

Objectives of Physics for third year secondary (SE)

Energy

Work and Energy

- Define work, where force and displacement are parallel.
- Recognize that potential energy is position-dependent.
- Recognize that translational kinetic energy is velocity-dependent.
- Know that mechanical energy is the sum of kinetic energy and potential energy.

Forms of energy

- Relate thermal energy to changes of temperature and changes in state.
- Explain that chemical energy is stored in elements and compounds and may appear in different forms during and after a chemical reaction.
- Relate electrical energy to charge and voltage.
- Know that nuclear energy is due to nuclear forces.
- Relate mass to energy.
- Explain that heat accompanies all types of energy conversions.

Sources of energy and the pollution they cause

- Give examples of sources of energy of each form.
- Describe the pollution due to different sources of energy.
- Identify the effects of pollution on environment and health.

Radioactivity and Nuclear Reactions

Radioactivity

- Define radioactivity.
- Name the types of radiations.
- Know the properties of the emitted radiation.
- Define the half-life of a radioactive substance.
- Give some examples of spontaneous nuclear reactions.

Stimulated Nuclear Reactions: Fission and Fusion

- Relate the energy produced to the mass defect.
- Understand what a nuclear fission reaction is.
- Understand what a nuclear fusion reaction is.
- Estimate the magnitude of the energy released in reaction type.
- Give some examples on stimulated nuclear reactions.

Applications and Dangers of Radioactivity

- Define the unit of measurement of radioactive rays.
- Name the types of biologic and genetic effects of radioactive rays.
- Give examples of the uses of radioactivity in medicine.
- Outline the method of disposal of nuclear wastes.
- Name some detectors of radioactive radiations.
- Describe methods of protection from radioactive rays

The Universe

History of Development of Astronomy

- Distinguish between astronomy, astrology and cosmology.
- Explain the geocentric theory of Aristotle and Ptolemy.
- Know the development of astronomy in the 16th and 17th century.
- Recognize that the development of astronomy during the 18th and 19th centuries was a continuation of the ideas of the scientific revolution

The Solar System

- List the basis data of the constituents of the solar system (distances from the Sun, period, size, number of moons, chemical constituents of each, surface temperature).