



September/October 2015

Xplor

JEEPERS,
CREEPERS!

ANIMALS
HAVE SOME
AMAZING
PEEPERS.



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You can learn some eye-opening things about an animal by focusing on its vision.

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Fall brings bling to the branches at Hickory Canyons Natural Area near Ste. Genevieve.

 by David Stonner



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ON THE COVER

Jumping Spider
by Andrew Tiedman

GET OUT!

DON'T MISS THE CHANCE TO DISCOVER NATURE AT THESE FUN EVENTS



Aim for a bull's-eye at **ARCHERY BASICS**. Andy Dalton Shooting Range and Outdoor Education Center in Bois D'Arc. September 10, 6–7:30 p.m. Register at 417-742-4361.



Bluegill

Cast a line at **FAMILY FISHING**. Burr Oak Woods Conservation Nature Center in Blue Springs. September 12, 9–11:30 a.m. Register at 816-228-3766.

2



Explore the Mississippi River at **DAY ON THE RIVER**. Cape Girardeau Conservation Nature Center. September 12, 9 a.m.–4 p.m. For more info, call 573-290-5218.

3

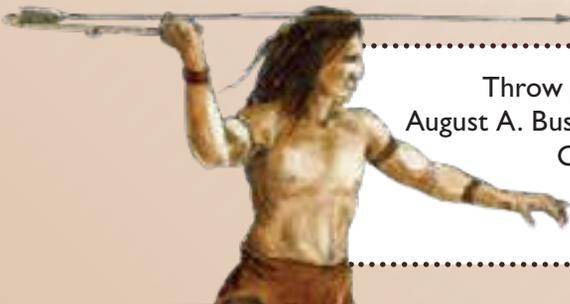
Learn how deer communicate at **YOUTH DEER CALLING CLINIC**. Jay Henges Shooting Range in High Ridge. October 6, 6–8 p.m. Register at 636-938-9548, ext. 0.



4

White-tailed deer

Throw primitive spears at **BEGINNING ATLATL**. August A. Busch Shooting Range and Outdoor Education Center in St. Charles. October 10, 9 a.m. to noon. Register at 636-441-4554. Ages 11–16 must be accompanied by an adult.



5

With summer winding down, and fall gearing up, there's plenty to discover outside. Watch for these natural events around the following dates.

SEPTEMBER 7

Monarch butterflies begin migrating in large numbers, sometimes traveling 3,000 miles.

SEPTEMBER 17

On hikes, look for puffballs and other fall mushrooms.

SEPTEMBER 27

Stay up late to see the total lunar eclipse.

OCTOBER 5

Start watching for fall colors.

OCTOBER 19

Look for spiders ballooning on clear, windy days.

OCTOBER 22

Orionid meteor shower peaks.

OCTOBER 25

American wigeon, pintail, and gadwall ducks arrive in large flocks.

WHAT IS IT?

DON'T KNOW?
Jump to Page 20 to find out.



- ① I'm a sticky, green giant.
- ② When I go thump, you might jump.
- ③ Gramps puts me in the corner to keep pests away.
- ④ In French, I'm called *bois d'arc*.

Into the WILD

your backyard
(at night)

Nighttime is the right time to find cool creatures in your backyard.



Gray treefrog



Gray treefrogs have a handy trick to hide from hungry hunters. As they move around, their skin changes color to match whatever they are clinging to. Look for these little frogs climbing on windows to zap bugs near porch lights.



Luna moth — actual size

LOOK

If you stay up late, you might find a luna moth fluttering around your porch light. Luna moths have big, fuzzy bodies and lime-green wings. Spots on their wings look like angry eyes. When the spots show, they startle would-be predators, giving the moth time to fly away.

Take a Closer Look

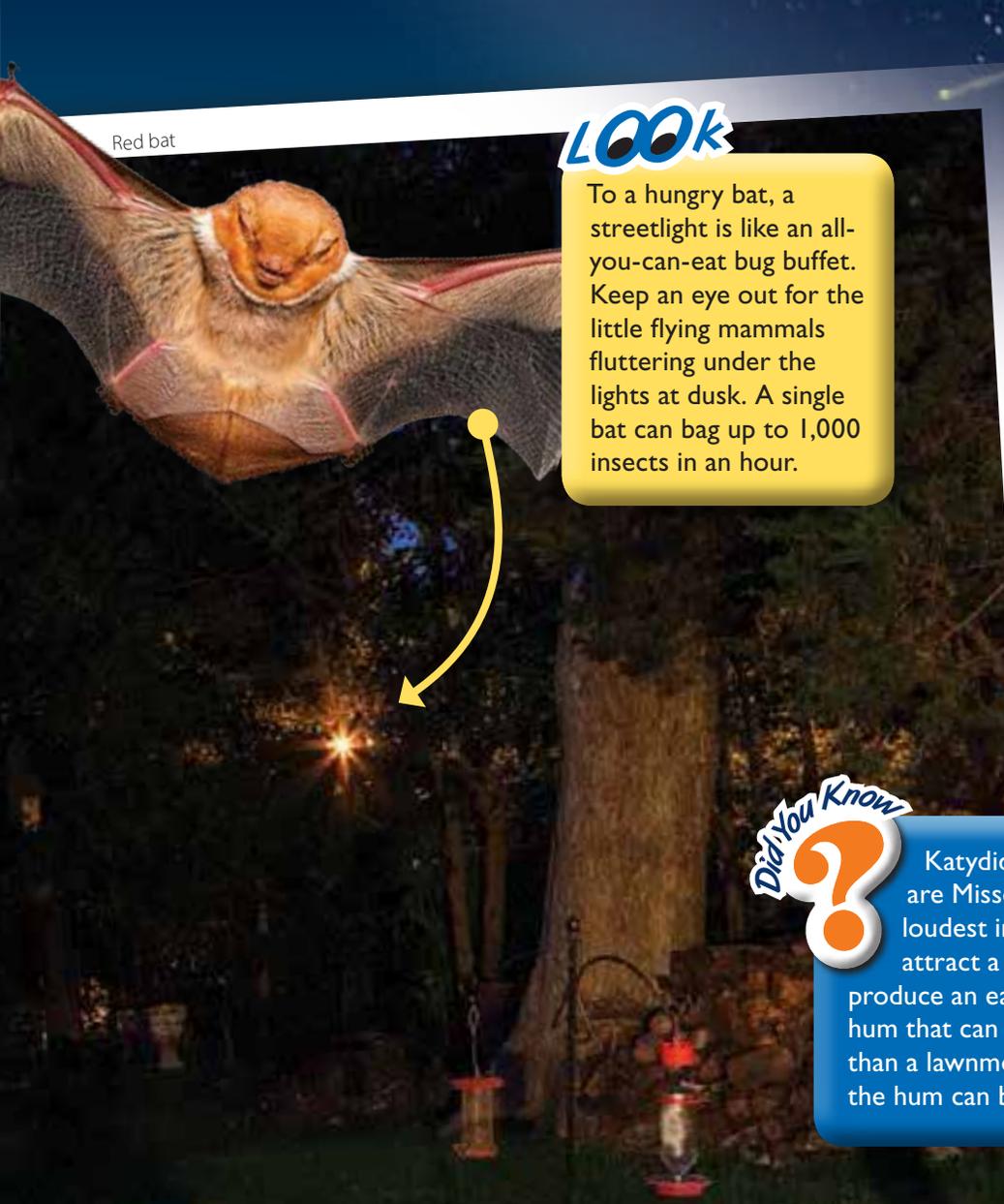
Shine a flashlight at your lawn, and you might see it sparkle with dozens of spider eyes. But fear not. The eyes belong to wolf spiders, which are harmless. Wolf spiders don't build webs. Instead, they prowl through the grass looking for prey, such as crickets.



Wolf spider

Heads Up!

Raccoons, skunks, and opossums rarely turn down a free meal. To avoid unwanted guests, place trash in a can that has a tight, locking lid and feed your pets indoors.



Red bat

LOOK

To a hungry bat, a streetlight is like an all-you-can-eat bug buffet. Keep an eye out for the little flying mammals fluttering under the lights at dusk. A single bat can bag up to 1,000 insects in an hour.



LOOK

Set your alarm for 3 a.m. on October 22. That's when the Orionid meteor shower peaks, sending hundreds of shooting stars streaking across the night sky. Shooting stars aren't really stars but bits and pieces that have crumbled off a comet. The debris flares up as it falls through Earth's atmosphere, giving dreamers something to wish upon.

Did You Know?

Katydid
are Missouri's loudest insect. To attract a mate, males produce an earsplitting hum that can be louder than a lawnmower. On a still night, the hum can be heard nearly a mile away.



Katydid

Listen

How do you know *hoo*'s hooting in your backyard? Eastern screech-owls give a quavering whinny. Great horned owls go "hoo, huh-HOO hooo, hooo." And barred owls give a series of hoots that sound like, "Who cooks for you, who cooks for you all?"



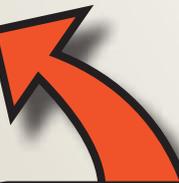
Eastern screech-owl

Jeepers, Peepers

by Matt Seek

Different Places on Different Faces

Where an animal's eyes are located on its head determines how much of its surroundings the animal can see.



If pesky predators come calling, **bitterns** point their beaks skyward, hoping to look like a cattail. Yet even with its bill raised, a bittern can still see forward thanks to its downward-facing eyes.

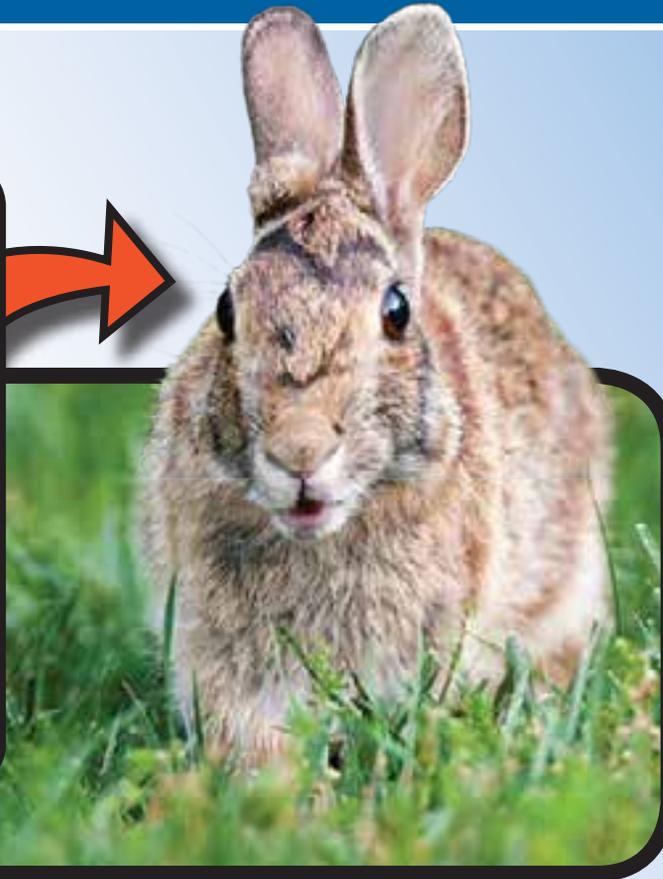
Alexander Erdbeer/Shutterstock.com

Nopadol Paothong

Nature is full of VIPs — very impressive peepers. Let's take a peek at a few animals and see what eye-opening things we can learn about them by focusing on their vision.



Thanks to eyes that stick out from the sides of its head, a **cottontail** sitting on a pitcher's mound could see home plate and every base — all without turning around. This wide field of view helps rabbits spot predators approaching from any direction.



Noppadol Paothong

Owls, like many meat eaters, have eyes that face forward. By comparing two images seen from slightly different angles, the owl can use its “binocular vision” to judge distances. This comes in handy when swooping down to snatch prey.



A **beaver**'s eyes are located near the top of its furry, buck-toothed head. When the water-loving rodent slips its nose above the surface to catch a breath, it can also catch a peek at its surroundings.



Noppadol Paothong



Noppadol Paothong

The huge eyes on a **flying squirrel** gather lots of light. This helps the squirrely skydivers see well at night and swoop safely around branches as they glide from tree to tree.



Jim Rathert

A **shrew** would need thick glasses to see as well as a human. The tiny eyes on these tiny mammals are nearly useless. But that's OK. Shrews use touch and smell to move around and find food.



Night Sight, Slight Sight

Many nocturnal animals can see well in the dark. Others, not so much.

Eye-identify Yourself!



Nonvenomous snakes, such as this **gartersnake**, have round pupils, like a human's eyes.





Mighty Sight-y

You're probably familiar with animals that have two eyes. But many animals have more. Some even have different *kinds* of eyes.



Many spiders have poor vision, but not **jumping spiders**. They use their eight simple eyes to spot predators and judge distances when pouncing on prey.

Andrew Tiedman



The two huge, compound eyes on a **dragonfly** are each covered with 30,000 "mini eyes." This helps the insect see in nearly all directions at once. Three small simple eyes help the dragonfly sense which way its body is turned while flying.

Noppadol Paothong

In Missouri, you can tell whether a snake is venomous or not by looking at its eyes.



All of the Show-Me State's venomous snakes, such as this **copperhead**, have vertical pupils, like a cat's eyes.

Shelly's Guide to COOL CAVES

by Brett Dufur and
Shelly Colatskie



Hi,

I'm Shelly. I study Missouri's bats. Let's go see what makes caves so cool. You'll be surprised by all the different critters that live down here. So slap on your helmet, turn on your headlamp, and get ready to crawl, slip, and slide underground.

It took millions of years for these cave formations to grow, as water slowly trickled down through rock and left these minerals behind. Let's check them out!



David Stonner

Stalactites

Drip. Drop. That slow but steady drip — over thousands of years — leaves behind enough minerals to form immense stalactites. They look like icicles, but they're made of rock!



Cave Bacon

Water dripping off cave ceilings can leave behind a thin strip of cave bacon, made of calcium. It's so thin that light shines through. Cave bacon always makes me hungry for breakfast!



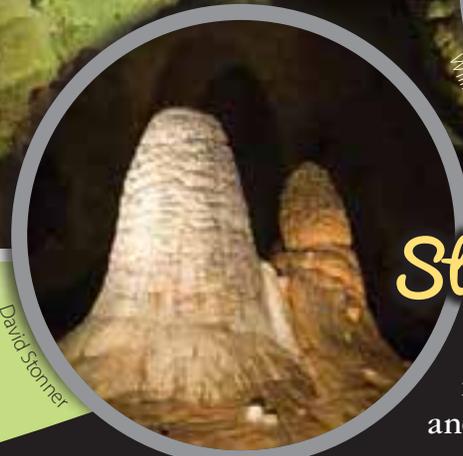
Soda Straws

In some caves, these delicate soda straws hang from the ceiling. Dripping water forms tiny, hollow straws. Aren't they beautiful?



Cave Pearls

Cave pearls are a rare treat. They can grow as big as marbles! They form when sand gets coated with calcite. A little water movement keeps them from sticking to the ground.



Stalagmites

Dripping water also forms stalagmites on the cave floor.

It takes about 100 years for them to grow a quarter inch. Remembering the difference between stalactites and stalagmites is easy — you *might* step on a stalagmite.

BATS

love it down here! It's cool and damp year-round. Most bats spend their winters in caves and their summers in trees or barns, raising their young. Gray bats, however, live in caves all year and raise their babies (called pups) here.



Big Brown Bat



Tricolored Bat

SO MANY BATS

The big brown bat is one of the most common bats in Missouri. You've probably seen them swooping in for a meal near light poles. Missouri has many other types of bats, too, such as tricolored, little browns, and grays — 14 different kinds in all. Sometimes I find rare bats, like the silver-haired bat.



Big brown bat: Merlin D. Tuttle, Bat Conservation International

INSECT EATERS

Bats are Missouri's top insect eaters. The Show-Me State doesn't have vampire bats or fruit bats, like other parts of the world. Sure Missouri's bats eat mosquitoes, but they love bigger meals like beetles and moths, which give them more energy. Bats can eat their body weight in insects in a single night.

SOUND OFF

When chasing down a meal, bats use their eyes and also rely on echolocation (*ek-ob-lo-cay-shun*), a form of sonar. Bats emit high-pitched chirps up to 200 times per second. By listening to the echoes, they can locate and nab prey. It sounds way harder than playing *Marco! Polo!* in the swimming pool, doesn't it?

Little Brown Bat



Jim Rathert

Gray Bat



William R. Elliott

Ren Colatskie



Silver-Haired Bat



Let's keep exploring so you can meet some unusual cave life. You won't believe your eyes!



BUNGHERS OF BATS

William R. Elliott

Those are hibernating gray bats. They can pile on top of each other four deep. I've seen 250 bats snuggled together in a space no bigger than this page! Sometimes clusters contain hundreds of thousands of bats. As a cave biologist, it's my job to count them all to help other scientists learn whether bat numbers are going up or down. Watch this short video to see how we count bats: on.mo.gov/1hjP6lC.

SLEEPY TIME

When bats hibernate, their body temperatures drop to the cave temperature. Their heart rates slow down, too. Most bats wake up every few weeks to get a drink, but most don't eat all winter long. Tricolored bats can hibernate for six months.

Shelly Colatskie



LIFE IN THE TWILIGHT ZONE

Most cave life is near the entrance, where there's sunlight. This is called the twilight zone. It provides wildlife with food, water, and shelter. You might see eastern phoebes building nests or turkey vultures raising chicks. This is a great place to find snakes and other reptiles cooling down on hot summer days. Since the air is damp, mosses and ferns thrive.

Missouri, the Cave State, has more than 7,000 caves. About 900 different types of animals have been seen down here. That's a whole lot of life underground!



William R. Elliott

Walking Fern

Brett Dufur

EXPLORING THE DARK ZONE

It's pitch black all the time back here. Whoa! Don't climb that dirt pile — that's a giant heap of bat droppings, called guano, from a gray bat colony. Guano is rich in nutrients and all sorts of cave insects live on it, such as cave crickets, millipedes, and pseudoscorpions.



Camel Cricket

William R. Elliott

David C. Ashley



Pseudoscorpion

Tumbling Creek Cave Millipede

William R. Elliott

UNIQUE and RARE

Grotto Salamander

Cave critters are uniquely evolved for life underground. The grotto salamander is the only blind salamander in Missouri. They live in total darkness and prefer caves with a spring or stream running through them. See more photos and a video at on.mo.gov/1gauCuE.



William R. Elliott

Tumbling Creek Cave Snail and Pink Planarian



William R. Elliott



William R. Elliott

Ozark Cavefish

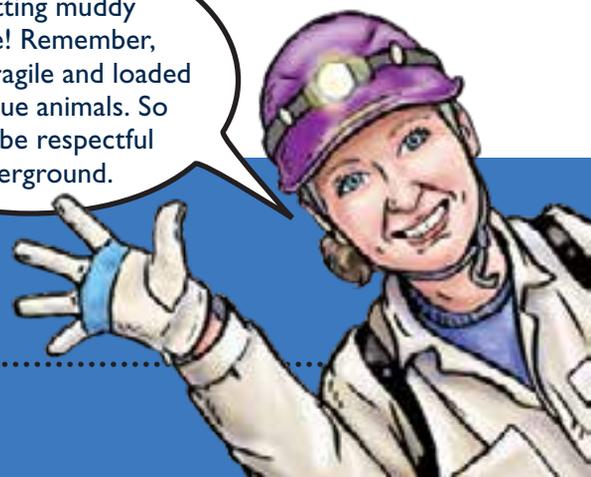
Ozark cavefish are very rare. Cavefish live most of their lives in total darkness, so they don't develop eyes. Caves have a limited supply of nutrients, so cavefish depend on food brought in from outside, like leaves, sticks, and bat guano. Learn more about these fish at on.mo.gov/1INN1J8.

The Tumbling Creek cave snail and the pink planarian, like many of Missouri's cave creatures, are found nowhere else on Earth. The pink planarian is a flatworm, one of the simplest animals with a brain and nervous system. It sucks the juices out of tiny amphipods to stay alive. Learn more about pink planarians at on.mo.gov/1W2a2h2.



Jim Rathert

Thanks for getting muddy with me! Remember, caves are fragile and loaded with unique animals. So always be respectful underground.



THIS ISSUE:

GIANT WATER BUG VS REDEAR SUNFISH

Illustrated by David Besenger

Toe Biters

Giant water bugs are nicknamed “toe biters” for their painful bite. These hunters sit motionless underwater, waiting for lunch to pass by. They breathe air through snorkel-like tubes extending from their hind end.

Bug Bomb

Boom! The water bug’s stealth leads to an explosive attack. The clawlike front legs nab prey while it uses long, oarlike back legs to swim fast so prey doesn’t get away.

Grow Big to Survive

Redear sunfish are only attacked by giant water bugs when they are small. Eventually, these fish outgrow water bug attacks. In fact, full-grown redear sunfish may get the last laugh by feeding on water bugs later.

Bug Beak, Future Bleak

Grasping prey with powerful front legs, a giant water bug thrusts its sharp beak into its victim and injects chemicals that paralyze the prey and turn its guts into goo, which the giant water bug slurps up.

Big Eyes to Stay Alive

Redear sunfish are related to bluegills and are similar in shape and size, although redears have red spots (orange in females). Redears use their keen eyesight to spot predators and escape using quick, darting speed.

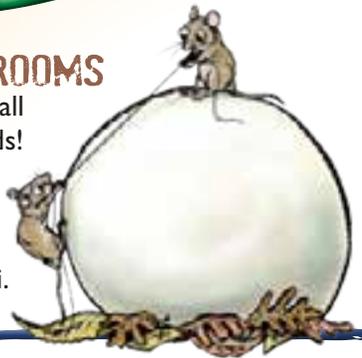
AND THE WINNER IS...

STRANGE but TRUE!

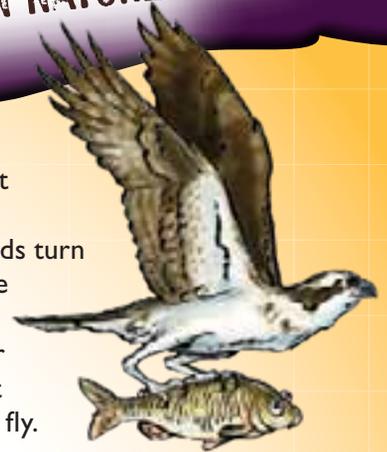
YOUR GUIDE TO ALL THE
UNUSUAL, UNIQUE,
AND **UNBELIEVABLE** STUFF
THAT GOES ON IN NATURE

Puff Daddy:

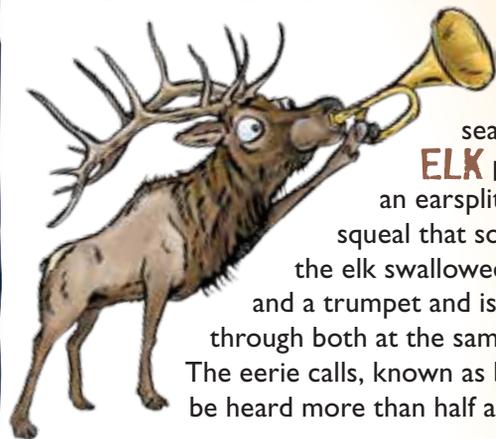
Giant **PUFFBALL MUSHROOMS** can grow larger than a beach ball and weigh more than 40 pounds! The humongous fungus grows from May to October in woods, pastures, and backyards throughout Missouri.



OSPREY are excellent anglers. After snagging supper, the *talon*-ted birds turn their fish missiles to face forward. The fish cut through the wind better this way, which makes it easier for the osprey to fly.



YELLOW AND BLACK GARDEN SPIDER silk is tiny but tough. A single strand of silk long enough to circle the Earth would weigh less than two pounds. Ounce for ounce, however, the silk is nearly as strong as steel.



During mating season, male **ELK** produce an earsplitting squeal that sounds like the elk swallowed a flute and a trumpet and is blowing through both at the same time. The eerie calls, known as bugles, can be heard more than half a mile away.

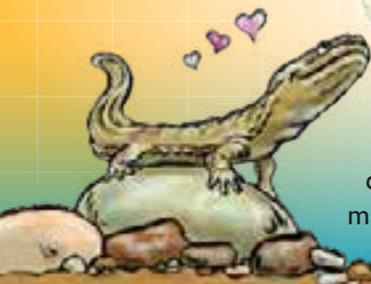
To float like a boat, **DUCKS** coat their feathers with oil. The oil is produced by a gland at the base of the duck's tail. Ducks spread the oil with their bills, and in no time, water rolls off their feathers like, well, water off a duck's back.



GRASS CARP often eat their body weight in plants each day. Although they grow quite large — Missouri's record weighed 71 pounds — the fish aren't great at turning plants into weight. Half the vegetation a carp eats passes through its body undigested.



Scents make sense. To attract a mate, female **HELLBENDERS** release natural perfumes, called pheromones. One whiff of this love potion helps males find the female, even if she's hidden under a rock.



HOW TO

Partake in Persimmons

At the end of September, purplish-orange persimmons ripen and drop from the branches of their knobby-barked trees. Here are a few ways to partake in — that’s a fancy word for “experience” — this yummy fall fruit.

FIND A PERSIMMON TREE

Persimmon trees grow in fencerows and woods throughout Missouri. New trees grow from the roots of older trees, so where you find one persimmon, you’ll usually find several. The brownish-black bark has deep grooves that form chunky, rectangular blocks. Some people think the bark looks like an alligator’s back. When you find a tree with knobby bark, look up.

If you see orange, golf-ball-sized fruits hanging from the branches, you’ve found a persimmon.

PUCKER UP!

Persimmons taste yummy — if they’re ripe. If they aren’t, one bite will make your mouth pucker like you drank a whole jar of pickle juice. When a persimmon is slightly squishy, it’s ready to eat.



Use these pictures to decipher your persimmon's forecast.

FORECAST THE WEATHER

Some people claim you can forecast winter's weather by splitting open a persimmon seed. The white embryo inside — the part that would grow into a new tree — will be shaped like a spoon, fork, or knife.

SLICE A SEED, NOT YOUR FINGER

Persimmon seeds fresh out of the fruit are as slippery as buttered bullfrogs. Trying to cut one with a knife is a good way to slice your finger. To keep your pointers intact, use a pair of pliers to hold the seed while you slice it longways.



A **spoon** — like a tiny snow shovel — predicts lots of snow.



A **fork** forecasts a pleasant, mild winter. Sorry, no snow days.



A **knife** predicts frigid winds that will cut through your coat like a blade.

MAKE A Sweet Treat

For a quick, yummy dessert, make this persimmon parfait from *Cooking Wild in Missouri* by Bernadette Dryden.

- 1 Gather about 25 ripe persimmons. You'll also need $\frac{1}{4}$ cup of vanilla yogurt, 2 tablespoons of toasted pecans, and four gingersnap cookies.
- 2 Remove the greenish-brown caps from the persimmons and rinse any dirt from the fruit.
- 3 Run the fruit through a food mill, catching the dark orange pulp in a bowl. (The seeds and skins should stay in the mill.)
- 4 Dish 3 tablespoons of the pulp into a small dish or bowl. On top of that, put 2 tablespoons of yogurt and then another 3 tablespoons of pulp. Repeat this procedure in a second dish.
- 5 Sprinkle each dish with chopped pecans and crumbled gingersnap cookies. Find two spoons and one friend, then dig in.

XPLOR MOR

Hare Today, Gone Tomorrow

Cottontail rabbits are known for their ability to produce lots of offspring — and we mean lots. If winter ends early, mama rabbits start having babies in mid-March, and then they have seven more litters (about one litter each month) through September! Each litter may contain up to nine babies, but four or five is most common.

With that many bunnies being born, you'd think Missouri would quickly turn brown as herds of hungry rabbits nibbled every green plant down to nubbins. Luckily, plenty of predators have cottontail on their menus.

How many rabbits will remain when summer comes to an end? Use a bit of rabbit arithmetic to find out. **Hint:** Don't forget to add the mother rabbit to your total.

START

In March, mama cottontail had four baby bunnies.

$$+ 4 = \square$$

Hoo's got two wings and a belly full of bunny? This owl.

$$- 1 = \square$$

In April, mama cottontail had five baby bunnies.

$$+ 5 = \square$$

April showers may bring flowers, but they were hard on the nest of rabbits.

$$- 4 = \square$$

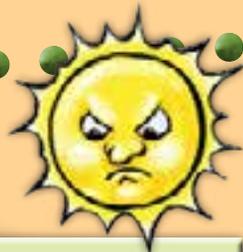
WHAT IS IT?

— FROM PAGE 3 —

for fence posts and furniture. Wood from the Osage orange tree is also considered the world's finest for crafting traditional archery bows.

The softball-sized hedge apples of the Osage orange tree land with a giant thump. When this tree is cut, the stump is a brilliant orange. The wood is extremely hard and heavy and is used





A couple rabbits weren't too jumpy. Now this snake is fat and lumpy.

$$-2 = \square$$

A drought in July made plants wither. Less food equaled fewer babies.

$$+2 = \square$$



Bunny bonbons had these coyote pups howling with glee.

$$-4 = \square$$

A mink slinked in for a snack attack.

$$-1 = \square$$

A bobcat got a hankering for a honey bunny.

$$-1 = \square$$

In June, mama found a clover field planted for rabbit habitat. Extra food equaled extra babies.

$$+7 = \square$$

They grow up so fast! In August, two of mama rabbit's offspring had babies of their own.

$$+7 = \square$$

In May, mama found a big, safe brush pile in which to have her babies.

$$+6 = \square$$

A fox found a secret stash of rabbit num-nums.

$$-4 = \square$$

One little rabbit got free hare fare back to a hawk's nest.

$$-1 = \square$$

In September, an exhausted mama cottontail had two baby bunnies.

$$+2 = \square$$

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FREE TO MISSOURI HOUSEHOLDS

CRITTER CORNER

Eastern Hellbender



Jeff Briggler

These large salamanders live in cold, clear Ozark streams. Nicknamed “old lasagna sides,” the hellbender’s skin flaps absorb oxygen as water flows around them. During the day, hellbenders hide under big, flat rocks. At night they hunt, walking slowly along the stream bottom and chowing mainly on crayfish. If you accidentally catch a hellbender while fishing, please release it unharmed. They are a rare and unique part of the Ozark’s underwater world.