

Netherlands

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Introduction

Overview of Education System

Dutch schools traditionally have significant autonomy. The Dutch education system is based on the principle of freedom of education, guaranteed by Article 23 of the Constitution.¹ Each resident of the Netherlands has the right to establish a school, determine the principles on which the school is based, and organize instruction in that school. Public and private schools (or school boards) may autonomously decide how and, to a large extent, when to teach the core objectives of the Dutch curriculum based on their religious, philosophical, or pedagogical views and principles.

The Ministry of Education, Culture, and Science is primarily responsible for the structure of the education system, school funding, school inspection, the quality of national examinations, and student support.² The administration and management of schools is decentralized and is carried out by individual school boards. Specifically, these boards are responsible for the implementation of the curriculum, personnel policy, student admission, and financial policy. A board can be responsible for one school or for a number of schools. The board for public schools consists of representatives of the municipality. The board for private schools often is formed by an association or foundation.

Two-thirds of schools at the primary level are privately run. The majority of private schools are Roman Catholic or Protestant, but there also are other religious schools and schools based on philosophical principles. The pedagogical approach of a small number of public and private schools is based on the ideas of educational reformers such as Maria Montessori, Helen Parkhurst, Peter Petersen, Célestin Freinet, and Rudolf Steiner. Almost all public and private school types are funded by the central government and, to some extent, by municipalities. A very small number of schools (offering primary and/or secondary education) are fully financed by parents.

The Dutch Inspectorate of Education makes visits at least once every four years to ascertain whether schools, both public and private, provide the expected quality of education.³ Schools not meeting quality standards are visited more frequently. The inspectorate can apply sanctions to very low performing schools; however, the final decision about whether a school should be closed is made by the Minister of Education, Culture, and Science. The findings from school inspection visits are reported to the individual schools, the government, and the public.

For children under age 4, there is almost no educational provision.⁴ There are day nurseries or *crèches* for children between 6 weeks and 4 years old. These nurseries are for working parents and do not have an academic function. In addition, there are “play groups,” which are open for a few hours per week for children ages 2 to 4. Some of these play groups offer educational stimulation programs (preschool), particularly in language development, for children with disadvantaged backgrounds.

Compulsory education begins on the first day of the month following a child’s fifth birthday and concludes either at the end of the school year of the student’s 16th birthday, when the student obtains an upper secondary education (International Standard Classification of Education [ISCED] 3) diploma, or at the end of the school year of the student’s 18th birthday.

In the Netherlands, preprimary (kindergarten) and primary education are offered together at one school. Most children begin preprimary education at age 4. On average, preprimary education lasts two years (depending on the child’s birthday and cognitive and social development) and has both a social and an academic function, although the basics of reading, writing, and mathematics usually are not taught until the first year of primary education. Together, preprimary and primary education consists of eight grades, so the majority of children are 12 years old when they begin secondary education.

Most secondary schools in the Netherlands offer different education tracks.⁵ For the first two or three years, secondary schools offer basic education in which students of similar abilities are grouped together in the same track, or they may offer “mixed basic education,” in which students of different abilities are grouped together. The main reason for grouping students of mixed abilities is to postpone the decision about which education track best fits the abilities of each student. After two (or three) years of basic education in secondary school, students enroll in one of the following three tracks:

- Prevocational secondary education (*VMBO*)—This track lasts two additional years after eighth grade, and offers four programs: basic vocational, middle management vocational, combined vocational and theoretical, and theoretical. After completing prevocational secondary education, students may continue with vocational secondary education (*MBO*), or if they finished the combined or theoretical program, senior general secondary education (*HAVO*).
- Senior general secondary education (*HAVO*)—This track lasts three years after eighth grade and offers general secondary education in four programs: science and technology, science and health, culture and society, and economics and society. Upon completion of a program, students can continue with preuniversity secondary education (*VWO*) or (higher) vocational education.
- Preuniversity secondary education (*VWO*)—This track lasts four years after eighth grade and offers the same four programs as senior general secondary education. Upon completion, students may continue to higher vocational education or a three-year bachelor’s degree program at a university.

Students who are not expected to complete their secondary education with a diploma but are able to attain a higher level of proficiency than students in special needs education often enroll in a program for practical training (*PRO*). These programs prepare students directly for the labor market. Students can participate in practical training until they are 18 years old.

Tertiary, or higher education, programs are divided into two types: higher vocational education programs and bachelor's degree programs. Higher vocational education programs lead to a four-year bachelor's degree. Bachelor's degree programs lead to a three-year degree, after which a master's degree can be earned in an additional one to three years.

Languages of Instruction

Dutch is the first official language in the Netherlands. Frisian, the second official language, is spoken by more than 350,000 people in the northern province of Friesland. Students receive instruction in their native language (Dutch) or in some schools also in Frisian. A minority of secondary schools offer Frisian as an optional final examination subject.⁶

Around 130 secondary schools offer bilingual education.⁷ This designation means that a minimum of 50 percent of the subjects offered at school is provided in another language—in most cases, English. In 2014, a five-year pilot program started offering bilingual education in 18 primary schools, with 30 percent to 50 percent of the total instruction in English. The study has been extended once and will now run until 2023.

Use and Impact of TIMSS

The Dutch government aims to be among the top five knowledge economies of the world. High quality education and well-educated students, especially in mathematics and science, are necessary to achieve this goal. This objective is one of the main reasons why the Netherlands is participating in large-scale international assessment studies, such as TIMSS, the Progress in International Reading Literacy Study (PIRLS), and the Programme for International Student Assessment (PISA).

After initially participating in IEA's First and Second International Mathematics Studies and First and Second International Science Studies, the Netherlands has participated in all TIMSS studies conducted to date: in 1995, Dutch students participated in Grades 3 and 4, Grades 7 and 8, and in the final year of secondary education; in 1999, students participated in Grade 8; in 2003, students participated in Grades 4 and 8; and in 2007, 2011, 2015, and 2019, students participated in Grade 4. The Netherlands also participated in TIMSS Advanced 2008 (Grade 12).

TIMSS results have been used by policymakers to make changes in education policy.⁸ A small decrease in reading and mathematics achievement in PIRLS and TIMSS from 1995 to 2007 in the Netherlands reinforced the policy at that time of focusing more on the basic subjects of reading and numeracy in primary and lower secondary education. This policy led to the introduction of the reference levels for these subjects in primary and lower secondary education in 2010.

PIRLS 2011 and TIMSS 2011 showed relatively very low percentages of students in the Netherlands reaching advanced benchmarks compared with other high achieving countries. These

results boosted the discussion of talented and high-achieving students and led to the introduction of several projects focused on developing talent in education.

The decrease in both mathematics and science achievement in TIMSS 2015 has not resulted yet in direct changes in education policy. However, the whole curriculum (core objectives) of primary education and the first two years of secondary education are currently under revision and will be updated (for example, by including 21st century skills) in the coming years. The revision is carried out by a large group of teachers and school principals with support from education specialists and curriculum developers.⁹

The Mathematics Curriculum in Primary and Lower Secondary Grades

The current mathematics curriculum for primary school comprises 11 core objectives.¹⁰ These objectives describe the desired results of the learning process but not the way in which they are to be achieved. In primary school, students should become familiar with mathematical basics, offered in a recognizable and meaningful context. Primary school students will gradually acquire familiarity with numbers, measurements, and two- and three-dimensional geometric shapes and solids, as well as the relationships and calculations that apply to them. Students will learn to use mathematical language while gaining mathematical literacy and calculation skills. By the end of primary school, students are taught how to:

- Use mathematical language
- Solve practical and formal mathematical problems and clearly demonstrate the process of finding a solution
- Identify different approaches for solving mathematical problems and learn to assess the reasonableness of solutions
- Understand the general structure and interrelationship of quantities, whole numbers, decimal numbers, percentages, and proportions, and use these to do arithmetic in practical situations
- Quickly carry out basic arithmetic calculations mentally, using whole numbers through 100, and learn the multiplication tables
- Count and calculate by estimation
- Add, subtract, multiply, and divide by taking advantage of number properties
- Add, subtract, multiply, and divide on paper
- Use a calculator with insight
- Solve simple geometrical problems
- Measure and calculate using units of time, money, length, area, volume, weight, speed, and temperature

In 2010, so-called reference levels, or benchmarks for language (Dutch and English) and numeracy, were introduced to help raise student achievement in primary and secondary education.

These levels describe the knowledge and skills students are expected to acquire at different stages in their school career. For numeracy in primary education, there are two important levels: the fundamental level (1F) and the advanced level (1S).¹¹ The achievement level of at least 85 percent of students by the end of primary school should be at level 1F.

For the first two years of secondary school, the mathematics curriculum comprises nine core objectives.¹² By the end of the first two years of secondary education (Grade 8), students should have been taught how to do the following:

- Use appropriate mathematical language to organize mathematical thinking, explain things to others, and understand explanations in the context of mathematics
- Recognize and use mathematics to solve problems in practical situations, both individually and in collaboration with others
- Establish a mathematical argument and distinguish it from opinion, learning to give and receive mathematical criticism and to respect other ways of thinking
- Recognize the structure and coherence of the systems of positive and negative numbers, decimal numbers, fractions, percentages, and proportions, and learn to work with these systems meaningfully in practical situations
- Make exact calculations, provide estimates, and demonstrate an understanding of accuracy, order of magnitude, and margin of error appropriate to a given situation
- Make measurements, recognize the structure and coherence of the metric system, and calculate with measurements in common applications
- Use informal notations, schematic representations, tables, diagrams, and formulas to understand connections between quantities and variables
- Work with two- and three-dimensional shapes and solids, make and interpret representations of these objects, and calculate and reason using their properties
- Learn to describe, order, and visualize data systematically, and to judge data, representations, and conclusions critically

For the first two years of secondary education, there are four “reference levels” for numeracy: two fundamental levels (2F and 3F) and two advanced levels (2S and 3S).¹³

The Science Curriculum in Primary and Lower Secondary Grades

In primary education, science is taught within the content area Personal and World Orientation. The curriculum in this area is organized to teach students to “orientate on themselves, on how people relate to each other, how they solve problems, and how they give meaning to their existence.”¹⁴ The educational content of personal and world orientation is presented as a coherent whole, and content from other learning areas is applied as much as possible. The seven core objectives for nature and technology and the science subcategory of Personal and World Orientation are as follows:

- Distinguish, name, and describe the roles and functions of common plants and animals
- Describe the structures of plants, animals, and humans, and the form and function of their parts
- Research material and physical phenomena, including light, sound, electricity, power, magnetism, and temperature
- Describe weather and climate in terms of temperature, precipitation, and wind
- Find connections between form, material composition, and function of common products
- Design, implement, and evaluate solutions to technical problems
- Describe the positions and motions of the Earth–Sun system that cause the seasons as well as night and day

In secondary school, science is taught under the core objectives of the content area Man and Nature.¹⁵ Students should be taught how to do the following:

- Transform questions arising from topics pertaining to the sciences, technology, and human health and welfare into research questions; carry out an investigation on a scientific topic and present the results
- Acquire knowledge about and insight into key concepts of living and nonliving things and connect these key concepts with situations from everyday life
- Describe how people, animals, and plants are related to each other and the environment, and how technological and scientific applications can have permanent positive or negative influences on these living systems
- Acquire knowledge about and insight into the nature of living and nonliving things, as well as their relationship to the environment, through experimentation
- Work with theories and models by investigating chemical and physical science phenomena, such as electricity, sound, light, movement, energy, and matter
- Acquire knowledge about technical products and systems through investigation, estimate the value of this knowledge, and design and construct a technical product
- Understand the essential structures and functions of human body systems, establish connections between these systems and the promotion of physical and psychological health, and take responsibility for one’s own health
- Care for oneself and others, one’s environment, one’s safety, and the safety of others

Professional Development Requirements and Programs

A variety of courses and other voluntary professional development activities are available for both primary and secondary school teachers. Professional development courses for teachers are offered by teacher education colleges, universities, or commercial institutes, as well as organizations offering education advice and support. In addition, teachers can participate in subject-related workshops or conferences. Many general and subject-specific digital journals, magazines, and newsletters also are available for teachers.

Monitoring Student Progress in Mathematics and Science

In addition to autonomously deciding how and, to a large extent, when to teach the core objectives of the Dutch curriculum, schools may decide when to assess students. Schools often use curriculum-embedded tests that correspond with the subject matter covered in their textbooks.

With the exception of a compulsory final summative test at the end of sixth grade, there are no national examinations during primary school. However, the use of a student monitoring system is compulsory. A majority of schools test their students regularly using tests developed by the National Institute for Educational Measurement (*CITO*). All sixth grade students are tested in the main subjects at the end of the school year (a policy introduced in the 2014–2015 school year). Schools can choose to use tests from a small number of test developers (including *CITO*), as long as the tests are officially approved by the government. The results of these tests indicate which education track might be appropriate for each student in secondary school, as well as the reference level students have reached. It is not the final summative test results, however, that determine the initial track of students in secondary school, but rather principal and teacher recommendations. Experts decide whether a student will need extra support in secondary school or should enroll in practical training (*PRO*) or special needs education.

Secondary education culminates with national examinations in each subject during the last month (usually around May) of the final year of education (Grades 10, 11, or 12, depending on the track). The content of these examinations depends on the track and the program of the student.

Student grade promotion policies are determined by individual schools, and in most cases are described in the School Guide. The Ministry of Education, Culture, and Science discourages retention based on the premise that retention will decrease student motivation and not necessarily address the student's learning difficulties. Over the last years, the rate of retention has decreased in most grades.¹⁶

Special Initiatives in Mathematics and Science Education

The *Platform Bèta Techniek* is an important initiative that encourages students to pursue a technical or science-related career, and involves schools, universities, businesses, ministries, municipalities, and regions.¹⁷ The initiative serves as a platform for the development of stimulation programs for primary, secondary, and tertiary education.

Partly as a result of the outcomes of PIRLS 2011 and TIMSS 2011 in the Netherlands, the focus of policymakers on high achieving students has increased in the last few years. A number of education institutions and schools received financial support for their plans to improve the education of talented students or to stimulate talent among students. The website www.talentstimuleren.nl initiated by the Ministry of Education, Culture, and Science is a platform where schools, teachers, parents, students, experts, and policymakers can find and share information about stimulating talent and high achieving students in primary, secondary, and tertiary education, and includes learning materials.¹⁸

Suggested Readings

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