Côte d'Ivoire

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Introduction

The Ivorian education landscape is characterized by a centralized system.[1] However, as part of the decentralization process, the State has transferred some of its powers to local authorities (districts, regions, departments, and boroughs) in accordance with Law No. 2003-208 of 7 July 2003 on the transfer and distribution of powers from the State to local authorities.

In Côte d'Ivoire, the education/training sector is managed by several Ministries, including the Ministry of National Education and Literacy (MENA); the Ministry of Higher Education and Scientific Research (MESRS); the Ministry of Technical Education, Vocational Training and Apprenticeship (METFPA); the Ministry of Culture and the Francophony (MCF); the Ministry of Employment and Social Protection (MEPS); the Ministry in Charge of Sports and the Living Environment (MSCV); and the Ministry for Women, Family and Children (MFFE).

These Ministries are governed by regulations clearly setting out the roles and responsibilities of the various actors. In organizational terms, each Ministry has central directorates and regional and/or departmental directorates.

Côte d'Ivoire's education system includes public, private secular, and denominational institutions, each with its own specific management and funding arrangements. The State grants private secular and denominational structures some of its prerogatives. Private secular and denominational schools are generally funded by State-subsidized tuition and school fees.

Education from nursery school to the end of upper secondary school (Year 13) is divided into three levels: preschool, primary, and secondary. At the end of the first cycle of secondary school (Year 10), students can choose to study science (mathematics and science) or literature. As a general rule, most students start nursery school at the age of 4 or 5, although some are allowed to start as early as age 3. Formal primary education begins in Year 1 at the age of 6. The transition to secondary education takes place at the end of primary school (Year 6), generally at the age of 12.

The official language is French, which is used as the main language of instruction.

The curricula are uniform throughout the country, with the exception of a few schools that follow the guidelines of French or American academies.

The Mathematics Curriculum in Primary and Lower Secondary Grades

Fourth-Grade Mathematics Curriculum

The Year 4 mathematics syllabus in Côte d'Ivoire is uniform throughout the country. It is structured around three skills broken down into 18 lessons and focuses on topics such as numbers and operations, geometry, and measurement (see Exhibit 1). This program is partly aligned with the *TIMSS 2023 Assessment Frameworks*.

Exhibit 1: Year 4 Mathematics Syllabus

Skill	Topic	Lesson
Learning how to use numbers and operations	numbers and operations	• whole numbers • addition • subtraction • multiplication • division • fractions • decimal numbers • proportionality • percentage • reading tables and graphs
Learning about geometry	geometry	• the rectangle and the square • the circle • the triangle • the development of the cube and the right angle
Learning how to use measurements of size	measurement	• mass • capacity • time • money

The syllabus also specifies the skills and content students need to know, understand, apply, and process. In Côte d'Ivoire, teaching time is prescribed by MENA. The duration of teaching, equivalent to approximately 27.5% of the overall education time in Year 4, is determined by MENA.

Eighth-Grade Mathematics Curriculum

The Year 8 mathematics syllabus in Côte d'Ivoire is uniform throughout the country. It is structured around three skills broken down into 11 lessons and emphasizes topics such as algebraic calculations, modeling random phenomena, and geometry (see Exhibit 2). This program is partly aligned with the *TIMSS 2023 Assessment Frameworks*.

Exhibit 2: Year 8 Mathematics Syllabus

Skill	Topic	Lesson
Learning how to use algebraic calculations and functions	algebraic calculations	• relative decimal numbers • rational numbers • literal arithmetic • equations and inequalities of the first degree in **Q** (rational numbers)
Learning how to model random phenomena, and organizing and processing data	organizing and processing data	• statistics
Learning about the geometry of a plane, the geometry of space, and the transformations of a plane	plane geometry	• angles • distances • circles and triangles • vectors
	space geometry	• one-point perspective
	plane transformations	• symmetries and translations

The syllabus also specifies the skills and content students need to know, understand, apply, and process. The duration of teaching, equivalent to approximately 15% of the overall education time in Year 8 (third year of secondary school), is determined by MENA.

The Science Curriculum in Primary and Lower Secondary Grades

Fourth-Grade Science Curriculum

The Year 4 physics and chemistry syllabus in Côte d'Ivoire is uniform throughout the country. It comprises two skills based on two themes. These themes are divided into two lessons each (see Exhibit 3). This program is partly aligned with the *TIMSS 2023 Assessment Frameworks*.

Exhibit 3: Year 4 Science Syllabus

Skill	Theme	Lesson
Learning about the different changes of states of water and mixtures	changes of states of water and mixtures	• changes of states of water • mixtures
Learning about technical objects	technical objects	• the Roberval balance • the discovery of various balances

The syllabus also specifies the skills and content students need to know, understand, apply, and process. The duration of teaching, equivalent to approximately 12% of the overall education time in Year 4, is determined by MENA. (It is important to note that the 12% of education time includes life and earth science and physics and chemistry. Life and earth science and physics and chemistry are combined under the Science and Technology subject in Year 4.)

Eighth-Grade Science Curriculum

Like the mathematics syllabus, the Year 8 science syllabus is subject to a national requirement in terms of content prescription and coverage.

The science syllabus comprises eight skills, four of which are in physics and chemistry and four in life and earth science. Each skill corresponds to a topic that is broken down into several lessons (see Exhibit 4).

Exhibit 4: Year 8 Science Syllabus

Subject	Skill	Topic	Lesson
Physics and Chemistry	Investigating a situation involving optics	optics	• light sources and receivers • light propagation • the phases of the Moon and eclipses • analysis and synthesis of white light
	Investigating a situation involving alternating currents and voltages	alternating currents and voltages	• magnet and inductor • production of alternating voltage • sinusoidal alternating voltage • hazards of mains current • transformation, rectification, and smoothing of a sinusoidal AC voltage

Exhibit 4: Year 8 Science Syllabus (Continued)

Subject	Skill	Topic	Lesson
Physics and Chemistry	Investigating a situation relating to ions in solution	ions	• atoms and ions • transformation of a metal into an ion and vice versa
	Investigating a situation relating to water quality	drinking water	• water treatment • water quality
Life and Earth Science	Learning about human reproduction	human reproduction	• the different transformations of the human body from childhood to adolescence • the development of human sex cells
	Investigating a situation relating to the formation and degradation of endogenous rocks	the formation and degradation of endogenous rocks	• the formation of endogenous rocks • the degradation of endogenous rocks
	Investigating a situation relating to soils formation and their features	soils formation and their features	• soils formation • soil textures
	Investigating a situation relating to the use of water and human health	water use and human health	• water-related diseases • fighting water-related diseases • treatment of contaminated water

The curriculum also specifies the skills and content students need to know, understand, apply, and process.

As prescribed by MENA, science accounts for 14% of teaching hours in Year 8, i.e., 7% in physics and chemistry and 7% in life and earth science.

These lessons only partially cover the content of the TIMSS 2023 assessment.

Teacher Professional Development Requirements and Programs

There is particular importance to the professional development requirements of teachers in Côte d'Ivoire, and these requirements revolve around initial training, in-service training, promotion, and the health and well-being of teachers.

As regards the socioprofessional development of teachers, MENA has set up structures to manage teachers' careers at pedagogical, administrative, and social levels, with representation in all regions of the country.

The pedagogical professional development plan for teachers is implemented by the Management of Pedagogy and Continuing Education (DPFC). This management is represented

in the regions by the Pedagogy and Continuing Education offices, which provide local pedagogical support.

Human Resources Management is responsible for managing the teaching staff, while Mutuality and Social Welfare Management looks after teachers' health and well-being.

In addition, practicing teachers can be promoted either through professional competitions or by obtaining additional qualifications that hone their teaching skills and knowledge in a particular subject (including math and science). They may also be promoted by appointment.

Professional development can take the form of capacity building through workshops, conferences, teaching councils, and teaching units. These groups may be organized at the school, regional, or national level.

Monitoring Student Progress in Mathematics and Science

Student progress in mathematics and science is assessed at different levels and in different contexts. Locally, teachers assess students through class assignments, level assignments, and regional assignments.

In Côte d'Ivoire, assessment is conceptualized as assessment for learning in the pedagogical model used, which is the competency-based approach (APC).[2] Learning assessment is an integral part of the lesson, making it possible to check the level of assimilation of the course content. Each APC lesson systematically ends with one or more research exercises or an activity extending the learning process.

Large-scale examinations administered at cycle change points (Year 6, Year 10, and Year 13) enable students to be assessed at the national level.

Recognizing the importance of standardized assessment of learning outcomes in steering the education system, authorities in Côte d'Ivoire set up an assessment department in 1999, which became a central directorate in 2014 (Decree No. 2014-678 of 5 November 2014 on the organization of the Ministry of Education and Technical Education [MENA]). Since then, several national and international assessments have been conducted at primary and secondary levels.

At the primary level, a national assessment conducted every year since 2020 with students in Year 3 measures student progress in reading and mathematics. Similarly, the PASEC international assessment (CONFEMEN [Conference of Ministers of Education from French-speaking States and Governments] Program for the Analysis of Educational Systems)[3] is conducted every 5 years and measures the progress made by students in Year 2 and Year 6 of primary school in reading and mathematics. Côte d'Ivoire has participated in the 2014 and 2019 editions of PASEC.

As part of the implementation of the Millennium Challenge Corporation's Compact-Côte d'Ivoire, Côte d'Ivoire, through the Millennium Challenge Account and MENA, took part in national and international assessments at the secondary level in 2023. The national assessment covered students in Years 7 and 9 of secondary school in French and mathematics.

Côte d'Ivoire participated in TIMSS 2023 to measure the skills of Year 8 students in mathematics and science.

The implementation of these strategic actions could improve the quality of mathematics and science teaching and learning in Côte d'Ivoire, as highlighted by several authors.[4,5,6]

Special Initiatives in Mathematics and Science Education

In Côte d'Ivoire, the association Femmes en Mathématiques Côte d'Ivoire (FMATH-CI, African Women in Mathematics) was created in accordance with Law No. 60-315 of 21 September 1960 on associations. The main objective of FMATH-CI is to reduce the gender gap in the sciences by encouraging girls to study mathematics and, more generally, scientific and technical subjects.

The Société Mathématique de Côte d'Ivoire (SMCI, Mathematical Society of Côte d'Ivoire), founded on May 14, 1977, organizes activities to encourage students to take an interest in mathematics.[7] These include the following:

- The Houphouët-Boigny Mathématiques competition has been held every year since 1984 and is open to all students (boys and girls) at all levels of secondary school.[8]
- The Miss Mathematics competition has been organized every year since 2000. The aim of the competition is to prepare, motivate, and encourage young girls to persevere in mathematics so that they can take part in the global scientific boom.[9]
- Côte d'Ivoire has participated in the Pan-African Mathematics Olympiads (PAMO) since 1987.
- Côte d'Ivoire has participated in the International Mathematical Olympiad since 2010.

The goal of these activities is to encourage the emergence of new talent, thereby revitalizing mathematics and scientific teaching and research in Côte d'Ivoire.

It is important to note that awareness campaigns and support for female mathematics and science students are being extended to public universities. These measures, described as positive discrimination, include

- systematically awarding Côte d'Ivoire State scholarships to female students enrolled in mathematics and science, and
- organizing specific competitions for girls enrolled in mathematics and science courses, with additional prizes and bursaries offered by partners to the best participants.

In Côte d'Ivoire, the Ministries in charge of the education/training sector—MENA, MESRS, and METFPA—are committed to revitalizing and strengthening the teaching of science and technology at all levels of the Ivorian education system. This commitment will be materialized by the construction of a scientific and technological pole around the science high school in Yamoussoukro and the introduction of university preparatory classes at engineering schools and university institutes of technology.

Suggested Reading

Ministry of National Education and Literacy. (2023). *Programmes éducatifs et guides d'exécution du secondaire* [Secondary school educational programs and implementation guides]. Retrieved from https://dpfc-ci.net

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9 Société Mathématique de Côte d'Ivoire (SMCI). (2023). *Concours Miss Mathématique* [Miss Mathematics competition]. Retrieved from http://www.concoursmissmath.ci/