

A DOG'S FIVE SENSES

Touch. Hearing. Smell. Taste. Vision.

Touch: Dog whiskers are especially sensitive. They use their whiskers to judge the size and shape of close-up objects. Whiskers even help guide them in the dark. They are as sensitive as your fingertips.



Vision: People used to think dogs only see in black and white. While they don't see the same range of colours we do, they instead see the world in hues of blue and yellow. No wonder dogs have trouble finding a green tennis ball in the grass!

Touch: Born deaf and blind, puppies rely on their sense of touch right from birth to feel their way around. A dog's fur is connected to highly sensitive nerve endings. They can feel the lightest touch, from a fly landing on their backs to the wind blowing across their fur.

Vision: Compared to people, dogs have excellent peripheral (**per-if-er-all**) vision. This means they can detect the slightest movement, an ability passed down from their ancestry as hunters. Dogs also see very well in low light, especially at dawn and dusk.



Taste: Compared to humans, dogs don't have a great sense of taste. In fact, people have about five times more taste buds than a dog - 9,000 compared to only 1,700 in dogs. Maybe this is why dogs seem to eat just about anything that falls on the floor!



Smell – a dog's super sense!

Dogs can detect tiny chemical traces of an odor well beyond what people can. A dog's sense of smell is about 20 times greater than ours. This is why dogs are trained to sniff for explosives, illegal drugs, people buried in avalanches and more.



Photo of Bear's nose, from SPCA summer camper Isla Craig, 9, Vancouver!

Hearing: Dogs have awesome hearing. They can detect sounds from far away, long before we hear them – especially high frequency sounds. This explains why some dogs will bark at the sound of a siren well before we hear it. Dogs are so good at picking up subtle sounds that they can easily tell your footsteps from those of a stranger.

Smell: Dogs are being trained to detect the presence of the COVID-19 virus. Maybe one day COVID-sniffing dogs will be visiting schools.



Touch: Dogs' paws are connected to a concentration of nerves that help them feel their way over unfamiliar surfaces.



Mad, sad and glad

You probably already know that dogs are good at reading our body language to tell what we are feeling. They can tell by our facial expressions if we are scared, sad or happy. Did you know that dogs can also smell our emotions?

Recent research has shown that how we feel is linked to odours dogs can detect. The research had people watch short videos that were either scary or happy. Researchers then gathered their sweat samples, and the samples were presented to dogs. Dogs acted scared when they smelled the fear sample and then showed relaxed, friendly behaviours when sniffing the happy sample. The conclusion? Dogs really can smell our emotions.



Can dogs hear earthquakes coming?

Some researchers believe dogs can hear the sounds of grinding rock deep beneath the earth just before an earthquake. Other animals, including birds, have also been known to behave oddly just before an earthquake hits. Spooky!

Seeing Like a Dog

Which of these balls do you think a dog can see best lying lost in the grass?

Black

Green

Blue

White

Orange



If you guessed black or blue you may be part dog! So what colours do dogs see? You might be surprised to learn that a dog's view of the world is a whole lot different than yours. You may have heard that dogs are colour-blind – that they see the world in black and white – but that's not exactly true. They do see colour, but they see a world of yellows, blues and greys. Here's why.

There are two types of cells that receive light in the eye – rods and cones. Rods help to sense motion and work best in low light situations. Cones, on the other hand, allow mammals to see colours but they work best in bright light. Dogs have fewer cones than people do

and so the range of colours they see is less.

Not only do dogs have fewer cones but they also have different types of cones. People have three types of cones that allow us to see a wide spectrum of colour. Dogs have only two types of cones, preventing them from seeing all but yellow and blue, plus the full range of greys – from white to black.

To you, a bright orange ball would stand out against green grass. To your dog the colours would not look that different – a kind of pale yellow on light grey. A black or blue ball would be easiest for your dog to see – white the hardest.

Above: Odie is giving all of the coloured balls a good sniff.

Below: Graphic of a colour bar that shows the spectrum of colour; this gives you a good example of a dog's limited colour sense.





What humans see.



What dogs see.



Does your dog need glasses?

Have you ever noticed that your dog sometimes doesn't recognize friends or family members until they are close? Then the dog's tail starts wagging like crazy! The reason is that dogs don't actually see far away objects all that clearly. It is called myopia or near-sightedness. Compared with a person with 20/20 vision, a dog's vision would be more like 20/50 to 20/100. This means that if an object is 100 feet away, a person could see it clearly. The object would have to be 20 feet away for a dog to see it as well. A dog's eyesight is about six times poorer than the average person's.

Night Vision Pros and Built-in Motion Detectors

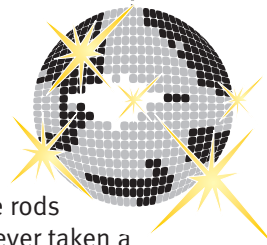
Where dogs can see better than people is in night vision and detecting motion. Dogs' eyes have a hundred times more rods than people's do. The rods are very sensitive to light and can pick up slight changes in movement. With so many rods, dogs can see better at night and can see things move that we just don't see. In fact, dogs can see in low light even better than cats.

Another unique feature that dogs have that people don't is a mirror-like surface at the back of their eyes



called the **tapetum**.

Light, even if it is very dim light, reflects off the tapetum and helps add more light for the rods in the eye. Have you ever taken a flash picture of your dog or cat and noticed that their eyes are glowing green? That's the tapetum reflecting light out of the back of your pet's eye.



Glowing green eyes are a result of the tapetum reflecting light out of the back of dogs' eyes.



Dogs can thank their wild ancestors for their unique vision. Dogs evolved from wolves, and wolves are able to detect the slightest motion and in very low light. This makes wolves successful hunters at dawn and dusk, plus they can instantly pick up any movement a prey animal makes in the grass regardless of how camouflaged it might be. Of course,

dogs have now adapted to being fed by people and active during daytime along with us, but they still have the eyes of a hunter. This helps explain why they sometimes chase things that move – like a squirrel,



WHAT A DOG'S NOSE KNOWS

Watch a dog's nose closely when she first steps outside for her morning walk. **Her nostrils will be twitching wildly**, sampling scents we can't even imagine. Those first few moments tell her what's been going on outside. She can easily pick up the traces of a robin who was hunting for earthworms at daybreak, or the **whiffs of a raccoon** who wandered across the lawn the night before. Yet, we can't smell any of these scents.

Why the long face?

While we rely primarily on sight, dogs' understanding of the world is built around their nose. **Dogs have 50 times as many scent receptors as people** – that's why they have such a long snout. As air passes over the receptor cells, they tell the dog's brain what's in the air. Maybe there's smoke, cut grass or a coyote. **Dogs have 300 million receptors!** People have only six million.



Dogs have dual exhaust

Dogs also process air differently than people. When we breathe, air goes in and out through the same passage. Dogs breathe in through the holes at the front of their

noses, but **exhale through slits at the side**. This allows dogs to trap some air in the nose chamber. This magnifies the smell strength. What was a trace smell becomes a strong scent.

A database of smells

Compared to humans, a dog's brain has much more space set aside just for storing and remembering different scents. The result is a **vast library of smells**. The ability to sort out all these smells and remember them makes a dog's nose so special.

Test your sense of smell

Lightly scratch this dog sticker. What do you smell? Do you smell anything?

Actually, we tricked you! There is no special scent in the ink. But your dog would easily smell the ink, the paper and all the people who touched this spot of the magazine. Try holding this *Bark!* page up to your dog. Watch her nose closely!





Dogs smell in stereo

Know how you turn your head to figure out where a sound is coming from? Dogs do that with their noses. **Each nostril draws in its own smells.** Smelling in stereo like this helps dogs know which direction a scent is coming from.

Often you see dogs weaving back and forth along the ground, snorting up concentrations of odour. What they are doing is figuring out in which direction the smell is stronger. This is why dogs are excellent at tracking. **Dogs trained to track find the concentrated source of a smell** – be it a missing person or a specific object. They follow the direction of the stronger smell.

People smell in stereo too. But our sense of smell is so poor compared to a dog that we make lousy trackers.



These rescue dogs work with Search & Rescue teams to help recover people trapped in avalanches, earthquakes and even mudslides!

10 things dogs help us "sniff out"

Specially trained detection dogs now help people in lots of incredible ways. They can detect . . .

- 1 Cancer cells at the earliest stages
- 2 Bed bugs, termites, ants and other pests
- 3 Peanut butter and other allergens
- 4 Explosives (e.g., bombs, bullets and land mines)
- 5 Dead bodies sunk in the ocean
- 6 Illegal drugs and bags of stolen money
- 7 Smuggled ivory and rhino horn
- 8 Bad guys hiding from police
- 9 Wildlife scat (poop!) from endangered species
- 10 Lost people trapped in avalanches, earthquakes and mudslides



Go on a sniff-ari!

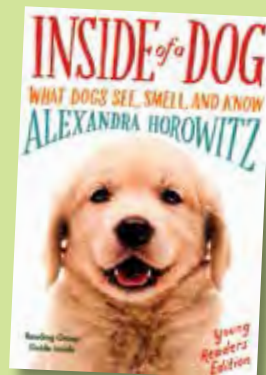
You probably hate it when your parents drag you away from the toy aisle at the store. It's so frustrating! You just want to keep looking. Well, this is what's going on for your dog when she stops to sniff at a tree and you pull her away to keep walking. "Wait," she thinks. "I'm just learning about all the other dogs who left a pee scent here!"

In fact, short walks that **allow your dog to sniff to her heart's content** are just as satisfying as a long walk without stopping to sniff. It may seem odd to only walk a short distance, but it's a serious mental workout for your dog. So, next dog walk, tell your parents you are taking Rex out on a "sniff-ari"!

Win a book about how dogs see, smell and know!

Send us a picture of your dog on a "sniff-ari" and be entered in a draw for *Inside of a Dog* by Alexandra Horowitz. The book explains what dogs think and feel.

Email your photo to kids@spca.bc.ca using the subject line "**Sniff-ari contest.**" Entries must arrive by June 1, 2019. The draw is open to *Bark!* readers ages 13 and under. Remember to include your name, age and address in your email! **Smell you later.**





A DOG'S NOSE KNOWS

A dog's sense of smell is **50 times better than yours**. It is so powerful, dogs can track the **smallest** traces of scent. This is why dogs are trained by search and rescue to find lost people and why the police use dogs to help track down bad guys.

Some dog breeds are better at detecting smells than others. Beagles are great sniffer dogs. If you have termites or bed bugs, you can call on specially trained beagles to **sniff them out**.



Training your scent detector!

Is your dog a smell tracker? If your dog already likes to follow a scent trail, you may have a potential sniffer dog – with some special training.

The “find it” game

Dogs are smart but they need to first learn the “find it” game. You can practise in your home, yard or a park.



1. Start with a food treat your dog really likes. Let her smell the food. While a buddy holds your dog, go hide the treat. It's okay if she sees you hide it the first few times. Making it easy helps her learn the game. Give extra treats and praise every time she finds the hidden treat. Make it fun for her!

2. Gradually make it harder for her to find the hidden treats. Once she knows how to find her favourite food, give her something else to find – like a banana.



Crash! Bang! Boom!

HELPING PETS COPE WITH LOUD NOISES

Have you ever been startled by the roar of a thunderstorm? Or maybe you've plugged your ears when an ambulance siren wailed? There's no doubt about it, the world can be a very loud place. Sometimes it can even make you jump!

Luckily for us humans, once we identify a sound and know that

it doesn't pose a threat, we can take the right action – like staying clear of the ambulance – and feel alert but not afraid. For pets, though, loud noises like thunder, sirens, horns, fireworks and motorcycles can be very frightening. After all, how do they know that the sound they're

hearing isn't a sign of danger? Plus, animals have more sensitive hearing than humans, so noises that aren't bothersome to you may still be upsetting for your pet. The good news? There are things you can do to help your cat or dog cope with loud noises.



1. Desensitize your pet. You can help your pet adjust to loud noises so they don't seem so scary. This process is called desensitization (dee-sense-it-eyes-ay-shun). Look for special CDs or MP3s with sounds like thunderstorms, fireworks, vacuum cleaners and doorbells, or try recording the sounds yourself! To start, play the recording at a level so low it doesn't bother your pet. Do this at random times each day, for 20 minutes at a time.

Over a few weeks, gradually increase the volume so it sounds like the real thing. Act just like normal and resist the urge to comfort your pet during the recordings. This will help him learn that the sounds aren't really threatening. Eventually your pet will be so used to the recordings that he'll no longer be scared when he hears the same noises in real life!

2. Create a calm space.

If you're expecting noises that could upset your pet, like Halloween fireworks, choose a quiet room where she can stay and feel safe. To muffle outside sound and prevent your pet from escaping, keep the doors, windows and curtains closed. Turn on familiar noise like music or television to help drown out the loud sounds. Plus, make sure the room has plenty of toys to keep your pet occupied.



3. Be on the safe side.

Even if you follow the first two tips, your pet may still get scared and try to run away. Remember that all pets should have identification – a tag and a tattoo or microchip – just in case they get lost!

