

Nazarbayev Intellectual Schools Autonomous Educational Organisation

# Educational programme of Nazarbayev Intellectual Schools AEO NIS-Programme



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## Content

Introduction	4
1. Scope	5
2. Regulatory references	6
3. Basic notions	7
4. General provisions	9
5. Values and objectives of education in Intellectual schools	10
6. Structure of education in Intellectual schools	17
7. Expected learning outcomes by educational and subject areas	19
8. Content of education	57
9. Approaches to assessment	66
10. Organisation of the educational process in Intellectual schools	67

#### Introduction

Modern school focuses on the interests of an individual, which is characterized by encouraging students to make conscious choices and independent decisions and responsibly participate in social life. These circumstances demand that an innovative model of school education should be developed to combine the best traditions of national and global education. Such model is to bring up a highly educated individual, proactive and able to compete internationally. The development of an innovative model requires taking a number of steps to determine the quality of education. Those are reinforcing the values, developing key competencies, changing the structure and content of education, using active learning methods and effective assessment of student achievements, and establishing a system of relationships.

One of the priorities of the state educational policy in implementing these objectives is the establishment of Nazarbayev Intellectual Schools (hereinafter referred to as Intellectual schools), which aim to ensure a better development of students' skills and potential. Upper secondary school aims to prepare students to study in leading national and foreign universities.

According to the Law of the Republic of Kazakhstan "On the status of Nazarbayev University, Nazarbayev Intellectual Schools and Nazarbayev Fund", Intellectual schools are an experimental platform carrying out the development, monitoring, research, analysis, piloting, and implementation of advanced models of secondary school curriculum and technology.

Educational programme "Nazarbayev Intellectual Schools" AEO – NIS-Programme, developed in collaboration with Cambridge Assessment International Education (CAIE), the strategic partner of "Nazarbayev Intellectual Schools" AEO (hereinafter referred to as NIS), is focused on the implementation of Science and Mathematics education.

## 1. Scope

- 1.1. Educational programme of "Nazarbayev Intellectual Schools" AEO–NIS-Programme (hereinafter referred to as the Educational Programme) establishes values and long-term objectives, expected learning outcomes, composition, and structure of content of secondary education, as well as assessment model of students' learning achievements, requirements for educational process in Nazarbayev Intellectual Schools (hereinafter referred to as Intellectual schools). The content of the Educational Programme covers the content of subjects in accordance with the State Compulsory Educational Standards of the Republic of Kazakhstan, and is compatible to the content of the International GCEAS/A level (Great Britain), O-Level (Singapore), International Baccalaureate (IB) etc.
- **1.2.** This Educational programme is used in the following institutions:
  - Intellectual schools implement primary, lower and upper secondary programmes aiming at advanced study of Science and Mathematics and the integration of the best national and international educational practices;
  - Centre for Educational Programmes develops innovative educational programmes, textbooks, teaching and learning materials and digital learning environment, provides scientific and methodological support in their piloting and implementation, carries out monitoring and research on the development and revision of the educational programme of Intellectual schools and similar activities related to the dissemination of experience nationwide;
  - Centre for Pedagogical Measurements provides research, organisational and information technology support for the student and teacher selection procedures, carries out monitoring of academic achievements, final certification of NIS graduates, quality assurance of educational services, assessment of trainers and teachers' work at CoE professional development courses;
  - Centre of Excellence provides continuing professional development and retraining for NIS educators and managers of Intellectual schools and educational institutions of Kazakhstan.

## 2. Regulatory references

This educational programme contains references to the following regulatory documents:

- The Law of the Republic of Kazakhstan "On education" dated 27 July 2007, No.319-III;
- The law of the Republic of Kazakhstan "On the Status of Nazarbayev University, Nazarbayev Intellectual Schools and Nazarbayev Fund" dated 19 January 2011, No. 394-IV;
- The national project "Quality education" and "Quality nation" approved by the Decree of the Government of the Republic of Kazakhstan dated 12 October 2021, No. 726;
- The concept of preschool, secondary, and vocational education of Kazakhstan for 2023–2029 approved by the Decree of the Government of the Republic of Kazakhstan dated 28 March 2023, No. 249;
- NIS2030 Development Strategy approved by the decision of the Supreme Board of Trustees of Nazarbayev Intellectual Schools AEO dated 1 December 2018.

### 3. Basic notions

The Educational programme uses terms and definitions in accordance with the laws of the Republic of Kazakhstan "On education" and "On the Status of Nazarbayev University, Nazarbayev Intellectual Schools and Nazarbayev Fund". The following terms are used:

NIS stands for "Nazarbayev Intellectual Schools" Autonomous Educational Organisation.

**Core content of secondary education** is the compulsory content, structure and scope studied in primary and lower secondary school (Grades 1–10) and sufficient for the student to continue studying at the subsequent stages of education.

**Intellectual Schools** are the branches of "Nazarbayev Intellectual Schools" Autonomous Educational Organisation, the main activity of which is to organise the educational process.

**Extracurricular activities** are the learning activities of NIS students participating in the educational process aimed at the comprehensive development and implementation of their individual abilities which get approved by the decision of the Board of Trustees.

**Educational Programme of "Nazarbayev Intellectual Schools" AEO – NIS-Programme** is a regulatory conceptual framework defining the overall approaches to the educational process and the content of education in Intellectual schools focused on the study of science and mathematics. This document describes basic principles, rules, and conditions for organising a result-oriented educational process.

Well-being of participants of the educational process is a stable life position that includes positive emotions, positive attitudes, flexible thinking, involvement in socially significant activities, aspiration for high achievements and noble goals, emotional competence, and problem-solving skills.

**Model course plan** is a document regulating a list, sequence, and a scope of academic subjects and other activities of students. It is developed in accordance with the State Compulsory Educational Standards of the Republic of Kazakhstan (primary, lower, and general secondary education) and the educational programme; it is a basis for the school's course plan.

**Course plan** is a regulatory document developed by Intellectual Schools based on the model course plan and defining the content, scope and structure of the educational process and other learning activities of NIS students.

**Subject programme of Intellectual Schools** is an educational and regulatory document intended for the organisation of the educational process on a particular subject. It sets goals, objectives, and expected learning outcomes, the composition and structure of the curriculum content; academic load; approaches to teaching and learning; approaches to the assessment of students' achievements.

**Long-term and short-term plans** are course plans for a particular subject designed to organise the educational process within one academic year and one term respectively, which specifies learning objectives, expected outcomes as well as the content of units and topics; the list of teaching materials on how to organise the educational process.

**Short-term plan** is a lesson plan specifying teaching objectives (teacher's guide) and learning objectives (student's guide), resources and stages of the educational process.

**Profession-oriented teaching** is a process of differentiation and individualization of learning, as well as organisation of the educational process with due account for the interests, aptitudes, and abilities of students.

Educational activity is a process of target oriented, pedagogically reasoned, and consistent interaction of subjects of education, which involves solving the tasks related to learning, development, and education of an individual. **Expected learning outcomes** refer to a multilevel system of long term and short-term learning objectives (learning and education), indicate students' development, and reflect expectations of an individual, society and state. They allow to trace students' academic achievements in their progress towards overall objectives of education.

Educational area is an integral part of education that include a set of related academic subjects.

**Trilingual education** is the development of a multilingual personality and a citizen of Kazakhstan who speaks Kazakh, Russian and English and can successfully communicate on various topics, values the culture of his or her people, understands and respects the culture of other people.

**Criteria-based assessment** is a process of correlating the real achievements of students with the expected learning outcomes based on criteria and descriptors.

**Formative assessment** is a type of assessment that is carried out during the educational process, provides feedback between the teacher and students, and allows for timely correction of teaching.

**Summative assessment** is a type of assessment that is carried out upon completing the study of units/cross-cutting themes of the subject programmes, or at the end of a particular academic period (term, level of education).

**Invariant part** is a part of the model course plan that includes academic load by subjects; it is compulsory for study in the NIS branches.

**Variative part** is a part of the model course plan that includes an additional academic load beyond the invariant component; it is compulsory for study in the NIS branches. The extracurricular component of the academic load consists of school (elective courses) and student (club activities) components.

**School component** is an integral part of the extracurricular component of a model course plan that includes a compulsory school course and elective courses studied in the NIS branches.

**Student component** is an integral part of the variable component of a model course plan that includes club activities.

**Compulsory school course** is a component of the variable part of a course plan. It is obligatory for NIS schools to deliver this component as it contributes to the implementation of the NIS development strategies and extends NIS Educational Programme. Domains and subjects for compulsory study as part of a school course, as well as their duration and content are determined by the Executive Board of NIS AEO. One compulsory school course can be provided for each grade.

**Elective courses** are compulsory courses that students can choose to study so it is an organisational form of implementing educational programmes according to the students' interests. It is a part of the variable school component of the course plan. They are aimed at implementing the strategy of the Intellectual schools' development.

**Elective courses equated to the invariant component** are school components including the preparation for international exams (IELTS, SAT, NUFYP, HSK, TOPIC, DSD); subject Olympiads (Mathematics, Physics, Chemistry, Biology, Geography and Computer Science); courses in Nanotechnology, Biotechnology, Engineering, Robotics, Information and Communication Technologies and Second Foreign Language.

**Standard level of mastering the content of education** is a level of mastering the standard scope of knowledge and skills.

Advanced level of mastering the content of education is a level of mastering an extended and indepth scope of knowledge and skills.

## 4. General provisions

- **1.1.** This educational programme is a regulatory conceptual document defining values and objectives of education in Intellectual schools, the content of education and overall approaches to the organisation of the educational process in Intellectual schools focused on the study of science and mathematics.
- **1.2.** This educational programme is aimed at:
  - implementing the NIS policy on the integration of Kazakhstani and international curricula in secondary education;
  - implementing trilingual education in Intellectual schools by organizing the educational process in the Kazakh, Russian and English languages;
  - improving the quality of education by establishing a system of objectives represented in the form of expected learning outcomes;
  - combining academic and practical orientation of Science and Mathematics education, particularly in upper secondary school, which provides for the study of scientific research methods and theories;
  - increasing step-by-step subject knowledge and skills to ensure the depth and complexity of subject content, considering the attainment age of students;
  - strengthening the role of pastoral work in the educational process through the creation of favourable conditions and friendly atmosphere for personal development;
  - ensuring continuity of pre-school, primary, lower, and upper secondary school, and higher education;
  - contributing to the economic and social development of the country by improving the quality of national education.
- **1.3.** This educational programme is the basis for the development of:
  - subject programmes for primary, lower, and upper secondary school;
  - long-term and mid-term course plans;
  - textbooks and teaching and learning materials;
  - indicators measuring student achievement in subjects;
  - professional development programmes for NIS teachers;
  - other documents related to the organisation of education in Intellectual schools.

## 5. Values and objectives of education in Intellectual schools

- **5.1.** The educational programme defines a **framework for key competencies** including a **list of values**, **knowledge**, **types of literacy and skills** which are the fundamental basis for learning. The framework provides the basis for the development of key competencies in students. It is necessary to create conditions for students to acquire fundamental knowledge and develop the skills that will enable them to achieve their potential and become responsible members of society.
- **5.2.** Key competencies are a combination of knowledge, types of literacy, skills and values required for an individual to successfully adapt to and live in modern society. They reflect a person's ability to adapt to changing conditions, learn and apply knowledge and skills in real life to solve various tasks related to education, social interaction, personal life, self-development, and future professional activity.

**Values** refer to a system of beliefs, attitudes, and ideals about what is meaningful and important in a person's life. They determine what people value and what they are guided by in their actions and decisions.

**Knowledge** is information that is obtained through study, experience, or the transfer of knowledge from others. It is understanding of facts, ideas, concepts, procedures, and principles which can be used to solve problems and achieve goals.

**Types of literacy** refer to a set of human abilities to analyse, reason and effectively communicate when setting, solving, and interpreting everyday problems in terms of various subject areas.

**Skills** are abilities and actions acquired through practice and experience which allow to successfully perform certain tasks and solve problems in specific areas of activity.

Key competencies are significant for a successful life and complement each other which increases their effectiveness. They can be applied in various situations and contexts and be important for different areas of life. It is important to realize that competencies are dynamic and can improve with experience and practice and their application depends on the specific situation.

The Framework of Key Competencies is a model that describes, clarifies, and structures knowledge, types of literacy, skills and values that take an important place in the content of subject programmes and course plans.

Key competencies and their elements will develop gradually (progressively) from primary school to upper secondary school. As soon as students master basic values, knowledge, types of literacy and skills at primary level, they will move on to the intermediate and advanced level in lower and upper secondary school respectively. Every next level will build on the current level of competencies and their elements contributing to the gradual enhancement and development of students' competencies. This approach will ensure a smooth and progressive transition to more complex levels of key competencies by preparing students for a successful adaptation in a rapidly changing world and providing better opportunities for their future professional achievements.

- **5.3.** The educational programme establishes **values** defining the importance of education. The main point is that they become a leading factor in developing a successful individual who can fulfill themselves and improve the quality of their life and environment. These values, as life guidelines, allow students to become harmoniously developed intellectual people. There are values and their definitions given below:
  - Respect is a value that expresses a sense of recognition, admiration and respect for another person and a group of people for their personal qualities, achievements, culture or belonging to a certain social group (senior people, low-income and multi-child families, and disabled people). This value is manifested in a respectful attitude, kindness, sensitivity, tactfulness

and tolerance towards other people, their opinions, rights, and freedoms. It is one of the core values of interpersonal relationships and contributes to the development of positive relationships between people.

- Openness is a value that refers to being willing to communicate, understand and consider different points of view, ideas, and cultural characteristics of other people. This value is associated with the ability to be tolerant, ready to change and adapt to new circumstances and actions in accordance with accepted agreements. Open-minded people are often tolerant, curious, and respectful to other people, their cultural values and life experience.
- Patriotism and responsibility are values associated with love and respect for one's country and willingness to take responsibility for it. Patriotism is manifested in the willingness to stand up for the interests and welfare of one's country, and responsibility is the willingness to bear one's own obligations and take care of the future of one's country. These values can promote civic awareness and active participation in social life.
- Strong work ethic and creativity are values that express respect for work and the desire for creative self-realization. These values refer to hard work, perseverance, a creative approach to solving problems and finding new ways to achieve them. Work ethic and creativity are important qualities for personal and professional development to help everyone to contribute to society.
- Integrity is a quality manifested in his desire to tell the truth and act in accordance with moral principles and norms. In the context of education and science, honesty includes adherence to the principles of academic ethics and integrity when conducting scientific research, respect for intellectual property and recognition of sources of information given in academic works. Academic integrity also refers to the absence of fraud, plagiarism, and other forms of violation of ethical and legal norms in the academic process.
- Family values and traditions are values that are passed down from generation to generation within a family. They are fundamental for the development of relationships and lifestyle within a family and have an impact on the relationships with the environment. Family values and traditions include such qualities as respect, trust, responsibility, care, mutual understanding etc. They can reflect certain social, religious, or cultural norms and standards that are accepted in the family. Family values and traditions are especially important in shaping an individual and his or her mindset and strengthening family relations.
- Health and well-being are values that refer to the physical and psychological well-being of an individual. They have to do with taking care about one's own physical and psychological health. These values include a healthy lifestyle, proper nutrition, regular physical activity, care about psychological state, i.e. managing emotions, dealing with stress and etc. They include concerns about health and well-being of other people, for example, caring for the family members and supporting public health. Health and well-being are fundamental values that contribute to a full and happy life.
- Global citizenship is a value that refers to a conscious participation in the life of a global community and encourages to handle world problems (poverty, hunger, environmental crises etc.) in a responsible way. It means understanding oneself as a part of the world community and striving to improve the lives of people in different countries and regions. Global citizenship includes respect for differences in culture, language and customs and encourages countries and peoples to coexist and cooperate.
- **5.4.** Within the educational programme, **knowledge** includes theoretical concepts and ideas, and practical understanding based on the experience of performing certain tasks. The educational programme distinguishes four types of knowledge:
  - Disciplinary knowledge is knowledge related to a specific field of science or discipline. It
    includes theoretical concepts, terms, facts, and research methods related to a specific area

of knowledge. Disciplinary knowledge helps understand and analyse certain aspects of the surrounding world in accordance with the norms and rules accepted within this discipline.

- Interdisciplinary knowledge is knowledge that combines the elements from different disciplines or areas of knowledge to address a specific problem or research a topic. It is a result of interaction between different sciences and their methods and can be applied in various areas. Interdisciplinary knowledge can be important in creating new ideas and concepts and making comprehensive and informed decisions.
- Epistemological knowledge is knowledge about how to think and act as a specialist. This knowledge allows students to realize the relevance and objective of learning and to deepen its understanding. Epistemological knowledge helps students become more confident in obtaining and using knowledge and analyzing and evaluating information which will affect their successful self-realization in the future professional activities.
- Procedural knowledge is knowledge related to the ability to perform certain actions or procedures. They include specific steps, processes, methods, and strategies needed to accomplish certain tasks. Procedural knowledge is usually the result of practical experience; students have to practice and revise it to acquire and improve. It is often associated with the practical application of disciplinary knowledge and can help students better understand their application in real life.
- **5.5.** In the educational programme, current types of literacy are integrated into the content of education. They contribute to the development of students' abilities to analyse, reason, and effectively communicate when setting, solving, and interpreting everyday problems within various subject areas. The educational programme is aimed at developing the following **types of literacy**:
  - **Functional literacy** is the ability to use acquired knowledge and skills in order to fully perform in the modern society, i.e. to solve a wide range of tasks in various areas of human activity, communicate and interact with surrounding people.
  - **Financial literacy** is the ability to apply knowledge and skills in managing personal finance through appropriate short-term solutions and long-term financial planning to achieve personal financial well-being considering life events and economic changes.
  - **Entrepreneurial literacy** is the ability to use knowledge, opportunities, and ideas and to transform them into values for others, to cooperate in planning and managing projects of a cultural, social, or financial value.
  - Legal literacy is knowledge and use of one's own rights, duties and legal acts regulating relations between people, social communities, and organisations; the ability to apply legal knowledge in the analysis of conflict situations and to evaluate the actions of social subject from legal perspectives.
  - Environmental literacy is the ability to understand natural systems, principles of organisation of ecological communities (ecosystems) and use these principles in creating sustainable human communities.
  - **Physical literacy** is the ability to apply knowledge and skills to obtain, understand and apply information to make decisions related to health and maintain physical activity throughout life.
  - Literacy for sustainable development is the ability to apply knowledge and skills to promote sustainable development; the ability to understand how social, economic, and environmental systems interact and support life recognizing and evaluating different perspectives which affect sustainable development; participation in activities contributing to a stable lifestyle.
  - **Health literacy** is the ability to understand and make informed decisions about one's own health and the health of others (physical and mental health); the ability to identify factors affecting health and well-being.

- **Media and information literacy** is the ability to apply knowledge and skills to analyse and evaluate information, check its source, distinguish facts from fiction and make informed decisions about one's own life.
- **Digital literacy** is the ability to apply knowledge and skills for safe, responsible, and effective use of digital technologies and Internet resources.
- **Data literacy** is the ability to extract necessary information from data, communicate and create new information based on mathematical understanding and statistical skills.
- Programming and coding literacy is the ability to apply knowledge and skills regarding programming languages, patterns, processes, and systems required to effectively use devices such as computers and robots.
- **5.6.** Knowledge and values established in the educational programme become the core of students' daily activities and should be manifested in their abilities to demonstrate the following **skills**:
  - Cognitive and metacognitive
  - Critical thinking is the ability to analyse information, evaluate its quality, consider it from different perspectives and make informed decisions. Critical thinking includes the ability to think rationally and logically, analyse arguments and evidence, critically evaluate, and interpret information. It helps students learn to see a problem from different perspectives, develops the ability to self-control and self-evaluate, improves communication and collaboration skills.
  - Creative thinking is the ability to generate new ideas, concepts and problem solutions which differ from traditional ones and represent an original approach to problem solving. This skill allows to see things not only in reality, i.e. in the form they appear, but also in the way they can appear. Creative thinking includes flexibility, the ability to associate different ideas and concepts and to innovate and experiment.
  - **Problem solving and decision making** refer to the ability to analyse a difficult situation, identify problems and find effective solutions; the ability to make informed decisions, evaluate possible consequences and risks, and monitor taken measures.
  - Research skills refer to the skills required to conduct research including the ability to formulate a question, collect and analyse data, interpret results, and draw conclusions. These skills may vary depending on the field of research but usually include the ability to develop hypotheses and research questions, identify data collection methods, analyse, and interpret data, summarize, and present research results.
  - Learning to learn is the ability to consciously and effectively use various learning strategies and methods to improve one's education and increase the level of academic achievement in school and life. It includes the ability to determine learning objectives, choose appropriate methods and techniques, evaluate one's progress and adjust approaches based on the results obtained; helps become more independent and responsible for one's learning and development.
  - Self-regulation is the ability to control one's emotions, thoughts, behaviour, and reactions to different situations and strive to achieve goals despite possible obstacles. This skill includes the ability to manage one's time, energy, and attention, regulate one's emotions and stress, take responsibility for one's actions and make effective decisions in difficult situations.
  - Computational thinking is the ability to analyse and solve decisions using computational tools and technologies. This skill includes understanding basic programming concepts, the ability to work with data and algorithms, use applications to solve problems and critical thinking when working with technologies.
  - Systems thinking is the ability to analyse complex systems and the interaction between their components, understanding the effect of one element on others and the entire system. This skill includes the ability to see problems in the context of a system and find solutions that take into account many factors and lead to a holistic approach to solving problems.

- Social and emotional skills
- Cooperation is the ability to work with other people to achieve a common goal or solve a common task. This skill includes the ability to listen and understand other people's point of view, negotiate, and come to a compromise, effectively work in a team, delegate tasks, and participate in a collective decision making.
- Communication is the ability to communicate effectively with other people including the ability to express one's thoughts and ideas, listen and understand others, establish a contact, and convince. This skill includes the ability to use various communication channels (oral and written speech, email, social networks) and adapt to different situations and cultural contexts.
- Social responsibility is the ability to consciously participate in the life of society and take care of the well-being of surrounding people and nature taking into account social, economic, and environmental consequences of their actions. It includes the manifestation of ethical principles, the ability to make informed decisions and take measures aimed at achieving social goals and eliminating negative consequences for society and the environment.
- Leadership is the ability to manage and influence the behaviour of other people in order to achieve a common goal or result. Leadership includes the ability to motivate, lead and coordinate teamwork, manage conflicts, solve problems, and make decisions. A leader should have communication skills, be able to negotiate, convince and inspire other people, be ready for constant self-development and improvement of their skills.
- Emotional stability is the ability to manage one's emotions and react to stressful situations without losing control over one's behaviour and decision. This skill includes the ability to assess emotional state and effectively apply various strategies to regulate it. It helps stay calm, make informed decisions and cope with difficult situations.
- **Curiosity** is the ability and interest in obtaining new knowledge, inner openness to people, phenomena and the surrounding world, a sincere desire to satisfy cognitive needs and get new experience or impression.
- Empathy is the ability to understand and feel emotions, feelings and needs of other people; the ability to put oneself in their place and respond to an emotional state with empathy and understanding. It is a key skill for effective interpersonal communication and establishing deep connections with other people.
- Self-awareness is the ability to recognize one's thoughts, emotions, and behaviour, realize one's strengths and weaknesses, have realistic understanding of oneself and analyse one's actions and reactions to situations. This skill includes understanding of one's values, beliefs and goals which helps make informed decisions and action plans in accordance with personal needs and goals.
- Perseverance and resilience are the ability to continue working and remain motivated even when faced with difficulties, failures, or stressful situations. This skill includes the ability to cope with failures, accept a constructive feedback and find the ways to solve problems that may arise while achieving goals. Insistence and perseverance help overcome difficulties and achieve success in various areas of life.
- Adaptability and flexibility are the abilities to quickly adapt to changes in the environment and flexibly respond to new circumstances and requirements. This skill includes a willingness to change plans, the ability to quickly switch between tasks and adapt to new processes and technology, the ability to accept constructive feedback and learn from one's mistakes to better cope with the challenges of the future.
- Practical and physical skills
- ICT skills refer to the ability to use information technology and communication tools to exchange, process, store, and present information, to solve problems and achieve goals in various areas of life. These skills include the ability to operate computers, software, and Internet-re-

sources, actively communicate via an e-mail, social networks, and other means, critically evaluate, and use information obtained from various sources.

- First aid is the ability to take urgent basic measures to save a person's life, prevent complications in emergency, reduce threats to health and life of the injured person in a serious condition. These activities are carried out on site by the victim himself (self-help) or another person nearby (mutual assistance) until medical workers arrive.
- Playing musical instruments/ drama / dancing is the ability to use one's body, voice, or instrument to create musical sounds, drama roles or dance movements in accordance with a given composition, director's idea, or technique. These skills require a person to think creatively, coordinate movements, be expressive and understand musical, drama or dance forms.
- Craft is the ability to make products by hand using certain tools and techniques often associated with manual labour and traditional crafts (weaving, embroidery, ceramics, carpentry and etc.). In the modern world, it may include the use of software and digital technology to create various products and projects. Craft skills can be important for self-expression, relaxation, and creativity to make unique handmade products.
- Playing sports is the ability to properly and effectively engage in physical exercises and sports activities to improve physical fitness, health and achieve sports results. This skill includes knowledge of sports rules and techniques, the ability to work in a team, observe discipline and ethics of behaviour in the sports environment.
- Responsible consumption is the ability to consciously choose goods and services that do
  not harm the environment and society considering their origin, quality, packaging, methods
  of use, needs and opportunities. This skill includes the ability to properly dispose and recycle
  waste, save resources, and protect the environment.
- **5.7.** Within the framework of key competencies represented by a range of values, knowledge, types of literacy, and skills, the aim of education in Intellectual schools is to create an educational space favourable for harmonious development of a highly educated and creative personality who has **core competencies** listed below.
  - Cognition is a competence that reflects a person's ability to learn effectively, acquire new knowledge and skills, apply them in different areas of life, critically reflect on their cognition process and consciously develop their cognitive abilities. This competence includes the ability to analyse information, apply various learning methods and strategies, develop creativity, analytical and critical thinking skills, and the ability to reflect on one's knowledge and experience to improve learning and personal development.
  - Self-regulation is a competence that reflects the person's ability to control one's emotions, thoughts, and behaviour in various situations. It includes the ability to manage one's emotions, make informed decisions and control one's actions in accordance with one's goals and objectives. Self-regulation includes the ability to manage one's time and resources and the ability to adjust to changing conditions and stressful situations.
  - Digital competence is a competence that reflects the ability to use information and communication technologies to process, transfer, and store data, solve problems and achieve goals in various areas of life. It includes the ability to work with electronic documents and databases, use a software to create and process texts, graphics and sound, the ability to work with network technologies and use the Internet to search for information, communicate and collaborate. This competence refers to the ability to evaluate and analyse information obtained through digital technologies and use it in one's activities.
  - Applied competence is a competence that reflects the ability to apply knowledge, skills and aptitudes in specific practical situations related to work, life, study, and other areas of life. It includes the ability to solve problems, design and create a product, conduct experiments, use tools, methods, and technology in one's activities. This competence refers to the ability

to evaluate and improve one's work and productivity and the ability to collaborate and work in a team.

- Eco-self is a competence that reflects the ability to understand the relationship between a human and the environment, realize his or her responsibility for the conservation of natural resources and biological diversity. It includes knowledge about ecosystems and environmental issues, the ability to make decisions focused on the sustainable use of natural resources and reduction of the environmental impact, the ability to use environmentally friendly technology and approaches in their activities. The key competence ''Eco-self'' involves the ability to act in accordance with the principles of sustainable development and to use opportunities to promote and support environmental initiatives.
- Agency is a competence that includes the ability to be initiative, enterprising and ready for action in different areas of life. It includes the ability to be a leader, make decisions and act in a context of uncertainty and changes, to set goals and work to achieve them. Agency refers to the ability to think creatively, be innovative and adaptive, to predict and anticipate possible issues and solve them in advance.
- Social interaction is a competence that reflects the ability to communicate effectively, collaborate and work in a team. It includes the ability to listen and understand other people, build partnership, solve conflicts, and find compromises. This competence also refers to the ability to work in an intercultural environment, respect differences between people and strive to create trusting relationships. It involves the ability to work with different groups of people including children, adolescents, adults, and the elderly, and interact with people from different social and economic strata of society.
- Transformative competence is a competence that reflects the ability to create new values and ideas, take responsibility for one's actions and decisions, resolve conflicts and solve complex issues. It includes the ability to analyse and evaluate existing processes and systems, identify their problems and shortcomings, propose, and introduce new approaches and solutions to improve them. Transformation involves the ability to work in a team, consider the interests and needs of different parties, resolve conflicts, and reach agreements based on compromise and respect. Within this competence, it is important to make complex decisions based on a holistic approach considering social, environmental, and economic aspects and their consequences for future generations.
- Global competence is a competence that reflects the ability to interact in an intercultural and global environment, the ability to understand and evaluate global issues and find solutions that contribute to sustainable development and collective well-being. This competence includes the ability to interact successfully with people from different cultures and countries, understand and respect their cultural traditions, customs, and beliefs, and use intercultural skills to achieve agreements and resolve conflicts. Global competence refers to the ability to act in a global and intercultural environment, understand the relationship and dependence between different regions of the world and take measures to create a sustainable and fair global community.

These competencies will allow graduates of Intellectual schools to harmoniously combine human and ethno-cultural values and demonstrate **functional literacy and competitiveness** in any life situation.

## 6. Structure of education in Intellectual schools

- **6.1.** Intellectual schools implement the learning process at three levels of education:
  - primary education is provided in primary school (Grades 1–5);
  - basic secondary education is provided in lower secondary school (Grades 6–10);
  - general secondary education is provided in upper secondary education (Grades 11–12).

This structure takes into account the stages when students grow up and move into adulthood, age specific features of their cognitive development, as well as positive international experience in organizing the process of education.

#### 6.2. Primary school (Grades 1–5)

The main objective of primary school is to ensure the development of initial learning skills and propaedeutic knowledge. Primary school enables students to acquire knowledge about human, nature, and society; develop moral values, intellectual skills, and creativity; and acquire necessary learning skills. Those will form the basis for the further study of the environment, awareness of one's place in the world, and the development of one's personality and intellect.

Standard duration of study is 5 years. Recommended age of students is 6–11 years.

Upon completion of this level, students will have developed the following:

- basic values and socially significant personal qualities;
- initial readiness for self-development, motivation to cognition and learning;
- basic logic and research activities and ability to work with information;
- basic social and emotional, practical, and physical skills;
- specific for each educational and subject area experience of obtaining new knowledge, its transformation and functional application;
- readiness for the transition to the lower secondary school including adaptation to a more complex educational process and extended content of the curriculum.

#### 6.3. Lower secondary school (Grades 6–10)

Lower secondary school aims to create conditions for students to help them complete basic education, choose a focus (profile) within the science and mathematics education, and develop independence through the balanced combination of all activities such as: learning, projects, and research.

Standard duration of study -5 years (Grades 6–10). Recommended age of students -11-16 years. Upon completion of this level, students will have developed the following:

- values and socially significant personal qualities;
- readiness for self-development, independence, initiative, and personal self-determination;
- motivation for cognition, learning and goal-directed activity;
- sufficient (average) level of social and emotional, practical, and physical skills;
- specific for each educational and subject area experience of obtaining new knowledge, its transformation and functional application including academic and social projects;
- readiness for the transition to upper secondary school and development of an individual learning trajectory in accordance with one's interests and abilities.

#### 6.4. Upper secondary school (Grades 11–12)

Upper secondary school aims to deliver profession-oriented education in science and mathematics, and to provide students with academic knowledge necessary to enter higher education institutions. It actively and intentionally develops learning, communication, social and research and problem-solving skills. Students self-determine from social, professional, and civic perspectives.

Standard duration of study – 2 years (Grades 11–12). Recommended age of students is 6–18 years.

Upon completion of this level, students will have developed the following:

- values and socially significant personal qualities;
- motivation for life-long educations, self-development, and self-improvement.
- social and emotional, practical, and physical skills implying an advanced level of emotional intelligence, physical activity, creative hobbies, and support for a healthy lifestyle;
- specific for each educational and subject area experience of obtaining new knowledge, its transformation and functional application including academic, research and social projects;
- skills of acquiring knowledge in the Kazakh, Russian and English languages;
- readiness for admission to leading national and international higher educational institutions.

## 7. Expected learning outcomes by educational and subject areas

- **7.1.** Expected learning outcomes refer to a system of long-term objectives determined for each educational and subject area. Expected learning outcomes for each educational area are the planned learning outcomes presented in a generalised form for all levels of secondary education (primary, lower secondary and upper secondary).
- **7.2.** Expected learning outcomes serve as the basis for the development of subject programmes. The subject programmes specify these generalised expected learning outcomes into subject learning objectives by grade and for each unit, forming a tiered system.
- **7.3.** The system of expected learning outcomes creates the opportunity for students to progress stepby-step towards long-term educational goals at the end of school. This requires students to achieve the expected learning outcomes planned for the long-term, medium-term, and short-term (lessonspecific) learning periods for the subject.
- **7.4.** Students' success in achieving long-term objectives is characterised by their readiness to integrate subject knowledge and skills with their life experiences to make successful decisions in any learning situation in accordance with age-appropriate capabilities.
- **7.5.** The expected learning outcomes are designed considering the peculiar features of each educational area combining several related subjects and taking into account the specifics of each subject.

The content of education in Intellectual schools includes 6 educational areas as compulsory components of complete education: Language and Literature, Mathematics and Computer Science, Science, Human and Society, Art, Physical Education.

- 7.6. Expected learning outcomes of *Language and Literature* educational area. *The student will*:
  - speak oral and written Kazakh, Russian and English, use language skills (listening, speaking, reading, writing) to receive, select, process, and transfer necessary information in accordance with the intended objectives or to solve problems;
  - creatively express his/her thoughts and ideas orally and in writing in three languages according to the given context, both in the learning process and in everyday life;
  - develop communicative skills to communicate in any life situations to express one's own emotional and value attitude to the surrounding reality;
  - understand the value of language as an instrument of cognition of the surrounding reality and as a means of justifying one's position in solving various problems;
  - be able to appreciate national and world literature as part of the world cultural heritage and to consider it as a basis for his/her own development and improvement.

#### 7.6.1. Primary school

#### 7.6.1.1. Expected learning outcomes of Kazakh Language and Literature (L1)

- know the basic units of the phonetic structure of the Kazakh language: distinction of vowels
  and consonants, sounds and letters; division into syllables, pronunciation and accent, phonetic
  and morphological composition of words, the main parts of speech and their most important
  grammatical categories, the syntactic role of words in a sentence, the studied orthograms;
- understand the main content of the text read or heard, the topic of discussion, dialogue; identify text types: description, narration, and reasoning; identify universal human values in works of fiction;

- apply various techniques of retelling the content of fiction, narrative and descriptive texts using emotionally colored means of expression; consciously use synonyms, antonyms, homonyms, words with direct and figurative meanings in speech; participate in dialogue using various methods of speech communication and speech norms; distinguish artistic texts from non-artistic ones; read texts using certain types and strategies of reading; apply the learned spelling rules; write in accordance with the studied grammatical, spelling and punctuation norms;
- analyse ideas about spiritual and moral values based on the information read or heard; reason, share their thoughts and emotions; determine the genre of a work, justify their choice; determine the main idea and composition of works of fiction; determine the artistic and expressive means used by the author to create images of characters; draw conclusions about the writer's attitude to his characters;
- evaluate the author's point of view, argue their point of view, following a logical sequence of reasoning; predict the course of events in the works; evaluate their own work, perform self-checking, find, and correct spelling and punctuation errors;
- create coherent, logical, reasoned statements in accordance with the proposed topic and communicative task; create texts using various forms of information presentation: pictures, diagrams, graphs, tables; create texts of different types, genres, and styles, selecting appropriate artistic and expressive means; synthesise small texts on topics related to the culture, customs of the people of Kazakhstan, expressing their moral position.

#### 7.6.1.2. Expected learning outcomes of Russian Language and Literature (L1)

- know the basic units of the phonetic structure of the Russian language: the distinction between vowels and consonants, sounds and letters, division into syllables, pronunciation and accent, phonetic and morphological composition of words, the main parts of speech and their most important grammatical categories, the syntactic role of words in a sentence, the studied orthograms;
- understand the main content of the text read or heard, the topic of discussion, dialogue, identify text types: description, narration, and reasoning; identify universal human values in works of fiction;
- apply various techniques of retelling the content of fiction, narrative and descriptive texts using emotionally colored means of expression; consciously use synonyms, antonyms, homonyms, words with direct and figurative meanings in speech; participate in dialogue using various methods of speech communication and speech norms; distinguish artistic texts from non-artistic ones; read texts using certain types and strategies of reading; apply the learned spelling rules; write in accordance with the studied grammatical, spelling and punctuation norms;
- analyse ideas about spiritual and moral values based on the information read or heard; reason, share their thoughts and emotions; determine the genre of a work, justify their choice; determine the main idea and composition of works of fiction; determine the artistic and expressive means used by the author to create images of characters; draw conclusions about the writer's attitude to his characters;
- evaluate the author's point of view, argue their point of view, following a logical sequence of reasoning; predict the course of events in the works; evaluate their own work, perform self-checking, find, and correct spelling and punctuation errors;
- create coherent, logical, reasoned statements in accordance with the proposed topic and communicative task; create texts using various forms of information presentation: pictures, diagrams, graphs, tables; create texts of different types, genres, and styles, selecting appropriate artistic and expressive means; synthesise small texts on topics related to the culture, customs of the people of Kazakhstan, expressing their moral position.

#### 7.6.1.3. Expected learning outcomes of Kazakh Language (L2)

- Upon completing primary school, the student will:
  - know the basic units of the phonetic structure of the Kazakh language: distinction of vowels and consonants, sounds and letters, division into syllables, pronunciation and accent, phonetic and morphological composition of words, the main parts of speech and their most important grammatical categories, the syntactic role of words in a sentence, the studied orthograms;
  - understand the main content of the text read or heard, the topic of discussion, dialogue, identify text types: description, narration, and reasoning; identify universal human values in works of fiction;
  - apply various techniques of retelling the content of fiction, narrative and descriptive texts using emotionally colored means of expression; consciously use synonyms, antonyms, homonyms, words with direct and figurative meanings in speech; participate in dialogue using various methods of speech communication and speech norms; distinguish artistic texts from non-artistic ones; read texts using certain types and strategies of reading; apply the learned spelling rules; write in accordance with the studied grammatical, spelling and punctuation norms;
  - analyse ideas about spiritual and moral values based on the information read or heard; reason, share their thoughts and emotions; determine the genre of a work, justify their choice; determine the main idea and composition of works of fiction; determine the artistic and expressive means used by the author to create images of characters; draw conclusions about the writer's attitude to his characters;
  - evaluate the author's point of view, argue their point of view, following a logical sequence of reasoning; predict the course of events in the works; evaluate their own work, perform self-checking, find, and correct spelling and punctuation errors;
  - create coherent, logical, reasoned statements in accordance with the proposed topic and communicative task; create texts using various forms of information presentation: pictures, diagrams, graphs, tables; create texts of different types, genres, and styles, selecting appropriate artistic and expressive means; synthesise small texts on topics related to the culture, customs of the people of Kazakhstan, expressing their moral position.

#### 7.6.1.4. Expected learning outcomes of *Russian Language (L2)*

- know the basic units of the phonetic structure of the Russian language: the distinction between vowels and consonants, sounds and letters, division into syllables, pronunciation and accent, phonetic and morphological composition of words, the main parts of speech and their most important grammatical categories, the syntactic role of words in a sentence, the studied orthograms;
- understand the main content of the text read or heard, the topic of discussion, dialogue, identify text types: description, narration, and reasoning; identify universal human values in works of fiction;
- apply various techniques of retelling the content of fiction, narrative and descriptive texts using emotionally colored means of expression; consciously use synonyms, antonyms, homonyms, words with direct and figurative meanings in speech; participate in dialogue using various methods of speech communication and speech norms; distinguish artistic texts from non-artistic ones; read texts using certain types and strategies of reading; apply the learned spelling rules; write in accordance with the studied grammatical, spelling and punctuation norms;
- analyse ideas about spiritual and moral values based on the information read or heard; reason, share their thoughts and emotions; determine the genre of a work, justify their choice; determine the main idea and composition of works of fiction; determine the artistic and expressive means used by the author to create images of characters; draw conclusions about the writer's attitude to his characters;

- evaluate the author's point of view, argue their point of view, following a logical sequence of reasoning; predict the course of events in the works; evaluate their own work, perform self-checking, find, and correct spelling and punctuation errors;
- create coherent, logical, reasoned statements in accordance with the proposed topic and communicative task; create texts using various forms of information presentation: pictures, diagrams, graphs, tables; create texts of different types, genres, and styles, selecting appropriate artistic and expressive means; synthesise small texts on topics related to the culture, customs of the people of Kazakhstan, expressing their moral position.

#### 7.6.1.5. Expected learning outcomes of English Language

Upon completing primary school, the student will:

- recognise by spelling the words from a limited range of general and academic topics; main facts and opinions in short, simple texts on general and academic topics;
- understand main points, specific information, and details with little support in short, simple texts
  on general and academic topics; understand a wide range of classroom instructions, questions
  about providing personal information, and simple questions on general and academic topics;
- apply a wide range of basic words, phrases, and short sentences to describe classroom objects, activities, and routines; contextual cues to predict the content and meaning of short speeches on general and some academic topics;
- analyse and compare words with different phoneme compositions, recognise basic opinions in short, simple texts on general and academic topics;
- evaluate and find, with the help of the teacher, books, worksheets, and other printed materials in the classroom or school library according to classification;
- create simple statements that provide information on a wide range of general and academic topics, plan, write, and correct sentences on basic personal, general, and academic topics with the help of the teacher.

#### 7.6.2. Lower secondary school

#### 7.6.2.1. Expected learning outcomes of Kazakh Language (L1)

Upon completing lower secondary school, the student will:

- know the features of monologic and dialogic utterance; features of texts of different types, styles, and genres; reading strategies (skimming, scanning, reading for specific information); orthographic and grammatical norms, punctuation rules;
- understand texts of social and every day, socio-cultural, educational, and professional spheres
  of communication; main and detailed information (textual, numerical, graphic) of texts of different types, genres, and styles, including digital;
- use various language means depending on the purpose of the speech act and the target audience; information and communication technologies depending on the communication tasks; grammatical, stylistic norms when forming their own statements; various reading strategies, including digital reading, in order to extract information depending on the reading task; orthographic, grammatical, punctuation norms; use language means in accordance with the task of writing; logically and reasonably express thoughts in various forms;
- analyse overtly and covertly expressed forms of speech behaviour and evaluation; the hidden meaning of texts of different genres and styles; visual and multimedia texts; necessary information from various sources, synthesising it; genre, structural, linguistic, and stylistic features of texts of different styles and genres, including digital ones;
- evaluate the speaker's attitude to the subject of speech, expressing their own opinion; information from various sources in terms of relevance, reliability, contradiction, validity, and relevance of evidence; distinguish between fact and opinion;

- create texts of different types, genres and styles, synthesising heard and read information; texts using information and communication technologies, considering the purpose and target audience; present information in various forms, synthesising data and drawing conclusions; write an academic essay on a particular problem, using a strict structure.

#### 7.6.2.2. Expected learning outcomes of *Russian Language (L1)*

Upon completing lower secondary school, the student will:

- know the features of monologic and dialogic utterance; features of texts of different types, styles, and genres; reading strategies (introductory, searching, studying); orthographic and grammatical norms, punctuation rules;
- understand texts of social and every day, socio-cultural, educational, and professional spheres of communication; main and detailed information (textual, numerical, graphic) of texts of different types, genres, and styles, including digital;
- use various language means depending on the purpose of the speech act and the target audience; information and communication technologies depending on the communication tasks; grammatical, stylistic norms when forming their own statements; various reading strategies, including digital reading, in order to extract information depending on the reading task; orthographic, grammatical, punctuation norms; use language means in accordance with the task of writing; logically and reasonably express thoughts in various forms;
- analyse overtly and covertly expressed forms of speech behaviour and evaluation; the hidden meaning of texts of different genres and styles; visual and multimedia texts; necessary information from various sources, synthesising it; genre, structural, linguistic, and stylistic features of texts of different styles and genres, including digital ones;
- evaluate the speaker's attitude to the subject of speech, expressing their own opinion; information from various sources in terms of relevance, reliability, contradiction, validity, and relevance of evidence; distinguish between fact and opinion;
- create texts of different types, genres and styles, synthesising heard and read information; texts using information and communication technologies, considering the purpose and target audience; present information in various forms, synthesising data and drawing conclusions; write an academic essay on a particular problem, using a strict structure.

#### 7.6.2.3. Expected learning outcomes of *Kazakh Literature*

Upon completing lower secondary school, the student will:

- know the basic literary terms, literary concepts, artistic and expressive means, figurative illustrations, the content of artistic works of various genres, literary works; know by heart fragments of poetic, prose, dramatic works; quotations from works;
- understand the nature of the national artistic heritage in world culture, human life, the main
  problems of Kazakh and world literature, the connection of a literary work with the era of its
  writing and modernity, the expression of values, type, genre, theme and idea of a literary work,
  problems, the author's point of view, the morality of the work;
- apply literary terms when analysing a work of fiction, draw up a plan for a work of fiction, stage fragments of a literary work, present the world of a literary work in various forms (table, infographic, diagram, etc.);
- analyse works in the aspect of their genre, literary, currents and trends; the theme and idea of the work, the problem raised, the author's point of view, the composition of the work, the plot, the world of characters, the author's style, linguistic features; analyse the work in comparison with works of Russian and world literature, its interpretation in works of other kinds of art;
- evaluate the modernity and novelty of themes and ideas, the expression of values, the problems raised, the behaviour and character of the characters; the author's position; express your own opinion about the writer's style;

- create a creative work in various literary genres; express thoughts artistically, using pictorial, expressive means in creating characters and episodes; effectively using various sources; write a critical article, literary essay, devoted to the theme and idea of the read/studied work, the problem raised, the author's style, the language of the work and other aspects of the work.

#### 7.6.2.4. Expected learning outcomes of *Russian Literature*

Upon completing lower secondary school, the student will:

- know the basic literary terms, literary concepts, artistic and expressive means, figurative illustrations, the content of artistic works of various genres, literary works, learn by heart fragments of poetic, prose, dramatic works; quotations from works;
- understand the nature of the national artistic heritage in world culture, human life, the main problems of Russian and world literature, the connection of a literary work with the era of its writing, modernity, the expression of values, type, genre, theme and idea of a literary work, problems, the author's point of view, the parable of the work;
- apply literary terms when analysing a work of fiction, draw up a plan for a work of fiction, stage fragments of a literary work, present the world of a literary work in various forms (table, infographic, diagram, etc.);
- analyse works in the aspect of their genre, literary, currents and trends; the theme and idea of the work, the problem raised, the author's point of view, the composition of the work, the plot, the world of characters, the author's style, linguistic features; analyse the work in comparison with the works of Kazakh and world literature, its interpretation in the works of other arts;
- evaluate the modernity and novelty of themes and ideas, the expression of values, the problems raised, the behaviour and character of the characters, the author's position; express their own opinion about the writer's style;
- create a creative work in various literary genres; express thoughts artistically, using pictorial, expressive means in creating characters and episodes; effectively using various sources; write a critical article, literary essay, devoted to the theme and idea of the read/studied work, the problem raised, the author's style, the language of the work and other aspects of the work.

#### 7.6.2.5. Expected learning outcomes of Kazakh Language and Literature (L2)

Upon completing lower secondary school, the student will:

- know the basic grammatical, lexical, syntactic concepts of the Kazakh language, direct and figurative meaning of words, synonymic, antonymic, and homonymic series of words, the content of artistic works of various genres;
- understand the main content of texts on every day, social, socio-cultural, educational, labour, socio-political topics, recognise the features of different styles and genres, understand the main idea of the text, the direct and figurative meaning of words, the meaning of artistic means, information in continuous, non-continuous and mixed texts;
- apply grammatical constructions of the Kazakh language, techniques of literary analysis, orthographic, stylistic and punctuation norms in oral and written statements;
- analyse typical stylistic and genre features of texts of different types, styles, and genres; the relevance of the information presented in the text and the problem posed; the author's point of view and impact on the reader; the image of characters in works of art; compare information in continuous and non-continuous texts;
- evaluate the relevance and reliability of information in texts, the theme, content structure, idea and purpose of texts, the author's thought in prose and poetic works, and the impact of the issue raised on the reader;
- create texts of various types, genres, and styles on the basis of heard or read material using various language tools, write an adventure story, create a monologue using language tools and taking into account the target audience, using multimedia components and visual materials.

#### 7.6.2.6. Expected learning outcomes of Russian Language and Literature (L2)

- Upon completing lower secondary school, the student will:
  - know general scientific and narrow specialised vocabulary of socio-cultural, educational, and professional, socio-political spheres; idiomatic expressions, grammatical forms (endings, suffixes, sentence construction schemes); rules of construction of word combinations and sentences;
  - understand in detail the information and subtext of the listened message, identifying the emotional and expressive features of speech and communicative intentions of the speaker; understand the hidden meaning of read texts, including electronic and multimodal, identifying the author's position;
  - apply types (strategies) of reading depending on the purpose and tasks, extracting necessary
    information from various resources; digital media for keeping the audience's attention and interacting with it, technologies/abilities of artificial intelligence for creating and publishing
    written texts, including comments in chat rooms, blogs, and forums; techniques of paraphrasing
    source material; learnt rules of spelling and punctuation in writing;
  - analyse the content of works of fiction, identifying and evaluating the role of composition, visual and expressive means and details in revealing the main idea, images of characters, their feelings, emotions and mood; the purpose, target audience, author's position, genre and stylistic features of texts; data from two or more sources united by one theme or problem; structural, lexical and grammatical features of texts of scientific and journalistic styles (article, review, public speech, abstract);
  - critically evaluate read and listened texts and oral statements from the point of view of effectiveness in achieving communicative tasks; ways and means of interpreting the content of texts;
  - create an extended monological statement for public speaking; dialogue/polemic, including in the Internet space, synthesising different points of view and proposing a solution to the problem; rules for joint discussions, defining the strategy of dialogue/polemic; electronic/handwritten texts of scientific and journalistic styles (article, review, annotation) taking into account the purpose and target audience; discussion and argumentative essay; concise presentation of material; non-continuous texts; creative works, revealing feelings, emotions and moods of characters.

#### 7.6.2.7. Expected learning outcomes of *English Language*

Upon the completion of lower secondary school, the student will be able to:

- know functionally important meanings, including details and specific information to complete forms, tables, charts, typical features of words, sentences, and text in various spoken genres;
- understand the main points of authentic texts of various genres, conversations, the meaning of terms and key units of texts, the main ideas of fiction and non-fiction texts on familiar and unfamiliar general and academic topics;
- use a variety of reading strategies, speaking, and listening skills for creative collaborative problem solving in groups; feedback to set personal learning objectives; imagination to express their thoughts, ideas, experiences, and feelings; speaking or writing to analyse and explore a wide range of opinions and world views;
- analyse and compare texts containing arguments to prove their point of view, recognise and compare inconsistencies in short texts of different genres and styles on general and academic topics, distinguish between fact and opinion;
- evaluate feedback from other students and respond constructively to it; critically evaluate the content of texts on a range of familiar general and academic topics and any unfamiliar topics; evaluate events, opinions, and problems in a reasoned manner; provide arguments

in writing; express emotional and evaluative attitudes to reality using previously suggested oral communication strategies;

 create written discursive texts expressing an opinion on an issue, business letters and other documents, essays on a variety of familiar general and academic topics; plan and create a synopsis of a written text; edit and proofread texts of various genres and styles.

#### 7.6.3. Upper secondary school

#### 7.6.3.1. Expected learning outcomes of Kazakh Language and Literature (L1)

Upon completing upper secondary school, the student will:

- know the features of monologic, dialogic and polylogic utterance; features of fiction and non-fiction texts of various genres, ways of expressing the author's position; various rhetorical techniques to influence the listener/reader; orthographic and grammatical norms, punctuation rules;
- understand texts belonging to different spheres of communication and styles, the content
  of texts of different types, styles, and genres, including academic, scientific, and technical
  topics, the content of digital texts; stylistic and genre features of fiction and non-fiction texts,
  considering the topic, main idea, problem, purpose, and target audience;
- apply various communication strategies in a situation of prepared and unprepared monological and dialogical communication, including public, achieving the set objectives; tactics of speech behavior, striving to influence the listener; observe the structure and norms of the use of language units, taking into account their stylistic differentiation; various reading strategies depending on the tasks facing the reader; carry out information search, extract and transform the necessary information; comply with grammatical, spelling, punctuation and stylistic norms;
- analyse overtly and covertly expressed forms of speech behaviour and evaluation; the hidden meaning of the text and the meaning of artistic means introduced in the text; linguistic, structural and genre features of complex texts; linguistic, genre and stylistic features of texts of various genres and styles;
- evaluate information from the listened and read text, expressing their point of view; the content of a problem text, drawing conclusions and proposing solutions; information in terms of credibility, relevance, effectiveness of the use of language units and rhetorical devices, offering recommendations for improving the statement;
- create extended statements (dialogue and polylogue, including discussion), texts of different types, genres, and styles, including those of an influential nature; continuous and non-continuous texts considering the speech situation, including texts in digital format; texts of creative and academic nature, arguing their opinion; synthesize information obtained from various sources and present it in the form of a clearly argued coherent message.

## 7.6.3.2. Expected learning outcomes of *Russian Language and Literature (L1)*

Upon completing upper secondary school, the student will:

- know the features of fiction and non-fiction texts of various genres, ways of expressing the author's position; various rhetorical techniques to influence the listener/reader; orthographic and grammatical norms, punctuation rules;
- understand texts belonging to different spheres of communication and styles, the content
  of texts of different types, styles, and genres, including academic, scientific, and technical
  topics, the content of digital texts; stylistic and genre features of fiction and non-fiction texts,
  considering the topic, main idea, problem, purpose, and target audience;
- apply various communication strategies in a situation of prepared and unprepared monological and dialogical communication, including public, achieving the set objectives; tactics of speech behavior, striving to influence the listener; observe the structure and norms

of the use of language units, taking into account their stylistic differentiation; various reading strategies depending on the tasks facing the reader; carry out information search, extract and transform the necessary information; comply with grammatical, spelling, punctuation and stylistic norms;

- analyse overtly and covertly expressed forms of speech behaviour and evaluation; the hidden meaning of the text and the meaning of artistic means introduced in the text; linguistic, structural and genre features of complex texts; linguistic, genre and stylistic features of texts of various genres and styles;
- evaluate information from the listened and read text, expressing their point of view; the content of a problem text, drawing conclusions and proposing solutions; information in terms of credibility, relevance, effectiveness of the use of language units and rhetorical devices, offering recommendations for improving the statement;
- create extended statements (dialogue and polylogue, including discussion), texts of different types, genres, and styles, including those of an influential nature; continuous and non-continuous texts taking into account the speech situation, including texts in digital format; texts of creative and academic nature, arguing their opinion; synthesize information obtained from various sources and present it in the form of a clearly argued coherent message.

#### 7.6.3.3. Expected learning outcomes of Kazakh Language and Literature (L2)

Upon completing upper secondary school, the student will:

- know grammatical, lexical, and syntactic concepts, direct and figurative meaning of words, synonymic, antonymic, and homonymic series of words, the content of works of fiction of various genres;
- understand the meaning of words and terms in special texts within the framework of educational and professional, socio-political, socio-cultural, and highly specialised topics;
- apply grammatical constructions of the Kazakh language, methods of literary interpretation, orthographic, stylistic and punctuation norms in oral and written statements; appropriately use forms of speech etiquette to influence the listener when creating a monologue/dialogue;
- analyse information in various graphic texts, genre and structural features and linguistic means, target audience of texts of scientific and journalistic styles;
- evaluate the main idea in the text (literary work) and the ways of its expression, the author's position, social problems raised in the work;
- create oral and written text, speak confidently and fluently in the form of "discussion-monologue", "discussion-dialogue", "discussion-polylogue", proving their opinion in various forms; systematically and logically express their civic position on the issue raised; state their point of view; write a brief article, press-sheet, thesis, abstract, interview, report, letter of address, blog, using appropriate language means according to the genre and stylistic features of publicistic and scientific styles; create a concise text, identifying the main information from the texts of popular scientific and publicistic styles with the use of media tools.

#### 7.6.3.4. Expected learning outcomes of *Russian Language and Literature (L2)*

Upon completing upper secondary school, the student will:

- know the lexical units of social, cultural, and educational spheres of communication, including grammatical forms (endings, suffixes, and sentence construction schemes);
- understand the basic and detailed information conveyed in an extensive message, discerning both its subtext and intended purpose; additionally, comprehend information from multiple continuous and discontinuous texts spanning various genres, forms, and styles, identify their respective themes, main ideas, purposes, and target audiences, along with the overt and covert forms of speech behavior and evaluation present; interpret the content of works of art or fragments, determining their underlying themes and main ideas;

- apply different types (strategies) of reading to extract and evaluate information, utilize digital media to reinforce arguments, captivate the audience's attention, and exert influence; employ technologies for creating and publishing creative works and utilize the information gathered in the production of oral and written communication products;
- analyse data presented in infographics, schemes, tables, graphs, diagrams as well as the stylistic features of texts across various genres and forms; examine the genre and compositional features, artistic and visual elements, and socio-historical context of artworks; evaluate the content of non-fiction texts, considering their intended purpose and target audience, genre, and language features, while discerning the author's position;
- evaluate the listened text\ oral statement based on the relevance and sufficiency of evidence and utilised techniques to captivate the audience's attention and align with the intended purpose and target audience, presenting factual and pertinent information; assess both the form and content of the text along with the author's standpoint and the issues addressed, the author's strategies for conveying ideas, and the actions of the characters,
- craft articulate monologues and dialogues addressing global issues, while presenting persuasive and credible arguments tailored to the target audience; develop oral statements through analyzing and synthesizing information extracted from non-sequential texts; demonstrate creative statements by proposing problem-solving ideas, considering specific social roles or situations; produce written content of diverse genres and styles, encompassing academic essays, a variety of literature compositions, and tailored texts for particular audiences; create non-sequential texts and concise or detailed statements.

#### 7.6.3.5. Expected learning outcomes of English Language

Upon completing upper secondary school, the student will:

- understand the speaker(s)' attitude or opinion in an unsupported extended speech, and grasp the author's position, opinion, or tone in extended texts discussing a variety of complex and abstract general and academic topics;
- understand the main points, specific information, and implied meaning within an unsupported extended speech, as well as complex and abstract main points, specific information and details in extended texts covering a broad range of familiar and unfamiliar general and curricular topics;
- apply both formal and informal language registers when discussing a variety of familiar and unfamiliar general and curricular topics, additionally select appropriate text structures for various general and educational topics, including complex and abstract subjects independently;
- analyse and identify inconsistencies in the argument during an open discussion on general and curricular topics;
- assess and provide feedback on the perspectives of others in diverse speech contexts; explain and substantiate student's own viewpoint and that of others; independently construct coherent arguments, bolstered by examples and justifications as needed, across various written genres addressing familiar general and curricular topics;
- present coherent arguments using various examples while creating written texts across diverse genres addressing familiar general and curricular topics.

## 7.7. Expected learning outcomes of *Mathematics and Computer Science* educational area *Students will:*

- know how to use the language of mathematics, laws, patterns, terms, and concepts to comprehend the surrounding reality and engage with it effectively;
- proficiently utilize various forms of representing mathematical information (formulas, diagrams, tables, graphs) to substantiate and make informed decisions in curricular and real-life contexts;

- understand how to apply, analyse, and transform information using information and communication technologies to create models of real objects and processes;
- use information and communication technologies (ICT) and mathematical language for both oral and written communication, including the substantiation of research findings within a specific context;
- systematise essential mathematical data and employs various mathematical procedures (such as measurement, calculation, and interpretation and construction of tables, charts, graphs, etc.) to facilitate decision-making in specific situations;
- be able to represent quantitative relations and spatial forms to solve practical problems across various contexts, determining unknown quantities from known quantities, and making classifications.

#### 7.7.1. Primary school

#### 7.7.1.1. Expected learning outcomes of *Mathematics*

- acquire a firm grasp of fundamental concepts in elementary mathematics, including the classification of numbers up to 1,000,000, arithmetic operations (such as addition, subtraction, multiplication, and division) involving both whole and fractional numbers (common fractions, mixed numbers, and decimal fractions); units of measurement for various quantities (such as length, mass, capacity/volume, time, area, speed, and cost), relationships between these units, and master the essential formulas in elementary mathematics (such as those for perimeter of square, and rectangle, as well as formulas for rectilinear motion and division with remainder); methods of problem solving; various types of plane figures and their elements; methods of collecting and processing statistical data; methods of mathematical modelling of the problem;
- comprehend the academic language of mathematics; methods of writing numbers in standard form; interconnection between the components of arithmetic operations; the relationship between quantities within a mathematical problem; principles of geometric constructions and measurements on a plane; the significance of graphical representation in presenting statistical data;
- apply mathematical knowledge to solve practical problems; algorithms for solving mathematical problems; mathematical terminology in appropriate contexts; computational operations on natural numbers; the properties of plane shapes in the resolution of geometric problems; mathematical models for problem-solving; microcalculators for computations involving multi-valued numbers; use a ruler, protractor, and compass for geometric constructions; the method of sorting possibilities for solving combinatorial problems; methods for solving logical problems, such as tables, diagrams, graphs, evidence-based reasoning, argumentation, hypotheses, and their justifications;
- analyse patterns and create sequences; interpret statistical data using various forms of representation; solve problems, equations, inequalities, and compound inequalities; consider the relative arrangement of geometric shapes; interpret the conditions presented in text problems; interpret data from graphs, tables, diagrams, and charts; provide proofs for statements;
- assess the accuracy of calculations, the validity of calculation methods, and the probability
  of events and phenomena within the context of the given task; evaluate the number of potential
  solutions;
- create algorithms for solving equations and mathematical problems, draw conclusions based on the processing and analysis of statistical data, provide logical reasoning by explaining causes and effects, and employ methods for solving construction problems.

- 7.7.1.2. Expected learning outcomes of Information and communication technologies
  - Upon completing primary school, the student will:
    - be aware of the definition of the concepts: 'information', 'object', 'file', 'folder', 'label', 'model', 'computer network', and 'Internet'; the purpose of operating system components; types of representation and units of measurement for information; the main parts of a computer; input and output devices; the purpose of application, service programs, and operating systems; safety rules when working on a computer;
    - understand the purpose of the main computer components, input and output devices, elements of the operating system interface; the impact of computer technology on human health; the importance of protecting information and devices from malicious programs; the necessity of providing information with references to the authors;
    - apply information and communication technology tools for collecting, storing, processing, and transmitting information; use application programs for working with various types of information and for creating models; utilize internet services to solve assigned tasks; apply computer operation guidelines;
    - analyse the capabilities of application programs; the consequences of violating ethical and legal norms online; information from various sources, selected in accordance with the stated requirements;
    - evaluate data presented in a graph, table, diagram; the compliance of the model with the specified criteria; the capabilities of using applied programs and network services to solve problems;
    - create models of objects and situations to solve practical problems by using information and communication technologies.

#### 7.7.2. Lower secondary school

#### 7.7.2.1. Expected learning outcomes of *Mathematics*

Upon the completion of lower secondary school, the student will:

- be aware of basic elementary mathematical concepts, statistics, and probability theory; number classification; computational operations on real numbers; basic formulas of elementary mathematics; the concept of a function, its properties, and its graph; apply methods for solving algebraic equations, inequalities, and their systems; know polygons categories; the properties and characteristics of the primary types of plane shapes; combinatorial rules; classical, statistical, and geometric approaches to determine the probability of an event; use methods for collecting and processing statistical data; understand the definition of the mathematical model of a problem;
- comprehend the academic language of mathematics; methods of writing numbers in standard form; interconnection between the components of arithmetic operations; understand the importance of using mathematical models to solve various applied problems; the meaning of mathematical terms such as axiom, theorem, corollary, inverse theorem; principles of geometric constructions and measurements on a plane; the meaning of numerical characteristics of a sample and a population; the role of graphical representation of statistical data in conducting quantitative and qualitative analysis;
- apply mathematical knowledge to solve practical problems; algorithms for solving mathematical problems; graphs and properties of functions to solve and study solutions of equations, inequalities, and their systems; mathematical terminology in appropriate contexts; computational operations on natural numbers; accurate and approximate calculations orally and in writing; the properties of plane figures in the resolution of geometric problems; mathematical models for problem-solving; graphing calculator, computer and software for solving mathematical problems; graphical representations for describing and analysing real dependencies; evidence-based reasoning, arguments, putting forward hypotheses and their justification when solving problems;

- analyse patterns and create mathematical models based on the analyses; interpret statistical data using various forms of representation; transformations performed on rational and irrational expressions; solutions of equations, inequalities, and their systems; relative arrangement of geometric figures; properties of functions; conditions of word problems for creating mathematical models; data and their results presented in the form of graphs, tables, diagrams, and various schemes; proofs of statements, inequalities, and theorems;
- evaluate the results of calculations in the context of a problem, including the likelihood by using the various techniques; probability of real events and phenomena in various situations; the number of possible variants of combinatorial methods; the placement of the function graph depending on the values of the specified parameters; approximate values of quantities and their representation in standard form; absolute and relative frequency of an event as the number of experiments increases; results of problem solving considering constraints related to the real properties of the processes and phenomena under consideration; probability using frequency and tasks from other subjects;
- create algorithms for solving equations and mathematical problems; draw conclusions based on the processing and analysis of statistical data; create proofs using axioms, theorems, and corollaries; methods for solving problems in construction using geometric transformations.

#### 7.7.2.2. Expected learning outcomes of Computer Science

Upon the completion of lower secondary school, the student will:

- be aware of fundamental principles of computers for system analysis; the purpose and main functions of system and application software; the basics of working with database management systems; life cycle models for software development; the basics of web programming and database theory for creating websites; programs for developing mobile applications; network protocols and how the Internet works; safety rules designed to ensure the data and computer system safety;
- understand the role of information processes in society, technical capabilities, and prospects for the use of information technologies in various domains of human activity; principles of organising relational databases; fundamental principles of network technology operations; principles of handling video and audio data; significant trends in the advancement of information technologies;
- analyse queries using multiple criteria and operators to search for information; tasks to identify appropriate methods and approaches for their resolution through modeling, creating algorithms, and programming; results of processing computer computations to match the specified task; ways of solving the task through various methods to determine the most efficient one;
- evaluate the results of their work based on the established objectives during project modeling and development (specificity, measurability, attainability, practicality, comparability); advantages and disadvantages of the using software, encompassing programming utilities;
- establish databases through forming and controlling components; websites aimed at resolving user tasks; multimedia products; small-scale applications to enhance own understanding of programming.

#### 7.7.3. Upper secondary school

#### 7.7.3.1. Expected learning outcomes of *Mathematics (7 hours)*

Upon completing upper secondary school, the student will:

- know the concepts of numbers and quantities, their properties; definitions of exponential and logarithmic functions, their properties and graphs; the concept of a composite function; the concept of an inverse function; definitions of inverse trigonometric functions; methods for solving trigonometric, exponential, and logarithmic equations and inequalities; methods for solving rational and irrational equations, inequalities; methods for solving rational inequalities; types of polyhedra, solids of revolution, and their developments; formulas for the area and volume of polyhedra and solids of revolution; axioms of solid geometry and their consequences; the concept of a vector in space; the equation of a sphere; equations of a line and a plane in space; the definition of the differential of a function; basic concepts of statistics; concepts of discrete and continuous random variables; the definition of the limit of a function at a point and at infinity; the definition of continuity of a function at a point and on a set; the definition of the derivative of a function; the equation of the tangent to the graph of a function; the definition of the antiderivative of a function, indefinite and definite integrals; formulas for finding the area of a plane figure and the volume of a body using the definite integral, curves of the second order; concepts of matrix and determinant, their properties, operations on matrices; classification of spatial figures, their properties and characteristics; formulas for calculating surface areas and volumes; equations of lines and planes in space; basics of combinatorics and probability theory; types of distributions of random variables; basic concepts of statistics and data analysis; concepts of power, logarithmic, and exponential functions, their properties and graphs; basic concepts of mathematical analysis; formulas for addition and multiplication of probabilities; Bernoulli's formula; types of distributions of discrete random variables;

- understand how to write a polynomial with one variable in a standard form; writing the complex numbers; the terms "population", "sampling", "variance", "standard deviation"; the geometric and physical meaning of the derivative; integration as an inverse process of differentiation; the system of axioms of stereometry and its consequences; methods of proof and solutions of geometric problems; computational operations on real and complex numbers; the importance of using mathematical models to solve various applied problems; the meaning of mathematical terms such as logarithm, degree with rational exponent, numerical series, differential equation; methods for solving systems of linear equations; connections between graphs of a function and its derivative; principles of geometric constructions and measurements in space; the significance of statistics, its regularities and laws; the task of testing a statistical hypothesis; the meaning of numerical characteristics of discrete and continuous random variables; conditions for the implementation of the Bernoulli scheme; the role of graphical representation of statistical data in quantitative and qualitative analysis; conditions for convergence of series; the nature of the coordinate method; the nature of formulas for the number of permutations, combinations, placements with repetitions.
- apply algorithms to solve trigonometric, exponential, and logarithmic equations and inequalities; algorithms for solving irrational equations, inequalities, systems of linear equations using Gaussian elimination, Cramer's rule, and inverse matrices; basic metric drawing techniques; characteristics and properties of parallel, intersecting, and perpendicular lines, parallel and perpendicular planes when solving problems; formulas for finding surface areas and volumes of geometric solids; rules for vector operations to solve geometric problems; conditions for vector collinearity and coplanarity; methods for finding critical and extreme points, increasing/decreasing intervals; the technique of differentiation and a table for finding the derivatives; the list of integrals and the Newton-Leibniz formula to determine definite integrals; the graphs and their characteristics to solve and examine the solutions of equations, inequalities, and systems; mathematical terminology in appropriate contexts; a list of integrals and Newton-Leibniz's formula to find the definite integral; statistical tables for solving problems in mathematical statistics; computational operations on real and complex numbers; exact and approximate methods of solving problems; properties and formulas for finding areas and volumes of three-dimensional figures when solving geometric problems; mathematical models for solving various applied problems; engineering and graphical calculators, software for solving mathematical problems; graphical representations for describing and analyzing real-world dependencies; deductive reasoning, argumentation, hypotheses, and their justi-

fications of problems; algorithms for solving irrational inequalities; the binomial theorem for approximate calculations; the Bernoulli's principles; methods for identifying asymptotes in the graph of the function; operations on matrices; scalar triple product of vectors; the second wonderful limit; L'Hôpital's rule; the Vieta's theorem for cubic polynomials; parametric differentiation; implicit differentiation; the trapezoid rule for numerical computation of the definite integral; improper integrals in simple cases; actions converging series; a necessary condition of convergence of the series; convergence tests for comparison, the sign of d'Alembert, Cauchy integral formula; the radius of convergence of power series; the expansion of functions in series Maclaurin and Taylor to calculate the definite integral; the equation of an ellipse, hyperbola, parabola;

- analyse patterns and create mathematical models based on the analyses; the mutual arrangement of lines, a straight line and a plane in a space, planes in space, planes and solids of revolution; rotation of solids about a plane; the difference in types of random variables and numerical characteristics of discrete random variables; properties of a function according to its graph; problems of geometric and physical content and their solution using a derivative and (or) integral; various methods for solving trigonometric, exponential and logarithmic equations and inequalities; methods for solving irrational equations; statistical data using various forms of their representation; transformations performed on algebraic expressions; conditions of tasks for plotting graphs, diagrams, tables, scans of spatial bodies, geometric shapes; solutions of equations, inequalities and their systems; combinations of spatial figures; the relative position of lines and planes in space given by equations; properties of functions; conditions of text problems for composing mathematical models; data presented in the form of graphs, tables, diagrams and various schemes; proofs of statements and theorems;
- evaluate the solution of trigonometric, exponential and logarithmic equations and inequalities; the solution of irrational equations and inequalities; the values of statistical data variation indicators; the results of calculations in the context of the problem, including the validity of the data obtained using various techniques; the probability of real events and phenomena in various situations; the results of hypothesis testing; distribution parameters; the arrangement of the graph of the function depending on the values of the specified parameters; approximate dimensions; results in problem-solving considering the limitations associated with the actual properties of the processes and phenomena; results of statistical studies utilizing variation indicators and measures of central tendency values;
- create algorithms for solving equations and mathematical problems; mathematical models of real phenomena and processes; draw conclusions based on the results of processing and analysis of statistical data; create proofs using axioms, theorems, and corollaries; methods for solving problems in construction using geometric transformations; models and graphs for data analysis.

#### 7.7.3.2. Expected learning outcomes of "Mathematics" (10 hours)

Upon completing upper secondary school, the student will:

- know the concepts of numbers and quantities, their properties; definitions of exponential and logarithmic functions, their properties and graphs; the concept of a composite function; the concept of an inverse function; definitions of inverse trigonometric functions; methods for solving trigonometric, exponential, and logarithmic equations and inequalities; methods for solving rational and irrational equations, inequalities; methods for solving rational inequalities; types of polyhedra, solids of revolution, and their developments; formulas for the area and volume of polyhedra and solids of revolution; axioms of solid geometry and their consequences; the concept of a vector in space; the equation of a sphere; equations of a line and a plane in space; the definition of the differential of a function; basic concepts of statistics; concepts of discrete and continuous random variables; the definition of the limit of a function at a point and at infinity; the definition of continuity of a function at a point and on a set; the definition of the derivative of a function; the equation of the tangent to the graph of a function; the definition of the antiderivative of a function, indefinite and definite integrals; formulas for finding the area of a plane figure and the volume of a body using a definite integral, curves of the second order; concepts of matrix and determinant, their properties, operations on matrices; classification of spatial figures, their properties and characteristics; formulas for calculating surface areas and volumes; equations of lines and planes in space; basics of combinatorics and probability theory; types of distributions of random variables; basic concepts of statistics and data analysis; concepts of power, logarithmic, and exponential functions, their properties and graphs; basic concepts of mathematical analysis; formulas for addition and multiplication of probabilities; Bernoulli's formula; types of distributions of discrete random variables; the generalized Vieta's theorem on the relationship between roots and coefficients; the definition of a sphere inscribed in a polyhedron and circumscribed around a polyhedron; improper integrals; continuous random variable, its probability density and distribution functions; Abel's theorem;

- understand how to write a polynomial with one variable in a standard form; writing the complex numbers; the terms "population", "sampling", "variance", "standard deviation"; the geometric and physical meaning of the derivative; integration as an inverse process of differentiation; the system of axioms of stereometry and its consequences; methods of proof and solutions of geometric problems; computational operations on real and complex numbers; the importance of using mathematical models to solve various applied problems; the meaning of mathematical terms such as logarithm, degree with rational exponent, numerical series, differential equation; methods for solving systems of linear equations; connections between graphs of a function and its derivative; principles of geometric constructions and measurements in space; the significance of statistics, its regularities and laws; the task of testing a statistical hypothesis; the meaning of numerical characteristics of discrete and continuous random variables; conditions for the implementation of the Bernoulli scheme; the role of graphical representation of statistical data in quantitative and qualitative analysis; conditions for convergence of series; the nature of the coordinate method; the nature of formulas of permutation, combination, repetitive placement;
- apply algorithms to solve trigonometric, exponential, and logarithmic equations and inequalities; algorithms for solving irrational equations, inequalities, systems of linear equations using Gaussian elimination, Cramer's rule, and inverse matrices; basic metric drawing techniques; characteristics and properties of parallel, intersecting, and perpendicular lines, parallel and perpendicular planes when solving problems; formulas for finding surface areas and volumes of geometric solids; rules for vector operations to solve geometric problems; conditions for vector collinearity and coplanarity; methods for finding critical and extreme points, increasing/decreasing intervals; the technique of differentiation and a table for finding the derivatives; a list of integrals and Newton-Leibniz's formula to find the definite integral; graphs and properties of functions for solving and investigating solutions to equations, inequalities, and systems; mathematical terminology in relevant contexts; a list of integrals and Newton-Leibniz's formula (the fundamental theorem of calculus) for finding definite integrals; statistical tables for solving problems in mathematical statistics; computational operations with real and complex numbers; exact and approximate methods of solving problems; properties and formulas for finding areas and volumes of three-dimensional figures when solving geometric problems; mathematical models for solving various applied problems; engineering and graphical calculators, software for solving mathematical problems; graphical representations for describing and analyzing real-world dependencies; deductive reasoning, argumentation, making hypotheses and justifying them when solving problems; algorithms for solving irrational inequalities; the binomial theorem for approximate calculations; the Bernoulli's principles; methods for identifying asymptotes in the graph of the function; operations
on matrices; scalar triple product of vectors; the second wonderful limit; L'Hôpital's rule; the Vieta's theorem for cubic polynomials; parametric differentiation; implicit differentiation; the trapezoid rule for numerical computation of the definite integral; improper integrals in simple cases; actions converging series; a necessary condition of convergence of the series; convergence tests for comparison, the sign of d'Alembert, Cauchy integral feature; the radius of convergence of power series; the expansion of functions in series Maclaurin and Taylor to calculate the definite integral; the equation of an ellipse, hyperbola, parabola;

- analyse patterns and create mathematical models based on the analyses; the mutual arrangement of lines, a straight line and a plane in a space, planes in space, planes and solids of revolution; rotation of solids about a plane; the difference in types of random variables and numerical characteristics of discrete random variables; properties of a function according to its graph; problems of geometric and physical content and their solution using a derivative and (or) integral; various methods for solving trigonometric, exponential and logarithmic equations and inequalities; methods for solving irrational equations; statistical data using various forms of their representation; transformations performed on algebraic expressions; conditions of tasks for plotting graphs, diagrams, tables, scans of spatial bodies, geometric shapes; solutions of equations, inequalities and their systems; combinations of spatial figures; the relative position of lines and planes in space given by equations; properties of functions; conditions of text problems for composing mathematical models; data presented in the form of graphs, tables, diagrams and various schemes; proofs of statements and theorems; solutions to problems related to a sphere inscribed in a polyhedron and circumscribed around a polyhedron; constructing a curve defined by parametric equations; solving equations and inequalities containing inverse trigonometric functions; sectioning polyhedra with a plane (cube, rectangular parallelepiped, pyramid);
- evaluate the solution of trigonometric, exponential and logarithmic equations and inequalities; the solution of irrational equations and inequalities; the values of statistical data variation indicators; the results of calculations in the context of the problem, including the validity of the data obtained using various techniques; the probability of real events and phenomena in various situations; the results of hypothesis testing; distribution parameters; the arrangement of the graph of the function depending on the values of the specified parameters; approximate dimensions; results in problem-solving considering the limitations associated with the actual properties of the processes and phenomena; results of statistical studies utilizing variation indicators and measures of central tendency values; approximate integration computed using the overestimate or underestimate trapezoidal rule; numerical characteristics of continuous random variables in simple cases; sum of a convergent numerical series;
- create algorithms for solving equations and mathematical problems; mathematical models of real phenomena and processes; draw conclusions based on the results of processing and analysis of statistical data; create proofs using axioms, theorems, and corollaries; methods for solving problems in construction using geometric transformations; models and graphs for data analysis.

#### 7.7.3.3. Expected learning outcomes of *Programming*

- be aware of the syntax of the Python programming language; data types in Python; distinctions among various data structures; the notion of lambda functions; class and instance identifiers; the significance of the concepts "polymorphism," "inheritance," "decomposition"; execution of commands from the PIL library Image module (load, create, size, save) for image manipulation; types of chatbots;
- comprehend the rules for organizing data input and output in Python, string output using split() and join() methods; allocation of functions and methods for processing lists; distinctions among various data structures; allocation of tuple and dictionary, custom functions in Python;

- apply escape sequences when outputting data; utilize nested loops when solving tasks in Python; sets of operations such as union, intersection, subtraction, and symmetric difference; slices for string conversion; apply list processing functions and methods; make use of the PyGame module;
- analyse the design and effectiveness of the designed program; the program based on the testing outcomes;
- evaluate the quality of the designed software product; the results of its endeavours according to the set goals of program development;
- design a program in the Python programming language using various data structures (sets, strings, lists, tuples, dictionaries) and functions (custom and lambda functions); games using the PyGame module; chatbots.

# 7.7.3.4. Expected learning outcomes of Computer Science (standard level)

Upon completing upper secondary school, the student will:

- know the operational principles of the central processor; use HTML tags to create web pages and components for mobile app builders; be familiar with the characteristics of mobile app development environments; know the data types of database fields;
- understand the differences between types of computer memory; be familiar with the characteristics of mobile app development environments; comprehend the principle of searching using an index; understand various types of relationships in a database;
- apply software for processing raster and vector images, sound, and video; use CSS, HTML tags in web page development; program code using conditional and iterative structures in the development of a mobile application;
- analyse website design considering web ergonomics features; create a prototype for a mobile application; understand various types of databases; relationships in a multi-table database;
- evaluate the quality of web page and other software product designs; assess the outcomes
  of own activities in accordance with the set goals in the databases' development, web pages,
  and mobile applications;
- design databases using inter-table relationships and normalization to the third normal form; data input forms; construct queries using query builders; mobile applications utilizing conditional and iterative structures; web pages.

## 7.7.3.5. Expected learning outcomes of Computer Science (advanced level)

- know the laws of Boolean algebra; architecture of RISC and CIS processors; programming paradigms; methods for protecting data and computer systems (physical risks, firewalls, information encryption, biometrics, and protection from computer viruses); privacy policy; methods for implementing a new system; advantages and disadvantages of using prototypes in the development of solutions; features of network/server operating system;
- understand the features of open and closed source software; the advantages and disadvantages
  of the methods for implementing a new system; the purpose and principle of Blockchain technologies; the principle of memory addressing; the concept of a virtual machine; the purpose
  of virtual and cache memory; the purpose of virtual and augmented reality;
- apply programming skills when developing a project; script language when creating a website; various algorithmic structures in the script language; query language to work with databases; laws of logic to simplify logical schemes; data flow diagrams (level 1 DFD) to represent input, processing, storage, and output in computing systems;
- analyse problems resulting from hacking computer systems; advantages and disadvantages of various life cycle models, high and low-level programming languages, compilers, and interpreters; advantages and limitations of a new system; assembly language programs;

- assess the risks of using cloud technologies, artificial intelligence; prospects for the development
  of network technologies; the quality of web page design and that of other software products;
- create a prototype for a new system; databases using inter-table relationships and SQL queries; logical schemas and expressions; program code using one-dimensional and two-dimensional arrays.
- **7.8.** Expected learning outcomes of *Science* educational area *The student will be able to:* 
  - use scientific notions, laws of development of the organic world; determine the cause-effect relationships of processes in living nature to get knowledge of the world and be aware of their place in it;
  - conduct experimental and research work to discover the nature of natural phenomena and processes, laws, and regularities, as well as their interpretation;
  - orient in media space and concepts of natural sciences; knows how to use them to expand their understanding of the scientific picture of the world;
  - recognize the interrelation of changes in the environment; the impact of human activity on ecosystems to make a constructive decision; and to justify the need for nature preservation;
  - project knowledge of natural sciences into real practice to interact with social reality, considering environmental and industrial factors and moral code.

#### 7.8.1. Primary school

#### 7.8.1.1. Expected learning outcomes of Introduction to Science

Upon completing primary school, the student will:

- know the fundamental scientific concepts about the Earth, nature and the universe; the life cycle of humans, plants, and animals; features of the structure and location of the main organs of humans, plants and animals, and their functions; classification of plants and animals; the basics of photosynthesis; composition and properties of the most common substances on Earth; properties of various bodies and some areas their applications; the main types of minerals and their significance, the main mineral deposits in the Republic of Kazakhstan; Solar system planets and their features; certain types of energy; some physical forces and their causes; certain properties of light and sound;
- understand the importance of caring for the environment and preserving biodiversity on Earth; the need for personal hygiene; protective functions of the human body; the importance of natural components for living organisms; features of organisms as means of adaptation to the environment; the need for rational use of natural resources; simple differences between plants and animals;
- apply separate research methods to study natural objects, processes, and phenomena; standard and non-standard units of measurement of natural objects, phenomena, and processes; simple tools for measuring certain characteristics of natural objects, processes, and phenomena; appropriate scientific terminology to explain the research; knowledge of simple signs of plant and animal species of their locality to compile their classification;
- analyse the cause-and-effect relationships between the components of nature; properties of materials to determine the possibilities of their application; flora and fauna of a certain territory; similarities and distinctive features of different habitats; data from their own research and materials from various sources; interpret and distinguish scientific data presented in various forms; draw appropriate conclusions of the study; present the results research in various forms; justify the choice of method (observation or experiment) for conducting research;

- evaluate the factors of development and the state of natural objects, phenomena, and processes; human activity and the impact of scientific and technological progress on environment; consistency of their own research findings with the forecast; the course of research;
- create coherent, logical, and justified statements in accordance with the research question; information materials in the form of drawings, charts, graphs, diagrams, and tables; simulation and graphic models of objects, phenomena, and processes of the surrounding world; statements reflecting their own ideas on environmental issues.

#### 7.8.2. Lower secondary school

7.8.2.1. Expected learning outcomes of Science

Upon completing lower secondary school, the student will:

- have an idea of the modern scientific picture of the world and the methods used in the natural sciences;
- understand the diversity and complexity of the surrounding world and the relationship of natural phenomena and processes; the causes of natural phenomena and processes occurring in living and inanimate nature; the possibility of systematizing the diversity of objects and processes in nature; the importance of scientific knowledge for various human activities; the relationship of changes in the environment and the impact of human activities on ecosystems for making constructive solutions;
- apply scientific knowledge in everyday life to ensure the safety of life, explain the phenomena of the surrounding world, for the competent use of modern technologies and for the protection of health and the environment;
- conduct simple experiments and observations that reveal the nature of processes in living and inanimate nature, the interrelation of ecosystem components and the impact of human activity on the surrounding nature;
- analyse, interpret, and distinguish the received data presented in various forms; plan and conduct observation or research under the guidance of a teacher; formulate a problem, hypothesis, set tasks, choose suitable methods for their solution, formulate conclusions based on the intended research aim; publicly present the findings;
- evaluate the methods for conducting experiments, research and justify your choice; predictions about the course of a process or phenomenon;
- create appropriate research conclusions and present the research findings in various forms; verbal and graphical models to explain the structure of living systems, phenomena, and processes of wildlife.

#### 7.8.2.2. Expected learning outcomes of *Biology*

Upon the completion of lower secondary school, the student will be able to:

- know the basics of the conceptual apparatus and scientific biological language; the main functional, morphological, and physiological features of living systems; the main groups of organisms in the system of the organic world; the basic laws of the organisation and functioning of objects, phenomena, and processes of wildlife; the basic principles of the evolutionary development of the organic world in its unity with inanimate nature;
- understand the role of biology in the formation of the modern scientific picture of the world; the role of the value attitude to wildlife, to one's own organism and the environment; the terminology, concepts, theories, laws, and patterns for the scientific explanation of the observed biological objects, phenomena, and processes;
- apply a scientific approach when conducting biological research; observe the stages of scientific research and use various research methods to study living objects, biological phenomena, and processes (observation, description, conducting simple biological experiments, using analog and digital devices and tools);

- analyse, interpret, and distinguish scientific data presented in various forms; write appropriate research conclusions; present research findings in various forms; plan and conduct research or project work in the field of biology under the guidance of a teacher; formulate a problem, hypothesis, set tasks, choose suitable methods for their solution, and formulate conclusions based on the intended research aim; publicly present the findings;
- evaluate the methods for conducting experiments, research methods and justify your choice;
   predictions about the course of a process or phenomenon; ways to increase the reliability,
   credibility and validity of scientific data and the reliability of their explanations;
- create and combine explanations of biological concepts and ideas; provide cross-curricular links between biology and other subjects; verbal and graphical models to explain the structure of living systems, phenomena, and processes of wildlife; educational tasks and questions of biological content, identifying cause-and-effect relationships, making calculations, and drawing conclusions based on the obtained findings.

#### 7.8.2.3. Expected learning outcomes of *Physics*

Upon the completion of lower secondary school, the student will:

- know the basic concepts of physics; basic and derived physical quantities and their units of measurement; basic research methods for physical phenomena, methods for collecting and analyzing physical experiment data; symbols of electrical circuit elements; methods for determining the average value of physical quantities; methods for determining the error of physical measurements; safety rules during a physical experiment;
- understand the academic language of physics; writing of the values of physical quantities in a standard form; how to express the interdependence of physical quantities in the form of mathematical formulas; basic physical laws using physical terms;
- apply knowledge of the physical laws to solve practical problems, explain physical phenomena and the operational principle of measuring instruments; graphs and properties of functions to determine the interdependence of physical quantities; basic characteristics of physical bodies to describe physical phenomena; measuring instruments and equipment for conducting an experiment;
- analyse the patterns of physical processes; the interdependence of physical quantities; the conditions of word problems to determine the methods for finding the desired quantities; data from observations of natural phenomena and demonstration experiments; measurement results of physical quantities presented in the form of graphs, tables, diagrams, and various charts; the causes of errors in the experiment results;
- evaluate the results of calculations in the context of a problem, including the likelihood; the results of measuring physical quantities during the experiment; approximate values of quantities and their recording in standard form, taking into account significant figures; disadvantages and advantages of using various research methods and different measuring instruments;
- create a plan for a physical experiment; conclusions following the analysis of research findings; ways to solve problems using mathematical transformations; ways to improve the experiment results; ways to reduce the error of measuring instruments.

#### 7.8.2.4. Expected learning outcomes of Chemistry

Upon the completion of lower secondary school, the student will:

- know the structure, properties and transformation of substances at the atomic/molecular level and their relationship; the main types and signs of chemical reactions; the main classes of inorganic compounds and their properties; the composition of solutions, electrolytic dissociation; patterns of chemical reactions, chemical bonding, periodic law and periodic system of chemical elements; the most important metals and nonmetals; features of determining inorganic compounds and the most important classes of organic compounds; the most important chemical productions of Kazakhstan; environmental problems and ways to solve them;

- understand the basic laws and patterns; chemical phenomena and processes to predict the results of chemical processes that have not been studied yet; the patterns of chemical reactions over time, the dependence of these patterns on external conditions; the difference between metals and nonmetals; the properties of ionic, chemical and metallic types of bonds; trends in changing the properties of elements in periods and in groups; properties and applications of dilute acids; the difference between classes of organic and inorganic substances; basic principles of industrial production of the most important chemical compounds and their chemical principles;
- apply skills to correctly write formulas of chemical compounds and reaction equations; knowledge of basic stoichiometric laws for solving various types of problems; knowledge and skills for conducting research, choosing appropriate experimental procedures, equipment, and materials with due regard to accuracy and safety; scientific methods and approaches to planning experiments;
- analyse how the properties of substances depend on their qualitative and quantitative composition, as well as their structure; cause-and-effect relationships between the properties and applications of substances; reactions occurring on electrodes in terms of oxidative and reducing processes; advantages of using alloys; data obtained as a result of a science experiment; information presented in graphical and tabular form; the importance of micro- and macroelements for the proper functioning of the human body; features of chemical production in Kazakhstan;
- assess the importance of various elements in the modern world; factors of chemical reactions; mechanisms of chemical reactions, reversibility of chemical reactions, chemical equilibrium for assessing situations and making decisions; the influence of the chemical industry on ecosystem disturbance and deterioration of human health; the importance of the proper use of minerals and natural sources;
- create works on the objects of chemistry study; scientific models and proofs for hypotheses, arguments and explanations; environmentally-friendly processes; models of processes occurring in living and inanimate nature, for systematization, classification and identification of empirical rules, principles and patterns; an experiment and research plan; tables, graphs, messages, reports and presentations on collected and analysed data; scientific models and evidence for hypotheses, arguments and explanations.

#### 7.8.2.4. Expected learning outcomes of Geography

Upon the completion of lower secondary school, the student will:

- know geographical concepts; the role of geography in modern life; stages of formation and development of geographical science; methods of geographical research; definitions of geographical object, process, phenomena and their features, location and distribution; geographical information systems and their scope of application; composition, properties, structure, patterns and main stages of development of geographical envelope and environment; types, classification and elements of geographical maps; features and physical and geographical position of continents and oceans, territories, countries and nature of the Republic of Kazakhstan; territorial and sectoral structure of the world economy, the economies of countries and regions of the Republic of Kazakhstan and their development; goals and types of international economic relations; types, structure and problems of settlements; global and regional demographic problems, features of demographic policy in certain regions, countries and the Republic of Kazakhstan and other countries; world economy models; types of international relations; types of environmental problems, features of sustainable development and types of environmental protection measures;
- understand global and local environmental problems; human impact on the environment; the importance of preserving biodiversity on Earth, the role of the Red Book in preserving

biodiversity in the Republic of Kazakhstan; natural and socio-economic patterns, processes and phenomena; features of modern geographical space and territorial complexes; the relationship of geographical objects, processes and phenomena; causes, stages, consequences and significance of processes in the geographical envelope and environment; geopolitical processes, their role and sphere of influence;

- apply basic geographical concepts and terms to describe geographical objects, processes and phenomena; sources of geographical information necessary in everyday life and the educational process (cartographic, statistical and textual materials, video recordings and photographs, computer databases); research methods; methods for determining quantitative and qualitative characteristics of the geographical envelope and components of the geographical environment; cartographic method and orientation skills; ICT skills in creating geographical databases, and visualizing geographical data, and the development of cartographies and maps;
- analyse data obtained as a result of practical work and observations; information presented in graphical and tabular form; natural phenomena and processes on geographical maps; causeand-effect relationships between processes and phenomena occurring in the geographical envelope and environment; factors influencing the location of geographical objects; distribution of natural resources in the world and Kazakhstan and their importance; trends and models of the development of the world economy; place, geographical and geopolitical position of the Republic of Kazakhstan in the world economy; features and factors of political, economic and social development of the Republic of Kazakhstan and their role and place in the world; developmental trajectory of the Republic of Kazakhstan;
- evaluate the contribution of scientists to the formation and development of geographical science; the impact of anthropogenic factors on global and local ecosystems; natural resource potential of the world, individual regions, countries and the Republic of Kazakhstan; economic and environmental potential of natural resources; the process of urbanization throughout the world and in the Republic of Kazakhstan; economic use of natural resources of the world and the Republic of Kazakhstan; the importance of infrastructure; the place of the Republic of Kazakhstan in the world economy; social, economic, political and geographical position of the countries of the world and the Republic of Kazakhstan;
- create geographical information in various forms (in the form of a map, cartography, tables, graphics, infographics, geographical description); graphically present the results of the study; propose ways to improve and effectively use anthropogenic landscapes and reduce the negative impact of the economy on the environment; solving environmental management issues in the Republic of Kazakhstan, and the measures to prevent natural disasters; predict the development of the economy of the Republic of Kazakhstan, proposing its developmental trajectories; offer solutions to various problems of the country and make proposals for the sustainable development of the economy of Kazakhstan; basic principles of lifestyle aimed at environmental protection.

#### 7.8.3. Upper secondary school

#### 7.8.3.1. Expected learning outcomes of *Biology (standard level)*

Upon completing upper secondary school, the student will:

- know biological principles, facts and terms related to the diversity of living organisms, with the structure and functioning of living systems; key biological processes (nutrition, transport of substances, respiration, excretion, movement, coordination, regulation, growth, development and cell cycle, evolutionary development, features of heredity and variability of organisms); the influence of environmental factors on ecosystems; scientific approach in conducting biological research; application of interdisciplinary integration in practice;

- understand the diversity of organisms and their adaptation to different environmental conditions; the fundamental principles underlying molecular biology, cell biology, microbiology and biotechnology; the interaction between the structure of cells/molecules and their functions; biological research methods; factors influencing the growth and development of organisms; the processes involved in photosynthesis and respiration; cell cycle characteristics; mechanisms of growth and development; transport of substances within cells and the emergence of chromosomal and gene mutations; the relationship between hereditary variability and evolution; the effects of human activity on the environment;
- apply the scientific knowledge to explain phenomena and comprehend data, make conclusions and conduct various types of experiments, both under controlled and in the field conditions, using laboratories and other equipment and presenting data in visual formats (graphs, tables, etc.); transform and process information; apply statistical methods in data analysis; use methods and approaches to solve problems related to molecular biology and genetics; comply with safety rules when handling reagents, biological samples, medicines, toxic substances and laboratory equipment; solve biology-related problems;
- analyse scientific data, characteristics of biological phenomena and data on the diversity of living organisms, and on the functioning and structure of living systems; key mechanisms (nutrition, transport of substances, respiration, excretion, movement, coordination, regulation, growth and development, cell cycle, evolutionary development, heredity and variability); relationships and adaptation of organisms in ecosystems; factors that can disrupt the normal cell cycle; complex inheritance and the role of genetic variations in phenotypic diversity; evidence of evolution (fossils, comparative anatomy, molecular genetics and biogeography); experimental data; ethical issues related to biotechnological research;
- evaluate experimental methods, research techniques to substantiate conclusions; complex scientific arguments, theories and achievements in biology and related sciences; validity and re-liability of scientific research and experimental methods; reliability and validity of scientific information presented in various forms; accuracy and reliability of data and practical aspects of the studied content, experiments and collected data; ethical considerations in manipulation with cells in areas such as IVF, stem cell exploration and genetic engineering; evidence supporting various hypotheses; the impact of human activities on the environment in various ecosystems;
- create oral, written and visual explanations of biological information, synthesizing scientific content related to the diversity of living organisms, the structure and functioning of living systems; models to explain such processes as nutrition, transport of substances, respiration, excretion, movement, coordination, regulation, growth and development, cell cycle, evolutionary development, heredity and variability; integrate biological knowledge with other academic disciplines; formulate and test hypotheses and experimental projects in the field of biological research; create diagrams and models representing biological objects and processes; present original ideas, suggesting ways to improve research in specific contexts; systematize and present processed data and information using tables, graphs, messages, reports and presentations; suggest potential solutions to the studied environmental problems.

#### 7.8.3.2. Expected learning outcomes of Biology (advanced level)

Upon completing upper secondary school, the student will:

- know biological concepts, facts, and terminology about the diversity of living organisms, about the functioning and morphology of living systems; the main mechanisms of nutrition, transport of substances, respiration, excretion, movement, coordination and regulation, growth and development, cell cycle, evolutionary development, heredity and variability; environmental factors that affect ecosystems; principles of scientific approach in conducting biological research; applied integrated sciences;

- understand the diversity of living organisms and their adaptation to different environmental conditions; principles of molecular biology, cell biology, microbiology and biotechnology; the relationship between the structure and function of cells and biomolecules; the main methods used in ecology, microbiology and biotechnology; factors affecting growth and development (genetics, environmental conditions and hormonal regulation processes occurring during photosynthesis, respiration); features of the cell cycle, mechanisms of growth and development, transport of substances, the occurrence of chromosomal and gene mutations; the relationship between hereditary variability and evolution; patterns of inheritance; mechanism of evolutionary processes; consequences of anthropogenic impact on the environment;
- apply knowledge for scientific explanation of phenomena and interpretation of data to make conclusions; knowledge about the diversity of living organisms, the functioning and morphology of living systems, the basic mechanisms of nutrition, transport of substances, respiration, excretion, movement, coordination and regulation, growth and development, cell cycle, evolutionary development, heredity and variability; conduct controlled practical, field, laboratory, experimental work; present data in graphical form, visualize experimental data; apply schemes and methods for solving problems of molecular biology and genetics; use statistical methods to analyse ecosystems, inheritance of traits and modification variability; use scientific methods to develop, conduct, observe, record and analyse experimental results, observing rules for the safe handling of reagents, biological objects, medication, toxic substances, and laboratory equipment; observe the stages of scientific research; solve biological problems;
- analyse and interpret scientific data presented in various forms; features of biological phenomena; data on the diversity of living organisms, on the functioning and morphology of living systems; basic mechanisms of nutrition, transport of substances, respiration, excretion, movement, coordination and regulation, growth and development, cell cycle, evolutionary development, heredity and variability; interrelation and adaptation of various organisms in ecosystems; factors that can disrupt the normal cell cycle and lead to uncontrolled cell division (mutations and oncogenes); complex patterns of inheritance and the role of genetic variations in phenotypic diversity; evidence of evolution (fossils, comparative anatomy, molecular genetics and biogeography), and understand how this evidence confirms the theory of evolution; experimental data and conclusions based on molecular, cellular, and microbiological principles; biological data, hypotheses, and experimental results; ethical issues of biotechnological research; complex biological concepts, theories, and experimental data;
- evaluate methods of conducting experiments, research and justify their choice; complex scientific arguments, theories and/or experimental developments in the field of biology and related sciences; validity and reliability of scientific research and experimental methods; reliability and relevance of scientific information in scientific articles, advertising and mass media; the importance of repeated tests; accuracy, reliability and validity of scientific data; practical aspects of the studied content, experiment and collected data; ethical considerations in manipulation with cells in areas such as IVF, stem cell exploration and genetic engineering; alternative explanations of evolutionary phenomena, the strength of evidence supporting various hypotheses, the nature of scientific debates and contradictions in the field of evolutionary biology; environmental impact of human activities on various ecosystems;
- create models of scientific explanation of biological content, information from various sources to obtain a comprehensive understanding of living organisms and their diversity; group and organise scientific content about the diversity of living organisms, the functioning and structure of living systems; explanatory models about the mechanisms of nutrition, transport of substances, respiration, excretion, movement, coordination, regulation, growth and development, cell cycle, evolutionary development, heredity and variability; integrate biological knowledge with other academic disciplines; integrate and generate hypotheses and experimental projects

to test them within biological research; create schemes and models of biological objects and processes; present original ideas and proposals for improving research in specific contexts; synthesize collected and analysed data, information to be presented in the form of tables, graphs, messages, reports and presentations; develop possible solutions to environmental problems.

#### 7.8.3.3. Expected learning outcomes of *Physics (standard level)*

Upon completing upper secondary school, the student will:

- know basic and derived physical quantities and their units of measurement; basic methods of studying physical phenomena; methods of collecting and analyzing physical experiment data; basic concepts and formulas of mechanics (kinematics (liquids), dynamics, conservation laws, vibrations and waves), thermal physics (molecular physics and thermodynamics), electromagnetism (alternating current, magnetic field, electromagnetic oscillations, electromagnetic waves), optics (geometric and wave), atomic physics (quantum physics, nuclear physics, charged particles)); methods for determining the average value of a physical quantity; methods for determining the error of physical measurements; safety rules for conducting a physical experiment;
- understand the basic laws, principles and postulates of mechanics (kinematics, dynamics, vibrations and waves, conservation laws), molecular physics and thermodynamics; electromagnetism (alternating electric current, magnetic field), optics (geometric and wave), quantum physics; processes, phenomena and laws, determining the relationship between nature and matter on a scientific basis; the relationship between scientific disciplines and the complex nature of the scientific method; the difference between accuracy and precision; the role and place of physics in shaping the modern scientific picture of the world and in solving practical problems;
- apply fundamental physical concepts, patterns, laws and knowledge to solve practical problems; physical terminology in appropriate contexts; formulas for calculating physical quantities; basic methods of scientific cognition in physics (observation, description, measurement, experiment); methods of analyzing measurement results and experiments, and determining the relationship between physical quantities; scientific models simulating physical processes and phenomena; graphical representations for describing and analyzing real dependencies between physical quantities;
- analyse and interpret scientific data presented in various forms; graphs showing the relationship between physical processes and that between variables; cause-and-effect relationships between human production activity and the state of the environment;
- evaluate the possibilities and limitations of modern science; the results of research and experiments to establish and verify facts, principles, phenomena, and relationships between physical quantities and/or to independently search for answers to questions; results and conclusions in oral/written/ICT form that demonstrate critical thinking; reliability and validity of scientific data; the relationship of physics with other disciplines;
- create a plan for conducting a physical experiment; conclusions based on the analysis of research findings; methods for solving problems using mathematical transformations; ways to improve the results of the experiment; ways to reduce the error of measuring instruments; forms of visualizing information in the form of tables, graphs, reports, reports and presentations; physical ideas, concepts that are used to explain physical processes, properties of bodies, technical devices, etc.

## 7.8.3.4. Expected learning outcomes of *Physics (advanced level)*

Upon completing upper secondary school, the student will:

know basic and derived physical quantities and their units of measurement; basic methods
of studying physical phenomena; methods of collecting and analyzing physical experiment
data; basic concepts and formulas of mechanics (kinematics (liquids), dynamics, conservation

laws, vibrations and waves), thermal physics (molecular physics and thermodynamics), electromagnetism (alternating current, magnetic field, electromagnetic oscillations, electromagnetic waves), optics (geometric and wave), atomic physics (quantum physics, nuclear physics, charged particles)); methods for determining the average value of a physical quantity; methods for determining the error of physical measurements; safety rules for conducting a physical experiment;

- understand the physical language; basic laws, principles and postulates of mechanics (kinematics, dynamics, vibrations and waves, conservation laws), molecular physics and thermodynamics; electromagnetism (alternating electric current, magnetic field), optics (geometric and wave), quantum physics; operational principles and characteristics of devices and tools, the application of scientific discoveries; processes, phenomena and laws, determining the relationship between nature and matter on a scientific basis; the relationship between scientific disciplines and the complex nature of the scientific method; the difference between accuracy and precision; the role and place of physics in shaping the modern scientific picture of the world and in solving practical problems;
- apply fundamental physical concepts, patterns, laws and knowledge to solve practical problems; physical terminology in appropriate contexts; formulas for calculating physical quantities; basic SI units for checking the homogeneity of physical equations; basic methods of scientific cognition in physics (observation, description, measurement, experiment); methods of analyzing measurement results and experiments, and determining the relationship between physical quantities; scientific models simulating physical processes and phenomena; graphical representations for describing and analyzing real dependencies between physical quantities;
- analyse and interpret scientific data presented in various forms; the relationships in the form
  of power functions; graphs showing the relationship between physical processes and that between variables; cause-and-effect relationships between human production activity and the state
  of the environment;
- evaluate the possibilities and limitations of modern science; the results of research and experiments to establish and verify facts, principles, phenomena, and relationships between physical quantities and/or to independently search for answers to questions; results and conclusions in oral/written/ICT form that demonstrate critical thinking; reliability and validity of scientific data; the relationship of physics with other disciplines;
- create a plan for conducting a physical experiment; conclusions based on the analysis of research findings; methods for solving problems using mathematical transformations; ways to improve the results of the experiment; ways to reduce the error of measuring instruments; forms of visualizing information in the form of tables, graphs, reports, reports and presentations; physical ideas, concepts that are used to explain physical processes, properties of bodies, technical devices, etc.

#### 7.8.3.5. Expected learning outcomes of Chemistry (standard level)

- know the geometric isomerism of organic compounds; basic ideas and concepts of thermodynamics; scientific principles of industrial synthesis of ammonia; basic principles of green chemistry;
- understand the principle of minimum energy, the Pauli principle, the Hund rule for filling electronic orbitals; environmental aspects of chemistry: the role of chemistry in ecology, environmental pollution problems and methods of their prevention;
- apply research skills by selecting appropriate experimental procedures, equipment and materials and making appropriate calculations; experimental change in the enthalpy of the reaction and calculate it based on reference data; calculate the yield and purity of the product in organic reactions;

- analyse, systematise, interpret, and present experimental research data; analyse the impact
  of acquiring and utilizing plastics on the environment; environmental problems associated with
  the influence of halogenoalkanes; trends in changes in melting points, atomic radii, primary
  ionization energy, electronegativity;
- evaluate the advantages and disadvantages of using chlorine in water purification; the impact
  of industrial production on the environment; advantages and disadvantages of using synthetic
  polymers; solutions to global challenges;
- create scientific papers to solve problems considering economic, social, environmental, and ethical factors.

#### 7.8.3.6. Expected learning outcomes of Chemistry (advanced level)

Upon completing upper secondary school, the student will:

- know optical isomerism and its effect on light of linear polarization; Bronsted-Lowry theory of acids and bases; basic ideas and concepts of thermodynamics; mechanism of heterogeneous catalysis; scientific principles of the chemical industry of ammonia and sulfuric acid; Friedel–Crafts acylation method and its importance for synthesizing the problem of producing synthetic medications; basic principles of green chemistry;
- understand the basic principles of organic synthesis reaction mechanisms; catalytic and thermal cracking processes with generation of free radicals; qualitative characteristics of acidic and basic buffer solutions in equilibrium conditions; the importance of analytical methods in modern chemistry and the principles of gas-liquid chromatography, mass spectrometry, infrared spectroscopy, NMR spectroscopy; the nature of production and operation hydrogen-oxygen fuel cells; ecological aspects of chemistry: the role of chemistry in ecology, problems of environmental pollution and methods of their prevention;
- apply indicators to determine the equivalence point and select the appropriate indicator for titration; research skills by selecting appropriate experimental procedures, equipment and materials and making appropriate calculations; determine the structure of the polypeptide according to the hydrolysis data; use electrochemical potential to create an electrochemical series of metals; calculate the yield and purity of the product in organic reactions;
- analyse, systematize, interpret, and present experimental research data; analyse the genetic basis
  of disease with altered base sequence causing changes in the structure and function of proteins;
  trends in changes in melting points, atomic radii, primary ionization energy, electronegativity;
  problems of organic synthesis, using general knowledge of organic chemistry obtained during
  the course;
- evaluate the advantages and disadvantages of using chlorine in water purification; the impact
  of industrial production on the environment; advantages and disadvantages of using synthetic
  polymers; the significance of modern methods for determining the structure in the production
  of medicines;
- create scientific papers to solve problems considering economic, social, environmental, and ethical factors.

#### 7.8.3.6. Expected learning outcomes of Geography

Upon completing upper secondary school, the student will:

- know the types of relief, endogenous and exogenous factors; modern research of meteorology; climatic conditions and features of the Republic of Kazakhstan; the concept of water resources and ways of their legal protection; types, sources and parameters of pollution of surface and groundwater; types of international tourism and the main factors and conditions of its development; the main centers and directions of tourism development in the Republic of Kazakhstan; legislation in the field of tourism of the Republic of Kazakhstan; population changes, types of international migration, migration process in the Republic of Kazakhstan; the concept of globalization and global challenges;

- understand endogenous and exogenous processes that change the relief of a specific geographical area; the influence of anthropogenic factors; the features of the seasons in a specific geographical area; the use of meteorological instruments; the features and use of water resources; the advantages and disadvantages of tourism and the impact of tourism development on the environment and the local population; the system of national currencies, international reserve currencies;
- use meteorological instruments; formulas for calculating various indicators; statistical materials and official Internet resources; geographical maps, graphs, and tables; computer software for the development of maps, topological maps, and graphic materials;
- analyse the impact of endogenous and exogenous processes on the formation of relief, the impact of relief on human life and economy; climatic conditions and features of the Republic of Kazakhstan; the impact of climate on human health; the impact, causes and consequences of favorable and unfavorable meteorological phenomena on the economic activity; the issue of access to drinking water in the country and the world; the consequences of water pollution; economic efficiency of using water resources; the issues and prospects of developing international and Kazakhstani tourism; business opportunities for the regional development of tourism; features of modern population transfer; positive and negative effects of migration;
- directions of international migration and measures to regulate labor migration; modern process
  of urbanization; mechanisms of international currency and credit relations; investment operations and investment climate in countries and regions; the activity of international economic
  organisations in solving global economic challenges; influence of geopolitical ties on modern
  economic relations; nature, causes and consequences of global challenges affecting the Republic
  of Kazakhstan;
- assess the anthropogenic impact leading to relief change; climatic parameters of a region; the impact of human activity on changes in rivers and groundwater; the attitude of the local population to foreign tourists; the tourism potential of the country; the quantitative and qualitative composition of the world's workforce;
- create a longitudinal and transverse profile of a river; a business plan for the development
  of tourist sites; an electronic map with international tourism centers and a route map to appeal
  to foreign tourists in the Republic of Kazakhstan; propose ways to solve global challenges,
  eliminate the consequences of water source pollution and suggest methods for their efficient
  utilization.

# **7.9.** Expected learning outcomes of *Human and Society* educational area *The student will be able to:*

- use the basic concepts and laws of the development of society, data on the nature of historical processes and historical facts to interpret current social events and phenomena;
- select the necessary information and use it to assess a specific social situation, to reveal the nature of the problem and create a reasonable conclusion;
- analyse and critically assess the situations of everyday societal situations to justify one's position, evaluating them against moral norms;
- navigate in current social events, show "patriotism in action", and express an active civic position.

#### 7.9.1. Primary school

#### 7.9.1.1. Expected learning outcomes of World Understanding

Upon completing primary school, the student will:

 know the kinship relations between family members; the values of one's dynasty; the simplest types of commodity-money relations; features of planning one's own expenses; the origin of consumer goods; the importance of school in human life; rules and norms of self-government in society; the importance of observing the daily routine; features of nomadic and sedentary lifestyle; first aid in various situations;

- understand the importance of the connection between cities and villages; the importance of following a dietary regime; the importance of adhering to the rules for using household appliances and safety guidelines in natural environments; the importance of serving society; the importance of national and state holidays; the influence of weather on human life and economy; the importance of historical and cultural monuments and their preservation;
- apply an understanding of intentions, motives, and desires of others in solving practical problems; differentiate settlements based on specific characteristics; identify useful and harmful food products using various sources; determine the direction of the horizon by astronomical signs and use globes and maps; characterize the lifestyle of the Huns through the visual materials; provide first aid in various situations;
- analyse their contribution and the contribution of their families to the development of society; compare the countries of the world using various sources; analyse the importance of the idea of a safe and healthy lifestyle; the rights and freedoms of a citizen of the Republic of Kazakh-stan; global climate change; natural conditions (relief, climate, flora and fauna, water bodies); demonstrate the importance of friendship between people based on their personal experience; analyse the achievements of the country in the 20th-21st centuries (culture, science, education, economy), evaluate the role of those who fought for the liberation of the Kazakh people based on historical examples;
- evaluate the ways of independent decision-making in various life situations; the importance
  of the Constitution in the life of society; compare the customs and traditions of the Kazakh people
  and other nationalities of the country; evaluate the ideas of reducing human dependence on natural
  conditions; compare the most attractive tourist sites of the Republic of Kazakhstan; evaluate famous
  historical monuments and relics of antiquity (Wusun, Kangly, times of the Huns);
- create a family tree of their dynasty; plan and optimize their expenses; describe geographical places and landmarks in various settlements; illustrate terrain outlines; provide graphical instructions for using household appliances; draw terrain outlines using symbolic representation on a scale; use ancient written symbols; create a code of behavior for adverse weather and climatic conditions; describe the structure of the dynasty's genealogical tree; present their own rules of self-government.

#### 7.9.2. Lower secondary school

#### 7.9.2.1. Expected learning outcomes of History of Kazakhstan

- Upon the completion of lower secondary school, the student will:
  - know the basic concepts of historical science; periodization of national history; types of historical sources; the main events, phenomena, and processes of the history of Kazakhstan from antiquity to the present day; historical figures and those who played an important role in national history; the most important achievements of national culture in the process of historical development;
  - understand the nature of the main events, phenomena and processes that characterize the integrity and continuity of the development of national and world history throughout all periods; the features of the socio-political, economic and socio-cultural development of the country; features of the historical path of development of the Republic of Kazakhstan, its role and place in world history; the role and place of prominent figures in national history; features of universal and national values in the period of globalization; the basis of systematization and organisation of historical events and processes within a certain time block; historical data characterizing events and processes in the history of Kazakhstan from ancient times to the present day;

- use a historical map, archival documents, primary and secondary data, library resources and media resources when learning events, phenomena and processes of the history of Kazakhstan from ancient times to the present day; distinguish historical periods and designate them in chronological sequence on the timeline; use historical terms and concepts when interpreting and analyzing historical events; structurally present facts and arguments, along with information about the nature of historical processes and the significance of historical facts for the interpretation of current social events and phenomena; apply the skills of interpretation of historical sources, orientation in time and space, historical analysis and explanation when learning events and processes of the history of Kazakhstan from ancient times to the present day;
- analyse historical events, phenomena, and processes of the history of Kazakhstan from ancient times to the present day; features of the historical development of the Republic of Kazakhstan, its role and place in world history; the role and place of prominent figures in the history of the country; social, economic, political, and cultural processes in time and space, in the context of continuity and changes, similarities and differences;
- evaluate historical events, processes, phenomena and figures in the context of their influence on national history, as well as their various interpretations; assess the reliability of various types of historical sources; prospects of modern civilization, its problems and challenges in development; the role of modern Kazakh society in the world economy, politics and culture; different points of view on specific historical events, phenomena and processes; the significance of a historical event, phenomenon and process for the development of society; objectively, appropriately and positively perceive feedback and value judgments about the process of their learning;
- create models and predict possible directions and trends of the present and future development of countries and regions, peoples, and various social groups; put forward hypotheses; formulate problematic historical questions and find answers to them; plan and carry out educational research; present educational information in a creative form; present the results of educational research to the audience.

#### 7.9.2.2. Expected learning outcomes of World History

- know the place (according to the historical map) and time (historical chronology) of key historical events and processes experienced by mankind from ancient times to the present day; the main historical terms and their meaning; outstanding historical figures, and recognize them by portraits and activities;
- understand the relationship between historical events, phenomena, and processes; synchronize world history events with events and processes in the history of Kazakhstan; understand diversity of civilizations, traditions, and cultures of the peoples of the world;
- apply historical map, archival documents, library resources and the Internet database; historical periodization and chronology, as well as historical terms and concepts in explaining and analyzing historical events and processes; relevant textual, visual, audio and video information from various sources, including primary and secondary historical sources and works of art; competently structure historical facts and arguments; holistically reproduce the past of mankind in various forms (abstractly, orally, in writing), synthesizing information from various sources;
- analyse historical events and processes based on historical concepts and meta-subject macroconceptions, interpreting various sources of information, identifying features and characteristics, similarities and differences, changes and continuity in time and space, cause-and-effect relationships and historical significance of events and processes in the context of the historical experience of mankind; reflect on historical events; systematize information from various

sources, using the results of historical research in judgement and in argumentation; formulate generalized conclusions, identifying patterns of historical development;

- evaluate historical facts and interpretations, the significance and reliability of information from historical sources; the role of historical figures; events of the past, present and future, comparing different opinions and views on the same historical event or phenomenon; form personally meaningful value-based conclusions; modern political, socio-economic and cultural processes, using historical knowledge and skills; the events, phenomena and processes of world history, clearly expressing their point of view orally and in writing; objectively, appropriately and positively perceive feedback and value judgments about the process of their learning;
- create models and predict possible directions and trends of the present and future development of countries and regions, peoples and various social groups; identify and represent historical arguments to justify and validate statements, evaluations and opinions; put forward hypotheses; formulate problematic historical questions and find answers to them; plan and carry out educational research; present educational information in a creative form; present the results of educational research to the audience.

#### 7.9.2.3. Expected learning outcomes of Fundamentals of Law

- Upon completing lower secondary school, the student will:
  - know the concept of law and morality, the system of constitutional law, the characteristics
    of offenses and responsibility in various areas of law (civil, labor, administrative, criminal);
    attributes of democracy, civil society and the rule of law, legality and law and order; the basic
    content and basic concepts of the Kazakh legal system; legal sources;
  - understand the key features of Kazakh law; the duties and responsibilities of citizens as the main
    participants in specific legal relations; the importance of protecting the rights of citizens,
    the necessity and possibility of their implementation; the need for legal regulation of public
    relations in the main spheres of social life, the need to respect the rights of an individual;
- apply the acquired knowledge in everyday life and practical activities, determining legal information, the procedure for actions and behavior in accordance with acts and law; the methods of exercising rights and freedoms; protecting violated rights, including with the qualified legal assistance from relevant bodies and organisations, if necessary; take part in discussions on public and private legal issues;
- analyse the legal norms regulating legal relations in society; the basic rights and obligations
  of subjects of legal relations with respect to legal relations in society; simple practical situations; legal responsibility of adolescents and the specifics of legal provisions; legal information
  obtained from various sources;
- evaluate the functions of state-legal institutions within society and the ability to contribute to their development; understand both positive and negative phenomena in society; the concepts of public order and legality; actively engage in resolving specific issues and work in a team to constructively solve tasks in accordance with moral norms;
- create (formulate) legal issues and predict solutions; substantiate conclusions, assessments, and opinions by providing evidence; compose research questions and provide answers; plan and conduct research work on a wide range of topics; present the results of educational research to the audience; present educational information in a creative way; create their own model for solving legal issues.

#### 7.9.3. Upper secondary school

#### 7.9.3.1. Expected learning outcomes of History of Kazakhstan

Upon completing upper secondary school, the student will:

 know the main historical events and processes that have occurred since the independence of the Republic of Kazakhstan to the present day in the social, political, economic, and cultural spheres from various sources; the place of Kazakhstan in the modern world; historical and public figures who have contributed to the development of the country; the methods of preserving the national values of Kazakh society in the context of globalization;

- understand the need to conduct sociological research to identify indicators of socio-political, economic, and socio-cultural development of modern Kazakhstan;
- apply methods and strategies of comparing historical and political events and processes in the Republic of Kazakhstan and in other countries; the political map of the world and the map of the administrative arrangement of the Republic of Kazakhstan; primary and secondary historical sources, library resources and media resources, materials from international research institutes, infographics, statistics, indicators, terms and concepts for the interpretation and analysis of events and processes;
- analyse the position and place of the Republic of Kazakhstan in the world community and in world politics in terms of national interests; unity and diversity of the multi-ethnic people of the Republic of Kazakhstan; the role that every citizen plays in strengthening the state; ways of preventing social tension; civilizational features of the country;
- evaluate the processes of political, economic, social, and cultural development of the Republic of Kazakhstan; measures to preserve national security; initiatives of Kazakhstan in solving global challenges of our time; measures to preserve the values of Kazakh society; contribution to the development of human capital; participation of Kazakhstan in the integration process; measures that have been implemented to improve the image of the country in the international arena;
- create an action plan to promote the achievements of the country and increase the popularity
  of Kazakhstan in the world, presenting information in the form of theses; provide solutions
  to threats and risks for the country; own model of social, cultural, economic, and political
  development of the country; educational and research project and present information in a creative form.

#### 7.9.3.2. Expected learning outcomes of *Economics*

- know the basic concepts, terms, and principles of economics (demand, supply, competition, production, enterprise, entrepreneurship, finance, macroeconomic indicators, etc.); the role and functions of the state in the economy, including fiscal policy, monetary policy, and economic regulation; the basics of international trade, foreign exchange markets and their impact on the country's economy;
- understand the interrelationships and dependencies between supply and demand in the market and their impact on prices and quantity of goods and services; production processes and the role of enterprises and firms in the economy; the basics of entrepreneurship, including the creation and development of business, planning and organisation of business processes;
- apply the principles of supply and demand to analyse market situations and forecast changes; fundamentals of financial planning, accounting, and financial management of enterprises; knowledge of the legal aspects of business to make informed decisions;
- analyse various types of competitive markets and their features, including monopoly, oligopoly, and monopolistic competition; economic efficiency, the efficiency of enterprises and business processes; the impact of government policy on the economy (taxation, regulation, and infrastructure projects);
- assess the impact of economic decisions on macroeconomic indicators (GDP, inflation, and unemployment); financial stability of enterprises and their potential growth and development; the role and contribution of international trade to the country's economy and its competitiveness;
- create business plans and projects, including the concept formation, the definition of goals, the choice of strategies and marketing plan; analytical reports and forecasts of economic processes and trends; recommendations for the development of enterprises and their efficiency.

# 7.10. Expected learning outcomes of Arts educational area

- *The student will be able to:*
- recognize art forms, characterize their distinctive features, using special terms and concepts;
- convey their impressions, feelings, and moods in artistic and musical form;
- apply knowledge about arts to express their attitude to modern trends in the field of culture;
- analyse and reveal the value of various artistic and musical works and express their own attitude to them in an accessible form;
- appreciate their national and global artistic and musical culture serving as a foundation for understanding the cultural heritage and peculiarities of each era;
- use applied skills (modeling, drawing, singing, playing instruments, artistic work, design technology);
- recognize the methods and strategies for retaining visual information;
- use art materials and computer graphics to present visual information and design proposals.

#### 7.10.1. Primary school

- 7.10.1.1. Expected learning outcomes of Arts. Upon completing primary school, the student will:
  - know the finest works of art and music from both Kazakh national and world culture; the main genres and styles in fine art and music; basic and additional colors, types of lines and shapes; basic techniques of working with artistic, natural, and improvised materials and instruments; the basics of musical literacy and notation; techniques for singing and playing musical instruments;
  - understand the significance and features of genres and styles of fine art and music, techniques for conveying objects, phenomena and sounds of the surrounding world through expressive means of fine art and music; properties of artistic materials and instruments; types of sounds, singing voices, musical instruments, ensembles, and orchestras;
  - apply knowledge and skills to convey ideas, emotions, and feelings through artistic and musical works, utilizing various performance techniques, including digital software and applications; conduct experiments with artistic, natural, sound, and other materials, while observing safety precautions; employ ICT tools, if necessary, in the creation of artistic and musical works;
  - analyse and compare artistic and musical works from both Kazakh national and world culture across various genres and styles; information, ideas and approaches used in the creation of artistic and musical works;
  - evaluate artistic and musical works and suggest ways to improve them;
  - produce works in fine art and music, applying practical knowledge and skills.

#### 7.10.2. Lower secondary school

#### 7.10.2.1. Expected learning outcomes of Arts

- Upon completing lower secondary school, the student will:
  - know the basic techniques for working with artistic materials and instruments; the basics of musical literacy; features of genres, styles and trends in art; expressive means of fine art and music; characteristic of decorative and applied art and folklore traditions in the music of the Kazakh people and other global cultures; properties of various materials and the main processing methods; functional, aesthetic, environmental and ergonomic requirements for designed objects; types and classification of singing voices, musical instruments, ensembles, choirs and orchestras; digital technologies and media; copyright features in the field of fine arts and music; safety rules when working with equipment and instruments;
  - understand the significance of fine art, music, engineering and technology in human life and society; the role of art and music in the protection of the environment; the aesthetic and artistic value of works of music and fine art; the connection of genres, styles and trends

of fine art and music with the history, traditions and culture of peoples; features of musical sounds and visual objects of the surrounding world; the influence of the properties of natural and artificial materials on the functional and aesthetic quality of products; the importance and value of social and emotional skills in teamwork for decision-making, generating ideas and creating creative products;

- apply knowledge and skills in the field of fine arts and music to generate ideas and plan activities, to create project research works, to convey feelings and emotions, including using computer software and applications, artificial intelligence services (hereinafter AI) and musical instruments; primary and secondary sources of information for research and experiments in the field of art and music; various ways of implementing and promoting creative products, taking into account copyright issues; methods and techniques for planning and organizing their work and creative project; ways of transmitting social, environmental and other urgent global challenges by expressive means of fine art and music; artistic, improvised and other materials and tools, observing safety regulations;
- analyse a variety of creative ideas and expressive means in works of fine art and music, including works created using computer software and applications, AI services; the influence of various factors (history, culture, time, place) on the form, function and aesthetic qualities of creative work and/or products; materials used, methods and strategies, techniques for the production of artistic and musical works; the impact of art and music, engineering and technology on the environment and human life;
- evaluate the main idea, images and ideas in works of art and music created by artists and musicians, and in their own creative works, including works performed using computer software and applications, AI services; artistic and aesthetic value of works of national and world art and music; independently/collectively performed artistic, musical works and projects; possibilities of creative products in terms of aesthetics, functionality, ergonomics and efficiency; consumer qualities of the product of labor and service capabilities of production operations;
- produce creative works and projects based on knowledge and skills in art and music, humanities, and natural sciences, considering the technological and operational properties of materials; copyright objects in the field of art and music, including using ICT and AI.

#### 7.10.3. Upper secondary school

#### 7.10.3.1. Expected learning outcomes of *Graphic and Design*

- know the main graphic methods and tools for visualizing information; the main types of graphic images (documentary, projection, sign, creative); drawing and geometric construction guidelines (Unified System of Engineering Drawings); the main types of images; projection techniques and methods for creating graphic images; the principles of shaping geometric bodies and constructing forms; image transformation, shape manipulation and the spatial positioning of objects; elements of technical, architectural, construction and information graphics; methods for designing and visualizing design proposals;
- understand the role and significance of images in visualizing information; principles and rules for projecting and creating graphic images; the relationship between the shape and function of geometric bodies; fundamentals of technical standardization and assembly drawing; principles of architectural and construction graphics and infographics;
- apply tools and materials for graphic works; basic data visualization methods and tools (including computer graphics) to create graphic images; drawing and geometric construction guidelines; projection techniques and methods for creating various graphic images; the principles of shaping geometric bodies and constructing forms; image transformation, shape manipulation and the spatial positioning of objects; standard elements of technical, architectural, construction

and information graphics; methods for designing and visualizing design proposals; manual and computer graphics in solving various tasks that involve graphic modeling, construction and design;

- analyse graphic information, including drawings, sections, and sections; images, shape, and spatial position of objects; elements of technical, architectural, construction and information graphics; design proposals and their visualization;
- evaluate the quality of drawings and graphic images; compliance of images with requirements and standards; visualization of design proposals and their effectiveness; capabilities of graphic software for creating 2D images and 3D models of designed objects;
- create drawings and graphic images using the guidelines and information visualization tools; design proposals and their visualization using design methods and graphics; 2D images and 3D models of designed objects using computer graphics.

# 7.11. Expected learning outcomes of **Physical Education** educational area

The student will be able to:

- use various types and forms of health and sports exercises as the basics of hygiene and physical education;
- choose and apply wellness techniques to improve their physical fitness;
- systematize the necessary information from various sources on health improvement, objectively analyse and use it to maintain a healthy lifestyle;
- use the rules and methods of interaction in a group (team) when participating in team games.

## 7.11.1. Primary school

## 7.11.1.1. Expected learning outcomes of *Physical Education*

Upon completing primary school, the student will:

- know the difficulties and risks when performing certain motor actions; basic motor actions in physical exercises; sequence of actions in exercises; roles in play activities; the role of physical activity in health promotion; muscle work in various movements;
- understand the difficulties and risks during physical activity; the impact of warm-up and recovery techniques on the body; the importance of leadership skills in teamwork; behavior reflecting spiritual and moral values and cooperation in games; muscle work in physical exercises; the importance of physical activity for health promotion;
- apply basic motor actions; sets of exercises to promote physical development; leader qualities when working together; motor skills to promote health; a set of physical exercises that induce changes in the body;
- analyse the basic motor actions; difficulties and risks of various forms of motor activity; leadership qualities in teamwork; moral values in fair play; the importance of physical activity for health promotion; a set of physical exercises that induce changes in the body; muscle work in various physical exercises;
- evaluate basic motor actions; a set of exercises and the sequence of their execution; exercises that develop physical qualities; tactical actions in games; physical activity for health promotion; roles in gaming activities for the development of social skills; leadership skills in teamwork; warm-up exercises and recovery techniques; physical activity for health promotion; create a set of exercises and the sequence of their execution; a set of exercises that develop physical qualities; exercises for warm-up and recovery techniques; exercises for health promotion; a set of physical exercises that induce changes in the body; sets of exercises for health promotion.

#### 7.11.2. Lower secondary school

#### 7.11.2.1. Expected learning outcomes of *Physical Education*

Upon completing lower secondary school, the student will:

- know the difficulties and risks in performing motor actions; special motor actions in physical exercises; principles of combining exercises; roles in various tasks; components of human health; the role of the human muscular system;
- understand the causes of injuries and ways to prevent them; the impact of warm-up and recovery techniques on the body; features of leadership skills in teamwork; behavior reflecting moral values in fair play; the importance of the human muscular system; the impact of a healthy lifestyle on health;
- apply special motor actions during independent work; sets of exercises aimed at developing
  physical qualities; safety and protective measures when performing motor actions; leadership
  skills in teamwork; exercises to strengthen physical health; exercises that have an impact
  on the functional systems of the body;
- analyse the performance of special motor actions; difficulties and risks in performing motor actions and using various equipment; personal leadership skills in teamwork; moral values in fair play; measures to strengthen physical and psychological health; the impact of physical activity on the functional systems of the body; muscle work in various exercises;
- evaluate combinations of exercises considering the sequence of their execution; performance of special motor actions; performance of a set of exercises aimed at developing physical qualities; features of warm-up and recovery techniques for a certain type of activity; skills of overcoming and responding to difficulties and risks; leadership skills in teamwork; moral values in fair play; health benefits of physical exercises; measures to prevent diseases, preserve and promote health;
- create a set of special motor actions; combinations of exercises taking into account the sequence of their execution; sets of exercises aimed at developing physical qualities; a set of warm up and recovery exercises for a certain type of activity; a set of roles, assessing their importance in certain tasks; various tactics and strategies of the game; sets of exercises to strengthen physical health; for coordination of movements and muscle development; demonstrate the influence of a healthy lifestyle on health by personal example.

#### 7.11.3. Upper secondary school

#### 7.11.3.1. Expected learning outcomes of *Physical Education*

- know safety measures when performing physical exercises; sports-specific motor actions: combinations and sequence of movements; basics of warm-up and recovery techniques; roles and responsibilities in sports activities; combinations of various exercises for special physical training; understand difficulties and risks in motor activity; behavior reflecting patriotism and responsibility; muscle functions in motor activity; the effect of exercises with varying intensities on health promotion;
- apply various methods to overcome difficulties and prevent risks when performing physical exercises; various roles and responsibilities in sports activities; teamwork skills; various tactics and strategies of the game; a set of exercises for the development of certain muscle groups; developed warm-up exercises and recovery techniques; sports-specific motor actions;
- analyse the impact of physical activity on well-being; functional capabilities of the body during physical exertion; competing and judging guidelines; various tactics and strategies of the game; the effect of exercises with varying intensities on health promotion;

- assess the difficulties and risks of physical activity; the impact of physical activity on well-being; tactics and strategies; various tactics and strategies of the game; leadership skills in team activities; special physical training skills;
- create sets of special exercises; a set of exercises for the development of certain muscle groups;
   a set of exercises with varying intensities to promote health; combinations and sequences of movements.

#### 7.11.3.2. Expected learning outcomes of *Initial Military and Technological Training*

- know the fundamentals of military science, including its purpose, organisational structure, standard weapons and equipment; the capabilities of lower-level tactical units; the basics of using orientation tools, robotics and IT technologies; the basics of civil protection procedures in the Republic of Kazakhstan; alerting system and protocols for situations involving modern means of destruction, terrorist threats and natural disasters; characteristics of natural disasters, the procedure for conducting rescue and emergency recovery operations in the affected areas; the purpose, specifics and procedure for using standard weapons, as well as the use of individual and collective protective equipment, and radioactive and chemical control devices; the procedure for organizing and conducting evacuation and deconcentration of the population; procedure and types of first aid; traffic rules;
- understand the basics of military science, robotics, and IT technologies; the specifics of the impact of nuclear, chemical, bacteriological (biological) weapons and other modern means of destruction on people, economic facilities, the environment, and their consequences; the consequences and possible economic and environmental damage in the event of natural or man-made emergencies;
- act as a soldier on the battlefield in various conditions, and serve as an intelligence officer within a radiation and chemical monitoring post; use standard weapons, as well as individual and collective protective measures; provide first aid for wounds, bleeding and burns, open and closed fractures in different parts of the body, frostbite, heatstroke, electric shock, and drowning incidents; apply bandages for various types of injuries on different parts of the body; use Internet connection; audio and visual technologies; know theoretical foundations of driving automotive vehicles and robotics; use digital photo and video equipment;
- analyse possible emergency situations when using modern means of destruction; possible situations in the event of natural or man-made emergencies;
- evaluate the consequences of the decisions;
- create action plans in case of possible emergency situations, when using modern means of destruction; action plans in case of possible natural or man-made emergencies.

# 8. Content of education

- **8.1.** The composition and structure of the educational content of Intellectual schools build on the integration of the core content of secondary education of the Republic of Kazakhstan with international educational programmes.
- **8.2.** The content of education is a means of achieving a system of learning objectives: the objectives of Intellectual schools, educational areas, and subjects.
- 8.3. The following guidelines were used to determine the content of education in Intellectual schools:
   age-appropriateness of the volume and structure of the educational content, and the sequence of studying academic subjects;
  - the need to systematically introduce students to scientific methods of cognition and research activities, and involve them in the development of key competencies;
  - the expediency of cross-curriculum integration in the content of education.
- **8.4.** The content of education of Intellectual schools is generally focused on in-depth study of science as the basis for the development of the intellectual potential of an individual. The content of advanced **Mathematics, Physics, Chemistry** and **Biology** is carried out through project and research activities of students.
- **8.5.** The educational content of Intellectual schools is implemented within the framework of trilingual policy. Trilingual education aims to develop individuals in Kazakhstan into multilingual personalities, allowing them to speak three languages and successfully communicate on various topics. It also encourages an appreciation of their own culture while fostering an understanding and respect for the cultures of others.

Trilingual education is practically implemented as follows:

- 1) by offering a level-based approach to assimilating the Kazakh, Russian, and English languages;
- 2) through the subjects studied in the Kazakh, Russian and English language;
- 3) by implementing language immersion programmes, which are recognized as one of the most effective methods for teaching the target language (Kazakh).

Language immersion is an educational method of creating a learning environment within educational institutions, encouraging children to master the target language and apply it in both communication and educational activities. Intellectual schools implement a model of early language immersion (full and partial) in the Kazakh language through various types of speech activity: listening, speaking, reading, and writing. The method of language immersion is implemented at the parents' choice.

In full language immersion, the Kazakh language serves as both the learning objective and the means of understanding the surrounding reality. In the first year and a half of primary school, students are completely immersed in the Kazakh language, as Kazakh is the language of instruction. From the second half of the 2nd grade, they start learning Russian, and from grade 3 the students start learning English.

8.6. The content of education in Intellectual schools includes 6 educational areas as compulsory components of complete education: Language and Literature, Mathematics and Computer Science, Science, Human and Society, Art, Physical Education. The content of education (both subjects and various educational areas) builds on the principles of integration.

**Global Perspectives and Project work** is not included in any of the educational areas, as it is focused primarily on the development of research skills, critical thinking, and meta-subject skills.

Level	Primary school	Lower secondary school	Upper secondary school		
Grade	Grades 1–5	Grades 6–10	Grades 11–12		
Age	6–11 years old	11–16 years old	16–18 years old		
Educational areas		Subjects			
Language and literature	Kazakh language and literature (L1) / Russian language and literature (L1), Kazakh language (L2)/ Russian language (L2), English language	Kazakh language (L1) / Russian language (L1), Kazakh literature / Russian literature, Kazakh language and literature (L2) / Russian language and literature (L2), English language	Kazakh language and literature (L1) / Russian language and literature (L1), Kazakh language and literature (L2) / Russian language and literature (L2), English language		
Mathematics and Computer science	Mathematics, Information and communication technologies	Mathematics, Computer science	Mathematics (7 hours), Mathematics (10 hours), Computer science (standard level), Computer science (advanced level), Programming		
Science	Introduction to Science	Science, Biology, Physics, Chemistry, Geography,	Biology (standard level), Biology (advanced level), Physics (standard level), Physics (advanced level), Chemistry (standard level), Chemistry (advanced level), Geography		
Human and Society	World understanding	History of Kazakhstan, World history, Fundamentals of Law	History of Kazakhstan, Economics		
Arts	Arts	Arts	Graphics and design		
Physical Education	Physical Education	Physical Education	Physical Education, Initial military and technological training		
Beyond the educational area	-	-	Global perspectives and project work		

**8.7.** *Compulsory subjects, project work, elective courses and extracurricular classes* are offered at all levels of education in Intellectual schools. The introduction of compulsory project work will enhance students' research, collaboration, presentation, and critical thinking skills. Upper secondary school provides students with elective subjects studied at the standard and advanced levels.

#### 8.8. The content of education in primary school

The content of education in **primary school** is designed in alignment with the school's mission, which emphasizes the importance of not only teaching academic subjects but also instilling the founda-

tions of a child's spirituality and socially significant skills. The content of primary school education is aimed at developing functional learning skills (reading, writing, arithmetic, articulating one's thoughts coherently, establishing cause-and-effect relationships), as well as research skills and creative abilities.

The educational area of *Language and literature* includes the following subjects: Kazakh language and literature (L1) / Russian language and literature (L1), Kazakh language (L2) / Russian language (L2), English language.

When teaching the first language (either Kazakh or Russian, depending on the language of instruction), the focus is on moving away from the traditional grammar-based approach to prioritize the development of communicative skills. The integration of the Kazakh/Russian language and literature is based on the use of literary texts for the development of four language skills (listening, speaking, writing, reading). After completing primary school, students will gain speaking skills, as well as initial writing and reading skills.

Teaching the second and third languages (either Russian or Kazakh, depending on the language of instruction, and English) emphasizes level-based language learning. The content of these subjects is designed to cultivate students' interest and foster a positive attitude towards language learning through play and cognitive activities. It aims to develop initial communication skills for information exchange, the ability to work with texts, comprehend the meaning of phrases and expressions, and apply them in specific situations.

The educational area of *Mathematics and Computer Science* includes the following subjects: **Mathematics** and **Information and Communication Technologies**.

The content of Mathematics in primary school is designed to developing students' knowledge of the basics of mathematical language and spatial thinking. This includes performing arithmetic operations, mastering both oral and written computational algorithms, calculating numerical expressions, solving word problems, developing general problem-solving techniques, and fostering the ability to make logical judgments based on measurement and computational skills.

The main learning objective of Information and communication technologies in primary school is to develop students' skills in using basic tools of information and communication technologies, and to form the ability to search, choose, transmit information, and think logically.

The educational area of *Science* is represented by the subject Introduction to Science.

Due to the deliberate focus of Intellectual schools on in-depth study within the natural science, the primary school curriculum includes a new independent subject "Introduction to Science". This is an integrated subject designed to provide fundamental scientific knowledge within the "Human – Nature" system. The content of the subject is designed to cultivate students' curiosity, research skills, scientific understanding, and their perception of the world around them, while also broadening their horizons. Introduction to Science is a propaedeutic course designed to prepare students for academic disciplines such as Biology, Physics, and Chemistry in lower secondary school.

The educational area of Human and society is represented by subject World understanding.

As an integrated subject, "World understanding" is focused on providing propaedeutic knowledge within the "Human – Society" system. This subject covers the basics of the humanities. The content of the subject is aimed at instilling initial ideas about the history of mankind, the impact of the past on the present, the formation of social systems, and the relationships between individuals within families and society. This subject provides a smooth transition to independent academic subjects of the educational area "Human and society" in lower secondary school.

The educational area of *Arts* is represented by the subject **Arts**, which involves the integrated study of music, fine arts, and crafts. This subject is based on a holistic approach to the organisation of aesthetic and cultural education.

The course involves the following types of individual and group activities: singing, playing instruments, recording, listening, and arranging natural and artificial sounds, drawing, modelling, decorating, moulding, etc. It implies the close integration of this academic subject with additional extracurricular activities of an artistic and aesthetic nature (dancing, theater, clubs, etc.). The educational area of *Physical Education* is represented by subject "Physical Education", which aims to develop skills for maintaining and strengthening health.

#### 8.9. The content of education in lower secondary school

The content of education in lower secondary school is designed with consideration for the necessity of completing a systematic course of academic subjects across all educational areas. They collectively contribute to the formation of the students' mindset, principles, and behavioral norms, providing them with essential skills as the foundation for interaction in society.

The educational area of *Language and literature* includes the following subjects: Kazakh language (L1) / Russian language (L1), Kazakh literature / Russian literature, Kazakh language and literature (L2) / Russian language and literature (L2), English language.

The content of education in the Kazakh (L1) and Russian (L1) languages is focused on developing students' communication skills, the ability to engage in various types of speech activities in different situations, as well as on fostering proficient writing abilities and refining academic speech.

The literature with the first language of instruction is presented as an independent subject. Kazakh Literature and Russian Literature (depending on the language of instruction) are aimed at developing reading skills; acquiring knowledge, skills and abilities that contribute to successful social adaptation though the study of world literature and culture; developing a holistic worldview corresponding to the modern science and culture; raising awareness of the value of literary heritage as a tool of cognition of the surrounding reality and the value of national literature as part of the world cultural heritage.

The educational content of the Kazakh/Russian language curriculum is focused on the development of communication skills. The content of these academic subjects is integrated with literature. Upon completing lower secondary school, the students will be able to regulate situational and verbal behaviour both in academic and professional activities in future. Students are able to use various sources of information and modern information technologies to express and justify their own opinions.

The educational content of the English language curriculum is designed to offer students the opportunity to communicate in English through interactive tasks involving formal and informal communication using both oral and written presentations; understanding the general content of complex texts covering global and academic topics; developing fluent and literate speech skills along with the ability to express their opinions. Teaching English in lower secondary school should ensure the level of English proficiency, which is necessary for further education in upper secondary school and for use as a means of acquiring knowledge.

The educational area of *Mathematics and Computer Science* in the lower secondary school is represented by the subjects **Mathematics** and **Computer Science**.

The content of Mathematics in primary school is designed to develop students' mathematical thinking as one of the means of communication, as well as the ability to solve problem situations based on mathematical models.

Computer Science focuses on the development and proficient use of not only computer technology application skills but also programming skills. It involves the implementation of both individual and collaborative projects using various software applications to support the study of all subjects.

The educational area of *Science* includes the following subjects: Science, Biology, Physics, Chemistry and Geography.

In grade 6 of lower secondary school, the subject of Science is incorporated into the curriculum. In grade 7, students begin learning independent academic subjects such as Biology, Physics and Chemistry. The curricula in these subjects will enable students to discern their strengths and interests, aiding them in choosing specialized academic subjects in upper secondary school.

The content of Biology is designed to reveal the features of the structure and properties of plants and animals, explore the diversity of living organisms, analyse environmental factors and their effects on living beings, examine the relationship between humans and the surrounding biosphere, and foster an understanding of their role within it. The content of Physics is designed to broaden students' understanding of the scientific worldview through the exploration of physical laws and patterns. The cognitive capabilities of primary school students are considered in forming a scientific understanding of the nature of matter (including matter and field, the unity of the macro- and microcosm), its interactions, and its manifestations in the natural world. There are various innovative methods offered to students to develop their scientific cognition skills (observation, experiment, measurement, modelling).

The content of Chemistry provides an opportunity to gain enough knowledge and understanding about the variety of substances and their transformations, as well as to understand the nature of chemical processes, the meaning of laws and patterns for their safe application in real-life situations. This subject fosters students' ability to investigate chemical phenomena in nature, followed by a critical assessment of the situation, experimental work, data collection and analysis, and the design of the research findings.

Geography aims to foster geographical knowledge as a means of understanding and interacting with the surrounding world. The content of this subject focuses on exploring the diversity of continents and oceans, understanding Kazakhstan's geographical position in the global community, and developing skills to work with maps and utilize geographic information for educational and practical purposes.

The educational area of *Human and society* is represented by the subjects **History of Kazakhstan**, **World History** and **Fundamentals of Law**.

The courses on the History of Kazakhstan and World History are designed to provide students with a historical perspective of the world and to instill in them a desire to embrace the moral values that have evolved over centuries of human development. These subjects are designed to develop students' historical thinking skills based on understanding and comprehension of the past, analysis, and system-atization of educational materials from various sources.

Fundamentals of Law is taught in grade 9. There are two reasons for studying this subject in the grade 9. The first reason is to avoid overloading students in grade 10 and to allocate time for subjects that will be externally assessed. Secondly, "Fundamentals of Law" as a compulsory subject must be completed in lower secondary school. The content of this academic subject aims to develop students' understanding of societal ideals and values (human rights, democracy, civil society, legal state, separation of powers, legality, and the rule of law). Studying this subject enables students to assess their personal attitudes towards events, fostering active citizenship and a sense of patriotism.

The educational area of *Arts* in lower secondary school entails an integrated study of music, fine arts, design, and technology, considering the cognitive abilities of students in this age group. The integrated course aims to develop aesthetic taste and artistic culture through practical experience in various art forms and creativity.

The educational area of *Physical Education* is implemented by the course "Physical Education", which aims to encourage students to apply healthy lifestyle skills in their daily lives.

#### 8.10. The content of education in upper secondary school

The content of education in upper secondary school is determined considering its main purpose, which is to provide students with pre-university training. In this regard, the content of education places special emphasis on the development of social skills and mobility of students, on ensuring their awareness of own interests, prospects, and choice of further life path. The functional completeness of the content of upper-secondary education is ensured by inclusion of academic subjects in all six educational areas.

Kazakh Language and Literature (L1) / Russian Language and Literature (L1), Kazakh Language and Literature (L2) / Russian Language and Literature (L2), and English are included in the educational area of *Language and Literature*.

The content of the subjects "Kazakh language and literature" (L1) and "Russian language and literature" (L1) ensures that students understand oral and written messages, have skills in creating texts of different styles and genres; promotes a conscious choice of language means in accordance with the communicative attitude and norms of oral and written speech; ensures the improvement of skills of deep understanding and interpretation of literary works of various levels of complexity; formation

of basic aesthetic and theoretical-literary concepts as conditions for the full perception and interpretation of a literary text. These subjects are aimed at developing the skill of being ready for a dialogue, for understanding others in the process of educational, socially useful, teaching and research, creative and other activities.

Subject programmes for Kazakh Language and Literature (L2) and Russian Language and Literature (L2) are focused on the development of communication skills in oral and written speech; skills of conscious, expressive reading, understanding and awareness of the value of the culture of the Kazakh, Russian and other peoples.

The subject content of "English language" focuses on the development of readiness for further self-education in various subject areas using the knowledge of English; getting the experience in project and research works in English.

The educational area of *Mathematics and Computer Science* includes the academic subjects **Mathematics, Computer Science** and **Programming**.

The subject content of Mathematics in upper secondary school is aimed at developing a mathematical style of thinking based on the use of induction and deduction, generalization and concretization, analysis and synthesis, classification and systematization, abstraction and analogy, the ability to formulate, substantiate and prove statements; the use of mathematical concepts, formulas and extended spatial representations in making drawings, figures, and schemes in real life. All the above skills are necessary for successful study at a higher educational institution.

To ensure differentiation and provide upper secondary school students of Intellectual schools with flexibility and freedom in choosing the level of study of the subject based on the future specialty, Mathematics is implemented in two subject programmes: a 7-hour weekly load and a 10-hour weekly load.

The subject programme for a 7-hour weekly load fully covers the content of subject programmes "Algebra and the beginning of analysis" and "Geometry" designed for the Science and Mathematics strand of SCES RK. The subject programme for a 10-hour weekly load includes a range of additional topics to provide students with conditions for successful further studies in Kazakhstani and international universities in specialties requiring a high level of mathematical competence.

The subject content of "Computer Science" is aimed at gaining experience in project work, working with information objects of various types using modern software tools, building computer models and their collective implementation.

Students can choose to study the subject of "Computer Science" at the standard or advanced levels. The standard level allows students to acquire basic information technology skills and programming skills that are necessary for further study at universities according to the chosen specialty and for future professional activity not related to the subject of "Computer Science".

The study of the subject "Computer Science" at an advanced level is aimed at achieving A-level by students. This level can be chosen by students who associate their further education with computer science.

The subject content of Programming curriculum aims to develop problem solving skills in the process of developing programs using programming languages, to provide students with in-depth knowledge in the field of information technology application and to explain how software tools are used for scientific, commercial, engineering, and cultural development.

The educational area of Science includes the subjects of Biology, Physics, Chemistry, Geography.

The subject content of Biology curriculum is aimed at the formation and development of students' scientific worldview and scientific thinking, understanding of the laws and patterns of phenomena and processes of wildlife. This subject aims to create a holistic picture of the organic world based on understanding the evolution of the animal and plant world, understanding the impact of human activity on the environment. By understanding of the relationship and mutual influence of biological processes, the ability to analyse the problems of ecosystem disturbance, students acquire a willingness to apply knowledge of biology in everyday life.

The subject content of Physics curriculum focuses on the development of the ability to apply physical models of phenomena and processes to understand the nature of the surrounding world and interact with it, considering environmental, man-made and informational factors. By studying the subject students get the foundations of a scientific worldview which includes a deep understanding of natural phenomena and develop critical thinking to understand scientific issues in the surrounding world.

The subject content of Chemistry curriculum aims to develop an understanding of the causal relationship of changes in the environment, chemical processes in nature and in human economic activity, the ability to plan experimental research in a given context and propose ways to solve them. The experiment, as the basis for the study of chemistry, contributes to the increase of cognitive activity and the development of analytical abilities of students, the independent search for solutions to problem situations. This subject contributes to the development of students' ability to design, which involves the development of a hypothesis, the choice of methods, conducting an experiment, risk assessment, formulation of conclusions, the assessment of mistakes made.

The subject content of Geography curriculum aims to develop the students' ability to use the information and conceptual field of geography to expand their understanding of the geographical picture of the world.

Students can choose to study subjects of "Biology", "Physics" and "Chemistry" at standard and advanced levels.

Two out of four subjects (Biology, Computer Science, Physics and Chemistry) are studied at the advanced level in grades 11 and 12. The subject content aims to ensure that students achieve A-level. Students can choose a combination of two subjects to get early profiling and to continue their studies at universities according to the relevant educational programmes.

One of the subjects (Biology, Physics, Chemistry, Geography (one subject of choice)) is studied at the standard level in grade 11 and in the first half of grade 12. Thus, students are given the opportunity to study three science subjects (two at the advanced level and one at the standard level).

The educational area of *Human and society* is represented by the academic subjects of History of Kazakhstan and Economics.

"History of Kazakhstan" is an integrated academic subject, which is the final course of the civil-forming cycle of subjects aimed at forming students' knowledge about the historical heritage and the development of modern Kazakhstan in the context of global community. The content covers the most important aspects of the past and modern history of the country and is based on the knowledge, skills and abilities formed in the process of studying the history of Kazakhstan in lower secondary school. At the same time, the content of the curriculum includes strands related to domestic and foreign policy, social relations, economic and cultural development of modern Kazakhstan, which requires the acquisition of initial knowledge in such disciplines as "Political Science", "Sociology", "Economics" and "Cultural Studies".

This subject is designed to promote understanding and awareness of the responsibility of each citizen for the prospects of development of Kazakhstan and instill a willingness to contribute to the further progressive development of the country.

The subject content of "Economics" aims to develop practical skills based on the ability to correctly interpret socio-economic events at the local, national, and global levels through the basics of microand macroeconomics, as well as the ability to clearly justify rational decision-making that requires economic and financial literacy. In the process of learning, students learn to evaluate data obtained in text, graphic and digital format, develop computational skills in statistics necessary in research activities.

The educational area of *Art* in upper secondary school is represented by the subject **Graphics** and design.

The academic subject "Graphics and design" is an integrated course combining a range of academic subjects to study their function in the context of modern requirements. The main purpose of this subject is for students to learn the basics of image theory, knowledge of the laws of the projection method and graphic modeling; to promote the development of design and creative activities, the formation

of graphic culture and skills to work with traditional and modern means of graphics. This subject develops the creative qualities of a person, provides polytechnic and functional graphic literacy, introduces the basics of design and engineering activities and guides in choosing a future profession.

The educational area of *Physical Education* includes the following subjects: **Physical Education**, and **Initial military and technological training**. These academic subjects are aimed at developing the skills to rationally apply health-improving techniques to improve physical fitness, to form basic knowledge and skills for initial military training. The content of academic subject **Physical Education** in upper secondary school promotes team sports, in which the main attention is paid to the development of team interaction skills along with the physical training of students. The content of the subject **Initial military and technological training** aims to educate students in the spirit of patriotism and readiness to defend the Motherland. The subject will allow students to acquire knowledge of the basics of military science, health and safety in emergency situations and develop the skills of military service.

- **8.11.** The subject of **Global Perspectives and project work** has been introduced in upper secondary school. It focuses on the development of research skills, and not on the content knowledge. It covers a wide range of issues that contribute to the development of a worldview and the formation of a personal point of view. In grade 11, students master such skills as analysis and evaluation of conclusions, arguments, reasoning, and statements; critical analysis and interpretation of context and evidence of arguments; self-reflection; the ability to effectively present research results.
- **8.12.** Implementation of the content of education in upper secondary school provides for a reduction in the number of academic subjects by providing students with a choice. Reducing the number of compulsory academic subjects in upper secondary school contributes to the purposeful preparation of students for further education in higher education institutions.
- **8.13.** Taking into account the individual interests and needs of students, NIS-Programme offers a flexible system of choosing academic subjects at two levels of education. The student independently chooses the subjects necessary for admission to universities to study both at the advanced and at the standard level. At the advanced level, the study of profession-oriented subjects provides for a larger number of hours than at the standard level. Profession-oriented subjects are studied at the standard level. Meanwhile, the study of some selected subjects may be completed in grade 11. Students can choose to study 2 subjects at the advanced level and 1 subject at the standard level:

Status	Subjects		Weekly load, h.	
	INVARIANT COMPONENT		Grade 11	Grade 12
Compulsory	1	Kazakh language and literature (L1) / Russian language and literature (L1)	2	2
	2	Russian language and literature (L2) / Kazakh language and literature (L2)	2	_
	3	English language	3	1
	4	Mathematics	7/10*	7/10*
	5	Programming		2
	6	History of Kazakhstan		2
	7	Global perspectives and project work	4	-
	8	Physical Education	3**	3**
	9	Initial military and technological training	1	1
Electives at advanced level	10	Physics/Biology/Chemistry/Computer Science	6	6
	11	Physics/Biology/Chemistry/Computer Science	6	6
Electives at standard level	12	Chemistry/Biology/Physics/Computer Science/Geography/Economics/ Graphics and design		1,5/-
	VARIATIVE COMPONENT			31,5/33
	13	School component (elective courses)	4	7
	14	Student component (club activity)	2	2

#### Note:

\*a student who choose a 10-hour Mathematics curriculum shall not choose a subject to study at the standard level.

\*\* 1 hour is allocated to attend team sports classes outside of school hours on a compulsory basis.

8.14. According to the Policy of Trilingual education in Nazarbayev Intellectual Schools, approved by the decision of the Board of "Nazarbayev Intellectual Schools" AEO dated 12 August 2013 (Minutes No. 44), subjects are taught in Kazakh, English and Russian in upper secondary school. The subjects "History of Kazakhstan" and "Geography" are taught in Kazakh. Subjects of integrated language and literature (as L1 and L2) are taught in Kazakh and Russian, respectively.

The subjects "Mathematics" and "Graphics and design" are taught in the first language (Kazakh or Russian), depending on the language of instruction.

The subjects "Physics", "Chemistry", "Biology", "Computer Science", "Economics", "Global perspectives and project work" are taught in English. Elective subjects ("Physics", "Chemistry", "Biology", "Computer Science") are taught in English at advanced and standard levels.

## 9. Approaches to assessment

Assessment of students' learning achievements is based on the content of the Educational Programme in accordance with the learning objectives of the subject curriculum and is an integral part of learning and teaching.

For this purpose, criteria-based assessment is used to obtain objective information on student learning outcomes based on assessment criteria and make it available to all stakeholders to further improve the learning process.

Criteria-based assessment in Intellectual schools includes two types of assessment: formative and summative assessment.

**Formative assessment** is carried out continuously, and is a current indicator of student performance, provides an operational relationship between teacher and student, allows timely correction and improvement of the learning process on the basis of feedback.

Any task that is completed in class and as homework can be used for formative assessment. At the end of the assessment, the teacher provides comments (feedback) on students' work and answers in writing (in notebooks, paper/electronic diaries, answer sheets, etc.) or orally. Such information should demonstrate where students are at in their learning, where they are aiming and how they can achieve their goal.

**Summative assessment** is carried out to determine the level of students' learning achievements after the completion of units/cross-curricular topics (summative assessment for a unit/cross-curricular topic) and a given academic period (summative assessment for a quarter, external summative assessment), with grades and scores, and to provide information on students' progress to teachers, parents, and students themselves.

**External summative assessment** is carried out at the end of a given level of learning at the primary, lower secondary and upper secondary education levels. The standards of external summative assessment examinations are comparable to the international standards of Cambridge Primary (grade 5), IGCSE (grade 10), AS-level and A-level (grades 11–12). External summative assessment examinations consist of several components, the examination tasks include closed and open-ended questions requiring short and extended answers.

As a result of external summative assessment, Grade 12 students are awarded a NIS Grade 12 Certificate, which is recognised by leading universities in Kazakhstan and around the world and by international organisations.

# 10. Organisation of the educational process in Intellectual schools

- **10.1.** In the educational process of Intellectual schools the principle of **unity of teaching and upbringing** is realised, which is based on the values and goals of education of Intellectual schools and is traced in the system of expected results of education and in the multilevel system of expected learning outcomes by educational areas. The expected learning outcomes, as benchmarks, subordinate the daily processes of teaching and upbringing to the general logic of education as a whole and thus reveal the meaning of the question "What is school for?". They determine the content basis of both teaching and upbringing.
- 10.2. During the study of each academic subject, questions of upbringing are addressed (learning leads to upbringing). All types of pastoral work are aimed at solving the issues of cognition and mastering by pupils of subjectively new knowledge (upbringing leads to learning). The organisation of various forms of extracurricular pastoral work together ensures the implementation of civic, patriotic, spiritual, moral, cultural, aesthetic and labour education. The whole system of pastoral work of Intellectual schools (curricular, extracurricular, out-of-school) along with the learning process contributes to the implementation of professional orientation of students, strengthening their health, to the development of intellectual abilities and creative potential; to the formation of confidence in their importance, in the fate of their country and its prosperity. The pastoral system, based on partnerships with family and community, includes all culture-building activities both inside and outside the school.
- **10.3.** In the organisation of the educational process, the priority role is given to learning as the main activity of students. Learning involves the use of **interactive teaching methods**, which are based on the organisation of learning experiences by the student himself/herself by showing initiative to search, to be active in discussing issues and arguing a point of view, to make a constructive decision.

The student's activity, both cognitively and socially, is not manifested in isolation, but in interaction with other students and with the teacher. A variety of interactive methods, both individually and in various combinations, create prerequisites for learning in cooperation of all participants, avoiding authoritarianism in relationships.

- **10.4.** Interactive teaching methods, as special forms of organisation of cognitive activity of students, contribute to the assimilation of educational information in the process of creative search, provide success for all participants in achieving the final results of joint activity. As a result, the cognitive process moves to a higher form of cooperation and collaboration, as everyone contributes to the final result, there is an active exchange of knowledge, ideas, and ways of activity.
- **10.5.** The use of interactive methods makes it possible to turn learning into a model of social communication of students in real creative activities instead of just communication in reproductive learning activities. Interactive methods, conventionally grouped into training, dialogue and reflexive methods, can be creatively used by the teacher taking into account the age characteristics of students and didactic possibilities of the content of a particular teaching material.
- **10.6.** Ensuring consistency in the development of students' **project** and **research activities** is one of the main principles of the organisation of the educational process in Intellectual schools. Purposefully developed abilities to design and scientific research activate independence, reveal intellectual potential, motivate students to set their own life goals and build a competent way to achieve these goals that do not contradict moral and ethical norms. Through project and research

activities, pupils acquire new knowledge not only within the framework of compulsory subjects, but also when organising their activities outside lessons. This kind of activity develops students' **critical thinking** and ability to navigate in the information space. During projects and research, students independently construct their knowledge, focus the process of scientific cognition on the need to assimilate and understand scientific knowledge and key scientific concepts, and mobilise all their knowledge and skills to solve real scientific problems.

- **10.7.** The project form of activity implies independent organisation of activity aimed at achieving the planned result. Students integrate different subject knowledge, skills, ICT skills and life experience in a meaningful way to realise the project. The process of designing and obtaining its final product involves students using a variety of forms of activity, referring to various sources of information, and making responsible choices. In organisational terms, students' project activities are carried out in the form of individual independent work, work in small groups, group projects, large social projects. In terms of content, students' project activities can have subject and interdisciplinary nature, be oriented to the use of both curricular and extracurricular material. Projects can be carried out not only in the form of educational project activities, but also in the form of pastoral project activities.
- **10.8.** When studying subjects of the science and mathematics cycle, students' project activities become **research-based**, which is clearly seen in lower secondary and upper secondary schools. Scientific research, organised according to the age-specific characteristics of students, becomes a crucial factor in the formation of general literacy. Research enables students to reflect and analyse, gather, and process facts, explain, and draw conclusions, understand the ethical dimensions of decisions, and evaluate the significance of findings for people and the environment.
- **10.9.** Functional literacy of students, formed on the basis of scientific research by means of science and mathematics disciplines, is projected on any studied educational area and type of activity, manifested in any situation in competent problem solving. Functional literacy enables students to realise the personal significance of the education they receive, to comprehend the positive role of education in their destiny, and to understand the need for lifelong learning.



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