

NCTM Article Reviews

1. *Number Sense – Right Now!*

This short article contains an abundance of information about number sense in the elementary classroom. The main objective concerning number sense in elementary mathematics is to have students develop a strong sense of number. This strong sense of number will hopefully be expanded and developed in middle school, and engaged into a higher-level mathematics in high school.

Number sense begins at a young age and is highly instinctive. Children often develop their number sense through experiences and home is a great place to begin this development. Parents can start having mathematical conversations with their children at a young age. Mathematical conversations with children do not need to be complex; simply asking a child “which is more?” or “which is less?” is an adequate beginner mathematical conversation. Once the child begins expanding on their mathematical experiences in school, they will develop a more formal sense of number than what was established at home.

Students who have developed a strong number sense are able to reasonably respond to various mathematical questions. A strong number sense provides students with the flexibility to work with various numbers in various settings. This flexibility is demonstrated in the process of estimation and mental math, and is also present when students talk about numbers and judge the reasonableness of their results.

The article concludes by stating that teachers should strive for “aha!” moments in their classroom. These moments, when students gain a mathematical understanding, demonstrate the importance of number sense. Number sense is something that should be worked on and developed from early childhood on, number sense is important right now.

2. *Do the Math in Your Head!*

While it is important for students to be mathematically proficient with pencil, paper, and technology, it is equally as imperative for a student to be skilled with mental mathematical techniques. Mental mathematics is typically thought of as the ability to answer questions quickly and without incorporating a pencil and paper. However, in its broadest sense, mental math also includes an abstract understand and problem solving.

The article begins by exploring mental mathematical concepts. The foundation for learning complex mathematics is establishing an understanding of what numbers and operations actually mean. Students who carry mental pictures of the size and value of numbers are prepared to learn addition and multiplication facts. Further, the student who has a mental image of size and value is more inclined to quickly solve simple mathematical problems involving computation.

Concerning mental computation, the article returns to the notion of a mental image. Students should be able to quickly recall their single digit addition and multiplication facts, this can be done with their mental image. The recall of simple addition and multiplication is an important component of mathematical knowledge. There are many quick and mental shortcuts that can help students execute calculations mentally or that can help them when problem-solving with pencil and paper.

Problem solving is a high priority aspect of mathematics, often regarded as the most important student goal. Mental mathematics provides students with the proper techniques for problem solving as well as filters for evaluating answers. A student who has strong mental math skills can quickly test various approaches to various problems and determine the optimal approach. Mental math provides students with the comparison point by which they can judge whether or not a result is reasonable.

Mental math is certainly an important dimension of mathematical knowledge and some believe that it does not receive the attention that it merits. Mental math is often regarded as memorization and as an information regurgitation technique. It is important to understand that mental math is not memorization; rather it is the process of engaging students in meaningful experiences with concrete objects and patterns.

3. Computation, Calculators, and Common Sense

Is there a place for both computation and calculators in the math classroom? This article responds to the previous question. NCTM believe that yes, calculators and computation can both happily share the same math classroom. Students should develop a range of knowledge, skills, and tools. This means that a student should be able to use a calculator, while also being able to do various computational procedures as well as mental math, estimation, and the list goes on.

Technology is everywhere; our culture has become significantly embedded in it. For this reason, a student will certainly be expected to use calculators in settings other than the classroom, and should therefore be instructed on the proper use. When a calculator is properly used, it can enhance a student's understanding and their use of numbers and operations. It is important that calculators do not replace mathematical understanding; they should simply enhance previously established knowledge.

The calculator should never replace the pencil and paper in the classroom. However, with the advanced technology that we have today, there is no longer the need to perform many of the lengthy math problems that we would have done in the past. It is the teacher's job to instruct students to understand when it is appropriate to use a calculator and when it is more fitting to use pencil and paper or mental mathematics. Students should not only know when it is best to use various mathematical tools in the problem solving process, they should be proficient in using their chosen method to solve a wide range of problems.