

Official Bulletin Cycle 1
TPS - PS - MS - GS
Build the first tools to structure your thinking

4.1. Discover the numbers and their uses

Since their birth, children have an intuition of magnitudes that allows them to compare and evaluate in an approximate way the lengths (sizes), the volumes, but also the collections of various objects ("there are many", "not a lot"...). On their arrival at kindergarten, they discriminate small quantities, one, two and three, especially when they form culturally known configurations (dominoes, dice). Finally, if they can enunciate the beginnings of the digital sequence, this recitation does not translate a true understanding of quantities and numbers.

The nursery school must progressively lead everyone to understand that numbers make it possible both to express quantities (cardinal use) and to express a rank or position in a list (ordinal use). This learning takes time and confrontation with many situations involving pre-digital and digital activities.

4.1.1. Objectives and elements of progressiveness

The construction of numbers is based on the notion of quantity, its oral and written codification, the acquisition of the oral sequence of numbers, and the use of enumeration. In young children, these learnings develop in parallel before being able to coordinate: the child can, for example, know how to recite the digital nursery rhyme far enough without knowing how to use it to enumerate a collection.

In the learning of the number in the nursery school, it is advisable to have the number built to express the quantities, to stabilize the knowledge of the small numbers and to use the number as memory of the position. The teacher favors the very gradual development of each of these dimensions to contribute to the construction of the notion of number. This construction can not be confused with that of numeration and operations which are part of the elementary school's learning.

Construct the number to express the quantities

To understand the notion of quantity implies for the child to conceive that the quantity is not the characteristic of an object but of a collection of objects (the child must also understand that the number serves to memorize the quantity). The child first uses a perceptual and overall estimate (more, less, the same, a lot, not a lot). Gradually, it goes from the appearance of collections to the consideration of quantities. The comparison of collections and the production of a collection of the same cardinal as another are essential activities for the learning of numbers. The number as a measuring tool of the quantity is stabilized when the child can associate it with a collection, whatever is the nature, the size of the elements and the occupied space: five allows indistinctly to designate five ants, five cubes or five elephants.

The three years of kindergarten are necessary and sometimes not sufficient to stabilize this knowledge by ensuring that the numbers worked are composed and decomposed. The control of the decomposition of numbers is a necessary condition for the construction of the number.

Stabilize the knowledge of small numbers

In Cycle 1, building up to ten quantities is essential. This does not exclude comparison work on large collections. The stabilization of the notion of quantity, for example three, is the ability to give, show, evaluate or take one, two or three and to compose and decompose two and three. Between two and four years, stabilizing the knowledge of small numbers (up to five) requires many and varied activities involving the decomposition and recomposition of small quantities (three is two and one again, one and two more, four is two and two more, three and one again, one and three more), the recognition and observation of the constellations of the dice, the recognition and the expression of a quantity with the fingers of the hand, the term correspondence to term with a known cardinal collection.

The iteration of the unit (three is two and one again) is built progressively, and for each number. After four years, the decomposition and recomposition activities are carried out on quantities up to ten.

Use the number to designate a rank, a position

The number also preserves the memory of the rank of an element in an organized collection. To keep in mind the rank and position of the objects (third pearl, fifth hoop), the children must define a sense of reading, a direction of travel, that is to say, give an order. This use of the number is based on the oral knowledge of the digital nursery rhyme and the writing on that of the numerical writing.

Build first knowledge and know-how with rigor

Acquire the oral suite of the word-numbers

For the spoken word of the word-numbers to be available as a resource for enumeration, it must be stable, ordered, segmented and sufficiently long. It must be worked for itself and constitute a reservoir of ordered words. The knowledge of the oral sequence of the names of the numbers does not constitute the learning of the number but contributes to it. Before four years, the first elements of the digital suite can be set up to five or six and then gradually expanded to thirty at the end of large section. The learning of digital nursery rhymes notably promotes the memorization of the sequence of numbers, the segmentation of word-numbers into linguistic units; these achievements make it possible to identify the numbers that are before and after, the next and the preceding of a number, to become aware of the link between the increase or decrease of an element of a collection.

Writing numbers with numbers

At the same time, the children meet the numbers written in occasional activities of the life of the class, in games and through a first use of the calendar. The first writing of numbers should not be introduced early, but gradually, starting from communication needs in solving concrete situations. Learning the drawing of figures is done with the same rigor as that of letters. The progression of the ability to read and write numbers is organized on the cycle, especially from four years. The institutional written code is the final stage of learning that continues in Cycle 2.

Count

The enumeration activities must avoid counting-numbering and when listing the collection, it should appear that each of the number names refers to the quantity just formed (the child must understand that showing three fingers, is not the same as showing the third finger of the hand). Subsequently, beyond five, the same attention must be paid to the gradual development of quantities and their relation to numbers under the different codes. Children must understand that any quantity is obtained by adding one to the previous quantity (or removing one to the higher quantity) and that its denomination is obtained advancing of one in the continuation of the names of numbers or their writing with numbers.

To count a collection of objects, the child must be able to synchronize the recitation of the sequence of the number words with the score of the objects to be counted. This ability must be taught in different ways by varying the nature of the collections and their spatial organization because the strategies are not the same depending on whether the objects are movable or not (put in a box, put on another table), and according to their arrangement (organized collection in space or not, organized collection-aligned on a sheet or not).

4.1.2. What is expected of children at the end of kindergarten

Use numbers

- Evaluate and compare collections of objects with numeric or non-numerical procedures.
- Make a collection of which the cardinal is given.
- Use counting to compare two quantities, to make a collection of a given size or to make a collection of quantity equal to the proposed collection.
- Use the number to express the position of an object or person in a game, in an organized situation, on a row or to compare positions.
- Mobilize analogical, verbal or written symbols, conventional or unconventional to communicate oral and written information on a quantity

Studying the numbers

- To have understood that the cardinal does not change if one modifies the spatial arrangement or the nature of the elements.
- Having understood that any number is obtained by adding one to the previous number and that this corresponds to the addition of a unit to the previous quantity.
- Quantify collections up to ten at least; to compose and to decompose them by effective manipulations then mental ones. Say how much to add or remove to obtain quantities not exceeding ten.
- Speaking numbers using their decomposition.
- Say the sequence of numbers up to thirty. Read numbers written in numbers up to ten.

4.2. Explore shapes, sizes, organized sequences

Very early, young children intuitively discern shapes (square, triangle ...) and magnitudes (length, capacity, mass, area ...). In kindergarten, they build knowledge and benchmarks on some shapes and sizes. The approach of plane shapes, objects of space, magnitudes, is done by the manipulation and coordination of actions on objects. This approach is supported by language: it makes it possible to describe these objects and these actions and favors the identification of first descriptive characteristics. This limited knowledge is a first approach to geometry and measurement that will be taught in Cycles 2 and 3.

4.2.1. Objectives and elements of progressiveness

Early on, children group objects together according to their appearance, their familiar use, or their effects. At school, they are encouraged to "put together what goes together" to understand that any object can belong to several categories and that certain objects can not belong to them.

Through observations, comparisons, sorting, children are better able to distinguish different types of criteria: shape, length, mass, capacity essentially. They gradually learn to recognize, to distinguish solids then flat shapes. They begin to understand the notion of alignment that they can also experiment in physical activity sessions. The teacher is attentive to the fact that the apprehension of plane shapes is more abstract than that of solids and that some terms are confusing (square / cube). The teacher uses a precise vocabulary (cube, ball, pyramid, cylinder, square, rectangle, triangle, circle or disc (to prefer to "round")) that the children are trained thus to understand first then to use wisely, but the manipulation of the mathematical vocabulary is not a goal of the nursery school.

In addition, from the small section, children are invited to organize sets of objects according to criteria of form and color; the first algorithms proposed to them are simple. In the following years, progressively, they are led to recognize a rhythm in an organized sequel and to continue this continuation, to invent "rhythms" more and more complicated, to complete gaps in an organized sequel.

4.2.2. What is expected of children at the end of kindergarten

- Classify objects according to characteristics related to their shape.
- Know how to name some flat shapes (square, triangle, circle or disc, rectangle) and recognize some solids (cube, pyramid, ball, cylinder).
- Classify or arrange objects according to a criterion of length or mass or capacity.
- Reproduce an assembly from a model (puzzle, paving, assembly of solids).
- To reproduce, to draw flat shapes.
- Identify the principle of organization of an algorithm and continue its application.