




### Points to study

- 15.1 What is Science
- 15.2 Why the Study of Science is Important for Us?
- 15.3 How Do Scientists Work?
- 15.4 Applications of Science in Our Daily Life



#### 15.1 What is Science


From ancient times, Science is related to the study and query of natural events, mysteries and principles by men. By their studies, observations and experiences, Indian sages also made countless efforts to make human life easier. Rishi Charak was a famous ancient scholar in the field of Ayurvedic Medicine. He published many books like the 'Charak Code' based on his experiments. The 'Charak Code' is considered to be the oldest book on the subject of Ayurved Medicine. This book presents the birth and growth of a child scientifically. In this book the structure of different organs of the body and their diseases, symptoms and cure, the names of Ayurvedic herbs and their benefits and which medicine is useful for different diseases are present.



Sages like - Ashvini Kumar, Dhanwantari, Bhardwaj, Kapil, Patanjali, Sushrut, etc. can be called the scientists of ancient times. They have written many books based on their researches and experiments. Indian lifestyle has been for a long time very scientific. Scientists have observed the information acquire from experiments and experiences and on the basis of analysis, they have developed the human lifestyle.

In the same line, modern scientists have also defined science as hereunder:

**The systematic knowledge collected through observation of nature is called science.**



In order to systematise the ever increasing pool of knowledge of science, science is classified into following branches of science:

Physical-science (Physics), Chemical-science (Chemistry), Biological-science (Biology), Mathematics, Agriculture-science, Medical-science, computer-science, Astrological-science (Astronomy), Geological-science (Geology), etc.

## 15.2 Why the Study of Science is Important for Us?

### From the study of science:

- A person remains far from conservative ideas.
- Independent thinking is developed in a person.
- People tend to learn more and more about the events, problems and activities going on around them.
- In life the ability to solve problems methodically is developed.
- Persons patiently find out reason of failure and try again.
- True and superstition free ideas are developed in a person.
- Development of scientific point of view takes place.

## 15.3 How Do Scientists Work?

Scientists draw conclusions after collecting and analysing observations of an experiment. Scientists conduct experiments. They collect data thereafter. Finally, they present conclusions after analysing the so collected, organised and analysed data. Doctors also give treatment in scientific manner to the patient.

A disease of patient is a scientific problem for a doctor. To solve this problem doctor starts the process as per the following steps:

- Doctor asks the symptoms of the disease.
- Doctor measures the temperature of the patient by a thermometer.
- Doctor examines the eye, tongue, breathe, etc. of the patient.
- Doctor notes down the facts on the prescription slip he observed from such examinations.
- Doctor presents the hypothesis for the possible disease, to confirm or reject his hypothesis doctor refers the patient for more examinations like stool examination, urine examination, blood examination, sonography, CT-scan, X-ray, etc.
- Finally, doctor prescribes medicines after clear understanding of the disease.

Such a process of solving a problem is referred to as scientific method by a scientist. The steps of the scientific method are as follows: -

- Identification of the problem.
- Collecting and classifying the related facts.
- Forming a hypothesis.





- Examining the validity of the hypothesis through experiments.
- Fram theories and laws on the basis of conclusions.

Science is amazingly progressing day by day. This could happen due to continuously progressing scientific approach of human. We are using a number of scientific equipments in our daily life, for example: - gas stove, fan, motorcycle, refrigerator, washing machine, electric iron, etc. all such items are related to science.

Just because of science our living styles, food habits and processes of medical treatments have become simplified and only healthy humans can create a strong nation.

#### 15.4 Applications of Science in Our Daily Life

Science is the biggest strength of humans. Activities of humans are based fundamentally on science. The scientific discoveries and inventions have established their primacy in each and every field of life.

##### 1. Science in The Field of Communication



(a) Telephone



(b) Fax



(c) Satellite launching

**Figure 15.1 Means of communication**

class rooms, studying through Eduset, writing books through e-mail and internet, to study, to write a letter, to solve the problems of maths, to study through distance education mode, e-learning etc.

##### 5. Science in the Field of Agriculture

Use of tractor for sowing, different machines for harvesting of crops to separate grains and husk by the process of winnowing, the use of thresher, the use of High Yield Variety (HYV) seeds, the use of fertilizers, insecticides on crops, artificial and scientific means of irrigation, for e.g. drip irrigation system, sprinkler irrigation system etc., and their uses, all could be possible because of science.

##### 6. Science in the Field of Entertainment

Cinema, television, radio, tape recorder, CD, preparing of new CDs by the medium of DVD player and computer, listening to music, producing films,



The success to reach on moon, the spaceship sent to planet Mars and the establishments of space-stations with regular space travels by scientists all are examples of the human progress in the field of advanced transportation. The super-fast trains (to the level of bullet train project recently started in our country by the Honourable Prime Minister Sri Narendra Modi Ji) have reduced very long distances to shorter ones. The application of computer in the field of transportation has played a great role, for example -

- The reservation of journeys through busses, trains and aeroplanes have become friendly, easier and quick.
- To command and control the aeroplane flights by the Air Traffic Control (ATC).
- Operation and control of metro trains.
- Operation and control of ships.

### 3. Science in the Field of Medical

Life is precious. God gifted the human body and provided a self defence system to our body. Even though our body may get infected may become unwell and diseased due to various reasons. The scientists regularly and continuously perform experiments to develop different kinds of medication procedures and systems and produce medicines to keep our body well and healthy.

To identify different types of diseases like cancer, TB, heart diseases, chicken pox etc. and find their proper medication and surgery, there are a number of equipments in the field of medical science, for eg.- X ray, CT scan, ECG etc. computers are used for operation and control of such equipments of medical science. With the help of computers medical help can be provided to a remote patient through telemedicine. Surgeries are also performed by laser method again with the help of computers.



**X-Ray Machine**



**C.T. Scan**



**E.C.G.**

**Figure 15.2 : Science in the Field of Medical**

### 4. Science in the Field of Education

Science have played a great role in the field of education, for eg. smart class rooms, studying through Eduset, writing books through e-mail and internet, to study, to write a letter, to solve the problems of maths, to study through distance education mode, e-learning etc.





### 5. Science in the Field of Agriculture

Use of tractor for sowing, different machines for harvesting of crops to separate grains and husk by the process of winnowing, the use of thresher, the use of High Yield Variety (HYV) seeds, the use of fertilizers, insecticides on crops, artificial and scientific means of irrigation, for e.g. drip irrigation system, sprinkler irrigation system etc., and their uses, all could be possible because of science.



**Figure 15.3 Harvester**

### 6. Science in the Field of Entertainment

Cinema, television, radio, tape recorder, CD, preparing of new CDs by the medium of DVD player and computer, listening to music, producing films, production and transmission of TV serial programmes in episodes, watching movies, creating animated movies, playing computer games etc., all are possible because of scientific inventions.



**Figure 15.4 Means of Entertainment**

### 7. Science in the Field of Industries

Most of the use of science is in the industrial field. The reason could be that all the machines used in the industries are in existence because scientific inventions. Moreover, operation of these industries could be done only by computers. The use of these big machines at such large level is not possible without the application of computers. For eg. in a cloth making factory, the thread has to go through a lot of processes like colouring, knitting and other different activities in which machines are involved.



**Figure 15.5 Industrial factory**

### 8. Science in the Field of Defence and Nuclear Power

You must have heard the name of Agnibaarn, Varshabaarn, Shaktibaarn while watching the serial Ramayana and Mahabharata on National Television



Network. The scientists of the world conducted experiments and carried out research on the basis of our ancient scriptures and other research works. There are several contributions of science and signs of scientific activities like Rawat Bhata's atomic reactor, Rajasthan, or the nuclear experiments and underground explosions of Pokhran which included India in the list of the nuclear power nations of the world. Dr. Homi Jahangir Bhabha is the great jewel of India who initiated the atomic research in India and carried out many experiments and researches, that's why he is remembered as the father of nuclear science in India.

### 9. Science in the Field of Construction and Architecture

The design and different construction methods of the ancient and medieval period forts, temples and modern times multi-storeyed buildings, could have been possible due to scientific inventions. By the use of cement and concrete which are given to us by science we have developed CC roads, RCC roofs, multi-storey buildings and other large and high buildings on the basis of architecture.

### 10. Science in the Field of Banking

Even when the world market is down the Indian economy rarely gets affected because of small saving habits found in Indian families. But in modern era, just because of science, we can get money as when we wish through ATM, credit card, transfer of money from one account to another through internet, e-commerce etc. Several works related to banking are the gifts of science.

#### What have you learnt

1. The systematic knowledge collected through observation of nature is called science.
2. By the study of science superstitions and conservative thoughts end and a person becomes truth oriented, curious and patient.
3. Scientists perform their works in a scientific method.
4. Science has brought revolutionary changes in every field of life.
5. The steps of the scientific method involve identification of the problem, collecting and classifying the data forming a hypothesis, examining the validity of the hypothesis through experiments, to draw conclusions and frame theories and laws on the basis of that.
6. Life has become comfortable by the use of science.



## Exercises

### I. Tick the correct answer from the following -

1. By which equipment does science bring revolution in the field of education?
 

a) Television	b) Radio	
c) Computer	d) Tape recorder	( )
2. What does science give in the field of education?
 

a) Fax	b) Television	
c) Telephone	d) All of the above	( )
3. Which among the following is not a means of entertainment?
 

a) Video game	b) Fax	
c) Computer	d) TV	( )

### II. Fill in the blanks -

1. The systematic knowledge collected through observation of nature is called .....
2. Because of the development of science, many nations today are able to generate electricity from ..... energy.
3. Sending mails through internet is known as .....

### III. Match the following -

Column A	Column B
1. Telephone	In the field of electricity
2. Thresher	In the field of medication
3. Nuclear power station	In the field of education
4. Eduset	In the field of communication
5. X ray	In the field of agriculture.

### IV. Short answer questions -

1. What is science?
2. Write the names of four electrical equipments which are used in daily life.
3. Where does in Rajasthan the nuclear energy is converted into electrical energy and then used?
4. What is telemedicine? Explain.

### V. Long answer questions -

1. Explain the contribution of science in the fields of education and medication.
2. What is scientific method? Write down its different steps.
3. How can Science be helpful in the development of villages ? Explain in brief.

