

Beyond Counting and Calendar: Number Sense for Primary School Students

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Components of Number Sense

Counting

Counting is a complex idea, and foundational to other number concepts. In order to count, children must

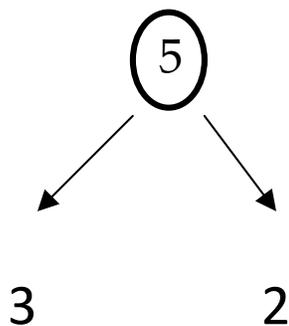
- Know the sequence of number names
- Touch each item while coordinating the touching with verbal counting (one-to-one correspondence)
- Keep track of which items have already been counted
- Understand that the last number they say stands for the entire quantity, and includes each of the other numbers they have said (inclusion)
- Realize that the items can be rearranged and still be the same quantity (conservation)

Number Relationships

- Children need to know how numbers relate to each other—for example, that five is one less than six, but three more than two. This includes the ideas of “more,” “less,” “the same,” “how many more,” “how many less,” and the sequencing of numbers.
- A number line is one tool to help children visualize these relationships.



Decomposing and Composing Numbers



- Children need to know that inside a number are other numbers, that they can break numbers apart and see what other numbers are inside. They need many chances to decompose numbers five and ten. They will use what they know about these smaller numbers to decompose larger numbers.

Landmark Numbers

- Landmark numbers are familiar landing places that make for simple calculations. They help children keep track of where they are. Children need many experiences with the number five, because everything that they know about five will help them know about ten. Later, children will use what they know about ten to help them with larger landmark numbers, such as twenty, fifty, and one hundred.

Place Value

- Place-value understanding grows from experience with counting. When students have frequent opportunities to count objects in many different ways, they come to realize the connections between quantity and the position of a digit. Until students understand place value, they solve problems based on counting and “one more than” relationships. Understanding that each digit in a multi-digit number represents a quantity as well as groups of a specific size is critical for students if they are to solve problems efficiently and flexibly.

Computational Flexibility

- Students with number sense can transfer their understandings to new situations. They know which methods are appropriate in various problem-solving situations and become more efficient with the methods they choose and use. If students are to develop computational fluency, they need experience with calculating mentally, with paper and pencil, and with a calculator. They also benefit and learn from hearing other students explain their solution strategies.

Sources:

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Math Matters 2nd Edition by Suzanne Chapin and Art Johnson
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Teaching Number Sense First Grade by Chris Confer
Teaching Number Sense Second Grade by Susan Scharton
The Math Instinct by Keith Devlin
Minilessons for Math Practice by Rusty Bresser and Caren Holtzman
 Hilde Howden *Arithmetic Teacher*, 1989
Math For All: Differentiating Instruction K-2

Literature Books

The Right Number of Elephants by Jeff Sheppard
Mouse Count by Ellen Stoll Walsh