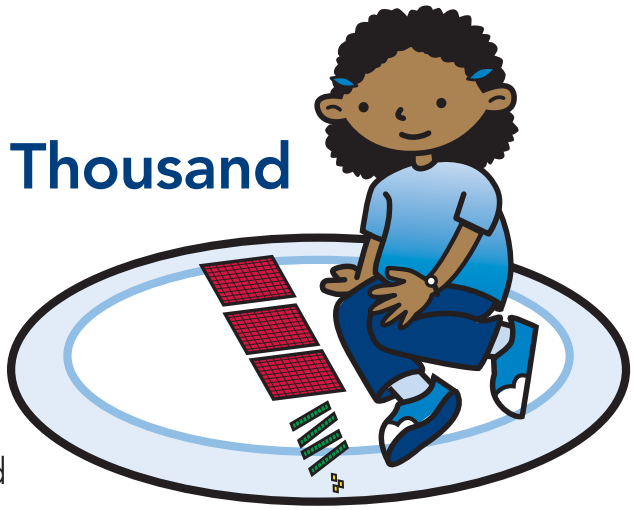
Bridges in Mathematics, Grade 2

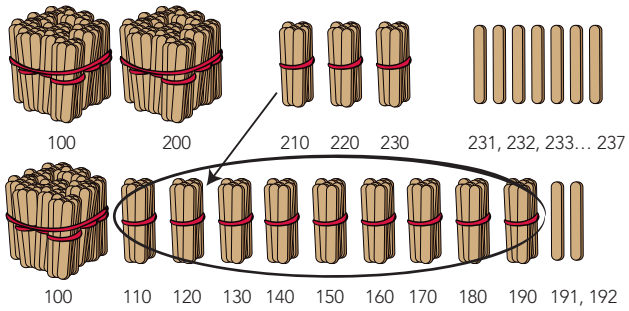
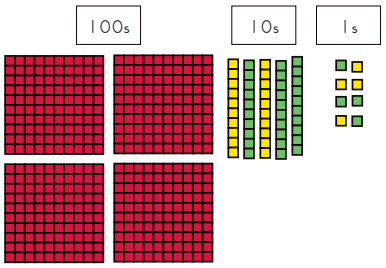
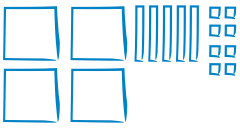
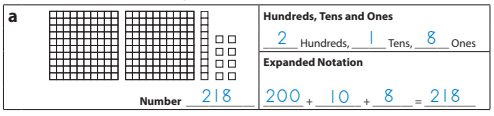
Unit 5: Place Value to One Thousand

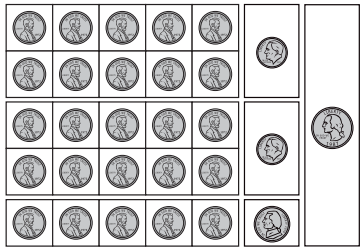


In this unit, your child will:

- Represent numbers using groups of 1s, 10s, and 100s to demonstrate an understanding of place value to 1,000
- Use models, sketches, and numbers to add and subtract within 1,000
- Mentally add and subtract multiples of 10 and 100 to and from any number within 1,000
- Solve money story problems involving pennies, nickels, dimes, and quarters using correct notation

Your child will learn and practice these skills by solving problems like those shown below. Keep this sheet for reference when you're helping with homework.

PROBLEM	COMMENTS
Count the sticks in each group. Which group has more? How many sticks are there in all?  *"I counted the sticks by 100s, 10s, and 1s. The first group has 237 sticks, and the second group has 192 sticks: 237 > 192. I took 1 ten from the first group and put it with the 9 tens in the other group to make another hundred. All together there's 4 hundreds, 2 tens, and 9 ones. That's 429 sticks!"*	Place value refers to our base ten number system. The value of each digit in a number depends on its place: ones, tens, or hundreds. Using models strategically grouped into 100s, 10s and 1s (like the bundles and sticks shown at left) emphasizes the connection between the quantity and symbol. Base ten area pieces (shown below) provide another model of 100s, 10s, and 1s for students to use during this unit. The pieces below show the number 458.  When using the pieces for computation, students may also show their thinking in their written work by making a sketch. 
Fill in the charts below to describe each set of base ten pieces. *"I see 2 squares for hundreds, 1 ten strip, and 8 small squares for ones."* Label the set of base ten pieces with the correct number name.  *"Two hundred eighteen."*	Expanded notation helps students think about the value of each digit in a number. The number in the example, 218, is written as 200 + 10 + 8. The digit in the hundreds place is a 2 for 2 hundreds or 200. The next digit, 1, is in the tens place for 1 ten or 10, and the last digit is in the ones place for 8 ones or 8. Numbers may also be written in word form. Two hundred eighteen is the word form for 218. In the example shown, the student labeled the set of base ten pieces by writing the words.

PROBLEM	COMMENTS
Count by 10s or 100s either forward or backward to fill in the missing numbers. 203, 213, 223, 233, 243, 253, 263, 273, 283, 293, 303 *"It's counting forward by tens. The tens digit goes up by 1 each time."* 950, 850, 750, 650, 550, 450, 350, 250, 150 *"This one is subtracting 100. The hundreds digit is counting down… 9, 8, 7, 6, 5, 4, 3, 2, 1!"*	Students practice counting forward and backward by 10s and 100s to develop mental math strategies based on the base ten number system. They discover that when adding or subtracting 10 (or 100) to a number, only the digit in the tens place (or in the hundreds place) changes by 1. Adding 100 is the same as counting forward by 100. Subtracting 100 is the same as counting back by 100.
How much money does each child have in his or her hand? How much do they have in all?  *"Jay has 38¢. The 3 dimes are 30¢ and the nickel and 3 pennies are 8¢. Sara has 31¢. Two dimes are 20¢, and 2 nickels are another 10¢ for 30¢, plus 1 more cent for the penny. They have 69¢ together because I added 38¢ and 31¢."*	The money value pieces are a proportional model for thinking about the value of coins. They let students see 25 cents as a unit that is made of 5 groups of 5 pennies, a quarter of a dollar. Students use their knowledge of ten to think flexibly about ways to make 10 with coins. A full ten-frame is 1 dime. The two full rows of five are equal to 2 nickels or 1 nickel and 5 pennies or 10 pennies. Counting money collections in 25s, 10s, 5s, and 1s develops an understanding of grouping structures and fractional relationships. 

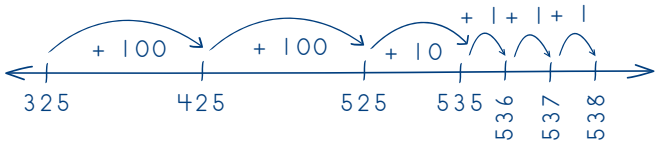
FREQUENTLY ASKED QUESTIONS ABOUT UNIT 5

Q: Why is there an emphasis on skip-counting by 10s and 100s?

A: As students skip-count forward and backward, they learn to recognize the structure in our number system. This practice helps them think about each number's place in the counting sequence and the distance between numbers. Skip-counting helps students develop mental math skills to add and subtract quickly and efficiently.

The ability to add or subtract 10 or 100 to any number is a foundational skill for many computational strategies involving larger numbers. When counting by 10s, students recognize that the 1s stay constant, while the 10s numbers increase sequentially, as in 27, 37, 47, 57. The structure is similar for adding or subtracting 100, as in 127, 227, 327, 427…

For example, when adding 325 and 213, students may start at 325, then jump 2 hundreds on the number line (325 to 425, 425 to 525); then jump 1 ten (525 to 535) and then jump the 3 ones (536, 537, 538). This kind of flexible thinking develops place value understanding.



Q: Why is money included in a unit on place value?

A: Pennies, dimes, and dollars follow our base ten number system. Students have learned that numbers can be made in different ways. For example, 42 is 4 tens and 2 ones, but it can also be 3 tens and 12 ones. This flexible grouping is the same for money. A quarter is 25 cents, but so is 2 dimes and 1 nickel, or 5 nickels, or 25 pennies. Solving problems with money can be a challenge because counting the number of coins is quite different than counting the amount of cents (5 nickels is 5 coins, but worth 25 cents). Patience, practice with real coins, and time help students acquire this real-world skill.