



**Emerging Literacy in Mathematics**



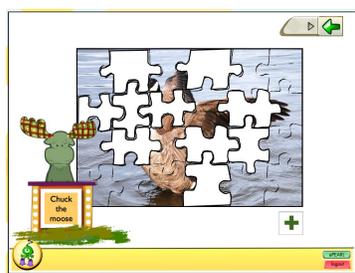
**Orienter la Réussite  
des Mathématiques Emergentes**

## What is ELM/ORME?



Emerging Literacy in Mathematics (ELM) is a set of software tools designed to teach the Grade 1 mathematics curriculum while also insuring that children acquire "Number Sense" and develop strategic thinking in mathematics. At the same time the tools are structured so as to lay the foundation for learning higher mathematics, e.g., algebra and also to avoid student development of "math anxiety". Included amongst the tools are modules designed specifically for teachers and parents. The former is designed to explain to teachers not only how to use the tools, but also how the tools have been structured to meet the above mentioned goals. Lesson plans, including suggestions for physical activities that would support student learning, are also included.

The parent module is designed to encourage parents to let their children explore ELM/ORME by explaining the underlying mathematical goals and discouraging parents from seeing it as homework that they perhaps need to do instead of their child. The parent module also includes suggestions to parents as to how they can include everyday activities with their child that will incorporate mathematical notions addressed in ELM/ORME.



## What is Number Sense?

Number sense can refer to "an intuitive understanding of numbers, their magnitude, relationships, and how they are affected by operations" (University of North Carolina School of Education, <http://www.learnnc.org/reference/number+sense>). This intuitive understanding must go beyond the rote manipulation of algorithms, e.g., "a well organised conceptual framework of number information that enables a person to understand numbers and number relationships and to solve mathematical problems that are not bound by traditional algorithms"(University of Cambridge, NRICH project, <http://nrich.maths.org/2477/index>). Gersten and Chard say number sense "refers to a child's fluidity and flexibility with numbers, the sense of what numbers mean and an ability to perform mental mathematics and to look at the world and make comparisons" (Number Sense: Rethinking Arithmetic Instruction for Students with Mathematical Disabilities, Gersten, R & Chard, D. J. (2001)), (Making Sense of Number Sense: Implications for Children With Mathematical Disabilities, Berch, Daniel B., Journal of Learning Disabilities, v38 n4 p333 Jul-Aug 2005).

The National Council of Teachers of Mathematics (NCTM) define number sense as follows: "Number sense refers to a person's general understanding of number and operations along with the ability to use his understanding in flexible ways to make mathematical judgments and to develop useful strategies for solving complex problems (Burton, 1993; Reys, 1991). Researchers note that number sense develops gradually, and varies as a result of exploring numbers, visualizing them in a variety of contexts, and relating them in ways that are not limited by traditional algorithms (Howden, 1989). Developing students' understanding of numbers, ways of representing numbers, relationships among numbers, and number systems are focus areas for grades PreK-2" ([http://illuminations.nctm.org/Reflections\\_preK-2.html](http://illuminations.nctm.org/Reflections_preK-2.html)).

## Why is developing Number Sense important for Grade 1 students?

Researchers consider number sense to be of prime importance for children in early elementary education, and the National Council of Teachers of Mathematics has made number sense a focus area of pre-K through 2nd grade mathematics education ([http://illuminations.nctm.org/Reflections\\_preK-2.html](http://illuminations.nctm.org/Reflections_preK-2.html)). Research shows that development of number sense in elementary education is a necessary condition for later success in higher mathematics courses, hence it opens the door to the possibility of a career in STEM fields. Further, early development of number sense helps combat development of math anxiety.