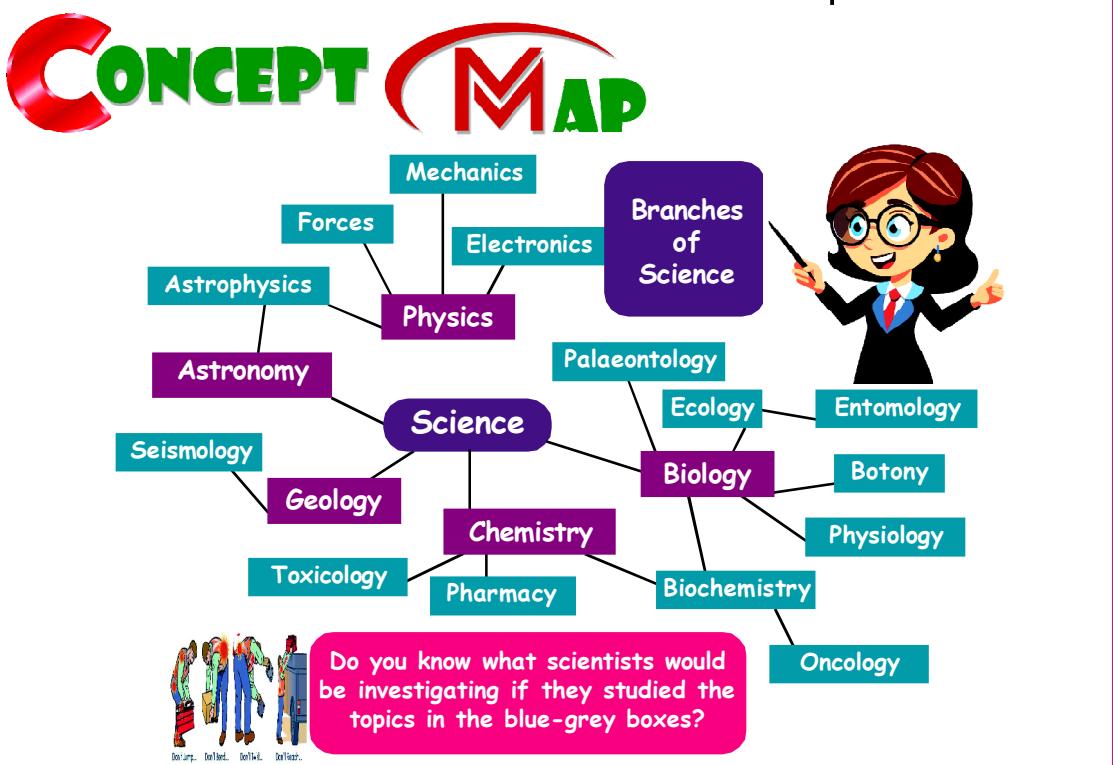
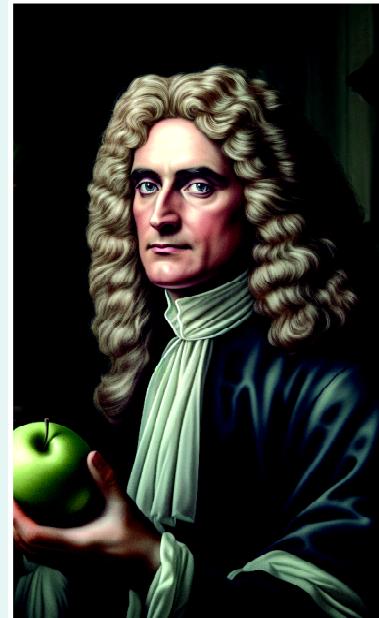


1

FUNDAMENTALS OF PHYSICS

Isaac Newton was a physicist and mathematician who developed the principles of modern physics, including the laws of motion, and is credited as one of the great minds of the 17th century Scientific Revolution. In 1687, he published his most acclaimed work, *Philosophiae Naturalis Principia Mathematica* (Mathematical Principles of Natural Philosophy), which has been called the single most influential book on physics. In 1705, he was knighted by Queen Anne of England, making him Sir Isaac Newton.



Concept 1

Introduction :

1. From the minute we rise in the morning till we go to bed and asleep, a large number of gadgets are working for us.
2. The bed we sleep on, the alarm clock that tries to wake us up, the glass containing water, the book that we were trying to read before falling asleep, have all been made by man.
3. Some objects like rocks, fruits or flowers occur naturally. Many other objects like plastics or bricks are man made.
4. These objects and materials have made our life more comfortable and enjoyable.
5. They have also increased our ability to develop other useful materials and fabricate more useful gadgets.
6. All this knowledge and skill has been accumulated over the past thousands of years.
7. Let us look at a few gadgets of the growth of science and technology over the age.

Knowledge Box

Science is the systematic study of the natural world through observation, experimentation, and analysis. It seeks to understand the universe and its workings.



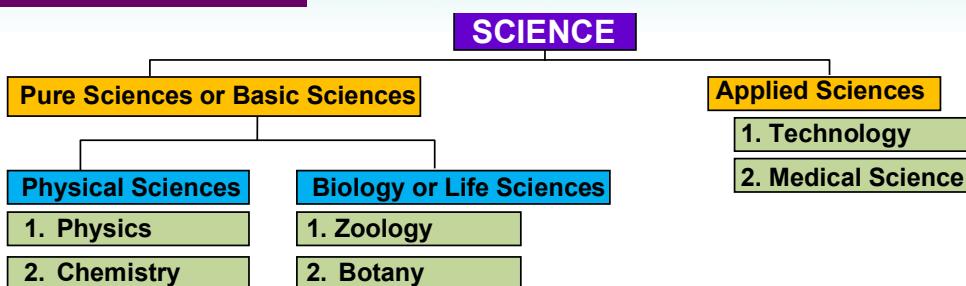
Fun Facts

Science is like solving nature's puzzles—you never know what exciting discoveries you'll make!



8. Science is a collection of systematic and organised knowledge about the various things around us obtained through observations and experiments.

Branches of Science :



Pure sciences or Basic Sciences :

Sciences related to matter or the non-living objects are termed as Physical Sciences and the sciences related to the living objects is termed as Life Sciences. Thus, pure science is further divided into three branches:

1. Physics
2. Chemistry
3. Life Sciences

Physics: A science that deals with matter and energy and their actions upon each other in the fields of mechanics, heat, light, electricity, sound and the atomic nucleus.

Chemistry : Chemistry is the branch of science that deals with the properties, composition, structure of elements and compounds, how they can change, and the energy that is released or absorbed when they change.

Zoology : Zoology is the scientific study of animals, including their biology, behaviour and how they interact with their environment:

Botany : Botany is the scientific study of plants, including their structure, properties and biochemical processes. It's also known as plant science.

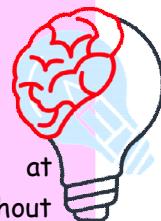
Science is divided into pure sciences (basic research) and applied sciences (practical applications).

Knowledge Box

Pure sciences involve theoretical studies aimed at expanding knowledge, without immediate practical applications.

Examples:

1. Physics
2. Chemistry
3. Mathematics



Applied Sciences :

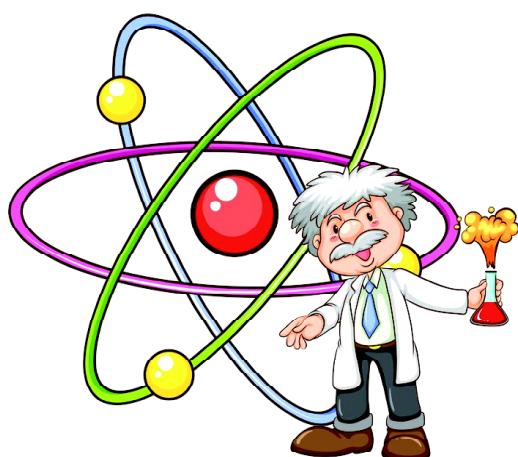
It is natural nature to make use of materials found in nature. For example, the birds use natural materials to make their nests. Similarly, man has brain and skill. He used it initially for making tools from sharp or pointed stones and used them in hunting for food and from here started the applied science. Applied science has two branches:

- Technology :** It is mechanical application for developing machines and generating energy.
- Medical Science:** The medical science is used for developing medicines and for the treatment of human beings and animals to keep them in good health.

SCOPE OF SCIENCE

You might have known from your grandparents about their lives during olden days. They would have told you about the type of houses and the mode of travelling and communications prevailing in the olden days. You will know that since then things around us have changed a lot. Things which we are using in our daily life such as stainless steel, plastic, fibre glass, television and jet aeroplanes were not known to them. Our way of life has considerably improved such as the quality of clothes, medicines, mode of communications and entertainment.

Have you ever thought how these improvements have come about? In fact, science helps us in bringing new things and knowledge about happenings around us. Today, the scientists all over the world through their hard work and systematic approach have solved many problems. In fact, scientific thinking helps us invent new devices which are useful in our daily life.





CLASSROOM DISCUSSION QUESTIONS

**CDQ
01**

- What is the primary purpose of gadgets in our daily life?
 - To make life more difficult
 - To make life more comfortable and enjoyable
 - To reduce our ability to develop new materials
 - To eliminate the need for natural objects
- Which of the following is a man-made object?
 - Rock
 - Fruit
 - Flower
 - Plastic
- What distinguishes pure sciences from applied sciences?
 - Pure sciences focus on practical applications, while applied sciences focus on theoretical knowledge
 - Pure sciences are related to living objects, while applied sciences are related to non-living objects
 - Pure sciences are related to theoretical knowledge, while applied sciences are related to practical applications
 - Pure sciences focus only on biology, while applied sciences focus only on technology
- Which branch of science deals with the study of non-living objects?
 - Life Sciences
 - Technology
 - Physical Sciences
 - Medical Science
- What are the two branches of applied sciences?
 - Physics and Chemistry
 - Zoology and Botany
 - Technology and Medical Science
 - Biology and Life Sciences
- Which of the following branches of science is concerned with developing medicines and treatments for health?
 - Technology
 - Medical Science
 - Physics
 - Chemistry
- How does science contribute to solving problems and inventing new devices?
 - Through random experimentation and guessing
 - By relying on superstitions and myths
 - Through hard work and systematic approach
 - By ignoring observations and experiments
- Which branch of pure science is related to the study of living organisms?
 - Physics
 - Chemistry
 - Biology
 - Technology

MARK YOUR ANSWERS WITH PEN ONLY. Time Taken Minutes 

1 <input type="radio"/> A	2 <input type="radio"/> A	3 <input type="radio"/> A	4 <input type="radio"/> A	5 <input type="radio"/> A
6 <input type="radio"/> A	7 <input type="radio"/> A	8 <input type="radio"/> A	9 <input type="radio"/> A	10 <input type="radio"/> A

Concept 2

Physics and its scope :

1. The word physics is taken from Greek word “Physikos” which means natural.
2. It is the science of nature in broader sense.
3. Physicists study the behaviour and interactions of matter and force.
4. The laws of physics are generally expressed as mathematical relations.
5. The branch of physics can be defined as “Physics is a branch of science which deals with the study of matter and energy.”
6. Physics is the study of matter, the substance from which our whole Universe is made and how it relates to the forms of energy in nature. Therefore, we must know about matter and energy.

Fun Facts

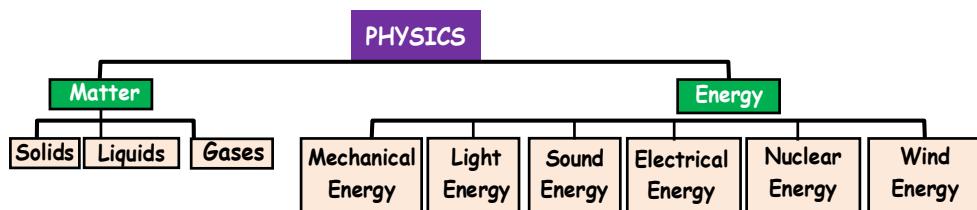
Physics is like a superpower—it explains why the world works the way it does!

Matter :

Matter is that which occupies space and possesses mass. For example, book, glass, chair and table etc.

Energy :

Energy cannot be seen. It could be felt only. For example, electricity, light, sound and heat etc. Energy can be defined as ‘Capacity of doing work’.



Branches in physics :

1. Physics emerged as a separate science only in the early 19th century; until that time the physicist was often also a mathematician, philosopher, chemist, biologist, engineer, or even an artist.

Today the field has grown to such an extent that for its systematic study the subject is subdivided into various branches - (i) Mechanics (ii) Heat and Thermodynamics (iii) Optics (iv) Electricity (v) Magnetism (vi) Modern Physics and Electronics.

Mechanics : It is a branch of physics that studies the relationship between force and motion in physical objects.

Heat : It is a branch of physics that studies the thermal energy transferred between two systems at different temperatures that come in contact.

Thermodynamics : It is the branch of physics that studies the relationship between heat, work, temperature and energy.

Optics : It is the branch of physics that studies the behaviour and properties of light.

Electricity : It is part of the branch of physics called electro magnetism.

Magnetism : It is a branch of physics which is a fundamental interaction in nature that describes how moving charges interact. It is a physical attribute that allows objects to attract or repel each other through a magnetic field.

Electronics : A branch of physics that deals with the emission, behavior, and effects of electrons (as in electron tubes and transistors) and with electronic devices.

Modern physics: The study of the underlying processes of matter's interactions.

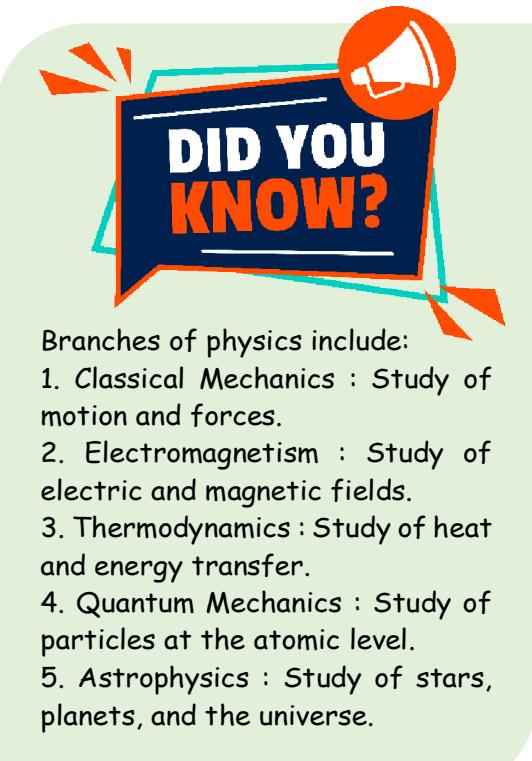
There are few other branches of physics, such as - meteorology, astronomy, geophysics, biophysics etc.

Meteorology : Meteorology is a branch of the atmospheric sciences (which include atmospheric chemistry and physics) with a major focus on weather forecasting.

Astronomy : Astronomy is the study of everything in the universe beyond Earth's atmosphere. That includes objects we can see with our naked eyes, like the sun, the moon, the planets, and the stars .

Geophysics : Geophysics is the study of the physics of the Earth and its environment in space.

Biophysics : Biophysics is the field that applies the theories and methods of physics to understand how biological systems work.



Physics in Daily Life :

The advancement in physics has enabled us to improve our life style. Applications of physics have an impact on almost every aspect of our daily lives.

Discoveries in the field of physics have affected our everyday life by the invention of thousands of machines.

From the moment we wake up in the morning till long after we have gone to bed at night, it is quite difficult to put them in a list. However, some very common applications are given below :

- Health and medicine :** X-rays, sonography, CT scan, MRI etc. are used to diagnose diseases. Stethoscope, thermometer, E.C.G. machine etc. are also used by doctors.
- Transport :** Cars, buses, trains, aeroplanes etc. made the world smaller by reducing travelling time.
- Communications :** Telephones, telegraphs, internet, mobile telephones, satellites etc. made communications faster and better.
- Household appliances and gadgets :** Electric bulbs, tubes, fans, refrigerator, washing machine, geyser, heaters, etc. have made our life comfortable.
- Energy production :** Electrical energy is one of the most important development in our modern life.

The solar energy, wind energy, tidal energy, atomic energy etc. are now replacing the conventional sources of energy.

- Dress materials :** Different types of fashionable and comfortable dresses are produced by the machines developed by physicists and engineers.

Fun Facts

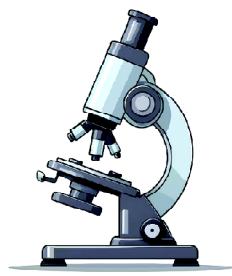
Physics makes the impossible possible—like streaming a video from space!

DID YOU KNOW?

Physics is everywhere in daily life: 1. Walking and driving involve principles of mechanics. 2. Cooking uses thermodynamics. 3. Mobile phones rely on electromagnetic waves.

7. Entertainment : Physics has gone a long way in the field of entertainment. Cinematography, radio, TV, video games, music systems, VCDs, etc., are the main sources of entertainment.

8. Scientific research : Telescope, microscope, and other instruments based on principles of physics are utilized for research in different branches of science.



Microscope



Telescope



Mobile Phone



Satellite



Washing machine



Camera



Music System



Television



Air Conditioner



Computer



MP3 player



CLASSROOM DISCUSSION QUESTIONS

CDQ
02

- What does the Greek word "Physikos" mean?
(A) Nature (B) Science
(C) Matter (D) Energy
- How are the laws of physics generally expressed?
(A) Through experiments
(B) As mathematical relations
(C) Using computer models
(D) In written descriptions
- Which of the following is NOT considered a branch of physics?
(A) Mechanics
(B) Chemistry
(C) Thermodynamics
(D) Magnetism
- What is the definition of matter?
(A) Anything that occupies space and possesses mass
(B) The ability to do work
(C) A form of energy
(D) A force in nature
- Which of the following is an example of energy?
(A) Book (B) Chair
(C) Electricity (D) Glass
- What are some common applications of physics in health and medicine?
(A) Trains and aeroplanes
(B) X-rays and MRI
(C) Internet and satellites
(D) Electric bulbs and heaters
- How has physics impacted transportation?
(A) By inventing the thermometer
(B) By reducing travelling time with cars and aeroplanes
(C) By creating fashionable dresses
(D) By developing video games
- Which of the following is an example of physics in entertainment?
(A) Stethoscope
(B) Refrigerator
(C) Washing machine
(D) Television

MARK YOUR ANSWERS WITH PEN ONLY. Time Taken Minutes 

1	(A) A	(B) B	(C) C	(D) D	2	(A) A	(B) B	(C) C	(D) D	3	(A) A	(B) B	(C) C	(D) D	4	(A) A	(B) B	(C) C	(D) D	5	(A) A	(B) B	(C) C	(D) D
6	(A) A	(B) B	(C) C	(D) D	7	(A) A	(B) B	(C) C	(D) D	8	(A) A	(B) B	(C) C	(D) D	9	(A) A	(B) B	(C) C	(D) D	10	(A) A	(B) B	(C) C	(D) D

Concept 3

Scientific Method :

The systematic method followed by a scientist in finding out fact is called scientific method. The scientific method consists of the following steps:

1. Making observations:

A scientist observes carefully what is happening in the nature. We know a body falls down when dropped from a height. In fact, most of the people do not give importance to what they see but, a scientist goes deep into the happening observed by him. For example, **Sir Isaac Newton** discovered the well known **Law of Gravitation** by a simple observation while he was sitting under an apple tree, that an apple had fallen from the apple tree.



2. Collecting information:

A scientist keeps an accurate record of all the observations and measurements made by him. He also gathers all the available information about the problem from various sources and records it properly.

3. Suggesting an explanation (theory or hypothesis or law):

A scientist thinks over all the observations, measurements and other information available to him about the problem. He thinks of various possibilities and probable causes. After a careful consideration of all the facts and evidences, the scientist suggests a reasonable explanation of the problem. This explanation may be a **hypothesis** or a **theory** or a **law**.

4. Experimenting:

The scientist performs experiments to test his explanation. You might have heard the name of **Galileo**. He performed number of experiments regarding falling bodies. He dropped different bodies, different in shapes, sizes and weights from the Leaning Tower of Pisa—his well-known experiment ‘Feather and Stone’ in the history of science.



5. Forming a conclusion:

If the results of the experiments support the explanation by the scientist then he makes a conclusion about the problem. But, however, if the results of the experiment do not support his explanation, then this explanation is rejected. When a hypothesis is proved, it becomes a law or theory. We also use scientific methods in cooking and other household activities.

Scientific Method in our Daily Life :

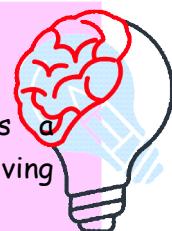
The scientific method is used by us in our daily life.

- (i) A farmer working in the field uses scientific method to grow crops.
- (ii) We use scientific method to detect and repair the fault in our bicycle.
- (iii) A mechanic uses scientific method to detect and repair the fault in a machine.
- (iv) A potter uses scientific method to make earthen pots.
- (v) In cooking and other household activities we make use of scientific method.
- (vi) You know a doctor is also a scientist. Usually a doctor adopts the scientific method to examine a patient.

Knowledge Box

The scientific method is a systematic approach to solving problems. Steps include:

1. Observing and questioning.
2. Formulating a hypothesis.
3. Conducting experiments.
4. Analysing results.
5. Drawing conclusions



Fun Facts

You're already a scientist—you test hypotheses every day without realizing it!


CLASSROOM DISCUSSION QUESTIONS
**CDQ
03**

1. Which step of the scientific method involves careful observation of natural phenomena?
 - (A) Step 2
 - (B) Step 3
 - (C) Step 4
 - (D) Step 1
2. Who is credited with discovering the Law of Gravitation through a simple observation of an apple falling from a tree?
 - (A) Albert Einstein
 - (B) Isaac Newton
 - (C) Galileo Galilei
 - (D) Charles Darwin
3. What is the purpose of performing experiments in the scientific method?
 - (A) To make conclusions
 - (B) To suggest explanations
 - (C) To collect information
 - (D) To test hypotheses
4. In which step of the scientific method does a scientist suggest a reasonable explanation of the problem?
 - (A) Step 2
 - (B) Step 3
 - (C) Step 4
 - (D) Step 5
5. How do farmers use the scientific method in their daily activities?
 - (A) To repair bicycles
 - (B) To grow crops
 - (C) To make earthen pots
 - (D) To examine patients
6. Which historical figure performed experiments regarding falling bodies, including the famous 'Feather and Stone' experiment?
 - (A) Albert Einstein
 - (B) Galileo Galilei
 - (C) Isaac Newton
 - (D) Charles Darwin
7. In which step of the scientific method does a scientist keep an accurate record of all observations and measurements?
 - (A) Step 2
 - (B) Step 3
 - (C) Step 4
 - (D) Step 5
8. How do mechanics utilize the scientific method in their work?
 - (A) To repair bicycles
 - (B) To detect and repair faults in machines
 - (C) To grow crops
 - (D) To make earthen pots

MARK YOUR ANSWERS WITH PEN ONLY. Time Taken Minutes

1	A B C D	2	A B C D	3	A B C D	4	A B C D	5	A B C D
6	A B C D	7	A B C D	8	A B C D	9	A B C D	10	A B C D

Concept 4

Is Science Good or Bad

1. The scientists try to apply their knowledge in a useful way. Scientists of different countries have contributed to the progress of science. The people of the Asian countries had taken a lead in scientific discoveries in earlier times.
2. Aryabhatta was a well-known Indian mathematician. Nagarjuna, an ancient Indian scientist, discovered many methods of curing diseases using plants as medicines. This method of treatment is called Ayurveda. It is practised in many places in our country, China and several other regions of the world.
3. In recent times, Jagadish Chandra Bose studied the sensitivity of plants in detail.
4. The hard work of scientists such as Sir C.V.Raman, S.Ramanujan, S.N.Bose, M.N.Saha, D.N.Wadia, B.Sahni, P.Maheshwari G.N.Ramachandran, T.R.Sheshadri, Homi J.Bhabha and Vikram Sarabhai have helped our country to progress in many fields.
5. At present, there is a large number of scientists in India helping significantly in the growth of science and the development of the country.
6. A scientist named Edward Jenner worked very hard and found out a vaccine to protect people from getting some diseases. This vaccine protected many people against diseases all over the world.
7. Similarly, Alexander Fleming discovered a very effective medicine called penicillin. Penicillin has cured many people from various infectious diseases.
8. You must have heard of Madame Marie Curie, a Polish scientist. She worked very hard and discovered Radium and Polonium.
9. A scientist, Leeuwenhoek, prepared a microscope and observed many tiny objects. Microscopes proved useful in studying different types of germs, examining the blood, and so on.
10. Methods to preserve milk, jam, etc. were found out by Louis Pasteur. These methods are being used by food industries.



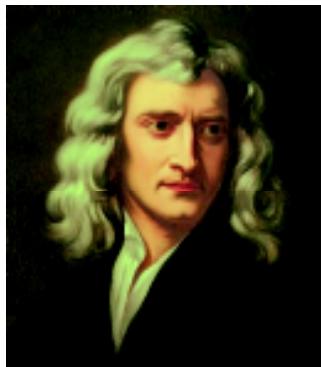
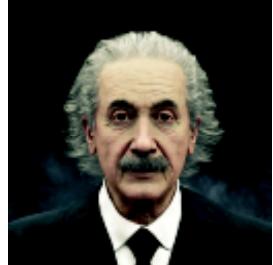
Famous physicists and their contributions:

1. Isaac Newton: Laws of motion and gravity.
2. Albert Einstein : Theory of relativity.
3. Marie Curie: Discovery of radioactivity.
4. Galileo Galilei: The telescope and heliocentrism.
5. Stephen Hawking: Black hole theories.

An old person can use a stick for support. A stick helps a blind man to move on a right path. Somebody can use a stick to damage glassware, toys or flower pots. Sometimes science, too, is used in harmful ways. Once people learnt that certain substances explode easily, they made bullets, bombs and crackers. These were devised for our safety and security. Some people misused bullets to kill animals in the forests and to commit dacoities. The existence of some beautiful animals and birds are in danger. A powerful bomb used in a war can kill many innocent people. It can destroy buildings and factories. Some people try to use poisonous gases in war. These gases kill animals, plants and innocent people. The crops are destroyed and land becomes infertile. All such destructive uses of science must be avoided. It is rightly said that, **“Science is a good servant but a bad master”**.

SOME EMINENT PHYSICISTS :

Today, we are living in the age of science and enjoying the modern technology. Do you know who made it possible by their continuous efforts?

<p>Sir C.V. Raman (1888-1970): Won Nobel</p> 	<p>Dr. Meghnad Saha (1893-1956) : Discoverer</p> 	<p>Dr. Homi Jahangir Bhabha (1893-1966) : Pioneer of atomic research in India. A nuclear reactor 'Apsara'</p> 
<p>Dr. Vikram Sarabhai (1919 - 1970) : Pioneer in Space</p> 	<p>Sir Isaac Newton (1642-1727) : Discoverer</p> 	<p>Albert Einstein (1879-1955) : A great scientist who discovered Theory of Relativity and won Nobel Prize in 1921. Originator of mass energy formula; $E=mc^2$. He is known as the</p> 


CLASSROOM DISCUSSION QUESTIONS
**CDQ
04**

1. Who is credited with discovering the Raman Effect and was awarded the Nobel Prize for it?
 - (A) Sir Isaac Newton
 - (B) Dr. Meghnad Saha
 - (C) Sir C.V. Raman
 - (D) Dr. Homi Jahangir Bhabha
2. Who is considered the pioneer in Space Research in India?
 - (A) Dr. Homi Jahangir Bhabha
 - (B) Dr. Vikram Sarabhai
 - (C) Sir Isaac Newton
 - (D) Albert Einstein
3. Who is recognized as the father of Modern Physics?
 - (A) Dr. Meghnad Saha
 - (B) Dr. Homi Jahangir Bhabha
 - (C) Albert Einstein
 - (D) Sir Isaac Newton
4. Which scientist discovered ionized molecules around the sun?
 - (A) Sir C.V. Raman
 - (B) Dr. Meghnad Saha
 - (C) Dr. Homi Jahangir Bhabha
 - (D) Dr. Vikram Sarabhai
5. Which scientist discovered the medicine called penicillin?
 - (A) Aryabhatta
 - (B) Nagarjuna
 - (C) Edward Jenner
 - (D) Alexander Fleming
6. Who prepared a microscope and observed many tiny objects, contributing to the field of microbiology?
 - (A) Aryabhatta
 - (B) Nagarjuna
 - (C) Leeuwenhoek
 - (D) Louis Pasteur
7. What does the saying "Science is a good servant but a bad master" imply?
 - (A) Science should only be used for beneficial purposes
 - (B) Science can be used for both good and bad purposes
 - (C) Science should be controlled by governments
 - (D) Science should be completely avoided

MARK YOUR ANSWERS WITH PEN ONLY. Time Taken Minutes 

1	2	3	4	5
(A) <input type="radio"/>	(B) <input type="radio"/>	(C) <input type="radio"/>	(D) <input type="radio"/>	(A) <input type="radio"/>
(A) <input type="radio"/>	(B) <input type="radio"/>	(C) <input type="radio"/>	(D) <input type="radio"/>	(B) <input type="radio"/>
6	7	8	9	10
(A) <input type="radio"/>	(B) <input type="radio"/>	(C) <input type="radio"/>	(D) <input type="radio"/>	(A) <input type="radio"/>

C.D.F.

(Concepts, Definitions and Formulae)

1. Science is an organised and systematic knowledge about the various things around us.
2. Science is divided in two branches—pure and applied.
3. Physics deals with matter and energy.
4. Matter is that which occupies space and possesses mass.
5. Energy is the capacity of doing work.
6. Scientific phenomenon or scientific method consists of the following four steps:
 - (i) Observation
 - (ii) Experimentation
 - (iii) Theory or Formation of hypothesis
 - (iv) Analysing the data and reaching the conclusion (or drawing inference)
7. Sir C.V. Raman was the discoverer of 'Raman Effect', a new phenomenon of light.
8. Dr. Meghnad Saha did constructive work on Astrophysics, a physics which deals with the space.
9. Sir Issac Newton had told 'Law of gravitation', a law which deals with the attraction between planetary bodies.
10. Dr. Homi Jahangir Bhabha was the pioneer in the field of 'Atomic Research in India'.
11. Dr. Vikram Sarabhai was awarded with Padma Bhushan.
12. Albert Einstein a German born American physicist who was awarded the 1921 Nobel Prize in Physics. His major contribution was the theory of RELATIVITY and the inter conversion of mass and energy in the formula $E=mc^2$, where E is energy, m is mass and c is velocity of light. Also known as father of Modern Physics.
13. According to the concepts of the theory of relativity, no material object can travel with a speed greater than that of light.

Advanced Worksheet

LEVEL **1****Single Correct Answer Type (S.C.A.T.)**

- The Indian Institute of Science is located at :**
 - Bombay
 - Ahmedabad
 - Bangalore
 - Delhi
- We measure the temperature of a substance with the help of a device called :**
 - Sonometer
 - Barometer
 - Lactometer
 - Thermometer
- 'APSARA' a nuclear-reactor was built in India under the guidance of Indian scientist :**
 - Homi Jahangir Bhabha
 - Dr. Vikram Sarabhai
 - Dr. Meghnad Saha
 - J.C. Bose
- The mass-energy formula $E = mc^2$ was formulated by :**
 - Isaac Newton
 - Albert Einstein
 - H.J. Bhabha
 - None of these

- By studying reference material we are able to :**

- Identify the problem
- Collect basic information
- Work out a hypothesis
- Draw conclusion and generalisation

- An instrument used for seeing aeroplane beyond the sight of vision, is called :**

- Telescope
- Television
- Radar
- Periscope

- The branch of science which deals about the study of 'Energy and its transference' is called :**

- Physics
- Chemistry
- Biology
- Space-science

- Physics is a branch of :**

- Pure science
- Applied science
- Biology
- Space science

9. The first step in scientific method is :

- (A) Making theory
- (B) Making hypothesis
- (C) Experimentation
- (D) Identifying the problem

10. For man, science is :

- (A) Only good
- (B) Only bad
- (C) Neither good nor bad
- (D) Both good and bad

11. Discoveries in the composition of matter are made by :

- (A) Physicists
- (B) Botanists
- (C) Chemists
- (D) Zoologists

12. A device which keeps you connected to the world anywhere, is :

- (A) Television
- (B) Telephone
- (C) Cell phone
- (D) Radio

13. A hypothesis is a :

- (A) Collection of related problems
- (B) Possible explanation of a problem
- (C) Correct explanation of a problem
- (D) Rejected explanation of a problem

14. A microscope is based on the principle of :

- (A) Mechanics
- (B) Optics
- (C) Magnetism
- (D) Electromagnetic waves

15. The fastest mode of travel is :

- (A) Cruise ship
- (B) Bullet train
- (C) Aeroplane
- (D) Car

16. The Latin word Scientia from which the word 'Science' has developed means _____.

- (A) Understanding
- (B) Reasoning
- (C) Knowledge
- (D) Logic

17. After experimenting and observing, scientists need _____ as a basis of their scientific studies.

- (A) Praying
- (B) Logical reasoning
- (C) Reading
- (D) Thinking

18. Natural Science deals with _____.

- (A) Living things
- (B) Nature
- (C) Stars and Satellites
- (D) Non-living things

19. Medical diagnostic technique such as _____ is a boon of Physics.

- (A) Radar
- (B) Satellite imaging
- (C) MRI scanning
- (D) Aroma therapy

20. Science which deals with the study of composition of matter is called :

- (A) Physics
- (B) Chemistry
- (C) Biology
- (D) Geography

21. We can see far-off objects clearly with a device called :

- (A) Microscope
- (B) Stethoscope
- (C) Telescope
- (D) Microphone

22. The device used for forecasting weather is :

- (A) Satellite
- (B) Radar
- (C) Telephone
- (D) Television

23. To see very minute things clearly we use a device called :

- (A) Radar
- (B) Telescope
- (C) Microscope
- (D) Computer

24. We have developed telescope by understanding the principles of

- (A) Optics
- (B) Gravitation
- (C) Mechanics
- (D) Magnetism

25. The study of the physics of the Earth and its environment in space.

- (A) Astronomy
- (B) Geophysics
- (C) Biophysics
- (D) Modern physics

26. Field that applies the theories and methods of physics to understand how biological systems work

- (A) Astronomy
- (B) Geophysics
- (C) Biophysics
- (D) Modern physics



Multi Correct Answer Type (M.C.A.T.)

27. Which of the following statements are true?

- (A) Physics is the study of all phenomena taking place around us.
- (B) One can become a good physicist by studying the works of other physicists.
- (C) Sense of sight is not always reliable.
- (D) Physicists use tools to make more accurate observations.

28. Which of the following statements are false?

- (A) We can develop our five senses by training and practice.
- (B) A person good in memorising can be a good physicist.
- (C) Nuclear radiations are highly dangerous to living beings.
- (D) A hypothesis is worked out by studying the reference material.
- (E) Zoology is systematic study of matter and energy.

29. Which of the following statements are true?

- (A) Physics is a branch of science, which deals with living matter.
- (B) A good scientist makes careful observations.
- (C) We can see small objects with the help of telescope.
- (D) A theory proved correct by experiments, is called hypothesis.

30. Choose the correct statements of the following.

- (A) The study of the physics of the Earth and its environment in space is called Geophysics.
- (B) The study of the motion of objects, with or without reference to force is called Mechanics.
- (C) Zoology is the scientific study of animals
- (D) Chemistry is the branch of science that deals with the properties, composition, and structure of elements and compounds

Comprehension Passage Type (C.P.T.)

PASSAGE - I

Science is a systematic study of the natural world. It helps us understand the universe through observation, experimentation, and analysis. From the bed we sleep on to the alarm clock that wakes us up, gadgets play a significant role in our daily lives. Some materials like rocks and fruits occur naturally, while others, such as plastics and bricks, are man-made. These advancements have made life more comfortable and enjoyable, showcasing the progress of science and technology over the ages.

31. What is science primarily concerned with?

- A) Creating gadgets
- B) Systematic study of the natural world
- C) Observing only human behavior
- D) Avoiding experiments

32. Which of the following is an example of a natural object?

- A) Plastic
- B) Brick
- C) Rock
- D) Glass

33. How has science contributed to daily life?

- A) By avoiding man-made materials
- B) By making life more complicated
- C) By making life more comfortable and enjoyable
- D) By discouraging the use of technology

PASSAGE - II

Physics, derived from the Greek word "Physikos," meaning natural, is the study of matter and energy and their interactions. Physicists explore forces, motion, heat, light, sound, and electricity. It is divided into branches like mechanics, thermodynamics, and electromagnetism. Physics has profound applications, from understanding the universe to creating technologies like X-rays, microwaves, and GPS systems.

34. What does the Greek word "Physikos" mean?

- A) Energy
- B) Nature
- C) Motion
- D) Physics

35. Which branch of physics deals with the relationship between force and motion?

- A) Thermodynamics
- B) Mechanics
- C) Optics
- D) Magnetism

36. What is the primary focus of physics?

- A) Study of plants and animals
- B) Study of matter and energy
- C) Exploration of fictional theories
- D) Examination of historical events

**Assertion Reason Type : (A.R.T.)**

A) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).

B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).

C) Assertion (A) is true, but Reason (R) is false.

D) Assertion (A) is false, but Reason (R) is true.

37. Assertion (A): Gadgets have significantly improved our comfort and convenience in daily life.

Reason (R): Science is the systematic study of natural phenomena through observation and experimentation.

38. Assertion (A): Mechanics is a branch of physics that studies the relationship between force and motion.

Reason (R): Physics, derived from the Greek word "Physikos," deals with the study of matter and energy.

39. Assertion (A): The scientific method involves forming a hypothesis before conducting experiments.

Reason (R): Hypotheses are formed to provide a possible explanation for observations and must be tested.

Integer Type Questions (I.T.Q.)

40. In what year was Isaac Newton knighted by Queen Anne of England?

41. How many major branches is physics commonly divided into, according to the lesson?

42. According to the text, how many steps are there in the scientific method?

43. In what year did Albert Einstein receive the Nobel Prize in Physics?

44. How many examples of physics in daily life are explicitly listed in the lesson under “Applications of Physics”?

Matrix Matching Type (M.M.T.)**SET I****Column - I**

45. Radiotherapy

46. Lightning

47. Satellite imaging

48. Limited energy resource

49. X-ray imaging

Column - II

(A) Phenomenon

(B) Treatment of cancer

(C) Detecting Fractures

(D) Weather Forecasting

(E) Fossil fuels

SET II**Column - I**

50. Study of animals

51. Study of plants

52. Study of composition of matter

53. Study of matter and energy

Column - II

(A) Physics

(B) Chemistry

(C) Botany

(D) Mathematics

(E) Zoology

Statement Type : (S.T.)

(A) Statement A is true, but Statement B is false.

(B) Statement A is false, but Statement B is true.

(C) Both statements A and B are true.

(D) Both statements A and B are false.

54. Scientific Method

Statement A: A scientist observes things carefully to learn more about nature.

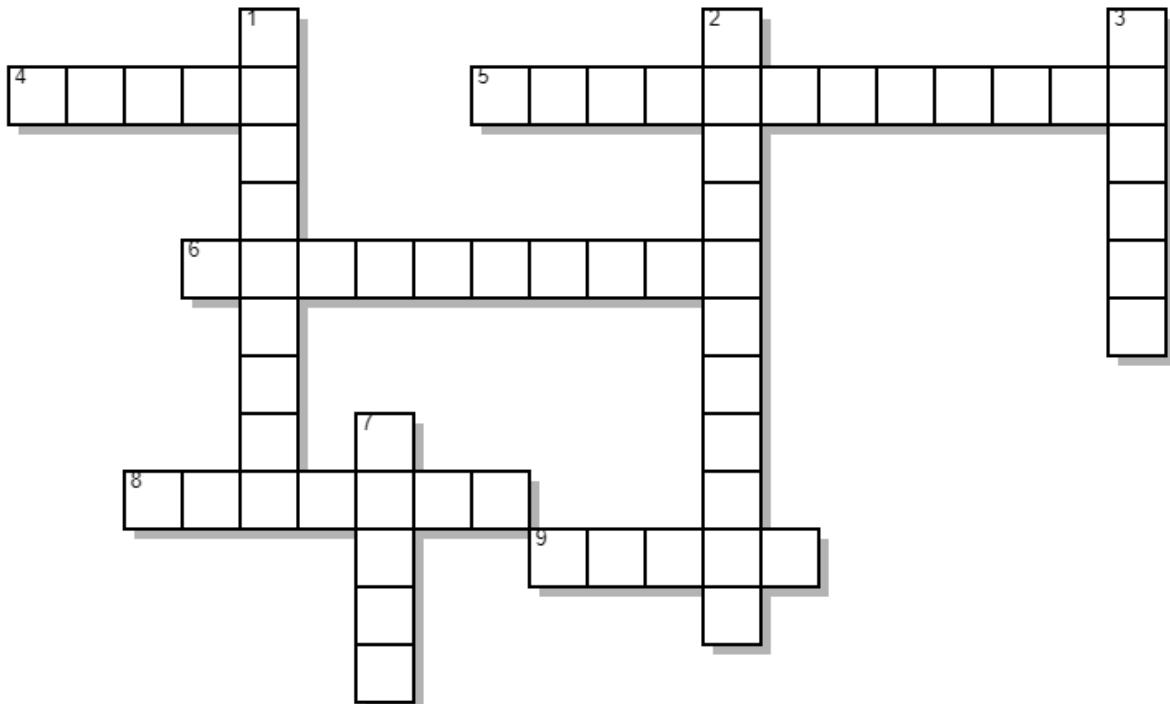
Statement B: Scientific experiments help in testing ideas and proving them right or wrong.

55. Importance of Physics

Statement A: Physics helps us understand how light, sound, and heat work.

Statement B: Physics has no role in the working of cars, mobile phones, or electricity.

PUZZLE TIME



Across (→)

4. Albert Einstein was awarded with _____ prize in 1921.
5. Dr. Vikram Sarabhai was awarded with _____.
6. Alexander Fleming discovered _____.
8. _____ deals with matter and energy.
9. Astrophysics deals with _____.

Down (↓)

1. Law of gravitation deals with the attraction between _____ bodies.
2. Sir C.V. Raman discovered _____.
3. The capacity to do work is called _____.
7. No material matter can travel with a speed greater than _____.