



Chemistry

Year 7

(51 hrs, 1.5 hrs per week)

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1.	<p>Introduction</p> <p>Chemistry as a natural science. Substances and their transformation in the environment.</p> <p>A brief history of chemistry. Rules of conduct of students in the chemistry room. Introduction to the laboratory ware and equipment in chemistry room, and labelling of dangerous substances. Safety rules during work with laboratory ware and equipment in the chemistry room.</p>
2.	<p>Initial concepts of chemistry</p> <p>Physical bodies. Materials. Substances. Molecules. Atoms.</p> <p>The way substances are studied. Observations and experiments in the chemistry room. Physical features of substances. Clean substances and mixtures (homogenous and heterogeneous). Ways of dividing the mixtures.</p> <p>Chemical elements, their names, and symbols. Spreading of chemical elements in nature. Introduction to the periodic table.</p> <p>Atomic mass. Atomic mass unit. Relative mass of chemical elements.</p> <p>Formulas of chemical elements. Simple and compound substances. Diversity of substances.</p> <p>Metals and non-metals. Metal and non-metal elements.</p> <p>Valency of chemical elements. Making up the formulas of binary compounds for element valency. Defining the valency elements by the formulas of binary compounds.</p> <p>Relative molecular mass, its calculation using a chemical formula.</p> <p>Mass fraction of an element in a compound substance.</p> <p>Physical and chemical phenomena. Chemical reactions and phenomena accompanying them. Chemical features of substances.</p> <p>Law of conservation of mass of substances during chemical reactions. Scheme of a chemical reaction. Chemical equations.</p>
3.	<p>Oxygen</p> <p>Air and its composition.</p> <p>Oxygen. Spreading of Oxygen in nature. Oxygen, the composition of its molecule, and spreading in nature. Physical features of oxygen.</p> <p>Producing oxygen in a laboratory (based on an example of hydrogen peroxide and water) and on an industrial enterprise. Decomposition reaction. Concept of a catalyst. Means of collecting oxygen. Proof of presence of oxygen.</p> <p>Chemical features of oxygen: interaction with simple substances (carbon, hydrogen, sulfur, magnesium, iron, and copper). Combination reaction.</p> <p>Concept of oxides and oxidation (burning, slow oxidation, and breathing).</p>



	<p>Conditions for beginning and end of burning. Interaction between oxygen and compound substances (full methane oxidation, hydrogen sulfide). Circulation of Oxygen in nature. Ozone. Problem of clean air. Use and biological role of oxygen.</p>
4.	<p>Water Water, molecule composition, and spreading in nature, chemical features. Water as a solvent. Solution and its components: the solvent and the dissolved substance. Quantity of solution. Mass fraction of the dissolved substance. Production of a solution. Interaction between water and oxides. Concept of acids and bases. Concept of indicators. Importance of water and water solutions in nature and the life of human. Acid rains. Clean water problem. Protecting water bodies from pollution. Water purification on water treatment stations and at home.</p>

Expected results

Pupil:

- **conducts** the simplest laboratory operations using the equipment from the chemistry room as directed by a teacher;
- **adheres** to the rules of conduct of pupils in a chemical room and safety rules during the work with laboratory ware and equipment in the chemistry room;
- **argues** on the use of chemical knowledge and history of development; the need to labelling of dangerous substances making up food products and household chemical agents;
- **makes conclusions** on the safe use of substances considering their labelling;
- **names** chemical elements (at least 20) using the modern scientific Ukrainian nomenclature, writes their symbols; the most widespread chemical elements in nature;
- **gives examples** of simple and compound substances and chemical phenomena in nature and household;
- **explains** the content of chemical formulas, the essence of law of conservation, and chemical reactions.