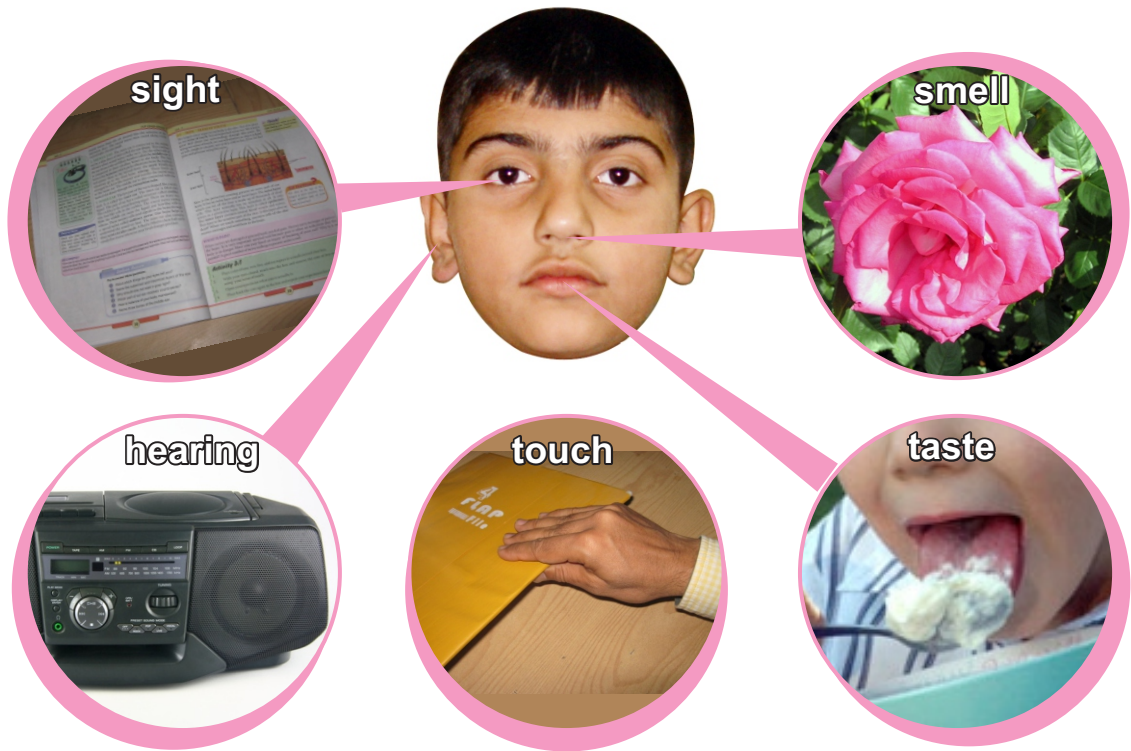


Chapter 2

Sense Organs



Our senses tell us about the surrounding world.

Student Learning Outcomes

After completing this chapter, you will be able to:

- Explain the structure and function of eye.
- Explain the structure and function of ear.
- Explain the structure and function of skin.
- Explain the structure and function of nose.
- Explain the structure and function of tongue.

The world around us is very interesting. Allah Almighty has blessed us with five sense organs to enjoy the world. **Sense organs** are special parts of our body that tell us what is going on around us. Our eyes, ears, skin, nose and tongue are our sense organs. All the sense organs are linked to the **brain** by nerves.

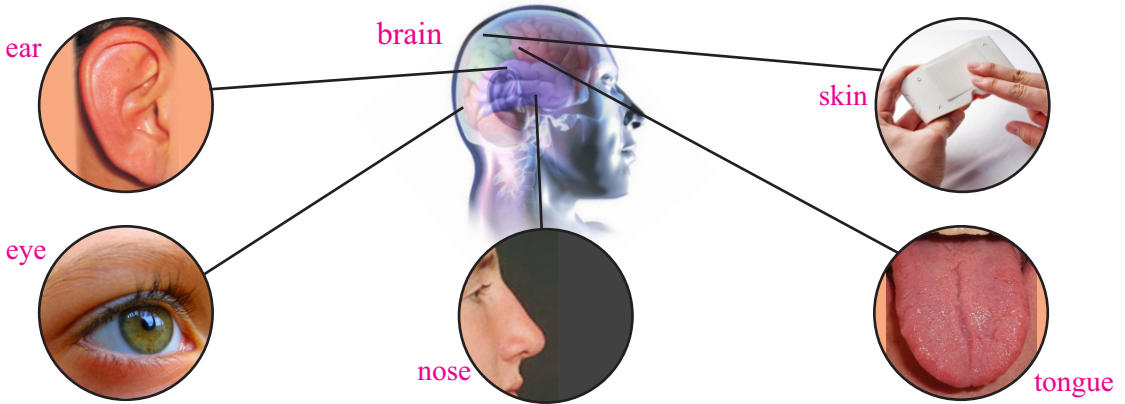


Fig.2.1: Our brain controls every thing that our body does.

The Eye

We see with our eyes. Our eyes tell us about colours, shapes and movements of objects around us. The eye is an organ of sight.

The human eye consists of an eyeball. The eye is covered with eyelids. Eyelashes on the eyelids keep away dust particles. Under the upper eyelids tear glands open.

Main parts of our eye are cornea, iris, pupil, lens, retina and optic nerve (Fig.2.2).

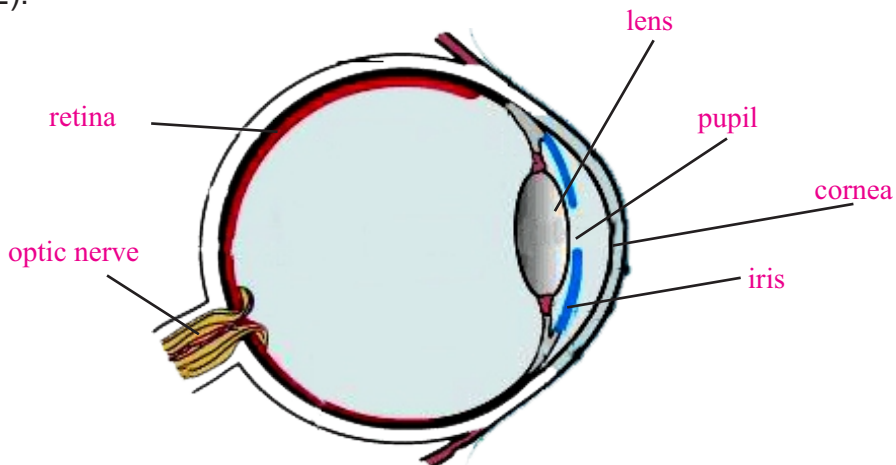


Fig.2.2: Internal structure of human eye

Cornea

In the front of eye, the transparent part is called **cornea**. Light rays enter the eye through the cornea.

Iris

Beneath the cornea the coloured portion of the eye is called **iris**. Have you ever observed brown, blue and hazel eyes of your friends?

There is a hole in the middle of the iris, known as **pupil**. This pupil contracts in bright daylight and expands in dim light.

Lens

Behind the pupil, a flexible **lens** is present. The lens helps the eye to focus light.

Interesting Fact

The lens in your eye can change its shape to see near and far objects. It becomes thick to see near objects. It becomes thin to see far objects.

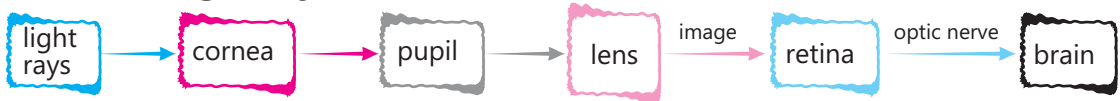
Retina

The light sensitive portion of the eyeball is called **retina**. Eye lens forms the image on the retina.

Optic nerve

When light hits the retina, its cells make nerve signals. These signals pass along the **optic nerve** to the brain.

Functioning of Eye



Do you know?

Our eye is similar to a camera. Both have lens. The lens in our eye forms image on the retina but camera lens forms an image on the film.

Observe model or chart of structure of eye. Identify different parts of human eye and draw a diagram.

The Ear

We hear sounds through our ears. Ear is an organ of hearing. Human ear consists of three parts; outer ear, middle ear and inner ear (Fig.2.3).

Outer Ear

The outer ear consists of a **pinna** and a long narrow tube called **ear**

canal. The pinna collects sound waves from the air around. The sound waves then travel along the ear canal.

Middle Ear

The outer ear is connected to the middle ear by a thin membrane called the **ear drum**. The eardrum vibrates when sound waves strike it. On the other side of the ear drum is the middle ear which is filled with air. It has three small bones in the body, i.e. **hammer, anvil** and **stirrup**.

Inner Ear

The last part of the ear is the inner ear. The inner ear is filled with a liquid. This part of ear has a coiled structure called **cochlea**. The cochlea is the actual hearing organ. The cochlea sends signals to the brain through a special nerve called **auditory nerve**.

Interesting Fact

Some animals can twitch their ears to catch sound waves. A horse can move its ears. We can not move our ears.

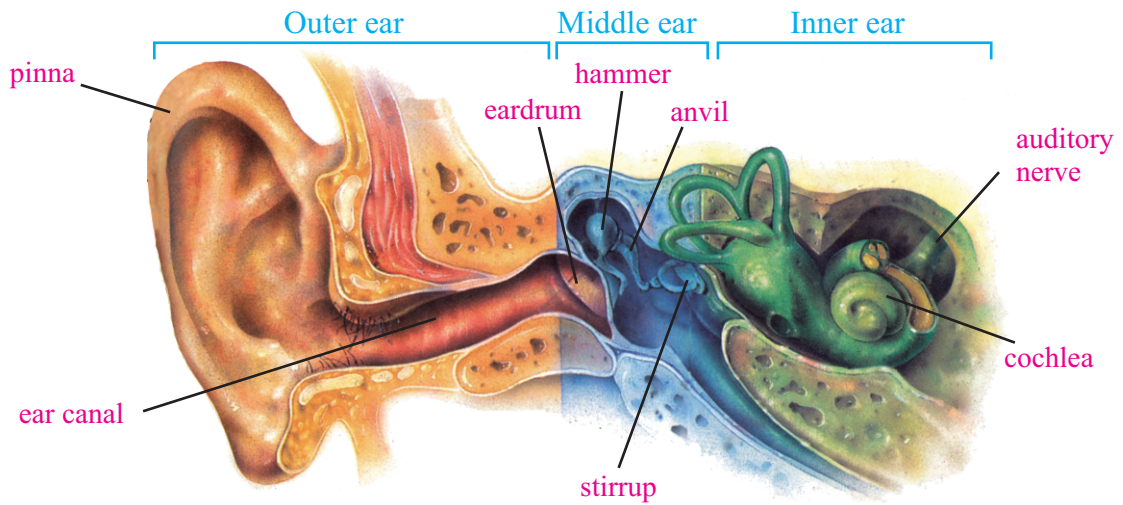
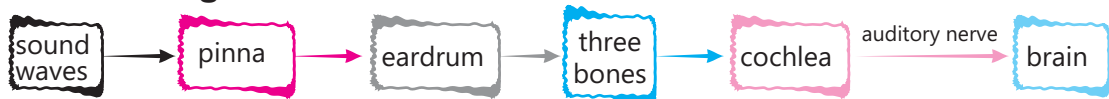


Fig.2.3: Internal structure of human ear

Functioning of Ear



Observe model/chart of human ear. Identify its different parts. Draw a diagram and label its various parts.

The Skin

The largest sense organ in our body is the skin. Skin is the organ of touch. Skin covers every part of our body. It protects the inner parts of our body. The skin contains several kinds of cells that detect pain, pressure, touch, heat and cold.

Our skin has an outer layer and an inner layer (Fig.2.4). The **outer layer** has colour pigment and protects the skin from harmful rays of the Sun. The **inner layer** has blood vessels, nerves, sweat glands and roots of hairs. This layer is the sensitive part of the skin. When we touch something, sensitive cells of the skin receive messages and send them to the brain.

Interesting Fact

A blind person can read Braille, by using the sense of touch.

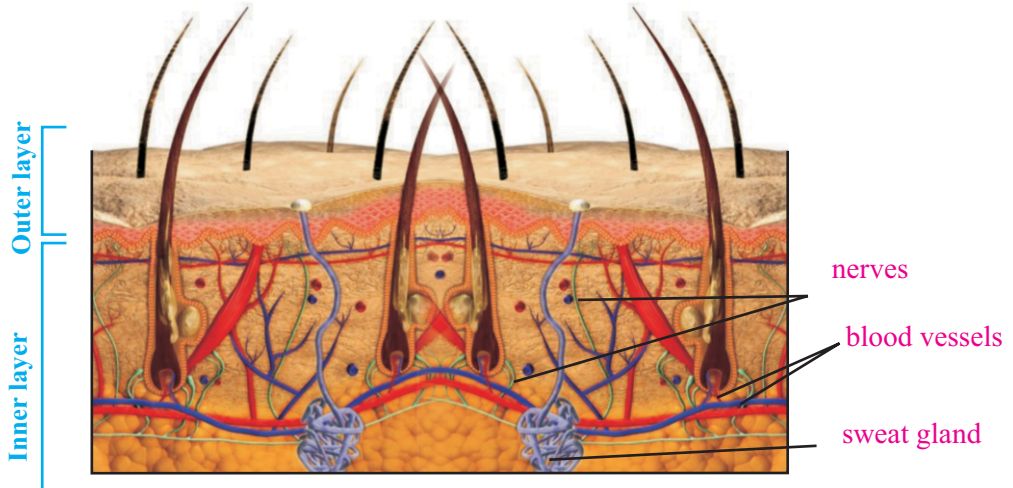
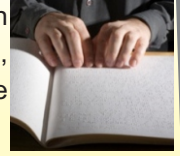


Fig.2.4: Internal structure of human skin

Do you know?

The skin at the tips of the fingers is most sensitive. The least sensitive part of our body is our heel.

1. Place coins of one, two and five rupees in a small covered shoe box. With your eyes closed, reach into the box and remove the coin of five rupees.
2. Open your eyes to see what coin it actually is.
3. Place back the coin again and repeat your experiment for other coins too.

The Nose

Suppose there is a dead and decaying rat in one of your room's corners. How would you come to know about the dead rat? Of course, you would smell bad odour in the room. The sense organ for smelling is the nose.

Our nose is a hollow air passage. It has two openings called **nostrils**. In each side of the nose is an air chamber (Fig. 2.5). The roof of the nose has lining of nerve cells to sense smell. When certain odour chemicals present in air enter our nose, they touch the nerve cells. Nerve cells pass the message to the brain through the **olfactory nerve**. Our brain tells whether the odour is pleasant or unpleasant.

Interesting Fact

Smells are tiny particles that breaks off the surface of things and float in the air

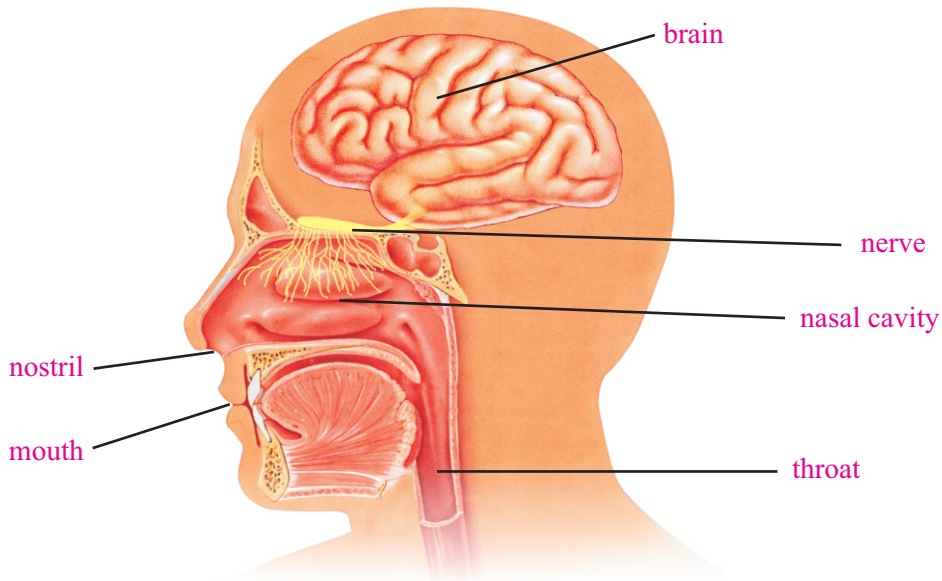


Fig.2.5: Internal structure of human nose

Do you know?

- Dogs have very strong sense of smell. They are often used to trace thieves and drugs.
- Our nose can detect 10,000 different scents and smells.
- Our sense of smell also helps our sense of taste.

The Tongue

Our tongue is the sense organ of taste. It helps to detect the flavour of food. We can detect sweet, salty, sour and bitter tastes with our tongue.

The upper surface of the tongue is covered with many pimple like lumps (Fig.2.6). Between these lumps, **taste buds** are present. Each taste bud has many nerve cells. When particles of a food touch the taste buds, nerves send signals of taste to the brain.

We feel sweet, salty, sour and bitter tastes on different parts of our tongue. The tip of the tongue has taste buds to detect sweet taste. The sides of the tongue are sensitive to salty and sour tastes. The back of the tongue has taste buds to detect bitter taste.

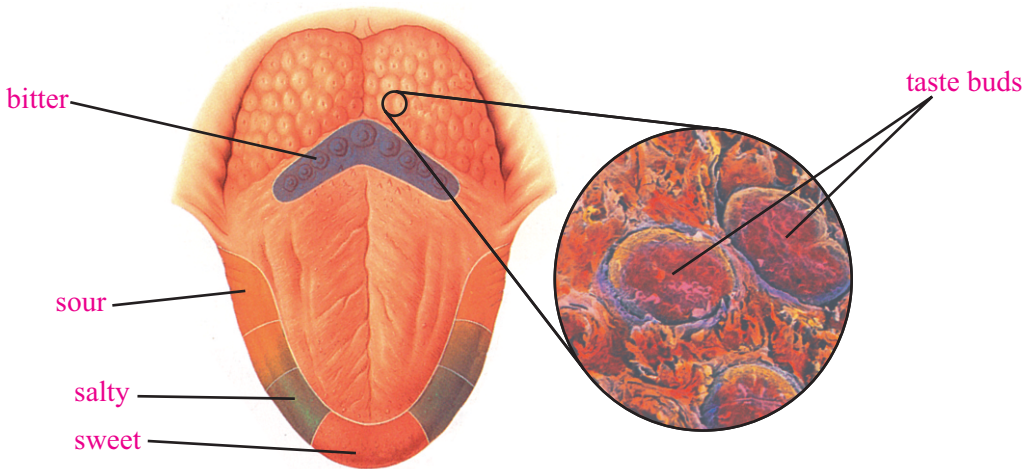


Fig.2.6: Different parts of the tongue detect different tastes.

Check the tastes of sugar (sweet), bitter gourd (bitter), lemon (sour) and table salt (salty) on different parts of your tongue.

1. Our body has five main sense organs.
2. Eye is the sense organ of sight.
3. Our ears are the organs for the sense of hearing.
4. Skin is the organ for the sense of touch.
5. The sense organ for smelling is the nose.
6. The sense organ for taste is the tongue.

1. Write proper term/word against each statement.

- i. It can feel the pressure _____
- ii. The hole in the middle of the iris _____
- iii. Air enters the nose through it _____
- iv. Carries signals from ear to brain _____
- v. Present on our tongue _____

2. Circle the letter of the best answer.

- i. The control room of our body is:
(a) heart (b) stomach
(c) brain (d) liver
- ii. The most sensitive part of our eye is:
(a) retina (b) cornea
(c) pupil (d) lens
- iii. A dumb by birth can not speak. He/She also has no:
(a) sense of touch (b) sense of taste
(c) sense of hearing (d) sense of sight
- iv. The olfactory nerve links:
(a) eye and brain (b) nose and brain
(c) ear and brain (d) tongue and brain
- v. Which senses of our body are closely related?
(a) touch and smell (b) smell and taste
(c) taste and hearing (d) seeing and touch
- vi. Which sense organ also functions as a sense organ for temperature?
(a) nose (b) tongue
(c) ear (d) eye

3. Answer the following questions in detail.

- i. Describe the structure of human eye.
- ii. Describe the structure and function of inner ear.
- iii. Write a note on the sense of smell.
- iv. What is the importance of our tongue?
- v. Write a note on our sense of touch.

4. Extend your thinking.

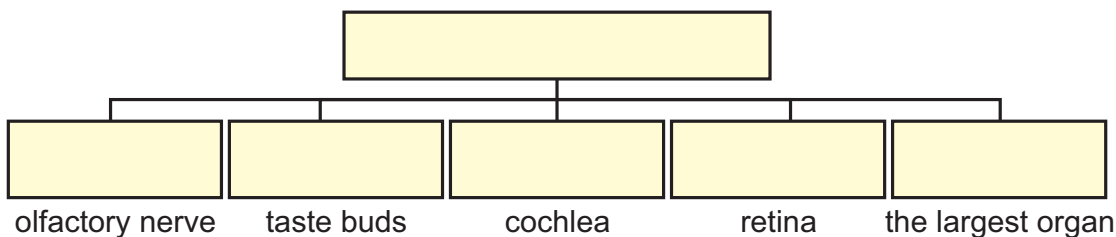
- i. What does happen to pupil of our eyes when we switch the lamp on?

- ii. Some times as a result of a cold, the middle ear becomes filled with fluid. Why do you think this can cause a temporary loss of hearing?
- iii. What is the advantage of having a lens in the eye that can change its shape?
- iv. Have you ever faced an injury of breaking of your nail? Why is it so painful?

5 Concept Map

Use following terms to complete the concept map.

skin, nose, ear, eyes, tongue, sense organs



- 1 Blow up a balloon and see if you can feel sound vibrations. Hold a tube of cardboard against the balloon and make a loud noise into it. Can you feel the vibrations in the skin of the balloon? Your ear drum feels sound vibrations in the same way.
- 2 Put water in four cups. Add salt to one, lemon juice to another and sugar to another. Leave the fourth. Ask your friends to hold their noses and taste them. See if they can tell the difference. Without smell, should they all taste the same?

All the sense organs are linked to the brain by nerves. When we hear a bell ring, nerves carry a signal to our brain. Our brain tells us that we are late for school. We must hurry. Our brain is like a big computer. It controls everything that our body does. Why do we think a healthy brain makes our senses better? How can we keep our brain healthy? Can mathematics and computer help us in this regard?

Computer Links

- <http://idahoptv.org/dialogue4kids/season10/senses/facts.cfm>
- <http://faculty.washington.edu/chudler/chsense.html>