

## Physics

Year 7

(70 hrs., 2 hrs per week, reserve – 4 hrs)

| <b>Table of contents</b> |   |
|--------------------------|---|
| 1.                       | <p><b>Introduction</b></p> <p>Physics as a school discipline.<br/>Physical devices, physical experiment, and physical tests. Safety rules during work with physical devices in the physics classroom</p>  |
| 2.                       | <p><b>Physics as a natural science. Nature learning</b><br/><b>Physics as a fundamental natural science.</b></p> <p>Substance and field. The main provisions of the atomic theory. Introduction to the structure of an atom.<br/>Physical bodies and phenomena.<br/>Physical units and measuring them. International System of Units.</p>   |
| 3.                       | <p><b>Mechanical movement.</b></p> <p>Relativity of movement. Initial body. Frame of reference. Material spot. Trajectory. Path. Movement.<br/>Rectilinear even motion. Moving speed. Moving graphs.<br/>Rectilinear uneven motion. Average uneven motion speed.<br/>Even movement of a material dot in circles. Rotation period.<br/>Swinging movement. Oscillations amplitude. Oscillations period and frequency.<br/>Pendulums.</p>  |
| 4.                       | <p><b>Interaction between bodies. Force</b></p> <p>Inertia. Body inertia. Body mass. Substance density.<br/>Interaction between bodies. Force. Deformation. Spring force. Hooke's law. Dynamometer.<br/>Adding forces. Resultant force. Graphic depiction of forces.<br/>Force of gravity. Body weight. Zero gravity.<br/>Friction. Friction force. Sliding friction index. Friction in nature and machines.<br/>Pressure of solid bodies against a surface. Pressure force.<br/>Pressure of liquids and gases. Pascal's law. Communicating vessels. Pressure gauges.<br/>Atmospheric pressure. Measuring atmospheric pressure. Barometers.<br/>Buoyant force. Archimedes' principle.</p> |
| 5.                       | <p><b>Mechanic work and energy</b></p> <p>Mechanic work Power. Mechanic energy and its types.<br/>Law of conservation of mechanical energy and its practical use.<br/>Simple mechanisms. Moment of force. Lever. Lever equilibrium.<br/>Efficiency of simple machines.</p>  |



## Expected results

### Pupil:

- **adheres** to the safety rules during the work with physical devices and equipment;
- **names** the characteristic features of physical phenomena, their difference from biological ones, chemical and other phenomena;
- **gives examples** of physical phenomena, physical bodies and physical units;
- **knows** the symbols of main physical units;
- **understands** the main provisions of the atomic theory; understands the difference between the substance and the field.
- **writes down** the physical unit, uses prefixes to form multiple and fractional units;
- **uses** the simplest methods of measurement, defines the increment of the scale;
- **compares** the values of physical units;
- **measures** linear sizes of bodies, volumes of solid bodies, fluids, and bulk material;
- **conducts experiments** (individual and group ones) using one's own plan or instruction with the help of a teacher, analyzes results, and makes conclusions.
- **realizes** the way new knowledge is correlated with the current one;
- provides arguments on the role of observation and experiments in learning the environment