Morocco

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Introduction

Overview of Education System

The Ministry of National Education, Preschool and Sports is Morocco's main official body responsible for providing education to all students at all levels of the public and private education system. The National Charter for Education and Training has recommended that education delivery be decentralized to increase responsiveness to local needs and realities.[1] Accordingly, Regional Academies of Education and Training in each of the 12 newly established administrative regions of Morocco have been charged with implementing the education policy adopted nationally. Regional directorates are in charge of providing services for education in their respective territories and implementing directives set nationally or by the regional academies.

The 2015–2030 national strategic vision laid out the Ministry's "priority measures," which are the foundation of the so-called integrated projects now being implemented.[2] The measures aim to do the following:

- improve the teaching of languages and reading, especially in the first four grades
- improve access to schooling in rural and underprivileged areas
- support students with disabilities
- support students with learning difficulties
- improve the quality of learning by renewing standards for teacher training
- encourage school life activities and school improvement plans
- improve equity and equal opportunities in the national system of assessment and examinations

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- renew students' orientation and information systems (i.e., for different options by the end of lower secondary and upper secondary school)
- establish good governance and mobilization around schools
- provide capacity-building of teachers, staff, and school leadership nationwide

The 2022–2026 road map that was recently developed by the Ministry aims to establish a new model for managing education reform.[3] It seeks to achieve three strategic goals by the year 2026: focusing on basic education, promoting openness and citizenship, and achieving compulsory education for both boys and girls. To achieve these goals, the road map revolves around 12 concrete commitments to make significant changes for the student, the teacher, and the educational institution.

Morocco's education system is divided into preprimary, primary, secondary, and tertiary education (see Exhibit 1).

Exhibit 1: Moroccan Education System

Education	School/Level	Grades	Ages	Number of Years	Notes
Preprimary	kindergarten	K1–K2	4–6	2	• prepares children for learning languages, mathematics, and common life skills • focuses on basic literacy and numeracy skills (to be generalized in the coming years)
Primary	primary school	1–6	6–12	6	• compulsory; certificate of primary school awarded on completion
Secondary	lower secondary	7–9	12–15	3	• certificate of secondary education awarded on completion
	higher secondary	10–12	15–18	3	• baccalaureate certificate awarded on completion
Tertiary (higher)	bachelor's	1–3	18–21	3	• bachelor's (license) degree awarded on completion
	master's		21–24	2	• master's degree awarded on completion
	doctorate			3–6	• after at least 3 years of research, a PhD awarded on completion
	engineering school		18–22	5	• engineering diploma awarded on completion

Use and Impact of TIMSS

The reliable, valid, and detailed data that TIMSS provides about Moroccan student achievement in mathematics and science have been beneficial to education reforms in Morocco. Equally important are TIMSS data on the education environment within which students learn these two subjects at the primary and lower secondary levels. TIMSS's international perspective provides Moroccan educators with deeper insight into ways to improve mathematics and science teaching further.

The National Center for Evaluation and Examinations (NCEE), in collaboration with the Regional Academies of Education and Training, organized a number of nationwide seminars. These seminars provided an opportunity to disseminate data on Moroccan students' achievement in mathematics and science (as well as reading) and identify the areas and skills needing further attention.

In light of Morocco's TIMSS results, the Ministry of National Education, Preschool and Sports has launched the Evaluation of Prerequisites program to nurture a culture of assessment in mathematics and science, and in particular to diagnose key competencies (and resources) students should master within the new science and mathematics curriculum. The new adapted syllabus for primary school reflects the content of TIMSS and PIRLS.

The Mathematics Curriculum in Primary and Lower Secondary Grades

In Morocco, a new primary school curriculum has been updated in line with the Ministry's 2015–2030 national strategic vision and in compliance with the 2022–2026 road map. The curriculum reflects the newly adopted competency-based approach, which emphasizes the need to train students to face the challenges of globalization and technological development.[4] Accordingly, as was the case with the 2004 mathematics and science curriculum, the new curriculum draws upon the tenets of competency- and value-based approaches, as well as the innovative active learning–oriented pedagogical model.[5]

The mathematics curriculum content for fourth and eighth grades reflects continuity between primary and secondary education, enabling students to strengthen previously learned concepts and skills while developing new ones (see Exhibit 2). Generally, the curriculum enables students to strengthen their mathematical reasoning. Specifically, the fourth-grade mathematics curriculum aims to enable students to do the following:[6]

- enjoy learning through practical and innovative activities
- gain confidence and competence in using numbers and number systems
- develop problem-solving abilities
- explore shape and space within a range of meaningful contexts
- develop measuring skills in a range of contexts

- develop insights into the importance of mathematics in a growing number of occupations and in daily life
- develop mathematical reasoning
- analyze data

The eighth-grade mathematics curriculum aims to enable students to do the following:

- acquire and apply knowledge and skills pertaining to numbers, measurement, space, and statistics necessary for use in everyday mathematical situations
- acquire mathematical knowledge and skills necessary for further mathematics studies
- develop the ability to make logical deductions and inductions through problem-solving
- acquire oral and written language skills to communicate mathematical ideas and arguments clearly
- develop a positive attitude toward, confidence in, and enjoyment of mathematics
- develop the ability to monitor and evaluate their own progress
- develop the skills necessary to plan and carry out projects

As of 2018, an adapted version of the mathematics syllabus has been implemented in the first, second, third, and fourth grades of primary schools. Among the main changes in this adapted syllabus are the following:

- supplementing the program with additional skills, such as analyzing and interpreting data and graphs
- adding a chapter about fractions
- linking mathematics problems with problems students encounter in daily life
- having more focus on applying inferences and deduction
- introducing mobile applications in mathematics and science
- encouraging the use of digital resources in instruction

Exhibit 2: The Mathematics Curriculum in Primary and Lower Secondary Grades

Grade Level	Unit	Lessons
Primary	Numbers and Arithmetic	• numbers from 0 to 999,999 • calculation of natural integers • addition, subtraction, multiplication, division • mental and rapid arithmetic • dividing by a one-digit number • proportionality • the concept of division (multiples and divisors) • decimal numbers (presenting, reading, writing, comparing, and arranging) • calculations on decimal numbers • fractional numbers

Exhibit 2: The Mathematics Curriculum in Primary and Lower Secondary Grades (Continued)

Grade Level	Unit	Lessons
Primary	Measurement	• measurement of lengths and masses • calculating the perimeter of a square, rectangle, and triangle • capacity • the meter, kilogram, and liter and their multiples and parts • measuring areas: square meters, parts, and multiples • time: days, hours, and periods • money
	Engineering and Space	• basic geometric shapes • engineering constructions • parallelism and orthogonality • parallelograms, rectangles • axial symmetry and axis symmetry shape • shifting, enlarging, and reducing shapes • solids
Lower secondary	Numeric Activities	• the numerical sets N, Z, Q, and R • the four operations on these sets • equations and inequalities • numeric powers • order and operations • two-equation systems
	Geometric Activities	• fundamental concepts • triangles • lines in a triangle • transformations in a plane • trigonometry • circle • vectors • Thales's theorem • the Pythagorean theorem • geometry in a space • volume calculations • isometric triangles • similar triangles • analytic geometry

Exhibit 2: The Mathematics Curriculum in Primary and Lower Secondary Grades (Continued)

Grade Level	Unit	Lessons
Lower secondary	Graphics and Statistics	• number lines • coordinates • proportionality • statistics • linear and affine functions

The Science Curriculum in Primary and Lower Secondary Grades

Just as for mathematics, the science curriculum content for fourth and eighth grades reflects continuity between primary and secondary education, enabling students to strengthen previously learned concepts and skills while developing new ones (see Exhibit 3).

The goals of the fourth-grade science curriculum are as follows:[7]

- build upon interest in and stimulate curiosity about the environment through high-quality science learning experiences
- gain deeper personal insights into the natural world and in turn aesthetic appreciation of it
- develop skills, attitudes, and values related to scientific inquiry
- develop the ability to use scientific knowledge and methods in making personal decisions
- develop full understanding of the influence of science and technology on the environment and students' lives
- develop awareness of the importance of preserving the environment and sustainable development

Within the framework of implementing guidelines outlined in the *National Strategy for Sustainable Development*,[b] efforts have been made while revising the fourth-grade science curriculum (the scientific activity subject) to integrate a number of topics, skills, and values related to the goals of sustainable development into the academic program.

Efforts are also being made, in accordance with Article Three of Framework Law 51.17, to encourage the values of genius, excellence, innovation, and development of learners' personal abilities.[8] In this respect, the science curriculum seeks to keep up with developments in various fields of science technology and knowledge. This is done by focusing on teaching science, technology, engineering, and mathematics (STEM) in an integrative and integrated manner. The integration of these four subjects into one coherent project-based education is intended

b The *National Strategy for Sustainable Development* is a strategic reference document that aims to strengthen all public policies with an eye toward sustainable development and correct institutional and organizational imbalances associated with them. Through this strategy, the Moroccan government aspires to achieve a transition toward a green and comprehensive economy by 2030 in line with the strong royal vision to make Morocco among the greenest and lowest carbon platforms in the world.

to enable learners to utilize the knowledge and skills acquired in STEM to design and create projects that contribute to solving economic and environmental problems they face in real life.

The eighth-grade science curriculum is designed to enable students to gain awareness and understanding of the skills needed in science. The distinguishing feature of the syllabus for this grade is that it focuses equally on the acquisition of scientific knowledge and thinking processes.

There was a recent change in the units covered in the lower secondary grades to the order of the content as follows: physics, life sciences, earth and space sciences, and technology.

Exhibit 3: The Science Curriculum in Primary and Lower Secondary Grades

Grade Level	Unit	Lessons
Primary	Gases	• air
		• other gases
		• common properties of gases
	Nutrition	• meals
		• introduction to the digestion process
		• the concept of the digestive tube
	Heat	• heat exchange
		• dilatation
	Status Changes	• from solid to liquid
		• from liquid to gas
	Life Cycle	• life cycle of a plant
		• animal life cycle (insect breeding)
	Classification of Animals	• classification of vertebrate animals
	Plants	• development of a flower to a fruit
	Water and Nature	• the use of water by humans
		• water pollution
		• awareness of the importance of water conservation
		• living things in nature
	Electricity	• simple circuits
		• simple circuit elements
		• simple circuit installation
		• simple circuit representation
		• installation in series
		• installation in parallel

Exhibit 3: The Science Curriculum in Primary and Lower Secondary Grades (Continued)

Grade Level	Unit	Lessons
Lower secondary	Life and Earth Sciences	• plate tectonics theory • relationship between the theory of plate tectonics and internal geological phenomena • animal reproduction • plants: sexual reproduction • plants: asexual reproduction • human reproduction • heredity in humans
	Physics and Chemistry	• the air around us • matter and environment • properties of air and its constituents • molecules and atoms • chemical reactions • natural and synthetic materials • air pollution • the light that surrounds us • light and images • light sources and receptors • light and colors: light scattering • light propagation • applications of rectilinear light propagation • thin lenses • applications: study of some optical devices • the sinusoidal alternating electric current • domestic electrical installation

Teacher Professional Development Requirements and Programs

The National Charter for Education and Training prioritizes professional development for teachers and school administrators. To cater to this, in addition to initial training, the Ministry of National Education, Preschool and Sports provides professional development programs at the Regional Centers for Education and Training Professions (which are under the supervision of the Regional Academies of Education and Training and provide initial and in-service training for teachers and administrative staff) in the 12 regions of the country. In this respect, the Ministry, in close collaboration with these centers, is making significant efforts to strengthen the skills of teaching and administrative staff in the 12 regions.

The Ministry establishes national policies, sets training standards, and oversees the implementation of professional development programs, while the regional centers provide

initial and continuing training programs targeting all education and administrative executives operating in the different phases of education management.

According to the national strategy of the Ministry, the regional centers are the main actors who implement regional plans for continuing training, which is considered an essential precursor for the professional development of Ministry civil servants. This continuing training is carried out according to three modes: face-to-face, distance, and alternating.

Pedagogical inspectors also play an important role in professional development. Among other endeavors, they design teacher professional development programs and organize seminars and in-service training sessions for novice as well as experienced teachers. They also supervise teachers as they further improve teaching and learning within the 12 Regional Academies of Education and Training across the country.

Monitoring Student Progress in Mathematics and Science

The Ministry of National Education, Preschool and Sports in Morocco has implemented policies that require students to pass exit examinations at each cycle of education to obtain a leaving certificate and continue to the next cycle.

At each education cycle, the following exit examinations are administered:

- primary school exit examination, resulting in an end of primary education certificate
  - This examination is administered at the end of Grade 6 in all directorates of the 12 regions of Morocco and is developed by commissions of experienced teachers and inspectors at the provincial level. Students are required to pass this examination to be eligible for admission to lower secondary school. The pass mark to advance to the next level is 10/20 (total marking scale is 20 points).
- lower secondary school exit examination, resulting in an end of lower secondary school certificate
  - This examination is administered at the end of Grade 9 in all directorates of the 12 regions of Morocco and is developed by commissions of experienced teachers and inspectors at the provincial level. Successful students are awarded a leaving certificate and are eligible for enrollment in upper secondary schools. The pass mark to advance to the next level is 10/20.
- higher secondary school exit examination, resulting in a baccalaureate certificate
  - This national achievement examination is administered at the end of Grade 12 in all directorates of the 12 regions of Morocco and is developed by commissions of experienced teachers and inspectors at the NCEE. The exam covers the content and objectives outlined in the syllabi for second-year higher secondary education (i.e., Grade 12). The content of the exam is based on the specific coursework and specifications prescribed by the Ministry of National Education, Preschool and Sports. Besides philosophy and foreign languages, it targets mathematics, physics, chemistry, life and earth sciences, technology, electric and industrial engineering, and economics for scientific streams. The pass mark to exit higher secondary school and obtain the baccalaureate certificate is 10/20.

- In the baccalaureate system, some subjects are tested via school assessment while others are tested via a regional exam at the end of Grade 11 and a national exam at the end of Grade 12. Students who pass these two exams are awarded a baccalaureate certificate and are eligible for enrollment in tertiary education. The pass mark for the baccalaureate exam is 10/20.

Aside from these three school exit examinations at the grade levels specified, moving from one level/grade to another is based on teachers' continuous assessment using class progress tests. The passing mark to advance from one grade to another is always 10/20 (10 out of 20).

Formative assessment is an important source of feedback for teachers and is geared toward helping them gauge the effectiveness of their teaching strategies in relation to the curriculum, as well as to orient their teaching style to student learning styles. Teachers use formative assessment aligned with Ministerial circulars and pedagogical guidelines as a source of information about student progress and ability.[9] Formative assessments are curriculum-based tests of student competencies that provide opportunities for remediation.[10]

The 1999 Charter for Education and Training stipulated that Morocco's assessment and certification system should be overhauled. In response, the NCEE has led significant reform of the assessment and certification system. To ensure uniformity and standardization in the evaluation process, the center developed frameworks and procedures for the design, administration, and scoring of exams. Moreover, in collaboration with the Higher Council for Education Training, and Scientific Research *(Conseil Supérieur de l'Education, de la Formation et de la Recherche Scientifique*, or CSEFRS), the center launched the National Program for the Evaluation of Acquired Learning Outcomes (*Programme National d'Evaluation des Acquis*, or PNEA) to implement a periodic assessment of student learning. The PNEA nationwide system of assessment makes it possible to gauge whether learning outcomes have been met and to define a benchmark against which to evaluate systematically the quality of education being provided. The executive summary of PNEA 2019 includes recommendations to redress and improve the quality of teaching and learning in primary and secondary school with special focus on languages, mathematics, and science.

Special Initiatives in Mathematics and Science Education

Lessons from Morocco's participation in PIRLS and TIMSS and in national assessments have triggered deep reflection about how to improve students' basic skills and knowledge, particularly in reading, writing, mathematics, and science. The CSEFRS has identified a wide apparent disparity in student performance between urban and rural areas. To tackle these issues, education reform is underway in accordance with the national strategic vision (2015–2030) and the 2022–2026 road map. This vision puts schools at the heart of greater social reform.

In this context, many pathways to improving student skills and knowledge have been considered. Among the most important measures taken to improve the quality of education in Morocco is the revision and improvement of the national curriculum in the first 4 years of

primary school, introducing greater emphasis on reading, writing, scientific awareness, and mathematics. Revisions of the national curriculum also target changes in the following:

- the roles played by teachers and students
- the methodologies and approaches used
- assessment and examinations
- teacher training and classroom equipment

To achieve the goals of the 2022–2026 road map for a quality public school for all, the Ministry of National Education, Preschool and Sports and the Japan International Cooperation Agency in Morocco have recently signed an agreement for the second phase of the Project for Promoting Education with Equity and Quality (PEEQ). The aim of this second phase of the project, which extends from July 2023 to January 2028, is to improve education by achieving equity and quality at the lower secondary school level. It will help strengthen the pedagogical model to improve learning and teaching of mathematics, which was developed during the first phase of this project (2014–2018) at the primary level. This project is currently piloted in middle schools at the Regional Academy of Education and Training of Rabat-Salé-Kenitra.

In accordance with the 2022–2026 road map for reforming the national education system, the Ministry of Education has recently adopted TARL (Teaching at the Right Level). This is a new approach for school support that has had good results in India and some African countries. It essentially aims to overcome the difficulties that hinder the education path of students at the primary level while enabling them to acquire basic learning in mathematics, Arabic, and French through activities based on interaction and play. This approach is currently still in the experimental stage and includes 250 primary schools in both rural and urban areas in various regions of the country. It targets about 10,000 male and female students, and it is expected to reach 1,000,000 students during the 2024–2025 academic year. To ensure appropriate implementation of this project, in-service training sessions were held for trainers (51 education inspectors) and 600 teachers before launching the pilot model in 200 schools with more than 15,000 students in September 2023.

The Moroccan education system also caters to special cases of students.[11] High-achieving students are offered the opportunity to participate in national and international Olympiads in mathematics and science. They are also offered financial support to continue their higher studies, especially if they come from disadvantaged areas. A national support program was implemented recently for the benefit of low-achieving students. The program is offered in schools' extra sessions to support learning and cater to any difficulties students have regarding school subjects.

Special interest is given to students with special physical or mental needs. There is a shift now from enrolling them in special classes with special programs to integrating them into mainstream classes and sensitizing teachers to better ways of educating them. The NCEE has made great efforts to adapt exams to these students' learning styles.

As part of initial training, education and social support executives, as well as education administration executives, benefit from a module dedicated to inclusive education (No. 063.22). At the same time, continuing training sessions targeting this component are at the heart of regional and provincial plans for teachers to benefit from training in inclusive education.

Suggested Reading

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