

How Your Cat's Vision Compares to Yours

Does your cat see the world like you do, or is her visual experience a unique one? Is it true cats can see in the dark - and are they really nocturnal? Discover what's true and what's not about your cat's eyes and how they see you and the world.

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STORY AT-A-GLANCE

- Cats' vision in the dark is six to eight times better than humans'
- This is primarily because cats have more rod photoreceptors, which are extremely sensitive to shape, movement and light, in their retina than humans
- Cats also have pupils that are up to 50% larger than humans' pupils in dim light, which lets more light into their eyes, helping them see better
- Cats have a tapetum lucidum, a reflective layer behind the retina that acts like a mirror, reflecting light at the back of the eyes; the reflective layer is another reason why cats see better at night
- While most humans have three color receptors, or cones, in their eyes, cats only have two; it's believed that cats see blue and gray colors, as well as potentially some yellows and greens

There's a lot of hearsay when it comes to cats' vision, but have you ever wondered how your cat actually sees the world? It's often said that cats can see in the dark. This is partly true; while your cat's night vision is far better than your own, they don't have night vision — and they're not even nocturnal.

Like dogs, cats are crepuscular animals, which means, if left to their own devices as they are in the wild, they're most active at dawn and dusk, during the twilight hours. This gives many clues about the way their eyes have evolved to see the world — with great acuity even in very low levels of light.

Your Cat Can See Eight Times Better Than You in the Dark

It's difficult to quantify exactly how much better cats can see in the dark than humans. But some estimates suggest that their vision in the dark is six to eight times better than humans'.¹ This is primarily because cats have more rod photoreceptors, which are extremely sensitive to shape, movement and light, in their retina than humans.

Caryn Plummer, a clinical veterinary ophthalmology specialist at the University of Florida College of Veterinary Medicine, told Live Science:²

"It's not a matter of seeing in the dark or not seeing in the dark. The perception of vision — you might say the 'quality' — is more of a spectrum than a yes or no. Cats can see in the dark because the structure of their eyes, and specifically their retinas, permits them 'better' vision than humans when light levels are low.

Cats have a higher percentage and concentration of rod photoreceptors than humans, which means they have better sensitivity to light, and can see more in low levels of illumination than we can."

Cats also have pupils that are up to 50% larger than humans' pupils in dim light, which lets more light into their eyes, helping them see better.³ Cats' eyes also have a curved cornea, vertical pupil and large lens, all of which contribute to their excellent low-light vision. In fact, while humans' pupils can expand about 15 times in low light, cats' pupils can expand up to 300 times.⁴

Cats also have a tapetum lucidum, which means "bright or shining tapestry" in Latin. Humans don't have a tapetum lucidum, which is sometimes referred to as "eyeshine."⁵

This reflective layer behind the retina acts like a mirror, reflecting light at the back of the eyes. The reflective layer is another reason why cats see better at night. Light is reflected outward, giving the cat's retina a second chance to absorb the rays. This is also why your cat's eyes may appear to glow at night if light hits them or may take on a noticeable glow in photos.

In cats, crystals of the B vitamin riboflavin make up the tapetum lucidum. As noted in *The Conversation*, "Riboflavin has unique properties that amplify light to a specific wavelength that cats can see well, which greatly increases the sensitivity of the retina to low light."⁶

Better Vision at Night Comes at a Price

While cats' vision at night is superior to humans', you can likely see better than your cat can during the day. In terms of visual acuity, cats' daytime vision is only about one-seventh as sharp as humans'.⁷ Cats are also nearsighted, which means they can see objects up-close clearly but objects far away appear blurry.

Your cat would need to be about five times closer to an object to see it with the same amount of detail you do.⁸ One trade-off? Cats have wider peripheral vision than humans; they're able to see about 200 degrees compared with humans' 180.⁹

Your Cat Sees Colors Differently Than You Do

Cats also see the world in terms of colors. While most humans have three color receptors, or cones, in their eyes, cats only have two. Although this is up for debate, it's believed that cats see blue and gray colors, as well as potentially some yellows and greens. "[T]hey do not see as many colors or colors as brightly as we do," Plummer said. "We would perceive their daytime visual resolution as fuzzy and out of focus."¹⁰ Put another way in *Wired*:¹¹

"While feline photoreceptors are most sensitive to wavelengths in the blue-violet and greenish-yellow ranges, it appears they might be able to see a little bit of green as well. In other words, cats are mostly red-green color blind, as are many of us, with a little bit of green creeping in."

Cats also use other senses to navigate their environment. "Cats have very acute hearing and olfaction [sense of smell], which aids their ability to navigate," Plummer explained to *Live Science*. "Interacting with the environment requires the collaboration of all of the senses."¹²

Indeed, when you're interacting with your cat you'll notice that their vision is perfectly adapted to help them do what cats do best — ambush their prey, especially at dawn and dusk. Whether that "prey" is a catnip-filled mouse or a food toy stuffed with a special treat, your cat sees its environment just as a cat should.

Sources and References

^{1, 2, 7, 10, 12} [Live Science September 2, 2022](#)

^{3, 5, 6} [The Conversation April 11, 2022](#)

^{4, 8, 9} [Reader's Digest July 27, 2022](#)

¹¹ [Wired October 16, 2013](#)
