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

1. What are fractions? How are they different than whole numbers? (What Are Fractions?, p. 4-5)
   1. Fractions are used to represent parts of a whole. They show something divided into equal portions. For example, if we divide one whole cookie into 6 pieces, each piece would represent 1/6. Fractions are different than whole numbers because they can show smaller parts of wholes.
2. What is a numerator? What is a denominator? (Writing Fractions, p. 6-7)
   1. A numerator is the top number (or left-most number) in a fraction. Numerators represent the number of pieces we have. A denominator is found on the bottom (or right) of a fraction. Denominators represent the number of pieces found in one whole. For example, the fraction 2/7 shows 2 equal pieces out of 7 total pieces in the whole. In this example, 2 is the numerator and 7 is the denominator.
3. In order to show fourths, we must divide one whole into four \_\_\_\_\_\_\_\_\_\_\_ parts.
   1. Equal. Fractions are not just any small pieces of a whole, they represent **equal** parts of a whole.
4. In general, how do you say the names of most fractions? (Common Fractions, p. 8-11)
   1. In general, we say fractions by first calling the numerator and then adding the denominator with a new suffix. Most fractions end in -th, although halves and thirds do not follow this rule. For example 1/8 is called “one eighth” and 3/9 is called “three ninths,” but 2/3 is called “two thirds.”
5. Look at how the characters partitioned the number line on pages 12-15. Explain how they used halving and doubling strategies to find 1/8 as the next mark on the line.
   1. In order to partition the number line into equal portions, the characters used a halving strategy. They began by dividing one in half to get ½. Half of ½ is the same as ¼. We can see a pattern beginning to emerge here: even though we are halving the fractions, the denominators are growing in a doubling pattern. Double 2 gives us 4 and double 4 gives us 8. This connects to why half of ¼ is 1/8.
6. What addition sentence can you write to model the story situation described on pages 16 and 17? (Fractions with Friends, p. 16-17)
   1. This story situation shows a group of friends who are picky eaters! They did not like their pizza and returned it. We can model this sentence as 1/5 + 1/5 + 1/5 + 1/5 + 1/5 = 5/5. Visually we can see that 5/5 is equivalent to 1 whole, so we could also model this as 1/5 + 1/5 + 1/5 + 1/5 + 1/5 = 1.
7. Do fractions always represent parts of exactly one whole? Explain your thinking. (Parts of a Whole, p. 18-19)
   1. Although fractions often refer to parts of 1 whole, sometimes fractions can refer to parts of a set. For example, a collection of 12 spools of yarn can be seen as the whole set. If 5 of those spools of yarn are red and 7 are purple, then 5/12 of the set is red and 7/12 of the set is purple.
8. Explain how you know ½ is equivalent to 3/6. Support your answer with strong reasoning. (Equivalent Fractions, p. 20-21)
   1. Students’ answers will vary. Some may use a number line or a fraction bar to model the situation whereas others may describe the situation using an example, like sharing a pizza. It is important to focus on the idea that even though these fractions are different numbers, they represent the same amount. Continue to model with other common fractions, such as fourths, sixths, eighths, etc. as needed to solidify this understanding.
9. What strategy can you use to compare fractions with the same denominator, such as comparing 3/10 to 9/10? (Comparing Fractions, p. 24-27)
   1. In order to compare fractions with the same denominator, we only need to compare the numerators. This is because the pieces are the same size, making them easier to compare. 3 is less than 9, so 3/10 is less than 9/10.
10. What strategy can you use to compare fractions with different denominators, such as comparing ¼ to 1/8? (Comparing Fractions, p. 24-27)
    1. At this stage of understanding, students should be able to explain that one way to do this is to compare the fractions visually. Drawing ¼ and 1/8 of the same sized whole allows us to more easily see that ¼ is larger.
    2. Some students may begin to extend their knowledge here. They may note the strategy of comparing the size of the pieces (denominators) when the numerators are the same. For example, ¼ is greater than 1/8 because fourths are larger than eighths and we have the same number of pieces. As the instructor, feel free to welcome other strategies, but do not focus too much on them at this time as students are just beginning to develop concepts about fractions in general.