MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

ENVIRONMENTAL STUDIES

5th grade

Curriculum for comprehensive schools[1]

[1] Curriculum is approved by the Ministry of Education and Science of Ukraine No. 804 of June 7, 2017

ENVIRONMENTAL STUDIES
5th grade
(70 hours – 2 hours per week, oh which 6 hours are reserve hours)

Expected outcomes of students' learning and cognitive activity	Content of study materials
INTRODUCTION *(6 hours)*	
Student ***Knowledge component*** *names* Natural Sciences (Biology, Physics, Chemistry, Geography, Astronomy, Ecology) and their contribution to the study of nature; methods of studying the nature (observation, experiment, measurement); *gives examples of* methods and equipment for studying the nature, their use. ***Activity component*** *tells* about natural scientists (2-3) and their contribution to the study of nature; about methods of studying the nature; *explains* the applied significance of achievements in Natural Sciences; *distinguishes between* the purpose, conditions of implementation and results obtained when describing the experiment or observation; *selects* the equipment required for measurement and observation, and explains own choice; *finds* necessary information in reference books on Natural Sciences; *complies with* the rules for safe handling of laboratory equipment.	Sciences studying the nature. Methods of studying the nature. Equipment for studying the nature. Importance of natural science knowledge for humans.
• to identify and classify objects of the surrounding world according to the proposed characteristics; • to enter data in tables, to build charts; • to summarize and draw reasoned conclusions; • to work in a team (to assign roles in a small group, to contribute to the teamwork, to encourage, to motivate others, to solve problems); • to show the results of the teamwork, to evaluate own contribution to the teamwork.	Class project "Animate and Inanimate Nature Around Us" (approximate project description)
SECTION I. OBJECTS, SUBSTANCES AND PHENOMENA AROUND US *(15 hours)*	
Student ***Knowledge component*** *names* the smallest particles of substances; object characteristics (shape, size, mass, volume); devices and tools for measuring the object size and mass; physical properties of substances (color, gloss, smell, state of matter); properties of gases (no definite shape, occupy all the available space); properties of liquids (no definite shape, have definite volume, fluid);	Objects around us. Object characteristics, their measurements. Substances. Physical properties of substances. Properties of solids, liquids, and gases. Atoms and molecules. Diffusion.

properties of solids (have definite shape and volume); methods of mixture separation (retention, filtration, evaporation); signs of chemical phenomena; conditions under which combustion takes place; *gives examples of* objects and substances surrounding humans; pure substances and mixtures (2-3); inorganic and organic substances (2-3); phenomena in nature, technology, everyday life; natural phenomena associated with seasons change; repetitive natural phenomena; use of mixtures. ***Activity component*** *distinguishes between* objects of animate and inanimate nature; physical, chemical and biological phenomena; *explains* the difference between solid, liquid, and gaseous state of substances; difference between pure substances and mixtures; importance of organic substances for wildlife; importance of combustion and putrefaction; *describes* objects and substances, natural phenomena (2-3) according to the proposed plan; *compares* objects and substances according to 3-4 characteristics; *describes* combustion as an example of chemical phenomena; *measures* object mass and size using appropriate devices; *is able to* separate the mixture by filtering; *establishes* connections between natural phenomena (using the studied examples and by analogy); *applies* knowledge for safe handling of objects and substances in everyday life situations; *complies with* the following rules: safe use of laboratory glassware.	Variety of substances. Inorganic and organic substances around humans. Pure substances and mixtures. Methods of separating mixtures. Natural phenomena. Physical phenomena and their diversity. Chemical phenomena and their characteristics. Combustion. Putrefaction. Repeatability of phenomena. Interrelation of phenomena in nature.
SECTION II. UNIVERSE *(8 hours)*	
Student ***Knowledge component*** *names* the constellations (2-3); the most famous astronomers (Ptolemy, Nicolaus Copernicus, Galileo Galilei, Edwin Hubble), space researchers (Yuri Gagarin, Neil Armstrong, Leonid Kadeniuk); *gives examples of* the influence of cosmic factors on the Earth; celestial objects and bodies making up our universe. ***Activity component*** *describes* the general structure of the Solar System; differences between the planet and the star; *compares* the size and temperature of the Sun with other stars;	Sky and celestial sphere. Celestial bodies. Visible movements of celestial bodies. Concept of constellation. Significance of the starry sky in history of humankind. Celestial objects and bodies. Star is a self-luminous celestial body. Differences between the stars. Interstellar space.

characterizes the features of astronomical research; man's place in the universe; *explains on models* the shape and structure of the Earth, movement of the Earth around its own axis and around the Sun, structure of the Solar System; cause of visible movements of celestial bodies; *distinguishes between* celestial bodies and objects (planet, star, galaxy); types of planets, nebulae, stars and galaxies; stars and planets in the celestial sphere; *shows on a star chart* the Polaris, constellations Ursa Major and Ursa Minor.	Planets. Solar System. Differences between the planets. Star systems are galaxies. Universe and its components. Man and the universe. Astronomy is the science that studies the universe. Methods and tools of astronomical research
• to express ideas in turn, to listen carefully to others during the discussion, to prove reasonably own opinion, to make a joint group decision, to assign roles, and contribute to teamwork; • to distribute evenly the load when presenting the project product; to perform self- and mutual assessment according to the criteria provided by teacher for the project product and students' activities during the project implementation.	Class project "Our home is the Solar System" (approximate project description)
SECTION III. EARTH IS A PLANET IN THE SOLAR SYSTEM	
Topic 1. Earth as a planet *(16 hours)*	
Student ***Knowledge component*** *names* the shape and size of the Earth; movements of the Earth; lunar phase; methods of depicting the Earth; continents and parts of the world; composition of soil, air; properties of soil, air and water; *gives examples of* soluble and insoluble substances; solutions in nature; use of water and solutions by humans. ***Activity component*** *describes* the internal structure of the Earth; results of own observations and experiments; *explains* the change between day and night; seasons change; changes in lunar phases; uneven distribution of sunlight and heat on the Earth's surface; causes of solar and lunar eclipses; water cycle in nature; importance of water, air and soil; importance of sunlight and heat for wildlife; *distinguishes between* lunar phases in images; ways of depicting objects on maps; *shows* the continents and parts of the world; major geographical objects, equator, hemispheres and poles *on the globe and map*; draws up an experiment plan and performs it; *applies knowledge* for land navigation, economic use of water in everyday life; *uses* additional sources of information for performing	Shape and size of the Earth. Internal structure of the Earth. Movements of the Earth. Seasons. Moon is a satellite of the Earth. Solar and lunar eclipses. Ways of depicting the Earth. Soil, its importance and properties. Soil care. Air is a mixture of gases. Air importance. Air properties. Water on the Earth. Properties of water. Three states of water. Water cycle. Water is a solvent. Soluble and insoluble substances. Solutions in nature. Importance of water in nature. Human use of water.

an educational task; studied natural science vocabulary in own oral messages; knowledge of soil properties for growing plants; *calculates* the possible economic effect of using the team project product.	
Topic 2. Earth as living environment for organisms *(15 hours)*	
Student ***Knowledge component*** *names* the properties of organisms; differences between plants, animals, fungi and bacteria; living conditions on the Earth; environmental factors; main living environments; ecosystem composition; *gives examples of* the adaptation of organisms to periodic changes in environmental conditions (leaf fall, hibernation, fur color changes, bird flights); coexistence of organisms; natural and artificial ecosystems. ***Activity component*** *describes* the adaptation of organisms to factors of inanimate nature; adaptation of organisms to the living environment; results of own observations and experiments; *explains* how to distinguish between living organism and inanimate natural body; influence of environmental factors on living organisms; relations between fungi, bacteria, plants and animals in nature; role of plants, animals, fungi and bacteria in ecosystems; *recognizes* the most common plants and animals of native region; poisonous plants, fungi and animals of native region; *is able to* determine the names of plants, animals and fungi using atlases; *uses* additional sources of information for performing an educational task; studied natural science vocabulary in own oral messages.	Organism and its properties. Cellular structure of organisms. Diversity of organisms: Plants, Animals, Fungi and Bacteria. Living conditions on the Earth. Living environment. Environmental factors. Influence of inanimate factors on organisms. Adaptation of organisms to periodic changes in environmental conditions. Diversity of living environments and adaptation of organisms to life in each of them. Ground-air environment. Aquatic environment. Soil environment. Influence of wildlife factors on organisms. Relations between organisms. Coexistence of organisms. Groups of organisms. Ecosystems. Flora and fauna of native region.
• makes an assumption and checks it while working on the project; • selects necessary resources and determines how to capture data; • conducts an experiment and long-term observations, records its progress using digital devices, enters data into the observation log, fills in tables, builds diagrams, and makes reasoned conclusions; • evenly distributed workload among team members, taking into account the interests of everyone; encourages others to high-quality work, helps others; • plans the teamwork, coordinates making final	Class project “Growing the Tallest Legume” (approximate project description)

report/presentation on the project progress and results; together with the team presents the work results, performs self- and mutual assessment of the project and presentation implementation, assesses presentations of other teams in a friendly manner.	
Topic 3. Humans on the Earth *(7 hours)*	
Student ***Knowledge component*** *names* the sources of environmental pollution; important environmental problems of native region; environmental facilities and protected areas of native region; *gives examples of* the impact of humans on nature and nature on humans; plants and animals of native region, which are included in the Red Data Book of Ukraine. ***Activity component*** *explains* the relations between humans and nature; changes in nature caused by natural factors and human activities; purpose of the Red Data Book and protected areas; analyzes positive and negative consequences of human-environment interaction; *adheres to* environmental standards of behavior in nature.	Humans are part of nature. Relations between humans and nature. Changes in nature caused by natural factors and human activities. Environmental problems and their solution (preservation of biological diversity, combating deforestation and desertification, protecting the planet from various types of pollution). Nature protection. Red Data Book of Ukraine. Reserves, national parks and their importance for preservation of the Earth's nature.
• expresses ideas for creating useful things from the used ones; • reasonably explains the environmental consequences of turning the used things into new useful ones, gives examples; • expresses reasonable suggestions for the teamwork, discusses the ideas of others in a friendly manner; • design the project product; • calculates the possible economic effect of using the team project product; • enters data in tables; • makes reasoned conclusions on the environmental impacts; • determines the importance of own purposeful environmental activities.	Class project “Say Yes to Recycling” (about the second life of everyday things) (approximate project description)