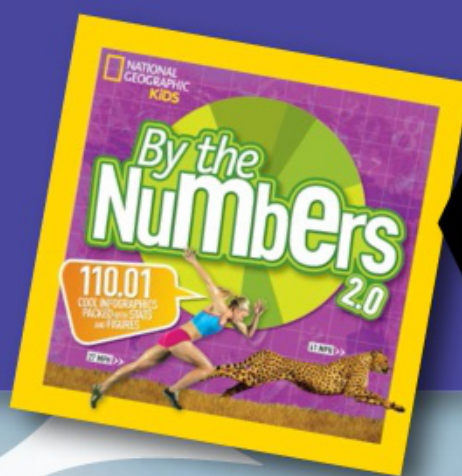
75.8 INCHES.

The blizzard took place in **SILVER LAKE, COLORADO,** in 1921.

The biggest snowflake on record was

15 INCHES WIDE.

BY JEN ADRIAN AND OMAR NOORY



CHECK
OUT THE
BOOK!

More than

1,000,000,000,000,000,000,000,000

snowflakes fall every winter.

What's that
big number? It's

10²⁴

or one **septillion!**

The tallest **SNOWPERSON** ever built was

122 FEET 1 INCH TALL.

It was created in Bethel, Maine, over one month in 2008.

AMAZING ANIMALS

MAKE SURE TO GET MY GOOD SIDE.

Penguins

Snap

"Selfies"

Mac. Robertson Land, Antarctica

Lights, camera, *squawk*-tion!

When a worker left a video camera filming on the ice, two emperor penguins decided it was their turn to be movie stars. One penguin waddled up to the camera and kicked it over so it faced the sky. Then the penguin stared into the lens as another bird shuffled into the frame. The two flaunted their feathers, presented close-ups of their beaks and eyes, then ended with a head-shaking finale.

"Emperor penguins know their colony grounds very well, and they're curious about anything that wasn't there before," says Barbara Wienecke, a senior research scientist with the Australian Antarctic Division. And what was up with the funny shaking? Wienecke says it was probably done to clear salt water out of their nostrils. These penguins definitely weren't camera shy!

—Elizabeth Hilfrank

HEY, YOU'RE IN MY SHOT.

IT IS A SUPERCUTE SELFIE.

GOOD
THING SHE
HAS THICK
SKIN. I LIKE
TO HEAD-
BUTT!

Goat in Charge of Rhino

Dubbo, Australia

Amira the white rhinoceros calf didn't know how to behave. Her mother at the Taronga Western Plains Zoo had gotten sick, and she needed somebody to teach her animal ways. Luckily, Gertie the goat took over. "Gertie was the boss," veterinarian Benn Bryant says. The older of the two, Gertie taught Amira things like "stable" manners and how to graze for hay. Gertie also showed Amira how to play fight by chasing and butting heads. Sometimes Gertie was sneaky: Once she nudged the rhino toward a tree, and when Amira lay down, Gertie climbed on her back to reach leaves to eat.

Eventually Amira joined other white rhinos at the zoo, and Gertie moved to a farm. "Amira became a well-adjusted and happy rhino," Bryant says. He gives Gertie credit for "goating" Amira into becoming a real rhino.

—Aline Alexander Newman

Dog Flies Away

Rochester Hills, Michigan

Tinkerbell the Chihuahua was relaxing with her owners at an outdoor market when a 70-mile-an-hour blast of wind tore through the area. Tables and chairs flew into the air—and so did the six-pound pup. Her frantic owners chased after her, but the wind carried Tinkerbell away like a furry paper airplane.

For two days, owners Lavern and Dorothy Utey searched the area. But the only sign of Tinkerbell was her leash, found about a quarter of a mile away. Desperate, the Uteys wandered along an old trail and called the dog one final time. She came running!

No one is sure how Tinkerbell survived her journey—or her landing. "She was probably only six or eight feet off the ground," meteorologist Dave Rexroth said. "I suspect she was tossed around like a tumbleweed until she got caught in small trees." Her owners, however, didn't care how she managed to survive. "We were just totally tickled to have her back," Lavern Utey said.

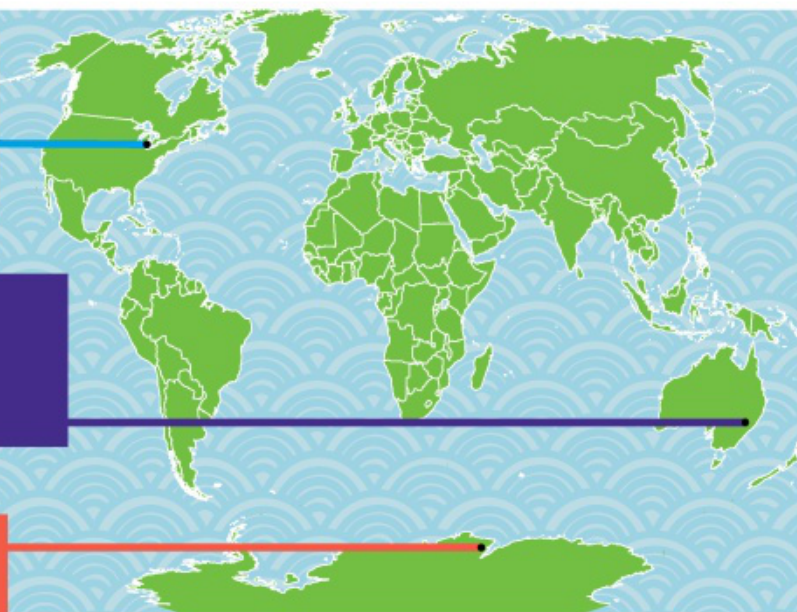
—Kitson Jazynka

I MUST
HAVE A
LITTLE
BIRD DOG
IN ME.

DOG
Rochester Hills,
Michigan

**GOAT AND
RHINO**
Dubbo, Australia

PENGUINS
Mac. Robertson
Land, Antarctica



POLAR BEAR

DAY CARE



Most polar bears give birth to twins.



TWO CUBS PEEK OUT FROM THEIR DEN IN WAPUSK NATIONAL PARK, CANADA.

HOW THESE ADORABLE CUBS LEARN TO LIVE ON THE ICE

BY SCOTT ELDER

Two tiny polar bear cubs poke their heads out of a hole and scan the snowy Arctic landscape. It's quiet except for their little squeals, urging their mom to join them outside the den.

They watch excitedly as the much larger female appears behind them. The mother polar bear stands tall on her hind legs, towering above her twins. She scans the horizon for possible threats. The cubs probably don't understand that the Arctic can be dangerous for them, even though adult polar bears—the largest land carnivores on Earth—have no natural predators. What they *do* know is that their mom's grunt means it's safe to emerge from the family's igloo-like winter den.

After their eyes adjust to the sunlight, the pair clumsily scramble after Mom. Although they're roughly two months old, the cooped-up cubs have never really used their legs before. Soon they're play wrestling like little kids until their mother has had enough, grunting to signal that playtime is over. It's time to find food.



A POLAR BEAR FAMILY
CROSSES THE SNOWY
LANDSCAPE IN
SEARCH OF FOOD.

COPY CUBS

Polar bears almost never stop hunting while the sea is frozen. Between March—when moms and cubs leave their dens—and July, the predators can walk out onto the ice-covered ocean for an all-you-can eat seal buffet. It's not because they're constantly hungry. They need to store up enough fat to survive the summers when the ice melts and hunting becomes difficult.

Polar bear cubs don't just wait around for their lunch though. They learn how to survive in the bitter-cold Arctic by closely watching their mother.

"Polar bear cubs learn by imitating," says Alysa McCall, a staff scientist at Polar Bears International. "While watching Mom hunt, the cubs put their paws in the same position. If she stops, they stop. If she stands, they stand. They mimic her so closely it looks like they're performing a dance routine."

Polar bears grow to 30 times their birth weight by the time they leave the den. (That'd be like you weighing over 200 pounds two months after you were born!)

EAT, NAP, REPEAT

Mimicking their mom is exactly what the two cubs are doing about a week after leaving their den to trek toward the sea ice miles away. Lying flat on their bellies, the twins watch their mother, who watches a hole in the ice. She's waiting for the ringed seal that carved the hole to come up for air.

Ringed seals are polar bears' main prey; the sea mammals' blubbery fat is rich in calories. Meals like this—as well as their mother's milk they'll continue to drink for two years—provide cubs with fuel to grow bigger and stronger.

Splash! The big bear dunks her head into the hole, latches on to the seal with her jaws, and yanks out her 150-pound prey with her hook-like claws. Her observant cubs study their mother's swift technique, then trot over to share the meal with Mom.

Full from their tasty dinner, the cubs are getting drowsy and snuggle up to their mom for a nap. Still small and short-haired, they need their mother's three inches of body fat and two thick layers of fur to shelter them from below-zero temperatures.

Once nap time's over, the twins stand and follow their mother toward an ice ridge. It's time to eat—again.

TWO CUBS
PLAY WRESTLE.



WATCH A VIDEO OF POLAR BEARS
ROLLING AROUND IN THE SNOW!
natgeokids.com/december



Where
polar bears
live (Polar bears
do live in Greenland,
just on its coastline.)

THESE JUVENILE BEARS SEARCH FOR PREY IN THE DISTANCE.



POLAR BEAR CUBS LEARN TO SWIM BY WATCHING MOM.



MOM TO THE RESCUE

The cubs are digging in to a seal when Mom suddenly stiffens. She's caught a whiff of something she doesn't like: a male polar bear approaching the family, likely hoping to steal their seal. That's bad enough, but male polar bears also sometimes kill cubs. Even though the male weighs up to 1,700 pounds (more than twice as much as the mother), she stands tall to protect her cubs. She cries out and puts herself in between the male and her twins. Luckily the male seems more interested in the seal than the tiny bears. The cubs scamper behind Mom as she steers them to safety.

Males aren't the only threat to the cubs. Though polar bears are good long-distance swimmers, young cubs lack enough fatty insulation—called blubber—to protect them from freezing water temperatures. The cubs must navigate around big ice cracks because a slip into the icy ocean could be deadly to the twins.

By June the temperature creeps up, causing ice to break apart more frequently. Now they have to swim from ice floe to ice floe in order to hunt. They've gained enough weight to brave the water but still need their mother's help to learn how.

Jumping in first, their mom coaxes the cubs to take the plunge. They both dive in, one after the other, quickly climbing on their mother's back and clinging to her fur. She propels the family forward to the next ice platform by using her dinner-plate-size front paws like paddles. Once ashore, the babies "towel off." They stretch out on the ground and roll back and forth, rubbing their wet fur on the snow until they're no longer dripping water.

A CUB LEAPS ACROSS MELTING ICE TO KEEP UP WITH MOM IN THE ARCTIC.

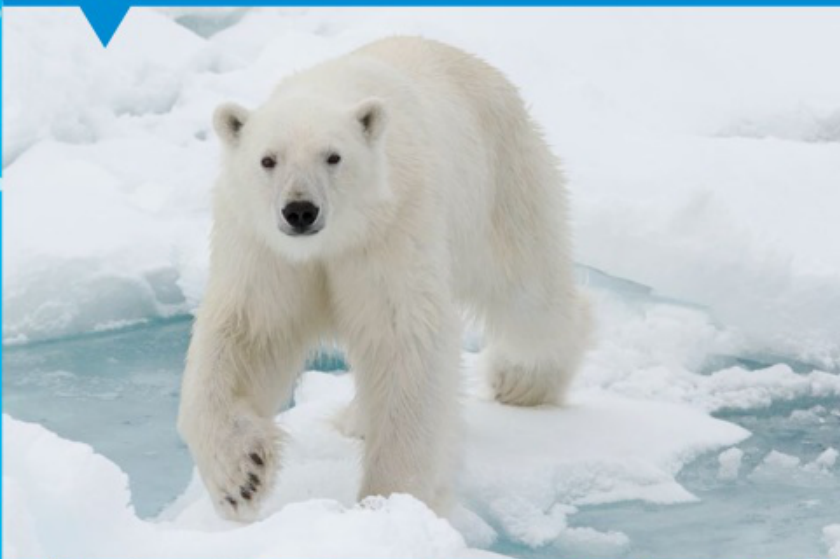


Polar bears have **blubber**, or a layer of fat, to help them keep warm. Go online to learn more—and discover how to **make blubber gloves!** natgeokids.com/december

Polar Bear

vs.

Grizzly Bear



Take a look at how these huge bears stack up to each other.

DISAPPEARING ICE

Because of the warming climate, some polar bear populations are seeing more water and less ice earlier in the year. That means less time to hunt seals—and less time to bulk up for summer. Experts worry that this shortened hunting season will continue to decrease polar bear numbers. “The warming we’re seeing on the planet isn’t good for polar bears or their habitat,” McCall says. “Humans need to make climate change a priority. Our future is the polar bear’s future.”

That’s why researchers are closely watching polar bear families like this one to see how their behavior is affected by the changing climate. For now, the twins will continue to make the sea ice their home. They’ll hunt and feast as they learn the skills they’ll need to survive on their own. After a few years, perhaps *their* cubs will take a peek out of their Arctic den, looking to their mom to teach them how to be a polar bear.



Polar Bear Checkup

HUDSON THE POLAR BEAR IS PREPPED FOR HIS CT SCAN.

A 12-year-old at the doctor’s isn’t that weird. Unless, of course, that 12-year-old is a thousand-pound polar bear.

Hudson the polar bear, a resident of the Brookfield Zoo near Chicago, Illinois, is believed to be the first living adult polar bear to receive a CT scan—sort of like a detailed x-ray. Unlike an x-ray, which looks at bones in the body, a CT scan takes digital images that allow doctors to see inside a body’s tissues and organs. This means vets can find out if something is wrong *before* animal patients show symptoms.

Taking the scan—in which the patient lies on a table enveloped by a circular scanning device—wasn’t the hard part; getting the huge predator to the vet’s office was. First the bear had to be sedated before zoo staffers transported him to the hospital using a bulldozer. Once there, 20 people had to lift and place the bear on the table.

Since global warming is shortening the lives of some polar bears in the wild, the ability to quickly identify health issues in zoo polar bears like Hudson is crucial. Learning as much as we can from captive polar bears can help us understand how to protect them now—and in the future.

Oh, and Hudson’s diagnosis? He’s a healthy polar bear!

VETERINARIANS GOT AN UP-CLOSE LOOK AT THE INSIDE OF HUDSON’S HEAD AND NECK THANKS TO THIS 3D RENDERING OF HIS CT SCAN.



WHERE THEY LIVE

The Arctic region; typically along shores and on sea ice.

THEY’RE HOW BIG?

These bears can weigh up to a whopping 1,700 pounds.

FOODS THEY LOVE

Seals, seals, and more seals. (Also, occasionally, beluga whales and walruses.)

KILLER MOVES

Polar bears can knock their prey unconscious with a single swipe of their paw.

STATUS

Vulnerable; climate change is making it harder for polar bears to hunt successfully.

POLAR BEARS

Woodlands, forests, and alpine meadows of parts of the United States and Canada

Slightly less massive than polar bears, grizzlies can weigh around a thousand pounds.

Mostly fruits, nuts, and roots—but they’ve been known to chow down on large prey such as moose.

Their bite force is strong enough to crush a bowling ball.

Least concern, but grizzlies are threatened by habitat loss due to human encroachment.

GRIZZLY BEARS

Family Reunion

A MOTHER POLAR BEAR MUST FIND HER LOST CUB.

A polar bear mom and her one-year-old cub are crossing an icy cliff near Baffin Island, Canada. The curious youngster wanders off to explore—but panics when it loses sight of its mother and becomes trapped at the bottom of the ice wall. Hearing a radio report of the situation, wildlife photographer Paul Goldstein snowmobiles to the scene to capture the drama from a distance.

1

SEPARATED

“When I got to the scene, I could see only the mother at the top of the ice,” says Goldstein, who’s been photographing animals for almost 30 years. “After a few minutes, I finally located the youngster at the bottom of an 80-foot ice cliff on the opposite side of the ice.” The one-year-old cub, called a yearling, is distressed, and the mom is calling back. “You usually never hear polar bears make this noise unless they’re *really* anxious,” Goldstein says.

2

STUCK ON THE ICE

The cub decides to climb in the direction of its mother’s calls, straight up the ice cliff. “Polar bears have superstrong paws and can grip well,” Goldstein says. “But this cliff was way too steep for the cub to climb.” The youngster successfully scales some large chunks jutting out from the wall but eventually gets stuck when it reaches a section of solid vertical ice.

CUB

3

DARING JUMP

At the cliff, the concerned mother knows her cub is close. “Like any bear, she ‘sees’ with her nose,” Goldstein says. “She’s tracking her baby by its scent.” But she needs to find a safe way down. Spotting a soft, snowy ledge 20 feet below the top of the cliff, the big bear carefully backs out over the edge and slides down with her claws dug in to the cliffside. She lands clumsily but safely on the ledge below.

4

SAFE WITH MOM

The cub has returned to the bottom of the ice cliff, so Mom heads that way from the ledge. Finally the pair spot each other, and the youngster dives head-first down a small slope and nuzzles against its relieved mother. She then leads her yearling to find an easier route up. Safely back at the top, the pair settles in together for a nap, exhausted from their journey.

CHECK OUT MORE PICS OF ANIMALS IN SNOW.
natgeokids.com/december

BRAIN GAMES



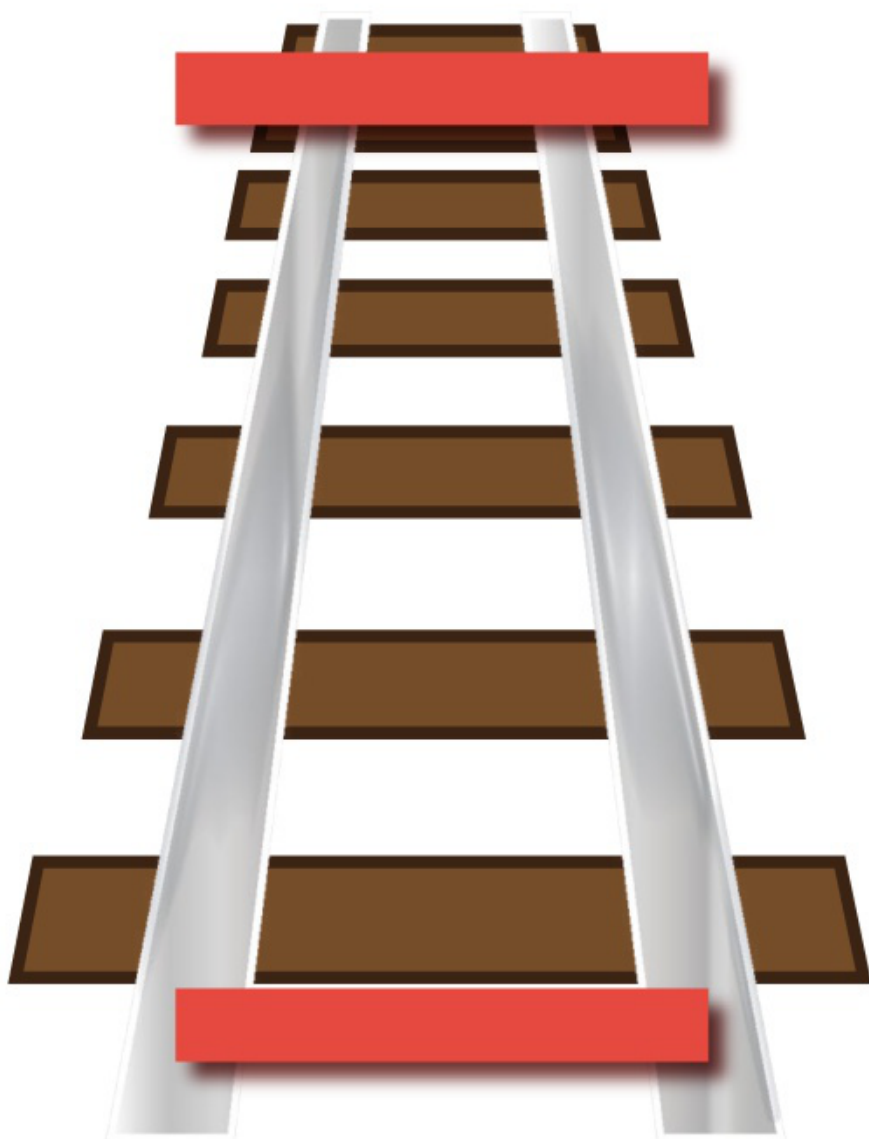
Trick your noodle with these optical illusions.

Your brain is responsible for all your thoughts and actions. But even though it's smarter than the most powerful computer, your thinker can still be fooled. Check out the science behind these tricky brain benders.

TEXT AND PUZZLES BY GARETH MOORE

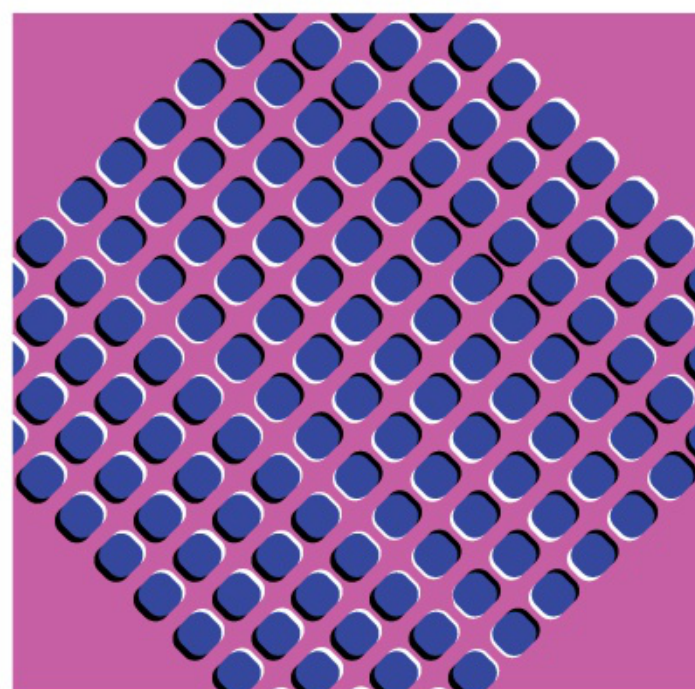
RAIL TRACK ILLUSION

Take a look at these railway tracks. Which of the two red rectangles is larger?



BEHIND THE BRAIN

Both of the red rectangles are actually the same width and height! Your brain “sees” the image as a realistic 3D scene, in which things look smaller as they get farther away. So your brain interprets the flat, 2D upper rectangle as if it’s 3D and compares its size against the smaller tracks—which makes it seem bigger than the bottom rectangle.

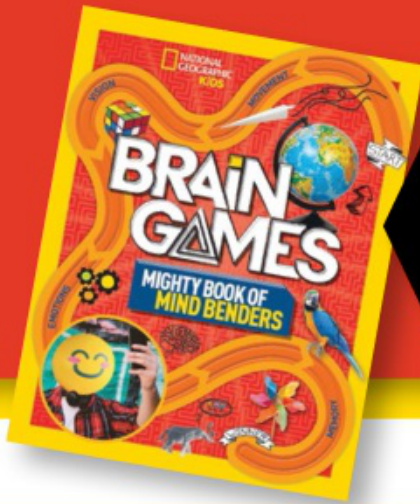


DOING THE WAVE

Slowly move your eyes around this picture. Does it look like the diagonal rows of shapes are gently swaying back and forth?

BEHIND THE BRAIN

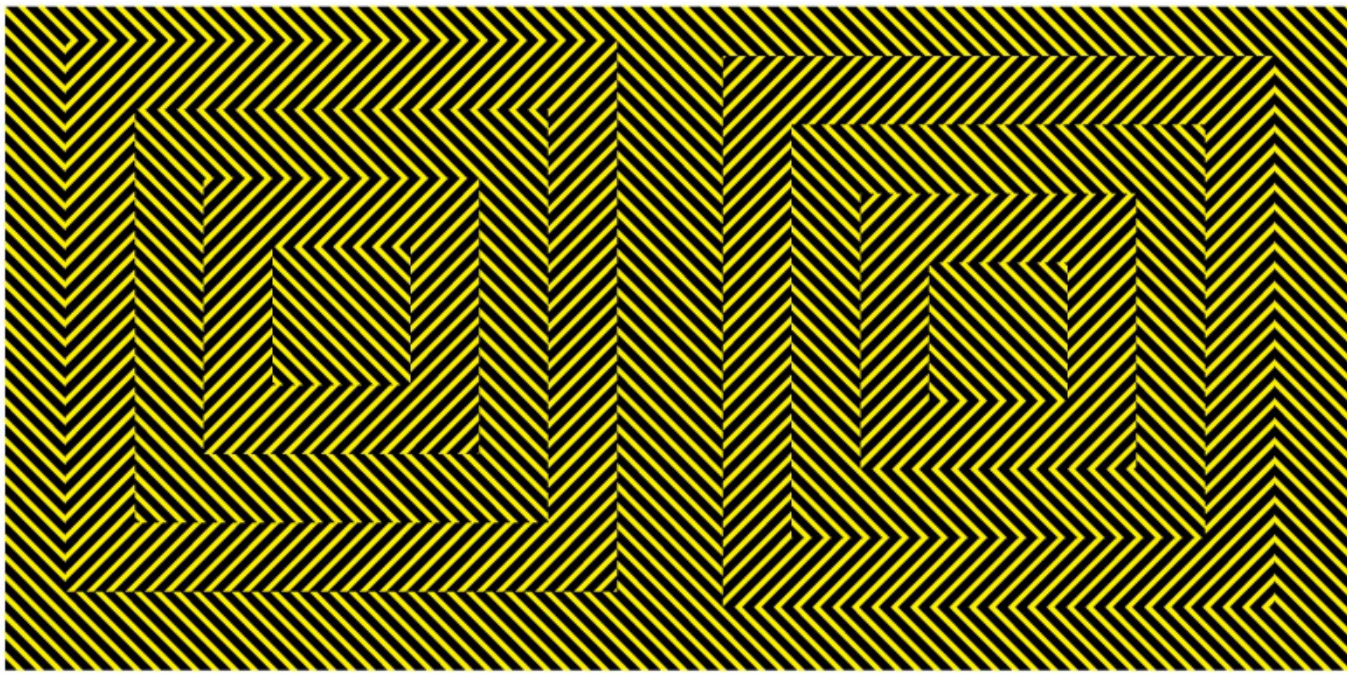
Your eye interprets the white and black edges on the sides of the blue shapes as light and shadow. But because they change from row to row, your brain is always reinterpreting where it thinks the shapes should be. The result? A strange, swaying motion as your brain mentally moves the shapes to where it thinks they should be placed.



GET MORE MIND-BLOWING FUN BY WATCHING THE NAT GEO KIDS VIDEO SERIES **BRAIN GAMES**, OR CHECK OUT THE BOOK. natgeokids.com/december

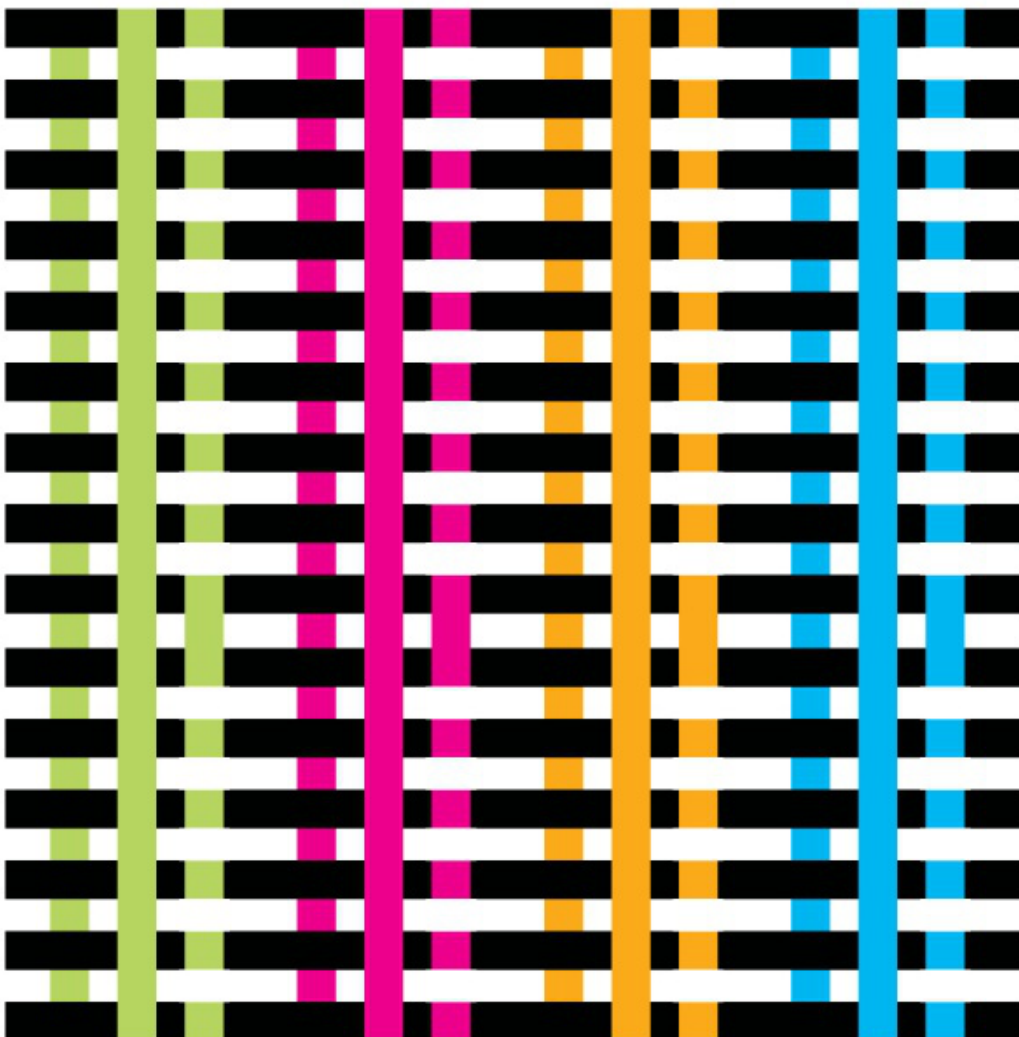
YELLOW ALERT

Move your eyes around this image to make it shimmer (just not for too long—your eyes might get tired!).



BEHIND THE BRAIN

This crazy effect happens because your eyes don't have a strong image to latch on to. The narrow, heavily contrasting lines confuse the way your eyes see the bright and dark areas. That's why your brain struggles to understand the scene—and why you see a flickering, shimmering picture.



THREE IN ONE

Check out this picture. Do you see three different shades of green, pink, orange, and blue?

BEHIND THE BRAIN

Amazingly, there's only one shade of each color! The way your brain "sees" color is influenced by other colors nearby, so the overlapping black and white bars are changing how you see the other colors. For instance, look at the three green stripes. Your brain thinks the area where the white bars cross over the right-side stripe is brightly lit, so that stripe appears brighter. When the black bars cross over the left-side stripe, your brain thinks that section—and therefore that stripe—is darker.

10 COOL

INVENTIONS

**SUPERSMART
GADGETS,
ACCESSORIES,
AND VEHICLES
THAT COULD
CHANGE
YOUR LIFE**



1

BIKE TAKES FLIGHT

The Speeder has a seat and handlebars just like a motorcycle, but this contraption travels to a place you could never reach on a regular bike—the sky! Just press a button to take off. Four **turbojet engines** on the bike's front and back launch it off the ground. Steer the handlebars to move the craft **through the air**. Weighing about 230 pounds, the bike won't require a pilot's license to fly. Although still being tested, the Speeder is expected to reach speeds of **60 miles an hour** and **climb up to 15,000 feet**. Talk about getting a lift!



2 DOG WATER FOUNTAIN

Your dog can sit, fetch, and play dead, but can it **drink from a water fountain**? That trick is simple for your pet with the **Pawcet**, which lets thirsty dogs get a fresh drink whenever they want with **the touch of a paw**. Just hook up the Pawcet to your garden hose, and all your pup has to do is **step on the platform** to drink. Now that's something that'll really get your dog's tail wagging.



INVISIBLE SHIELD

4 AIR UMBRELLA

Here's a way to *really* make the rain go away: **Blast it off of you!** Instead of simply shielding you from the weather like your basic umbrella does, this gadget doesn't even let the raindrops come close. A **powerful blast of air** shoots up through the umbrella and above you, creating a force field that acts like an **invisible shield** to keep you **totally dry**. The battery-operated umbrella is standard size and will easily slip into your backpack. So you can, you know, **save it for a rainy day**.



3

FLOATING POOL

The rivers surrounding New York City may not be the most **ideal place to swim**, but a group of designers is hoping to change that. Their plan? To build a pool in the city's **East River** that will serve as a **giant filter** for the surrounding river water. The pool's filters will remove **bacteria** and **contaminants**, leaving nothing but clean, chemical-free **H₂O** in the pool—and will pump over 500,000 gallons of clean water back into the river every day. The **Olympic-size pool**, designed to comfortably fit nearly 500 people, will make for a lot of happy (and healthy) New Yorkers on a **hot summer day**.



POOL



CHECK OUT THE BOOK!

Get the scoop on more cool gadgets in the video series *How Things Work*.
natgeokids.com/december



5

JET-POWERED SURFBOARD

Surf's up! But the big waves are crashing so far away from the shore. No need to exhaust yourself paddling to them—just hop on a **WaveJet**, a **jet-propelled surfboard**, to reach the swells without breaking a sweat. Powered by a pair of **battery-operated engines** at the base of the board, simply hit a switch on a **wristband** to pick up your speed to **10 miles an hour**, about five times the average person's paddling speed. Not a surfer? The removable engine pod can be attached to **stand-up paddleboards**, **boogie boards**, and **kayaks**, so you'll get a boost however you hit the water.

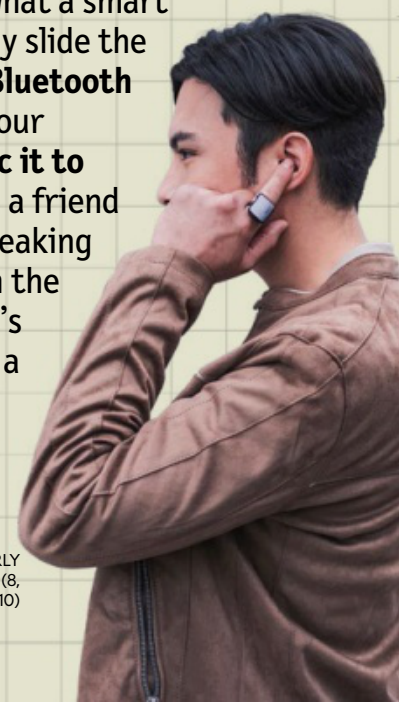
6 IN-EAR TRANSLATOR

So you're visiting Paris, **but you don't speak French**. No problem! Just pop in the **Pilot earpiece** and use the app to **understand every word another user says to you**. The earbud device **translates foreign languages** like Spanish and Italian in real time. Simply select which language you want from an **app on your phone**, then let the Pilot do the translation. **Voilà!**



7 SMART RING

When the lights are too low for you to read on your couch, just tap your thumb to your ring finger three times. And while you're at it, **make a call** too—all without ever touching your phone. That's what a smart ring called **ORII** can do. Simply slide the ring onto your finger, and a **Bluetooth chip** in the ring will control your smart devices wirelessly. **Sync it to your smart gadget**, then call a friend or **shoot off a text** just by speaking into a pair of microphones on the inside of the device. This ring's not quite the same as having a personal assistant—but it's the **next best thing**.



WHAT IS AVAXHOME?

AVAXHOME-

the biggest Internet portal,
providing you various content:
brand new books, trending movies,
fresh magazines, hot games,
recent software, latest music releases.

Unlimited satisfaction one low price

Cheap constant access to piping hot media

Protect your downloadings from Big brother

Safer, than torrent-trackers

18 years of seamless operation and our users' satisfaction

All languages

Brand new content

One site



AVXLIVE • ICU

AvaxHome - Your End Place

We have everything for all of your needs. Just open <https://avxlive.icu>

8

BENDY BIKE

Here's one way to confuse a bike thief: Wrap your bike around a pole! Bendy bikes let you do just that, thanks to a frame that's **flexible enough to wrap around lampposts and street signs**. Hoping to decrease the number of bikes stolen each year, a design student came up with this **clever cycle** that looks like a regular bike when you're riding it. Once you're ready to lock it up, however, loosen a cable below the seat to **split the bike into two segments**. Then **bend the frame** up to 180 degrees. Next, secure it to a pole with a regular bike lock, leaving would-be thieves **scratching their heads**.



BENDY BIKES LOOK LIKE REGULAR BIKES WHEN YOU RIDE THEM...



... BUT ARE FLEXIBLE ENOUGH TO WRAP AROUND A POLE WHEN YOU'RE READY TO HOP OFF!

9

BIRD PHOTO BOOTH

Snap pictures of hungry **swallows** or **chickadees** with the **Bird Photo Booth**. Simply pop your phone in the hidden enclosure in this **bird feeder**, then sneak into your house and **watch the birds chow down** in real time from a live feed on your computer or tablet. See the perfect shot? Click away as you get the **ultimate up-close pics** of your **backyard birds**. But these aren't ordinary snaps: The Bird Photo Booth's **high-quality lens** lets your phone take images that'll rival those of a real-life wildlife photographer. Say **"tweet!"**



WESTERN SCRUB-JAY

10 SOLAR-POWERED TENT

Normally you'd be out of luck if your smart-phone battery drained while you were camping—but this time you're sleeping in a **Bang Bang solar-powered tent**. The brightly colored four-person tent comes with a **solar panel** that soaks up sunlight all day. This creates enough energy to charge a lithium battery bank inside the tent. All you have to do is **connect your gadget** to the battery bank and charge away. Now you'll always have plenty of juice in your phone to have that **dance party under the stars**.



ROCK 'EM SOCK 'EM SHRIMP

**THESE TINY CRUSTACEANS
WILL KNOCK YOU OUT.**

BY ALLYSON SHAW

Burrowing under the sand near coral reefs lives a pint-size punk. Sure, this crustacean has a colorful shell and adorable eyes—but don't let that fool you. Although the peacock mantis shrimp is only between one and seven inches long, it's a fearsome ocean predator. Dig deeper to discover some stunning facts about this tiny toughie.



Where peacock
mantis shrimp live



EYES

LIMB

EGGS

MORE EGGS!

MEGA MOM

You might not expect a crustacean to be a protective parent, but don't mess with peacock mantis shrimp moms. They secrete a glue-like substance that binds together **thousands of eggs**, which they carry everywhere. For about 40 days these moms do nothing but remove debris and fan oxygen-rich water over the eggs with their gills. During that time, the new moms **never leave their burrows**—not even to eat.

EYE SPY

Sitting atop two stalks that can move in all directions are some totally tough eyes: They have many **more color receptors** than any animal, including humans. The extra receptors give peacock mantis shrimps the power to see a type of light that's invisible to all other animals. This circular polarized light allows them to **send secret messages** to each other. The shells of males and females reflect this light in different patterns, which might help them find a mate or avoid a fight with another mantis shrimp.

A male's shell is more colorful than a female's.

BRAINIAC ATTACK

One reason peacock mantis shrimps are so tough is their braininess: They have to be smart about how—and when—they wield their weapons. "They can remember another mantis shrimp they've fought before, and whether they **won or lost**," says Roy Caldwell, a biologist and professor at the University of California in Berkeley. And when they're going after a tricky meal, peacock mantis shrimps go in with a game plan. "If they're dealing with a crab, they'll first knock off the deadly claws, then the legs, *then* use their own limbs to hold the crab in just the right place for a **shell-shattering punch**," Caldwell says.

These invertebrates dig U-shaped burrows to live in.

SPEED DEMON

Don't blink around peacock mantis shrimps: They strike so quickly that they could knock out **50 punches** in the time it takes you to bat your eye. This mighty move is why tiny often means trouble—for prey, that is. The mantis shrimp's punching limbs quickly strike the animal's shell to form a bubble of vapor. Less than a nanosecond later, the bubble collapses. If the prey hasn't escaped yet, watch out. The water briefly heats up to **8500°F**, and a wave of energy thumps the victim like a **tiny implosion**.



SEA SNAIL

PUNCH!

PERFECT PUNCH

Peacock mantis shrimps have to punch for their lunch. That's because many of their favorite snacks—like crabs, clams, and sea snails—are protected by superhard shells. Good thing the shrimps have **two hinged, hammer-like limbs** that can thwap their targets with a force that's over 2,500 times stronger than their body weight. (That'd be like you punching through a steel wall!) These animals also use their powerful punchers to defend their territory against other peacock mantis shrimps. In fact, they're so brawny that they've been known to **shatter aquarium tanks' glass**.

Peacock mantis shrimps are named after colorful peacocks and the similar way that praying mantises fold their limbs.



EYES

FEEDING LIMBS

PUNCHING LIMBS

SWIMMING LIMBS

WALKING LIMBS

KAPOW! Watch a video of a peacock mantis shrimp in action. natgeokids.com/december

WESTEND61 / GETTY IMAGES (BIG IMAGE); RODGER KLEIN / GETTY IMAGES (EGGS); ROY L. CALDWELL (PUNCHING); HELMUT CORNELL / ALAMY (FULL BODY); MARTIN WALZ (MAP)



1

The Norse goddess of winter, **Skadi**, is one of the inspirations for the character of **Elsa** in the movies **Frozen** and **Frozen 2**.

4

Asgard could only be reached by crossing a **rainbow bridge** known as **Bifrost**.

6

Three sisters called the **Norns** decided the date of every being's death—including the gods.

2



Vikings believed that the universe was **9 overlapping worlds**. The gods lived in **Asgard**, and humans lived in **Midgard**.

3

Balder, god of goodness, beauty, and light, could only be harmed by **mistletoe**.

5

Trolls appear frequently in **Norse mythology**—they make appearances in the **Frozen films** too.

8

The **lindwurm** was a dragon-like creature in Norse mythology.



THINGS ABOUT

30 COOL



10

Vikings gave kittens to new brides since cats were associated with **Freya**, the goddess of love and marriage.



11

The **king of Asgard**, **Odin** was the god of war, wisdom, healing, royalty, poetry, the alphabet, and more.



9

Carrying a **magic hammer** called **Mjölner** (pronounced MUH-yol-nir), **Thor** is the god of strength and weather.

14

Vikings explained earthquakes with a story about a **giant snake dripping venom** onto a god, which caused him to shake so badly that the entire universe moved.



15

The names of **Thor's sons**—**Modi** and **Magni**—mean "courage" and "mighty."



12

Ravens **Hugin** and **Munin** told the gods what was happening in the different worlds.



13

A **murderous Norse god** once spoiled a party thrown by 12 other gods, making **13** an unlucky number.



16

A squirrel named **Ratatoskr** carried messages between the **9 Norse worlds**, which were **connected** by an ash tree.



17

Idun, goddess of **spring**, handed out **magical apples** to the other gods to **give** them **eternal youth**.



18

To honor **Odin** and his magical spear, Vikings opened battle by **throwing their own spears over their enemy**.



19

Aegir, **god of the oceans and sea creatures**, threw crazy parties.

20

Norse gods **were not immortal**, and many **died in battle**.

21

Trickster god Loki changed form simply to **cause trouble**—he's turned into a **salmon**, a **fly**, and an **elderly woman**.



22

Most modern stories show **Thor** with **blond hair**, but **Vikings** described him as a **redhead**.



23

Jörmungandr (pronounced YOR-mun-gand) the **sea serpent** was called the **world serpent**

because he **grew so big** that he could **wrap his entire body** around the **world of Midgard**.



24

In **Norse mythology**, gods and goddesses usually belonged to either the **Aesir tribe (the sky gods)** or the **Vanir tribe (the earth gods)**.



25

One-eyed Odin traded his **other peeper** for a drink from the **well of wisdom**.

Norse MYTHOLOGY



Living between A.D. 750 and 1050 in Scandinavia (modern-day Denmark, Sweden, and Norway), Vikings worshipped Norse gods and goddesses. Check out the mythology these fierce warriors believed in.

BY KAY BOATNER



26

Female warriors called **Valkyries** took **brave fallen soldiers** to a majestic hall in Asgard called **Valhalla**.

27

Hundreds of different **giants and giantesses** have been featured in Norse mythology—**Skrymir** is the **largest and strongest** of them all.

30

Thor drove a chariot pulled by **2 goats**.



28

Arendelle, the kingdom in which the film *Frozen 2* is set, translates to "**Eagle Valley**" in the **Old Norse language**.



29

The Vikings **performed daily rituals** to **please the Norse gods** in hopes that they'd bless them with **good crops and smooth sailing**.



GET MORE MOVIE SCOOP!
Go online to watch a trailer and check out photos from *Frozen 2*.
natgeokids.com/december

VADIM SADOVSKI / SHUTTERSTOCK (16, SCROLL); ERIC ISSELEE / SHUTTERSTOCK (16, SQUIRREL; 30, GOATS); TIM UR / SHUTTERSTOCK (17); MYKHAILO SKOP / SHUTTERSTOCK (18); LILIGRAPHIE / SHUTTERSTOCK (19); © AVENGERS / REAL JOSS WHEDON TOM HIDDLESTON THE WALT DISNEY CO. FRANCE / MARVEL / COLLECTION CHRISTOPHEL / ALAMY (21); PEERAWIT / SHUTTERSTOCK (22, FRAME); TOP VECTOR STUDIO / SHUTTERSTOCK (23); SOMCHAI SOM / SHUTTERSTOCK (24); CORNELIUS20 / DREAMSTIME (25); AF ARCHIVE / ALAMY (28); ELENARTS / GETTY IMAGES (29)

FUN STUFF

GAMES, LAUGHS, AND LOTS TO DO!

Mitten Mix-Up



This park is full of wintry fun. But some people—and some snow people—are wearing the wrong mittens. Find and circle the 10 matching pairs in this scene. (The white gloves don't count.) **ANSWERS ON PAGE 33**

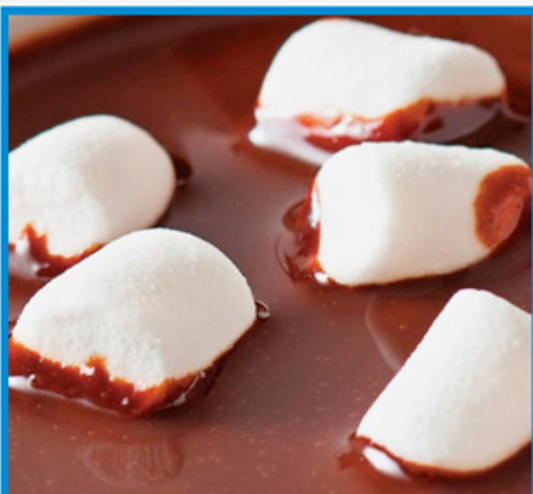
WHAT IN THE WORLD?

CHILL OUT

These photographs show close-up and faraway views of things you might see in cold weather. Unscramble the letters to identify what's in each picture. Freezing up?

ANSWERS ON PAGE 33

CHECK OUT
THE BOOK!



THO OCELAHTOC



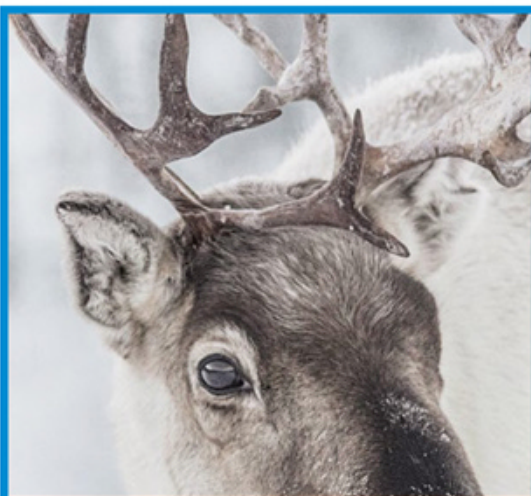
OLIOG



AROLP ERBA WAP



ESDL



ENEDIRER



NAWEOBRSDORD



OSVGEL



TRFOS



CEI-ERTSKSA

TOP ROW (LEFT TO RIGHT): OLGA MILTSOVA / SHUTTERSTOCK; MICHEL CECCONI / SHUTTERSTOCK; HEATHER M. DAVIDSON / SHUTTERSTOCK.
MIDDLE ROW (LEFT TO RIGHT): HOMEART / SHUTTERSTOCK; CENORMAN / DREAMTIME; DENNIS VAN DE WATER / SHUTTERSTOCK.
BOTTOM ROW (LEFT TO RIGHT): PHOTOS.COM / JUPITERIMAGES; COMSTOCK / GETTY IMAGES; VINCENT LAFORET / THE NEW YORK TIMES / REDUX.

FUNNY FILL-IN

ALL ABOARD

Ask a friend to give you words to fill in the blanks in this story without showing it to him or her. Then read out loud for a laugh.

BY MARGARET J. KRAUSS

PLAY MORE FUNNY FILL-IN!

natgeokids.com/ffi



_____ and I have a winter tradition. Every year we put on all the sweaters we can find, pack
 _____ **friend's name**
 sandwiches and a thermos of _____, and go hiking in the mountains. All that changed when my family
 _____ **liquid**
 moved to _____, where it's always _____°F! But we had to follow our
 _____ **warm place** _____ **large number**
 tradition. So this year we put on our _____, packed _____ soup, and rented
 _____ **type of warm clothing, plural** _____ **something gross**
 a(n) _____. We _____ up a tall _____ until we could see all the way to
 _____ **type of transportation** _____ **past-tense verb** _____ **noun**
 _____. We _____ our _____ onto our _____
 _____ **faraway city** _____ **past-tense verb** _____ **type of athletic equipment, plural** _____ **body part, plural**
 and, with a(n) _____, pushed ourselves down. We were moving faster than a(n) _____,
 _____ **sound** _____ **animal**
 and _____ were _____ our faces. "_____!" we yelled.
 _____ **something small, plural** _____ **verb ending in -ing** _____ **exclamation**
 It was a total blast until we realized our ride was right where we left it—way up at the top.



EXPLORER ACADEMY

In the new book *Explorer Academy: The Double Helix*, 12-year-old Cruz Coronado breaks secret codes in order to fight dangerous villains and solve mysteries. Test your own skills by cracking the code on this page, then check out more about the book at ExplorerAcademy.com.

TEXT AND PUZZLE BY GARETH MOORE

THE CODE: POLYBIUS SQUARE

This cipher puts the alphabet on a square-shaped grid and turns each letter into a number. Check out the Polybius square on the right. The row number to the left of the letter is the first digit, and the column number above the letter is the second digit.

So you write **C R U Z**
like this: **13 42 45 55**

The table has only 25 spaces, so the letters *i* and *j* share a square. When you're decoding a message with the number 24, use your judgment to decide if the letter should be an *i* or a *j* based on the rest of the word.

	1	2	3	4	5
1	A	B	C	D	E
2	F	G	H	I/J	K
3	L	M	N	O	P
4	Q	R	S	T	U
5	V	W	X	Y	Z

CRACK THIS CODE!

Using the Polybius square, decode the message below.

ANSWER ON PAGE 33

21 24 33 14
44 23 15
13 24 35 23 15 42

This cipher is named after the ancient Greek historian Polybius (puh-LIH-bee-uhs), who is thought to be the first person to use this system.

BREAK MORE CODES!
ExplorerAcademy.com



CHECK
OUT
THE
BOOK!

ARTZONE

WEIRD ALIENS

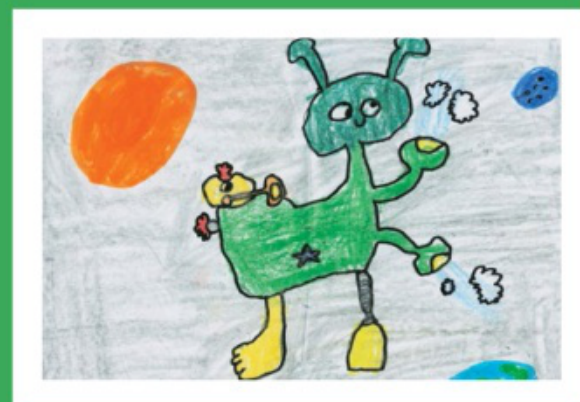
These drawings by *Nat Geo Kids* readers are out of this world!



▲ **Aqua-rex**
Jackson M., 12
New York,
New York



Greetings ▶
Morganne D., 11
Hampton,
New Hampshire



Alien Friends ▶
Lucy M., 12
Green Bay,
Wisconsin



What Is That? ▶
Keira C., 12
Good Hope,
Georgia

**My Martian
Kitty** ▶
Cailyn C., 8
Madison,
New Jersey



Draw a spooky jack-o'-lantern.

Send us your original drawings:

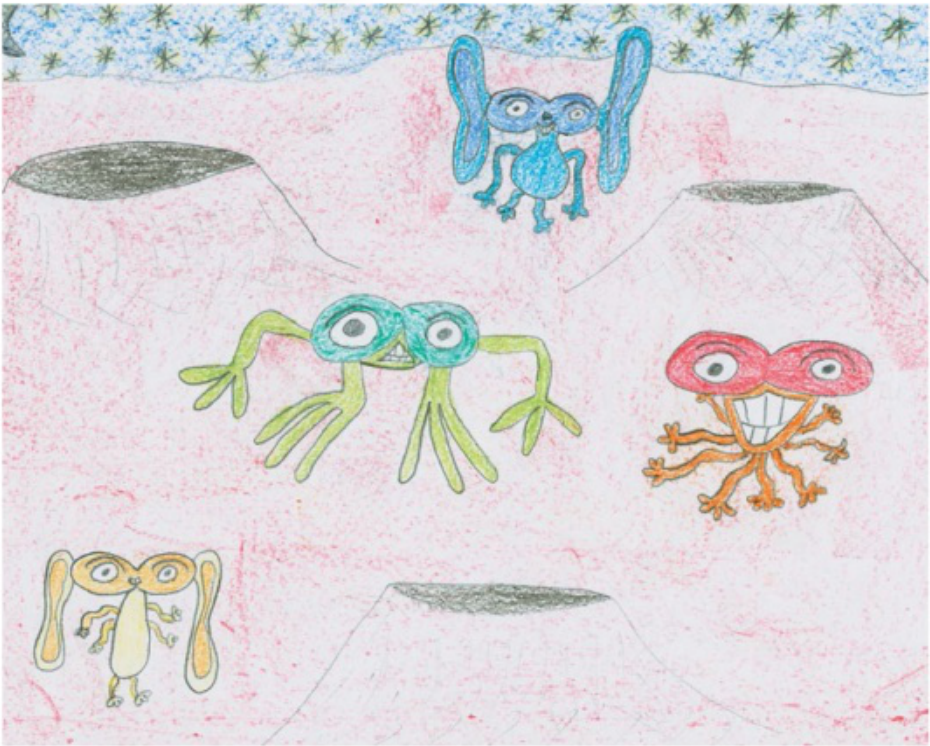
Nat Geo Kids—
Spooky Art Zone
P.O. Box 98002
Washington, DC
20090-8002

Include your name, address, phone number, date of birth, a title for your drawing, a statement that it is your own work, and the name of your parent or guardian. Your parent or guardian must sign a release for publication if your illustration is selected. Submissions become the property of National Geographic Partners, and all rights thereto are transferred to National Geographic Partners. Submissions cannot be acknowledged or returned. Selection will be at the discretion of Nat Geo Kids.

Alien in a Spaceship
Graham M., 6
Germantown,
Tennessee



Proud to be Weird
Naia T., 12
Cambridge,
Massachusetts



Jeremy the Alien
Carter T., 13
Fayetteville,
Arkansas



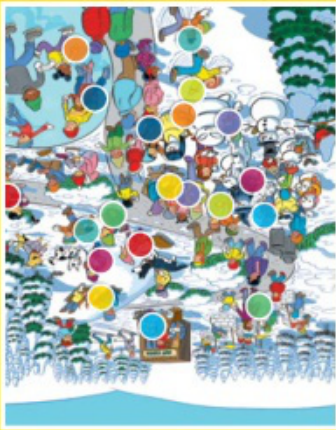
Mars Aliens
Sami M., 12
Mineral Wells,
West Virginia



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HEADQUARTERS OF PUBLISHER AND PUBLICATION:
1145 Seventeenth Street N.W., Washington, DC 20036
STOCKHOLDERS; BONDHOLDERS; MORTGAGE;
OTHER SECURITY HOLDERS: National Geographic Society
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3. Non USPS Distributed	66,678	64,985
4. Other Classes Mailed Through USPS	-	-
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K. PERCENT PAID	99%	99%

“Explorer Academy”
(page 31): Find the cipher.
row: gloves, frost, ice-skaters.
sled, reindeer, snowboarder. Bottom
igloo, polar bear paw. Middle row:
(page 29): Top row: hot chocolate,
“What in the World?”



“Mitten Mix-Up”
(page 28):

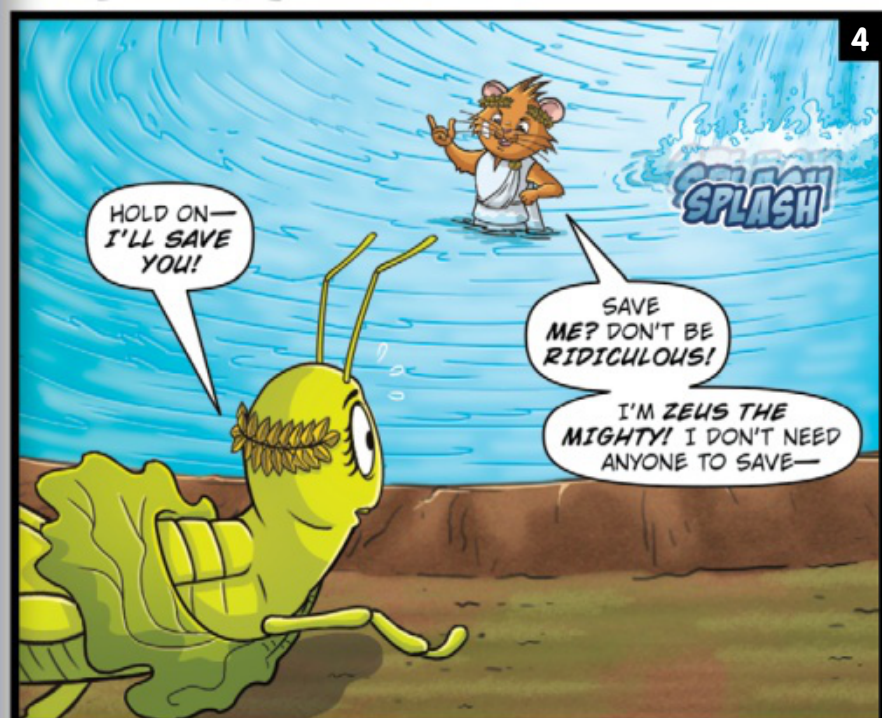
Answers

ZEUS

THE MIGHTY

Zeus the hamster lives with his friends at a pet rescue center. But he thinks he's a Greek god! Check out what happens when his two worlds collide, then go online to learn more about the book *Zeus the Mighty: The Quest for the Golden Fleas*.

ZeusTheMighty.com



STRIKA ENTERTAINMENT

CHECK OUT THE BOOK!

kids vs. PLASTIC

Part of the PLANET OR PLASTIC? initiative

MAKE THIS **HOMEMADE COOKIE MIX**
TO AVOID THAT **STORE-BOUGHT GIFTS**

BY ELLA SCHWARTZ

COOKIE GOODNESS IN A JAR

Help keep the Earth healthy by ditching single-use plastic items. This month, make gifts to share with your friends, family, and teachers instead of buying something from the store, which might come wrapped in plastic.

MATERIALS

- Medium-size mixing bowl
- Spoon
- 1³/₄ cups flour
- 3/4 teaspoon baking soda
- 3/4 teaspoon salt
- 1-quart glass jar with lid
- 3/4 cup brown sugar
- 1/2 cup white sugar
- 1 1/2 cups chocolate chips
- Paper (either printer paper or heavy cardstock)
- Colored construction paper (optional)
- Hole puncher
- Ribbon or string

PLANET PROTECTOR TIP

Fill a reusable bag with chocolate chips from the bulk section of your grocery store.

STEPS



1

In the mixing bowl, combine flour, baking soda, and salt.



2

Put the mixture into the glass jar and gently shake the jar to even it out.



3

Pour a layer of brown sugar on top of the flour mixture.



4

Use the spoon to press the brown sugar into an even layer.



5

Add the white sugar to the mason jar. Pat the sugar down with the spoon.



6

Place the chocolate chips on top of the white sugar layer. Then seal the jar with the lid.

7

Cut out the recipe card below, write it out on a piece of paper, or go online to print out the card. Use a hole puncher to attach the recipe to the jar with ribbon or string.



HOMEMADE

cookies

1. Grab a parent and preheat the oven to 375°F.
2. In a mixing bowl combine 3/4 cup softened butter, 1 egg, and 1 teaspoon vanilla extract.
3. Add the mix from this jar and stir until combined.
4. Scoop out tablespoon-size balls of dough and drop them on a nonstick cookie sheet.
5. Bake for 10 minutes, then let cool. **Enjoy!**

Go online to print the recipe card.
natgeokids.com/KidsVsPlastic

GET MORE PLASTIC-FREE GIFT IDEAS!
natgeokids.com/KidsVsPlastic

**Awesome
Animals!**

 **NATIONAL
GEOGRAPHIC
KIDS**



SPOTTED HYENA

SPOTTED HYENA

A Hyenas have a “nervous” laugh.

TRUE. Their laugh communicates submission.

B Hyenas usually eat what other animals have killed.

FALSE. They catch most of their meals themselves, though they do steal from other predators once in a while.

C The sign outside a hyena’s den would say “No adults allowed.”

TRUE. Cubs hide in dens dug by warthogs and other animals—and taken over by hyenas. Adults are too big to fit inside.

D Male and female hyenas are equals.

FALSE. Even the weakest female is higher ranking than the toughest male.

E A hyena could hear someone making popcorn miles away.

TRUE. A hyena can hear another predator catching and eating prey more than six miles away. That’s a distance of more than a hundred football fields.

SUZI ESZTERHAS / MINDEN PICTURES



**NATIONAL
GEOGRAPHIC
KIDS**



STRAWBERRY POISON DART FROG

STRAWBERRY POISON DART FROG

A This frog is named for the fact that it loves to eat strawberries.

FALSE. It was named for the variety that has a bright strawberry-red body. This frog comes in many varieties and colors, including green with black spots.

B Their motto could be “Don’t touch him with a 10-foot pole.”

TRUE. Males protect territories, staying about 10 feet apart.

C These frogs have been accused of having bad taste.

TRUE. Strawberry poison dart frogs secrete a bitter-tasting toxin, or poison.

D The plants they eat are the source of strawberry poison dart frogs’ toxin.

FALSE. Poison dart frogs get their deadly coating from toxins in the ants they eat.

E Poison dart frogs play darts.

FALSE. But humans learned to use some poison dart frogs’ toxin on the tips of darts for hunting.

MARK MOFFET / MINDEN PICTURES



**NATIONAL
GEOGRAPHIC
KIDS**



EURASIAN LYNX

EURASIAN LYNX

A Eurasian lynx all look alike.

FALSE. Their coats can vary a great deal from cat to cat. Some are striped, others are spotted, and some don't have any pattern. Color varies too.

B The lynx's fine, thin fur means it's too cool of a cat to survive in snow.

FALSE. Its thick fur keeps it toasty warm and makes it perfectly adapted to live in Siberia and other northern, cold habitats.

C This 40-pound cat eats only 20-pound prey.

FALSE. The Eurasian lynx can hunt large hoofed animals that are three to four times its own size.

D There is no link between the Canada lynx and the Eurasian lynx.

False. They're closely related, but live in separate parts of the world.

E Lynx have very short tails.

TRUE. Their tails are less than six inches long.

KONRAD WOTHE / MINDEN PICTURES



NATIONAL
GEOGRAPHIC
KIDS



BORNEAN ORANGUTAN

**Awesome
Animals!**

BORNEAN ORANGUTAN

A

You would win an arm wrestling match with an orangutan.

FALSE. They're eight times stronger than an average man.

B

Tree shaking and loud cries are invitations to play.

FALSE. It's how males warn rivals away from food or territories.

C

Orangutans eat on the run.

FALSE. They spend two to three hours a day chowing down.

D

If you're invited to help make an orangutan's bed, think twice.

TRUE. Orangutans build a new leaf nest every night—up to a hundred feet high in a tree. That's 10 stories up.

E

Most oranges are tall enough to get on the fastest rides at an amusement park.

False. Males are only about 38 inches tall, while females are about 32 inches. They miss the height requirement for many rides by a foot or more.

JEAN PAUL FERRERO / ARDEA LONDON LTD.



**NATIONAL
GEOGRAPHIC
KIDS**



RAINBOW LORIKEETS

RAINBOW LORIKEETS

A Rainbow lorikeets live in South America.

FALSE. Lorikeets are found in the rainforests, coastal bush, and woodlands of Australia and northwest Tasmania.

B If you're packing a picnic for a lorikeet, a juice box is perfect.

TRUE. They dine on nectar, pollen, fruits, and berries.

C Other animals love having lorikeets for dinner.

TRUE. Their predators include birds, such as falcons and kites, as well as snakes.

D A lorikeet has a "hairy" tongue.

TRUE. The brushlike tongue soaks up nectar.

E This bird is as long as 10 collector's cards end-to-end.

FALSE. A rainbow lorikeet is about the length of three collector's cards—and a lot noisier.

WILLIAM OSBORN / NATURE PICTURE LIBRARY



**NATIONAL
GEOGRAPHIC
KIDS**

CLOWNFISH

CLOWNFISH

A Clownfish live among the tentacles of poisonous anemones.

TRUE. A slimy substance on the fish protects them from the stinging tentacles of anemones—another kind of sea creature.

B The clownfish is as long as your computer's space bar.

FALSE. It's about three inches long—about as long as four computer letter keys side-by-side.

C All clownfish are male when they hatch.

TRUE. The largest clownfish in a group living around one anemone becomes a female. If she dies, the next largest becomes a female.

D The eggs will hatch before your new carton of milk turns sour.

TRUE. Eggs hatch in a week. A newly hatched larva is as big as this word: egg.

E These fish love leftovers.

TRUE. They often eat the leftovers from the anemones' meals.

CHRIS NEWBERT / MINDEN PICTURES