

# Sense of Touch

When you feel the sun on your face, or shiver when the cold wind blows, you are using your sense of touch. Your sense of smell comes through something small - your nose, and sight from your eyes, but your sense of touch is from your skin. This is the biggest organ on your body. Your skin is very clever and it can tell your brain lots of different information.

## It can tell if you are:

- hot
- cold
- dry
- wet
- hurt
- being pushed
- being pulled

and many other things as well!

Skin does it by using things called receptors. These are all over your skin and each have a job to do. If you touch a piece of wood, they send a little message from your fingertips to your brain to say if it is rough or smooth. Some parts of your skin have lots of these receptors so they are very sensitive, like your fingertips and lips. Other parts don't have that many, so aren't that sensitive like the skin on your arms. Some of the messages the receptors send your brain are nice 'like the feeling of sitting by a warm fire' but others could be really painful, such as cutting your finger.

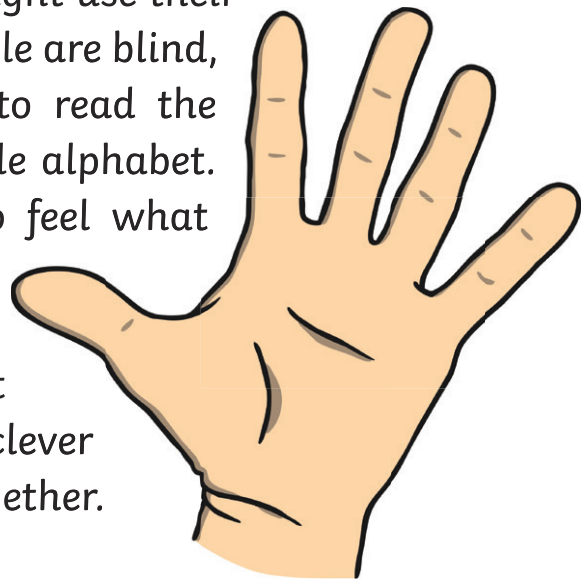
**Amazing Fact** – even though people think they are slimy, snakes have smooth, dry skin.



You are a mammal. This means that you have warm blood but also that you have hair on your skin. The hairs on your skin are important to your sense of touch. They can be very hard to see but they help your skin become more sensitive so you can feel things more easily.

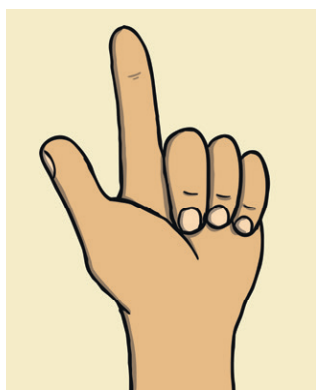
You are very sensitive to touch but there are some amazing animals that are very sensitive as well. The catfish is so good at feeling rumbles that they are able to know when earthquakes are coming. Fish swim in huge groups or shoals by feeling the other fish close to them using special parts down their sides. This means they know when to move without even looking at each other.

We use our sense of touch all the time without knowing. When people lose another sense, they might use their sense of touch to replace it. If people are blind, they might use their fingertips to read the little dots that make up the Braille alphabet. They might use a white stick to feel what is in front of them when they are walking and feel the bumps under their feet when they stop at traffic lights. The body is very clever and the senses work very well together.



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Your sense of touch is when you interact with the world through your skin. The skin is the largest organ of the human body and is covered in receptors. These help you to sense various different sensations. Hot or cold. Smooth or rough. Wet or dry. Your skin is amazing at telling what is going on, and passing these messages on to your brain. Your skin is constantly sending your brain messages about how things feel so the brain is very clever and simply ignores the ones that aren't important. It doesn't need to worry about the fact you are wearing a hat but it would send a warning if some of your skin got very hot, very suddenly. If you were to cut your finger, the brain would get the message and move your finger away so it didn't happen again.



Certain parts of your body are more sensitive than others. For example, your lips, finger tips and toes are very sensitive. The lips can sense very small changes in temperature and your fingertips can find the smallest lumps and bumps. This is how people who are blind are able to learn to read using Braille. This is an alphabet that is made up of raised dots instead of letters printed on a page.

Our skin is amazing. It is made up of different layers with hairs and nerves covering it. There is some pretty awesome skin in the animal kingdom as well. Rhinoceros have skin like armour, which protects them and can be between 1cm and 5cm deep. Frogs don't even need to drink; they absorb water through their skin and even take in air this way.



Did you know that dust is mostly dead skin that has rubbed off people's bodies? Yuck!

You might think that touch is all about using your hands but that isn't exactly true. It could also be about how things feel in your mouth. If you enjoy eating something, it is often because you like the taste but also the texture, which is how it feels in your mouth when you eat it. Crisps wouldn't be as tasty if they weren't crunchy. When we eat something that isn't ripe or has gone off, the flavour is bad but the texture is also really unpleasant.

### **The Most Sensitive Animal Awards**



#### **Best Whiskers: The Harbour Seal**

This seal can track fish swimming 180 metres (591feet) away even in dirty water. It has sensitive whiskers, like a cat, that pick up vibrations from the fish's body.



#### **Best Web: The Spider**

The spider uses the vibrations along the strings of its web to know when it has caught a fly. It will then dash out and wrap it up in silk for later.

Technology is using touch in many new and interesting ways. Many computers and tablets now use touch screens to select apps. Fingerprints are being used to unlock phones, and athletes wear skin tight materials that breathe with the skin. The technology of touch is just beginning.

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Many people will own or have access to a smartphone or tablet computer. These work by the user touching the right part of the screen to select the app they want. This technology is quite new and works by using one of the five senses, the sense of touch.

Our skin works a bit like one big touch screen, sending information back to our brains about what is happening. Human skin is coated in a variety of receptors, which pass messages to the brain through nerves about the environment. The nerves carry the messages to the brain as tiny electrical signals that travel down the nerve, up the spinal cord, and to the brain. The skin is able to feel four main sensations:

- heat
- cold
- pain
- pleasure

This means that you are easily able to tell when it is warm and cool and whether something hurts or not. Other sensations need more sensitive receptors. For example, it is difficult to tell whether something is rough or smooth unless you use either your fingertips, toes or lips. This is because those parts of your body are packed with receptors that are far more receptive. Your body is an expert at using a combination of information from all of your receptors to make judgements about sensations.

You are not always aware of how your clothes feel against your skin as your body filters out this information, deciding that it is irrelevant. It only uses relevant information so that you can make choices, like if you were too cold – you would go inside or put a coat on?

Did you know nerve signals travel at a speed of 100 metres per second?!



The human body has adapted amazingly to react to sensations. We even do this when we eat! When you bite into a crisp apple, you have receptors telling your brain what it tastes like but also how crunchy it is. They enjoy the texture. Our brains love this combination of two senses and, in studies, people don't enjoy the apples as much without the crunch even if they taste great.

Though we are very sensitive to changes in our environment, we cannot match some of the members of the animal kingdom for sensitivity.



### **The Jewel Beetle**

It can use an infrared sensor under one of its legs to detect a fire over 50 miles away. Bizarrely, the beetle then chooses to head towards the fire. This is because once the fire is over, the burnt tree trunks offer a rare opportunity for the jewel beetle to lay its eggs in an environment with no predators.



### **The Star Nosed Mole**

This almost blind animal's unique nose has almost six times more touch receptors than a human hand and it uses its nose more for feeling than smelling. As it makes its way down a tunnel, it whips its twenty-two tentacles back and forth with incredible speed touching 10 to 12 different objects per second.

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