

## Animal Diversity

- An animal have grouped using different criteria.

Ex: mode of locomotion, body shape, body color, size of body, mode of nutrition, living environment etc.

- Animals can be divided in to two groups as animals with a backbone or without a backbone
  1. Vertebrates
  2. Invertebrates
- The central line of bones is known as backbone
- An animal that has backbone (skeleton/spine) inside their body known as vertebrates

There are five animal classes that are vertebrates

1. Amphibians – Ex: Frogs, Salamander
2. Fishes - Ex: Tuna, Sharkes
3. Reptiles - Ex: Snakes, Alligator
4. Birds - Ex: Parrots, Penguins
5. Mammals - Ex: Monkey, Dolphins, Humans

- An animal without a backbone or spine meaning they are invertebrates.

There are many different types of invertebrates

- Each type of invertebrate has its own unique features. Ex: Insects, Spiders, Worms, Snail, Prawn, Jellyfish, Crabs, Shrimps, Lobsters, Star fish, Urchins etc.

Do the Assignment 6.2 page number at 75.

Do the activity 6.1 page number 77.

## Adaptations of Organisms to Environment

- The ability of organisms adapt to their environment is called adaptation.
- Living organisms are adapted to their environment. Ex. Behavior is also an important adaptation.

This is where the basic needs of the organism to survive are met, Foods, Water, Shelter, Protection etc. In animal may adapt to its habitat in different ways.

### 1. How color is useful for the existence of animals?

Methodology- Take 100 small piece of tooth picks with red, green, white and brown color.

- Firstly, spread the pieces of tooth picks in lawn randomly.
- Allow four students to pick up the pieces of tooth sticks
- Take the observations while they are picking.
- Secondly, spread all above sticks on a gravel floor
- Take the observations in a same way

Observations- In a first step, dark colored tooth picks were picked up past by students than green color sticks.

- Green colored sticks were collected last by students due to the similar color of the grass and make difficult to separate them when picking

-When student picking sticks are in a gravel floor they were picked up green colored sticks pastor than brown colored sticks.

Conclusion –the green colored sticks were difficult to separate then due to similar color of the grass

-The brown colored sticks were difficult to separate them due to similar color of the gravel floor.

Do the assignment 6.3 page number at 80.

So,

- According to above conclusion, presence of the same color in the environment and the body of many animals will help them to protect themselves from the predators or enemies.
- Camouflage is a type of coloration or pattern that helps an animal blend in with its surrounding. it is highly useful adaptation.

Ex- Leopard with lumpy skin and dusty colors help them to catch preys.

Some kinds of Lizard change their color according to the environment they live.

Leaf insects take on the appearance of something else in its environment,

## 2. How shape helps the existence of animals

Do the activity 6.3 page number at 81

- Body shape of animal is also very important for locomotion.
- Locomotion is directional movement that enables someone or something to move from one place to another.
- The body shape of birds and aquatic animals helps to overcome the difficulties they have in their living environment.
- The body shape of birds and fish mainly of streamlined shape because they need to have efficiency in their locomotion.

### Use of dichotomous key for classification of organisms

- Dichotomous key is a tool created by scientist to help identify objects and organisms in the natural world.
- Dichotomous keys are most often used for identifying plant and animal species based on their characteristics.
- Any type of object that can be identified by a known set of observable characteristics.
- So that is used to classify living organisms based on the presence and the absence of characteristics.

#### Features of Dichotomous Key

1. Select a feature that could be differentiated easily.
2. Consider one feature at a time.
3. Separate the item so that only one item will remain at the end.

Do the assignment 6.5 page number at 84.

Do the exercise.

## Forms of Energy and Uses

People are engaging in a different kind of activities in day to day life.

1. Give five examples for instances of doing work in day to day life

People as well as animal and machines do a lot of work during life.

Do the activity 7.1 page number 87.

Do the activity 7.2 page number 88.

- According to above activity work can be defined as a push or pull.
- Energy is necessary to perform work.
- Energy is the capacity for doing work or ability to do a work.

It may exist in many different forms. Examples of these are Light energy, Heat energy, Mechanical energy, Gravitational energy, Electrical energy, Sound energy, Chemical energy, Nuclear energy etc.

- International unit of measuring energy is Joule.

Do the activity 7.3 page number at 89.

### Kinetic energy

- The kinetic energy of an object is the energy that possesses due to its motion.
- Energy that a moving object contains is called kinetic energy.

Ex: moving objects, flowing water, in a sea waves, flowing wind etc.

2. What are the functions can be used to kinetic energy?

### Energy transformation

- Energy can be neither created nor destroyed but only changed or converted from one form to another.
- So, conversion of one form of energy to another form of energy is called energy transformation.

Ex: kinetic energy to electrical energy

Potential energy to Kinetic energy (electricity is generated by wind or water)

Electrical energy to Heat energy (in an electric iron)

Electrical energy to Sound energy (in a radio)

Electrical energy to Light energy (in an electric bulb)

Chemical energy to Kinetic energy (in a human body)

Do the self-assignment 1

### Potential energy

- Energy stored in an object because of the change of positions or the change of shape is known as potential energy

3. Name five instances where there is potential energy.

- Potential energy and kinetic energy are commonly known as Mechanical energy.

### Electrical energy

Do the activity 7.6 and fill in the table 7.3.

4. What is the instances electrical energy can be used?

### Sound energy

- Energy contained in sound is scientifically known as sound energy.

Ex: in a radio, speakers,

Do the activity 7.8 page number at 96.

5. Name four instances where sound energy is used

### Light energy

Light is very important for vision

Do the assignment 7.4 page number at 97

Explain activity 7.9 page number at 98.

The main source of light to the earth is the sun. But very small amount of light energy is utilized by the sun light.

Solar energy to Electrical energy (electricity generated in a solar cell by the light energy)

6. List out some other main instances where light energy is used.

### Heat /Thermal energy

- Heat energy is defined as types of transfer of energy and very important for doing various types of work. Ex: cooking, ironing cloths, evaporating water, melting something, deformation of things, burning etc.

Do the activity 7.10 page number at 99.

- Electricity is gener
- ated in thermal power stations by rotating dynamos, connected to large turbines which are driven by steam.

Do the assessment 4 page number at 101.

7. List out five occasions where heat energy is used.

### Chemical energy

- Chemicals can exit as solid, liquid or gases.
- Energy stored in chemicals is known as chemical energy.

Do the activity 7.13 page number at 102.

8. What are chemical substances in the dry cell?

Diluted hydrochloric acid, the piece of magnesium ribbon

9. Write down instances where chemical energy converts to another form of energy.

- The energy transformation that occurs in a dry cell is given below

Chemical energy to Electrical energy

Do the exercise page number at 103.

## The Nature of the Earth

As far as we know, our world is unique in the universe, defined by three elements, air or atmosphere, land and water.

Each above element has its own special properties and phenomena.

The other planets are lifeless because of the non-existence of such environmental conditions.

- Geologist receive more information about the nature of the inner part by examine earthquakes.
- Earthquakes happen when two large pieces of the earth's suddenly slip.
- An earthquake usually occurs on the edges of large sections of the earth's crust called tectonic plates.
- Shock waves from earthquakes that travel through the ground are called Seismic waves. During earthquakes huge rocks movements within the earth give rise to seismic waves. They are most powerful at the center of the earthquakes.
- Scientists use Seismic waves to measure how big an earthquake is. They use a device called a Seismometer to measure the size of the waves.

Seismometers are installed in different stations of the earth. (Pallekelle, Sri Lanka)

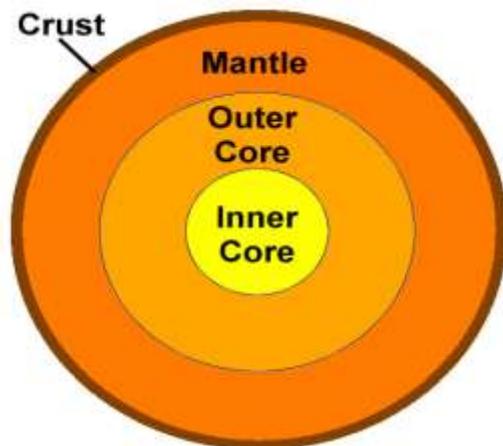
The structure of the earth is divided in to layers. These layers are physically and chemically different.

- The earth's interior is composed of three layers.

1. An outer solid Crust
2. A highly viscous Mantle
3. A liquid outer Core and a solid inner Core.

Ex: The inner part of earth can be equal to cross section of hard-boiled Egg or Orange.

Egg yolk- Core,            Egg white- Mantle,            Egg shell- Crust



## Information on the Layers of the Earth

Part of the Earth	Thickness	Composition	Elements present	Special information
Crust	Deep bottom of oceans 5km land 35 km	Rocks, soil	Silica, Aluminum and Oxygen	Very thin layer
Mantle	2900km	Solid rocks (outer Mantle) and molten rocks ( inner Mantle)	Silicon, Magnesium, Iron and Oxygen	Very much thicker than the Crust
Core	3500km	outer Core (metals liquid) and Inner Core (solid)	Iron and Nickel	Temperature between 4400-5000oc. Inner Core is the hottest part of the earth.

Do the Activity 8.1 or 8.2.

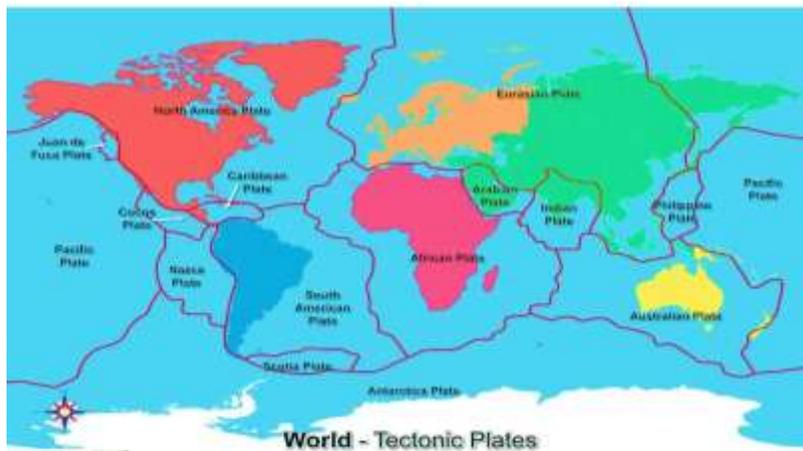
Do the Assignment 8.1 page number at 109.

## Tectonic Plates

- Tectonic plates are a combination of the Crust and the outer Mantle.
- These plates move very slowly and relatively to each other.it is 1-2cm per year.

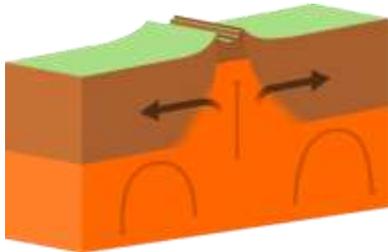
There are two main types of Tectonic plates. (Oceanic and Continental)

- The movements of Tectonic plates are most evident at the boundaries between the plates.
- One famous transform boundary is the **San Andrea's fault in California**. It is boundary between the **North American plate** and the **pacific plate**. It is cause of so many earthquakes in California.

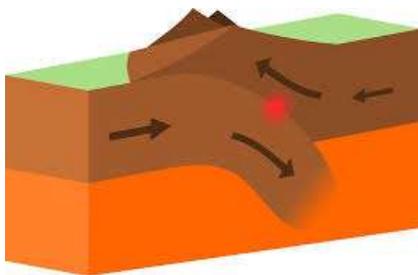


Tectonic plates move relatively to each other in three ways.

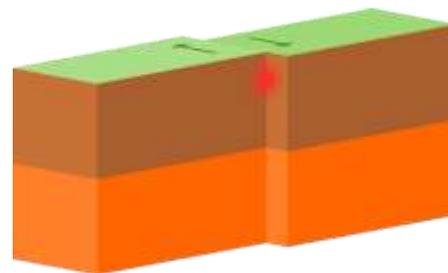
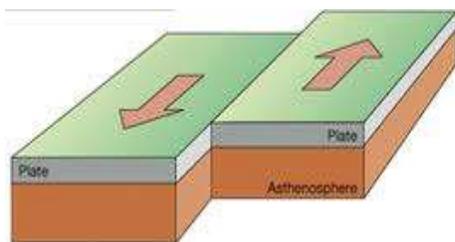
1. Divergent boundaries- One where two plates are getting pushed apart and they produce cracks in the ocean floor. Magma rises up from the mantle.



2. Convergent boundaries- Where two Tectonic plates push together or plate will move under the other.



3. Transform boundaries- One where two plates slide past each other these places are often called faults and can be areas where earthquakes often occur.



Do the assignment 8.3 page number at 112.

Do the exercise page number at 113.

## The Correct Use of the Microscope

- The microscope is an instrument used to see objects that are too small to be seen by the naked eye.
- The instrument with curved surface or protruded surface can be used to magnify small items.
- There are many types of Microscope and they may be grouped in different ways.

1. Light Microscope - Simple Light Microscope (Hand Lenses, Convex Lenses)

Compound Light Microscope

2. Electronic Microscope.

## The simple Microscope

- Convex lenses and Hand lenses are example for simple Microscope.

Do the activity 10.2 page number at a139.

- According to above activity will realized that there should be a constant distance kept between the object and the lens when an object observed by a hand lens.

## Magnification power and Resolving power of Microscope

### Magnification power

- Magnification is the ability to view an object as larger
- The number of times a specimen is magnified is known as the magnifying power.

**Magnification power of the Light microscope - 2000 times**

**Magnification power of the Electron microscope - 500,000 times**

Do the activity 10.3 page number at 140.

### Resolution power

- Resolution power is the ability to measure the separation of images that are close together.
- So, Resolution is the minimum distance by which two points must be separated in order to be seen as two distinct points.

**Resolution power of the Naked eye - 0.1mm**

**Resolution power of the Compound microscope - 0.02 $\mu$ m (200nm/ 0.0002mm)**

**Resolution power of the Electron microscope- 0.0005 $\mu$ m**

Do the activity 10.4.

- According to above activity realized that the Resolution power of the Hand lens is higher than the Resolution power of the Naked eye.

### Do the activity 10.5

- According to above activity two hand lenses or two convex lenses can be used to obtain a higher magnification and higher resolution.

Similarly, the Compound Light microscope is produced using two convex lenses with a high magnification power.

### Compound Light Microscope

- It is called as the light microscope.
- Although, microorganism can't be observed through a hand lens. They can be observed through the compound light microscope.
- Resolution power of the compound light microscope is 500 times than the naked eye.

Draw a Compound Light Microscope and name its part.

Draw a Table 10.2 page number at 143.

### Do the Assignment 10.1.

1. Point out the correct method to use a Light microscope.
2. What are the factors to be considered in the use of microscope?

### Calculation of the Magnification power of a Microscope

**Magnification of microscope = magnification of eye piece \* magnification of objective lens**

**magnification of the eye piece \* magnification of the objective lens \* the number of times the visual image is magnified when drawn**

Draw the line diagrams of the Rhoeo lower epidermal tissue, Human Cheek cells observed through a light microscope

### The Electron Microscope

- Al electron beam is used in the electron microscope instead of light rays.
- The resolution power of the Electron microscope is 200000 times than a healthy human eye.

Instances where the Electron Microscope is used

1. To observe the activity of pathogenic microorganisms (Virus, Bacteria) during research.
2. Learn about internal structure of the cell in detail.
3. To use in genetic research.
4. To get information on crime investigation.

Do the Exercise page number at 148.