**The Development Cycle (cycle 4)**

**Cycle 4, which goes from "Cinquième" (second year of lower secondary school) up to "Troisième" (fourth year of lower secondary school) is the last stage of compulsory education for all pupils: at the end of this cycle, pupils must have acquired sufficient mastery of the knowledge and skills defined in the Common Core to successfully continue their education, whichever baccalaureate pathway they choose next. Subjects covered in Cycle 4 include French, Modern Languages (foreign and regional), Art, Music, History of Art, Physical and sport education, Civic and moral education, History and Geography, Life and Earth Sciences, Physics-Chemistry, Technology, Mathematics, Media and Information education, and Interdisciplinary Teaching Topics (EPI).**

* [**French**](http://eduscol.education.fr/cid116621/the-development-cycle-cycle-4.html#lien0)
* [**Modern Languages (foreign or regional)**](http://eduscol.education.fr/cid116621/the-development-cycle-cycle-4.html#lien1)
* [**Art**](http://eduscol.education.fr/cid116621/the-development-cycle-cycle-4.html#lien2)
* [**Music**](http://eduscol.education.fr/cid116621/the-development-cycle-cycle-4.html#lien3)
* [**History of art**](http://eduscol.education.fr/cid116621/the-development-cycle-cycle-4.html#lien4)
* [**Physical and sports education**](http://eduscol.education.fr/cid116621/the-development-cycle-cycle-4.html#lien5)
* [**Civic and moral education**](http://eduscol.education.fr/cid116621/the-development-cycle-cycle-4.html#lien6)
* [**History and Geography**](http://eduscol.education.fr/cid116621/the-development-cycle-cycle-4.html#lien7)
* [**Life and Earth Sciences**](http://eduscol.education.fr/cid116621/the-development-cycle-cycle-4.html#lien8)
* [**Physics-Chemistry**](http://eduscol.education.fr/cid116621/the-development-cycle-cycle-4.html#lien9)
* [**Technology**](http://eduscol.education.fr/cid116621/the-development-cycle-cycle-4.html#lien10)
* [**Mathematics**](http://eduscol.education.fr/cid116621/the-development-cycle-cycle-4.html#lien11)
* [**Media and information education**](http://eduscol.education.fr/cid116621/the-development-cycle-cycle-4.html#lien12)
* [**Interdisciplinary teaching topics (EPI)**](http://eduscol.education.fr/cid116621/the-development-cycle-cycle-4.html#lien13)

During this cycle, abstract thinking, in both knowledge and approaches, will occupy an increasingly important role. Pupils gradually learn to use critical thinking and their capacity for judgement. The objective is to gradually increase their autonomy, in terms of individual work and group projects carried out in class, and develop their thought processes. Cycle 4 is also when they prepare to make their initial choices about their future career.

**French**

The teaching of French in Cycle 4 helps pupils develop their critical thinking and judgement, and construct independent ideas, using precise and correct language. During Cycle 4, pupils perfect their capacity for expression and oral and written comprehension, develop their knowledge of and proficiency in the French language, and build up a literary and artistic culture.

**The main points covered are:**

**Comprehension and oral expression**

Pupils learn how to understand varied, complex documents (speeches, documentaries, newspapers, stories, etc.), express themselves fluently in front of an audience (during a presentation or speech of a few minutes for example), and take an active part in a debate. They also work on reading aloud or acting out literary works.

**Writing**

Pupils continue to imagine and write fictional texts related to the works studied in class; they also learn to present arguments in writing, express a judgement or a point of view and develop their understanding of a literary or artistic work, in varied formats, on paper or computer.

**Reading**

Pupils learn to read texts and images of all kinds efficiently, extracting the information needed to understand them. When studying literature, which takes on an increasingly important role, they learn how to place a work in its context and interpret it using specific indicators. Every year, they read at least six works (in full or in extracts) and three groups of texts.

**Understanding of language (grammar, spelling, vocabulary)**

Pupils continue to learn spelling, agreements, conjugated forms, in increasingly complex scenarios. There is a particular focus on constructing sentences, punctuating them correctly, sequencing them in a long text and understanding how texts work. Pupils learn the language through regular oral and written practice, gradually acquiring an understanding of the system of French language and learning to make the most of its richness to express themselves better and with greater accuracy.

**Literary and artistic culture**

Based on the main topics in the curriculum, French teachers freely choose the literature and artworks studied and encourage individual reading; pupils therefore acquire a rich, diverse culture which helps them reflect on the world around them and on the questions posed by humans, and identify the answers that can be found in art and literature. They become familiar with the main literary genres and build up a store of historical and cultural markers.

**Curriculum Topics:**

**"Cinquième":** "Travel and adventure: towards the unknown?" (tied to the historical topic: the Age of Discovery); "With others: family, friends, networks" (compulsory study of a 17th century comedy); "Looking at the world, inventing worlds" (compulsory study of a fairy tale); "Heroes/heroines and heroism" (Middle Age history: chivalric novels, epic poems); "Are humans the masters of nature?".

**"Quatrième":** "Describing love" (exploring lyric love poetry); "Individuals and society: a confrontation of values?" (compulsory study of a 17th century comedy or tragedy); "Fiction interrogating reality" (realism and naturalism, linked to the study of the 19th century in history); "Informing, obtaining information, misrepresentation?" (studying the press and the media).

**"Troisième":** "Telling your story" (autobiography); "Exposing the shortcomings of society" (how to present arguments); "Poetical visions of the world"; "Acting in the city: individuals and power" (linked to the study of the 20th century in history, works that examine the history of this century).

**Modern Languages (foreign or regional)**

In Cycle 4, pupils choose a second foreign or regional modern language, and therefore learn two foreign languages at the same time, drawing on their experience of learning French and their first modern language during the preparatory class. The teaching of modern languages has two main, closely linked objectives: to learn to communicate in another language (understand and express yourself, orally and in writing, and have conversations with others) and to discover another culture. Media and digital tools are often used in class. Teachers also highlight the links and contacts between languages, to help pupils transpose their skills and knowledge from one language to another. Depending on their projects, they may also study another subject in a foreign language, which helps them to learn this language and use it in a different educational context from a language lesson.

The same curriculum applies to all foreign and regional languages, each teacher adapting it to the language they teach, particularly as regards linguistic knowledge (vocabulary, grammar, pronunciation). Five language skills are worked on simultaneously: listening and understanding, reading, reacting and conversing, speaking continuously, writing and responding to writing. The skills levels used in all European countries, on a scale from A1 (minimal skills, beginner level) to C2 (advanced skills) are used as a reference point for teachers:

* for modern language 1, by the end of cycle 4, all pupils should have reached at least level A2 in the five language activities, and level B1 in several of them;
* for modern language 2, all pupils should have reached level A2 in at least two language activities.

**With regard to the cultural dimension of language learning, there are four topics in the curriculum, common to modern language 1 and modern language 2, which facilitate projects between languages:**

* languages;
* school and society;
* travel and migrations;
* encounters with other cultures.

The level of detail studied in these topics varies during Cycle 4 depending on whether it is the first or second modern language studied. The topics make pupils aware of other cultures and help them learn about others and themselves, moving away from their own references and going beyond stereotypes and prejudices.

One of the goals of modern language teaching in Cycle 4 is to enable pupils to plan a temporary stay in a foreign country, for example during their future educational pathway.

**Art**

In art, pupils exercise and develop their creativity, imagination and manual skills to experiment, produce and create individual or collective works. Artistic practice is continually linked to the discovery and analysis of leading works and artists, French and international historical or contemporary art, training pupils' eyes, taste and critical judgement and shaping their artistic culture.

Pupils are taught to question what artistic creativity is: its process, purposes, the presentation of artworks and their dissemination, relationships with the public, etc., based on the three main topics on the curriculum, which are revised and developed every year of the cycle, according to new perspectives and through the study of different artworks and artists:

* "Representation; images, reality and fiction";
* "The material nature of artworks; the object and the work";
* "The artwork, space, artist and spectator".

Pupils also learn to reflect on their own creative practice and analyse it, helping it develop and grow.

They study and practice various art forms: painting, sculpture, drawing, photography, video, new image production methods. In Cycle 4, there is a specific focus on the development of art in the digital era.

**Music**

The teaching of music in Cycle 4 continues to build on pupils' musical culture, through expressive and creative activities, usually in a group, by listening to and analysing varied musical works. The goal is to educate their taste, help them understand past and present music, develop their own interests and encourage them to perform or create music.

In musical practice, the projects produced and techniques used become increasingly complex; singing is practised most regularly, sometimes complemented by the use of instruments or sound objects. Pupils are taught to create and produce musical works in reference to the styles or works studied, or according to specific instructions; they reflect on their own practice and must be capable of presenting and justifying their performance and creative choices.

In listening activities, pupils learn to identify, describe and comment on musical works, placing them in their creative context and comparing them to other works, justifying their opinion on a work and defending a point of view by presenting arguments.

Pupils who want to practise more music in a group context can join a choir, offered in every school.

**History of art**

In Cycle 4, history of art is taught by different subject teachers (in particular art, music, French and history), linked to the subject they teach and often as part of joint projects. History of art helps to consolidate and enrich pupils' artistic culture, by connecting the artistic subjects studied in class (mainly literature, art and music) and discovering other artistic fields (design, architecture, dance, street arts, etc.). The main objective is to encourage interest enjoyment in both art and diverse artistic forms, both culturally and historically.

Pupils learn to describe a work of art using appropriate vocabulary and offering personal interpretation and analysis. They acquire knowledge of artistic trends and cultural movements that helps them to understand the relationship with the artworks.

Teachers may freely draw from the eight topics on the curriculum, related to the history syllabus, designed to give pupils strong historical markers, choosing the works and artists they consider most relevant:

* Arts and society in ancient times and the Early Middle Ages;
* Artistic forms and flows (9th-15th century);
* The coronation of the artist (14th-early 17th century);
* State, society and lifestyles (13th-18th century);
* Art in the time of the Enlightenment and the Revolutions (1750-1850);
* From the "Belle Époque" to the Roaring Twenties: the avant-garde era (1870-1930);
* Art as freedom or propaganda (1910-1945);
* Art in the era of mass consumption (from 1945 to the present).

As part of this syllabus, pupils will meet people who work in the arts and culture sector and visit cultural centres dedicated to the conservation, production and dissemination of the arts.

**Physical and sports education**

During Cycle 4, pupils move from pre-adolescence to adolescence and undergo significant physical and psychological developments that change them and affect their social life. Physical and sports education gives them new ways to understand themselves, other people and their environment, construct a positive image of themselves and increase their self-confidence, while learning how to respect others and be part of a team.  They learn to look after their health and enjoy practising a sport or artistic physical activity. Involvement in individual and group projects helps pupils to use new resources of observation, analysis, memory and communication.

The main objectives of Physical and sports education are the same throughout the three cycles of primary school and lower secondary school, with levels of learning that increase through the cycles:

* developing motor skills and learning to express oneself using their body;
* gaining methods and ways of learning through sports;
* sharing rules and taking on roles and responsibilities within a team;
* learning how to look after your health through regular physical activity;
* becoming familiar with a physical and artistic sport culture.

Pupils gradually learn, following an increasing level of difficulty, to produce their best performance, adapt their movements to varied environments, express themselves in front of others through artistic or acrobatic activities, lead and manage a match in a team or between two players. Depending on their pupils, teachers freely choose the available materials and equipment and different physical and sports activities for the lessons (athletics, swimming, dance, circus arts, gymnastics, team ball games, racket sports, etc.), constructing an appropriate, coherent training programme. They ensure that each pupil participates in a variety of individual and group activities during the cycle.

In addition to Physical and sports education, sports clubs at lower secondary school offer the opportunity to all pupils, on a voluntary basis, to extend their physical practice as part of a club, enjoying new experiences and taking on new responsibilities.

**Civic and moral education**

**Civic and moral education has four main objectives during the three cycles of primary and lower secondary school:**

* emotional awareness education, to learn to identify feelings and emotions, put them into words, discuss them and understand other people's feelings and emotions;
* education in rules and law, to understand the meaning of rules in the classroom, primary or secondary school and to make pupils (future citizens) aware of the role and importance of law in the French Republic;
* education in moral judgement, in order to understand and discuss the moral choices encountered in life, requiring pupils to put forward arguments, debate and justify their choices;
* experiencing engagement, encouraging pupils to participate in the social life of their class and school, acquire a spirit of cooperation and a sense of responsibility towards others.

In Cycle 4, this subject is allocated one hour every week, taught by different subject teachers on a voluntary basis. More generally, however, all lessons contribute to it. For example, in French, by working on expressing and presenting arguments, or by analysing situations experienced by characters in the texts studied; in Physical education and sport by being involved in a team; in Life and Earth Sciences by reflecting on the responsibilities of humans towards their environment. This is not theoretical education, but practical, concrete education that puts pupils in role play situations to get them to think, express themselves, act and react.

**Curriculum in Cycle 4:**

* Emotional awareness: expressing moral opinions (using questions or a variety of formats), comparing them with others' opinions; reflecting on the limits of personal freedom in relation to others; understanding the principles, values and symbols of French and European citizenship, etc. For example, pupils may take part in a community or sustainable development action.
* Rules and law: understanding the main principles of justice (the right to a fair trial, right to defence); identifying the main stages involved in passing a law in France; the main elements of the Declarations of Human Rights, etc. For example, pupils may work on an internal rules project or make amendments to the rules, or attend court hearings.
* Moral judgement: education in differentiating between inequality and discrimination, understanding the challenges of a secular society (freedom of conscience and equality of citizens), understanding the main characteristics of a democratic State, etc. For example, pupils may look at how inequality and injustice is expressed in literature, or take part in the Press Week and reflect on the challenges of press freedom.
* experiencing engagement: understanding the principles of employment rights, the main principles governing National Defence, understanding the relationship between urban citizen engagement and pupil engagement in schools, etc. For example, pupils may organise different activities during a citizenship week in order to elect pupil representatives, create and lead a club or association at school, or participate in a socio-educational centre or sports club.

**History and Geography**

In Cycle 4, the teaching of history complements that of geography, and vice versa. Pupils gradually understand how these two scientific disciplines help us accurately reflect on time and space in human societies and analyse a wide variety of social phenomena. The topics on the curriculum ensure that pupils discover the complexity of the historical development and geographical organisation of human groups.

**History**

The history curriculum in Cycle 4 follows a chronological progression, continuing on from the first year of lower secondary school: after prehistory, the first States and early writings of Antiquity, pupils explore a large period going from the Early Middle Ages to the end of the 20th century; they therefore tackle all the major periods of history in lower secondary school. The aim is to acquire a solid knowledge of political, economic, social and cultural history.

The history of France has a predominant place, but always in a more global context: the curriculum enables pupils to discover the history of European relations around the world, the connections between economies, societies and cultures, and the history of international relations.

One of the main challenges of this syllabus in Cycle 4 is also to develop pupils' capacity to reflect on the past and on historical science: they begin to understand the major developments, turning points or watersheds in both national and world history, thereby acquiring information that explains the contemporary world in which they live. The link to the topics tackled in geography helps them to appreciate the relationship and also the distance between the past and the present, to situate themselves in time and to gain a better understanding of how the present is constructed.

Pupils continue to explore historical approaches in greater detail: critical examination of sources, putting sources in a precise context, analysing historical documents, etc.

**The second year of lower secondary (Cinquième)**

**It covers a large period from the Middle Ages to the 17th century, focusing on the emergence of Islam and the relationships and contacts between the empires influenced by this religion and the Christian Empires, the feudal Western society and the role of the Church in it, and the changes that took place in the 16th and 17th century with the Age of Discovery and "early globalisation". This class therefore introduces pupils to societies marked by religion, within which new ways of thinking, seeing and exploring the world sprang up, as well as a new concept of power and the exercise of power. The study of religious events has an important role in this topic.**

**In the third year of lower secondary (Quatrième)**

Pupils learn about the major political, social, economic and cultural changes that occurred in France and Europe from the death of Louis XIV to the installation of the Third Republic, studying: the principal aspects of the 18th century (expansion, the Enlightenment and the Revolutions); the Industrial Revolution and colonial expansion in Europe and the world; political, social and cultural life in France in the 19th century.

**The final year of lower secondary (Troisième)**

It  focuses on the 20th century, giving pupils the information they need to understand the modern world. Pupils therefore study the extent of the crises undergone by French, European and global societies and the social and political changes caused by these crises: the First World War, the crises between the wars and the rise of totalitarian regimes, the Second World War; the reorganisation of the world and international relations since 1945; changes in France since 1945 - social, political, economic and cultural.

**Geography**

Continuing and extending the "Living" topic that formed the structure of the Cycle 3 curriculum, the teaching of geography in Cycle 4 focuses on questions of development and sustainability, examining how human societies develop land and territories and the geographical effects of contemporary globalisation. Pupils are therefore made aware of the problems involved in global change and the over-exploitation of some resources.

The topics on the curriculum in each year of the cycle enable pupils to gradually master the fundamentals of geographical analysis of the spaces constructed by human society on different scales (from a specific location to the world as a whole). Pupils are introduced to mapping language, both the main principles of traditional mapping and those of digital mapping and geographic imaging, producing sketches and diagrams. They carry out practical case studies on specific territories placed in context, from a variety of areas worldwide; this approach helps pupils to use geographical reasoning and a range of very important tools and documents (world maps, maps, landscapes, photographs, GIS, statistical data, written sources, qualitative data, etc.).

**In the second year of lower secondary (Cinquième)**, pupils are made aware of the problems faced by human spaces due to global change and the tensions caused by access to essential resources (water, food, energy). They learn about the vulnerability of human spaces, and about the capacity of societies to find solutions for fair, sustainable development, via three main topics: "Demographics and unequal development"; "Limited resources, managing and renewing them"; "Preventing risks, adapting to global change".

**In the third year of lower secondary (Quatrième)**, the focus is on the major characteristics of contemporary globalisation, making pupils aware of the new ways of organising land and territories due to globalisation, and tackling the problems it causes. They study global urbanisation, transnational human mobility and the transformation of land through globalisation. This topic can be linked to that of "early globalisation" in the 15th and 16th centuries, studied in history, to show the differences between them.

**In the final year of lower secondary (Troisième)**, the focus is on the geography of France and the European Union, linked to the study of the changes in France since 1945 (social, political, economic, cultural) in history, in three sections:

* "Territorial dynamics in contemporary France";
* "Why and how should we develop land?";
* "France and the European Union".

**Life and Earth Sciences**

Life and Earth Sciences is a subject that studies living beings and how they work, and how the planet works. Along with Physics-Chemistry, Technology and Mathematics, Life and Earth Sciences is part of pupils' scientific education.

The objective of scientific education is to acquire specific skills: pupils develop their ability to observe living beings and natural phenomena, seek the causes and predict the effects, putting forward hypotheses, experimenting and drawing conclusions by analysing the results of experiments or data. Life and Earth Sciences also helps to develop rigorous critical thinking that can distinguish between facts and ideas, scientific theories and beliefs, or assess the validity of "scientific" information that might be in the public domain.

**The topics studied in Life and Earth Sciences are linked to current scientific events and the main challenges currently faced by Life and Earth Sciences.**

They cover three main topics:

**Planet Earth, the environment and human action**

This topic develops an understanding of the interactions between the living world and its environment, the impact of human activity on natural environments, our responsibility to the environment and the importance of protecting the planet's limited resources. Pupils study climatic and meteorological phenomena, as well as geological phenomena (plate tectonics, volcanoes and earthquakes) and the risks and challenges these pose to human populations.

**The living world and its evolution**

Pupils learn about the diversity of species on Earth (biodiversity) and the connections between all living beings. This topic traces the history of life on Earth (based on the theory of evolution) and situates humans in the development of the species. It also looks at the functions of human beings: their nutrition, reproduction and transmission of genetic heritage.

**The human body and health**

Pupils, who are adolescents during their time at lower secondary school, are constructing their relationship to the world, to other people and to their own bodies. The Life and Earth Sciences curriculum looks at how the body works and the related health questions: muscular and cerebral activity, diet and digestion, human reproduction. Learning about biological processes also helps them to examine the individual and collective challenges of healthcare (prevention policies such as vaccination) and reproduction control.

By the end of lower secondary school, Life and Earth Sciences, along with other subjects, has helped to form future citizens who are responsible about their health and that of others and towards the environment, armed with scientific knowledge that will help them to make decisions.

**Physics-Chemistry**

Like Life and Earth Sciences, Physics-Chemistry at lower secondary school is an experimental and observation science, which helps pupils discover that all physical and chemical phenomena are governed by laws, which they learn to describe and predict. Gradually, by observing, experimenting and measuring, pupils learn to model the complexity of the real world, from the microscopic to the astronomical scale.

**The four main topics are rooted in the history of science and contemporary science:**

**Organising and transforming matter**

Pupils discover the microscopic nature of all types of matter and learn to interpret changes in physical state at a microscopic level (the transition between a solid, liquid and gaseous state). They study initial chemical transformations, through experiments conducted in class. They become aware that matter is the same everywhere in the universe (same structure and same chemical elements), obeying the same laws.

**Movement and interaction**

Different types of movements are studied (rectilinear, circular, uniform or non-uniform) using examples from everyday life. Pupils begin to model the interactions between objects through forces, for example the force of gravity.

**Energy and its conversions**

Pupils learn to identify the different forms of energy (kinetic, potential, thermal, electrical, chemical, nuclear, light energy) and how they are converted. They make an energy assessment of a simple energy production system (production, consumption and losses) and look at concepts of energy savings and sources of renewable and non-renewable energy. Electrical energy is studied particularly closely, making simple electric circuits and applying the laws of electricity.

**Signals for observing and communicating**

Different types of signals are studied, in particular light and sound signals: their characteristics, importance in transmitting information and the risks involved in their use (lasers, hearing risks). The rectilinear propagation of light and speed demonstrates the importance of using the light year as the measurement unit for astronomical distances.

Throughout Cycle 4, Physics-Chemistry is closely linked to the other scientific and technical subjects, in particular Mathematics, whose tools are continually used for measuring, calculation and estimating measurements.

**Technology**

The aim of teaching technology at lower secondary school is to help pupils understand the contemporary technical environment, its links to scientific advances and the needs of society, and to train pupils to be responsible users. The focus is on technical objects and the services related to their social reality, in various fields (transport, housing and construction, home comfort and automation, sports and leisure, etc.).

The approach is practical, getting pupils to research, design, model and produce.

**There are three main topics on the curriculum:**

**Design, innovation, creativity**

Pupils take part in the complete process of technical projects, aimed at improving a technological function or creating a new one, considering the question of design. They identify a need and take account of the difficulties and available resources in order to draw up specifications. They devise solutions to meet a need and represent it through sketches, diagrams or algorithms. They also take part in organising the project, defining the role of the participants, planning and reviewing the steps and presenting the results.

**Technical objects, services and changes in society**

This topic has a significant historical dimension: pupils study the development of objects in relation to technological inventions and innovations. Using a technical object as an example, they assess the changes it causes in society and the impact on the environment.

**Modelling and simulation of technical objects**

Through experimental activities, pupils analyse the functioning and structure of an object, in particular to check its performance and compliance with the specifications. Modelling and digital simulation are used to study the virtual behaviour of an object, to understand its real-life possibilities and decide on the technical choices in order to produce it.

Finally, special importance is placed on the teaching of computer science and programming, in collaboration with mathematics. The aim is to consolidate pupils' proficiency in computer tools, and help them design and execute simple computer programs.

**Mathematics**

In Cycle 4, the teaching of Mathematics places significant importance on solving problems (as authentic as possible), training in reasoning and demonstration, and practising investigation (in which pupils proceed by trial and error). Close links are developed with other subjects, to give more meaning to the learning of mathematics.

Six main skills are studied: discovery, modelling, representing, reasoning, calculating and communicating.

**The curriculum is structured around the four traditional topics of this subject: Numbers and calculation; Organisation and management of data; Size and measurements; Space and geometry. It also includes Computer Science, which is carried out in collaboration with Technology.**

**Numbers and calculation**

Pupils reinforce their knowledge of numbers and their proficiency in calculation. Mental calculation must be automatic, enabling pupils to concentrate on thinking about and preparing an approach for calculating and solving problems. They study decimal numbers, fractions, discover rational numbers (positive or negative), square roots and prime numbers. They begin to solve basic equations.

**Organisation and management of data**

The aim of this topic is to learn to manipulate data, learning how to sample, interpret and represent it (for example in the form of a graph) and process it. For the first time, this topic also tackles concepts of uncertainty and randomness, to make initial probability calculations. Pupils also learn to recognise situations of proportionality and solve proportionality problems (for example percentages). Finally, they gradually approach the concept of function, by studying examples of measurements connected by a function, from everyday life or other subjects (power as a function of energy, fuel consumption as a function of speed, etc.) and learning to solve problems modelled on functions.

**Size and measurements**

This topic has the most links to other subjects, essentially Physics-Chemistry and Life and Earth Sciences: pupils must make measurement calculations (for example calculating speed, volume, concentration and surface/area) and give the results using the appropriate units. They become capable of estimating measurements, using their results and the reference measurements they have learned (e.g. the circumference of the Earth). Pupils also make changes (increases, decreases, movements) to geometrical measurements.

**Space and geometry**

Pupils enter Cycle 4 with a knowledge of geometrical shapes, triangles, squares, rectangles, etc. and their properties; they now learn to demonstrate these properties, and learn new properties (relationships between angles and parallelism, sum of the angles of a triangle, triangle inequality, identifying the median of a triangle, Pythagoras' and Thales' theorems). They construct geometrical shapes and apply changes to them, in particular by using geometrical software. By the end of lower secondary school, they are capable of solving plane geometry problems through demonstration.

**The fifth topic, Algorithms and coding**

It teaches pupils the rudiments of coding: they learn to break down a problem, write a simple program in response to a specific problem and execute this program on a computer. No specific coding language is taught.

**Media and information education**

Media and information education is a cross-curricular subject in Cycle 4. The aim is to give pupils access to an understanding of the media, networks, forms and dissemination of information in all its dimensions (economic, societal, technical, ethical) and to train them in reading media content critically and objectively. Pupils learn the relevant, effective approaches for obtaining information and documents. They learn about safe, legal, ethical use of the publication and dissemination possibilities of different media, in particular digital media. Pupils are encouraged to keep themselves informed, by reading the French and foreign language press regularly, and by producing and disseminating information.

**The main points covered are:**

**The independent use of media and information**

Using dictionaries and encyclopaedia in all formats; learning how to search for information and use it through advanced use of search engines; discovering how information is indexed and ranked and understanding the main relevant technical terms, etc.

**Reasoned use of information**

Differentiating between information sources; questioning the validity and reliability of information, its degree of relevance; learning to distinguish between the objective and the subjective when processing information, etc.

**Responsible media usage**

Understanding digital identity and traces; becoming familiar with the concepts of private and public space, in reference to the basic rules of the right to expression and publication, particularly on networks, etc.

**Producing, communicating and sharing information**

Using collaborative digital platforms to cooperate with others; to distinguish between a quotation and plagiarism; being involved in a creative publication project, printed or online, useful to a community of users in or outside the school, which complies with information law and ethics, etc.

**Interdisciplinary teaching topics (EPI)**

This subject is specific to Cycle 4 of lower secondary school. It takes the form of projects on interdisciplinary topics, freely chosen by teachers from a national list of topics. It takes place during lesson time.

**Every year, from the "Cinquième" class onwards, pupils cover at least two of the following eight topics:**

1. body, health, well-being and safety;
2. artistic culture and creativity;
3. ecological transition and sustainable development;
4. information, communication, citizenship;
5. ancient languages and civilisations;
6. foreign, or where applicable regional, languages and cultures;
7. the economic and business world;
8. sciences, technology and society.

By the end of "Troisième" (last year of lower secondary), pupils will therefore have tackled at least six of the eight topics.

Examples of topics are given in the curriculum, demonstrating how the subjects can work together. For example, a Physics-Chemistry teacher could work with an Art teacher on the study of "Light and art: optical illusions, white light and coloured light" or the History-Geography teacher could work with the Life and Earth Sciences teacher on "New scientific theories that change our view of the world: the example of Darwin and evolution".

During interdisciplinary teaching, pupils take an active approach, developing their autonomy, spirit of initiative and collaboration. These are also good opportunities to consolidate knowledge, giving meaning to the areas studied in the different subjects.