

Barroz trailer launch: Mohanlal and Akshay Kumar to team up for a Bollywood film? What we know



Mohanlal, one of the most loved Indian stars and an icon of Malayalam cinema, has turned a new leaf. The artist par excellence has turned a director with his 3D film Barroz. Aimed at kids and families, this fantasy film is the second 3D to come out of Malayalam film industry, 40 years after it gave India its first 3D film, Chota Chetan. Mohanlal is proud and excited about the world to see what he has created. The movie is being dubbed and released the world over in multiple languages to help it reach as wide an audience as it can. The trailer launch happened in Mumbai on Wednesday with Akshay Kumar in attendance as the chief guest. It was interesting to see the superstars come together in the same frame. It's a noted fact Akshay has starred in many Hindi rankes of Mohanlal's films. But he doesn't hold a gripe against Kumar for it. In fact, he praised Akshay and said, "I have seen most of his films that he has done with Priyadarshan and he is a brilliant actor. He also is very punctual and loves his profession. He is 100 per cent professional, I am not." He also pointed out that the remakes were different when it came to costumes, body language and characters so there shouldn't be comparisons."

Later asked about the possibility of working with Akshay in a film, Mohanlal said, "Actors don't have any choice. If a good project comes, why not?" Akshay on the other hand was awed by the film's trailer and expressed interest to watch the film with Nitara. The actor had plans to catch a movie with his daughter right after the trailer launch and said that he is sure his daughter will be happy to see Barroz when it releases and will be happy, as will be other kids who watch it. Mohanlal and team also promised to send first day first show tickets of Barroz to Akki and Nitara. Barroz tells the story of the ghost of Barroz who protects a little girl Isabella. It is the bond between Barroz and Isabella that is the crux and the film has a terrific team from LA, India and Macedonia work relentlessly to bring it to life. Barroz releases in theatres in Hindi on December 27, 2024.

Scintillation Counter

The flash of light that is produced by a transparent material due to the passage of a subatomic particle (electron, ion, alpha particle, or photon) is called scintillation. A scintillation detector usually consists of the following components:

Scintillator: A scintillator is a device that emits light when a high-energy particle hits it. The energy of the emitted pulse of light is directly proportional to the particle that hits the scintillator. This makes it an efficient energy-dispersive radiation detector much used in spectroscopy. The generation of photons occurs in the scintillator as a response to the incident radiation.

Photodetector: A photodetector converts light to an electrical signal in order to process the signal. A photomultiplier tube (PMT), a photodiode or a charged coupled device (CCD) is generally used as a photodetector.

Scintillation Counter How it Works: Let us try to understand the principle of the scintillation counter through the following points.

- When ionizing radiation enters the scintillator, it interacts with the material of the scintillator due to which the electrons enter an excited state.
- Charged particles follow the path of the particle itself.
- The energy of gamma



radiation (uncharged) is converted to a high energy electron either through the photoelectric effect, Compton scattering, or pair-production effect.

• The excited atoms of the scintillator material gradually undergo de-excitation and emit photons in the visible range of light. This emission is directly proportional to the energy of the incident ionizing particle. The material shines or flows brightly due to fluorescence.

Three types of phosphors are used namely:

- Inorganic crystals,
- Plastic phosphors,
- Organic crystals.
- The pulse of light emitted by the scintillator hits the photocathode of the photomultiplier and releases at most one photoelectron for each photon.
- These electrons are accelerated through electrostatic means by applying a voltage potential and are targeted to hit the first dynode, by having enough energy to produce further electrons.

ther electrons.

• These released electrons are called secondary electrons. They strike the second dynode, thereby releasing further electrons. This process occurs in a photomultiplier tube.

• Each subsequent impact on the dynode releases further electrons, and hence a current amplifying effect occurs on the dynodes. Each subsequent dynode is at a higher potential than the previous one, and so helps in enhancing the acceleration. Likewise, the primary signal is multiplied throughout 10 to 12 stages.

• At the final dynode, highly sufficient numbers of electrons are present to produce a pulse of high magnitude to develop amplification. This pulse carries information about the energy of the incident ionizing particle. The number of pulses per unit time gives the significance of the intensity of radiation.

Types of Scintillation Counter: There are basically two types of scintillators used

in nuclear and particle physics. They are plastic or organic scintillators and crystalline or inorganic scintillators.

a. Organic Scintillators: Organic scintillators are organic materials that provide photons in the visible part of the spectrum after a charged particle is passed through it. The scintillation mechanism of organic material is different from that of inorganic material. The fluorescence or scintillation in organic materials is produced due to the transition of the energy levels of a single molecule. The fluorescence in organic materials can be observed independently in any of the physical states viz: vapor, liquid, and solid.

b. Inorganic Scintillators: Inorganic scintillators are crystals made in high-temperature furnaces. They include lithium iodide (LiI), cesium iodide (CsI), sodium iodide (NaI) and zinc sulfide (ZnS). NaI(Tl) (thallium-doped sodium iodide) are highly used inorganic scintillation materials. The iodide present in sodium iodide provides the necessary stopping power (because it has a high Z = 53). The process of scintillation in inorganic materials is normally slower than that of organic materials. The inorganic scintillators have a very high efficiency to detect gamma rays and are also capable of handling high rates of counts.

i. Scarborough Shoal, Ayungin Shoal, and the Spratly Islands were recently in the news. These islands are situated in -

- 1) Labrador Sea
- 2) Coral Se
- 3) South China Sea
- 4) Mediterranean Sea

ii. The government has constituted a committee to explore the possibility of 'one nation one election' headed by -

- 1) Sunil Arora
- 2) Ram Nath Kovind
- 3) Justice B.P. Jeevan Reddy
- 4) Manmohan Singh

iii. Which of the following states has got first of its kind state-level bird atlas in India?

- 1) Kerala
- 2) Maharashtra
- 3) Rajasthan
- 4) Andhra Pradesh

iv. The Winter Youth Olympic Games 2024 will be held in -

- 1) Gangwon
- 2) Lausanne
- 3) Dakar
- 4) Singapore

v. Who established Sarvodaya Sadhana Ashram in Chittoargarh?

- 1) Siddhraj Daddha
- 2) K. M. Munshi
- 3) Manikyal Lal Varma
- 4) Jin Vijay Muni

vi. On average, urea excreted by a healthy adult



human per day is -

- 1) 10-15 mg
- 2) 150-200 mg
- 3) 2-2.5 gm
- 4) 25-30 gm

vii. Who among the following has been named Election Commission's National Voter Awareness Ambassador?

- 1) Sachin Tendulkar
- 2) Virat Kohli
- 3) Neeraj Chopra
- 4) Alia Bhatt

viii. The government of India has constituted a committee to explore possibilities of 'One Nation One Election' under the chairmanship of -

- 1) Former CJI Justice Ranjan Gogoi
- 2) Former CEC, Sushil Chandra
- 3) Former President of India, Ram Nath Kovind
- 4) Former Secretary Lok Sabha, Subhash Kashyap

ix. Which of the following cities has India's first solar roof cycling track?

- 1) Chennai
- 2) Jaipur
- 3) Hyderabad
- 4) Bhopal

x. Global Biofuel Alliance (GBA) was launched by -

- 1) The US President Joe Biden
- 2) UK PM Rishi Sunak
- 3) Indian PM Narendra Modi
- 4) UN Secretary-General Antonio Guterres

xi. Ministry of Defence signed a contract with which company for the acquisition of first-of-its-kind five fleet support ships (FSS) of 44000 tonnes for the Indian Navy?

- 1) Hindustan Shipyard Ltd., Vishakhapatnam
- 2) Garden Reach Shipbuilders & Engineers Ltd, Kolkata.
- 3) Mazagon Dock Shipbuilders Limited (MDL), Mumbai
- 4) Naval Ship Repair Yard, Kochi

xii. Which institution in India has been selected for the Gandhi Peace Award 2021?

- 1) Geeta press, Gorakhpur
- 2) Sulabh International
- 3) Vivekanand Kendra, Kanyakumari
- 4) Ram Krishna Mission

Answer

- i. 3, ii. 2, iii. 1, iv. 1, v. 4, vi. 4, vii. 1, viii. 1, ix. 3, x. 3, xi. 1, xii. 1.

Details of Inelastic Collision

An inelastic collision is in contrast to an elastic collision is a collision in which the energy which is the kinetic energy is not conserved due to the action of internal friction. In collisions of bodies which are macroscopic bodies and some of the energy which is the kinetic energy is turned into vibrational energy of the atoms which cause a heating effect and the bodies are deformed.

At any one instant, we can simply say that the half the collisions are said to be inelastic to a varying extent that is the pair possesses less kinetic energy after the collision than before and we can also say that half could be described as "super-elastic" that is possessing more kinetic energy than too after the collision than before. The averaged which is across an entire sample is a molecular collision that is said to be elastic.

Inelastic Collision Definition: Both kinetic energy and momentum are said to be of conserved quantities in elastic collisions.

Suppose, we can say that if there are two similar trolleys which are travelling towards each other with equal speed. After a period of time, they collide that too by bouncing off each other with no loss in speed. This collision which we have seen is said to be



perfectly elastic because no energy has been lost.

In reality, we can say that the examples which are of perfectly elastic collisions are not part of our everyday experiences. Some of the collisions which are between atoms in gases are said to be examples of perfectly elastic collisions. However, we can say that there are some examples which are of collisions which are in mechanics where the energy lost can be negligible. These collisions which we have seen can be considered elastic and even though they are not perfectly elastic. The collisions which are of rigid billiard balls or the balls which are in Newton's cradle are said to be two such examples.

Given that no mechanics problem we can see is likely to encounter a perfectly elastic collision, it may seem that the concept which is of little practical use. However, we can say that in practice

it is often very useful. This is because the requirement that the kinetic energy is conserved provides an additional constraint to our equations of motion. This allows us to very easily solve problems which were created in which we would otherwise have too many unknowns. Often we can see that the solution will be quite adequate because the collision is 'close enough' to being perfectly elastic.

Inelastic Collision in Two Dimension: An inelastic collision is a collision in which there is a loss of kinetic energy. While momentum that we are aware of is of the system is conserved in an inelastic collision so the energy which is the kinetic energy is not. This is said to be because some energy which is kinetic had been transferred to something else such as thermal energy, sound energy and even material deformation are likely outcomes.

Suppose we can say that there are two similar trolleys travelling towards each other. They collide but because the trolleys are equipped we can say that with magnetic couplers they join together in the collision and generally become one connected mass. This type of collision which we have just learnt is perfectly inelastic because the maximum possible kinetic energy has been lost.

MCQ on Indian Constitution

i. Which of the following writ(s) is/are given in Article 32 of the Constitution?

1. Habeas Corpus
 2. Mandamus
 3. Prohibition
 4. Quo Warranto
- Select the correct answer using the code given below:
- 1) Only 1 and 2
 - 2) Only 2 and 3
 - 3) Only 3 and 4
 - 4) All 1, 2, 3 and 4

ii. With reference to the amendment to the constitution, consider the following statements -

1. Provisions related to Fundamental Rights can be amended by a simple majority.
 2. In special majority, the amendment Bill is passed in both Houses of Parliament by a majority of not less than two-thirds of the members present and voting.
 3. There is no amendment that requires ratification by the legislatures of the states.
- How many of the statements given above are correct?
- 1) Only one
 - 2) Only two
 - 3) All three
 - 4) None

iii. With reference to citizenship in India, consider the following statements -

1. A person born outside India and who has at least one



Indian parent will be granted citizenship.

2. If in the opinion of the central government, the applicant has rendered distinguished service to the cause of science, philosophy, art, literature, world peace or human progress will be granted citizenship.
 3. India has a national policy on granting asylum or refugee status.
 4. A certificate of naturalization can be granted to a person who is not an illegal immigrant and has resided in India continuously for 3 months before making an application.
- How many of the statements given above are correct?
- 1) Only one
 - 2) Only two
 - 3) Only three
 - 4) None

iv. Consider the following statements -

1. He was the first non-

Congress PM to serve a full term.

2. In his term, India successfully conducted three nuclear weapon tests in Pokhran.
 3. In his term, the Delhi-Lahore Bus service was started.
- The above-mentioned statements refer to which Prime Minister of India?
- 1) Morarji Desai
 - 2) Charan Singh
 - 3) Atal Bihari Vajpayee
 - 4) Inder Kumar Gujral

v. Which of the following is/are a constitutional institution in India?

1. NITI Aayog
 2. National Commission for Backward Classes
 3. National Human Rights Commission
- Choose the correct option from the codes given below -
- 1) Only 1
 - 2) Only 2
 - 3) Only 2 and 3
 - 4) 1, 2 and 3

vi. Which of the follow-

ing committees is/are not related to Panchayati Raj?

1. Bai want Rai Mehta Committee.
 2. Ashok Mehta Committee.
 3. Lakdawala Committee.
 4. L. M. Singhvi Committee.
- Choose the correct option from the codes given below -
- 1) Only 1
 - 2) Only 3
 - 3) Only 2 and 3
 - 4) 1, 2, 3 and 4

vii. Which justice is mentioned in the Preamble of the Indian Constitution?

1. Political Justice
 2. Social Justice
 3. Economic Justice
- Which of the above statements is/are correct?
- 1) Only 1
 - 2) Only 2
 - 3) Only 2 and 3
 - 4) 1, 2 and 3

viii. Which of the following is correctly matched?

- 1) The functions of Public Service Commissions: Article 317
- 2) Dismissal of members of Public Service Commissions: Article 320
- 3) Provision of Public Service Commission for Union and States: Article 315
- 4) Appointment and tenure of members of UPPSC: Article 312

Answer

- i. 4, ii. 1, iii. 2, iv. 3, v. 2, vi. 2, vii. 4, viii. 3.

An overview of Scientific Methods

Have you ever wondered what steps do scientists follow to give such amazing theories and inventions? The immense knowledge and world-transforming theories that the scientific society provides us are incredible indeed. Sometimes these theories and experiments can even shake the roots of our understanding. We can find the answers to our unanswered questions through science. In a real sense, this field plays a crucial role in advancing our civilization and building a better future for ourselves. It is all thanks to the scientific methods that we can enjoy such a comfortable life that was never possible before. So you must be thinking, what is the scientific method? To understand and discuss the essential methods of Scientific method of research and scientific method steps, we must first understand the scientific method definition physics.

Scientific Method Definition: What is the scientific method? Well, the scientific method definition states that a method that is devised to gather knowledge and further develop the field of science is known as the scientific method. This rigorous process involves several steps, mainly 8 steps of the scientific method in order. We have been using this process since the 17th century for the development of science. It involves using observation scepticism since assumptions can twist the things that we observe. Scientists use observations to formulate their hypothe-



ses and perform experiments regarding the same. Going through several processes, they refine their hypothesis to give accurate results. Some of these are investigation, verification, and construction of reliable observation and theories. They often use scientific inquiry to create a reliable framework and based upon that bring out the positive or negative results scientifically. Let us discuss the essential methods of Scientific method of research. We will further look at a scientific method example, scientific method steps, and definitions.

Who invented the Scientific Method?

The scientific method was not invented by one person. It is the result of centuries of discussions and debate on how best to find out how the world works.

Greek philosopher Aristotle was one of the first ones to push for the application of observation and reasoning to figure out the workings of nature. Arab mathematician and scientist Hasan Ibn al-Haytham is cited as the first one to write about the importance of experimentation.

Over centuries, many scientists like Galileo Galilei, Francis Bacon, Isaac Newton, John Hume, John Stuart Mill, Thomas Aquinas, among others, have written about how science should ideally be conducted, leading to our modern understanding of the scientific method. As today's scientists continue to explore new techniques and areas of science, the scientific method continues to evolve.

What are the Scientific Method Steps?

To discuss the essential methods of the Scientific method of research, we will have to look at the steps objectively through a broad perspective.

The scientific method is applied in all sciences, including biology, physics, chemistry, geology and psychology. However, their core approach towards finding answers that are logical and supported by evidence are the same because at the core of all sciences lies a problem-solving approach.

The scientific method has five steps and one feedback step:

1. Make an observation
2. Ask a question

3. Form a hypothesis
4. Make a prediction based on the hypothesis
5. Test the prediction
6. Then the additional step of iteration or using the results to make new hypotheses or predictions.

Generally, all scientific methods follow this same pattern.

Scientific Method Example: Let us look at a scientific method example to understand the process. The topic is growing a money plant.

1. Observation and Question: We want to find out how the environment affects the growth of a money plant in a time frame of five weeks.

2. Hypothesis: The hypothesis would be that money plants can grow anywhere regardless of the environment.

3. Experimentation: An experiment would be to take four money plants in different pots. And keep two of them inside and the remaining outside. We will keep the initial conditions such as soil quality, amount of sunlight, amount of water, etc. constant. Upon completion of five weeks, we will observe all the plants and measure their size.

4. Analyzing: We will analyze the data such as the growth of plants, height, etc. and compare the results from the two environments to determine which is better suited for the purpose.

5. Conclusion: We can draw a logical conclusion from the analyzed data and form a relevant report.

i. After arranging the given words according to dictionary order, which word will come at the 'Fifth' position?

1. Popular
2. Population
3. Populace
4. Pope
5. Poppy

ii. Consider the following statements -

1. A parent or guardian to provide opportunities for education to his child or, as the case may be, ward between the age of six to fourteen years.
2. To provide early childhood care and education for all children until they complete the age of six years.
3. To protect and improve the natural environment including forests, lakes, rivers, and wildlife, and to have compassion for living creatures.
4. To safeguard public property and to abjure violence.
5. To provide primary healthcare to the persons below the poverty line.

Which of the statements above is/are related to fundamental duties?

- 1) Only 1, 2 and 3
- 2) Only 1, 3 and 4
- 3) Only 1, 4 and 5
- 4) Only 1, 3 and 5

iii. In a classroom, an effective listener -

- 1) Resists distractions
- 2) Seeks diversions
- 3) Prefers message filtering

iv. Utility and change are the basic principles of -

- 1) Realism
- 2) Naturalism
- 3) Pragmatism
- 4) Idealism

v. To bring harmony among all the elements of programmes -

- 1) Coordination
- 2) Planning
- 3) Commanding
- 4) Organisation

vi. Which of the following is the nature of the curriculum?

- 1) Critical
- 2) Creative
- 3) Conservative
- 4) All of the above

vii. Curriculum is -

- 1) Course
- 2) Syllabus
- 3) Co-curricular activities
- 4) Overall activities of institution

viii. The peer group is a group whose members share -

- 1) Similar values
- 2) Similar playground
- 3) Similar circumstances
- 4) Similar study circle and books

ix. The teaching learning process is a journey from -

- 1) Concrete to abstract
- 2) Known to unknown
- 3) Simple to complex
- 4) All of the above

x. The effectiveness of teaching has to be judged

in terms of -

- 1) Syllabus Coverage
- 2) Students interest
- 3) Use of teaching aids in the classroom
- 4) Learning outcomes of students

xi. Learning may be -

- 1) Formal
- 2) Informal
- 3) Formal and Informal
- 4) None of the above

xii. The main task of educational computers is -

- 1) Preservation of data
- 2) Scoring the answer
- 3) Analysis of data
- 4) All of the above

xiii. In this approach of team building, the leader forms an artificial team where members interact, discuss, and learn from other member behaviours -

- 1) Team roles approach
- 2) Simulation approach
- 3) Action research approach
- 4) Role negotiation approach

xiv. In what sense do teachers provide mentor leadership?

- 1) He uses his mental capacities teaching
- 2) He imparts knowledge to students
- 3) He imparts life skills to students
- 4) He influences his learner with his own mental altitude, knowledge skill and character

Answer

- i. 1, ii. 2, iii. 1, iv. 3, v. 1, vi. 4, vii. 4, viii. 4, ix. 4, x. 4, xi. 3, xii. 4, xiii. 2, xiv. 4.