# **Decimals Discussion Guide (for use during or after reading)**

1. What is a decimal? What is a decimal point? (Introduction to Decimals, p. 4-5)
   1. A decimal is a number that is based on powers of 10 and represents amounts less than one whole. A decimal point is placed between the units (ones) place and the tenths place to represent this change in type of number.
2. Describe two scenarios that involve using decimals in the real world. (Uses of Decimals, p. 8-9)
   1. Students’ answers will vary. They will likely discuss money, sports scores, points on assignments or tests, and/or temperature.
3. How is place value with decimal numbers similar to place value with whole numbers? (Place Value in Decimals, p. 10-11)
   1. Place value with decimal numbers is quite similar to place value with whole numbers because they both rely on the same base ten number system. In both decimal and whole number place value, each place represents 10 times as much as the amount to its right. For example, 1 is 10 times greater than 0.1 and 0.1 is 10 times greater than 0.01.
   2. Students may discuss the similarities between the names of different places, noticing that decimal names end in “-th” and that there is no “ones” place equivalent on the right of the decimal point.
4. Define the following kinds of decimals: repeating, terminating, and nonrepeating, nonterminating. (Three Kinds of Decimals, p. 12-13)
   1. Repeating decimals have an infinite number of digits that repeat in a pattern. For example, 0.444444444444… is a repeating decimal, as is 0.1414141414…
   2. Terminating decimals have a finite number of digits that do not repeat in a pattern forever. For example, 0.37 is a terminating decimal, as is 0.89895.
   3. A nonrepeating, nonterminating decimal has no repeating patterns but does not end and thus goes on forever. One of the most famous nonrepeating, nonterminating decimals is pi, also written as π.
5. Describe how to round 3.472 to both the tenths and the hundredths places. (Rounding, p. 14-15)
   1. We can apply the same rounding rules we use when working with whole numbers in order to round this decimal number. To round to the tenths place, we will look at the digit to its right. The 7 tells us to round up, so 3.472 rounded to the tenths place is 3.5. To round to the hundredths, we will look at the digit to its right. The 2 tells us to round down, so 3.472 rounded to the hundredths place is 3.47.
6. How is the process used for comparing decimal numbers similar to that of comparing whole numbers? (Comparing Decimals, p. 16-17)
   1. The process used for comparing decimal numbers is the same as that of comparing whole numbers. When comparing decimals, it is important to remember to line up the place values. One easy strategy for doing this is to make sure the decimal points are lined up. We compare by starting with the largest place value, moving right one place value until the digits we are comparing are different. The greatest digit in the greatest place value represents the greatest number, decimal or otherwise!
7. Solve the addition problem 4.72 + 3.49. How is adding decimal numbers similar to adding whole numbers? (Adding Decimals, p. 18-19)
   1. In order to solve this problem, we should line up our decimal points. Here, we will need to regroup both the hundredths and the tenths just as we would regroup whole numbers:

1 1

4.72

+ 3.49

8.21

1. Explain how you would efficiently multiply the following decimals: 4.3 x 1.2. Is your answer reasonable? How do you know? (Multiplying Decimals, p. 22-25)
   1. In order to multiply two decimal numbers efficiently, count to determine the number of places to the right of the decimal point in both factors. Then remove the decimal point and multiply both factors as though they were whole numbers. To finish, replace the decimal point in your product so your final answer has the same number of places to the right of the decimal point as both factors did.
   2. 4.3 x 1.2 is like 43 x 12, which is 516. In order to find the correct product of 4.3 and 1.2, we must make sure there are two places to the right of the decimal point, so 4.3 x 1.2 = 5.16.
   3. This is a reasonable answer. We know this because 4.3 rounds to about 4 and 1.2 rounds to about 1. 4 x 1 = 4, which is a close estimate compared to our final product.
2. Explain how you would efficiently divide the following numbers: 560 ÷ 0.7. Is your answer reasonable? How do you know? (Dividing Decimals, p. 26-27)
   1. In order to efficiently divide 560 by 0.7, it can be helpful to think about the problem as if it contained only whole numbers. To do this, we must move the decimal point in both numbers so they are whole numbers.
   2. In this example, we can multiply 0.7 by 10 to create a whole number of 7. We must therefore multiply the other factor, 560, by 10 to get 5,600. Now we can rewrite the problem as 5,600 ÷ 7 = 800. So, we know 560 ÷ 0.7 = 800.
3. What are percentages? How are they related to what you already know about decimals and fractions? (Percents and Comparing Decimals, Fractions, and Percents, p. 32-36)
   1. Percentages are another way of stating a decimal to the hundredths place. For example, the decimal 0.30 is the same as 30% and the decimal 0.68 is the same as 68%. Percentages, decimals, and fractions can all be used to represent parts of a whole.