

## What We Are Learning

Multiplying and  
Dividing Fractions

## Vocabulary

These are the math words we are learning:

**least common denominator (LCD)** the least common multiple of the denominators

**least common multiple (LCM)** the smallest number that is a multiple of two or more numbers

*Dear Family,*

In this section, your child will learn how to add and subtract fractions with unlike denominators. As a prelude to this skill, your child will first learn concepts that help him or her master this skill.

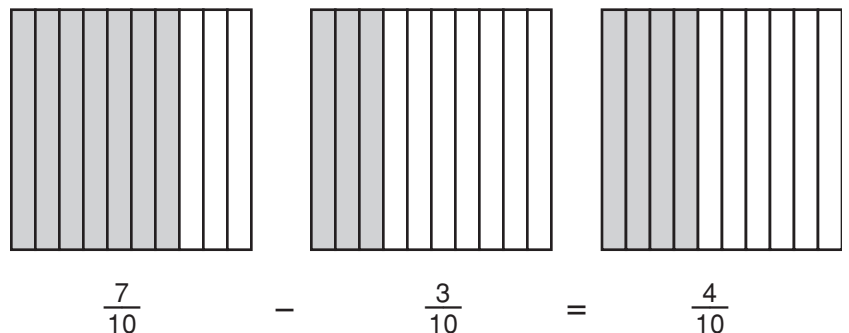
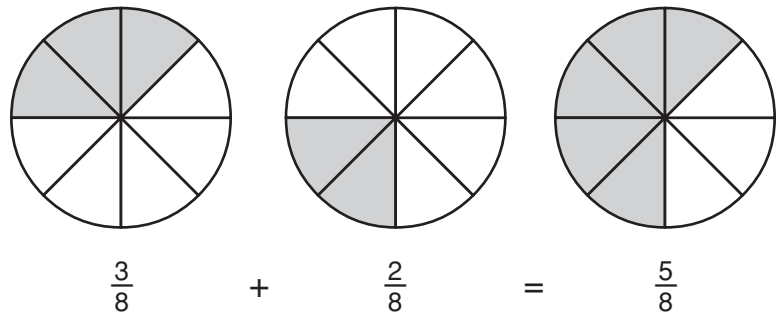
Your child will be learning the concept of **least common multiple** or **LCM**. The LCM is the smallest multiple of all the multiples that two or more numbers have in common. For example:

**Find the least common multiple (LCM).  
8, 12, and 16**

8: 8, 16, 24, 32, 40, **48**, 56, 64, 72, 80, ...    List the multiples of 8, 12, and 16.  
12: 12, 24, 36, **48**, 60, 72, 84, 96, ...    Find the smallest number that is in all the lists.  
16: 16, 32, **48**, 64, 80, 96, ...

Notice that 48 is the least multiple that all three numbers have in common. So, the LCM of 8, 12, and 16 is 48.

Your child will learn to model fraction addition and subtraction. When a shape is divided into parts, each part represents a fraction of the whole. Your child can make drawings to represent each fraction in an addition or subtraction sentence and count the number of parts in each drawing to find the answer, as shown below.



Being able to recognize the least common multiple of two or more numbers will help your child in finding the **least common denominator**, or **LCD**, of unlike fractions. Once the LCD is identified, your child can use it to find equivalent fractions that will help him or her find the sum or difference.

**Add. Write your answer in simplest form.**

$$\frac{1}{4} + \frac{1}{6}$$

Find the LCM of 4 and 6.

4: 4, 8, **12**, 16, 20      LCM: 12

6: 6, **12**, 18, 24

Since the LCM of 4 and 6 is 12, use this as the least common denominator of the two fractions to make equivalent fractions.

$$\frac{1}{4} + \frac{1}{6} \quad \text{The LCD of the denominators is 12.}$$

$$\frac{3}{12} + \frac{2}{12} \quad \text{Write equivalent fractions.}$$

$$\frac{5}{12} \quad \text{Add.}$$

As your child becomes more proficient in adding and subtracting fractions, the degree of difficulty of the problems will increase, such as with adding and subtracting mixed numbers.

**Subtract. Write your answer in simplest terms.**

$$7\frac{1}{8} - 3\frac{5}{8}$$

$$7\frac{1}{8} \rightarrow 6\frac{9}{8} \quad \text{Rename } 7\frac{1}{8} \text{ as } 6 + 1\frac{1}{8} = 6 + \frac{8}{8} + \frac{1}{8}.$$

$$- 3\frac{5}{8} \rightarrow - 3\frac{5}{8}$$

$$\begin{array}{r} 6\frac{9}{8} \\ - 3\frac{5}{8} \\ \hline 3\frac{4}{8} \end{array} \quad \text{Subtract the fractions and then the whole numbers.}$$

$$3\frac{4}{8} = 3\frac{1}{2} \quad \text{Write the answer in simplest form.}$$

Your child now has a solid base for understanding fractions and fractional applications. In the following chapters, your child will build upon the information learned in this section.

Practice adding and subtracting fractions with your child in order to keep these skills sharp. Have your child begin to recognize the need for fractions in everyday situations.

**Sincerely,**

**CHAPTER**  
**5**

**Family Letter**

**Adding and Subtracting Fractions**

Model each problem and solve.

1.  $\frac{6}{9} + \frac{2}{9}$

2.  $\frac{5}{6} - \frac{1}{6}$

3.  $\frac{3}{8} + \frac{5}{8}$

4.  $\frac{6}{7} - \frac{5}{7}$

Find the least common multiple (LCM).

5. 4, 16

6. 3, 8

7. 2, 3, and 5

8. 5, 10, and 12

Add or subtract. Write each answer in simplest form.

9.  $\frac{6}{7} + \frac{1}{2}$

10.  $\frac{5}{9} - \frac{1}{3}$

11.  $\frac{3}{8} + \frac{5}{12}$

12.  $6\frac{3}{5} + 5\frac{1}{4}$

13.  $5\frac{1}{9} + 8\frac{1}{3}$

14.  $10\frac{6}{8} - 2\frac{1}{4}$

Find each sum or difference. Write the answer in simplest form.

15.  $7 - 5\frac{3}{4}$

16.  $6\frac{3}{5} + 4\frac{2}{3}$









17.  $15\frac{1}{8} - 7\frac{5}{6}$

Solve each equation. Write the solution in simplest form.

18.  $y - 6\frac{1}{6} = 7\frac{1}{2}$

19.  $x + 2\frac{4}{7} = 3\frac{1}{14}$

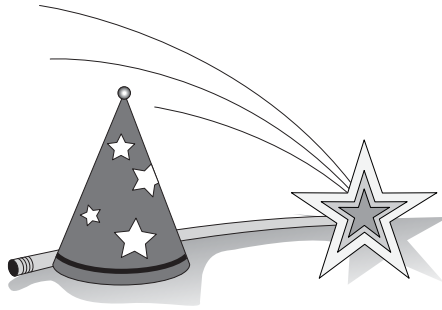
20.  $3\frac{3}{8} = a - 8\frac{10}{16}$

Answers: 1.  +  =  $\frac{6}{8} = \frac{3}{4}$  or  $\frac{3}{2}$ . 2.  -  =  $\frac{6}{6} - \frac{3}{6} = \frac{3}{6} = \frac{1}{2}$  or 1. 3.  +  =  $\frac{6}{8} + \frac{3}{8} = \frac{9}{8}$  or 1  $\frac{1}{8}$ . 4.  -  =  $\frac{7}{10} - \frac{3}{10} = \frac{4}{10} = \frac{2}{5}$ . 5.  $\frac{1}{5}$ , 6.  $\frac{2}{4}$ , 7.  $\frac{2}{7}$ , 8.  $\frac{6}{10}$ , 9.  $\frac{1}{5}$ , 10.  $\frac{9}{2}$ , 11.  $\frac{9}{2}$ , 12.  $\frac{11}{17}$ , 13.  $\frac{13}{4}$ , 14.  $8\frac{2}{1}$ , 15.  $1\frac{1}{4}$ , 16.  $11\frac{15}{4}$ , 17.  $7\frac{2}{7}$ , 18.  $y = 13\frac{3}{2}$ , 19.  $x = \frac{2}{1}$ , 20.  $a = 12$

CHAPTER

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**Family Fun**  
**Magic Squares**



**Directions**

- Find the solution to the magic squares. The sum of each row, column, and diagonal must be equal. In some instances you must finish the squares when the magic sum is given. Other times you need to determine the magic sum by finishing the square.
- Create your own magic square and see if your friends can find the solution.

1. The magic sum is  $4\frac{4}{11}$ .

		$1\frac{8}{11}$
$1\frac{9}{11}$		
	$1\frac{7}{11}$	$1\frac{6}{11}$

2. What is the magic sum?

	$2\frac{1}{6}$	
$2\frac{1}{3}$	$2\frac{7}{18}$	$2\frac{1}{9}$

3. The magic sum is  $3\frac{15}{16}$ .

		$1\frac{1}{4}$
$1\frac{1}{16}$		
	$1\frac{7}{16}$	$1\frac{1}{8}$

4. What is the magic sum?

		$2\frac{3}{5}$
	$1\frac{1}{2}$	
$\frac{2}{5}$		$1\frac{1}{5}$

Answers:  $1\frac{1}{4}, 1\frac{11}{3}, 1\frac{11}{5}, 1\frac{11}{1}, 1\frac{11}{2}, 2\frac{6}{5}, 2\frac{9}{4}, 2\frac{9}{2}, 2\frac{1}{2}, 2\frac{1}{1}, 2\frac{1}{18}, 2\frac{1}{18}, 2\frac{2}{1}, 2\frac{2}{3}, 1\frac{2}{1}, 1\frac{16}{3}, 1\frac{16}{5}, 1\frac{16}{9}, 1\frac{8}{3}, 4\frac{4}{1}, 4\frac{2}{1}, 1\frac{5}{4}$

## What We Are Learning

**Multiplying and  
Dividing Fractions**
**Vocabulary**

These are the math words we are learning:

**reciprocal** two numbers whose product equals 1

**unlike fractions** fractions with different denominators

*Dear Family,*

In this section your child will continue to study fractions. Your child will learn to multiply and divide fractions, as well as solve equations using fractions.

Your child has previously learned that multiplication is simply repeated addition. Using this knowledge, your child will learn to multiply fractions by whole numbers and write the answer in simplest form.

Your child will need to remember that whole numbers can be rewritten as improper fractions with a 1 in the denominator. For example,  $7 = \frac{7}{1}$  or  $25 = \frac{25}{1}$ .

To multiply fractions, your child will learn to multiply the numerators *and* the denominators. He or she will then write the product in simplest form.

**Multiply. Write the answer in simplest form.**

$$\frac{3}{4} \cdot \frac{2}{5}$$

$$\begin{aligned} \frac{3}{4} \cdot \frac{2}{5} &= \frac{3 \cdot 2}{4 \cdot 5} \\ &= \frac{6}{20} \\ &= \frac{3}{10} \end{aligned}$$

Multiply the numerators. Multiply the denominators.

The GCF of 6 and 20 is 2.

Write the answer in simplest form.

To multiply fractions and mixed numbers, your child will learn to first change the mixed number to an improper fraction. Once the mixed number is in this new form, your child will multiply the numerators and the denominators.

**Multiply. Write the answer in simplest form.**

$$2\frac{1}{4} \cdot 1\frac{2}{3}$$

$$\begin{aligned} \frac{9}{4} \cdot \frac{5}{3} \\ \frac{9 \cdot 5}{4 \cdot 3} &= \frac{45}{12} \\ &= 3\frac{9}{12} \\ &= 3\frac{3}{4} \end{aligned}$$

Write the mixed numbers as improper fractions.

Multiply numerators. Multiply denominators.

You can write the improper fraction as a mixed number.

Simplify.

Your child will use concepts from multiplying fractions to successfully divide fractions. Your child will use the **reciprocal** of a fraction when dividing fractions. To find the reciprocal of a number, simply flip or switch the numerator and the denominator of the fraction or whole number. The product of a number and its reciprocal is always 1.

**Find the reciprocal.**

$$\frac{6}{7}$$

$$\frac{6}{7} \cdot ? = 1$$

Think:  $\frac{6}{7}$  of what number is 1?

$$\frac{6}{7} \cdot \frac{7}{6} = 1$$

$\frac{6}{7}$  of  $\frac{7}{6}$  is 1.

The reciprocal of  $\frac{6}{7}$  is  $\frac{7}{6}$ .

Dividing by a number is the same as multiplying by its reciprocal.

**Divide. Write the answer in simplest form.**

$$\frac{2}{3} \div \frac{1}{4}$$

$$\frac{2}{3} \div \frac{1}{4} = \frac{2}{3} \cdot \frac{4}{1}$$

Rewrite as multiplication using the reciprocal of  $\frac{1}{4}$ , 4.

$$= \frac{2 \cdot 4}{3 \cdot 1} = \frac{8}{3}$$

Multiply by the reciprocal.

$$= 2\frac{2}{3}$$

You can write the answer as a mixed number.

Your child will apply the skills from this section when asked to solve equations, particularly equations that contain fractions. Multiplying and dividing fractions are important tools that your child will use throughout this course. Review these skills daily with your child.

**Sincerely,**

**CHAPTER**  
**5**

**Family Letter**

**Adding and Subtracting Fractions**

**Multiply. Write your answers in simplest form.**

1.  $6 \cdot \frac{1}{15} =$  \_\_\_\_\_

2.  $9 \cdot \frac{1}{20} =$  \_\_\_\_\_

3.  $3 \cdot \frac{3}{25} =$  \_\_\_\_\_

**Evaluate  $9x$  for each value of  $x$ . Write your answers in simplest form.**

4.  $x = \frac{1}{3}$  \_\_\_\_\_

5.  $x = \frac{5}{9}$  \_\_\_\_\_

6.  $x = \frac{7}{9}$  \_\_\_\_\_

**Multiply. Write the answer in simplest form.**

7.  $\frac{1}{2} \cdot \frac{3}{5} =$  \_\_\_\_\_

8.  $\frac{1}{4} \cdot \frac{6}{7} =$  \_\_\_\_\_

9.  $\frac{5}{9} \cdot \frac{3}{10} =$  \_\_\_\_\_

10.  $\frac{2}{3} \cdot \frac{3}{8} =$  \_\_\_\_\_

**Evaluate the expression  $x \cdot \frac{1}{3}$  for each value of  $x$ .**

11.  $x = \frac{3}{8}$  \_\_\_\_\_

12.  $x = \frac{9}{10}$  \_\_\_\_\_

13.  $x = \frac{6}{11}$  \_\_\_\_\_

**Multiply. Write the answer in simplest form.**

14.  $3\frac{1}{4} \cdot \frac{1}{8} =$  \_\_\_\_\_

15.  $5 \cdot 2\frac{1}{5} =$  \_\_\_\_\_

16.  $2\frac{1}{3} \cdot 3\frac{1}{2} =$  \_\_\_\_\_

**Find the reciprocal.**

17.  $\frac{6}{9}$  \_\_\_\_\_

18.  $\frac{7}{11}$  \_\_\_\_\_

19.  $\frac{6}{7}$  \_\_\_\_\_

20.  $\frac{1}{2}$  \_\_\_\_\_

**Divide. Write the answer in simplest form.**

21.  $\frac{7}{9} \div 3$   
\_\_\_\_\_

22.  $\frac{4}{7} \div \frac{5}{7}$   
\_\_\_\_\_

23.  $3\frac{1}{2} \div 1\frac{7}{8}$   
\_\_\_\_\_

24.  $\frac{8}{15} \div 2\frac{3}{5}$   
\_\_\_\_\_

**Solve each equation. Write the answer in simplest form.**

25.  $5x = \frac{2}{3}$  \_\_\_\_\_

26.  $\frac{2}{5}x = 18$  \_\_\_\_\_

27.  $\frac{8x}{9} = 16$  \_\_\_\_\_

**Answers:** 1.  $\frac{2}{5}$  2.  $\frac{3}{20}$  3.  $\frac{9}{25}$  4.  $\frac{7}{9}$  5.  $\frac{5}{6}$  6.  $7\frac{7}{8}$  7.  $\frac{10}{3}$  8.  $\frac{14}{9}$  9.  $\frac{6}{1}$  10.  $\frac{4}{1}$  11.  $\frac{8}{1}$  12.  $\frac{10}{3}$  13.  $\frac{11}{2}$  14.  $\frac{32}{13}$  15. 11  
16.  $8\frac{6}{1}$  17.  $\frac{9}{6}$  18.  $\frac{7}{11}$  19.  $\frac{6}{7}$  20.  $\frac{2}{1}$  21.  $\frac{1}{21}$  22.  $\frac{27}{7}$  23.  $\frac{5}{4}$  24.  $\frac{15}{2}$  25.  $x = \frac{15}{2}$  26.  $x = 45$  27.  $x = 18$

CHAPTER

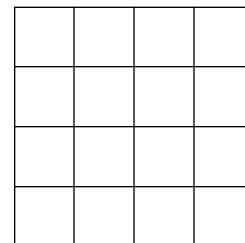
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# Family Fun

## Four in a Row Fractions

### Directions

- Cut out and shuffle the problem cards below.
- Each player should create a 4-by-4 grid as shown.
- Have each player write the fractions from the shaded box below in any order in each one of the squares in the grid.
- Taking turns, each player will draw a card from the problem cards, and find the product or quotient in simplest terms.
- If the player has the simplified fraction on his or her grid, he or she will color in the corresponding square.
- The first player to color in four squares in a row, column, or diagonal line wins the game.



$\frac{1}{4}$	$\frac{5}{12}$	$\frac{1}{2}$	$\frac{10}{27}$	$1\frac{2}{3}$	$\frac{4}{21}$	$1\frac{1}{2}$	$\frac{7}{72}$	$\frac{1}{10}$	$\frac{4}{5}$	$\frac{13}{25}$	$\frac{1}{14}$	$\frac{27}{40}$	$\frac{1}{22}$	$\frac{27}{32}$	$\frac{2}{11}$
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$\frac{5}{12} \times \frac{3}{5}$	$\frac{1}{3} \div \frac{4}{5}$	$\frac{3}{5} \times \frac{5}{6}$	$\frac{5}{9} \times \frac{2}{3}$
$8 \div 4\frac{4}{5}$	$\frac{6}{7} \times \frac{2}{9}$	$\frac{3}{8} \div \frac{1}{4}$	$\frac{1}{9} \times \frac{7}{8}$
$\frac{9}{10} \times \frac{1}{9}$	$\frac{8}{15} \div \frac{2}{3}$	$\frac{13}{15} \times \frac{3}{5}$	$\frac{2}{7} \times \frac{1}{4}$
$\frac{3}{8} \div \frac{5}{9}$	$\frac{1}{10} \times \frac{5}{11}$	$\frac{3}{4} \div \frac{8}{9}$	$\frac{3}{7} \times \frac{14}{33}$