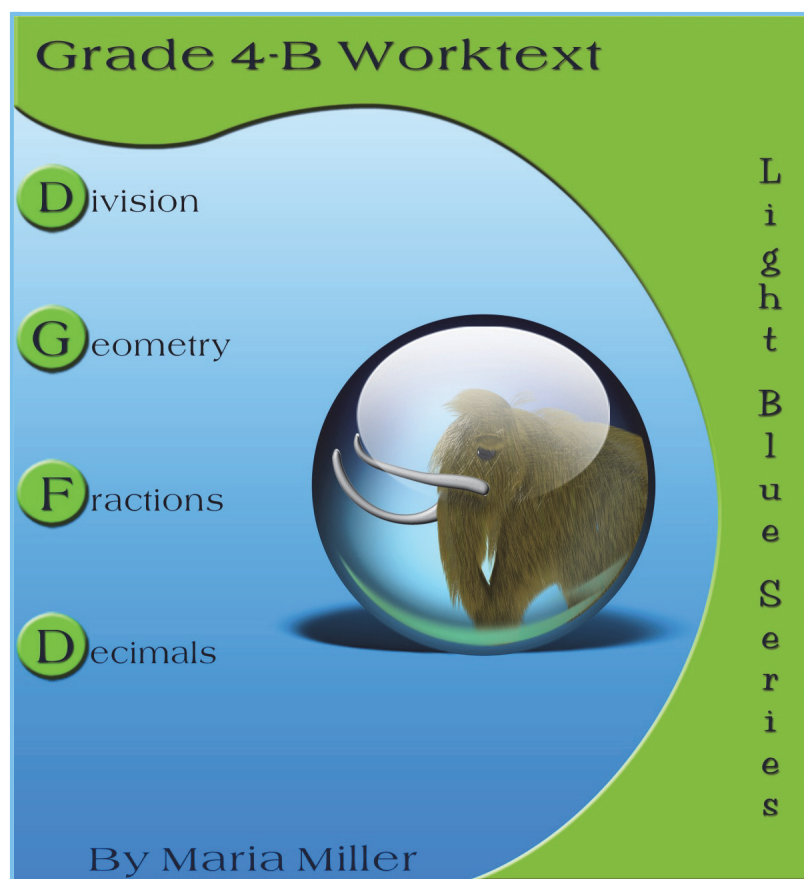


# Math Mammoth

## Grade 4-B Worktext



*By Maria Miller*

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ISBN 978-1-942715-63-4

Edition 1/2020

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# Review of Division

**Multiplication** has to do with equal-size groups:  $2 \times 4$  means 2 groups of 4.

**Division** is the opposite operation of multiplication, and it *also* has to do with equal-size groups:  $8 \div 4$  can mean, “How many groups of 4 are in 8?”

It can also mean, “How many in each group, when 8 things are put into 4 groups?”

Division has two “meanings”:

- Dividing to find how many are in each group.
- Dividing into groups of a certain size.



“12 divided into 2 groups;  
how many in each group?”

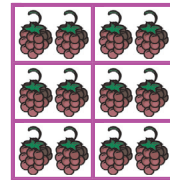
$$12 \div 2 = 6$$

OR

“How many sixes are in 12?”

$$12 \div 6 = 2$$

$$2 \times 6 = 12$$



“12 divided into 6 groups;  
how many in each group?”

$$12 \div 6 = 2$$

OR

“How many twos are in 12?”

$$12 \div 2 = 6$$

$$6 \times 2 = 12$$

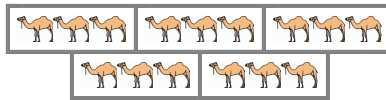
1. Write a multiplication sentence and two division sentences.



a. \_\_\_\_\_

\_\_\_\_\_

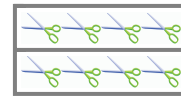
\_\_\_\_\_



b. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



c. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2. Fact families: write two division and two multiplication sentences.

a. **21**  
7 and 3

b. **24**  
4 and \_\_\_\_\_

c. **36**  
4 and \_\_\_\_\_

3. Practice a little. Continue the patterns for three more steps.

<b>a.</b>	<b>b.</b>	<b>c.</b>	<b>d.</b>
$16 \div 2 = \underline{\quad}$	$45 \div 5 = \underline{\quad}$	$90 \div 10 = \underline{\quad}$	$56 \div 7 = \underline{\quad}$
$18 \div 2 = \underline{\quad}$	$40 \div 5 = \underline{\quad}$	$100 \div 10 = \underline{\quad}$	$49 \div 7 = \underline{\quad}$
$20 \div 2 = \underline{\quad}$	$35 \div 5 = \underline{\quad}$	$110 \div 10 = \underline{\quad}$	$42 \div 7 = \underline{\quad}$

4. Fill in the tables.

<b>Eggs</b>	6	12	24	36		54		78
<b>Omelets</b>	1				7		11	

<b>Thumbtacks</b>	8	24	32	48				
<b>Pictures</b>	1				8	10	12	13

5. Write a number sentence for each situation (It is not always division!). Explain what you find out from your calculation.

<b>a.</b> Three children shared equally 18 marbles. <u><math>18 \div 3 = 6</math>. Each child got 6 marbles.</u>	<b>b.</b> Jim has \$34 and he wants a \$45 book.
<b>c.</b> A fruit store received a shipment of 400 apples in four boxes.	<b>d.</b> Mrs. Davis divided 24 pieces of chocolate equally between 6 persons.
<b>e.</b> Five boxes arrived at the bookstore, each containing 50 books.	<b>f.</b> Mom bought two books that cost \$13 each.
<b>g.</b> A herd of cows had a total of 20 legs.	<b>h.</b> Sixty books were placed on three shelves.

6. Divide.

a. $36 \div 4 = \underline{\quad}$	b. $54 \div 9 = \underline{\quad}$	c. $32 \div 8 = \underline{\quad}$	d. $24 \div 3 = \underline{\quad}$
$50 \div 5 = \underline{\quad}$	$42 \div 7 = \underline{\quad}$	$64 \div 8 = \underline{\quad}$	$27 \div 9 = \underline{\quad}$
$60 \div 12 = \underline{\quad}$	$48 \div 6 = \underline{\quad}$	$72 \div 9 = \underline{\quad}$	$35 \div 7 = \underline{\quad}$

7. Find what number  $x$  stands for.

a. $64 \div x = 8$ $\underline{x} = \underline{8}$	b. $35 \div x = 7$ $x = \underline{\quad}$	c. $x \div 5 = 9$ $x = \underline{\quad}$	d. $x \div 9 = 6$ $x = \underline{\quad}$
---	---	--	--

8. For each division, write a multiplication. Then find the value of the unknown.

a. $N \div 3 = 10$ _____ $N = \underline{\quad}$	b. $x \div 4 = 9$ _____ $x = \underline{\quad}$
c. $60 \div T = 20$ _____ $T = \underline{\quad}$	d. $81 \div y = 9$ _____ $y = \underline{\quad}$

9. Write a number sentence for each situation (It is not always division!). Explain what your answer tells you.

a. How many books can you buy for \$3 each with \$21?	b. A hundred apples were boxed into 5 boxes.
c. Five boxes of nails cost \$30.	d. A chocolate bar has 8 rows and 5 columns of squares.
e. How many fives are in 45?	f. Each of the five boxes weighs 12 pounds.





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# Chapter 7: Fractions

## Introduction

In third grade, students have studied equivalent fractions and compared some easy fractions. In fourth grade, it is time to expand their knowledge of fraction topics. We study:

- mixed numbers
- adding and subtracting like fractions and mixed numbers with like fractional parts (sums where the denominators are the same, such as  $\frac{5}{6} + \frac{3}{6}$  or  $1\frac{2}{3} + 2\frac{1}{3}$ )
- equivalent fractions (for example,  $\frac{2}{3} = \frac{8}{12}$ )
- comparing fractions
- multiplying a fraction by a whole number (for example  $5 \times \frac{1}{2}$ )

Then in fifth grade, students tackle *all* four operations with fractions. This chapter is laying groundwork for that. The lessons here are important also because they are the basis for understanding decimal numbers, which is the topic of the next chapter.

In this grade, we continue studying fractions and their operations with the help of visual models. In addition to the visuals in the lessons, you can optionally also use fraction manipulatives, but they are not required.

Visual models help children build a strong conceptual understanding of fraction operations. While we do study some actual rules of fraction arithmetic in this chapter, we also want to avoid presenting fraction math as a list of computational rules to be learned by rote memory. If students only memorize these rules, then they will also easily confuse them (eventually), because there are so many of them. The rules become *shortcuts* for ideas that are already understood, but we don't want to start with them. The goal is to let the ideas and concepts "sink in" first, and then study the shortcuts.

A friendly reminder: don't automatically assign all the exercises. As always, use your judgment.

### The Lessons in Chapter 7

	page	span
One Whole and Its Fractional Parts .....	137	3 pages
Mixed Numbers .....	140	4 pages
Mixed Numbers and Fractions .....	144	3 pages
Adding Fractions .....	147	2 pages
Adding Mixed Numbers .....	149	3 pages
Equivalent Fractions .....	152	5 pages
Subtracting Fractions and Mixed Numbers ....	157	4 pages
Comparing Fractions .....	161	4 pages
Multiplying Fractions by Whole Numbers ....	165	3 pages
Practicing With Fractions .....	168	2 pages
Mixed Review Chapter 7 .....	170	2 pages
Review Chapter 7 .....	172	2 pages

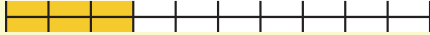
# One Whole and Its Fractional Parts

A fraction always relates to some kind of *one whole*. Study the examples below:



Let's say the one whole is this square. It is divided into 12 parts.

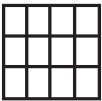



Each part is  $\frac{1}{12}$  of the whole. Also, we can write  $1 = \frac{12}{12}$ .

Maybe the one whole is this line, and  $\frac{3}{10}$  of it is colored. 






Maybe the one whole is Daddy's salary. To find  $\frac{5}{6}$  of it, imagine dividing the salary into 6 parts, and taking five of those parts. All six parts form the one whole, or  $\frac{6}{6} = 1$

$\frac{7}{12}$  The top number is the **numerator**. It *numerates* or counts *how many pieces* there are.  
The bottom number is the **denominator**. It *denominates* or *names* what kind of parts they are.

1. Color parts. Write the colored part *and* the white (uncolored) part as a fraction.

<p>a. Color 1 part.</p>  <p><math>\frac{1}{12}</math> and —</p>	<p>b. Color 5 parts.</p>  <p>and</p>	<p>c. Color 8 parts.</p>  <p>and</p>	<p>d. Color 3 parts.</p>  <p>and</p>
--	---	--	---

2. Color and write one whole as a fraction.

 <p>a. <math>1 =</math> —</p>	 <p>b. <math>1 =</math> —</p>	 <p>c. <math>1 =</math> —</p>	 <p>d. <math>1 =</math> —</p>	 <p>e. <math>1 =</math> —</p>
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3. Solve.

a. The Jacksons ate  $\frac{3}{4}$  of the pie.

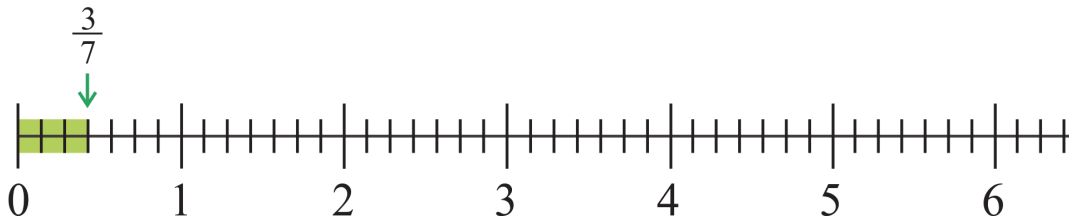
How much is left?

b. Jerry ate  $\frac{1}{6}$  of the pizza.

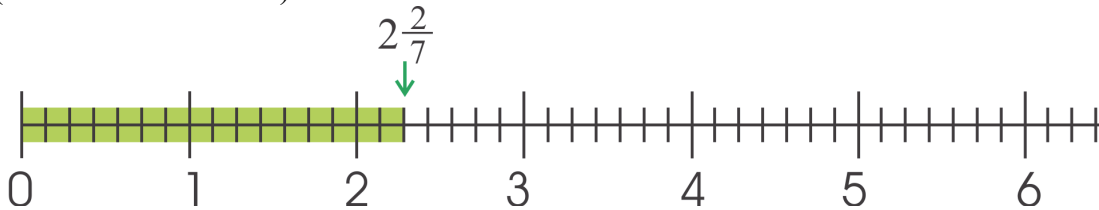
How much is left?

c. Five boys shared a chocolate bar equally. Each one got — of the bar.

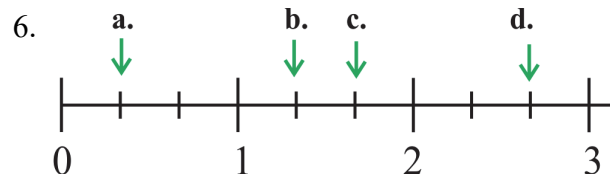
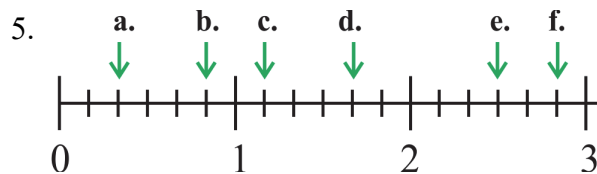
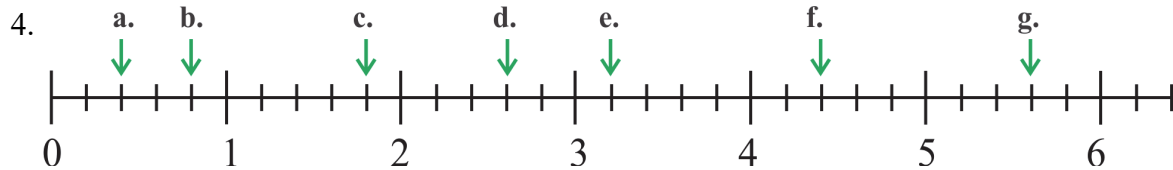
To show  $\frac{3}{7}$  on a number line, each whole-number interval (from 0 to 1, from 1 to 2, from 2 to 3, and so on) is divided into seven parts. Three of those parts are colored to show  $\frac{3}{7}$ .



In a **mixed number**, we have a whole number and a fraction. The number line below shows  $2\frac{2}{7}$  (two and two sevenths).



In problems 4 - 6, write the fractions and mixed numbers that the arrows mark on the number line.



7. Mark the mixed numbers on the number line:

**a.**  $1\frac{2}{4}$  **b.**  $\frac{3}{4}$  **c.**  $4\frac{1}{4}$  **d.**  $5\frac{1}{2}$  **e.**  $3\frac{1}{4}$  **f.**  $2\frac{3}{4}$

*Hint: First divide each whole-number interval into four parts (using three tick marks).*

