SCHEMATIC LEARNING OF INTRODUCTORY CONCEPTS OF ARITHMETIC

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Even in their preschool period, most children learn to count up to ten or twenty. However, reciting the words in order is not the same as forming the ideas of these numbers. Forming the idea of number begins with the perception of a collection of objects followed by an abstraction of their essential properties. Number is a primary concept and so basic that it is actually quite hard to say which properties is abstracted — it is easier to note those properties that are ignored, being inessential noise.

Thus the idea of number forms when we perceive different collections of objects, when we ignore: a) *their nature*, and b) *their arrangements and groupings*. After this ignoring, the pure idea of number remains in the mind. Traditionally, teachers managed to get along using natural didactical material (grains of corn, beans, etc.) for all numbers from the initial blocks. Children used to compose and decompose such arrangements of grains representing in that way numbers and operations with them. Here, we will confine our considerations to number pictures as the way of visible representation of numbers and operations. Such a way of representing is also feasible in case of numbers belonging to larger number blocks and it can be carried out easily using a variety of printed material and by means of computer animation. In addition, teachers have to get rid of a widely spread prejudice that representing numbers by natural objects is better. On the contrary, when less noise is present learning effects are better, particularly when the objective is development of calculation skills. We also add that once chosen a way of representing numbers should not be changed and it should be applied throughout all didactical procedures. Learning addition and subtraction, children are directed first to perceive *additive schemes*, being two disjoint sets together with their union. These schemes are followed by an *addition task* – the number of elements of the two sets is given and the number of elements of the union is searched for or by a *subtraction task* – the number of elements of the union and one of the two sets is given and the number of elements of the other set is searched for. Practicing such activities, the meaning of these two operations establishes what has to precede formal calculation tasks.

REFERENCES

[1] Marjanovic, M. (2002): A Broader Way Through Themas of Elementary School Mathematics, IV, The Teaching of Mathematics, Vol. V, 1, pp. 47–55,
[2] Marjanovic, M., Mandic, A. (2009): Numbers as Visible Shapes, The Teaching of Mathematics, Vol. XI, 1, pp 45-49.