There are several skills that are critical to mathematics success in the elementary grades. Among them are an understanding of number, number sense, and place value. Place value is the system of writing numerals in which the value of the digit is determined by its position, or relationship to the other digits. These values are multiples of a common base of 10 in our decimal system. In Singapore, where students consistently outperform American students in math, place value is considered a foundational skill for all mathematics learning.

The U.S. edition of Singapore’s math curriculum, *Math in Focus*, stresses mastery, coherence, and focus. Students master foundational math skills early and carry those skills with them as they progress through the grades. With each new concept learned, students build on what they have already learned. This systematic approach to mathematics is particularly evident in the program’s approach to teaching place value. From grade level to grade level, place value is developed, honed, and applied to operations. As a result, numbers are demystified and students excel in mathematics because, for them, numbers become tools for solving problems rather than obstacles that cause frustration.

Throughout *Math in Focus*, a concrete-pictorial-abstract approach encourages students to use place value blocks, chips, charts, and strips to create an association between the physical representation of numbers, the number symbol, and the number name, and later to perform arithmetic operations using these materials. These concrete and pictorial representations add meaning to numbers so that when students progress to the abstract, they have an understanding of what the numbers stand for. This way students experience problem solving as more than just a process, there is real meaning behind the elements of a problem.

In Grade 1, place value is developed in a coherent, focused manner to stress the importance of the number 10 and help students master it. Grade 1, Chapter 1 begins with the study of the set of numbers from 0 to 10. This is followed by an introduction to number bonds, showing the additive relationship between numbers less than 10 and, in later chapters, adding and subtracting up to 10. In these chapters, students come to understand 10 as an anchor number for future applications of sums and differences with 10 and multiples of 10.
Place value is introduced with numbers to 20, in a chapter that examines all “teen” numbers (11 to 19) as “10 plus numbers.” This helps students master two major concepts that will play a pivotal role in their future mathematics learning:
1. Seeing all two-digit numbers as composed of tens and more
2. Understanding expanded notation—10 + 1 or 1 ten plus 1, 10 + 2 or one ten plus two, 10 + 3 or one ten plus three, and so on.

Next comes a chapter focused on practice with addition and subtraction to 20, which helps to solidify students’ understanding of 10 as an anchor number, the place value of numbers to 20, and adding and subtracting of numbers to 20.

By the second half of Grade 1, students using *Math in Focus* have developed a solid understanding of place value with numbers to 20. As the year progresses, the concept of place value continues to be developed with a chapter devoted to numbers to 40, followed by addition and subtraction to 40. In this chapter students begin their study of regrouping, which is clearly based on their earlier study of place value up to 40. Previously, students learned to make a ten and learned how to use number bonds. These foundational skills enable them to begin working with multi-digit numbers. Focusing only on numbers to 40 allows students to associate numerals with easily managed quantities of physical materials while the place value concept is developed.

In Grade 2, students study how to count, read and write numbers up to 1,000, and learn to add and subtract numbers to 1,000 with and without regrouping. Here place value is key to understanding why the algorithms work. Students learn how the place value ideas they learned in Grade 1 can be applied to the thousands place by using place value blocks. In addition, there is a chapter that teaches mental math strategies for adding and subtracting three-digit numbers without the use of paper and pencil. This solidifies students’ understanding of place value.
In Grade 3, the place value chart is extended to the ten thousands place. Predictably, the study of addition and subtraction in the ten thousands place follows. The depth of development of place value in Grade 3 directly correlates to the depth of development in Singapore Math. The chapter teaches the following skills:

1. Count, read, and write numbers to 10,000.
2. Learn to count by ones, tens, hundreds, and thousands.
3. Show representations of numbers up to 10,000 using place value charts and place value strips.
4. Identify the place value of each digit in the number and express the number in standard, word, and expanded forms.
5. Compare and verbally describe sets of numbers using the terms least and greatest.
6. Write five-digit numbers in increasing or decreasing order.
7. Apply the number and place value concepts to identify and complete number patterns and find missing numbers on a number line.

Throughout Math in Focus, students develop fluency in understanding numbers in multiple place value representations; for example, two thousand five hundred is 25 hundreds or 250 tens.

In the later chapters of Grade 3, students explore strategies for mental math and addition and subtraction for numbers to 10,000. These are the final chapters exploring place value addition and subtraction. In Grades 4 and 5, students continue to explore place value, but now with an emphasis on multiplication and division, and decimals.

In Grade 4, students extend their understanding of the place value system to the hundred thousands place and decimals to hundredths. Again, fluency with place value is emphasized as students learn to understand. For example, students see 38.2 as 38 and 2 tenths, or 3 tens and 82 tenths, or 382 tenths, and can then apply their knowledge of place value to multiplication, division, and mental math.
Conclusion

In *Math in Focus* place value is presented in a systematic and focused manner. From the very beginning students understand numbers as a system of tens. This system lays the foundation for all future lessons including computation skills, problem solving, the decimal system, and more.

Mastery of math in the elementary grades is key for student success in the classroom and in the 21st century working world they will eventually enter. Since the 1980s, students in Singapore have consistently outscored U.S. students in math. Now, with *Math in Focus*, U.S. students can learn using the same effective manner with which students in Singapore have had such success, preparing them for a lifetime of deep mathematics understanding and real-world problem solving.

About the Author

Patsy F. Kanter is an author, teacher, and international math consultant. She worked as the Lower School Math Coordinator and Assistant Principal at Isidore Newman School in New Orleans, Louisiana, for 13 years. Kanter is the author of a number of mathematics programs, including *Afterschool Achievers: Math Club (K–8)* and *Summer Success*: *Math (K–8)*, and co-author of *Every Day Counts*: *Calendar Math, Partner Games (K–6)*, and *Practice Counts (1–6)*. She is a consulting author for *Math in Focus*, which is the U.S. version of Singapore’s *My Pals Are Here! Maths*. Both programs are published by Marshall Cavendish, Singapore (part of Times Publishing Limited).
Math in Focus: Singapore Math by Marshall Cavendish is the U.S. edition of My Pals are Here! Maths, the world-class program most widely used in Singapore classrooms today. Marshall Cavendish math programs have contributed to Singapore’s consistent top performance on the Trends in International Math and Science Study (TIMSS) since 1995.