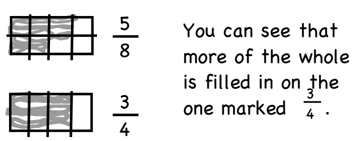
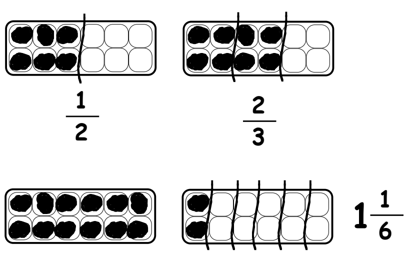
Grade 5, Unit Four: Multiplication, Division & Fractions

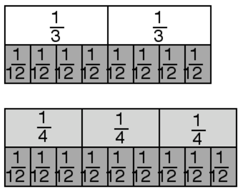
In this unit your child will:

- show fractional amounts using pictures and numbers
- compare fractions and recognize equivalent fractions
- identify which of two fractions is greater
- add and subtract fractions with like and unlike denominators
- multiply and divide 2- and 3-digit numbers using algorithms and other numerical strategies
- write and solve story problems featuring fractions and multi-digit multiplication and division

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.

Problem	Comments
Circle the fraction that is greater. Draw and label a picture to explain how you know. $\frac{5}{8}$ $\frac{3}{4}$  	To compare fractions, students must start with wholes that are the same size. They also need to show each fraction accurately by dividing the wholes into equal parts and then filling in the appropriate number of those parts. In Unit Six, students will learn to rewrite fractions so that they have the same denominator and are easier to compare.
Add 2/3 and 1/2. Use the pictures below to show all your work.  $\frac{1}{2} + \frac{2}{3} = 1\frac{1}{6}$	The egg carton model used in this unit and in earlier grade levels allows students to compare, add, and subtract fractions with unlike denominators, as long as they are factors of 12. In this example, the student first showed each fraction on the top cartons and then combined them on the bottom cartons to arrive at a sum of one and one-sixth. Models like this lay the groundwork for more formal methods of rewriting fractions with the same denominator in Unit Six.

<table>
<tr>
<td>Frank has 2/3 of a candy bar. Susan has 3/4 of the same kind of candy bar. Who has more of a candy bar, and exactly how much more? Show all your work.



You can't compare $\frac{2}{3}$ and $\frac{3}{4}$ exactly unless you turn both of them into twelfths. Then you can see that Susan has exactly one twelfth more.</td>
<td>By using labeled fraction strips, students are able to compare fractions that have unlike denominators. In this example, both fractions have to be shown as twelfths before they can be compared exactly. Like the egg carton model, fraction strips help set foundations that enable students to add and subtract fractions numerically with good understanding later in the school year.</td>
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<tr>
<td>Estimate the answer to this division problem and explain your estimate.

221 ÷ 17

I know 17 x 10 is 170. 17 x 20 is twice that: 340. So the answer will be somewhere between 10 and 20, somewhere in the teens.

Make a multiplication menu for 17 and then use it to solve the problem.

17 x 2 = 34
17 x 4 = 68

17 x 10 = 170
17 x 5 = 85

1, 2, 10 → 13
17 ⟌ 221
− 170
51
− 34
17
− 17
0

221 ÷ 17 = (13)</td>
<td>Students make and explain estimates before dividing so that they can judge whether or not their final answer is reasonable. Next, they use what they know about multiplication to build up to the dividend (the number being divided, in this case 221). This is very similar to the way many people learn to do long division, but with this method, you don't have to figure out the maximum number of times the divisor (in this case 17) goes into the part you're dividing. Instead, you can work with the multiplication combinations that are comfortable for you until you build up to the divided. As a result, this method is easier and more flexible than the one shown at left because it is not necessary, for example, to know that 17 goes into 51 exactly 3 times. Instead, you can take away 2 groups of 17 (34) and then 1 more.

13
17 ⟌ 221
− 170
51
− 51
0</td>
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Frequently Asked Questions about Unit Four

Q: Why do students learn an algorithm that is different from the method I learned?

A: The way many people learned to do long division is accurate, elegant, and reliable. However, it is not the only way to divide large numbers, and we find that the procedure can become tedious when students struggle to determine the maximum number of times the divisor goes into the part of the dividend they are dividing. For example, to solve the problem shown at right, students must figure out how many times 26 goes into first 96 and then 182. Such calculations are tedious for even those students who are skilled in mental multiplication. The method students are taught in this unit allows them to use the multiplication combinations for the divisor that come quickly to them. In many cases, it is more efficient than the way many of us were taught. Have your child help you try it with a few problems like the one shown here (962 ÷ 26) and others.

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     37          3
26 ⟌962           26
  − 78↓          x 5
    182          130
  − 182
      0          4
                  26
                 x 7
                 182
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