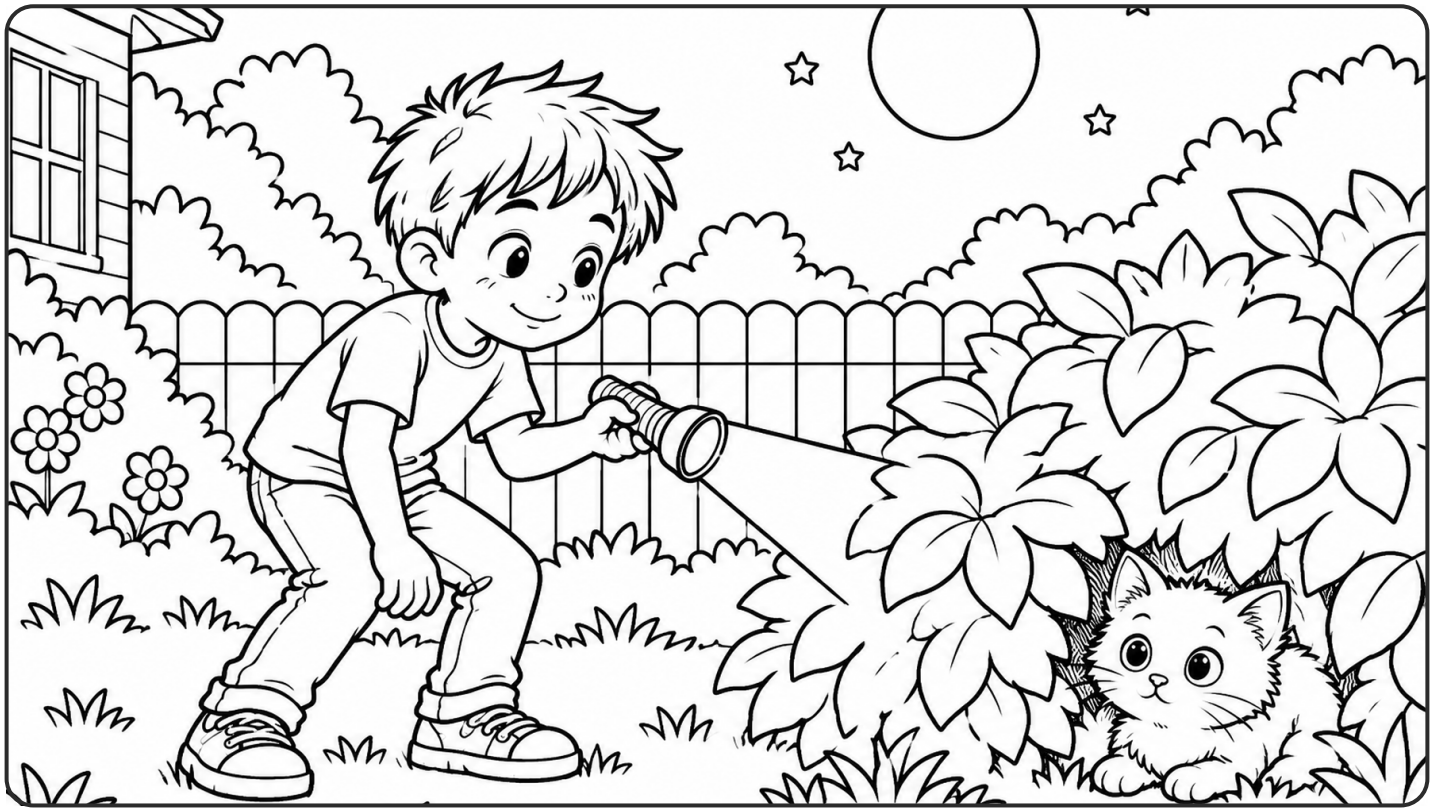
Why do cats' eyes glow in the dark?

At night, when a light shines on a cat, its eyes glow like two little lanterns. Do cats have lights inside their eyes?



Why?

1. **Nope, there are no lights inside!**
   A cat's eyes don't make any light. They bounce light back, like a mirror.
2. **Cats have a shiny mirror at the back of each eye.**
   Light that slips past the seeing layer bounces off the mirror and goes through the eye a second time. So cats can see in very dim light, about six times dimmer than what you need.
3. **Some of that bounced light comes back out.**
   When a flashlight or a car light shines at a cat, you see the light coming back. That is the glow!

Try it! Watch your pupils grow

You need: a mirror and a grown-up

1. Stand in front of a mirror in a bright room. Look at your pupils, the dark dots in the middle of your eyes.
2. Ask a grown-up to dim the lights. Wait a little bit.
3. Look again. Did your pupils get bigger?

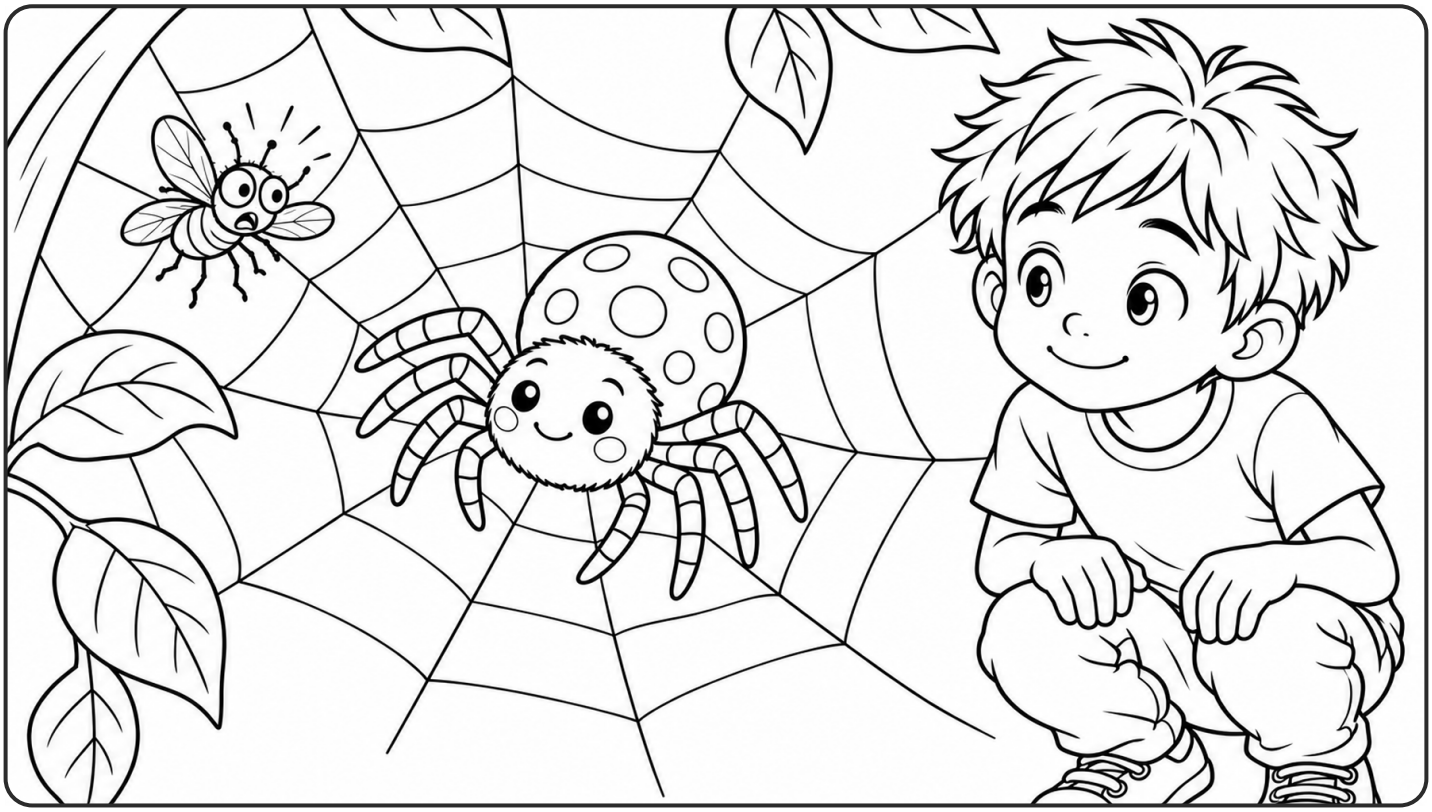
What happened? Pupils open wide in the dark to let in more light, just like a cat's.

Video + more questions:
whywhywhykids.com/cateyes

scan with a grown-up

Why don't spiders get stuck in their own webs?

A spiderweb is sticky, so it can catch flies. But the spider runs all over it, and never gets stuck. How does the spider do that?



Why?

1. **A spider can make different kinds of silk.**
   Some threads are dry, and not sticky at all. Other threads are covered with tiny drops of glue.
2. **The web has dry spokes and a sticky spiral.**
   The spider starts with dry threads. It makes a frame, and then lots of spokes, like a bicycle wheel. Then it lays a long sticky spiral, with drops of glue like tiny beads. That's the part that catches bugs.
3. **The spider walks on the dry spokes, on tippy-toes.**
   It knows exactly which threads are sticky, and steps around them. When it does touch a sticky thread, it touches very gently, with just the tips of its feet. Tiny hairs and little hooks on its feet help, so it doesn't get stuck.

Try it! Web detective

You need: a misty morning, and a grown-up

1. On a misty morning, go outside with a grown-up and look for a spiderweb on a bush or a fence.
2. Tiny water drops make the threads easy to see.
3. Can you find the spokes and the spiral? Just look, don't touch.

What happened? The spokes are the dry threads the spider walks on. The spiral is the sticky part that catches bugs.

Video + more questions:
whywhywhykids.com/spider

scan with a grown-up

Will a watermelon grow in your tummy if you swallow a seed?

If you swallow a watermelon seed, will a watermelon plant grow inside your tummy?

Why?

1. The answer is no! A seed needs a few special things to grow.
Soft soil to hold its roots. Water to drink. Warm sunshine. Fresh air. And time, about a week just to pop open.

2. Your tummy has none of them.
It is dark in there, with no sunshine at all. There is no soil. And your stomach is full of strong, sour juice that breaks your food into tiny bits.

3. The seed just slides along for the ride.
It wears a hard, slippery coat, so the juice cannot break it open. It zooms through a very long, twisty tube called the intestine, like a slow water slide. It is always moving, so there is no time to grow. After a day or two, it comes out when you go to the bathroom.

Try it! Grow a real sprout

You need: a black watermelon seed, a cup of soil, water, and a sunny window

1. Wash a black seed from your watermelon.
2. Plant it in a cup of soil, and water it.
3. Put it by a sunny window. In a week or two, a little green sprout will say hello!

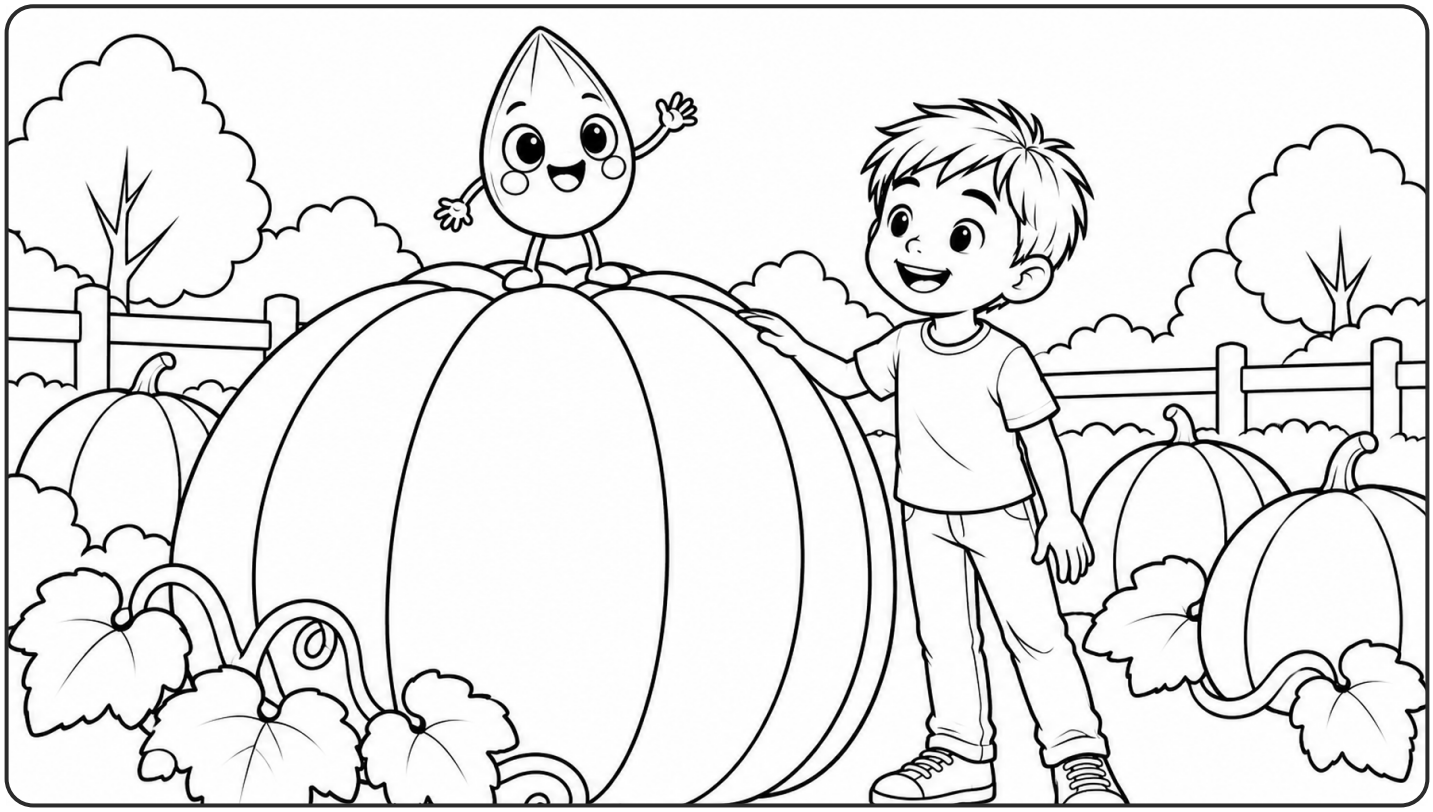
What happened? In the cup, the seed gets soil, water, sunshine, air and time. That is everything it needs.

Video + more questions:
whywhywhykids.com/seed

scan with a grown-up

How does a tiny seed grow into a giant pumpkin?

A pumpkin seed is smaller than your fingernail. But a pumpkin can be bigger than you! Where does all that pumpkin come from?



Why?

1. Inside the seed, a baby plant is sleeping, with a little packed lunch.
Someone pokes the seed into warm soil and gives it some water. The water wakes it up! A tiny root pushes down into the soil, and two little green leaves push up into the sunshine.

2. The leaves make the plant's own food.
They catch sunlight, and use it to turn air and water into sugar. That sugar builds the whole plant, one tiny bit at a time. A long, twisty vine grows, with big, wide leaves like umbrellas.

3. Busy bees help, and the vine feeds the baby pumpkin.
In summer, big yellow flowers open up, and bees carry yellow pollen from flower to flower. Where a bee has brought pollen, a tiny green ball starts to grow under the flower. That's a baby pumpkin! The vine sends it water and sugar every day, and it swells up bigger and bigger.

Try it! Plant pumpkin seeds

You need: a few pumpkin seeds, a cup of soil, a sunny window, and a grown-up

1. Save a few seeds from a pumpkin. Ask a grown-up to help you rinse them.
2. Plant them in a cup of soil, near a sunny window.
3. Keep the soil damp. In about a week, can you see a little sprout?

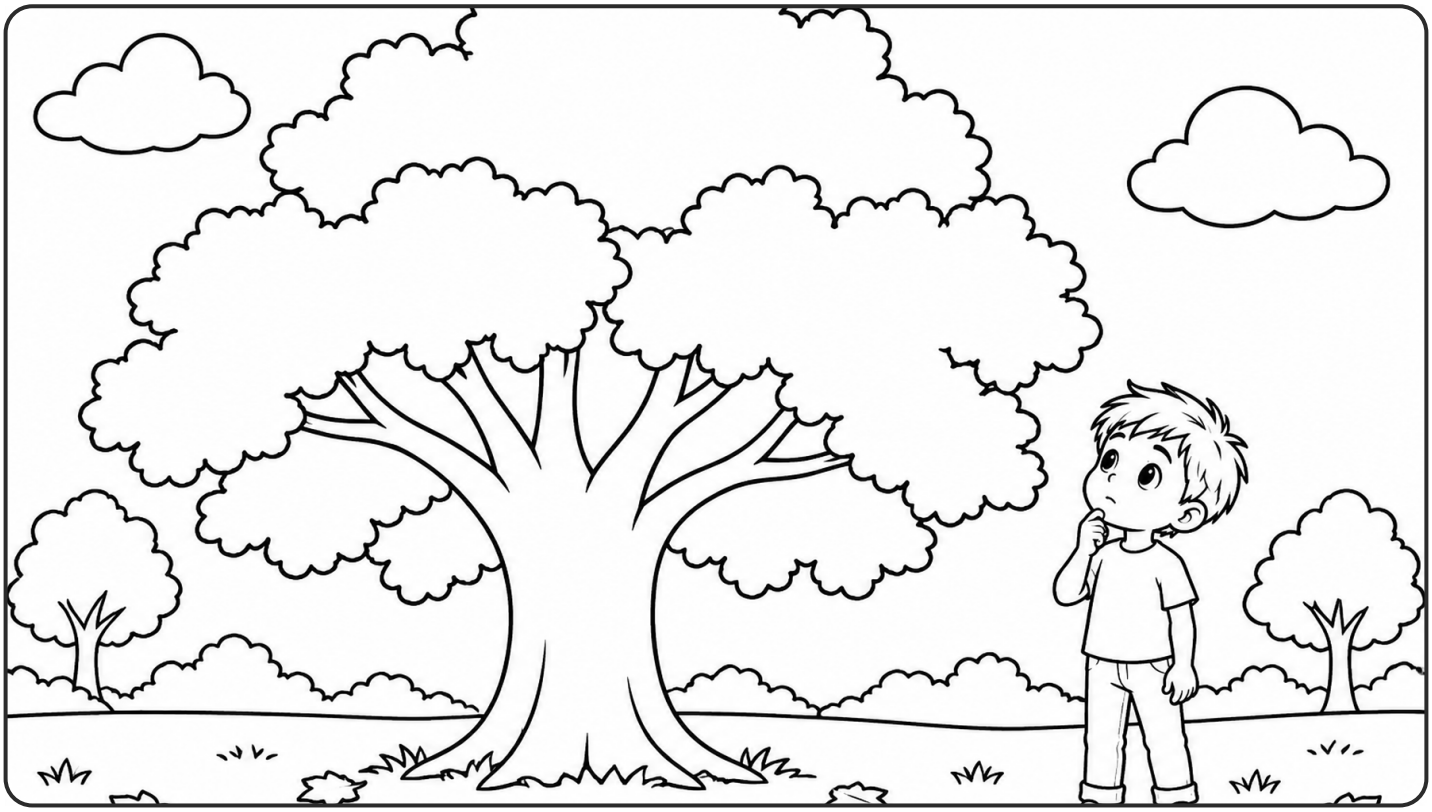
What happened? The water wakes up the baby plant sleeping inside each seed.

Video + more questions:
whywhywhykids.com/grow

scan with a grown-up

Why do leaves change color in autumn?

Why do some trees turn red, some turn yellow, and some stay green all year long?



Why?

1. In summer, every leaf is full of tiny green helpers.
They are called chlorophyll. They catch sunlight and make food for the tree. They are so green that they hide every other color.

2. When autumn comes, the green fades and the yellow shows up.
The days get shorter and the nights get colder, so the tree stops making new green helpers. Under the green, yellow and orange paint was hiding all summer. It is called carotenoids. Ginkgo and birch trees do this.

3. Red is a brand new paint.
It is called anthocyanin, and the leaf makes it in autumn! On sunny days, sugar gets stuck in the leaf and turns into red paint, like sunscreen for the leaf. Maple trees do this.

Try it! Color detective

You need: a tree that is changing color, and a grown-up

1. Next time you go outside, find a big tree that is changing color.
2. Look at the top, the sunny side, and the leaves hidden deep inside.
3. Can you spot where the colors start?

What happened? The top and the sunny side get the most sun and feel the cold first, so they change first. The color then spreads through the whole tree.

Video + more questions:
whywhywhykids.com/autumn

scan with a grown-up

How do bats find their way in the dark?

Bats fly around at night, zooming between the trees and catching tiny bugs. How do they find their way when it is so dark?

Why?

1. Bats are not blind! But in the dark, many bats use their ears.

Bats can see. But even good eyes can't spot a tiny moth far away in the dark.

2. A bat makes lots of tiny, high squeaks.

They are so high that your ears can't hear them. Each squeak flies out, hits something, and bounces back, like a ball bouncing off a wall. That bounced-back sound is called an echo.

3. Big ears catch the echoes.

If an echo comes back fast, the thing is close. If it takes longer, the thing is far away. Echoes tell the bat where things are, how big they are, and if they are moving. It is like drawing a picture with sound!

Try it! Clap for an echo

You need: a big empty gym, a tunnel, or a tall wall far across a field, and a grown-up to take you

1. Ask a grown-up to take you to a big empty gym, a tunnel, or a tall wall far across a field.
2. Clap your hands once, loud and sharp.
3. Listen. Do you hear your clap come back?

What happened? Your clap flew out, hit the wall, and bounced back to you. That is an echo, just like a bat's squeak.

Video + more questions:
whywhywhykids.com/bats

scan with a grown-up

Why does my dog pant?

After a dog runs and plays, it opens its mouth, hangs out its tongue, and breathes very fast. Huff, huff, huff! Why does a dog pant?

Why?

1. A running dog gets hot inside, and it can't sweat like you.

You cool down by sweating. But a dog's body is covered in fur, and it has hardly any sweat glands. Just a few, on the bottom of its paws.

2. So a dog uses its wet tongue.

When a dog pants, air rushes in and out, very fast, over its wet tongue. Each breath carries water bits away, and every water bit takes a little bit of heat with it. That is evaporation, the same trick as sweat!

3. A cool tongue cools the whole dog.

The tongue is full of warm blood. As the tongue cools, the blood inside it cools too. Then that cooler blood travels around the body.

Try it! Pant like a dog

You need: the back of your hand and a little water

1. Lick the back of your hand, or wet it with a little water.
2. Now pant on it, like a dog. Huff, huff, huff!
3. Does it feel cool?

What happened? The air carries the water away, and the water takes the heat with it. That is just how a dog's tongue feels.

Video + more questions:
whywhywhykids.com/pant

scan with a grown-up

Why do cats always land on their feet?

Have you ever seen a cat jump down from a high shelf? It twists in the air, and plop! It lands on its feet. How does a cat always land on its feet?

Why?

1. **It starts inside the ears.**
   Deep in each ear there are tiny tubes filled with liquid. When a cat tips or turns, the liquid moves, and tells its brain which way is up and which way is down.
2. **Head first, then the front half, then the back half.**
   The cat turns its head, so its eyes can see the ground. Next it twists the front half of its body, so the front paws point down. Then it twists the back half, to catch up.
3. **A super bendy back, and legs like a parachute.**
   A cat's backbone bends and twists much more than yours, so its body can turn in the middle, like a spring. Then it spreads its legs out wide, like a little parachute, and its bendy legs fold like springs to soften the bump.

Try it! Balance like a cat

You need: just you

1. Stand on one leg.
2. Now close your eyes.
3. Is it harder?

What happened? Your eyes help your ears keep your balance, just like a cat's.

Video + more questions:
whywhywhykids.com/catfeet

scan with a grown-up

Why do dogs get the zoomies?

Have you ever seen a dog suddenly run around and around, super fast, for no reason? Zoom, zoom, zoom! Why do dogs get the zoomies?

Why?

1. **A short burst of wild running.**
   The dog races in circles, spins and bounces, with a big happy face. Then, after a minute or two, it stops, and flops down.
2. **Saved-up energy pops out.**
   A dog's body stores up energy, like a balloon filling up with air. When there is lots and lots of energy inside, pop! It all comes out at once.
3. **Happy, excited feelings.**
   The zoomies usually mean a dog is happy and excited. Puppies and young dogs get them the most. The zoomies are normal and healthy.

Try it! Time the zoomies

You need: a dog to watch

1. Next time you see a dog zooming, start counting.
2. Stop counting when the dog stops.
3. How long did it last?

What happened? Most zoomies are over in just a minute or two!

Video + more questions:
whywhywhykids.com/zoomies

scan with a grown-up