Unit 7 Research

Subitizing, a fundamental skill in the development of children's understanding of numbers, is the process of instantly recognizing how many objects are in a group without actually counting them. The importance of teaching subitizing to young children has been underscored by a series of studies, which found that doing so helps children mathematize their environment and stimulates their interest in numerical skills.(1)

How is it that children see an eight-dot domino and "just know" the total number? Mathematics researchers Steffe and Cobb found that children recognize the number pattern as a composite of parts and as a whole. They see each side of the domino as composed of four individual dots and as "one four." They see the domino as composed of two groups of four and also as "one eight." Children are capable of viewing number and number patterns as units of units.(2)

The author of "Subitizing: What is it? Why teach it?," Douglas Clements, says that children can use pattern recognition to discover essential properties of numbers such as conservation.(3) Subitizing also helps children develop skills such as counting on, composing and decomposing numbers, as well as place value.

Many number activities can promote subitizing. One particularly valuable activity is known as "quick images." Starfall classrooms utilize this technique through the use of ten-frames. The children are shown a ten-frame with magnets placed in varying numbers of sections, then it is quickly hidden. The children respond by articulating how many magnets are on the ten-frame. Other variations of the quick image activity are matching games such as Concentration, and using dominoes or dice to help children develop pattern recognition by visualizing combinations of objects.

(1) Hannula, Minna M. (2005). Spontaneous Focusing on Numerosity in the Development of Early Mathematical Skills. Turku, Finland: University of Turku.

(2) Steffe, Leslie P., and Paul Cobb. (1988). Construction of Arithmetical Meanings and Strategies. New York: Springer-Verlag.

(3) Clements, Douglas H. (1999). "Subitizing: What is it? Why teach it?" *Teaching Children Mathematics*. National Council of Teachers of Mathematics.

Unit 7 Frequently Asked Questions

What is subitizing?

To be able to subitize is to have the ability to quickly identify numbers of objects in relatively small sets, without the need to count. It is recognizing a number without relying on other mathematical processes. Subitizing plays an important role in the development of basic math skills, especially addition and subtraction skills.

Why does the Starfall Math Curriculum introduce subitizing before addition and subtraction?

Subitizing is initially presented as the rapid recognition of images of the dots on dice and dominoes. Children quickly learn these patterns, and without really trying, commit the patterns to their visual memories. The children then extend this skill to the ability to add on from a given number. For example, if a domino has 3 dots on one side and 6 dots on the other side, the children learn to identify the larger number (6) then count on (3) from that number (6, 7, 8, 9). Repeated recognition of patterns of dots and use of tally marks help children learn number combinations, so eventually when a child looks at the same domino with 3 dots on one side and 6 on the other, he or she instantly realizes that 6 plus 3 is equal to 9. Therefore, subitizing provides an early basis for composing and decomposing numbers.