

Key Scientific Advancements in Modern History

Modern History · Answer Key · 12 Questions

1. Which scientific theory, developed by Albert Einstein, revolutionized our understanding of gravity and the universe by proposing that gravity is a curvature of spacetime caused by mass and energy?

- A) Quantum Mechanics
- B) Theory of Evolution
- C) General Relativity**
- D) Big Bang Theory

2. The discovery of penicillin by Alexander Fleming in 1928 marked a turning point in medicine. What class of microorganisms does penicillin primarily target and inhibit?

- A) Viruses
- B) Fungi
- C) Bacteria**
- D) Protozoa

3. The development of the Haber-Bosch process in the early 20th century had a profound impact on agriculture and population growth. What essential nutrient for plant growth does this process synthesize?

- A) Potassium
- B) Phosphorus
- C) Nitrogen**
- D) Sulfur

4. In 1953, James Watson and Francis Crick, building on the work of Rosalind Franklin and Maurice Wilkins, elucidated the double helix structure of DNA. What fundamental biological process does this structure explain?

- A) Cellular Respiration
- B) Photosynthesis
- C) Protein Synthesis
- D) Heredity and Genetic Information Storage**

5. The discovery of radioactivity by Henri Becquerel, and its subsequent investigation by Marie and Pierre Curie, led to significant advancements in physics and medicine. What is the fundamental phenomenon associated with radioactivity?

- A) The emission of charged particles from atomic nuclei**
- B) The bending of light around massive objects
- C) The expansion of the universe
- D) The transfer of heat through a vacuum

6. The development of the first working transistor by John Bardeen, Walter Brattain, and William Shockley at Bell Labs in 1947 was a foundational event for modern electronics. What is a transistor primarily used for in electronic circuits?

- A) Generating electric current
- B) Storing electrical energy
- C) Amplifying or switching electronic signals**
- D) Measuring electrical resistance

7. The Theory of Evolution by Natural Selection, famously popularized by Charles Darwin, explains the diversity of life on Earth. What is the core mechanism proposed by this theory for evolutionary change?

- A) Random mutation and genetic drift
- B) Artificial selection by humans
- C) Survival and reproduction of individuals with advantageous traits**
- D) Lamarckian inheritance of acquired characteristics

8. The invention of the integrated circuit (microchip) by Jack Kilby and Robert Noyce in the late 1950s led to miniaturization in electronics. What does an integrated circuit contain?

- A) A single vacuum tube
- B) Thousands or millions of transistors and other electronic components on a single piece of semiconductor material**
- C) A large number of independently wired components
- D) A purely mechanical switching system

9. The discovery of the structure of the atom and its subatomic particles, particularly by Ernest Rutherford's gold foil experiment which identified the nucleus, fundamentally changed our understanding of matter. What did Rutherford's experiment largely prove about atomic structure?

- A) Atoms are solid, indivisible spheres.
- B) Most of the atom's mass is concentrated in a small, positively charged nucleus.**
- C) Electrons orbit the nucleus in fixed paths.
- D) Atoms are mostly empty space with no central core.

10. The development of vaccination, a practice pioneered by Edward Jenner with smallpox, utilizes the body's natural defense mechanisms. What is the primary scientific principle behind vaccination?

- A) Introducing artificial antibodies into the bloodstream
- B) Stimulating the immune system to recognize and fight a specific pathogen**
- C) Directly killing disease-causing microorganisms with chemicals
- D) Repairing damaged cells and tissues at a molecular level

11. The theory of continental drift, proposed by Alfred Wegener, suggested that Earth's continents were once joined together and have since moved apart. What key piece of geological evidence did Wegener use to support his theory?

A) Patterns of ocean currents

B) Similarities in rock formations and fossil records on widely separated continents

C) The formation of mountain ranges due to volcanic activity

D) The observation of tectonic plate movement through seismic waves

12. The understanding of electromagnetism, significantly advanced by scientists like James Clerk Maxwell, unified electricity and magnetism. What fundamental phenomenon did Maxwell's equations predict the existence of?

A) Nuclear fission

B) The bending of light

C) Electromagnetic waves (including light)

D) The flow of neutrinos