Presentation

In this new edition, “I Learn Maths CP” still adheres to the main pedagogical choices which are the basics in the approach to numbers:

- Differentiate counting from calculating
- Facilitate calculation by referring to the numbers 5 and 10
- Teach subtraction as early as CP
- Allow the solving of problems at different levels (from basic to advanced) in order to help every learner in their progress.

The results of recent research on number didactics support our choices.

Two new types of action, taking into account the experience of teachers, have been introduced in this new edition:

- An easier progression for subtraction
- A progression and complete rethinking of activities for geometry.

In the following text we will develop these points.

A progression organized around the distinction between counting and calculating.

In order to make this distinction clearer, let us consider the following problem:” I have got 4 discs in my left pocket and 3 discs in my right pocket. I’m going to put them all on the table. How many discs will there be?”

- To solve this problem, some children will count on 4 fingers on the one hand, 3 on the other one and they will count their fingers one by one up to 7.
- Other children will immediately say that 4 plus 3 equals 7, in other words they calculate.

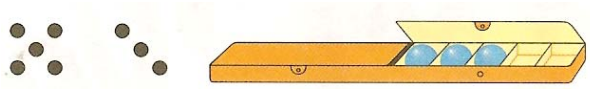
Learning how to calculate is obviously an essential objective as early as the CP class. But it is much less obvious to answer the following question: “How do we facilitate the transition from counting to calculating?”

In our opinion, it is not by **continued counting** that children learn how to calculate. Some can engage themselves for a long time in one by one-counting, without automatically progressing to calculating. Therefore, although learning how to count is an essential step it is not sufficient in itself.

It is not by **repeating many times** the results of an addition table, in other words by learning by heart, that children learn how to calculate. This does seem to be perhaps possible in the CE class with the multiplication tables, as learners have acquired a good knowledge of numbers, however it would be of dubious benefit with the addition tables in CP.

Learning how to calculate with the 5 and 10 landmarks.

We chose to use another way of learning in which children first learn to represent quantities using the landmarks 5 and 10. For example, 8 would be:



- a configuration of dots with the form 5+3
- a “box of Pickmarble” in which 8 appears as 5 objects enclosed in a compartment with a closed lid and 3 other objects in the second compartment.

In the same way, 13 would be a whole box (10) and 3 objects.

Therefore, sums like 5+3 and 10+3 are known at an early age and it is their memorized results that children use in other calculations.

Thus 4+3 is thought as (4+1) + 2 (cf. page 37)
5+8 is thought as (5+5) + 3 (cf.78)
9+4 is thought as (9+1) + 3 (cf.96), etc.

This is how curricula define “mental arithmetic” or “**reflected calculation**”.

Solving numerical and geometrical problems

Our option is to propose many problems with auto-corrections.

To solve a problem is indeed to **anticipate** its solution using one’s knowledge of counting or calculating in the case of numerical problems, or using one’s know-how and spatial knowledge in the case of geometrical problems. Providing children with auto-corrective problems means in fact helping them to solve these problems. It even helps them to conceive what a problem is because it allows them to **verify** their anticipations. Thus the **solving of a problem makes real sense** to the learner.

As for the numerical problems, we favoured problems with auto-corrections: orders, finding a complement to a given number (problems solved with a masking card), pictured problems, etc. The lids of the so-called “boxes of Pickmarble”, stickers and so forth allow creating such problem situations.

Towards the end of the year, the teacher will be able to propose the activities of Solving Problems Workshops (SPW), which prepare the learners to solve written problems.

As for geometry, preliminary comprehension of Squeaky’s errors and comparison with the expected results, as in Geom’s work, play the same role.