Hungary

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Introduction

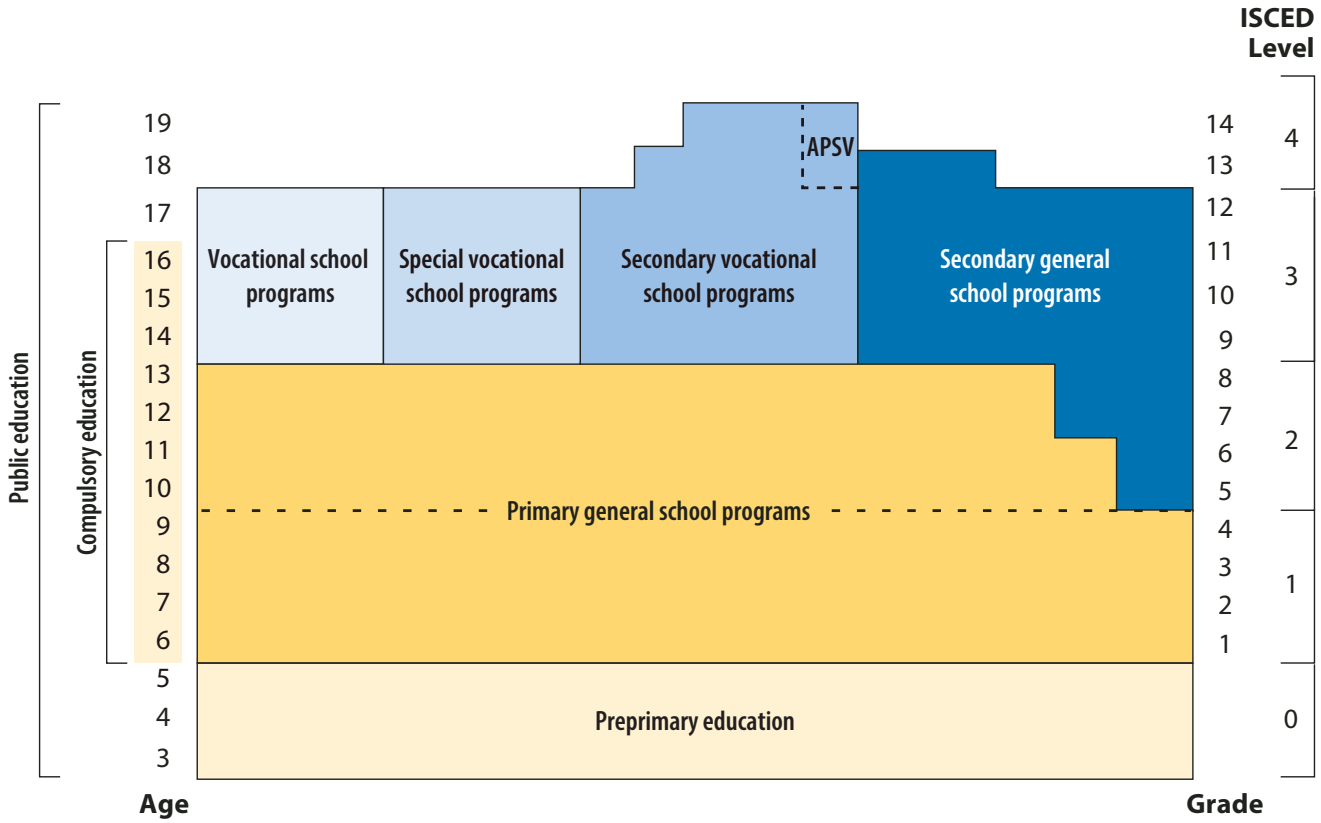
Overview of Education System

In Hungary, the state provides public education by establishing and operating institutions and by working with the church or private institutions through public education agreements. Local governments are responsible for the provision of preschool education. Besides state-provided education, there are schools maintained by the church and by private institutions. After 2013, the maintenance of municipal schools was taken over by a central state institution maintenance center, the Klebelsberg Centre, which organizes the maintenance of public education institutions through regional school district centers.

Central education governance is under the auspices of two ministries. Overall responsibility of public education lies with the Ministry of the Interior. Vocational education and higher education are within the competence of the Ministry of Culture and Innovation. The government is authorized to regulate the introduction and implementation of the national curriculum, which was last renewed in 2020; it renewed the previous curriculum, which was introduced in 2012. The renewed national curriculum was introduced in phases (e.g., in 2020 for Grades 1, 5, and 9 and for Grade 7 in secondary grammar schools that comprise six grades).

Exhibit 1 presents the structure of the Hungarian education system by age, grade, and International Standard Classification of Education (ISCED) level.

Exhibit 1: Structure of the Hungarian Public and Vocational Education System by Age, Grade, and ISCED Level



APSV = Accredited postsecondary vocational

Crèche (nursery) is a noncompulsory welfare institution serving children ages 20 weeks to 3 years; it provides professional day care and fosters child development. Since September 2015, preprimary education (kindergarten) has been required for children ages 3 to 6. Previously, enrollment had been mandatory at age 5, although children were generally enrolled in preprimary education at age 3. As of 2013, all children who turn 6 by August 31 become school mature on September 1 of that year. Even though as of 2013, a child becomes ineligible for compulsory preprimary education in the year they turn 6 by August 31, in justified cases, the child may—at the request of the parent and on the basis of a decision by the Educational Authority in favor of the request—attend kindergarten for an additional year of education.

Compulsory schooling lasts from ages 6 to 16. Most primary education (ISCED Levels 1 and 2) typically takes place in eight-grade schools (general school), including primary and lower secondary education. The primary school stage (Grades 1 to 4) corresponds to ISCED Level 1. Lower secondary education (Grades 5 to 8) corresponds to ISCED Level 2 (see Exhibit 1). Exceptions to this are the eight- and six-grade grammar schools: The former starts in fifth grade and the latter starts in seventh grade. The majority of students remain in general school for 8 years.

Upper secondary education (ISCED 3, typically for students ages 14 to 18, Grades 9 to 12) is provided by secondary grammar schools, secondary vocational schools, technicums, vocational schools, or vocational schools for students with special education needs. Secondary grammar schools provide general education and prepare students for the secondary school leaving examination, which is a prerequisite for admission to higher education.

There are two types of secondary vocational school programs: Secondary vocational schools provide general and prevocational education, prepare students for the secondary school leaving examination, and offer vocational postsecondary nontertiary programs (ISCED 4C); technicums provide quality vocational education combined with upper secondary general education, leading to the secondary school leaving examination and higher education. Technicums also provide the possibility to acquire technician qualification after 5-, or in some cases, 6-year training.

Vocational schools provide general, prevocational, and vocational education and may also provide remedial lower secondary general education for those who have not completed basic education. Students can continue their studies to acquire an upper secondary general school examination certificate after finishing their vocational program.

Higher education programs (ISCED 5A, 5B, 6) are offered by public or private universities and colleges. In accordance with the three-cycle Bologna degree structure, there are bachelor's degree programs lasting six to eight semesters (ISCED 5A, 180 to 240 European Credit Transfer System [ECTS] credits) that can be followed by master's degree programs (ISCED 5A, 60 to 120 ECTS credits) lasting another two to four semesters. The third cycle provides doctoral studies (ISCED 6). There are also continuous long programs (10 to 12 semesters, 300 to 360 ECTS credits, ISCED 5A) for some disciplines, such as medicine or law.[1]

Use and Impact of TIMSS

Hungary has participated in every TIMSS cycle and has performed well in each cycle. Despite this, TIMSS is not widely known in Hungary, appearing mainly in education publications; its media attention is moderate compared with, for example, the Programme for International Student Assessment (PISA).

Partly due to the impact of international large-scale studies, Hungary started to experiment with competency-based education programs and implemented the National Assessment of Basic Competencies (NABC) in 2001, an assessment system focusing on reading and mathematical literacy. As of the 2021–2022 academic year, students are required to take these assessments online with additional NABC assessments in science and foreign languages. The mathematics and science assessment frameworks for the NABC were influenced by the TIMSS assessment.

The Mathematics Curriculum in Primary and Lower Secondary Grades

According to Act CXC of 2011 on National Public Education,[2] the new national curriculum came into effect on September 1, 2013, implementing a spiral approach for Grades 1, 5, and 9. The National Core Curriculum (NAT) regulates the education process by specifying the content to be acquired for each subject and the skills to be developed. The Framework Curriculum is an intermediate regulator between local curricula and the NAT. It specifies the knowledge content to be acquired and the output requirements for each pedagogical phase (2-year cycle).

Exhibits 2 and 3 present the expected competencies to be acquired in mathematics by the end of Grades 4 and 8, according to the Framework Curriculum.[3]

Exhibit 2: Expected Mathematics Competencies by the End of Grade 4

Area	Expected Competencies
Methods of thinking and cognition	• sorting into sets based on various criteria • recognizing and describing common characteristics of elements in a set • deciding whether a given object belongs to a given set • interpreting changes in a simple text with mathematical content • ordering a few elements, finding all cases (by repeated trials)
Number theory, algebra	• reading and writing numbers (up to 10,000) • place values, digits, and real values (up to 10,000) • negative numbers in everyday life (temperature, debt) • fractions in everyday life: writing; expressing with words; modeling fractions with 2, 3, 4, 10, and 100 as the denominator with folding, cutting/shearing, drawing, and painting • comparing natural numbers up to 10,000 • recognizing the relationship between quantities in activities • applying correct and meaningful estimation and rounding in different fields of mathematics • mental calculations up to 100 • exact knowledge of multiplication charts up to 100 • calculation without calculators up to 10,000 in simple cases with numbers ending in 0 • sums, differences, products, and quotients • applying properties of operations, commutative property of addition and multiplication, and knowing and applying order of operations • adding and subtracting four-digit numbers, multiplying with two-digit numbers, and dividing with one-digit numbers in writing • checking of operations • word problems: interpreting text, collecting data, solution plans, estimation, verification, interpreting results • knowing concepts of multiples, divisors, and remainders

Exhibit 2: Expected Mathematics Competencies by the End of Grade 4 (Continued)

Area	Expected Competencies
Relationship, functions, sequences	• recognizing and following rules, recognizing and creating increasing and decreasing numerical sequences • finding relationships between terms of simple sequences • establishing a rule in simple form, continuing/complementing missing terms
Geometry	• recognizing relative position of intersecting and parallel lines • standard units of measurement: mm, km, ml, cl, hl, g, t, s • simple conversions between neighboring units • measuring length, distance, and time (simple examples in practice) • creation, recognition, and characteristics of triangles, squares, rectangles, and polygons • experimental knowledge of the concept of circle • understanding difference between solids and shapes • creation, recognition, and characteristics of cubes and cuboids • recognition of a sphere • creating figures with reflection, and reflection of symmetry by folding, cutting/shearing, drawing, and painting • the perimeter and area of squares and rectangles • measuring the area of squares and rectangles by different units, covering the area
Statistics, probability	• noting experimental data and entering it into a table, reading tables • collecting and recording data, reading diagrams • interpreting probability-based games, experiments; experimental knowledge of “certain,” “impossible,” and “possible but not certain”
Information technology	• using age-appropriate educational software with teacher assistance • using drawing software to create and paint simple drawings • cooperating using interactive whiteboard

Exhibit 3: Expected Mathematics Competencies by the End of Grade 8

Area	Expected Competencies
Methods of thinking and cognition	• sorting elements into sets • the truth content of simple statements, the logical value of statements, negotiation of statements • clear, accurate communication of statements, assumptions, choices, and interpreting simple texts with mathematical content • solving exercises in combinatorics by finding and listing all cases systematically • using binary trees in solving exercises

Exhibit 3: Expected Mathematics Competencies by the End of Grade 8 (Continued)

Area	Expected Competencies
Number theory, algebra	• exact calculation knowledge with rational numbers • knowledge and the reliable application of the order of operations and parentheses • estimating results, using estimation for checking, correct and meaningful rounding • measurement, the use of measurement units, and conversion • proportionality, inverse proportionality • basic concepts of percentage calculation, applying formulas in solving exercises • choosing the greatest common divisor and the least common positive multiple • prime numbers, composite numbers, and prime decomposition • the substitution value of simple algebraic integer expressions • adding, subtracting terms; multiplying polynomials with several terms by polynomials with one term • squaring, calculating square roots, exponentiation of integers with positive integer exponents • linear equations and inequalities with one variable • solving simple word problems from mathematics and use in everyday life with deduction and equations, verification, and representing the solution on a number line • using expressions and operations with them to solve exercises in mathematics, science, and everyday life • reasonable usage of calculator to make computation easier
Relationships, functions, sequences	• continuing sequences according to a known rule • the graphical representation of proportionality, applying knowledge about linear relationships in exercises in science • analyzing graphs according to the aspects previously studied, drawing graphs, and reading data from graphs • reading, interpreting data in a table; representing data using graphs
Geometry	• making figures and exact constructions based on geometrical knowledge • knowing characteristics of studied geometrical figures (the sum of the interior angles of the triangle and the quadrilateral) • symmetry properties of special quadrilaterals and applying them in solving exercises • reflection symmetry and point symmetry, translation by construction • recognizing reduction and enlargement in everyday situations (without construction) • the Pythagorean theorem and its application in calculations

Exhibit 3: Expected Mathematics Competencies by the End of Grade 8 (Continued)

Area	Expected Competencies
Geometry	• calculating the perimeter and area of triangles and special quadrilaterals and the circumference and area of circles • knowing the formula for the volume of previously studied three-dimensional shapes (triangular and rectangular right prisms, right circular cylinders) and calculating the volume of three-dimensional shapes used in everyday life
Statistics, probability	• probability experiments, noting the results, frequency, and calculation of relative frequency • understanding chance and probability in concrete calculation exercises, recognizing certain and impossible events
Other knowledge	• rational use of calculators in probability calculations • famous Hungarian mathematicians in history, their areas of research and findings

The Science Curriculum in Primary and Lower Secondary Grades

Exhibits 4 and 5 present the expected competencies developed in science to be acquired at the end of Grades 4 and 8, according to the Framework Curriculum.[4] In Grade 4, science is made up of integrated natural sciences, while in Grade 8, science comprises physics, chemistry, biology, and Earth and the environment.

Exhibit 4: Expected Science Competencies by the End of Grade 4

Subject	Expected Competencies
Integrated natural sciences	• applying the basic elements of a healthy lifestyle for health preservation, healthy development, and disease prevention • behaving responsibly and safely in emergency situations • measuring time and length, estimating time and length in everyday situations • engaging in planned observations of nature and studying simple experiments on natural phenomena • explaining the importance of a sustainable lifestyle by using examples, interpreting the role of tradition in building a harmonic connection with nature • demonstrating the organization levels of living creatures and connections of ecosystems, classifying living creatures • demonstrating a natural ecosystem • classifying materials according to their properties, uses, and effects and recognizing the most responsible uses and methods of disposal for them • locating Hungary geographically, knowing its main cultural and natural values • using information and communications technology with guidance to find information and solve problems

Exhibit 5: Expected Science Competencies by the End of Grade 8

Subject	Expected Competencies
Physics	• symbols and units of physical quantities (length, volume, mass, density, temperature, time, pressure, atmospheric pressure, force, weight, voltage, electric current), using equipment to measure those quantities, and converting familiar units • states of water, the role that changes in states of matter play in everyday life • features of sound and light, the physical processes of hearing and seeing sound and light, recognizing light and sound pollution in everyday life, the importance of ultrasound, how cameras and telescopes work, and the equipment of space exploration • energy sources used in households and traffic, the necessity of saving energy, and the concept of sustainable development • characterizing simple motions in traffic and everyday life, knowing the relationship between change in velocity and force, and using knowledge to explain how a vehicle's velocity changes • knowing the objects of the solar system, having knowledge about the structure of the universe, and understanding the difference between astrology and astronomy • weather phenomena and natural disasters, identifying human activities causing environmental pollution and nature damage • using knowledge of electric current when using household equipment, including its risks and dangers • using information and communications technology for collecting, ordering, and representing information about physics; representing measurement data on tables and graphs • explaining school experiments and making connections between classroom experiences and personal experiences of everyday physical phenomena
Chemistry	• scientific thinking: science results, knowledge, work of scientists, inventions • modeling as a scientific method, recognizing its boundaries; responsibly implementing simple chemical experiments, comparing results with previous experiences and knowledge; recognizing physical changes (change of state, dissolution, sieving, distillation, absorption) and distinguishing them from chemical changes • familiarity with the periodic table, computation in simple cases based on the number of substances and chemical equations • basic knowledge about metals and nonmetals important in everyday life, their compounds, usage, and biological effects • macromolecules of life and their most important properties

Exhibit 5: Expected Science Competencies by the End of Grade 8 (Continued)

Subject	Expected Competencies
Chemistry	• recognizing typical chemical changes and classifying them by given aspects • knowing that living and nonliving things are made up of atoms; the structures determine the properties; the conservation of mass, energy, and electric charge is always in effect; and these processes (usually) seek to use the minimum amount of energy
Biology	• understanding reasons for the formation of climate zones and the relationship between the composition of biomes and the environmental factors characterizing an area • knowing the dangers of global environmental damage, understanding that diversity and biodiversity are valuable • knowing and characterizing the most important species of ecosystems by appropriate algorithm, constructing the food chain from them • giving examples for the most common forms of interaction between organisms • describing the structure of ecosystems, the similarities and differences in their spatial arrangement; knowing the reasons for their diversity and change • distinguishing between grouping and classifying, knowing the basics of the biological system; knowing the typical kingdoms, phylum, and classes of living organisms based on their morphological characteristics and being able to locate them in the evolutionary system (up to class level) • understanding the relationship between the structure and function of cells, tissues, and organs; the relationship between cellular and organ systems' life processes • knowing the advantages and disadvantages of sexual and nonsexual reproduction, and their role in the survival of species and in maintaining the diversity of life on Earth • knowing the structure and basic functions of the human body, the difference between a male and a female, and the biological-psychological challenges of adolescence • knowing the causes of diseases, their prevention and recognition, and the most important rules of a healthy lifestyle and first aid; understanding the importance of screening tests • observing and investigating experiments individually or in groups, recording and reporting on findings; familiarity working with microscopes

Exhibit 5: Expected Science Competencies by the End of Grade 8 (Continued)

Subject	Expected Competencies
Earth and the environment	• having an overall, realistic picture of Earth and its geography (continents, oceans, landscapes, and economically important countries); having an overall knowledge of Hungary's continent, neighboring countries' geography, and social geography; perceiving the determinative role of geographical factors in lifestyle • recognizing the relationships and laws in the formation of geographical zones • giving examples for effects of socioeconomic processes causing environmental damage, local problems with global consequences • knowing the effects of the changing environment on humans • having a realistic picture of environmental conditions, data, and changes in time; knowing the basics of the timeline of Earth's history; being able to observe natural and socioeconomic phenomena; collecting and summarizing information from printed or electronic documents and highlighting important elements using digital knowledge; being able to describe climate zones, continents, countries, and typical landscapes by given aspects • using maps as a source of information, being able to link geographic and environmental content to topographic knowledge; using topographic knowledge to orient in geographical space and on maps and apply topographic knowledge when studying other subjects; being able to collaborate; developing a curiosity for expanding geographical knowledge individually later in life

Teacher Professional Development Requirements and Programs

Professional Development Requirements

The regulation on continuous professional development requires teachers to participate in in-service training from their seventh year of teaching until the year in which they reach the age of 55.[5] Teachers are expected to participate in at least 120-lesson-long professional development training every 7 years, which can be fulfilled with shorter trainings or by obtaining additional qualifications.

A teacher career model was implemented in 2013:[6] The first 2 years are a mandatory internship period that ends with a qualification exam consisting of a portfolio (comprising the teacher's professional record, lesson plans, and other materials), performance evaluation, and classroom observation. After the exam, the teacher moves to the Teacher I level and is required to pass an additional exam to move to the Teacher II level. There are two optional upper levels of the career ladder for experienced teachers: master and researcher teacher. The regulation of teachers' employment and the career model are being amended in 2023–2024. One of the main changes includes changing the Teacher II level to be optional.

Ongoing Professional Development Programs

There are multiple professional development possibilities provided by various actors (e.g., government institutions, universities, nonprofit and for-profit organizations). The Regional Pedagogical Centres of the Educational Authority organize multiple conferences for teachers. The organization Neteducatio organizes an annual conference called the Modern Pedagogical Conference, which covers topics from early childhood care to high school or vocational trainings.[a]

Monitoring Student Progress in Mathematics and Science

Act CXC of 2011 on National Public Education regulates student assessment methods.[7] Teachers regularly evaluate the performance and progress of students during the school year, and numerical marks are used at the end of the school year in the assessment and qualification of a student's knowledge. The marking system is as follows: excellent (5), good (4), average (3), sufficient (2), insufficient (1). A student may proceed to the next grade of school if the student has successfully completed the requirements by the end of the school year, i.e., has obtained at least a sufficient (2) mark in each subject. If a student obtains one or two insufficient (1) marks at the end of the school year, the student may take remedial examinations in these subjects before the start of the next school year.

The Educational Authority provides all educational institutions with a free evaluation kit for first-grade students called the Diagnostic Development System.[8] The evaluation kit is designed to measure students' social development and skills, elementary arithmetic, fine motor coordination for writing, and comprehension of and vocabulary for relationships.

Since the 2001–2002 academic year, Hungary has administered the NABC to examine student performance in mathematics and reading. Since 2004, all students in Grades 6, 8, and 10 have taken part. The assessment measures whether students can use their skills and knowledge to solve everyday situations and does not focus on textbook knowledge. The NABC benchmarks student performance along seven levels of competency. School-level results are published on a website 9 months after the assessment and are available to the public. Since the 2008 implementation of the assessment, it has been possible to keep track of individual student development from Grades 6 to 10. In 2022, the assessment method was changed from being paper based to being administered digitally. Assessment in science was also introduced in Grades 6, 8, and 10, and the previously separate foreign language assessment became a part of the NABC. As of 2023, students in Grades 4 to 11 are required to take the assessment, and two more measurement areas (history and digital culture) are in development.

Students can also take noncompulsory central entrance examinations for secondary schooling in mathematics and reading in Grades 4, 6, and 8 provided by the Educational Authority. The examinations in Grades 4 and 6 are part of the examinations used for entrance

a See https://neteducatio.hu/ for more information.

to secondary general schools starting from Grade 5 or 7. The results of the examination in Grade 8 are part of the examination used for entrance to most secondary schools.

Special Initiatives in Mathematics and Science Education

For science teachers in Grades 1 to 6, an online diagnostic evaluation and program to develop natural science knowledge is available and organized by the Educational Authority.[9] The purpose of this continuing education is to prepare teachers who teach science subjects (or who are interested in teaching them) to use eDia[b] (the online diagnostic evaluation) and eLea[c] (the online program to develop science knowledge). After processing the topics, the teacher is able to use the teacher module of the eDia system independently and compile online assessment and development tasks/tests. Teachers can interpret the assessment results and the problems that may be discovered for the implementation of online development.

The government-funded National Talent Programme project Matalent aims to identify and facilitate special development for students talented in mathematics. The program consists of a methodology established for identifying talented students in mathematics in Grade 4, along with accompanying test materials and analytical tools. Talented students are offered access to mathematics-related programs.

Suggested Reading

Eurydice. (n.d.). *Hungary. Overview*. Retrieved from https://eurydice.eacea.ec.europa.eu/national-education-systems/hungary/overview

Oktatási Hivatal [Educational Authority]. (n.d.). Retrieved from https://www.oktatas.hu/

Oktatási Hivatal [Educational Authority]. (n.d.). *A TIMSS mérésről* [About TIMSS]. Retrieved from https://www.oktatas.hu/kozneveles/meresek/timss

References

1 Eurydice. (n.d.). *Hungary. Overview: Key features of the education system*. Retrieved from https://eurydice.eacea.ec.europa.eu/national-education-systems/hungary/overview

2 *2011 évi CXC. törvény a nemzeti köznevelésről* [Act on National Public Education in Hungary]. (2011). Retrieved from https://net.jogtar.hu/jogszabaly?docid=a1200110.kor

3 Oktatási Hivatal [Educational Authority]. (n.d.). *A 2012-es NAT-hoz illeszkedő kerettantervek* [Framework curriculum for the 2012 NAT]. Retrieved from https://www.oktatas.hu/kozneveles/kerettantervek/2012_nat

b See https://pedagogus.edia.hu/ for more information.

c See https://edia.hu/elea/ for more information.

4 Oktatási Hivatal [Educational Authority]. (n.d.). *A 2012-es NAT-hoz illeszkedő kerettantervek* [Framework curriculum for the 2012 NAT]. Retrieved from https://www.oktatas.hu/kozneveles/kerettantervek/2012_nat

5 *277/1997. (XII. 22.) Korm. rendelet a pedagógus-továbbképzésről, a pedagógus-szakvizsgáról, valamint a továbbképzésben részt vevők juttatásairól és kedvezményeiről* [Government Decree 277/1997. (XII. 22.) on Teacher In-Service Training, Teacher Examination and on the Benefits and Reductions Provided for Participants in In-Service Training]. Retrieved from https://net.jogtar.hu/jogszabaly?docid=99700277.kor

6 *26/2013. (VIII. 30.) Korm. rendelet a pedagógusok előmeneteli rendszeréről és a közalkalmazottak jogállásáról szóló 1992. évi XXXIII. törvény köznevelési intézményekben történő végrehajtásáról* [Government Decree on the Promotion System of Teachers and the Status of Public Employees]. Retrieved from https://njt.hu/jogszabaly/2013-326-20-22

7 *2011 évi CXC. törvény a nemzeti köznevelésről* [Act on National Public Education in Hungary]. (2011). Retrieved from https://net.jogtar.hu/jogszabaly?docid=A1100190.TV

8 Oktatási Hivatal [Educational Authority]. (n.d.). *A Diagnosztikus fejlődésvizsgáló rendszerről* [About the diagnostic development system]. Retrieved from https://www.oktatas.hu/kozneveles/meresek/difer/difer_leiras

9 Oktatási Hivatal [Educational Authority]. (n.d.). *Online diagnostic evaluation and development of natural science knowledge for grades 1–6*. Retrieved from https://pedakkred.oh.gov.hu/PedAkkred/Catalogue/CatalogueDetails.aspx?Id=7212