Poland

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Introduction

Overview of Education System

The Polish education system consists of preprimary education (*przedszkole*), primary school (Grades 1 to 8), secondary school (Grades 9 to 12/13), and postsecondary nontertiary school.[1,a] Institutions for children ages 0 to 3 are supervised by the Minister of Family, Labour and Social Policy. Preprimary education is available for children starting at age 3. From 2020 to 2023, the education system and higher education were managed by the Ministry of Education and Science. On January 1, 2024, the Ministry of Education and Science was divided into the Ministry of National Education and the Ministry of Science and Higher Education. Since December 2023, the education system has been managed by the Ministry of National Education, and higher education has been managed by the Ministry of Science and Higher Education. Parallel to the system of general education is a system of artistic education in Poland supervised by the Minister of Culture and National Heritage. Sports schools and sports championship schools, supervised by the Ministry of National Education, enroll children and young people who excel in sports. They include primary schools (International Standard Classification of Education [ISCED] 1 and 2) and general secondary schools (ISCED 3) that combine general education with an extended training program in one or more sports.

The education system combines centralized regulation and decentralized school administration, with important roles assumed by local governments and schools. Parliamentary acts and ministerial ordinances regulate key aspects of the system, such as the general structure, management and funding, core curricula, timetables, examinations and assessments, admissions, and remuneration rules and career advancement arrangements for teachers. Local governments and school principals have broad autonomy in establishing schools, school administration, hiring teachers, and influencing learning conditions and teacher professional development. Quality assurance responsibilities are divided among the Ministry of Education, heads of regional education authorities (*kurator oświaty*), and school principals. Some responsibilities at the school level also are granted to teaching councils (composed of all teachers), parent councils, school councils, or student government. The unified system of external examinations, operated by the Central Examination Board and Regional Examination

a See the Eurydice description of education in Poland for more detailed information: https://eurydice.eacea.ec.europa.eu/national-education-systems/poland/overview

Boards, also plays an important role in quality assurance, admissions, and certification. Schools are financed mainly by local governments, based on a central government subsidy adjusted for student and school characteristics. Nonpublic institutions are also eligible for public funding.

Over the last two decades, substantial structural education reforms have been introduced. Of particular significance are changes to the school starting age and changes to school structure. Until 2009, the school entry age was 7. Starting in September 2009, children could begin primary school at age 6 at the discretion of their parents. At the same time, the age of compulsory participation in 1-year preprimary education was lowered from 6 to 5. In September 2014, children born in the first 6 months of 2008 (half of the cohort) were required to start first grade, together with the large majority of 7-year-olds. The following year, all children commenced compulsory schooling in first grade at age 6. As a result, 6-year-olds constituted about half of all students in first grade in academic year 2014–2015 and more than 70% the following academic year. However, when a new government came into power in 2015, this reform was reversed; in September 2016, the starting age for compulsory education was raised from 5 to 6, and the school entry age was raised back to 7. In 2017, the new government decided to change the school structure. Six-year primary school (*szkoła podstawowa*) was replaced with an 8-year program that covered basic and lower secondary education, and 3-year lower secondary education (*gimnazjum*) was phased out. This change was legislated in 2016 and implemented in 2017. Education in primary school was extended from 6 to 8 years by integrating 2 years of the prereform 3-year lower secondary education. As a result, sixth graders continued their education in seventh and eighth grade, and lower secondary schools (Grades 7 to 9/*gimnazjum*) were phased out. More recent graduates of primary schools move directly to secondary schools (which have been extended by 1 year) and learn according to new curricula. Eight-year primary education includes two stages: Grades 1 to 3 (early school education) and Grades 4 to 8 (teaching by subject). At the end of Grade 8, students take a compulsory external examination.

Other key changes of the most recent reform included extending (upper) secondary education—general secondary education (*liceum ogólnokształcące*)—by 1 year to 4 years instead of 3, extending technical secondary education (*technikum*) to 5 years instead of 4, and introducing a new type of vocational school—two-stage sectoral school (*dwustopniowa branżowa szkoła*)—with Stage I sectoral vocational school replacing the previous basic vocational school (*zasadnicza szkoła zawodowa*). Additional changes in vocational education have focused on increasing involvement of employers in vocational education and training (VET). The reform also aimed to modernize vocational education by increasing the importance of dual vocational training and the cooperation of schools with employers and other business partners.

As of 2024, primary education is organized as a single-structure, 8-year program for students ages 7 to 15. Primary education is compulsory for all children beginning at the age of 7. Secondary education (typically for students ages 15 to 18, 19, or 20) consists of the following types of schools:

- 4-year general secondary school (general lyceum, *liceum ogólnokształcące*)
- 5-year technical secondary school (*technikum*)
- 3-year Stage I sectoral vocational school (*szkoła branżowa I stopnia*)
- 2-year Stage II sectoral vocational school (*szkoła branżowa II stopnia*)

Changes in school structure have been accompanied by introduction of the new core curricula and an adjusted central examination system—in particular, the Grade 8 examination that covers mathematics, Polish, and foreign language, which has replaced the examination after lower secondary school (previously taken in Grade 9 and that covered mathematics, sciences, Polish, history, and knowledge about society, as well as foreign languages). The central assessment at the end of Grade 6 was phased out.

Postsecondary schools offer programs of up to 2.5 years that lead to vocational qualifications. They are intended mainly for students ages 19 to 20/21 who have completed general upper secondary education and want to obtain vocational education. Higher education programs are offered in public or private institutions in accordance with the three-cycle Bologna degree structure. Higher education institutions (HEIs) in Poland are divided into public institutions (established by the State and represented by the competent authority or public administration body) and nonpublic institutions (established by natural persons or legal entities other than those administered by national or local authorities). In organizational terms, they are divided into university-type institutions (uczelnia akademicka), which conduct research activities and have been awarded a research grade/category (A+, A, or B+) in at least one discipline of science or fine arts; and nonuniversity institutions (uczelnia zawodowa), which offer programs responding to the needs of the socioeconomic environment and do not fulfill the criteria for a university-type HEI.

The school education reform has no implications for the higher education system. Adult education is affected insofar as it has been reorganized to fit into the new school education system.

The core curriculum defines curricular contents and aims, as well as knowledge, skills, and competencies that students are expected to acquire by the end of primary education and on which school curricula and textbooks are based. The core curriculum is also used as a framework for external examinations. TIMSS 2023 students were taught according to the new curriculum, which was adopted in 2017.[2] A separate regulation defines outline timetables, which list the minimum weekly number of hours to be allocated to subjects in individual grades.[3]

Pursuant to the national legislation, the school year starts on September 1 and ends on August 31 of the following year. Classes in an academic year run from the first working day of September until the first Friday after June 20. The school year is divided into two semesters that are separated by a winter break. The dates of the 2-week winter break are set between mid-January and the end of February and vary among the provinces. Summer break begins on the Saturday following the final day of classes and ends on August 31. Primary school students normally attend school 5 days a week (Monday through Friday). Each lesson typically lasts 45

minutes; however, in Grades 1 to 3, teachers determine the length of each lesson. Internal skill assessments are conducted by teachers, and external assessments are conducted by the Central Examination Board and Regional Examination Boards.[b] Each school adopts its own assessment system based on national legislation. Students are assessed by teachers throughout the school year. Students' learning achievements are assessed by a generalist teacher in Grades 1 to 3 and separately for each subject by subject teachers in Grades 5 to 8. Midyear (semester) and end-of-year marks are based on single marks given during a semester or year. Students in Grades 1 to 3 receive one end-of-year descriptive mark for educational activities and one end-of-year mark for behavior. In Grades 4 to 8, teachers typically use a marking scale of 1 to 6 to assess learning achievements (6: excellent, 5: very good, 4: good, 3: satisfactory, 2: acceptable, 1: unsatisfactory). The school statute may allow descriptive assessment to be used instead in Grade 4. There is a separate mark for behavior (conduct) according to the following scale: excellent, very good, good, acceptable, unacceptable, and inadmissible.

Promotion is automatic in Grades 1 to 3. A student may repeat a year only in exceptional cases justified by the student's level of development, achievements, or health. In Grades 4 to 8, students must receive a positive mark for each compulsory subject or class at the end of the school year to be promoted to the next grade. A student who has received up to two unsatisfactory marks may resit for an examination. In principle, a student who fails this additional attempt is not promoted to the next grade. However, the school teaching council may promote a student who has received an unsatisfactory mark in only one subject conditionally.

External examinations are carried out by the Central Examination Board and Regional Examination Boards. Before the change of school structure, all students took a compulsory external assessment at the end of primary education (after sixth grade). In the new system, the structure of school education requires all students in eighth grade to take a compulsory examination. This examination assesses the extent to which students meet the requirements set out in the national core curriculum. The examination covers Polish, mathematics, and foreign language.

The results of the examination are used, together with school marks and other achievements, in the recruitment process for secondary school. Graduates can take the matriculation examination (*egzamin maturalny*) at the end of upper secondary education. This examination certifies the achievement of knowledge and skills defined in the core curriculum and enables entrance to higher education. Higher education institutions use the results of the matriculation examination in a given subject or subjects as criteria in the admission process. Examinations have both written and oral parts. The compulsory examinations are Polish, mathematics, a foreign language, and a selected additional subject. Students in vocational tracks can take vocational examinations (officially termed "examinations confirming vocational qualifications") intended to evaluate the candidate's attainment of the required knowledge and skills covered

b See the Central Examination Board website for more details on the examination system: https://cke.gov.pl/en/

by a single qualification related to a given occupation. Adults also can sit for extramural examinations for different levels of education.

The Russian invasion of Ukraine has had a significant impact on Poland's education system in recent years. Many institutional solutions and policies have been implemented to facilitate the inclusion of Ukrainian students in the education system. However, the scale of migration has required significant effort from local governments, schools, teachers, and nongovernmental organizations (NGOs).

Use and Impact of TIMSS

Poland participated in several cycles of the TIMSS study (2011, 2015, 2019, and 2023). TIMSS national reports were published, and national events were organized to disseminate the results. Because of the lack of other representative data on students' performance in Grade 4, TIMSS data are an important resource for monitoring the quality of education in Poland. TIMSS assessments increased awareness of the strengths and weaknesses of mathematics and science education in primary schools. The results of TIMSS Home and Student Questionnaires were also used in discussions about issues such as school belonging, bullying, socioeconomic disadvantage, and homework activities.

The Mathematics Curriculum in Primary and Lower Secondary Grades

An overall framework for single-structure education is set by the national core curriculum for general education and outline timetables. The core curriculum defines general and specific requirements that determine the range of knowledge and skills students are expected to achieve. Each school is expected to follow the core curriculum. It is implemented through school programs that describe how to achieve the goals and content of education in individual subjects. The curricula and syllabi for subjects can be developed individually by teachers or in subject teams. More often, teachers choose or adapt curricula developed by other authors; typically, these curricula accompany the textbooks available on the market. A curriculum should be approved by the head of a school after consultation with the teaching council. Textbooks may support the implementation of the curriculum, and teachers may choose textbooks from a list approved by the Minister of Education (these textbooks are consistent with the core curriculum, and their list is published on the website of the Ministry of Education) or choose to use other educational resources or materials instead of textbooks.

Mathematics is a compulsory subject at all levels of education and in all types of schools. It is part of the curriculum for the first stage of education (Grades 1 to 3) and taught as a separate subject starting in Grade 4. Pursuant to the Regulation of the Minister of National Education of April 3, 2019, on framework teaching plans for public schools, the minimum weekly number of hours for mathematics in each of Grades 4 to 8 is 4 teaching hours per week. The curriculum for Grades 1 to 3 assumes education based on multifunctional activities

with functional, methodical, and content integration. The education process at this stage is integrated, not subject specific; consequently, national regulations do not specify how much time should be dedicated to mathematics education. In the core curriculum for Grades 1 to 3, the education goals, i.e., the general requirements of early school education, are described in relation to four areas of the child's development: physical, emotional, social, and cognitive. The area of cognitive development defines the following three math-specific skills and abilities:

- understand basic mathematical concepts and operations and apply them independently in various life situations; experience initial mathematization with the description of words, images, and symbols
- ask questions, notice problems, collect information needed to solve them, plan and organize activities, and solve problems
- read simple mathematical texts (e.g., word problems, puzzles, symbols)

The general goals of the student's development to be achieved at the end of early school education are the foundation for specific goals, described in the form of effects. The student is to achieve them by completing tasks that require multidirectional activity. This is determined by the learning outcomes listed in the core curriculum that are assigned to individual disciplines. In mathematics education, learning outcomes are divided into the following six areas of achievement (the number of learning outcomes are given in parentheses):

- understanding spatial relations and size features (3)
- understanding numbers and their properties (4)
- using numbers (4)
- reading mathematical texts (2)
- understanding geometric concepts (4)
- applying mathematics in real-life situations and in other areas of education (9)

Educational objectives (general requirements) are specified for Grades 4 to 8, and teaching content (specific requirements) is specified separately for Grades 4 to 6 and Grades 7 and 8 without separate objectives and content for each grade.

At the end of the second stage of primary education (Grades 4 to 8), the following educational objectives should be achieved (general requirements):

- arithmetic fluency (*sprawność rachunkowa*)
  - performing simple calculations by memory or through more difficult activities in writing and using these skills in practical situations
  - verifying and interpreting the results obtained and evaluating the solution
- use and creation of information
  - reading and interpreting data presented in various forms and their processing
  - interpreting and creating mathematical texts and graphical representation of data
  - using mathematical language to describe reasoning and results obtained

- use and interpretation of representation
  - using simple, well-known mathematical objects, interpreting mathematical concepts, and operating mathematical objects
  - choosing a mathematical model for a simple situation and building it in various contexts, including a practical context
- reasoning and argumentation
  - performing simple reasoning, providing arguments justifying the correctness of reasoning, and distinguishing between proof and example
  - seeing regularities, similarities, and analogies, and drawing conclusions based on them
  - using strategies resulting from the task content and creating strategies to solve the problem, including multistage solutions and those that require the ability to combine knowledge from different branches of mathematics

The expected learning outcomes for Grades 4 to 6 are grouped into 14 areas (number of specific learning outcomes in parentheses): natural numbers in the decimal position system (5), operations on natural numbers (17), integers (5), fractions and decimals (14), operations with fractions and decimals (9), algebra elements (2), lines and line sections (5), angles (6), polygons (8), shapes (5), geometry calculations (7), practical calculations (9), elements of descriptive statistics (2), and math word problems (7).

The Science Curriculum in Primary and Lower Secondary Grades

Science is a mandatory content area at all education levels and in all types of schools. The current core curriculum was introduced in 2017 as part of the reform of the education system. TIMSS 2023 students followed this core curriculum from the very beginning of their education.

The core curriculum lists objectives (general requirements) and content (detailed requirements). The content (detailed requirements) defines the abilities and knowledge to be mastered by means of operational verbs. Among these, verbs relating to lower-order thinking skills (e.g., describes, gives, lists) are predominant, but verbs relating to higher-order learning skills (e.g., recognizes, explains, evaluates) are also numerous. The amount of content (detailed requirements) is only slightly less than the number of lessons available, which makes the content in practice much more important in shaping textbooks and instruction.

Exhibit 1 presents the number of science classes per week by subject and grade.

Exhibit 1: Weekly Number of 45-Minute Science Classes by Subject and Grade

Subject	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Nature	2	—	—	—	—
Geography	—	1	1	2	1
Biology	—	1	1	2	1
Chemistry	—	—	—	2	1
Physics	—	—	—	2	2
Technics	1	1	1	—	—

In Grades 1 to 3, science is part of integrated teaching content and does not have a dedicated number of hours of instruction. General objectives distinguish four areas of development: physical, emotional, social, and cognitive. The area of cognitive development defines the following science skills and abilities: observe facts and natural, social, and economic phenomena; perform experiments; formulate conclusions and observations; and understand the relationship between components of the natural environment. The core curriculum identifies 30 learning outcomes related to the subject nature, grouped according to the following three achievement areas (with the number of learning outcomes in parentheses):

- understanding the natural environment (8)
- understanding human life functions, health protection, safety, and rest (15)
- understanding geographic space (7)

The core curriculum emphasizes the need to organize activities that support perceiving the natural environment and exploring it, learning the values and interrelationships of components of the natural environment, learning the values and norms that source a healthy ecosystem, and developing behaviors resulting from these values.

In Grade 4, science topics are integrated into one subject: nature (*przyroda*). Separate science subjects start in Grade 5 (biology and geography) and Grade 7 (chemistry and physics). In addition, the school subject technics is taught in Grades 4 to 6 and includes certain concepts and skills related to science.

The objectives (general requirements) of teaching nature in Grade 4 are divided into three sections: knowledge, skills, and attitudes.

- Knowledge includes the following objectives:
  - mastering the basic vocabulary of nature (biological and geographical, with elements of physical and chemical vocabulary)
  - understanding ways to conduct observations and orientation in the field
  - learning how to use plans and maps as sources of geographic information
  - understanding systems building the human body (bone, respiratory, digestive, blood, reproductive, nervous)
  - understanding natural and anthropogenic components of the environment; understanding simple relationships between these components; observing and

conducting simple scientific experiments, analyzing them, and associating the reason with the result; explaining (e.g., students explain how natural phenomena depend on the seasons); demonstrating knowledge of facts (e.g., students name body parts and internal organs of humans and animals) and practical knowledge (e.g., students know basic rules of healthy nutrition and basic threats in the world of plants and the world of animals, and actively participate in environmental protection in their local area)

- Skills include the following objectives:
  - conducting observations and measurements in the field, including the use of various aids (plan, map, magnifying glass, compass, tape measure, binoculars, etc.)
  - performing observations and experiments in accordance with instructions (verbal, textual, and graphic); properly documenting them and presenting results
  - analyzing, describing, comparing, classifying, and using various sources of information (e.g., personal observations, research, experiments, texts, maps, tables, photographs, films, information and communications technologies)
  - using acquired knowledge about the structure and hygiene of one's own body in everyday life
  - applying principles of caring for one's own health, including disease prevention
  - indicating the adaptation of organisms to the living environment and obtaining food
  - recognizing relationships between individual components of the natural environment, as well as between components of the environment and human activity
- Attitudes include the following objectives:
  - carefully observing natural phenomena, accurate and meticulous conducting of experiments, using instructions when taking measurements and conducting experiments, taking notes and processing the results
  - recognizing the multilateral value of nature in integral human development
  - responding appropriately to life-threatening dangers
  - improving the ability to care for one's own body and immediate surroundings
  - developing sensitivity to all manifestations of life
  - improving communication, cooperation, and action skills, as well as leadership skills
  - adopting attitudes of shared responsibility for the state of the natural environment through appropriate behavior in the natural environment; shared responsibility for the state of the immediate area; activities for the local environment; sensitivity to the beauty of nature, the order, and aesthetics of developing the immediate area; and conscious actions for environmental and nature protection

The content (detailed requirements) of teaching nature in Grade 4 is divided into seven areas (with the number of learning outcomes and examples in parentheses):

- Ways to Learn About Nature (6, e.g., student describes ways of exploring nature, distinguishing between an experiment and an observation)
- Orientation in the Field (11, e.g., student uses a plan and a large-scale map when planning a trip)

- Weather, Components of Weather, and Observation of Weather (8, e.g., student describes and compares characteristics of the weather in different seasons of the year)
- Me and My Body (6, e.g., student lists basic rules to protect the senses of sight and hearing)
- Me and My Surroundings (10, e.g., student provides rules of behavior and first aid in the event of bites, stings, and ingestion of or contact with poisonous plants)
- The Environment in My Neighborhood (13, e.g., student recognizes and names common organisms found in the area around school)
- Anthropogenic Environment and the Landscape in the Immediate Vicinity of the School (9, e.g., student describes the former landscape of the neighborhood based on, for example, family stories or old photographs)

For each subject, the core curriculum contains a commentary that specifies conditions and modalities of its implementation. The commentary on nature in Grade 4 shows an emphasis on outdoor activities, which includes trips outside of school (these trips need not be distant and may include, for example, a visit to the school playground, the road in front of the school, or a park). This subject has a practical focus on the neighboring environment that is also present in the learning outcomes for Grades 1 to 3.

In Grades 5 to 8, science is divided into four subjects: geography, biology, chemistry, and physics. For biology and geography, content is assigned to specific grades. The curriculum thoroughly describes the teaching objectives for each subject. Biology is described in terms of the following six objectives (general requirements):

- knowledge of biodiversity and basic biological phenomena and processes
- planning and carrying out observations and experiments; making conclusions based on results
- using information from an analysis of source materials
- reasoning and applying acquired knowledge to solve biological problems
- knowledge of the determinants of human health
- attitude toward nature and the environment

The expected learning outcomes for biology are organized under the following units (with the number of specific skills listed in the curriculum in parentheses):

- organization and chemistry of life (8)
- diversity of life (88)
- human body (65)
- homeostasis (4)
- genetics (11)
- evolution of life (3)

- ecology (9)
- threats to biodiversity (4)

Geography is described in terms of the following three objectives (general requirements):

- geographical knowledge
- skills and application of knowledge in practice
- formation of attitudes

The expected learning outcomes for geography are organized under the following units (with the number of specific skills listed in the curriculum in parentheses):

- map of Poland (4)
- landscapes of Poland (9)
- Earth's lands and oceans (3)
- landscapes of the world (7)
- movements of Earth (6)
- geographic coordinates (3)
- European geography (14)
- Poland's neighbors (7)
- Poland's natural environment in comparison to Europe (16)
- Poland's society and economy in comparison to Europe (17)
- relations between elements of the geographic environment on the example of selected regions of Poland (7)
- one's own region (8)
- "Little homeland" (5)
- selected problems and geographic regions of Asia (11)
- selected problems and geographic regions of Africa (8)
- selected problems and geographic regions of North and South America (9)
- selected problems and geographic regions of Australia and Oceania (2)
- geography of circumpolar areas (3)

Physics is described in terms of the following four objectives (general requirements):

- using physical concepts and quantities to describe phenomena and identifying examples of these in everyday life
- solving problems using physical laws and relationships
- planning and carrying out observations or experiments and drawing conclusions from their results
- using information from an analysis of source materials, including popular science texts

The expected learning outcomes for physics are organized under the following units (with the number of specific skills listed in the curriculum in parentheses):

- cross-cutting requirements (9)
- motion and forces (20)
- energy (5)
- thermal phenomena (12)
- properties of matter (12)
- electricity (20)
- magnetism (8)
- vibrational motion and waves (11)
- optics (16)

Chemistry is described in terms of the following three objectives (general requirements):

- acquiring, processing, and creating information
- reasoning and applying acquired knowledge to solve problems
- mastering practical activities

The expected learning outcomes for chemistry are organized under the following units (with the number of specific skills listed in the curriculum in parentheses):

- substances and their properties (10)
- the internal structure of matter (15)
- chemical reactions (7)
- oxygen, hydrogen, and their chemical compounds (10)
- water and aqueous solutions (7)
- hydroxides and acids (8)
- salt (6)
- carbon-hydrogen compounds, hydrocarbons (10)
- hydrocarbon derivatives (6)
- chemical substances of biological significance (10)

Teacher Professional Development Requirements and Programs

Professional development is a statutory duty of every teacher; thus, a teacher may not refuse to participate in professional development/in-service training activities related to the teacher's position. Teachers are required to develop their professional competence in line with the needs of their schools. Theoretical vocational subject and practical vocational training teachers should take training courses in 3-year cycles. For all teachers, participation in continuous professional development (CPD) activities is also a precondition for professional promotion, as the process includes an assessment of the teacher's professional achievements based on the implementation of a professional development plan. The CPD system includes three

levels: national-level (ministry responsible for school education) support for in-service teacher training institutions and teacher training projects; regional-level (provinces) support measures for teachers in the area of teaching methodology and to implement national-level teacher training projects; and local-level (local government units [LGUs]) support measures that focus on the development of the local school education system and on school development plans. In-service training is provided mainly by in-service teacher training institutions and higher education institutions.

Universities offer postgraduate courses for teachers seeking to teach additional subjects, and every province has a public in-service education center. Commercial education firms also offer shorter or longer courses. Teachers are required to participate in workshops at school devoted to issues such as formative assessment, personal development, cooperation with parents, and first aid. Some teachers also pursue postgraduate studies to earn qualifications that enable them to teach additional school subjects.

Monitoring Student Progress in Mathematics and Science

The performance and progress of students are assessed regularly by teachers throughout the school year. Students are assessed in each subject by their subject teachers. Teachers collect information on student achievement using a form based on the assessment system adopted in that particular school. Cumulative assessment results from the entire school year are considered in the end-of-term (midyear) and end-of-year assessments. In Grades 1 to 3, these summative assessments are descriptive in nature and address students' academic and social achievements, as well as their strengths and weaknesses. Polish law does not permit the use of conventional grades.

Starting in fourth grade, teachers assess student achievement based on a grading scale of 1 to 6. School grades and assessment criteria should be made available to students and their parents. Students take their first external examination in the final grade of primary school (Grade 8, modal age 15) and in general and technical education; their second examination (Matura) is taken at the end of secondary school (Grade 12, age 19).

The exam in Grade 8 covers Polish, mathematics, and foreign language. Results of the exam are used, together with school marks and other achievements, in the recruitment process for secondary schools. The law envisaged the final examination to include an additional subject of the student's choosing: biology, chemistry, physics, geography, or history. During the coronavirus pandemic, this idea was abandoned. In Grade 8, schools usually organize one or more mock examination. These are prepared by teachers or by publishers, who also provide a detailed analysis of the results.

The Matura examination assesses the extent to which students fulfill the requirements set for each subject in the national core curriculum. The Matura exam consists of oral and written components. The oral component includes compulsory exams in the Polish language and a modern foreign language. The written component consists of compulsory exams at the basic

level in the Polish language, mathematics, and a modern foreign language. Students should choose at least one additional subject (and may choose up to six subjects) for an exam at the extended level. The Matura exam has replaced entrance exams at higher education institutions where results of the Matura exam are the key admission criteria.

Special Initiatives in Mathematics and Science Education

Competitions have a prominent role in the education system. Achievements in competitions are recognized by the Ministry of National Education or regional education authorities. They can be listed in school-leaving certificates and are used for admission to higher levels of schooling.

Some Olympiads and competitions provide significant benefits to students who take the eighth-grade exams (at the end of primary school) and the high school–leaving exam (at the end of secondary school). A student who is a winner or finalist of a subject Olympiad or a winner of a provincial or supraprovincial subject competition organized in the field of one of the subjects covered by the eighth-grade examination or the secondary school–leaving examination, respectively, is exempt from a given examination in this subject. Exemption is equivalent to obtaining the highest result in the exam for a given subject. Achievements in certain Olympiads or competitions may facilitate admission to secondary schools for Grade 8 students and admission to universities for high school graduates. Recruitment points are calculated based on special achievements. The list of subject competitions conducted in the subject or subjects covered by the eighth-grade examination, entitling the winners and finalists of these competitions to be exempt from that subject's examination, is communicated by the Minister of Education and Science.

The Laboratories of the Future project is an educational initiative implemented by the Ministry of National Education in cooperation with the GovTech Center at the Chancellery of the Prime Minister. The mission of this project is to create a modern school where classes are conducted in an interesting way, engaging students and encouraging their talents and interests. The aim of the initiative is to support all primary schools in building future competencies among students in the so-called STEAM fields (science, technology, engineering, art, and mathematics). As part of Laboratories of the Future, school-governing bodies received financial support from the state worth over PLN 1 billion. As of September 1, 2022, almost 12,000 schools have been equipped with modern laboratories with 3D printers, virtual reality (VR) goggles, robots, microcontrollers, modern recording studios, and various types of technical equipment. The project is complemented by Mobile Laboratories of the Future. As part of the project, 16 buses with experts and laboratory equipment have visited students and teachers in primary schools since September 2022 to support the process of using these solutions in each voivodeship. Mobile Laboratories of the Future is implemented with the support of the Educational Research Institute, the Education Development Center, and the GovTech Center. Additionally, one of the basic directives of the state education policy in the 2023–2024 academic year is developing the skills of students and teachers using equipment purchased under the Laboratories of the Future program.

Polish schools actively engage in international science-related events such as Earth Day or Landscape Day. The Science Picnic is an event aiming to promote science. Around 200 institutions, including scientific organizations, universities, research institutes, museums, cultural institutions, foundations related to science, and science clubs, present their achievements and reveal behind-the-scenes aspects of their daily work. They present science to audiences of various ages in ways that are easily understood with the aid of experiments, demonstrations, and interactive exhibits.

The Copernicus Science Centre supports teachers by organizing teacher training workshops and activities, and by promoting science teaching and learning in Poland. It also develops programs for children and youth at all ages, such as the Young Explorer's Club program (comprising over 180 clubs and support for the development of smaller science centers across Poland). The 2022 edition was available onsite and online and consisted of workshops, panels, speeches, and postevent publications concerning climate change issues.

Several special initiatives are also initiated by Polish NGOs and research institutions. The Center for Citizenship Education (CCE) is the largest educational not-for-profit organization in Poland. The mission of CCE is to inspire school communities to adopt innovative teaching methods and introduce significant social issues to their work with students. CCE areas of activity include programs introducing active teaching methods and formative assessment, as well as global and environmental education programs (e.g., in 2022, the Global School program reached 5,000 teachers and 20,000 students). The Batory Foundation is an organization that supports initiatives aimed at increasing civic participation and strengthening citizens' sense of responsibility for the common good. Their priorities include supporting the development of NGOs and coalitions working to improve the quality of Polish democracy and expand international cooperation. The foundation also undertakes activities aimed at equalizing opportunities for young people from poor communities. The foundation hosts public debates and conferences, organizes seminars and workshops, issues publications, and runs social campaigns.

High-achieving students can apply for a variety of scholarships awarded by both state and local authorities, as well as by foundations and associations (e.g., the Good Network Foundation has databases of current scholarships, competitions, and internships, including more than 16,000 opportunities in Poland and abroad).

References

1 Kolanowska, E. (2021). *The system of education in Poland 2020*. Foundation for the Development of the Education System. https://doi.org/10.47050/66515222

2 Rozporządzenie Ministra Edukacji Narodowej z dnia 14 lutego 2017 r. w sprawie podstawy programowej wychowania przedszkolnego oraz oraz podstawy programowej kształcenia ogólnego dla szkoły podstawowej, w tym dla uczniów z niepełnosprawnością intelektualną w stopniu umiarkowanym lub znacznym, kształcenia ogólnego dla branżowej szkoły I stopnia, kształcenia ogólnego dla szkoły specjalnej przysposabiającej do pracy oraz kształcenia ogólnego dla szkoły policealnej (*Dziennik Ustaw* 2017, poz. 356) [Ordinance of the Minister of National Education of February 14, 2017, concerning the national curriculum for preprimary and general education in primary schools, including pupils with mental disabilities, general education for stage I sectoral vocational schools, general education for schools preparing for jobs and postsecondary general education] (*Journal of Laws of the Republic of Poland* 2017, item 356). (2017). Retrieved from https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=wdu20170000356

3 Rozporządzenie Ministra Edukacji Narodowej z dnia 3 kwietnia 2019 r. w sprawie ramowych planów nauczania dla publicznych szkół (*Dziennik Ustaw* 2019, poz. 639) [Ordinance of the Minister of National Education of April 3, 2019, on the outline timetables in public schools] (*Journal of Laws of the Republic of Poland* 2019, item 639). (2019). Retrieved from https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20190000639