COMMON MISCONCEPTIONS

- **Adding the tens first gives an incorrect sum.**
  Students may decide that we must add the tens place numbers or the ones place numbers first, or the result is incorrect. Allow students to demonstrate solving addition problems using both methods. They can try adding the tens place values first, then the ones place values. Then, they can try adding the ones place values first, and then the tens place values. If regrouping is required, students need to regroup in both cases. Students can see that we arrive at the correct answer using either method, but that if we add the tens place values first, and then regroup ones into tens, we may have to add tens again.

- **You always need to regroup when subtracting.**
  Once students are introduced to the concept of regrouping to subtract, they may believe that regrouping needs to happen in every subtraction problem, regardless of the number of ones in each quantity. Show students several examples, both using manipulatives and in written form. When we subtract, it is easiest to start with the smallest place value: the ones place. To subtract 25 – 13, we first subtract 5 ones minus 3 ones. Can we do that? Yes, because 5 is greater than 3. To subtract 25 – 17, we need to subtract 5 ones minus 7 ones. Can we do that? No, because 5 is less than 7. This is when we need to regroup one of the 2 tens into ones. Lead students to see that they need to make a decision. Note that if they choose to regroup unnecessarily, they still get the correct answer, but then they have to regroup again at the end.

- **When subtracting, a ten is regrouped into ones, but the same number remains in the tens place.**
  When asked to demonstrate a subtraction process that requires regrouping, a student may pull a ten out of thin air to acquire 10 additional ones, without losing any value in the tens place. This is more likely to occur when students are subtracting on paper, rather than when they are using manipulatives. First, ensure that students understand when and why we need to regroup. Then, have students perform the subtraction and regrouping process on paper, while simultaneously demonstrating each step using manipulatives. When students see the steps using physical objects, it becomes more obvious that an exchange occurs, and that we do not introduce new base-ten blocks.

REGROUPING SINGLE NUMBERS

Students should be familiar with the concept of regrouping already, since they have represented values using base-ten blocks.
Give students practice representing values using blocks and regrouping ones blocks into tens blocks, and vice versa. Have students start by modelling a number using the most tens, then regroup 1 ten as 10 ones repeatedly, showing all of the ways to represent that number, down to representing the number entirely with ones. Given a different number, have students apply the process in reverse. The first process shows how they regroup before subtracting. The second process shows how they regroup after adding.

REGROUPING BEFORE SUBTRACTING

Whereas regrouping is required at the end of addition problems, it is often necessary at the beginning of subtraction problems. Once again, ensure that students can recognize when regrouping is necessary, and when it is not. It is essential for students to work with manipulatives, especially to start, when regrouping before subtraction. Seeing that the number of ones in the original number (minuend) is less than the number of ones in the number being subtracted (subtrahend) makes it clear to students that they need to have more ones. This reinforces visually that when the ones digit of the minuend is less than the ones digits of the subtrahend, regrouping is needed. Using blocks demonstrates to students that an exchange occurs of 1 ten for 10 ones, as opposed to the addition of 10 new ones blocks.

REGROUPING AFTER ADDING

In addition, we regroup after the operation is complete. Regrouping allows us to express the sum formally and correctly using the base-ten system. Students see that some sums require regrouping, while others do not. Focus their practice on problems that require regrouping, but make sure that some problems do not, to ensure that students can recognize when it is required. At first, students should solve addition problems using manipulatives, so that they can physically touch and see the exchanges between tens blocks and ones blocks as they are required. Have students ask themselves: can I make another tens block with my ones blocks?

TEACHER TIPS

Give students plenty of time to practice addition and subtraction problems that require regrouping using manipulatives before having them switch to pencil and paper. Allow them to continue using manipulatives along with their notebooks while they make the transition to solving problems by writing their steps using numbers and symbols.