COMMON MISCONCEPTIONS

• 25 quarters make 1 dollar.
Students may take the value of the coin to be equal to the amount of coins that make up a dollar. Help students by showing them visual and written representations of the value of each coin, and use repeated addition to help them understand how many of that coin they need to equal 1 dollar. The only case where the number is the same is for dimes, and this is because there are 10 groups of 10 in 100. However, there are 20 groups of 5 in 100, and 4 groups of 25 in 100.

• To pay for a 65-cent item, we should use 13 nickels.
While this is not incorrect, students using large quantities of low-valued coins to create amounts do not meet the learning goals of the lesson. Ensure that students see that there is a variety of coin combinations that can create a value, but that usually, our goal is to use the least number of coins possible. How heavy would our pockets be if we carried 500 pennies to pay for a $5 item? We always want to try to use the least number of coins. This is why we always start with the greatest value of coin when deciding which coins make up a dollar and cent amount.

• To make $2.25, start by taking a nickel to make 5 cents.
Students may also look for coin combinations by observing the smallest unit first. In the case of $2.25, if they start with the smallest place value, they may choose a nickel first, then two dimes, and then finally, 2 dollar bills. This is inefficient because they will later realize that a nickel and two dimes can be exchanged for a quarter. If you see students trying this method, allow them to complete it, but then also ask them to try building the combination from left to right, and by looking for the greatest value coin first. This way, they can discover which method works better on their own.

FINDING THE VALUE GIVEN A GROUP OF COINS

Before students begin the more challenging task of finding coin combinations to represent given values, they should practice determining the value of a given combination of coins. Begin by having students determine a value given only one or two types of coins, and gradually increase the amount and variety of coin types until students have practiced determining a value given all four types of coins and dollar bills. For example, have students begin by determining the value of 5 quarters and 2 dimes. Finish by having students determine the total value of 1 dollar bill, 2 quarters, 4 dimes, 2 nickels, and 8 pennies. You can also ask students if some of those coins can be exchanged for fewer coins of a larger denomination.
Students first find coin combinations to represent values that only require 2 types of coins. For example, they may be asked to represent 12 cents, 30 cents, 35 cents, 45 cents, or 52 cents (but not 40 cents or 32 cents because those examples require three types of coins). This is an opportunity for students to practice starting with the greatest-valued coin first, before they try to create more challenging coin combinations.

Once students master combining two types of coins to represent values, they can move on to finding representations of values using dollar bills and all types of coins. Students should begin with simpler amounts that only require them to use dollar bills and two types of coins, and they should aim for using all four types of coins as well as dollar bills by the end. Remind students to begin by using the greatest value of coin first.

To help students understand why we try to use the least number of coins and why we start with the greatest-valued coin first, you can allow them to experiment. Give students an exercise in which they are shown several ways to make a dollar and cent amount, and then have them count the number of coins used in each combination.