

UNIT 1. PHYSICS AS A SCIENCE

1. Read and translate the text

Even since humankind first looked at the stars moving about the sky, they have wondered how and why they do that. People have always wondered why things behave the way they do. For thousands of years have been asking questions like why things fall to the ground, not away from it. Why are some types of stone hard and others soft? Why does the Sun come up in the east and go down in the west? These are all questions that physics can answer.

In the beginning, people answered questions like these in philosophical or religious ways. In early descriptions of the world, philosophers such as Aristotle reported what they believed to be true. Others, however, such as astronomers from India, Egypt and China, or the Greek thinker, Archimedes, were able to use calculations to predict the movements of the Sun and the Moon or to describe and build machines.



The works of Eastern scholars reached Europe in the 12th and 13th centuries. There were studies of planetary motion by Indian astronomers, the theories of light from Buddhist and Persian thinkers and especially the work of the Persian philosopher Nasir al-Din al-Tusi on the planetary system. Eventually, these ideas pushed Europe into a scientific revolution. Galileo laid the foundations for this with his work on dynamics, that is, how things move. Nicolas Copernicus and then Johannes Kepler described the solar system with the Sun at its center. Later, building on their work, Isaac Newton set out his Laws of Motion and modern physics was born.

The next great area of investigation was electricity and in the 19th century Michael Faraday first demonstrated an electromagnetic motor. Later, it was improved by James Clerk Maxwell, whose equations were also used to describe light. In proving Maxwell's equations, Heinrich Hertz discovered radio waves and Wilhelm von Rontgen, X-rays. Maxwell's work was also the starting point for Einstein's Theory of Relativity. At the same time, other scientists were working on thermodynamics, that is, the study of changes of heat in matter. Physicists such as Robert Boyle, James Prescott Joule and many others set out the theories that allow us today to make use of engine and other mechanical devices. Rontgen's discovery of X-rays and the work of Pierre and Marie Curie on radioactivity led to the development of the science of nuclear physics.

In the first half of the 20th century, developments in physics were concerned with the structure of atoms. The parts of the atom were identified – its nucleus, protons and electrons. Eventually in the 1940s, scientists in the USA were able to split a nucleus and the result was the world's first nuclear explosion. Also at that time, scientists such as Max Planck were looking at the relationship between matter and wave motion. The field of quantum mechanics, which explains not only how atomic particles move, but how the universe does, came into being. Without physics to describe the way things behave, we would have none of the technology and machinery we take for granted today.

Vocabulary

humankind – человечество

to use calculations – использовать вычисления

to predict the movements – предсказать движения

to reach – достигать

planetary motion – движение планет

to push into a scientific revolution – подтолкнули к научной революции

set out – устанавливать

laws of motion – законы движения

investigation – исследование

to improve – улучшать, совершенствовать

engine – мотор

mechanical devices – механические устройства
 to lead to the development – приводить к развитию
 nuclear physics – ядерная физика
 to split a nucleus – ращеплять ядро
 a wave – волна
 come into being – возникать, появляться
 take for granted – считать доказанным

2. *Answer the questions*

- 1) What does physics study?
- 2) How old is the science of Physics?
- 3) Can you name any famous physisists?
- 4) What physical phenomenon do you know?
- 5) Why are you interested in physics?
- 6) What branch of physics is the most interesting for you?
- 7) Are you planning to be a physisist or a teacher of physics?

3. *Read the text and choose the best title for each paragraph.*

There is one title which you do not need to use

- Paragraph 1
- Paragraph 2
- Paragraph 3
- Paragraph 4
- Paragraph 5

- A. Early ideas about Physics.
- B. Mechanical devices.
- C. Ideas that created the modern world.
- D. What we can learn from physics.
- E. Atomic physics.
- F. The origins of modern physics.

4. *Write nouns, adjectives and verbs connected with the word*

physics

nouns	adjectives	verbs
proton	interesting	to make expirements