Arithmetic in primary school

The nature of mathematics as a discipline is characterised by use of different representations, meaning making, investigation on and reasoning with different properties of mathematical objects and the relations between them. Emphasizing these aspects in school mathematics in general is important for students' understanding of what mathematics is about and appreciation of the subject, but it is also crucial for students' further learning.

Arithmetic is the branch of mathematics dealing with numerical computations. By concerning properties of and relations between different operations and objects, arithmetic stretches to other branches of mathematics such as number theory and abstract algebra. In primary school, the arithmetic operations in focus are addition, subtraction, multiplication and division, and the objects are integers and fractions. Arithmetic constitutes the greatest part of the mathematics in early grades in school, and it is important for the students' further learning. Type of questions and tasks that are discussed, and the way they are discussed in the mathematics classroom, give different opportunities for students' learning.

Arithmetic in school often seems to be reduced to "mere" computations. On the other hand, research in mathematics education shows that emphasis on sense making and reasoning can strengthen both students' learning of arithmetic and successful development of mathematical competence later in education (see e.g. Carpenter, Franke & Levi, 2003; Robinson, Price & Demyen, 2016). Use of different representations is important for all mathematical work, and researchers (Schifter, 2009; Morris, 2009; Fosnot & Jacob, 2009) emphasize particularly the crucial role use of different representations (such as drawing, symbols or concrete materials) has in supporting students' investigations and reasoning in arithmetic.

Research questions that are studied in the project are connected to students' learning and teachers' teaching in the area of arithmetic in primary school. Examples are representations used, routines employed in classrooms by students and by teachers, communication, and types of tasks implemented in teaching.

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