France

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Introduction

Overview of Education System

France's education system is a state responsibility with the Minister of National Education responsible for the definition and implementation of education policy. The ministry's goals are to distribute resources allocated to education, guarantee equal access to this public service, and monitor education policies. Specifically, the government defines education policies and curricula; recruits, trains, and manages education staff; determines the status of schools and the rules under which they function; and appoints teachers and administrative staff. Only the state government may define and establish diploma levels.

France provides free education for all students in primary and secondary public schools, and schooling is compulsory at the primary and lower secondary levels from ages 6 to 16. Children must be registered at a primary school at the beginning of the school year (September) in the calendar year in which they reach the age of 6. The proportion of students enrolled in public state education in France is 85.9 percent at the primary level and 78.9 percent at the secondary level.[1] Private schools are primarily religious, mostly Roman Catholic, and are subject to monitoring by the state.

Since 2016, education at the primary and lower secondary levels has been organized in four cycles: Cycle 1 encompasses early learning (first, second, and third years of preprimary); Cycle 2 encompasses fundamental learning (Grades 1, 2, and 3); Cycle 3 encompasses the consolidation of learning (Grades 4, 5, and 6), Grade 6 being the first grade of lower secondary schooling; and Cycle 4 encompasses the deepening (enhancing) of learning (Grades 7, 8, and 9).

Hence, primary schooling is divided into two levels: the preprimary level (*maternelle*) covering Cycle 1 and the elementary level covering Cycles 2 and 3 up to Grade 5. Preprimary school (*maternelle*) is free but not compulsory and accepts children ages 3 to 5, and at age 2, when places are available. In 2018, 99 percent of children in France aged 3 to 5, as well as 12 percent of 2-year-old children, attended a *maternelle* school.[2] Beginning September 2019, a reform set the age of compulsory schooling at 3 years old.

Schooling at the elementary level comprises five years, from Grade 1 to Grade 5. At the primary level, many schools have classes composed of two or more grade levels. In 2019, the average class size in elementary schools was 23 students. In 2018–2019, there were 31,021 public schools and

5,413 private schools in France at the elementary level.[3] Promotion from primary to secondary education is automatic.

Secondary education is divided into two successive levels: lower secondary and upper secondary. Lower secondary education comprises Grades 6 to 9 (typically ages 11 to 15). In 2018, the number of students enrolled in public and private lower secondary schools in France was 3.3 million.[4] In 2018–2019, there were 5,290 public schools and 1,907 private schools in France at the lower secondary level.[5] Upon completion of the ninth grade, students attend a general and technological or a vocational upper secondary school that prepares them for the corresponding *baccalauréat*, a certification examination usually taken at age 18. There are three types of *baccalauréats*:

- General *baccalauréat,* which includes literature, economics, social studies, and science.
- Technological *baccalauréat,* which includes tertiary science and technology, industrial science and technology, and laboratory science and technology.
- Vocational *baccalauréat,* which includes production and services sectors.

Use and Impact of TIMSS

France participated in TIMSS for the first time at the fourth grade level during the 2015 assessment cycle. TIMSS 2019 marks the first time since 1995 France has participated at Grade 8.

The Mathematics Curriculum in Primary and Lower Secondary Grades[6,7]

France has a national curriculum that covers mathematics and science instruction at the fourth grade; it has been renewed 11 times over a 95 year period. The curriculum is national and compulsory for all teachers and students, and it governs teacher practice. Teachers are responsible for building a coherent progression through the curriculum, adapting the pace of the curriculum to suit their students' abilities and needs, defining instructional strategies, and evaluating students. School staff decides the distribution of content across grades. Hence, the content taught at Grade 4 might differ slightly from one school to another.

The 2015 mathematics curriculum revised in July 2018 for Grades 1, 2, and 3 (second cycle of primary school) may be summarized as follows. Problem solving is at the center of students' mathematical activity, developing their ability to search reason and communicate. The written component of the mathematical activity is essential. Students consolidate their understanding of whole numbers, already encountered in Cycle 1. The study of the four operations (addition, subtraction, multiplication, division) starts at the beginning of the cycle with problems that help make sense of them, particularly problems involving quantities or their measurements.

Students work on skills including research, modeling, representing, reasoning, calculating, and communicating.

Exhibit 1 lists expectations for the three content areas at the end of Cycle 2.

Exhibit 1: Expectations for Mathematics Content at the End of Cycle 2

Content Area	Objectives
Numbers and Calculations	▪ Understand and use whole numbers to count, order, locate, compare ▪ Name, read, write, represent whole numbers ▪ Solve problems using operations on whole numbers ▪ Calculate using whole numbers
Quantities and Measurements	▪ Compare, estimate, and measure lengths, masses, capacities, and durations ▪ Use the lexicon, units, and specific measurement instruments of these quantities ▪ Solve problems involving lengths, masses, capacities, durations, and prices
Space and Geometry	▪ Locate and relate objects in space using directional representations ▪ Recognize, name, describe, and reproduce some solids ▪ Recognize, name, describe, reproduce, and construct some geometric figures ▪ Recognize and use the concepts of alignment, right angles, equality of length, center, and symmetry

The 2015 mathematics curriculum revised in July 2018 for Grades 4, 5 and 6 (Cycle 3) may be summarized as follows.

In continuity with the previous cycles, Cycle 3 ensures the further development of six major mathematics skills: searching, modeling, representing, calculating, reasoning, and communicating. Problem solving is the main criterion for mastery of knowledge in all areas of mathematics. Cycle 3 aims to deepen the mathematics concepts covered in Cycle 2; to extend the field of study; to consolidate the automation of the written calculation techniques introduced previously (addition, subtraction, and multiplication), as well as mental calculation results and procedures of Cycle 2; to construct new written (division) and mental calculation techniques; and to introduce new concepts, such as decimal numbers, proportionality, and the study of new quantities (area, volume, angle in particular). The geometric activities in Cycle 3 are a continuation of those in Cycle 2. They are distinguished by a greater emphasis on reasoning and argumentation, which complements the perception and use of instruments. They are also an opportunity to frequent new representations of space (patterns; perspectives; front, side and top views, etc.). In addition to the use of paper and pencil and the manipulation of concrete objects, digital tools are gradually being introduced. Thus, the use of calculation and numbering software enables students to deepen their knowledge of the properties of numbers and operations as well as to increase the mastery of certain calculation techniques. Quantities are taught in a structured and explicit way, with sound knowledge of the units of the international system of measurement being aimed at. The study of the prefixes of decimal units of measurement, in relation to units of numeration, facilitates the understanding and learning of the units of measurement of most of the quantities in Cycle 3.

Students work on skills including research, modeling, representing, reasoning, calculating, and communicating.

Exhibit 2 lists expectations for the three content areas at the end of Cycle 3.

Exhibit 2: Expectations for Mathematics Content at the End of Cycle 3

Content Area	Objectives
Numbers and Calculations	▪ Use and represent large whole numbers, simple fractions, and decimal numbers ▪ Calculate with integers and decimals ▪ Solve problems using operations on simple fractions and decimals
Quantities and Measurements	▪ Compare, estimate, and measure geometrical quantities with integers and decimal numbers: length (perimeter), area, volume, and angles ▪ Use lexicon, units, instruments of measurement specific to these quantities ▪ Solve problems involving quantities (geometric, physical, economic) using integers and decimals
Space and Geometry	▪ Locate and relate objects in space using directional representations ▪ Recognize, name, describe, reproduce, represent, and construct usual figures and solids ▪ Recognize and use some geometric relationships (notions of alignment, belonging, perpendicularity, parallelism, equality of length, equality of angle, distance between two points, symmetry, enlargement, and reduction)

The curriculum described below applies to Grades 7 to 9 (Cycle 4) in France. School staff decides the distribution of content across grades. Hence, the content taught at Grade 8 might differ slightly from one school to another.

The mathematics curriculum is organized into five themes: Numbers and Calculations; Data Handling and Functions; Quantities and Measurements; Space and Geometry; Algorithms and Programming. Problem solving is an important focus, while making sure automatisms (the body of knowledge and automated procedures immediately available in memory) are available. The regular and balanced practice of diverse activities enables the development of six specific skills that are the major components of mathematical activity: searching, modeling, representing, reasoning, calculating, and communicating.

Exhibit 3: Objectives of Mathematics Curriculum Themes in Cycle 4

Theme	Concept	Objectives
Numbers and Calculations	Numbers	▪ Use various representations of the same number (decimal or fractional writing, scientific notation, number lines) ▪ Move from one representation of a number to another (positive and negative numbers, square roots)
	Comparing numbers	▪ Compare, sort, and enclose rational numbers in decimal, fractional, or scientific writing ▪ Locate and place a rational number on a number line ▪ Associate orders of magnitude with objects
	Practicing exact or approximate calculations, mental, manual, or instrumented	▪ Calculate with relative numbers, fractions, decimal numbers ▪ Check the plausibility of a result, in particular by estimating its order of magnitude ▪ Perform simple numerical calculations involving powers, in particular by using scientific notation

Theme	Concept	Objectives
		▪ Use the square root to solve problems, especially geometric problems ▪ Perform calculations and comparisons to solve problems
	Understanding and using divisibility and prime numbers	▪ Determine whether an integer is a multiple or factor of another integer ▪ Determine prime numbers less than 100 ▪ Use the divisibility criteria of 2, 3, 5, 9, and 10 ▪ Determine the factors of a number by hand, using a spreadsheet, or using a calculator ▪ Decompose an integer into the product of prime factors (by hand or using software) ▪ Simplify a fraction ▪ Model and solve problems involving divisibility
	Using algebraic expressions	▪ Develop, factorize, and reduce simple algebraic expressions ▪ Use algebraic expressions to translate a general property, to demonstrate a general result, to validate or invalidate a conjecture, and to model a situation ▪ Translate a problem into an equation with a view to solving it ▪ Solve algebraic equations of the first degree or related equations (product equations)
Data Handling and Functions	Interpreting, representing, and processing data	▪ Collect and organize data ▪ Read and interpret data in the form of raw data, tables, and diagrams ▪ Use a spreadsheet grapher to present data in the form of a table or diagram ▪ Calculate frequencies ▪ Calculate and interpret indicators of position or dispersion (mean, median, and range)
	Understanding and using basic concepts of probability	▪ Address issues of randomness from simple problems ▪ Calculate probabilities in simple cases ▪ Express probabilities in various forms (decimal, fraction, percentage) ▪ Relate frequency to probability
	Solving problems involving proportions	▪ Recognize a situation of proportionality or nonproportionality ▪ Calculate with proportions ▪ Divide a quantity into two or three parts according to a given ratio ▪ Using a formula linking two quantities in a proportionality situation ▪ Solving problems using proportionality (percentages, scales, enlargement-reduction)
	Understanding and using functions	▪ Switch between different representations of a function ▪ Determine from a representation the image or a preimage of a number by a function ▪ Graphically represent a linear function, an affine function ▪ Model a continuous phenomenon by a function ▪ Model proportionality using a linear function ▪ Solve problems modeled by functions

Theme	Concept	Objectives
Quantities and Measurements	Calculating with measurable quantities; expressing the results in the appropriate units	▪ Calculate the volume of a prism, a pyramid, a cylinder, a cone, a ball ▪ Perform calculations involving measurable quantities, especially compound quantities, express the results in the appropriate units ▪ Check the consistency of results from the point of view of the units ▪ Perform unit conversions
	Understanding the effect of some transformations on geometric figures	▪ Understand the effect of displacement, enlargement, or reduction on lengths, angles, areas, and volumes ▪ Use a reduction or enlargement ratio to calculate lengths, dimensions, areas, volumes ▪ Use the scale of a map ▪ Use transformations to calculate geometric quantities ▪ Make the link between proportionality and certain geometrical configurations or transformations. (enlargement reduction, similar triangles, homothecy)
Space and Geometry	Representing space	▪ Plot on a graduated line, in the plane provided with an orthogonal coordinate system, in a cuboid, on a sphere ▪ Recognize solids (cuboid, cube, prism, cylinder, pyramid, cone, ball) ▪ Construct and relate representations of these solids (seen from a rider's perspective, from the front, from above, flat sections, patterns, etc.) ▪ Use dynamic geometry software to represent solids
	Use planar geometry principles to solve problems in contexts	▪ Implement or write a protocol for the construction of a geometrical figure ▪ Link equality of triangles and the construction of a triangle starting from the data of side lengths and/or angle measurements ▪ Understand the effect of translation, symmetry, rotation, and homothecy on a figure ▪ Mobilize knowledge of figures and configurations (sum of the angles of a triangle, height and line bisector; triangular inequality; similar triangles, parallelograms, Thales' theorem and its reciprocal, the Pythagorean theorem and its reciprocal; trigonometry in the right-angled triangle) to determine geometric quantities ▪ Reason and learn to prove using the properties of figures, configurations, and transformations
Algorithms and Programming		▪ Algorithms and coding ▪ Computer variables ▪ Triggering an action with an event ▪ Sequence instructions, loops, conditional instructions

The Science Curriculum in Primary and Lower Secondary Grades [8,9]

Just like in mathematics, teachers are responsible for building a coherent progression through the curriculum, adapting the pace of the curriculum to suit their students' abilities and needs, defining instructional strategies, and evaluating students. Hence, the content taught at Grade 4 might differ slightly from one school to another.

The 2015 sciences curriculum (natural and technical systems) revised in July 2018 for Grades 1, 2, and 3 (the second cycle of primary school) may be summarized as follows.

Questioning the World is the preferred mode of teaching students to formulate questions, make suppositions, imagine exploratory devices, and propose answers. Through the detailed observation of reality in three fields—the living, matter and objects—an investigative approach provides access to knowledge of some characteristics of the living world, the observation and description of some natural phenomena, and an understanding of the functions and workings of simple objects.

Students work on the following skills: practicing scientific approaches; imagining, realizing; appropriate tools and methods; practicing languages; mobilizing digital tools; adopting ethical and responsible behavior; situating oneself in space and time.

Exhibit 4 lists the expectations for the three content areas at the end of Cycle 2.

Exhibit 4: Expectations for Science Content Areas at the End of Cycle 2

Content Area	Expectations
Questioning the world of life, matter, and objects	▪ Identify the three states of matter and observe changes in state ▪ Identify a change in the state of water in a phenomenon of daily life
How to recognize the living world?	▪ Know the characteristics of the living world, its interactions, its diversity ▪ Recognize behaviors that are favorable to health
What are technical objects? What needs do they meet? How do they work?	▪ Understand the function and functioning of manufactured objects ▪ Make a few simple electrical objects and circuits, while observing basic safety rules ▪ Begin to appropriate a digital environment
Questioning space and time	▪ Find one's way in space and represent it ▪ Locate a place on a map, globe, or computer screen
Locating oneself in time	▪ Find one's bearings in time and measure times ▪ Locate and situate historical events in time
Exploring organizations in the world	▪ Compare some ways of life of men and women, and some representations of the world ▪ Understand that a space is organized ▪ Identify landscapes

The 2015 sciences curriculum (Science and Technology) revised in July 2018 for Grades 4, 5, and 6 (Cycle 2) may be summarized as follows.

The curriculum is divided into four main themes: (1) Matter, Movement, Energy, Information; (2) Living Things, Their Diversity and Their Functions; (3) Technical Materials and Objects; and (4) Planet Earth—Living Beings in Their Environment. Each of these themes enables the construction of concepts or notions that find their application in education for sustainable development. The concept of energy, progressively constructed, is present in each theme and links them.

Students work on the following skills: practicing scientific approaches; imagining, realizing; appropriate tools and methods; practicing languages; mobilizing digital tools; adopting ethical and responsible behavior; situating oneself in space and time.

Exhibit 5 lists expectations for the four content areas at the end of Cycle 3.

Exhibit 5: Expectations for Science Content Areas at the End of Cycle 3

Content Area	Expectations
Matter, Motion, Energy, and Information	▪ Describe the states and constitution of matter on a macroscopic scale ▪ Observe and describe different types of motion ▪ Identify different sources of energy ▪ Identify a signal and information
Living Things, Their Diversity, and Their Functions	▪ Classify organisms, using kinship to understand and explain the evolution of organisms and their relationships to each other organizations ▪ Explain the varying food needs of humans; the origin and techniques used to produce food; and works to process and preserve food. ▪ Describe how living things develop and become capable of reproduction ▪ Explain the origin and fate of organic matter in living things
Technical Materials and Objects	▪ Identify the main changes in needs and objects ▪ Describe the functioning of technical objects, their functions and constitutions. ▪ Identify the main families of materials. ▪ Collaborate to design and produce a piece of technology that satisfies a need ▪ Identify and understand communication and information management.
Planet Earth—Living Beings in Their Environment	▪ Locate the Earth in the Solar System and characterize the conditions of life on Earth ▪ Identify issues related to the environment

In secondary schools in France, sciences are taught in two subjects: (1) physics and chemistry and (2) Earth sciences. Both subjects are compulsory for Grade 8 students.

Experimental and observational sciences, which include physics, chemistry, and life and Earth sciences, explore nature to discover and explain its laws, thus granting some control over the phenomena of the real world. Teaching in Cycle 4 aims to enable students to develop scientific knowledge in seven competencies: practicing scientific approaches; designing, creating, realizing;

appropriating tools and methods; practicing languages; mobilizing digital tools; adopting ethical and responsible behavior; and situating oneself in space and time.

The curriculum described below applies to Grades 7 to 9 (Cycle 4) in France. School staff decides the distribution of content across grades. Hence, the content taught at Grade 8 might differ slightly from one school to another.

Exhibit 6 lists the learning objectives of Cycle 4 in physics and chemistry, which is organized into four themes.

Exhibit 6: Learning Objectives of Cycle 4 in Physics and Chemistry

Theme	Content Area	Objectives
Organization and Transformations of Matter	Describe the constitution and states of matter	▪ Characterize the states of matter (solid, liquid, and gas) ▪ Propose and implement an experimental protocol to study the properties of state changes ▪ Characterize the changes of state of a pure body ▪ Interpret the changes of state at the microscopic level ▪ Propose and implement an experimental protocol to determine the density of a liquid or a solid ▪ Use density measurements to differentiate between chemical species ▪ Design and conduct experiments to characterize mixtures ▪ Experimentally estimate a water solubility value
	Describe and explain chemical transformations	▪ Implement characteristic tests of chemical species from a supplied bank ▪ Experimentally identify a chemical transformation ▪ Distinguish between chemical transformation and mixing, or physical transformation ▪ Interpret a chemical transformation as a redistribution of atoms ▪ Use a chemical reaction equation provided to describe an observed chemical transformation ▪ Identify the acidic or basic character of a solution by measuring the pH ▪ Associate the acidic or basic character with the presence of H^+ and OH^- ions
	Describe the organization of matter in the universe	▪ Describe the structure of the universe and the Solar System ▪ Discuss the units of distance and know how to convert them: from kilometer to light-year ▪ Know and understand the origin of matter ▪ Understand that observable matter is everywhere of the same nature and obeys the same laws ▪ Know the constituents of the atom, internal structure of an atomic nucleus (nucleons: protons, neutrons), electrons
Movements and Interactions	Characterize a movement	▪ Characterize the movement of an object ▪ Use the relationship between speed, distance, and time in the case of a uniform movement
	Model an interaction by a force characterized by a	▪ Identify the interactions involved (contact or remote) and model them by forces ▪ Associate the notion of interaction with the notion of force

Theme	Content Area	Objectives
	point of application, a direction, and a magnitude	▪ Exploit the algebraic expression of the law of universal gravitation, the law being provided
Energy and Its Conversions	Identify sources, transfers, conversions, and forms of energy; use energy conservation	▪ Identify the forms of energy ▪ Identify sources, transfers, and conversions of energy ▪ Establish an energy balance for a simple system ▪ Use the relationship linking power, energy, and time
	Make simple electrical circuits and exploit the laws of electricity	▪ Develop and implement a simple experimental protocol aimed at creating an electrical circuit meeting simple specifications or verifying an electrical law ▪ Exploit the laws of electricity: series and shunt dipoles, laws of additivity, Ohm's law, law of unicity of voltages ▪ Relate the laws of electricity and the safety rules in this field ▪ Conduct an electrical energy consumption calculation relating to a real-life situation
Signals to Observe and Communicate	Light signals	▪ Distinguish a primary source (light object) from a diffusing object ▪ Experimentally exploit the rectilinear propagation of light in vacuum and the model of the light beam ▪ Use the unit "light year" as the unit of distance
	Sound signals	▪ Describe the conditions under which sound propagates. ▪ Relate the distance traveled by a sound to the propagation time
	Signal and information	▪ Understand that the use of sound and light makes it possible to emit, to transport a signal and therefore information

The curriculum described below applies to Grades 7 to 9 (Cycle 4) in France. School staff decides the distribution of content across grades. Hence, the content taught at Grade 8 might differ slightly from one school to another, depending on the schemes of works agreed on locally.

Exhibit 7 lists the learning objectives for Cycle 4 in life and Earth sciences, which are organized into three main themes: Planet Earth, The Environment, and Human Action; Life and Its Evolution; and The Human Body and Health.

Exhibit 7: Learning Objectives of Cycle 4 in Life and Earth Sciences

Theme	Content Area	Objectives
Planet Earth, The Environment, and Human Action	Explore and explain some geological phenomena related to the functioning of the Earth	▪ Earth in the solar system ▪ Explain some geological phenomena from the global geodynamic context
	Explore and explain elements of meteorology and climatology	▪ Explain some meteorological and climatic phenomena (air and water mass dynamics; wind and ocean currents, difference between weather and climate; the Earth's major climatic zones, past and present climate change) ▪ Link scientific knowledge on natural hazards as well as those related to human activities to prevention, protection, adaptation, or attenuation measures
	Identify the main impacts of human action, benefits, and risks, on the surface of planet Earth	▪ Characterize some of the main issues at stake in the exploitation of a natural resource by human beings, in relation to some major societal issues ▪ Understand and explain natural resource management choices at different scales ▪ Explain how human activity can change the organization and functioning of ecosystems in relation to some global environmental issues
	Consider or justify responsible behavior toward the environment and the preservation of the planet's limited resources	▪ Propose arguments on the impacts generated by the rhythm, nature (benefits/nuisances), importance, and variability of human actions on the environment
Life and Its Evolution		▪ Link the needs of animal cells and the role of transport systems in the body ▪ Link the needs of plant cells containing chlorophyll, and understand where chlorophyll is produced, stored, and how it moves and is released from the plant ▪ Link biology elements of the sexual and asexual reproduction of living things and the influence of the environment on the survival of individuals to population dynamics ▪ Link the study of kinship relationships between living beings and evolution ▪ Explain the basis for the genetic diversity and stability of individuals ▪ Explain how phenotypes are determined by genotypes and by the action of the environment ▪ Link, as dynamic processes, genetic diversity and biodiversity ▪ Highlight facts about the evolution of species and provide arguments for some of the mechanisms of evolution
The Human Body and Health		▪ Explain how the nervous and cardiovascular systems intervene during muscular effort, identifying the capacities and limitations of the body ▪ Highlight the role of the brain in the reception and integration of multiple sources of information ▪ Relate some behaviors to their effects on the functioning of the nervous system

Theme	Content Area	Objectives
		▪ Explain the path of food in the digestive tract ▪ Relate the nature of foods and their qualitative and quantitative intakes to understand the importance of food to the body ▪ Connect the microbial world hosted by our organism and its functioning ▪ Explain the reactions that allow the organism to preserve itself from pathogenic microorganisms ▪ Explain the merits of policies to prevent and control contamination and/or infection ▪ Link the functioning of the reproductive system from puberty onward to the principles of reproductive control ▪ Explain the basis for responsible sexual behavior: fertility, pregnancy, respect for others, informed reproductive choice, contraception, prevention of sexually transmitted infections

Professional Development Requirements and Programs

Higher National Institutes of Professorship and Education (*Inspé*) are vocational schools aiming to provide teachers with professional development gradually and in a work-linked modality. They offer a four semester course, leading to a national master's degree in teaching, education, and training (*MEEF*). Competitive examinations are organized at the end of the first year of the master's program. Work-linked training in the second year of the master's program is remunerated after passing the competitive examination.

To become a teacher in a school, lower secondary school, or higher secondary school, passing the competitive examination is a compulsory step that requires both practical and theoretical knowledge. The aim of the *Inspé* is to provide this high level theoretical background and to support the entry into the professional world of future teachers with the following resources:

- Courses related to the future teacher's discipline(s)
- Training oriented toward practice, familiarizing candidates with expectations for classroom life
- Numerous internships from the first year of the master's degree, to a work-study program in the second year, with a part-time internship in responsibility in a school or education establishment
- Courses shared with all other future education professionals
- Progressive specialization, depending on its orientation

The *MEEF* master's degree is a university course involving teaching teams from different backgrounds. Primary and secondary school teachers, teacher-researchers, master trainers specializing in teacher training, and professionals working in the French education system (inspectors, principals, etc.) are involved throughout the training program. The pluralistic nature of these teams, as well as the up to date quality of their expertise, derived from their practice, make it possible to provide, in real-life situations, training in line with the practice of the profession. The following practices are also at the heart of the *MEEF* curriculum:

- Learning by and in digital format
- The use of innovative methods and tools
- Opening up to international practices
- Research
- Writing a dissertation based on the work-linked training course and other teaching within the training

This work enables teachers to build skills that will be useful throughout their careers.

The MEEF master's degree brings together two specializations:

- 1st degree mention to become a primary school teacher
- 2nd degree mention for teaching in lower secondary and higher secondary schools

Throughout the master's program, all *Inspé* students study the Common Core Curriculum. The Common Core Curriculum includes the following areas:

- Laicity and the values of the Republic
- Professional gestures linked to learning situations, knowledge linked to students' backgrounds
- Appropriation of cross-cutting education issues and major societal topics, combating all forms of discrimination
- Child psychology
- Civil service law
- Inclusive schools (adaptation and schooling of students with disabilities)
- Sociology of the public
- Diversity management
- Orientation
- Academic difficulties
- Dropping out
- Learning processes
- Relationships to knowledge
- Memory and learning
- Cognitive styles
- Multiple intelligences
- Teacher and student posture
- Professional communication (voice, gestures, etc.)
- Internet use
- Conflict and violence management
- Combating gender stereotypes

- Gender diversity in schools
- Ethics
- Professional postures
- Cooperative work

Monitoring Student Progress in Mathematics and Science

School report cards are sent to parents regularly, facilitating communication between teachers and families. Report cards detail the results of periodic competency assessments, recommendations for student promotion to the next grade or cycle, and final decisions. The cycle council of teachers decides whether students will be promoted to the next cycle, taking into account teacher recommendations. In France, there are no examinations of consequence for students at the primary level, and promotion or retention depends on academic progress at key points rather than at each grade.

The Personal Skills Booklet (*Livret Personnel de Compétences*) comprises part of school report cards[10] and provides evidence of student attainment of knowledge and skills from primary school to the end of compulsory education. At every stage, families are informed of student progress. At the end of primary school, the booklet is passed on to the appropriate lower secondary school. Since 2016, a new version of the personal skills booklet has been implemented for primary and lower secondary students, making reporting to parents simpler and more accurate. This new booklet is also available online.

Required student competencies are fixed for each cycle. If students have not met the required competencies at the end of a cycle, the cycle council of teachers may recommend retention for one year, and the head of school would present the recommendation to their parents.

From Grade 1 to Grade 9, national assessments are numerous and diverse. Exhibit 8 gives a summary of the main national assessments.

Exhibit 8: Summary of Main National Assessments

National Assessment	Grades	Subject	Time	Type
Repères	1 and 2	Mathematics	Every start of the school year	Diagnostic, census based
CEDRE	5 and 9	Mathematics and science	Every five year at the end of the school year	Sample based
National Assessment in Grade 6	6	Mathematics	Every start of the school year	Diagnostic, census based
Diplôme national du brevet	9	Mathematics and science	Every end of school year	Certificate evaluation, national examination

Special Initiatives in Mathematics and Science Education

Every year, the Ministry of National Education, organizes or supports a number of nationwide mathematics and science events. These events primarily aim to facilitate an interest in scientific languages and to promote access to mathematics and science in or outside of school. Examples of these events include the following:

- *La Semaine des mathématiques* (Mathematics Week)[11]—This event is designed to engage students at the primary and secondary levels and their parents through presenting a current, lively, and attractive picture of mathematics. It stresses the importance of mathematics in educating citizens and its role in their daily lives. It shows the diversity of professions in which mathematics plays an important or essential role and the richness of the links between mathematics and other disciplines. Finally, it shows that the practice of mathematics can stimulate emotions of an aesthetic nature, to reveal the link between mathematics, fun, and creativity.
- *La fête de la Science* (Science Festival)[12]—Founded in 1991, the Science Festival promotes exchanges between the scientific community and the general public. The aims of the Science Festival are to foster interest in science and curiosity about scientific careers among young people and to inspire them to pursue scientific vocations; to stimulate knowledge sharing and exchange between researchers and citizens; to facilitate access to quality scientific information; to enhance popular understanding of the challenges of scientific development; to publicize the work of scientists and research opportunities; and to raise public awareness of scientific culture.
- *Les Rallyes mathématiques* (mathematical rallies) are organized for students and schools in most academies. Modeled on the Olympics, the aim of mathematical rallies is to give students the opportunity to take a different approach to mathematics. Requiring curiosity, ingenuity, and initiative, the rallies develop the ability of students to work in teams and enable them to discover the pleasure of research.

There are numerous foundations, associations, and networks engaged in promoting mathematics and science. Most of them are involved in the events described above. Some also organize their own events, such as *La main à la pâte* and *Canopé*:

- *La main à la pâte*[13]—Managed by the Scientific Cooperation Foundation for Science Education, *La main à la pâte* (which may be translated Hands On and Join In) was founded in 1996. The primary objective of the initiative is to reform the teaching of science and technology in primary schools by promoting education based on scientific investigation. *La main à la pâte* awards annual prizes under the auspices of the Academy of Sciences. In particular, the annual primary school award distinguishes classes that lead experimental science activities using an investigative approach.
- *Canopé* [14]—*Canopé* is a network that publishes educational multimedia resources (i.e., print, digital, cellular, and television) to meet the needs of the education community. *Canopé* organizes a mental calculation contest (*Mathador*) for classes in Grades 3 to 9.[15]

21 Actions for the Teaching of Mathematics[16] is an important institutional initiative, launched in 2018 by the Minister of National Education. The 21 actions are issued from the work of a national committee tasked with evaluating strengths and weaknesses of France's education system with regard to mathematics teaching, identifying issues and potential levers before formulating concrete proposals based on the most conclusive practices and in the light of international studies, such as TIMSS and the Programme for International Student Assessment (PISA). The initiative gave birth to a national mathematics teacher training program.

Suggested Readings

Ministère de l'Éducation nationale — Direction de l'Evaluation de la Prospective et de la Performance. (2019). *Repères et références statistiques sur les enseignements, la formation et la recherche* [Statistical references on education, formation and research]. Paris: Author. Retrieved from http://www.education.gouv.fr/sites/default/files/imported_files/document/depp-rers-2019_1162516.pdf
This volume presents all statistical information available on the French educational and research system, compiled around 200 themes. This vast data set contributes to and supports debate on the functioning and the results of French schools.

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