

BUILDING UP THE CONCEPT OF MULTIPLICATION IN ELEMENTARY GRADES

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Scientific based teaching approach to building basis of a theory is often called “building up a theory.” In building up a theory of natural numbers we may distinguish two approaches: axiomatic and set based approach.

Accordingly, we may introduce *multiplication* $c=a \cdot b$, in several ways:

1. As a number of elements of a union of a disjoint sets whereas each set have b elements.
2. As a result of repeated addition of a equal addends whereas each addend is equal b .
3. As a number of ordered pairs (x, y) with the first element x chosen from set with a elements and y chosen from set with b elements.

Bruner’s representations may be used as a basis for interpretation of different operations used in elementary school. In the paper we define three kinds of representations of multiplication and analyze examples of particular visual representations of the operation. We present the results of empirical research in which we studied how successful are young students (7-11 years old) in recognition of and manipulation with different representations of operation of multiplication.

The goal of our paper is to propose a didactical approach to teaching multiplication based on axiomatic and/or set theory of natural numbers and to find suitable representations for children who learn about concept of multiplication for the first time.

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