Bulgaria

Kiril Bankov
Adriana Tafrova-Grigorova
Sofia University

Marina Mavrodieva
Center for Assessment in Preschool and School Education

Introduction

Overview of Education System

The Bulgarian education system is centralized. The Ministry of Education and Science, a specialized body of the Council of Ministers, is charged with determining and implementing a unified government policy in the fields of education and science. The main functions of the Ministry are to:

- Exercise control over all types of schools and kindergartens in the country
- Participate in forming the national strategy for the development of education
- Approve education documentation
- Manage the introduction of innovations and the supply of textbooks and manuals
- Define unified state education standards
- Establish, transform, and when necessary, close state and municipal schools
- Approve the establishment of private schools and kindergartens
- Appoint the heads of the Regional Divisions of Education

Each of Bulgaria's 28 administrative regions has a Regional Division of Education, a specialized body of the Ministry that administers the education system regionally. These offices plan, coordinate, and monitor the functioning of each region's schools and kindergartens. The heads of these offices appoint the school principals in the different regions.

Each municipality has education departments that implement local education policy. Municipal departments are the supporting and managing bodies for preschool education but have only a supporting role in primary through upper secondary education.

Schooling in Bulgaria begins at age 7 with primary education and is compulsory through age 16. Children may begin at age 6 with parental approval if they are deemed ready for school.

The school year begins in September, ends in June, and consists of 31 to 36 weeks, depending on level and grade.

Prior to the 2015 adoption of the new Public Education Act (effective August, 1 2016), the Bulgarian education system was organized into the following stages:[1]

- Kindergarten (International Standard Classification of Education [ISCED] Level 0) is for children ages 3 to 6 or 7. Prior to 2010, only one year of preprimary education was compulsory preparation for primary school. However, following a change in the Public Education Act in 2010, preprimary education is compulsory starting at age 5.[2] This regulation has been reaffirmed in the new Public Education Act.
- Basic Education comprises primary and lower secondary education:
  - Primary Education (ISCED Level 1), which includes Grades to 4, is for children ages 6 or 7 to 10 or 11.
  - Lower Secondary Education (ISCED Level 2) includes Grades 5 to 8. After completing Grade 7, students can apply for admission to specialized upper secondary schools or profiled classes (with additional instructional hours on specific subjects, such as foreign language or mathematics) in general schools. After completing Grade 8, students can apply for admission to specialized upper secondary vocational schools.
- Upper Secondary Education (ISCED Level 3) includes Grades 9 to 12.
- Post-Secondary Education includes universities and colleges. A bachelor's degree requires four years of study with an additional year or two for a master's degree. A doctoral degree requires three or four years of study beyond a master's degree.

The new Preschool and School Education Act approved a change in the structure of the Bulgarian education system, splitting upper secondary education (ISCED Level 3) into two stages—first (Grades 8 to 10) and second (Grades 11 to 12)—and leaving lower secondary education (ISCED Level 2) to comprise Grades 5 to 7.[3]

Secondary education comprises two distinct tracks: secondary general (comprehensive and profile) and vocational education. Students may complete secondary general or profile education at a secondary school, over five years. Students may complete secondary vocational education at a vocational training school within a five year training period.

Profile secondary schools offer additional lessons in certain profile subjects. In mathematics, for example, students in comprehensive schools that do not offer a mathematics profile study two academic hours of mathematics per week. (One academic hour is equivalent to 40 or 45 minutes.) In contrast, students in mathematics profile secondary schools may study up to nine academic hours of mathematics per week. The mathematics profile curriculum does not cover significantly more mathematics content than the compulsory curriculum, but students in mathematics profile secondary schools devote more time to mathematical exercises, experiments, and problem solving.

Because the assessed students in TIMSS 2019 were following the previous Public Education Act, this chapter focuses on the previous curricular content.

Use and Impact of TIMSS

Bulgaria participated in TIMSS 1995, TIMSS 1999, TIMSS 2003, and TIMSS 2007 at Grade 8. After skipping the TIMSS 2011 cycle, Bulgaria participated in TIMSS 2015 and TIMSS 2019 at Grade 4. Bulgaria has participated in the Progress in International Reading and Literacy Study (PIRLS) since its inception in 2001.

Another important study in which Bulgaria has participated every third year since 2001 is the Programme for International Student Assessment (PISA). PISA frameworks focus on the practical application of student knowledge, and study results have shown that education in Bulgaria is theoretically oriented with little practical application.

These international studies made it clear that mathematics and science education in Bulgaria were in need of modernization. According to the international reports from these studies, the school year in Bulgaria was one of the shortest among participating countries, and the average number of hours students spent studying mathematics and science yearly was comparatively lower than that of other countries. The new Preschool and School Education Act outlined the groundwork for education reform in Bulgaria by improving the quality of school education and student outcomes, and by ensuring students are well prepared when they enter the job market. [4]

Bulgaria's participation in TIMSS, PIRLS, and PISA, among other international educational studies, has also enabled its education professionals to develop expertise in assessment, evaluation, education research, and testing. Many publications, workshops, and media commentaries have discussed Bulgarian participation in TIMSS, and research activities connected with the achievement of Bulgarian students in TIMSS have been presented at conferences and meetings.

The Mathematics Curriculum in Primary and Lower Secondary Grades

The curriculum for all subjects in Bulgaria is centralized and determined by the Ministry of Education. There is a single curriculum for primary and lower secondary education, which are compulsory for all students. All students are required to study the same topics, at the same level of difficulty, with the same workload (study hours). From Grade 9, most subjects are taught at two levels. Level 1 covers knowledge basics and is intended for students who are not intending to pursue a career related to the subject. Although it generally covers the same topics as Level 1, Level 2 is taught in greater depth, includes additional topics, and requires more study hours. From Grade 9, students are required to choose one of the two levels for each subject, where possible. Although it does not happen often, students can move from one level to another within a particular subject.

The National Education Content Standards for all subjects were approved by the Ministry of Education. These standards outline what students are expected to know and be able to do by the end of each level of schooling (primary, lower secondary, and upper secondary). Instructional

programs for every subject were developed for each grade level, stipulating topics of study as well as skill objectives.

The main topics of the primary school mathematics curriculum (Grades 1 to 4) are natural numbers and geometrical figures. The curriculum includes a basic introduction to reading, using, and interpreting data from tables, graphs, and diagrams. Primary school students do not study fractions or decimals, except for ½, ⅓, ¼, and $\frac{1}{10}$ (i.e., the concept of division by two, three, four, and 10).

Exhibit 1 presents Mathematics content standards, expected learning outcomes, and core topics for students at the end of Grade 4, following the previous Public Education Act.

Exhibit 1: Mathematics Learning Outcomes at the End of Grade 4

Area of Content/Competency	Expected Learning Outcomes
Numbers	▪ Read and write natural numbers and know the decimal numbering system; compare and order natural numbers ▪ Add and subtract natural numbers ▪ Multiply and divide by one- and two-digit numbers; understand the connection between components of arithmetic operations ▪ Know the order of operations and the function of parentheses; solve numeric equations with up to three operations ▪ Know the Roman numeric system ▪ Understand the concept of fractions $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, and $\frac{1}{10}$
Geometrical Figures	▪ Know geometric shapes (straight and curved lines, rays, line segments, angles, triangles, rectangles, squares, circumference) and their elements ▪ Distinguish types of shapes (angles and triangles) ▪ Draw line segments by given length and angles by given degree measurement ▪ Draw triangles, squares, and rectangles on a square grid
Measurement	▪ Know units of measurement for length (millimeter, centimeter, meter, and kilometer), weight (gram, kilogram, ton), time (second, minute, hour, day, week, month, year, century), money (Bulgarian currency), and angles (degree), and how to convert units of measurement ▪ Know units of measurement for area (mm^2, cm^2, m^2, km^2, daa) ▪ Measure line segments and angles ▪ Convert uniform metric units ▪ Calculate perimeter of a triangle and a rectangle, and area of a rectangle
Modeling	▪ Use numerical expressions to build mathematical models for situations represented by "*n* more," "*n* less," "*n* times more," or "*n* times less" ▪ Model real world situations using mathematical equations (trade problems, and problems involving the perimeter and area of polygons) ▪ Analyze the content and interpret the results of solved problems ▪ Make educated guesses using organized real world data

In accordance with the national mathematics curriculum, students in Grades 5 and 6 study rational numbers, focusing on fractions and decimals in Grade 5 and negative numbers in Grade 6. In geometry, students in Grades 5 and 6 study the main properties of certain three-dimensional figures, as well as formulas for surface and volume and the area of a triangle. The curriculum includes reading, using, and interpreting data from tables, graphs, and diagrams.

Grade 7 is a milestone in the study of mathematics in Bulgaria. Students begin the study of algebra with the introduction of algebraic expressions, linear equations, and inequalities. They are given a formal, axiomatic introduction to the study of geometry and begin to study congruent triangles and the application of their properties.

The mathematics curriculum in Grade 8 covers the study of numbers, beginning with the introduction of irrational numbers and square roots; solving quadratic equations, using the set of real numbers; the basic idea of functions followed by the study of linear functions and $y = ax^2$; and solving simultaneous linear equations and inequalities. The geometry curriculum includes vectors and geometric transformations, as well as certain properties of angles connected with a circle.

Mathematics content standards, expected outcomes, and core topics for students in lower secondary grades can be found on the website of the Ministry of Education.[5]

The Science Curriculum in Primary and Lower Secondary Grades

The science curriculum in Grades 2 to 6 treats science as one general integrated subject. In Grade 2, science is known as the World Around Us, and in Grades 3 to 6, it is known as Man and Nature.

In Grade 4, Man and Nature is structured according to three distinct subject areas in physical, chemical, and biological modules. The main requirements for students in Grades 4 and 8 are summarized according to the National Education Content Standards following the previous Public Education Act, which are guiding and compulsory documents for all Bulgarian schools.

The science programs of study prescribe:

- Content fields, called content cores
- National attainment targets, or expected learning outcomes, by content field
- Science content by topic, concepts, context, activities, and interdisciplinary links
- Specific methods and forms of assessment
- Recommended teaching methods and guidelines

Exhibit 2 presents science content standards, expected outcomes, and core topics for students at the end of Grade 4 following the previous Public Education Act.

Exhibit 2: Science Learning Outcomes at the End of Grade 4

Area of Content/Competency	Expected Learning Outcomes
Substances, Bodies, and Organisms	▪ Distinguish substances by their properties and uses ▪ Differentiate nonliving things from living things by their characteristics ▪ Give examples of major groups of organisms living in water, in soil, and on land, and their adaptive characteristics ▪ Classify plants (e.g., trees, bushes, and grasses) and animals (e.g., mammals, birds, reptiles, fish, and insects) ▪ Know that the Earth is a planet in our solar system and the Sun is the main source of heat and light for the Earth
Phenomena and Processes in Nature	▪ Name the basic life processes in organisms: nutrition, movement, growth, and reproduction ▪ Give examples of the need for energy in living organisms, everyday life, and industry ▪ Explain where the energy for living things comes from and how it is used ▪ Identify the three water states and explore water state changes through heating and cooling ▪ Describe the motion of bodies and organisms (i.e., the movement of everyday things and animals in certain habitats, and forces that cause motion) ▪ Recognize the seasons and seasonal changes in nature
Man and Health	▪ Describe human organs and basic life processes in the human body ▪ Understand principles of hygiene and personal health (e.g., nutrition, infectious and noninfectious diseases, and general health) ▪ Identify human actions that can affect the balance of nature ▪ Recognize that disturbing the balance of nature can impact human health ▪ Identify possible courses of action for environmental protection ▪ Identify substances harmful to human health ▪ Identify common environmental pollutants
Observation, Experimentation, and Inquiry	▪ Share observations of living and nonliving things in the natural world (following a given plan or guidelines) ▪ Carry out simple experiments with objects, substances, and plants ▪ Measure the temperature of air, water, and the human body ▪ Compare sounds by their power and understand that very loud sounds can be harmful to people

In Grade 7, the science curriculum is split into three distinct subjects: Physics and Astronomy, Chemistry and Environmental Protection, and Biology and Health Education. Together, the World Around Us (Grade 2), Man and Nature (Grades 3 to 6), Physics and Astronomy, Chemistry and Environmental Protection, and Biology and Health Education (Grades 7 to 8) cover the core education domains of Natural Sciences and Ecology.

Geography is taught as a component of Geography and Economics, which is pertinent to the education domains of Social Sciences, Civic Education, and Religion.

Science (Physics and Astronomy, Chemistry and Environmental Protection, and Biology and Health Education) and Geography content standards, expected outcomes, and core topics for students in lower secondary grades can be found on the website of the Ministry of Education.[6]

Exhibit 3.1 (Physics and Astronomy), Exhibit 3.2 (Chemistry and Environmental Protection), and Exhibit 3.3 (Biology and Health Education) present science content standards, expected outcomes, and core topics for students at the end of Grade 8 following the previous Public Education Act.

Exhibit 3.1: Grade 8 Physics and Astronomy Topics

Area of Content/Competency	Topics
Movement and Forces	▪ Mechanical movement—Average and instantaneous velocity, acceleration, and linear motion laws ▪ Principles of mechanics—Gravitational force and weight, normal force, friction, applications of Newton's Second Law, and action and opposite reaction ▪ Mechanical work and energy—Mechanical work and power, kinetic and potential energy, and mechanical energy ▪ Equilibrium of objects, and simple machines—Stable and unstable equilibrium; center of gravity; and laws of the lever, the windlass, and the inclined plane ▪ Fluid mechanics—Common properties of liquids and gases, the application of Pascal's law, the formula for hydrostatic pressure to explain how hydraulic machines operate, and water and mercury manometers
Energy	▪ Thermal energy—Thermal motion, thermal equilibrium, internal energy and temperature, and Celsius to Kelvin temperature conversion ▪ Conservation of energy—Quantity of heat, heat transfer, first law of thermodynamics as a law of conservation of energy, and specific heat capacity ▪ Ideal gases—Isothermal, isobaric, and isochoric processes, and the ideal gas law ▪ State of matter changes—Boiling, condensation, melting and freezing, including everyday examples, and specific temperature of fusion and evaporation ▪ Heat engines—The calculation of the energy conversion efficiency of heat engines, the Otto cycle and ecological problems caused by internal combustion engines, and the evaluation of the thermal efficiency of heat engines and thermal pollution
Observation, Experimentation, and Inquiry	▪ Student skill objectives: ▪ Using information on mechanical and thermal processes from a variety of sources (e.g., tables, schemes, pictures, videos, and software) ▪ Performing observations and experiments ▪ Working with calorimeters, thermometers, scales, manometers, etc. ▪ Reporting results of measurements and calculating physical quantities

Exhibit 3.2: Grade 8 Chemistry and Environmental Protection Topics

Area of Content/Competency	Topics
Classification of Matter and Nomenclature	▪ Properties of matter—Common properties of metals and nonmetals, differences and similarities between metals of the alkaline group and nonmetals of the halogen group, and the relationship between the position of elements in the periodic table and their properties ▪ Classes of inorganic substances—Metals, nonmetals, oxides, hydroxides, and acids; the relationship between different classes of compounds
Structure and Properties of Chemical Substances	▪ Group IIA—Properties and biological importance of magnesium and calcium, calcium oxide, hydroxide, and carbonate ▪ Group VIA—Properties of sulfur, its oxides, sulfuric acid and sulfates, and acid rain, including its causes and impact on the environment ▪ Aluminum—Properties of aluminum and its compounds ▪ Aqueous solutions of acids, bases, and salts—Definition, ionization
Chemical Processes	▪ Behavior of metals—Activity series, redox processes and their applications, and oxidizing and reducing agents
Uses of Substances	▪ Organic substances—Examples of hydrocarbons and organic compounds containing oxygen, and their uses: methanol, ethanol, glycerol, acetone, and acetic acid; the composition of petroleum and natural gas; examples of plastics and their uses: polyethylene, polyvinyl chloride, and polystyrene; examples of chemical fibers and their uses: cotton, wool, silk, nylon, and polyester ▪ Organic substances in living organisms—Carbohydrates: glucose, sucrose, starch, and cellulose; the origin and properties of fats and oils; and the composition and biological role of proteins
Experimentation and Inquiry	Student skill objectives: ▪ Testing physical quantities and relationships (mass, amount of substance, molar mass, molar volume, and mass fraction) ▪ Planning simple chemistry experiments ▪ Performing experiments to identify sulfates, acids and bases, and calcium hydroxide ▪ Observing safety rules while carrying out experiments

Exhibit 3.3: Grade 8 Biology and Health Education Topics

Field of Content/Competency	Topics
Structure, Living Processes, and Classification of Organisms	The animal kingdom: ▪ Phylum–Chordates ▪ Superclass–Fish ▪ Class–Amphibians ▪ Class–Reptiles ▪ Class–Birds ▪ Class–Mammals
The Human Organism: Structure, Living Processes, and Hygiene	▪ The place of humans within the mammal class— ▪ Classification according to the following taxa: Order–Primates, Family–Hominids, Genus–Homo, Species–Homo Sapiens ▪ Listing distinctive features of homo sapiens in relation to the mammal class; recognizing humans as biosocial beings ▪ The human organism: Structural levels of organization—cells, tissues, organs, and organ systems ▪ Skin—Structure, functions, skin diseases, and hygiene ▪ Musculoskeletal system—Structure, functions, disorders and diseases, and a healthy balanced lifestyle (sports and tourism) ▪ Cardiovascular (circulatory) system—Structure, functions, blood composition, heart and vascular diseases and disorders, emergency help for severe bleeding, and risk of blood borne infections ▪ Digestive system—Structure, functions, healthy food and nutrition, digestive diseases and disorders, and risks of food, alcohol, and drug abuse on health ▪ Excretory system—Structure, functions, and disorders and diseases ▪ Respiratory system—Structure, functions, disorders and diseases, and the impact of air pollution, smoking, and narcotics on health ▪ Reproductive system—Female and male reproductive system, stages of embryogenesis, disorders and diseases, sexually transmitted infections, safe sex, and contraception ▪ Nervous system—Reflex, reflex arc, analyzations, organs (brain, spinal cord, and nerves), disorders and diseases, and risks of alcohol and drug abuse ▪ Endocrine system—The pituitary, thyroid, and adrenal glands, the pancreas, ovaries, and testes; the role of hormones in the regulation of physiological processes, and disorders and diseases
Organism and Habitat	▪ The interaction of organisms and their habitat ▪ Humans as organisms—The role of humans in the natural world, the negative consequences of certain human activities, the need for education about the natural world and the proper use of its resources, and the human role in the preservation of biodiversity
Observation, Experimentation, and Inquiry	Student skill objectives: ▪ Observing objects and phenomena in nature and the school laboratory ▪ Checking blood pressure (i.e., measurement and normal ranges) ▪ Performing first aid ▪ Rules of hygiene

Professional Development Requirements and Programs

In Bulgaria, there are five levels of postgraduate professional qualification for actively employed teachers in Bulgaria, the first level being the highest and the fifth the lowest. These qualifications are not mandated and can be completed at any time at the teacher's own discretion. The requirements for completing each level are nationally regulated. The qualifications are conferred by the Departments for In-Service Teacher Training, affiliated with three of Bulgaria's universities.

Several universities in Bulgaria have departments for professional development and enhancing teacher qualifications. These departments offer qualification courses and conduct qualification degree examinations for teachers. Teachers primarily receive professional development through periodic updates on pedagogical knowledge, new instructional methods, and the use of Information and Communications Technology (ICT) in education. Teachers may then take examinations to acquire professional qualification degrees, which lead to salary increases. Master's degree programs in general are designed for actively employed teachers as part of their ongoing professional development, but they also are open to applicants who are not actively teaching.

Teachers' continuous professional development is not regulated by the state, and professional development opportunities are limited once teachers enter the profession. Usually, they may attend one or two short term courses (one or two days each) during the school year on varying topics, such as teaching methods, student assessment, and specific subject content materials. Teachers rarely attend long term training courses, as they would have to take a temporary leave of absence (i.e., one term) to do so.

A 2016 ordinance regulates teachers' continuous professional development and expands the field for providing qualification courses and programs for teachers by allowing other educational and training institutions to offer such programs after being approved by the Ministry of Education.[7]

Monitoring Student Progress in Mathematics and Science

When the Law of Public Education (1991) was enacted, the need for a national assessment of the education system was identified as a priority in Bulgaria. Tasked with the development of national assessment standards, the Ministry of Education created the Center for Assessment in Preschool and School Education (CAPSE), the official national testing agency.

One of the main goals of the Program for Development of Education, Science, and Youth Policies in Bulgaria (2009–2013) was the development of a modern, effective, and objective evaluation system of the quality of education.[8] In 2010, the CAPSE administered a project called the Development of a System for the Evaluation of the Quality of General Education with the support of the European Social Fund. This project included the development of a strategy for the internal and external evaluation of the educational process and guiding principles of assessment.

Assessment throughout the education system is carried out both internally and externally. While internal assessments are administered by teachers, external assessments are administered

locally by school principals, regionally by Regional Divisions of Education, and nationally by the Ministry of Education. The regulations of the System of Evaluation in addition to school curricula stipulate the types of assessment to be used for each subject. Assessments may include oral, written, and/or practical examinations.

Designed to test academic subject knowledge, examinations may be administered to individual students, groups of students, or entire classes. The required number of examinations depends on the number of hours spent studying a particular subject. Subjects with only one hour of instruction time per week or every two weeks use an annual grade but no term grade.

Over the last few years, standardized national tests have become the leading form of external assessment. The results of these tests provide policymakers with indicators regarding the state of the education system as a whole. Student achievement is evaluated according to the objectives outlined in the curriculum for each grade and subject.

At the beginning of Grade 1, students are evaluated to determine their level of readiness for school. These results help teachers differentiate students' individual needs. An assessment at the end of Grade 1 is carried out using qualitative indicators only.

In Grades 2 to 12, student knowledge and skills are evaluated on a six point scale with five levels based on qualitative and quantitative indicators: Excellent (6), Very Good (5), Good (4), Fair (3), and Poor (2). Students complete their grade level if their annual grades average Fair (3) or higher. Term and annual grades reflect students' academic performance throughout the year. Upon completing Grade 4, students receive a certificate of completed primary education. After the change in the structure of the Bulgarian education system following the new Preschool and School Education Act, lower secondary education (ISCED Level 2) comprises Grades 5 to 7, and the certificate for completion of basic education is given after Grade 7.

In primary school, students who receive a final grade of Poor (2) in a subject still progress to the next grade level, during which teachers will work with them individually. After the adoption of the new Preschool and School Education Act in 2016, quantitative indicators for Grades 2 and 3 were replaced by qualitative indicators. In Grades 5 to 12, students who receive a grade of Poor (2) are required to pass a correction exam. Students who fail the exam must repeat the grade level.

The Ministry of Education has launched a program financing additional school hours for talented students as well as students falling behind. The aim of the project is to encourage all students to take an active role in their education.

During the 2006–2007 school year, national assessments based on the National Education Content Standards were introduced for all Grade 4 students in public and private schools in four subjects: Bulgarian Language and Literature, Mathematics, Man and Nature, and Man and Society. The Ministry of Education also conducts a national assessment of students in Grade 7 in the core subject areas of Bulgarian Language and Literature and Mathematics. These national examinations include optional additional modules that serve as admission exams for enrollment in specialized secondary schools upon completion of Grade 7.

During the 2007–2008 school year, national matriculation exams were introduced as a requirement for receiving a secondary education diploma. Students are required to take an exam in Bulgarian language and literature and another from among eight subjects: mathematics, geography, physics, chemistry, biology, history, philosophy, and foreign languages. In addition to conducting their own entrance exams, some colleges and universities offer admission based on national matriculation exam results. Students who wish to continue their education at an institute of higher education are required to pass the two compulsory matriculation exams to receive a diploma of completed secondary education.

Special Initiatives in Mathematics and Science Education

The Ministry of Education organizes various competitions in mathematics and science to meet the needs of students who have the capacity and motivation to study these subjects in greater depth. In addition to the National Olympiad, there are several other competitions in mathematics or science on the national or regional level during the school year.

Many schools organize extracurricular activities in mathematics and science to help students prepare for these competitions. In this way, schools foster the study of mathematics and science, and encourage students to pursue careers in mathematics, science, and technology.

The Ministry of Education offers training for talented students in mathematics and science in Grades 5 to 12, within the framework of the With Care for Each Pupil program, to prepare them for local, national, and international competitions. This training is offered in schools as an extracurricular activity, normally at the end of the regular school day or on the weekend. Two other modules of the program target the education needs of low achieving students and are designed to support learning and improve student outcomes.

Suggested Readings

Bankov, K. (2015). *Bulgaria: An overview*. In Trevor Corner (Ed.), Education in the European Union: Post-2003 Member States (pp. 8–25). Bloomsbury.

Tafrova-Grigorova, A. (2014). Education for enhancing scientific literacy. *Chemistry, 23*, 27-47.

Tafrova-Grigorova, A. (2013). Contemporary trends in school science education. *Bulgarian Journal of Science and Education Policy, 7,* 121–200.

National Statistical Institute. (2019). *Education in the Republic of Bulgaria 2019*. Retrieved from http://www.nsi.bg/sites/default/files/files/publications/education2019.pdf

References

[1] UNESCO. (2012). *International standard classification of education ISCED 2011*. Retrieved from http://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-isced-2011-en.pdf

[2] Public Education Act. (1991). Retrieved from https://www.mon.bg/upload/4057/zkn_narodnata_prosveta.pdf

[3] Pre-School and School Education Act. (2015). Retrieved from https://www.mon.bg/upload/18448/zkn_PedUchObrazovanie_291218.pdf

[4] Pre-School and School Education Act. (2015). Retrieved from https://www.mon.bg/upload/18448/zkn_PedUchObrazovanie_291218.pdf

[5] Ministry of Education and Science. (n.d.). *Curriculum archive.* Retrieved from https://www.mon.bg/bg/1688

[6] Ministry of Education and Science. (n.d.). *Curriculum archive.* Retrieved from https://www.mon.bg/bg/1688

[7] Ministry of Education and Science. (2016). *Ordinance No. 12 of September 2016 on status and professional development of teachers, directors, and other pedagogical specialists.* Retrieved from https://www.mon.bg/upload/4173/naredba_12_01.09.2016_prof_razvitie_uchiteli.pdf

[8] Ministry of Education and Science. (2009). *Program for development of education, science and youth policies in Bulgaria (2009–2013).* Retrieved from http://www.mon.bg/?h=downloadFile&fileId=2007