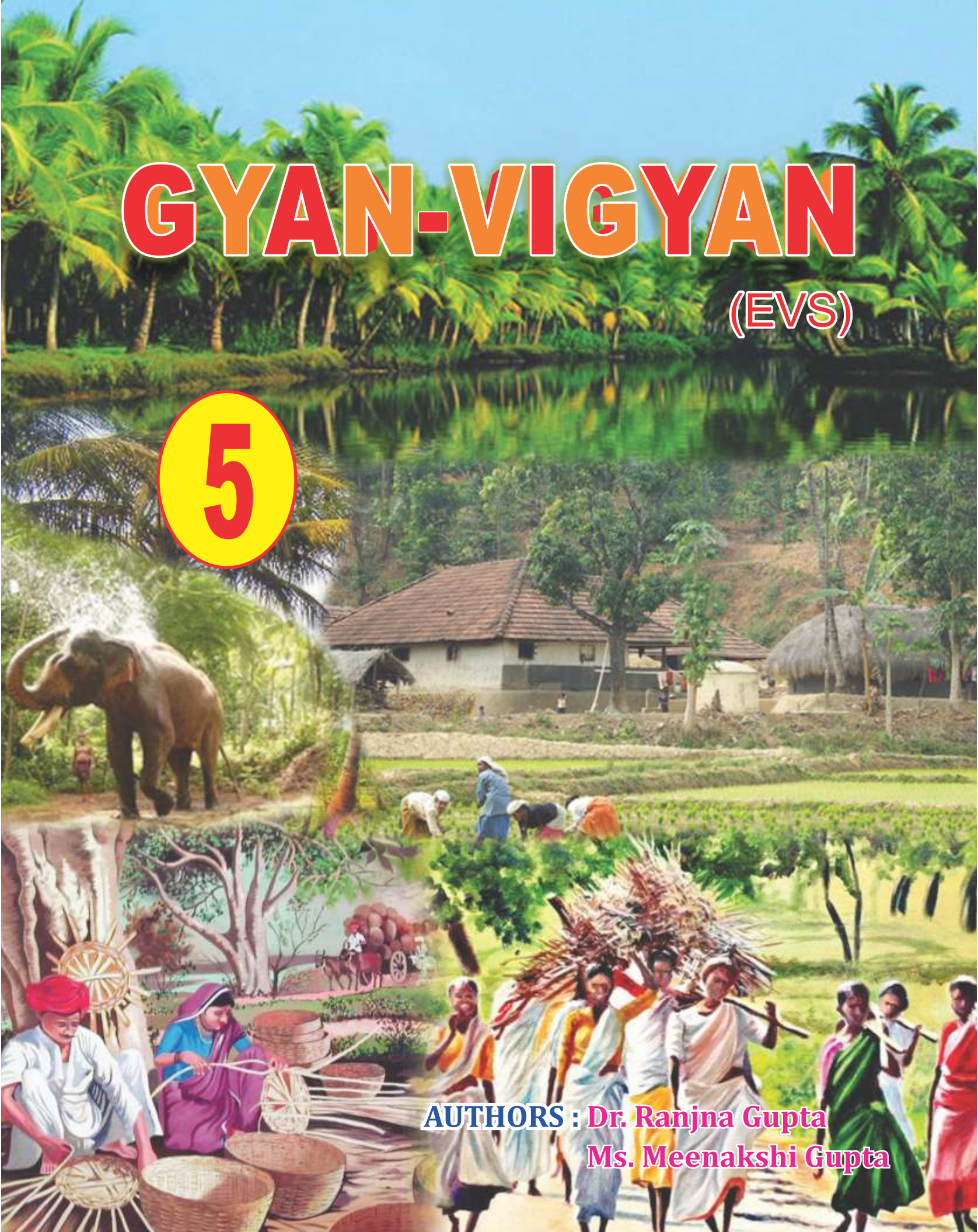


# GYAN-VIGYAN

(EVS)

5

**AUTHORS :** Dr. Ranjna Gupta  
Ms. Meenakshi Gupta



# GYAN-VIGYAN

## (EVS)

5



**Vidya Bharti Uttar Kshetar**

Narayan Bhawan, Gita Niketan Parisar, Salarpur Road, Kurukshetra-136118



01744-259941



vbukprakashan@gmail.com, vbukkr@yahoo.co.in



vbukprakashan.com

## प्रकाशक एवं वितरक

# Vidya Bharti Uttar Kshetar

Narayan Bhawan, Gita Niketan Parisar, Salarpur Road, Kurukshetra-136118

☎ 01744-259941 ✉ : vbukprakashan@gmail.com, vbukkr@yahoo.co.in 🌐 : vbukprakashan.com

## वितरण-केन्द्र

### भारतीय शिक्षा समिति, जम्मू कश्मीर प्रदेश

भारतीय विद्या मंदिर परिसर, अम्बफला, वेद मंदिर, जम्मू-180 005

दूरभाष : 0191-2547953

E-mail: bssjk08@gmail.com

E-mail: bssjmu2006@yahoo.com

### सर्वहितकारी शिक्षा समिति, पंजाब

विद्या धाम, गुरु गोबिन्द सिंह एवेन्यू,

नजदीक टेलीफोन एक्सचेंज, जालन्धर-144 009

दूरभाष : 0181-2421199, 2420876

E-mail: ses.jld@gmail.com

### हिमाचल शिक्षा समिति, शिमला

सरस्वती विद्या मन्दिर, हिम रश्मि परिसर, विकास नगर,

शिमला-171 009, दूरभाष : 0177-2620813, 2620814

E-mail: himachalshikshasamitishimla@gmail.com

E-mail: shikshasamiti@sancharnet.in

### हिन्दू शिक्षा समिति, हरियाणा

संस्कृति भवन, गीता निकेतन आवासीय विद्यालय परिसर,

लाजपत राय मार्ग, कुरुक्षेत्र-136118 (हरियाणा)

दूरभाष : 01744-270241, 9996542500

E-mail: hsskk@yahoo.co.in

### ग्रामीण शिक्षा विकास समिति, हरियाणा

संस्कृति भवन, गीता निकेतन आवासीय विद्यालय परिसर,

लाजपत राय मार्ग, कुरुक्षेत्र-136118 (हरियाणा)

दूरभाष : 01744-270241, 9996542500

E-mail: gsvskkr@yahoo.co.in

### हिन्दू शिक्षा समिति-दिल्ली

डी.ए.वी.व.मा. विद्यालय क्र. 2, शंकर नगर, दिल्ली-110 051

दूरभाष : 011-22008542

E-mail: hindushikshasamiti@gmail.com

### हिन्दू शिक्षा समिति, न्यास

गीता बाल भारती परिसर, राजगढ़ कॉलोनी,

दिल्ली-110 031

दूरभाष : 011-22002957

E-mail: hssn2604@gmail.com

### समर्थ शिक्षा समिति

सरस्वती शिशु/बाल मन्दिर परिसर, आरामबाग,

डेसू कार्यालय के पास, पहाडगंज, नई दिल्ली-110055

दूरभाष : 011-23631216, 23631247

E-mail: samiti59@yahoo.com

## New Edition - 2020

### वैधानिक चेतावनी

यह पुस्तक विद्या भारती उत्तर क्षेत्र द्वारा प्रकाशित है। इस पुस्तक का प्रत्येक भाग सर्वाधिकार सुरक्षित है।

### Author : Dr. Ranjna Gupta

M.sc. M.Phil Ph.D B.ed  
PGT Chemistry, Geeta Bal Bharti  
Raj Garh Colony, Delhi-31

### Co-Author : Ms. Meenakshi Gupta

B.Arch.

### मुद्रक: बुलबुल प्रिंटिंग प्रैस

प्लॉट नं. 1831, दीप कॉम्प्लेक्स,  
हल्लो माजरा, चण्डीगढ़

दूरभाष: 9815963599, 9041364509

ई-मेल: bulbulpress@gmail.com

## Preface

This book, 'Gyan Vigyan' deals with the child and his relation with the environment and surroundings. It gives knowledge of health and hygiene also. The main purpose of this series is to make the learning of environmental studies interesting and creative for the young beginners. It gives the impact that the subject is easy and child friendly.

It links the learners to their surroundings e.g. family, neighbours, community, environment and eco system. It will help the children to inculcate values like cleanliness, honesty, co-operation, concern for life and environment. The book is written in simple language, colourful illustration and interesting activities.

Each chapter is followed by exhaustive exercises that include true/false, fill in the blanks, match the following and simple questions. Things to remember at the end of each chapter provides quick revision of the chapter.

We have tried our best to present the book according to the need of students. We welcome your suggestions for further improvement.

**Dr. Ranjna Gupta**

# CONTENTS

S.No.	Topic	Page No.
1	Super Senses	1
2	A Snake Charmer's Story	12
3	From Tasting to Digesting	18
4	Mangoes Round the Year	23
5	Seeds and Seeds	31
6	Every Drop Counts	39
7	Experiments with Water	47
8	A Treat for Mosquitoes	54
9	Up you go	60
10	Walls Tell Stories	65
11	Sunita in Space	72
12	What if it Finishes ....	80
13	A Shelter So High	86
14	When the Earth Shook	94
15	Blow Hot Blow Cold	100
16	Who will do this Work ....	106
17	Across the Wall	111
18	No Place for Us	116
19	A Seed tells a Farmer's Story	121
20	Whose Forest ....	127
21	Like Father Like Daughter	135
22	On the Move Again	140

# Chapter 1

## Super Senses

We have five senses i.e., sense of sight, sense of smell, sense of hearing, sense of touch and sense of taste.

Other animals also have senses. Ants like humans also live in colonies. Each of their colonies or communities have a queen ant that produces large number of eggs that are to be the next generation. Only the queen can lay eggs in a colony. When the offspring hatch out and grow, all male ants have wings, some females also have wings. These winged females are the next queens. Other female ants become workers or soldiers. The queen mate with one of the males called drones and then all males die. After mating, queen gets settled in one nest and produce eggs for new generation. No ants have ears and some of them are blind, but they have great sense of smell. They can smell with their antennae on their heads. Because each colony has different smell from the other, even though they belong to the same species, they can recognise their companies and enemies.

Each ant produce a chemical called pheromone. When they move they get a smell of this and get attracted towards this. Due to this they move in a queue. The more ants circulate the route, the stronger pheromones remain on the way between the food and the nest. This is the way they make a perfect procession.

When they smell the food, they come to it, collect it and go to their nest.

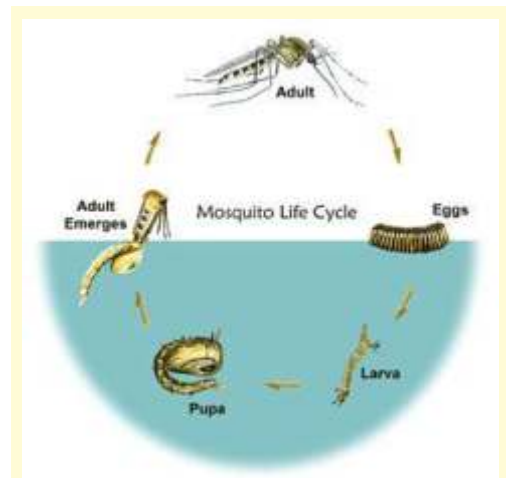
Mosquito is a type of insect. Like many insects mosquitoes go through four life stages that include egg, larva, pupa and adult. The female mosquitoes lay their eggs in water, where they can sit from 24-36 hours. Once they



Row of Ant



Ant hill



Life cycle of mosquito

hatch, the mosquitoes are in their larva phase for 7-14 days. During this time they feed on organic debris and micro organisms in water. The mosquitoes stay in pupa phase for about 2 days until they exit their pupal skin and fly off to find their first blood or nectar meal.

The life span of a mosquito is about two weeks. Mosquitoes do not feed on blood, they get the nutrients from the nectar of flowers and plants. Blood is required for the development of eggs, which require certain proteins found in the blood. Because males do not lay eggs, so it is only female mosquitoes that suck blood.

Female mosquitoes can locate its victim by detecting carbon dioxide level in air. Once carbon dioxide is exhaled from the lungs, the mosquito may follow the carbon dioxide trail in a zig zag manner until it has located the source. Once located, the female mosquito can puncture the skin with its mouth part. Many species of mosquito can take blood in up to four times their weight. They are able to do this due to special chemicals in their saliva which keeps our blood from clotting. Once it has fed, female mosquito will finish developing its eggs and lay them in a still water source.

## **WHAT ELSE ARE MOSQUITOES ATTRACTED TOO ?**

Using highly sensitive sensory hairs along the length of their antennae, mosquitoes are able to detect many changes in their environment which allow them to find easily their blood meal. Depending on the species, female mosquitoes can detect a host to feed on from upto 40 meters away. These structures can sense changes in the air moisture, heat, movement and vibrations, as well as the levels of chemicals in the air like carbon dioxide and lactic acid. There are about 400 chemicals emitted from human skin and about 100 volatile compounds in each human breath that mosquitoes can detect. They also find you by the smell of the sole of your feet and the heat of your body.

Mosquitoes can spread Malaria, Dengue, Chickengunia etc.

The best way to control the population of mosquitoes is to remove their breeding ground. Other steps you can take to prevent mosquito bites are:

1. Proper use of insect repellent.
2. Wearing long sleeves and full pants.
3. Replace outdoor lights by bug lights.

#### 4. Securing door and window screens.

In dogs sense of smell is predominant, so much so that a huge part of its brain is devoted to analysing odour. Dogs can detect odour (smell) upto 40 feet underground. Dogs can smell human finger prints that are a week old. Dogs can detect cancer in humans. Scientists think that simply by sniffing samples of human breath, dogs can detect lung, breast and other cancers with an accuracy rate of between 88 to 97%. Dogs can also be trained to alert people with heart conditions they are about to suffer. Dogs help police and forensic department to extract information on theft and murder.



Dogs mark out their own area on the road. They can make out if another dog has come into their area by the smell of its urine or potty (latrine).

Although human sense of smell is feeble compared to that of many animals, it is still very acute. Our smelling sense is carried out by two small odour detecting patches - made up of about five or six million yellowish cells - high up in the nasal passage. If we compare with dog, it has about 220 million cells. The human nose is in fact the main organ of taste as well as of smell. If we close the nose and eat, then we can detect only four types of taste i.e., sweet, sour, bitter and salt. Other can be tested by smell.

People can detect at least one trillion distinct scents. We can smell fear and disgust also through sweat. Women have a better sense of smell than man. As the person grow older his sense of smell decreases. Loss of smell at early age may be a sign of Parkinson's disease.



Sometimes sense of smell is also related to our thinking. Mother can clean potty of her baby easily and happily but she cannot clean other baby of same age even of her sister. This is all related to our thinking.

Same thing happens when we walk near a heap of garbage. It has a bad smell but children picking things from it can spend the whole day in it. It is bad for us but not bad for them who



**Garbage**



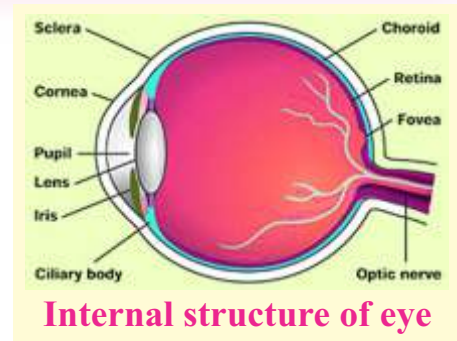


Eye

work there.

### **SENSE OF SIGHT :**

We see with our eyes. Eyes have two types of cells - rods and cones. The cone cells



**Internal structure of eye**

are sensitive to color. The rod cells are not sensitive to color, but have greater sensitivity to light than the

cone cells. These cells are responsible for night vision. color blindness is a common abnormality in human vision that makes it impossible to differentiate colors accurately. One type of color blindness results in the inability to distinguish red color from green.

To see in full colors, humans use three types of cones : red, blue and green. Cats and dogs have only blue and green cones. This is similar to color blindness in humans. Cats and dogs are not sensitive to red light, they can distinguish red from blue, but often confuse between red and green. Also they often perceive green as grey.

Birds have three types of cells (photo receptors) in their eyes which translate light into nerve impulses. There are rods for black and white vision in dim light, cones - for color vision in bright light and double cones for color vision. Thus birds can see more colors than humans.

Birds move their head sideways to have a look at an object closely. Because in most of the birds eyes lie at the sides of their head and bird's eye ball can't be rolled like humans. Therefore when most birds look closely at something, they use only one eye at a time and they must turn their head. This means that most birds have little or no binocular vision, which makes judging distances difficult. Because of this many birds bob their head. When they look straight, they do have vision like human beings focussing on only one object.



Eagles are known for their excellent eye sight. They have two centres of focus, that allow them to see both forward and to the side at the same time.

Eagles are capable of seeing fish in water from several hundred feet above, while soaring, gliding or in flapping flight. Eagles, like other birds have color vision. Eagle's eye is almost as large as humans but its sharpness is at least four times that of a person with perfect vision. The eagle can probably identify a rabbit moving almost a mile away. Kite, and vultures can also see four times as far as we can.



**Eagle**

Owl, unlike the other birds, has eyes in front of the face. It foccuses with its eyes on a single object at a time as we do. When the birds focus their eyes on an object they assess the distance of the object and they increase their span of vision when they look at it with both the eyes. Owls are generally active at night. Because of their keen sense of sight they can hunt successfully in dim light or in dark. An owl almost turn its head in order to see in any direction other than straight ahead. It can turn its head completely around so that it can see directly behind it. Owls have good binocular vision needed when pouncing on rodents at night.



**Owl**

Most of the spiders have eight eyes and almost all are blind.

The only animal which see things as black and white is a fish called skate, because it has no cones in its eyes.

The organisms who live in dark caves and in deep sea where there is no light, do not have eyes, since they don't need them.

It is believed that animals that are awake in the day time can see some colors. Those animals that are awake at night can see things only in black and white colors.

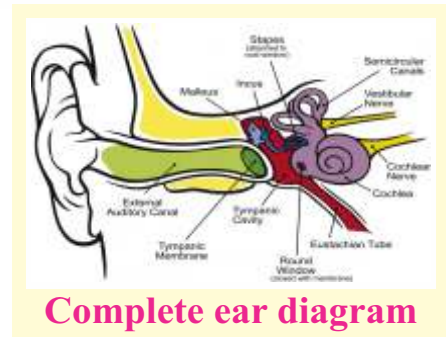
The bulls can not see red. Like many other animals, bulls can only see blue and mix of red and green. Other than this it can see a shade of grey. Bulls charge at a matador's cape not because of color but because of its grand and theatrical cape waving gestures. It can be of any color.



**bull charges at cape**

## SENSE OF HEARING

The ear is the organ of hearing. The ear has three parts : outer, middle and inner ear. The outer ear protrudes away from the head and is shaped like a cup to direct sounds towards the eardrum or tympanic membrane, which transmits vibrations to the inner ear through a series of small bones in the middle ear called malleus, incus and stapes. The inner ear or cochlea is a spiral shaped chamber covered internally by nerve fibres that react to the vibrations and transmit impulses to the brain via the auditory nerve. The brain combines the input of our two ears to determine the direction and distance of sounds



**Complete ear diagram**



**ear of rabbit**



**ear of cat**



**ear of dog**



**ear of pig**



**ear of elephant**



**ear of man**

The bird like an owl have large ear holes at slightly different heights, above and below eye level, helping them pinpoint the vertical position of sound source. They have very fast reaction time. In complete darkness, it takes less than 1/100



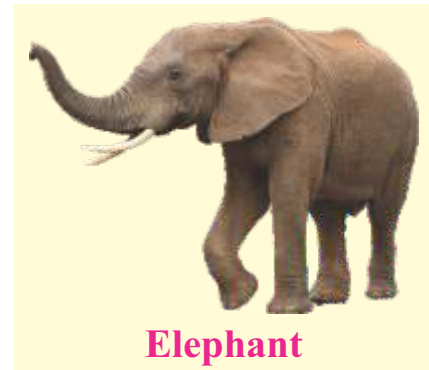
**Owl**

**Bat**

part of a second to assess the precise direction of a scurring mouse.

Bat can find its way in complete darkness using a biological sonar system called echolocation. This involves emitting ultrasonic chirps and interpreting the echo, the sound waves make after bouncing off objects and other creatures in their vicinity. Bats prevent damage to their own ears by closing them with every wing stroke.

Elephant have an exceptional sense of hearing and can hear at a frequency 20 times lower than us. They also use their trunk and feet to hear, both of which are packed with special receptors to pick up on low frequency vibrations. Their exceptional hearing ability helps them "tune into" things such as thunder storm and rain. And it is believed that their low rumble calls can be picked up by other elephants 6 km away.



**Elephant**

Like elephants pigeons can also hear sounds of very low frequency. This helps to explain their exceptional sense of direction. e.g. steep hill side reflect



**Pigeon**

airborn sound waves horizontally, providing a low frequency beacons that pigeon can perceive for hundreds of miles. There are many things which produce infrasound, such as - thunderstorm, seismic activity, motion of the sea - allowing pigeon to build an acoustic landscape which is totally unknown to us. Pigeons also possess the equivalent of an inbuilt compass which allows them to navigate using the Earth's magnetic field and the position of sun. Due to this they are best navigators in nature.

Cat, Lion, Tigers etc. can hear sound of higher frequencies than us. They can distinguish a sound's tone and locate its source far better too. With 30 different muscles, the cat can independently rotate its ears 180 degrees and position one ear or both facing any sound the cat detects.



**Cat**

The tigers whiskers are very sensitive and can sense the vibrations or movements in the air. They