

Early Number Sense in *Everyday Mathematics*

What is early number sense and why is it important?

While number sense can be defined in a variety of ways, researchers agree that it has important early roots in the ways young children are encouraged to think and learn about numbers—specifically, number meanings; the connection between number, counting, and quantity; number relationships; number combinations; and representations of number (Andrews, Sayers, and Back, 2013). Developing a strong number sense early in life helps children gain a good understanding of counting and cardinality; learn to count flexibly; compare and estimate quantities; represent, put together, and take apart numbers and sets in different ways; and employ these foundational understandings to solve problems. Gersten and Chard (1999, p. 19) neatly summarize the issue in saying that number sense refers to a child’s “fluidity and flexibility with numbers.”

Children’s early number sense lays the foundations for later learning in mathematics, helping them understand operations, perform mental calculations, and solve complex problems. More generally, developing number sense early “results in an expectation that numbers are useful and that mathematics has a certain regularity” (McIntosh, Reys, and Reys, 1992, p. 3), giving children the empowering and durable idea that they can make sense of numbers and mathematics. Young children who lack opportunities to develop their early number sense are often susceptible later to difficulties stemming from poor foundations and a belief that math is not understandable.

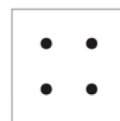
How does *Everyday Mathematics* help young children develop number sense?

Sood and Jitendra (2007) note that number sense “develops over time 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” (p. 146). The early grades in *Everyday Mathematics* emphasize materials, activities, and routines that help children develop their number sense by regularly engaging them in exploratory and “sense-making” number work. This includes:

Developing sound understanding of fundamental counting principles, such as one-to-one correspondence and cardinality. *Everyday Mathematics* uses explicit teaching strategies such as gesture and alignment, as well as targeted games and other interactive activities to help young children learn to count with understanding, rather than just repeating number words in order.

Developing flexible counting skills. Children benefit from developing flexibility in their counting abilities. *Everyday Mathematics* uses games, routines, and a variety of tools to engage children in counting forward and backward from different numbers, skip counting, and using flexible counting to solve meaningful problems such as counting back to subtract or grouping and counting by 10s to count large sets.

Working with and creating different representations of numbers besides written numerals, including manipulatives, pictures, dots, and five, ten, and double-ten frames (see illustration). Throughout *Everyday Mathematics* children have regular opportunities to create and use these diverse representations to compare quantities, match quantities and numerals, explore benchmarks of 5 and 10 and other number



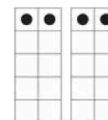
A dot-pattern representation of the number 4



A five-frame representation of the number 4



A ten-frame representation of the number 4



A double ten-frame representation of the number 4

relationships, and to subitize (recognize small quantities without counting) and decompose numbers.

Composing and decomposing numbers. Children explore the part-whole relationships of number in a variety of ways in *Everyday Mathematics*, using representations like those mentioned above. Quick Looks activities and routines encourage children to “see” numbers in different ways and to explain, compare, and discuss strategies for working with numbers. Quick Looks promote number sense by helping children use what they already know to develop fact strategies and improve fluency.

Estimating. *Everyday Mathematics* encourages even young children to estimate quantities, which both calls on and develops their sense of number and quantity.

Focusing on foundational place-value concepts. *Everyday Mathematics* helps children develop a foundational understanding of the importance and power of 10 in our number system. From Pre-Kindergarten through Grade 1, lessons in *Everyday Mathematics* provide a variety of activities focused on combinations that add to 10. Kindergarten *Everyday Mathematics* also includes a series of activities that help children understand and represent “teen” numbers (10–19) as 10 ones and some more ones. These activities further develop the part-whole and number representation concepts described above, and also lay a foundation for more advanced place-value work later on.

Exploring number patterns and relationships. Children in *Everyday Mathematics* classrooms are repeatedly encouraged to discover, explore, and discuss number patterns and relationships through counting activities, number line and number grid activities, and games, as well as in the context of the various number representations that they use regularly.

Engaging in mental math and problem solving. Solving problems mentally has been shown to help develop number sense. *Everyday Mathematics* provides frequent opportunities for mental math through *Minute Math* and *Minute Math+*, number stories, daily routines, and Mental Math and Fluency activities.

Using numbers in different ways and for real-life tasks and situations. Presenting problems in a real-life context is a hallmark of *Everyday Mathematics*, and it helps students develop their sense of how numbers work and how to reason and work with numbers for useful purposes. Daily routines are a big part of this effort, but throughout the program children are taught to use numbers in meaningful contexts and for real-world problems, solving data problems and number stories, and in reference to their everyday lives.

References

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