# Slovak Republic

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## Introduction

### Overview of Education System

The national education system is decentralized into eight autonomous, self-governing regions (*samosprávny kraj*). Primary schools, preschools, and school facilities are administered by municipalities, while secondary schools are administered by self-governing regions.[1]

At the national level, the Ministry of Education, Research, Development and Youth (MŠVVaM) is the central body of the state administration of the Slovak Republic for elementary, secondary, and higher education; educational facilities; and lifelong learning; as well as the state's support for research, development, and youth. The Ministry also is responsible for developing educational concepts and a unified education policy, as well as for creating laws, general binding regulations, and documents related to education (e.g., curriculum documents).

In 2008, the National Council of the Slovak Republic approved Act No. 245/2008 (the Education Act), which addressed upbringing and education and defined the two-level system of education.[2] The act mandates that education in schools be conducted according to the State Education Program (*Štátny Vzdelávací Program*, or ŠVP) and the School Education Program (*Školský Vzdelávací Program*, or ŠkVP). The ŠVP defines the compulsory content of education in schools and delineates the general objectives and key competencies for education in Slovakia. It provides a framework for teaching plans and corresponding teaching standards at all school levels. The ŠkVP is a curricular document adapted for individual schools that describes how schools may attain the general objectives and content standards required by the ŠVP, considering specific regional and school conditions.

A new Innovated State Education Program (*Inovovaný Štátny Vzdelávací Program*, or iŠVP) was approved in 2015.[3] This program was introduced during the 2015–2016 academic year. The main changes are as follows: Education standards and instruction time were defined for each grade; more lessons were indicated in the curriculum for Slovak language and literature, mathematics, and science subjects (the basics of science [*Prvouka*] subject was reintroduced for Grades 1 and 2); and there was a distinct decrease in the number of optional lessons managed by schools themselves. All students participating in TIMSS 2023 were educated according to the iŠVP.

Principals manage primary and secondary schools and are primarily responsible for curricular implementation, the integration of professional and pedagogical standards into the

teaching process, the evaluation and ongoing education of teaching staff, budget management and effective use of school financial resources, and the first level of state administration for individual students (e.g., admission, exclusion, delay of enrollment, permission to follow an individual study plan). The principal collaborates with a school board, which functions as a public monitor and comprises pedagogical and nonpedagogical school employees, parents, students (at secondary schools), and representatives of the municipality or self-governing region.[4]

There are four main levels in the education system in Slovakia: preprimary, primary, secondary, and higher education.

Preprimary education (International Standard Classification of Education [ISCED] Level 0) is designed for children ages 3 to 5 and is provided by preschools (*materská škola*) and special preschools for children with special education needs. Preschools are founded mostly as independent institutions but can be associated with primary schools. Preschool education is not compulsory, but it is considered part of the education system and is organized according to official documents approved by the Ministry. Generally, it is provided on a fee-paying basis. The last year of preprimary education is free of charge, and since January 1, 2021, it has been compulsory for all 5-year-olds.

Compulsory education in the Slovak Republic lasts 10 years (ages 6 to 16) and consists of three stages. The first two stages comprise primary school (*základná škola*) in Grades 1 to 4 (ISCED Level 1) and Grades 5 to 9 (ISCED Level 2). The final year of compulsory education typically coincides with the first year of secondary school. Children from socially disadvantaged backgrounds (SDBs) who have not reached the development level necessary for primary school by age 6 have the option to attend an additional Grade 0. Students with special education needs may attend special primary schools.

After completing fifth grade, students with special talent in academic subjects or the arts may apply for enrollment in 8-year grammar or conservatory schools, both requiring entrance examinations. Nationwide Testing 5 (*Testovanie 5*) has been administered annually in Slovakia since 2015. Students are tested in mathematics, as well as the language of instruction (Slovak or Hungarian) and literature. In ninth grade, students take the annual national examination Testing 9 (*Testovanie 9*) in mathematics, as well as their language of instruction (in addition to Slovak if the student has studied in a minority language) and literature.[a] Students may then apply to secondary school, which may require them to pass an additional entrance examination.

Secondary education (ISCED Levels 2A and 3) is provided by three main types of schools: grammar schools (*gymnázium*), secondary specialized schools, and conservatories.

Grammar schools (*gymnázium*) provide general secondary education in 4-year, 5-year, and 8-year study programs. Bilingual grammar schools offer 5-year programs. Students may attend 8-year grammar schools after completing fifth grade (depending on their entrance examination results). The standard duration of grammar school programs is 4 years (for primary school leavers). Grammar schools offer academic courses in a variety of subjects and prepare students

a Both the Testing 5 and Testing 9 examinations were canceled in 2020 and 2021 due to the COVID-19 pandemic.

primarily to study at higher education institutions. Upon completion of general secondary education, students take a school leaving examination (*Maturita*), and if successful they receive a school leaving certificate that gives them access to higher education.

Secondary specialized schools (*stredná odborná škola*) prepare students not only for vocational occupations but also for higher education. The duration of programs culminating with school leaving examinations (*Maturita*) is 4 or 5 years. There are 3-year and 4-year programs leading to a certificate of apprenticeship, as well as 2-year and 3-year training programs leading to qualifications for trade workers and vocational occupations (mainly for low achievers who do not complete the primary education program). Conservatories (*konzervatórium*) offer 6-year (music, drama) and 8-year (dance) programs. Upon completion of these programs, students take a school leaving examination (*Maturita*) and may continue their studies in higher education or complete an additional 2 years of conservatory (postsecondary) to obtain an *absolutorium* diploma.

Depending on the type of secondary education completed, students may continue their studies in postsecondary education (ISCED 4), higher professional education (ISCED 5B), or university education (ISCED 5A). The tertiary level of education is provided only by universities in the Slovak Republic.

Special schools provide education using special education and training methods and accommodations for students with mental, sensory, or physical disabilities; students with dysphasia; students with multiple disabilities; and talented students. Special schools provide education from preschool to the secondary level. Special education and training also are provided for students with special needs in regular school classrooms or in special classes within regular schools with the assistance of specialized teachers. Special schools typically accept students on the recommendation of pedagogical, psychological, or specialized advisory centers.[5,6,7]

## Use and Impact of TIMSS

The National Institute of Education and Youth (NIVaM) (previously known as the National Institute for Certified Educational Measurements until July 1, 2022) publishes a short achievement report for the Slovak Republic that coincides with the release date of the international TIMSS report. This report follows national and short reports from the TIMSS 2003, 2007, 2011, 2015, and 2019 cycles published by the Slovak TIMSS team that contain detailed analysis of results from a Slovak point of view. The National Institute for Certified Educational Measurements also prepared textbooks in mathematics and science based on released items from previous TIMSS cycles (2007 and 2011) as an inspiration for schools.

## The Mathematics Curriculum in Primary and Lower Secondary Grades

The mathematics curriculum for Grades 1 to 4 is in accordance with the iŠVP for the domains of Mathematics and Information and Communications Technology (ICT) and contains topics in both subject areas. The mathematics educational content for ISCED 1 is structured into three content areas: natural numbers and algebraic calculations with natural numbers; geometry and measurement; and solving applied problems, and problems developing specific mathematical thinking. Exhibit 1 presents the mathematics topics and competencies of a student at the end of Grade 4 assessed in TIMSS 2023.

**Exhibit 1: Mathematics Content Areas and Competencies by the End of Grade 4[8]**

| Content Area | Competencies |
|---|---|
| Natural numbers and algebraic calculations with natural numbers | • read, write (including the expanded form in the decimal system), compare, arrange, and round natural numbers; mark a number on an axis<br>• add and subtract natural numbers (up to 10,000) mentally on paper and with a calculator<br>• multiply and divide natural numbers using a multiplication table up to 100<br>• know and use terms (addend, sum, minuend, subtrahend, difference, factor, product, dividend, divisor, fraction, multiple, odd numbers, even numbers)<br>• use commutativity of addition and multiplication<br>• identify fractions (propaedeutic level fraction, graphically)<br>• solve simple conceptual and applied problems using parentheses, solve simple equations, inequations<br>• understand numerical series<br>• know basic Roman numerals and numbers |
| Geometry and measurement | • recognize points, lines, and line segments; draw lines and line segments<br>• know units of measurement for length and apply and convert between them independently; measure the length of line segments; add, subtract, and multiply line segments; compare line segments based on length<br>• draw squares and rectangles on grid paper and determine vertices, sides, and pairs of adjacent sides<br>• enlarge and reduce geometrical plane figures on grid paper; construct triangles based on given side lengths, and determine vertices and sides |

**Exhibit 1: Mathematics Content Areas and Competencies by the End of Grade 4 (Continued)**

| Content Area | Competencies |
|---|---|
| Geometry and measurement | • calculate perimeter of squares, rectangles, and triangles by adding their sides (introductory)<br>• draw circles given center and distance and recognize their properties<br>• construct geometrical space figures using cubes according to a given plan and design a construction plan for geometrical space figures using cubes |
| Solving applied problems, and problems developing specific mathematical thinking | • create compound statements and decide if true (or false)<br>• collect, record, and interpret data in different ways<br>• work with a table and a bar chart (creation, orientation, and completion of data)<br>• solve appropriate problems using combinatorics and in area of financial literacy<br>• create or complete patterns with numbers, figures, or symbols based on a rule |

The mathematics curriculum for Grades 5 to 9 is in accordance with the iŠVP for the domains of Mathematics and ICT and contains topics in the two subject areas mathematics and information. Exhibit 2 presents the mathematics content areas and competencies of a student at the end of Grade 8 assessed in TIMSS 2023.

**Exhibit 2: Mathematics Content Areas and Competencies by the End of Grade 8[9]**

| Content Area | Competencies |
|---|---|
| Numbers, variables, and algebraic calculations with numbers | • use natural, integer, and rational numbers to depict real situations<br>• read, write, and compare natural, integer, and rational numbers; use, write, and read correlations of equality<br>• locate numbers on an axis<br>• know and use different ways to express relationships quantitatively (i.e., whole numbers and their parts—fractions, decimals, and percentages), solve conceptual and applied problems<br>• solve ratios by means of modeling and calculating, work with scale in maps and plans<br>• solve contextual problems in direct and inverse proportion, ratios and measures<br>• represent real situations mathematically using variables and determine their value |

**Exhibit 2: Mathematics Content Areas and Competencies by the End of Grade 8 (Continued)**

| Content Area | Competencies |
|---|---|
| Numbers, variables, and algebraic calculations with numbers | • represent real situations mathematically using equations and systems of equations and solve the equations<br>• formulate and solve problems applying knowledge of numbers and algebraic calculations |
| Variable, expression | • know addition, subtraction, multiplication, and division of numerical expressions and algebraic expressions containing variables<br>• solve word problems including true-false test<br>• solve an equation for a variable<br>• work in the Cartesian coordinate system |
| Geometry and measurement | • know, describe, name, draw, and construct basic plane figures; know their basic elements and properties and the fundamental relationships among their elements and properties (height, axis, diagonals)<br>• calculate perimeter and surface area of plane figures (triangle, quadrilateral, compound polygon, circle)<br>• identify relative position of a line with respect to a circle (chord, Thales's theorem)<br>• recognize, name, and describe basic geometrical space figures; find corresponding shapes in real life; identify their components (e.g., diagonals and relationships among edges); calculate surface area and volume of plane figures (cube, cuboid, cylinder)<br>• recognize and construct figures reflected across axes and points, understand simple geometrical transformations, know the basic properties of pairs of symmetrical figures and apply them to simple constructions<br>• know how to measure angles and calculate with angles, apply properties of known pairs of angles (e.g., supplementary, alternate, complementary) to calculate inner and outer angles of plane figures<br>• know measuring tools and units and use them independently to take practical measurements<br>• analyze and solve geometrical problems by applying acquired mathematical techniques |
| Probability, statistics | • read, collect, sort, organize, and graphically display data from a table<br>• calculate the average<br>• know and use basic terms from statistics, probability, and combinatorics<br>• solve contextual problems using combinatorics<br>• read and interpret data from a table, pie chart, and bar chart |

## The Science Curriculum in Primary and Lower Secondary Grades

The science curriculum for Grades 1 to 4 is in accordance with the iŠVP for the domain Nature and Society and contains topics in the two subject areas natural science (*Prírodoveda*) and basics of science (*Prvouka*). Exhibit 3 presents content areas of education by the end of Grade 4.

**Exhibit 3: Natural Science and Basics of Science Content Areas by the End of Grade 4[10,11]**

| Main Topic | Content Areas |
|---|---|
| Plants | • characteristics of plant life, the basic structure of plants (roots, stems, leaves, flowers, fruit), plant morphology and function<br>• germination, vegetative reproduction, conditions for plant growth (light, heat, water, air, soil), effects of water (hydrophilous and xerophilous plants) and light on plants, diversity of plants, pollinators, lifespan of plants (annual, biennial, and perennial plants), effects of environmental changes<br>• poisonous plants; edible, nonedible, and poisonous mushrooms; molds; yeast cells<br>• typical plants in meadows and forests; introduction to the systematic classification of plants; differences between meadows and fields; the most important field commodities and their uses; medicinal plants (collection, storage, application); the preparation of extracts (how to increase the solubility of compounds) |
| Animals | • reproduction and development (growth, maturity, death)<br>• animals hatched from eggs; life cycle of butterflies and birds; diversity in the animal kingdom; lifespan, growth, and development of various animal species<br>• various animal diets (herbivorous and carnivorous animals)<br>• significance of animal mobility<br>• various conditions for animal life, land and water animals (ways of life, flying land animals, animals living in soil), parasites<br>• typical species of animals living in water and on land (meadows, fields, forests) and their ways of life, introduction to the system of animals<br>• characteristics of animal life, similarities and differences among living organisms, and basics of the system of vertebrates; fishes; reptiles; birds; animal societies and their ways of life (ants, bees); household animals<br>• food chain and impact of its disruption |

**Exhibit 3: Natural Science and Basics of Science Content Areas by the End of Grade 4 (Continued)**

| Main Topic | Content Areas |
|---|---|
| Human beings | • food as a source of energy and building material for renewal of organisms, food with different nutrient contents, obesity, vitamins<br>• the digestive system and the process of digestion, poisons and drugs, water<br>• the excretory system<br>• the respiratory system and the process of breathing, the importance of oxygen, the synergy of respiratory and cardiac function<br>• the human skeleton, the importance of physical activity for health, the musculoskeletal system<br>• the importance of clean air, coughing and sneezing, droplet infection<br>• the importance of a proper lifestyle for supporting human body systems, bone fractures and healing, muscle development and exercise<br>• the cardiovascular system (the heart, the function and composition of blood, circulation, heartbeat, blood pressure)<br>• reproduction (conception, pregnancy, birth, development of a human being)<br>• functions of sensory organs (vision, hearing, taste, smell, touch)<br>• sound<br>• basics of a healthy lifestyle |
| Inorganic nature and exploration of natural events | • living organisms and inorganic nature (differences)<br>• water as an environment for life (animals and plants)<br>• changes in state of water from liquid to solid (freezing) and to gas (evaporation)<br>• water supply, drinking water, the significance of water in soil and air, the water cycle, water uptake and defecation by various organisms, drinking regimens<br>• seasons and periodic changes in nature, measuring time by repeating phenomena (e.g., hour, sunrise and sunset, day, year), pendulums, measuring time with a watch<br>• air, oxygen, carbon dioxide, airflow, wind, rainfall<br>• environmental temperature<br>• heat, temperature, thermometer, body temperature<br>• thermal conductivity of different types of materials (thermal insulators), heat distribution<br>• hydrologic cycle in nature, rain, snow, fog |

**Exhibit 3: Natural Science and Basics of Science Content Areas by the End of Grade 4 (Continued)**

| Main Topic | Content Areas |
|---|---|
| Inorganic nature and exploration of natural events | • melting, evaporation, solidification, solids, liquids, and gases; dissolution and melting<br>• floating and sinking objects in water, buoyancy of objects in water<br>• volume and weight (measurement)<br>• light sources, transmission of light (translucent and transparent materials), shadows, reflection of light<br>• simple devices (levers, inclined planes, pulleys, and gear wheels and their construction, uses, and principles of operation)<br>• deceleration and acceleration of falling objects<br>• magnet, magnetic field, compass<br>• changes of season, temperature changes during the year, the Sun as a source of light and heat<br>• the universe, planets, the solar system, stars; constellations<br>• Earth's rotation (day and night), Earth's axial tilt, Earth's revolution around the Sun (the seasons), conditions for life in the universe, space exploration<br>• electric energy and its importance, electric current, electric conductivity of materials (conductors and insulators), simple electric circuit[b] |

The science curriculum for Grades 5 to 8 is in accordance with the iŠVP for the domain Man and Nature and contains topics in the three subjects of biology, physics, and chemistry, as presented in Exhibits 4, 5, and 6.

b The electric energy content area is included in the subject technical education.

### Exhibit 4: Biology Content Areas by the End of Grade 8[12]

| Main Topic | Content Areas |
|---|---|
| Nature and life<br>Kingdoms of organisms<br>Life with humans and in human habitats<br>Living organisms and their bodily structure<br>The bodily structure of vertebrates | • understanding the relationship between organic and inorganic nature<br>• observation, experiment, magnifier, microscope, binocular<br>• living organisms and their importance in nature and for human life; forest, water, meadow, and field ecosystems and human habitats as living environments for organisms; familiar organisms and their defining characteristics, life processes, and food web relationships; prevention of and protection from harmful species<br>• the basic structure, functions, and life characteristics of plant and animal cells; unicellular and multicellular organisms; viruses, bacteria, fungi, and parasites<br>• the bodily structure of invertebrates and vertebrates, reproduction and development |
| Humans and the human body<br>Basic life processes of organisms<br>Heredity and changeability of organisms<br>The environment of organisms and human beings | • the basic structure and function of human organ systems (skin, skeleton, muscular, digestive, breathing, circulatory, excretory/urinary, reproductive), human development, illnesses<br>• basic first aid principles; activities of the human body as an integral system in terms of health and healthy lifestyle; alcoholism, obesity, smoking, psychoactive substances (addictions)<br>• photosynthesis<br>• genetics and heredity, DNA, chromosomes, crossbreeding, genetic disorders<br>• elements of the environment; environmental science; pollution of water, air, and soil, global environmental problems; protection of nature, protected species and areas; renewable sources of energy |

### Exhibit 5: Physics Content Areas by the End of Grade 8[13]

| Main Topic | Content Areas |
|---|---|
| Examining the properties of gases, liquids, and solids | • different and similar properties; measurement and units of length, volume, and weight |
| The behavior of objects in gases and liquids | • measuring and comparing volume and weight of buoyant, floating, and sinking objects in water and liquids of various densities; density and its units of measurement; determining density of various liquids through experimentation; observing the behavior of soap bubbles in air and gases of higher density than air; density of gases |

**Exhibit 5: Physics Content Areas by the End of Grade 8 (Continued)**

| Main Topic | Content Areas |
|---|---|
| Temperature; examining changes of state of matter | • time and temperature (measurement and units), constructing graphs showing the relationship of temperature and time<br>• examining changes of state of matter (e.g., liquid to gas through evaporation and boiling, boiling temperature, atmospheric pressure and boiling point; steam to water through condensation, measuring condensation point; modeling rain; melting and freezing), constructing graphs to display data collected, meteorological observations<br>• crystalline and amorphous materials |
| Heat | • receiving and transmitting heat by objects, heat conduction, constructing calorimeters from simple components, estimating and measuring final temperature after heat transmission between hot metals or hot water (copper, aluminum, iron) and cold water, difference in temperature (Δt), specific heat capacity, heat and its units of measurement (c, Q, J/kg°C, J, Q = c, m, Δt), determining the energy value of foods by fuel combustion<br>• heat combustion engines and its impact on the environment |

**Exhibit 6: Chemistry Content Areas by the End of Grade 8[14]**

| Main Topic | Content Areas |
|---|---|
| Substances and their properties | • chemical substances (sugar, salt, sand, water, glass, ethanol, etc.) and their properties (flammability, state, smell, odor, appearance, solubility), comparing the properties of substances<br>• homogeneous and heterogeneous mixtures (solutions, water, saturated mixtures)<br>• solvents and solutes, methods for separating components of mixtures (sedimentation, filtration, evaporation, distillation, crystallization)<br>• water and air (drinking and sewage water, water and air as mixture substances, pollution) |
| Transformation of substances | • observing chemical reactions<br>• the law of conservation of mass, combustion and flammable substances, reactants and products, chemical association and dissociation, heat transformation in chemical reactions, rate of chemical reactions and factors affecting the rate of chemical reactions |
| Composition of substances | • chemical elements (symbols) and compounds<br>• chemical formulas, particles of matter, atoms (electron shell and nucleus, protons, neutrons, electrons, atomic number), molecules, ions (cation and anion)<br>• chemical bonds (covalent and ionic)<br>• observing the properties of ionic/covalent and metallic substances |

**Exhibit 6: Chemistry Content Areas by the End of Grade 8 (Continued)**

| Main Topic | Content Areas |
|---|---|
| Major chemical elements and compounds | • the periodic table of the elements, groups and periods<br>• oxygen and its compounds (oxides), hydrogen and its compounds (acids, oxoacids, oxygen-free acids, acidic solutions)<br>• alkali metals and their compounds (hydroxides, alkaline solutions)<br>• salts (neutralization, pH, pH scale, pH indicators)<br>• oxidation and reduction, the oxidation-reduction reaction |

## Teacher Professional Development Requirements and Programs

New Act No. 138/2019 on pedagogical staff and professional employees took effect on September 1, 2019.[15]

In the Slovak Republic, there is no mandatory requirement for teachers to undertake professional development. Professional development activities that are undertaken in the context of school development plans are free of charge for teachers. Teachers are also given 5 working days to take courses that prepare them for the first and second certification examinations. The following types of professional development are available: adaptation programs, specialization programs, functional programs, updating programs, and innovation programs.

Professional development is provided by a range of different institutions, including higher education institutions and educational organizations within the MŠVVaM (e.g., NIVaM and the National Institute of Vocational Education[c]). Programs of professional development are accredited by the Accreditation Council, which is part of the MŠVVaM. The largest provider of professional development is NIVaM (previously known as The Methodology and Pedagogy Centre [MPC] until July 1, 2022 NIVaM),[d] which provides courses free of charge. The main role of NIVaM is to develop and provide in-service education and training to teachers. NIVaM's activities include providing continuing education for teaching and professional staff in schools and school facilities and preparing school leadership; providing expert methodological activities in the area of continuing education for teaching and professional staff; and carrying out research activities in the field of continuing education for teaching and professional staff.

Examples of educational programs include creating tasks to develop mathematical literacy, using reading strategies to support development of students' mathematical literacy in primary education, and project education in science subjects.

c See https://siov.sk/vzdelavanie/vzdelavacie-podujatia/ for more information.

d The Methodology and Pedagogy Centre and the National Institute for Certified Educational Measurements were separate institutions until July 1, 2022. After July 1, 2022, they merged (together with three other institutions) and became part of a single institution, NIVaM. See https://mpc-edu.sk/sk/edu/program/ for more information.

## Monitoring Student Progress in Mathematics and Science

Since 2005, students in ninth grade have been required to take a national examination, Testing 9 (*Testovanie 9*), which assesses students' abilities and knowledge in mathematics, as well as the language of instruction and literature. Students attending schools where instruction is delivered in minority languages are tested in Slovak language and literature as well. Examination results may provide decisive admission criteria for secondary schools.

Testing 5 (*Testovanie 5*), which is a nationwide test of Grade 5 students, has been administered in Slovakia since 2015. The test is compulsory for all students and covers mathematics, as well as the language of instruction (Slovak or Hungarian) and literature. The main objective of Testing 5 is to provide schools with feedback on how well students are prepared for the transition from ISCED 1 to ISCED 2 by assessing and monitoring student knowledge and skills at the national level at the end of ISCED 1 and beginning of ISCED 2.

The use of other standardized tests is not compulsory for schools, but most schools use some type of commercially prepared test.

The Education Act prescribes various forms of student assessment. Teachers conduct ongoing assessment of student performance using numeric grades (on a five-point scale), oral examinations, and a combination of the two. Up until fourth grade, assessment may exclusively consist of oral examinations. Continuous assessment is conducted throughout the school year and is based on observations, student activities, oral examinations, written examinations, and other assignments (e.g., projects). Twice per school year (at the end of January and the end of June), students receive assessment feedback with the final evaluation in June presented as a report card.

Students who pass all subjects advance to the next grade. Students who fail to complete or pass the end-of-year examination for up to two subjects may retake the examinations with permission by the school principal. If students pass the examinations the second time, they may advance to the next grade. Students who fail end-of-year examinations in more than two subjects or who fail examination retakes must repeat the grade.

## Special Initiatives in Mathematics and Science Education

In order to improve the quality of mathematics education in primary and secondary education, NIVaM issued a draft of *Framework for Improving the Quality of Mathematics Education in Primary and Secondary Education*. It was prepared by a work group consisting of teachers and members of several educational institutions. The main goals of this framework are making the education process more effective, improving the quality of mathematics education focused on developing mathematical thinking, and monitoring effective implementation of state educational programs and education standards from mathematics into school educational programs and the education process.[16]

MŠVVaM made a call for proposals titled "Reading, Mathematical and Science Literacy in Primary School" that was aimed to improve the quality of the education process and to improve the results of students in the areas of reading, mathematical literacy, and science literacy in primary schools. The call was open for primary schools in all regions of Slovakia. Most schools have started to implement educational activities related to the call for proposals since September 2019. The project ran for 12 to 24 months in selected schools between 2019 and 2021.[17]

NIVaM, universities, and other educational institutions also work on directing students to study natural science and mathematics. They organize various educational programs for students, such as Physics Live, Natural Science for Everyone, Young Scientists, and the AMAVET Festival of Science and Technology.

Students with a high interest in mathematics and natural science may participate in national competitions such as Olympiads (related to mathematics, physics, biology, etc.); Pytagorics (*Pytagoriáda*); Mathematical Kangaroo (*Matematický Klokan*); or correspondence seminars such as MAKS, Genius Logicus, PIKOFYZ, and PIKOMAT, among others.

To ensure the education and upbringing of children from SDBs, schools can modify certain conditions—namely, implementing preprimary education, establishing teaching assistant and pedagogical consultant positions, or introducing Grade 0—in order to (1) integrate children into the education system, (2) reduce the number of students per class, (3) apply whole-day education, and (4) enhance cooperation with the family. Education of students from SDBs is accomplished in standard classes (together with other students). If necessary, the school may launch an individual education program for a particular student in one or more teaching subjects.

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