

Teaching of General Science

Scientist and Their Works

1. Isaac Newton (Durdana Saleem)

- He was president of The Royal Society.
- Was an associate of the French Academy of Science
- A MP.(Member of Parliament) for Cambridge University.
- Warden of the Royal Mint.
- Professor of Mathematics & The Newton (N) was adopted as the unit of force in the System International (SI).
- You may know Sir Isaac Newton (1642-1727) as "that apples-and-gravity guy,"
- Master of Astronomy, Chemistry, Mathematics, Physics and Theology.
- The Principia Mathematica, Optical Spectrum of Light, Principals of Gravity, Theories of Motion, Orbital Motion of the Planets, Newtonian Physics (Mechanics), One general law of nature, Reflective Telescope.

2. Albert Einstein (Meryam Sher)

- He developed the general theory of Relativity.
- He is best known for the mass energy Equivalence : $E = mc^2$
- He discovered the "law of Photoelectric Effect".
- He established the "law of Quantum Theory".
- He laid the foundation of "Photon Theory of Light".
- He published more than 300 Scientific Papers. 150 Non- Scientific works.
- Noble Prize in Physics (1921), Malteucci Medal (1921), Copley Medal, Time Polson of the century

3. Louise Pasture (Tooba Rauf & Dure-e-Najaf)

- He was a French chemist and microbiologist.
- He is well known for his discoveries of the principles of vaccination, microbial fermentation and pasteurization.
- Awards: Copley Medal, Rumford Medal, Leeuwenhoek Medal

Inventions or discoveries of Louis pasture:

1. He resolved a problem of the nature of tartaric acid in 1849.he solve that mystery that tartaric acid is non-direction.
2. Germ theory: According to that theory he proves that every disease has a cause active micro-organism that living.
3. Pasteurization: He invented pasteurization through food and beverages are preserved and stored for a long period.

- 4. Vaccination: He introduced vaccination a word which not known before. Vaccination is actually a technique by which small and less powerful micro-organisms are injected in the body by which body become able to fight against large diseases.
- 5. Immunology: He invented this theory according to which after a certain time of medical treatment patients body develop immune against germs.

He invent cures of following diseases:

- Chicken Cholera, Anthrax, Rabies, Small Pox.

4. Jabir – Bin – Hay an (Zainab)

- Discovered “Caustic Soda”.
- First to evoke Water Gold.
- First to introduce the method of separation of NOAH.
- First to discover Nitric Acid & Hydrochloric Acid.
- First to retrieve the Sulphuric Acid & termed in Alzaj Oil
- Manufactured incombustible paper.
- He made some sort of Paint that prevents Iron – Rust.
- He was the first one o introduce the method of separating Gold from Silver solution by acid, which is the predominant mode to this day.

5. Edward Jenner (Arooba)

- Known as “Father of Immunology”.
- Was an English Scientist.
- Famous for his discovery of “Smallpox Vaccine”.
- First successful vaccine ever to be developed & remains the only effective preventive treatment for the fatal smallpox disease.
- Discovery was medical breakthrough & saved countless lives.
- In 1980, the “World Health Organization” declared Smallpox an eliminated disease.
- During his training in chipping Sudbury, an interesting thing happened that led to his famous discovery in the later years. He overheard a girl say that she could not get the dreaded Smallpox disease because she had already, had another disease known as Cowpox.
- In the 18th century Smallpox was considered to be the most deadly and persistent human pathogenic disease.
- In his last days his right side paralyzed, he never fully recovered and finally died of an apparent stroke on 26 Jan 1823 in Berkeley.

6. Marie Curie (Aqsa Farooq & Freeha)

- Born in Kingdom of Poland.
- Field: Physics & Chemistry.
- Studied in University of Paris.
- Works: Radio Activity Rays, Polonium, Radium.

- Got Noble Prize in Physics.
- Got Noble Prize in Chemistry.
- Discovered Alfa, Beta, Gamma rays & their signs.

7. Al – Beruni (Aneela Farooq)

- His full name is Bin Ahmad Al Khwarizmi Al Beruni.
- He was master of History, Languages, Math, Earth & Palmistry.
- His first book was “ **Asar Al Baqia** ” .
- Found the age of Earth (24779).
- His total works are 146.
- He discovered about drugs & medicines.
- He was Buried in Ghazni.

8. Alexander Graham Bell (Nida Inam)

- Born in 1847, Scotland.
- Scientist, Inventor, Engineer & Innovator.
- His famous work is the invention of Telephone.
- Other inventions / work in Optical
 1. Telecommunication
 2. Hydrofoils
 3. Aeronautics
- Other Invention: Metal Detector

9. Blaise Pascal (Ghina Anwar)

- Pascal’s father was a King & later become president.
- Blaise Pascal was a French mathematician, physicist, inventor, writer and Christian philosopher.
- He was a child prodigy who was educated by his father.
- Works: Contribution to hydrostatic, experimentations with the barometer & theoretical work on the equilibrium of Fluids.
- He was known for his theories of Liquids and gasses and their interrelations.
- Also his was best known for his work regarding the relationship between the dynamics of hydrodynamics and rigid bodies.
- Equilibrium of Liquids by Pascal is an extension to Simon Stevin’s research on hydrostatic paradox; it was termed as the Final law of hydrostatics, the famous Pascal’s Principle.
- He worked on a book “Essay on Conics”, its highlight was “Mystic Hexagram” .
- Died suffering from TB.

10. Robert Brown (Hafsa Shabbir)

- Botanist and palaeobotanist.
- He made important contributions to botany largely through his pioneering use of the microscope.
- His contributions include one of the earliest detailed descriptions of the cell nucleus and Cytoplasmic streaming.
- His First observation was of Brownian motion.
- Worked on plant Pollination and Fertilisation.
- He was the first to recognise the fundamental difference between Gymnosperms and Angiosperms.
- He did some of the earliest studies in Palynology.
- He did contributions in plant taxonomy.

11. Marconi (Afshan Nisar)

- An Italian who invented “Radio” (1895).
- Won Noble Prize in Physics for this accomplishment.
- Born near Bologna in Italy in 25 April 1874.
- He proved the concept of communication by the waves.
- Cause of Death: Heart Failure.

12. Charles Babbage (Momna)

- Charles Babbage was born on 26 Dec 1791 in London.
- Son of a Banker.
- Studied from Cambridge University.
- Interested in Mathematics.
- He invented difference engine.
- Fields: Philosophy & Code – Breaking.
- Died in London in 1871.

13. Charles Lyell (Fatima Asif)

- Sir Charles was the most famous lawyer and geologist of his time and one of the most important British scientist in the history.
- His primary belief was that all the past changes of earth can be detailed by the forces now acting. The notation becomes the fundamental basis of modern geology.
- Lyell wrote “*Principle of Geology*”, a landmark work in geology that explores James Hutton doctrine of uniformitarianism. Its first volume was published in 1830 and third and last volume was published three years later.
- His another work “*Antiquity of Man*”, was published in 1863, and discussed the *proofs of the long existence of human beings on the earth*.
- He was one the earliest man to embrace Darwin’s theory of natural selection in biology.

- Lyell's geological contributions ranged from volcanoes and geological dynamics through stratigraphy, palaeontology and glaciology to subject that would now be considered as part of prehistoric archaeology and paleoanthropology.
- Lyell was made a foreign member of Royal Swedish Academy of Sciences in 1866.

14. Thomas Edison (Sana Zahid)

- Thomas Edison was born on February 11, 1847 in Milan, Ohio.
- He was the first inventor to apply principles of mass production.
- His inventions are *photograph, motion picture camera* and *electric bulb*.
- He died in 1931.

15. Muhammad Ibn Musa (Sumbal Zakir)

(Al- Khwarizmi)

- He was born in a Muslim country Khwarizm which was taken by Russia 1973.
- He was the founder of algebra and several other branches of mathematics.
- He made major contribution to the field of Algebra, trigonometry, astronomy, geography and cartography.
- The name algebra was derived from his 830 books on the subject of *Hisab al-jabr wa al-muqabala* and developed analytical equation linear and quadratic equation.
- He developed the trigonometric table containing the sin functions, which were later extrapolated to tangential functions.
- He developed the calculus of two errors, which lead him to the concept of differentiation.
- He also developed the concept of algorithms in mathematics. Logarithms with base **e** (natural logarithms) and with base **10** known as common logarithm for rapid and computations,
- He was also known as an astronomer and geographer.

16. Ibn – Sina (Sumaiya Khalid)

- Born in 980 A.D in a village Afshan, near Bukhara.
- Father was an advocate.
- At the age of 10 he became Hafiz – e – Quran.
- Contributions: Medicine, Psychology, Pharmacology, Geology, Physics, Chemistry, Astronomy, Philosophy.
- He was also a poet & Islamic Scholar.
- Important contribution: Book "Al – Quran".
- At the age of 18 he was reputed Physician.
- Learned about medicine at the age of 16.

17. Elizabeth Blackwell (Mahak Tahir)

- She was the first openly identified woman to graduate from medical school.
- At first, she was even kept from classroom medical demonstrations, as unsuitable for a woman but very soon the students started getting impressed by her ability.
- she graduated first in her class in 1849.

- When Blackwell lost sight in one eye, she returned to New York City in 1851, giving up her dream of becoming a surgeon.
- In the 1860s she organized a unit of female field doctors during the Civil War.
- In 1857, Blackwell along with her sister Emily founded their own infirmary, named the New York Infirmary for Indigent Women and Children.
- she published in 1852 as *The Laws of Life, with Special Reference to the Physical Education of Girls*.
- In 1856, she adopted Katherine "Kitty" Barry, an orphan of Irish origin.

18. Alexander Fleming (Sana Hakeem & Iqra)

- Born in Scotland 1881.
- He looked for medicine that would heal infections.
- He discovered Penicillin.
- Penicillin cured many diseases like magic spell.
- Died in London in 1955.
- Died because of Heart failure.

19. Edward Teller (Rida Masood)

- Born in Hungary in 1904.
- Graduated in chemical engineering.
- Received his Ph.D. in physics at the University of Leipzig.
- Contribution in diverse fields such as: Nuclear Physics, Plasma Physics, Astrophysics, Statistical Mechanics, Edward Teller – Atomic Bomb.
- He had idea for thermonuclear weapon in 1951.
- He worked on his work and tested first Hydrogen bomb.
- Published more than a dozen books on subjects ranging from energy policy to defence issues.
- Received numerous awards for his contributions to Physics and public life
- Awarded with 23 honorary degrees
- Called the father of hydrogen bomb.
- Two months before his death he was awarded with the Presidential Medal of Freedom, the nation's highest civil honour, during a special ceremony at the white house.

20. Georg Simon OHM (Durdana & Tooba & Quart)

- Born in 1787.
- Discovered the most fundamental laws of current electricity.
- Discovered laws relating to the strength of current in a wire.
- He found that electricity acts like water in a pipe.
- OHM discovered that current in a circuit is directly proportional to electric pressure & inversely to the resistance of conductors.

- This mathematical tool of OHM has greatest use in determining an unknown factor of voltage, current or resistance in an electric circuit in which the other two factors are unknown.
- Died in 1854.

Multiple Choice Questions (s)

1. Isaac Newton was rewarded with the post of....

- a) **The Royal Society** b) The Lord Society c) The Common Society

2. Isaac Newton was a member of

- a) Political Party b) Common Society c) **Parliament for Cambridge**

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3. Isaac Newton was Master of

- a) Biology **b) Astronomy** c) None of these

4. Principle of Gravity was given by

- a) **Isaac Newton** b) Faraday c) Brown Smith

5. Isaac Newton gave principle(s) of

- a) Principle of Gravity b) Principle of Mathematics c) **Both**

6. Einstein received Noble Prize in.....

- a) 1920 **b) 1921** c) 1922

7. General theory of Relativity was developed by?

- a) Newton b) Louis Pasture c) **Einstein**

8. Einstein published Scientific papers almost..

- a) 200 **b) 300** c) 3000

9. "E = mc²" was formed by...

- a) Jabir – Bin – Hayan **b) Einstein** c) Newton

10. Einstein received Medal(s)

- a) One **b) Two** c) Four

63. Charles Lyell was ...

- a) **Geologist & Lawyer** b) Geologist c) Lawyer

64. Charles Lyell's work "Antiquity of Man" was published in

- a) 1836 b) 1832 **c) 1863**

65. Charles Lyell was made a foreign or the Royal Swedish Academy of Science in 1866.

- a) Manager b) Partner **c) Member**

66. Thomas Edison was son of his parents.

- a) Sixth **b) Seventh** c) Fifth

67. He is famous due to his invention.

- a) Phonograph b) Camera **c) Electric bulb**

68. He was an inventor.

- a) English **b) American** c) Pakistani

68. He was born in

- a) Lahore, Pakistan **b) Milan, Ohio** c) Sydney, Australia

69. He created first

- a) School **b) Research Laboratory** c) University

70. Thomas Edison invented

- a) **Motion Camera** b) Radio c) Calculator

71. A Muslim country Kwarism was taken by Russia in

- a) 1994 b) 1990 **c) 1973**

72. Al-Khwarizmi was recognized as the founder of

- a) Chemistry **b) Maths** c) Physics

73. He developed the calculus of

- a) Eight errors b) six errors **c) two errors**

74. Logarithms with base is known as common logarithm.

- a) e b) 6 **c) 10**

Question & Answers:

Q1. In which fields Isaac Newton worked?

Ans. He was Master of : Astronomy, Chemistry, Mathematics, Physics and Theology. His other works are:

- The Principia Mathematica
- Optical Spectrum of Light
- Principals of Gravity
- Theories of Motion
- Orbital Motion of the Planets
- Newtonian Physics (Mechanics)
- One general law of nature & Reflective Telescope.

Q2. What is the Einstein Equation?

Ans. Einstein is best known for the Mass Energy Equivalence:

$$E = mc^2$$

Q3. What is vaccination theory of Louis pasture?

Ans. Louis introduced vaccination a word which not known before. Vaccination is actually a technique by which small and less powerful micro-organisms are injected in the body by which body become able to fight against large diseases.

Q4. Write any two achievements of Jabir – Bin – Hayan?

Following are the two achievements of Jabir – Bin – Hayan:

- Discovered “Caustic Soda”
- Discovered “Nitric Acid”

Q5. Who is the father of Immunology?

Ans. Edward Jenner.

Q6. In which science field (s) Marie Curie won Noble Prize?

Ans. She was the first women who won two Noble Prizes in two Science fields:

- Physics
- Chemistry

Q6a. Marie Curie was known for what?

Ans. She was known for:

- Radium
- Polonium
- Radio Activity Rays

Q7. What are Al – Beruni great works?

Ans. Following are the works of Al – Beruni:

- Mathematics
- Astronomy
- Physics
- Natural Science
- Geography
- Chronologist
- History

Q8. Why did Alexander Graham Bell invented the telephone?

Ans. The Telephone revolutionized long – distance communication, which allow people to speak with each other quickly, clearly & affordably.

Q9. What is the most significant contribution of Pascal in the history of Maths?

Ans. The development of “**Probability theory**” is considered to be the most significant contribution in the history of Mathematics

Q10. What Did Robert Brown, the Botanist, Discover?

Ans. Robert Brown, the botanist, discovered among other things, the cell nucleus and Cytoplasmic streaming. He was also the first to make an observation of the early work on plant pollination and fertilisation, and Brownian motion.

Q11. Who was Marconi?

Ans. Marconi was an Italian who invented the radio in 1895. He won Noble Prize in Physics for this accomplishment.

Q12. In which fields Charles Babbage worked?

Ans. These are the fields in which Charles Babbage worked:

- Philosophy
- Code – Breaking

Q13. What was Charles Lyell's primary belief?

Ans. Lyell's primary belief was that " all the past changes of the earth can be detailed by the forces now acting".

Q14. Write the names of Thomas Edison's invention?

Ans. inventions of Thomas Edison's are:

- Phonograph
- Motion Picture Camera
- Electric Bulb

Q15. Where the word algebra is derived from?

Ans. The word algebra was derived from the name of Muhammad Ibn Musa's 830 books on the subject of Hisab al-jabr wa al-muqabala.

Q16. What are the main contributions of Ibn – Sina in Physics?

Ans. In Physics he compared forms of Energy, Heat, Light, Mechanical & such concepts of Force, Volume & Infinity.

Q17. Why Elizabeth Blackwell was rejected from all the leading school of medical???

Ans. She was rejected from all leading schools of medical because she was the first girl in America who wanted to be a Doctor. At first, she was even kept from classroom medical demonstrations, as unsuitable for a woman but very soon the students started getting impressed by her ability.

Q18. What is Penicillin? When & where Alexander Fleming discovered it?

Ans. Penicillin is an Antiseptic medicine, discovered in Sep 1928, in his laboratory.

Discovery:

Fleming, being a bacteriologist, was searching for cures to treat bacterial infections. One day in 1928 he discovered that bacteria he had been growing on a culture plate had been killed in an area close to where a mould was accidentally growing. He isolated the mould and showed that it released a substance that inhibited bacterial growth. He named the substance penicillin after the name of the mould. Fleming reported his ground-breaking results in the scientific paper "On the antibacterial action of cultures of a Penicillium with special reference to their use in the isolation of B. influenza" published in British Journal of Experimental Pathology 10, 226-236 (1929).

Q19. In which diverse field Edward Teller contributed?

Ans. In the following diverse fields Edward Teller contributed:

- Nuclear Physics
- Plasma Physics
- Astrophysics
- Statistical Mechanics

Q20. What is OHM's law?

Ans. OHM's law is made from three mathematical equations that shows the relationship between electric voltage, current & resistance.

$$I = V / R$$

$$V = I \times R$$

(Voltage = Current by Resistance)

$$R = V / I$$

(Resistance = Voltage by Current)

$$I = V / R$$

(Current = Voltage by Resistance)