Official Bulletin Cycle 2
CP - CE1 - CE2
Mathematics

In Cycle 2, problem solving is at the center of students' mathematical activity, developing their abilities to seek, reason and communicate. The problems make it possible to approach new notions, to consolidate acquisitions, to provoke questions. They can come from situations of class life or situations encountered in other lessons, such as "Questioning the world". They have as much as possible a playful character. Care should be taken to provide students with CPs with learning problems that are not just application problems in one or more operations but require trial and error research.

The written component of mathematical activity becomes essential. These writings are first and foremost writings and representations produced in situa- tion by the pupils themselves, who progressively evolve with the teacher's help towards conventional forms. It is equally essential that an oral language activity based on a suitable syntax and lexicon accompany the use of writing and be favored in the exchange of arguments between students. The introduction and use of mathematical symbols are realized as they become meaningful in action situations, in relation to the vocabulary used.

Students consolidate their understanding of whole numbers, already encountered in Cycle 1. They study different ways to designate numbers, including their numerical entries, oral names, compositions-decompositions based on numerical properties (twice as many). , half of, etc.), as well as decompositions in units of numbering (units, tens, etc.).

The four operations (addition, subtraction, multiplication, division) are studied on the basis of problems which contribute to make sense of them, in particular problems concerning quantities or their measurements. The daily practice of mental calculation supports the mastery of numbers and operations. In connection with the work carried out in "Questioning the world", students encounter magnitudes that they learn to measure, they construct essential knowledge of space and approach the study of some geometric relations and some objects (solid and figures planes) by facing problems in which this knowledge is at stake.

Skills worked	Areas of the base
Look for • Engage in a problem-solving approach by observing, asking questions, manipulating, experimenting, hypothesising, if necessary with the accompaniment of the teacher after a period of independent research. • Test, try several tracks proposed by oneself, other students or the teacher.	2, 4
Modeling • Use mathematical tools to solve concrete problems, including problems with quantities and their measurements. • Realize that some problems come from additive situations, others from multiplicative situations, from sharing or groupings. • Recognize shapes in real objects and reproduce them geometrically.	1, 2, 4
Represent • Understand different representations systems (drawings, diagrams, calculation trees, etc.). • Use numbers to represent quantities or quantities. • Use various representations of solids and spatial situations.	1, 5
Reason • Anticipate the result of manipulation, calculation, or measurement. • Reasoning on figures to reproduce them with instruments.	2, 3, 4

• Consider various elements (arguments of others, results of an experiment, sources internal or external to the class, etc.) to modify one's judgment. • Gradually become aware of the need and interest of justifying what is said.	
Calculate • Calculate with whole numbers, mentally or by hand, in an exact or approximate way, using strategies adapted to the numbers involved. • Check the likelihood of its results.	4
Communicate • Use oral and written, natural language and some representations and symbols to explain procedures, argue reasoning.	1, 3

Numbers and calculations

The knowledge of the integers and the calculation is a major objective of the cycle 2. It develops in support on the quantities and the sizes, working along several axes. Contextualized problem solving: counting collections, measuring quantities, locating a rank in a list, predicting the results of actions relating to collections or quantities (compare them, bring them together, increase them, reduce them, share them in equal or unequal parts, how often one is included in the other, etc.). These actions relate to objects first of all material and then spoken or written; the research and modeling work on these problems makes it possible to progressively introduce the four operations (addition, subtraction, multiplication, division). The study of internal relations to numbers: to understand that the successor of an integer is "this number plus one", to decompose / recompose the numbers additively, multiplicatively, by using the numbering units (tens, hundreds, thousands) , change reference number units, compare, rank, iterate a sequence (+1, +10, + n), etc. The study of different oral and / or written designations: name of the number; usual writing in digits (decimal position number); double of, half of, sum of, product of; difference of, quotient and remainder of; additive / subtractive, multiplicative, mixed, numeric, etc. The appropriation of calculation strategies adapted to the numbers and operations involved. These strategies are based on the knowledge of memorized digital facts (additive and multiplicative repertoires, knowledge of numeration units and their relations, etc.) and on properties of operations and counting. Mental calculation is essential in everyday life where it is often necessary to quickly arrive at an order of magnitude of the result of an operation, or to check a price, etc.

A good knowledge of numbers less than a thousand and their relations is the foundation of the comprehension of integers and this numerical field is privileged for the construction of calculation strategies and the resolution of the first arithmetic problems.

Expected end of cycle	
- Understand and use whole numbers to count, order, locate, compare. - Name, read, write, represent whole numbers. - Solve problems using integers and calculation. - Calculate with integers.	
Related knowledge and skills	**Examples of situations, activities and resources for the student**
Understand and use integers to count, order, locate, compare	
Count, build and compare collections. Use various counting strategies. -Enumeration procedures (additive or multiplicative decompositions / recompositions, uses of intermediate units: tens, hundreds, in relation or not with groupings). -Find a row or position in a queue or track. Make the link between the rank in a list and the number of	Counting collections by organizing them and designating their number of elements (additive or multiplicative writing, writing in numeration units, usual writing). Particular importance is given to groupings in the tens, hundreds, thousands. The comparisons can relate to usual or not,

elements that precede it. -Relationship between ordinals and cardinals. Compare, arrange, frame, insert integers, using the symbols =, ≠, <,>. -Equality representing the equivalence of two designations of the same number. -Order. -Meaning of symbols =, ≠, <,>.	for example to compare 8 + 5 + 4 and 8 + 3 + 2 + 4 by using that 5 = 3 + 2 and to deduce that the two numbers are equal.
Name, read, write, represent whole numbers	
Use various representations of numbers (writing in numbers and letters, names in oral, graduations on a half-line, constellations on dice, fingers of the hand ...). Moving from one representation to another, especially associating the names of numbers with their encrypted entries. Interpret the names of numbers using numeration units and arithmetic writing. - Numeration units (single units, tens, hundreds, thousands) and their relationships (decimal principle of numeration in figures). - Value of digits according to their rank in the writing of a number (position principle). - Names of numbers.	The knowledge of the oral numeration is deepened by a specific work from the "word-numbers". Use writes in numeration units (5d 6u, but also 4d 16u or 6u 5d for 56). Iterate a sequence of 1 in 1, 10 in 10, 100 in 100.
Associate an integer with a position on a graduated half-line, as well as at the distance from this point to the origin. Associate a number or frame with a quantity by measuring it with a unit. - The half-line graduated as a way of representing numbers thanks to the link between numbers and lengths. - Link between number and measure of quantities one unit being chosen.	Graduate a straight line with an origin point using a unit of length. Make the connection between numeral units and metric units studied in Cycle 2.
Solve problems using integers and calculating	
Solve problems arising from situations of daily life or adapted from games on quantities and their measurement, displacements on a graduated half-line ..., leading to use the four operations. - Direction of operations. - Problems related to additive structures (addition / subtraction). - Problems related to multiplicative structures, divisions or groupings (multiplication / division). - Model these problems using mathematical writings. - Meaning of symbols +, -, ×,:	Study the links between: - addition and subtraction - multiplication and division. Distinguish the problems of additive structures from problems of multiplicative structures.
Organization and data management Exploit digital data to answer questions. Present and organize measurements in the form of tables. - Digital data representation modes: tables, simple graphs, etc.	This work is conducted in connection with "Quantities and Measures" and "Questioning the World".
Calculate with integers	
Memorize digital facts and procedures. -Tables of addition and multiplication. - Additive and multiplicative decompositions of 10 and 100, additions to the top ten, to the next hundred, multiplication by a power of 10, doubles and halves of numbers of common use, etc.	Answer the questions : 7 × 4 =? ; 28 = 7 ×? ; 28 = 4 ×?, Etc. Use your knowledge about numeration: "24 × 10 is 24 tens, it's 240".
Develop or choose oral and written computing strategies. Check the likelihood of a result, in particular by estimating its order of magnitude. -Addition, subtraction, multiplication, division.	Process calculations under the four operations, explain the procedures used and compare their effectiveness. To calculate, estimate or verify a result, use

-Implicit properties of operations: 2 + 9 is the same as 9 + 2, 3 × 5 × 2 is the same as 3 × 10. -Numeration properties: "50 + 80, it's 5 tens + 8 tens, it's 13 tens, it's 130" "4 × 60 is 4 × 6 tens, it's 24 tens, it's 240".	various supports or instruments: the fingers or the body, abacuses or abacuses, string with knots, pebbles or tokens, fictional currency, double graduated rule, calculator, etc.
Mental calculation: to calculate mentally to obtain an exact result or to evaluate an order of magnitude.	Calculate mentally - on the numbers 1, 2, 5, 10, 20, 50, 100 in connection with the currency - on the numbers 15, 30, 45, 60, 90 in relation to the durations. Mental Resolve Arithmetic Problems with Simple Numeric Data Use the properties of operations, including those of type 5 × 12 = 5 × 10 + 5 × 2.
Online calculation: calculate using additive, subtractive, multiplicative, mixed online postings.	Examples of online calculation strategies: 5 × 36 = 5 × 2x18 = 10 × 18 = 180 5 × 36 = 150 + 30 = 180 5 × 36u = 15d + 30u = 15d + 3d = 180u Use 21 = 4 × 5 + 1 line writes to find the quotient and the remainder of the 21 by 4 (or 5) division.
Calculation posed: to implement a computation algorithm posed for the addition, the subtraction, the multiplication.	The learning of the operating techniques posed (addition, subtraction, multiplication) is done in connection with the numeration and the properties of the operations.

Progressivity benchmarks

It is possible, when solving problems, to go beyond the progressiveness markers identified for each level. At CP, the systematic study of numerical relationships between numbers less than 10 and then 20 (decomposition / recomposition) is investigated throughout the year. At the same time, the study of the decimal numeration in numbers (tens, single units) for numbers up to 100 and that of the oral designation, allows pupils to count and build increasingly important collections (the complexity of oral numeration in France must be taken into account for numbers greater than 69). At CE1, a lot of time is devoted to the resumption of the study of numbers up to 100, especially for their oral designation and for strategies of mental or written calculation. At the same time, the study of the written decimal numeration (hundreds, tens, single units) is extended in stages, up to 200, then 600 and possibly 1000, then at the CE2, up to 10 000 (the absence of a specific word). to designate the next group corresponding to 10,000 justifies this level).
At CP, students begin to solve additive and subtractive problems with multiplicative problems later in the cycle. The study of the division, worked out in cycle 3, is initiated during cycle 2 in simple situations of sharing or grouping. It is then prepared by the resolution of two types of problem: those where one looks for how many times a magnitude contains another magnitude and those where one shares a magnitude in a given number of magnitudes. In grade 2, students are asked to solve more complex problems, possibly in two stages, requiring for example the exploration of a table or a graph, or the elaboration of an original resolution strategy.
Reinvestment in many basic arithmetic problems then allows students to access different understandings of each operation.

With regard to calculus, students establish and then must gradually memorize:
• numerical facts: additive decompositions / recompositions at the beginning of the cycle (including addition tables), multiplicative in the rest of the cycle (including multiplication tables);
• basic calculation procedures.
They rely on this knowledge to develop calculation procedures adapted to the numbers involved for CP additions, for subtractions and multiplications at CE1, and to obtain the quotient and the remainder of a Euclidean division by a number to 1 digit and numbers like 10, 25, 50, 100 at the end of the cycle.

The operations that are used allow results to be obtained, especially when the mental calculation or online writing reaches its limits. Their learning is also a way to reinforce the understanding of the decimal position system and to consolidate the memorization of elementary numerical relationships. It therefore

takes place when the students have appropriated calculation strategies based on decompositions / recompositions related to the decimal numeration, often used also in mental or written calculation.
At CP, students learn to add the additions in columns with two-digit numbers.
At CE1, they consolidate mastery of addition with larger numbers and with numbers of different size; they learn a calculation technique laid down for subtraction.
In CE2, they consolidate the control of the subtraction; they learn a calculating technique for multiplication, first multiplying a two-digit number by a one-digit number and then larger numbers. The choice of these techniques is left to the school teams, it must be followed in cycle 3.

Sizes and measures

In the different teachings but also in their daily life, students are brought to compare objects or phenomena using numbers. Through comparison activities, they learn to distinguish different types of quantities and to use the appropriate lexicon: lengths (and location on the right), masses, capacity (and volume content), durations (and time tracking), price . The comparison of quantities can be direct, object to object (juxtapose two rods), require comparison to an intermediate object (use a third container to determine which of two bottles has the largest capacity) or several objects of the same size (put end to end several identical sticks to compare the lengths of two lines drawn on the ground). It can also be based on the comparison of measurements of the quantities.

In the case of lengths, masses, capacities and durations, students have a mathematical approach to measuring a quantity: they determine how many times a quantity to be measured "contains" a reference quantity (the unit) . They then appropriate the usual units and learn to use measuring instruments (an hourglass, a ruler, a measuring cup, a scale, etc.). To solve problems related to lived situations, students are compelled to calculate with magnitudes. They use the properties of numbers and operations, and thus consolidate mastery.

To understand the situations and validate their results they must also give meaning to these quantities (estimate the length of a room or the distance between two trees in the yard, judge if a book can be heavier than another, etc.).) relying on some references they will be built. These problems are an opportunity to strengthen and connect digital and geometric knowledge as well as those acquired in "Questioning the World".

Expected end of cycle	
- Compare, estimate, measure lengths, masses, capacities, durations. - Use the lexicon, the units, the specific measuring instruments of these quantities. - Solve problems involving lengths, masses, capacities, durations, prices.	
Related knowledge and skills	**Examples of situations, activities and resources for the student**
Compare, estimate, measure lengths, masses, capacities, durations Use the lexicon, the units, the measuring instruments specific to these quantities	
Compare objects according to several sizes and identify when it is a length, mass, capacity or duration. - Specific lexicon associated with the lengths, the masses, the capacities, the durations.	One object may be higher, narrower, and lighter than another; identify that "high" and "broad" refer to the notion of length and that "light" refers to the notion of mass.
Compare lengths, masses and capacities, directly, by introducing the comparison to an intermediate object or by measurement. - Principle of comparison of the lengths, the masses, the capacities.	Juxtapose objects to compare their length. Estimate at sight very simple ratios of length. Check possibly with a strip of paper.
Estimate orders of quantities of some lengths, masses and capacities in relation to metric units. Check with an instrument if necessary. - Orders of magnitude of the usual units by associating	At sight or by manipulation, propose an estimate of the measure of a magnitude attached to an object, before confrontation with other approaches.

them with some familiar objects. - Very simple ratios of lengths (double and half).	

Measure lengths with a suitable instrument, including reporting a unit.
Measure masses and capacities with suitable instruments.
Frame a size by two whole numbers of units
Express a measure in one or more units chosen or imposed.
- Notion of unity: arbitrary magnitude taken as a reference for measuring the magnitudes of the same species.
- Usual measurement units.
  - length: m, dm, cm, mm, km.
  - mass: g, kg, tonne.
  - capacity: L, dL, cL.
- Relationship between units of length, between mass units, between capacity units.
	Instruments: graduated ruler, strips of 1 dm long graduated or not, strip of paper more or less long, string, measuring meter or not, scale trays, direct reading, containers for decanting, a measuring cup, ...
	The size frames are of the type: the corridor is between 6 m and 7 m long.
	The quantities can be expressed with complex expressions (1 m 13 cm, 1 h 20 min, etc.)

Compare, estimate, measure durations - Usual measuring units of durations: j, week, h, min, s, month, year, century, millennium. - Relationships between these units.	This work is conducted in connection with "Questioning the world" Use an hourglass, clocks and watches with hands and digital display, a stopwatch.
In simple cases, represent a quantity by a length, especially on a graduated half-line. - Objects of equal size are represented by segments of equal lengths. - A double quantity is represented by a double length. - The ruler graduated in cm as a special case of a graduated half-line.	To read the graduations representing quantities: dial of a balance, chronological frieze, progressively axis of a graph.
Solve problems involving lengths, masses, capacities, durations, prices	
Solve problems, including measurement and comparison, using operations on quantities or numbers. - Operations on the quantities (addition, subtraction, multiplication by an integer, division: search for the number of parts and the size of a part). - Four operations on size measurements. - Principles of the use of money (in euros and cents). - Lexicon related to economic practices.	Observe that the lengths, the masses, the capacities, the durations, are additive quantities. Use the result of a measurement to calculate another magnitude, including measuring segments to calculate the length of a broken line, perimeter of a polygon. Reinvesting knowledge of mental arithmetic, numeracy and meaning of operations. Know the price of some familiar objects.
Solve problems involving simple conversions from one common unit to another. Convert before calculating if necessary. - Relationships between usual units.	Make connections between decimal units of measurement and number units.

Progressivity benchmarks

It is possible, when solving problems, to go beyond the progressiveness markers identified for each level.

Throughout the cycle, students work on a variety of variables, starting with comparing them to understand the concept, before measuring them using appropriate instruments, gradually appropriating the usual units. The different units are introduced and connected progressively during the cycle:
• the length (comparison, double and half from CP, in dm, cm, m, km at CE1 then in mm at CE2);
• mass (in g and kg, as independent units in CE1, then in g, kg, and tonne in relation to CE2);
• the capacity (in liters at CE1, in CL and dL in CE2);
• the duration (day and week and their relation throughout the cycle, relations between j and h, between h and min during CE1, j, month, year and their relations, year, century, millennium and their relations, min , s and their relation to CE2);
• the price (in euros from CP, in euros and cents, in relation to CE1).
The operations on the quantities are carried out in connection with the progress of the operations on the numbers, the knowledge of the units and the relations between them. The following lexicon is introduced: twice a length, half at the beginning of the cycle.

Space and geometry

In Cycle 2, students acquire both spatial knowledge such as orientation and spatial tracking and geometric knowledge about solids and plane figures. Learning to locate and move in space is closely related to work in "Questioning the World" and "Physical Education and Sport." Geometric knowledge contributes to the construction, throughout compulsory schooling, of fundamental concepts of alignment, distance, equality of length, parallelism, perpendicularity, symmetry. The skills and knowledge expected at the end of the cycle are built on problems, which are enriched throughout the cycle by playing on the tools and supports available, and in relation to the activities involving the geometric quantities and their measured.

In the continuation of the work started in kindergarten, the acquisition of spatial knowledge relies on problems aiming to locate objects or to describe or produce displacements in real space. The spoken word still holds a large place in the CP but the symbolic representations develop and the real space is gradually put in relation with geometric representations. The knowledge of solids is developed through sorting, assembling and making objects. The notions of plane geometry and the knowledge of the usual figures are acquired from the resolution of problems (reproduction of figures, sorting and classification activities, description of figures, recognition of figures from their description, traces following a simple construction program). The reproduction of various simple and compound figures is an important source of geometry problems, the difficulty of which can be varied according to the figures to be reproduced and the instruments available.

The general concepts of geometry (lines, points, segments, right angles) are presented from such problems. In geometry, as elsewhere, it is particularly important for teachers to use precise and appropriate language and to introduce the appropriate vocabulary during the manipulations and action situations in which it makes sense for students, and that these are gradually encouraged in the classroom. 'use

Expected end of cycle	
- locate and using landmarks and representations. - Recognize, name, describe, reproduce some solids. - Recognize, name, describe, reproduce, build some geometric figures. - Recognize and use the notions of alignment, right angle, equality of lengths, middle, symmetry.	
Related knowledge and skills	**Examples of situations, activities and resources for the student**
to find your bearings and to move using landmarks	
Find your way around your surroundings. Locate objects or people in relation to each other or to other landmarks. -Vocabulary used to define positions (left, right, above, below, on, under, in front, behind, near, far, foreground, foreground, north, south, east, west, ...). -Vocabulary used to define displacements (move forward, backward, turn right / left, up, down, ...).	This work is conducted in connection with "Questioning the world". In activities, go from close and known space to an unknown space. Situations, with oral and written use of an appropriate language.
Produce representations of familiar spaces (outdoor school spaces nearby, the village, the neighborhood) and less familiar (experienced during outings). -Some modes of representation of the space.	This work is conducted in connection with "Questioning the world" Study representations of the surrounding space (models, plans, photos), produce them. Draw the school space.
Orient and move using landmarks. Code and decode to predict, represent and move in familiar spaces, on a grid, on a screen. -Spatial landmarks. -Relationships between the space in which one moves and his representations.	Journey of discovery and orientation to identify elements, to locate them in relation to each other, to anticipate and to make a displacement, to code it. Make space moves and code them for another student to reproduce.

	Produce representations of a small space and use it to communicate positions. Program the movements of a robot or those of a character on a screen.
Recognize, name, describe, reproduce some solids	
Recognize and sort the usual solids among varied solids. Describe and compare solids using the appropriate vocabulary. Reproduce solids. Make a cube from a pattern provided. - Vocabulary suitable for: - name solids (ball, cylinder, cone, cube, right pad, pyramid); - describe polyhedra (face, top, ridge). - The faces of a cube are squares. - The faces of a right pad are rectangles (which can be squares).	Sort, recognize and name solids through sorting activities among various solids, games (portrait, Kim ...). Realize and reproduce assemblies of cubes and straight pavers. Associate such assemblages with various types of representations (photos, views, ...) Order the material just needed to make a cube from its faces. Observe, count the number of faces and vertices of a cube. Initiation to the use of a software allowing to represent the solids and to move them to see them from different angles.
Recognize, name, describe, reproduce, build some geometric figures Recognize and use the notions of alignment, right angle, equality of lengths, middle, symmetry	
Describe, reproduce figures or assemblages of plane figures on grid paper or plain Use the ruler, compass or square as plotting instruments. Recognize, name the usual figures. Recognize and describe from the sides and right angles, a square, a rectangle, a right triangle. Build them on a plain support knowing the length of the sides. Construct a circle knowing its center and a point, or center and radius. - Vocabulary suitable for describing the usual plane figures: - square, rectangle, triangle, right triangle, polygon, side, vertex, right angle; - circle, disc, radius, center; - segment, middle of a segment, right. Ownership of angles and equalities of length of sides for squares and rectangles. - Link between geometric properties and plot instruments: - right, alignment and non-graduated ruler; - right angle and square; - circle and compass.	Games such as portraits, Kim etc., the construction of friezes, tessellations, rosettes can contribute to develop the knowledge of the properties of the figures of the program and the associated vocabulary. The problems of reproducing figures (possibly from already supplied elements of the figure to be reproduced which it is then necessary to complete) give the opportunity to release and work the properties and geometric relations of the program. The choice of a plain, squared or pointed support and the available instruments is done according to the objectives. The problems of description of figures make it possible to develop the geometrical language.
Use the ruler (not graduated) to identify and produce alignments. Locate and produce right angles using a template, a square. Post a length on a line already drawn. Locate or find the middle of a segment. - Alignment of points and segments. - Right angle. - Equality of lengths. - Middle of a segment.	Through activities in the space or plots, students perceive the notions of alignment, sharing in two, symmetry. Mobilize various instruments during plots: templates, stencils, non-graduated ruler, paper strip with a straight edge to postpone lengths or find a medium, right angle template, square, compass. The report of lengths and the search of the middle of a segment can be obtained by using the graduated rule in connection with the measurement but they must first be able to be done without graduated rule.
Recognize if a figure has an axis of symmetry (to find). Complete a figure so that it is symmetrical about a given axis. - Axial symmetry. - A traced and then returned figure which coincides with	Recognize in its environment situations that can be modeled by symmetry (butterflies, buildings, etc.). Use tracing paper, cutouts, folds, software to move figures or parts of figures.

the initial figure is symmetrical: it has an axis of symmetry (to find). - A symmetrical figure folded on its axis of symmetry, is divided into two parts which coincide exactly.	

Progressivity benchmarks

It is possible, when solving problems, to go beyond the progressiveness markers identified for each level. In the CP, the representation of the places and the coding of the displacements are located in the class or in the school, then in the near neighborhood, and in the CE2 in an extended district or the village. Beginning in CE1, students can code moves using adapted programming software, which will take them to the second grade of comprehension, and the production of simple algorithms.

From CP, students observe and learn to recognize, sort and name various solids. The vocabulary necessary to describe them (face, summit, ridge) is progressively required. They learn from CE1 to build a cube with squares or stems that can be assembled. In CE2, they approach the notion of cube pattern. The discussion on the layout of the faces of a boss is cycle 3.

The geometric properties are progressively engaged in the reproduction and description of figures (alignment, length transfer on a straight line and length equalities at the beginning of the cycle, then right angle in the middle of the cycle). We are discussing the construction of a circle without constraints at CE1; then from the center and a point of its radius and center, and at the CE2, its diameter. The use of the instruments is done gradually: non-graduated rule, tool of extension of length (paper or cardboard band on which one can write) on a right from the CP; then graduated rule, right angle template; finally, square, compass to draw circles.

The report of lengths on a straight line already drawn with the compass can be approached in CE2 but it is mainly in Cycle 3. The introduction to the use of geometry software to produce or move figures or components of figures is done gradually, in connection with all geometric activities and the development of geometric knowledge and skills. The use of dynamic geometry software is mainly in cycles 3 and 4.