STRATEGIES FOR ADDITION

Students have learned numerous strategies for addition, including using concrete models or drawings and strategies based on place value and properties of operations. Remind students of these strategies and encourage them to identify when one strategy may be more efficient than another.

TEACHER GUIDE

ADD MORE THAN 2 NUMBERS

GRADES K–2

COMMON MISCONCEPTIONS

• You must add the numbers in the order they are given.

Students who always add 3 or 4 numbers by adding them in the order the numbers are given may not realize that they can add in any order. While the method these students use is correct, it is still important that they know how to add in any order. Choosing the order in which to add can help students to add more quickly, because it allows them to start by adding compatible numbers even when the numbers are not next to each other in the problem. Also, students use the method of adding in any order much more in later grades, so it is important they understand it now.

For these students, ask them to add $6 + 17 + 14 + 3$. Have them try adding these numbers in a few different orders and point out that they get the same answer each time. Also help students notice that when they start by adding the compatible numbers $6 + 14$ and $17 + 3$, they can complete the problem much more easily. Have students model the problem with base-ten blocks to see why changing the order doesn’t matter: no matter what order you combine the blocks in, you still combine the same number of blocks, so the sum is always the same.

• Students do not keep track of what numbers have been added.

Some students may not keep careful track of their work. When students add numbers in a different order than they were given, it can be easy to miss a number or add the same number twice. For example, when adding $8 + 17 + 12$, students may start by adding $8 + 12$ because they are compatible. If students are not keeping careful track of their work, they may then incorrectly add the third number in the problem, $12$, instead of adding the number they haven’t added yet, $17$. Encourage students to write down their work in an organized way so they can tell what numbers they have already added and what numbers they have left to add. If they often mix up which numbers should be added, suggest a method like crossing out the numbers once they have been added.

• Students struggle to add pairs of numbers.

To add 3 or 4 numbers together, students add 2 numbers together multiple times. Although students have added 2 numbers together before, some students may still struggle with this skill, especially when re-grouping is required. Give these students problems involving adding only 2 numbers together. Help them review regrouping with these more familiar problems before they try to add 3 or 4 numbers together.
For example, for a problem like $23 + 40 + 7$, help students identify that they can easily make a ten by adding $23 + 7 = 30$ first, and then adding $40 + 30 = 70$. For this problem, this strategy is much quicker and easier than breaking each number into parts and adding based on place value, although that strategy would also give the correct answer.

Some students may need a review of regrouping. When adding, we regroup when the sum of the digits in a given place value is greater than 10. For example, when adding $46 + 28$, the sum of the digits in the ones place is $6 + 8 = 14$. Regroup 14 ones into 1 ten and 4 ones. Then, add all the tens: $1 + 4 + 2 = 7$. The sum has 7 tens and 4 ones, which is 74.

**Adding More Than 2 Numbers**

In this lesson, students use addition strategies they learned when adding 2 numbers to add 3 and 4 numbers. Students add 3 numbers by choosing 2 of the 3 numbers, adding those 2 together, and then adding the third. Students can add 4 numbers by adding 2 numbers together, adding the third number, and then adding the fourth. Or, they can add 4 numbers by adding 2 pairs of 2 numbers and then adding those totals together. For example, add $14 + 15 + 16 + 17$ by first adding $14 + 15 = 29$ and $16 + 17 = 33$, and then adding the totals: $29 + 33 = 62$. In all of these strategies, students only add 2 numbers together at a time, which they already know how to do.

If students are overwhelmed by adding 3 numbers together, help them to simplify the problem into something they already know how to do. Cover up part of the problem so only the first 2 numbers are visible. Have them find the sum of those 2 numbers. Then, show them that they can now re-write the original problem as the sum that they found plus the third number. Have them find the sum of those 2 numbers. Explain that adding 3 numbers together just means you have to add 2 numbers together 2 times. Similarly, help students who are struggling to add 4 numbers together by hiding the

**Adding in Any Order**

When adding more than 2 numbers together, students learn that they can add in any order. This is the Commutative Property of Addition. It is useful in this lesson because sometimes students can identify numbers that are easier to add together mentally, such as by making a ten or using doubles facts. They can start by adding these compatible numbers instead of adding the numbers in the order given in the problem.

When explaining this method to students, make sure to state that this method is only for addition. This is not a method that they can apply in problems that involve subtraction, because in a subtraction problem, changing the order of the

**Teacher Tips**

In addition problems involving 3 or 4 numbers, there are multiple ways to solve each problem, since students can add in any order. Adding in a different order may allow students to use different addition strategies. Encourage students to try out different strategies and see which strategies are most efficient for them. When students start out, it may be useful for them to solve the same problem twice using two different methods to see which way they find easier or more efficient. They can then pick this method in the future for similar problems.