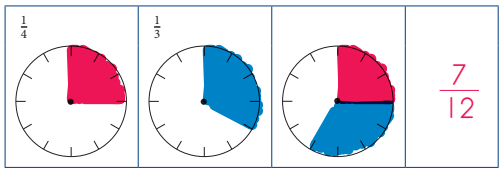
Bridges in Mathematics
Grade 5 Unit 2

Adding & Subtracting Fractions

In this unit your child will:

- Add and subtract fractions with unlike denominators
- Solve story problems involving addition and subtraction of fractions with unlike denominators
- Find common denominators for fractions with unlike denominators
- Find the greatest common factor and least common multiple to help simplify fractions and find common denominators
- Multiply multi-digit numbers

Your child will learn and practice these skills by solving problems like those shown below. Keep this sheet for reference when you're helping with homework. Use the free Math Vocabulary Cards app for additional support: mathlearningcenter.org/apps.

PROBLEM	COMMENTS
Compare these fractions. $1\frac{1}{2} > \frac{13}{10}$ $\frac{3}{10} < \frac{3}{4}$	Students use pictures to develop an understanding of fractions that they then extend to their work with numbers alone. To compare the first pair of fractions in this example, students can reason that $\frac{13}{10} = 1\frac{3}{10}$, and since $\frac{3}{10}$ is less than half ($\frac{5}{10}$), $\frac{13}{10}$ must be less than $1\frac{1}{2}$. They might notice that in the second pair of fractions, the numerator is the same: 3. Since tenths are smaller than fourths, $\frac{3}{10} < \frac{3}{4}$. They might also use $\frac{1}{2}$ as a landmark and see that since $\frac{3}{10} < \frac{1}{2}$ while $\frac{3}{4} > \frac{1}{2}$, $\frac{3}{10}$ must be less than $\frac{3}{4}$.
Show the fractions on the clocks. Then add them and report the sum.  $\frac{7}{12}$	Many problems—story problems and bare number problems alike—in this unit involve fractions with denominators that lend themselves to thinking about clock faces or money. Any fraction in which the denominator is a factor of 60 can be represented on a clock face, as part of the 60 minutes in an hour or a full rotation of a hand on a clock face, as shown here. The contexts of time and money are natural ways to ease students into thinking about adding and subtracting fractions with like and unlike denominators.
What is: $\frac{1}{5}$ of 60? 12 $\frac{1}{4} \times 60$? 15 $\frac{1}{4}$ of 100? 25 $\frac{1}{10} \times 100$? 10	Students multiply unit fractions (fractions with a 1 in the numerator) by whole numbers. Because so many of the problems in this unit invite them to think about fractions of an hour (60 minutes) or of a dollar (100 cents), these multiplication problems also involve finding some fraction of 60 or 100. Students come to see that they can find, for example, $\frac{1}{5}$ of 60 by dividing 60 by 5 and that this can be represented with multiplication notation.

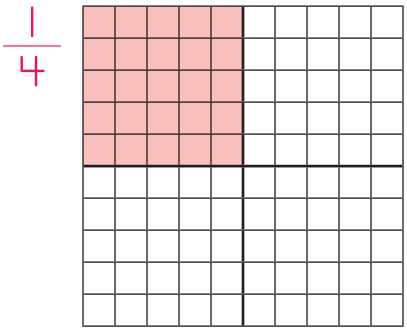
PROBLEM	COMMENTS
Find the sum or difference. $\frac{3}{7} + \frac{7}{21} = \frac{9}{21} + \frac{7}{21} = \frac{16}{21}$ $\frac{8}{15} - \frac{3}{6} = \frac{16}{30} - \frac{15}{30} = \frac{1}{30}$	Later in the unit, students will need to draw upon their understanding of factors and multiples, as well as of equivalent fractions, to add and subtract fractions with unlike denominators. In both examples here, students first need to determine a common denominator so that they can add or subtract the pair of fractions.
Use a ratio table to multiply the numbers. 45 × 44 = 1,980 1 | 2 | 4 | 40 | 44 45 | 90 | 180 | 1,800 | 1,980	Students continue to practice multiplying multi-digit numbers. In this example, they use a ratio table to use known facts to calculate first the partial products (45 × 4 and 45 × 40) and then the final product, which is the sum of those partial products (45 × 44 = 45 × 4 + 45 × 40).

FREQUENTLY ASKED QUESTIONS ABOUT UNIT 2

Q: Why do so many of the fraction problems use time and money?

A: Any fraction with a denominator that is a factor of 60 (2, 3, 4, 5, 6, 10, 12, 15, 20, 30) can be represented as part of the 60 minutes in a whole hour. Any fraction with a denominator that is a factor of 100 (2, 4, 5, 10, 20, 25, 50) can be represented as part of the 100 cents in a whole dollar. This makes a clock face and a whole dollar versatile models for a variety of fractions.

When students represent $\frac{2}{3}$ as part of a whole hour, they can see that it is also equal to $\frac{8}{12}$, $\frac{40}{60}$, and $\frac{4}{6}$.



When students represent $\frac{1}{4}$ as part of a whole dollar (100 cents in the whole square grid), they can see that it is equal to $\frac{25}{100}$.

The contexts of time and money are natural ways to ease students into thinking about adding and subtracting fractions with like and unlike denominators. When students represent each fraction as part of a whole hour or dollar, they are using the model to convert the original fractions into equivalent fractions that have a common denominator, as in the second example on the previous page.