

# CHAPTER 22

In the last chapter, you looked at two of your five external senses: smell and taste. You also read that all of your senses have sense organs that help to “unlock” messages sent to your brain.



In this chapter, you are going to look at your three external senses that are left: vision, hearing, and touch. Let's start with your...

## Vision

Your sense organ for vision is your eyes! You may not know this, but your eyes have a lot of parts to them!

Once you open your eyes in the morning, you should be able to see everything in your room. This is because light is bouncing off of everything you can see and into your eyeballs!

To be more correct, all of this light enters the black “dot” in your eye known as the **pupil** (“pew-pill”). The pupil is an opening in your eyeball that changes size with the amount of light that is shining in your eyes.

The more light that enters your eyes, the smaller your pupils will be! Try to look at your eyes in the mirror and remember how big your pupils are. Now close your eyes and wait for a couple of minutes. When you open your eyes, you will notice how the size of your pupils will look **huge** at first, and then they will start to shrink back to a smaller size! As your eyes were closed, your pupils began to get larger because there was not much light entering your eyes!

Your **iris** is the colorful portion of your eye! The job of the iris is to change the size of the pupil.

Once the light enters your pupil, it bounces into your **retina** ("rhet-in-ah"). The retina can be found behind your pupil. This part of your eye has a very important job! The retina acts just like a camera! It takes a picture of what you are looking at and sends it to your brain. If your brain sees a picture of a candy bar, you may start reaching for it... but if your brain sees a picture of an elephant running towards you, you better start running!

## look familiar?



MANY DIFFERENT ANIMALS, LIKE THESE CATS, HAVE EYES WHOSE PUPILS MOVE TOO

SMALL PUPILS/MUCH LIGHT



LARGE PUPILS/LITTLE LIGHT



## Other parts of your eyes are used to protect themselves...

**Eyebrows** (those bushy strips of hair above your eyes) help to keep sweat from dripping into your eyes! **Eyelashes** act just like the hairs in your nose...they try to "sweep away" any bad stuff in the air that may get into your eyes! **Eyelids** also sweep away dirt and other junk that gets on your eyeballs as well just like windshield wipers on your car! Every time you blink, you are cleaning your eyes with your eyelids! Don't forget about your **tears**! Tears work with the eyelids to wash away bad stuff from your eyes!

Now, on to your next sense...

## Hearing

Have you ever placed your hand on a speaker while music is playing? If you have, you should have felt vibrations in your hand!



Those vibrations cause the air around the speaker to vibrate as well. We call these vibrations in the air, **sound waves!** As these sound waves move through the air, they can end up entering your ears. Your sense organs for your sense of hearing are your ears!

As sound travels through your ear, it reaches your eardrum. Your eardrum is very thin covering inside your ear. Your eardrum vibrates when sound waves bounce off of it!

The vibrations from your eardrum cause the little bones inside your ear to vibrate as well. One of these bones, called the **cochlea** ("coke-lee-ah"), is filled with liquid. As your cochlea vibrates, so does the liquid inside!! Now, here comes the cool part...

The inside of your cochlea is covered with tiny little hairs that vibrate as well! Each of these hairs sends its own message to the brain. And, each of these messages tells the brain what kind of sound you are listening to!

When your brain gets the message, it tells your body whether or not to dance, jump or run for cover!

**One more sense to go.....**

# Touch

Unlike your other senses, your ability to touch uses sense organs that cover your entire body! Your skin is your sense organ for your sense of touch.

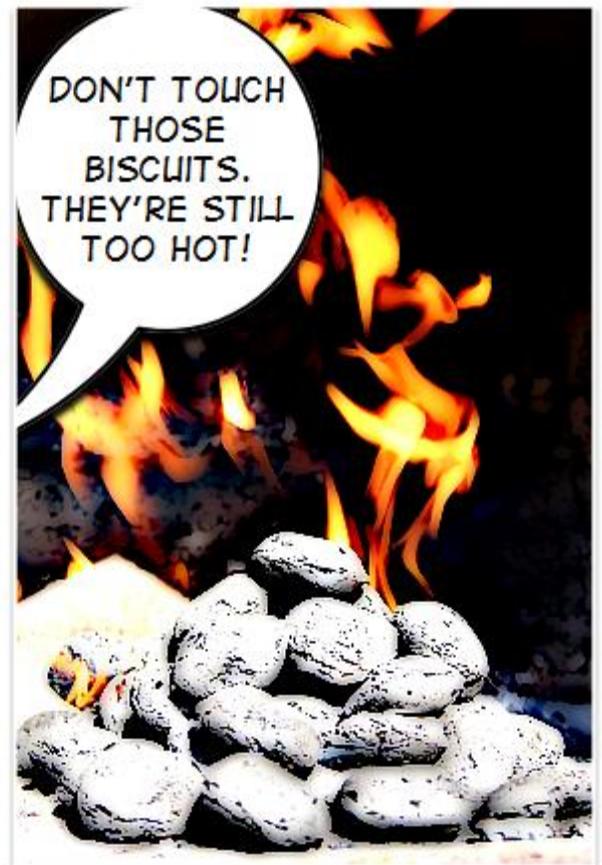
All of your sense organs have areas that send messages to your brain...

- The hairs in your cochlea
- Your taste buds
- Your ability to detect smells
- The retina in your eyes

**Your skin is no different than any of these sense organs!**  
**Your skin can sense a lot of different feelings!**

The most common feelings are:

**Heat**  
**Cold**  
**Pressure**  
**and Pain**



The areas of your skin that sense these feelings are called **nerve endings**. Nerve endings are found all over your body. However, they are not spread out evenly in your skin! Some areas of your skin have more nerve endings than other areas.

For example, your fingers can feel heat, cold, pressure and pain very well because you have many nerve endings in them! This is important because you use your hands every day!

## Nerve endings are not found everywhere in your body!

Some areas of your body that you can see and feel do not have any nerve endings in them at all. Your hair and fingernails are good examples of this.

You don't scream in pain every time someone cuts your hair do you?



# I hope not!

Our hair and fingernails help to protect our bodies. Our hair can keep us warm and act as a filter to keep bad things from getting into our bodies (remember to thank you nose hair!). Fingernails protect the ends of our fingers from getting hurt. The tips of our fingers are filled with nerve endings that we use everyday!

Our five senses are very, very, very important for us to survive. However, they are not the only senses that can be used by animals or plants. That's right! Plants can sense things too!

**In the next chapter, you will explore several different senses that organisms use to survive...**

## Circle the hidden words from below

E C S S Q I R J N G S S S Z W  
 N B O X E E K S N D X W R K U  
 D D D C T H T Z I I D O N Y O  
 I E O I H J S L Y K N R U Z L  
 N G N N K L E A J U U B C H L  
 G A B K K Y E I L X O E Q R S  
 S I J K E Y J A J E S Y X G K  
 K J R H L I P U P E Y E S A B  
 X M X I X B P N E R V E J O M  
 S I G U S H E A R D R U M N Z  
 Z R R U L E W F E C W D A S W  
 T F A W L U S O V N G H E B A  
 K Z T E U X G U K A F V I V Z  
 W X R Y T P Y Y B Y A N W Q N  
 E B Y K G V X R F W B G Z M T

**COCHLEA**  
**EYEBROWS**  
**IRIS**  
**RETINA**  
**WAVES**

**EARDRUM**  
**EYELASHES**  
**NERVE**  
**SOUND**

**ENDINGS**  
**EYELIDS**  
**PUPIL**  
**TEARS**

Match the words in the first column to the best available answer in the second column.

- |                 |  |
|-----------------|--|
| _____ Pupil     | 1) bushy strips of hair above your eyes that help to keep sweat from dripping into your eyes               |
| _____ Iris      | 2) part of your ear that vibrates when sound waves hit it  |
| _____ Retina    | 3) protective skin that can surround the eye and sweep away dirt and other junk that gets on your eyeballs |
| _____ Eyebrows  | 4) the colorful portion of your eye that changes the size of the pupil                                     |
| _____ Eyelashes | 5) takes a picture of anything you see and sends it to your brain  |
| _____ Eyelids   | 6) areas in your skin that sense the feelings of heat/cold/pressure/pain and taste                         |

- \_\_\_\_\_ Tears
- 7) looks like a seashell and is filled with fluid; when sound waves vibrate the eardrum tiny hairs inside the cochlea vibrate too; each hair sends a different message to the brain
- \_\_\_\_\_ Sound waves
- 8) the black "dot" in your eye where light enters your body
- \_\_\_\_\_ Eardrum
- 9) fluid that is made by your eyes to keep them wet and clean
- \_\_\_\_\_ Cochlea
- 10) vibrations that cause any kind of noise
- \_\_\_\_\_ Nerve endings
- 11) protective hairs that "sweep away" any bad stuff in the air that may get into your eyes

**Which one is right? Circle the correct answer.**

**1. To protect your eyes, your body uses \_\_\_\_\_.**

- a. eyebrows and eyelashes
- b. eyebrows, eyelashes and eyelids
- c. eyebrows, eyelashes, eyelids and tears

**2. Which happens first?**

- a. light enters your retina
- b. light enters your iris
- c. light enters your pupil

**3. What part of the ear sends messages to the brain?**

- a. cochlea
- b. tiny hairs inside the cochlea
- c. eardrum

**4. Which sense has the largest sense organ?**

- a. hearing
- b. vision
- c. touch

**5. Nerve endings can be found in which group of body parts?**

- a. fingernails, hair and the tongue
- b. tongue, skin and hair
- c. tongue, fingers and ears

**6. Which of the following paths of sound is in the correct order?**

- a. soundwaves cause the eardrum to vibrate, then the cochlea and finally the hairs inside the cochlea
- b. soundwaves cause the cochlea to vibrate, then the tiny hairs inside the cochlea and finally the eardrum
- c. soundwaves cause the eardrum to vibrate, then the hairs inside the cochlea and finally the cochlea