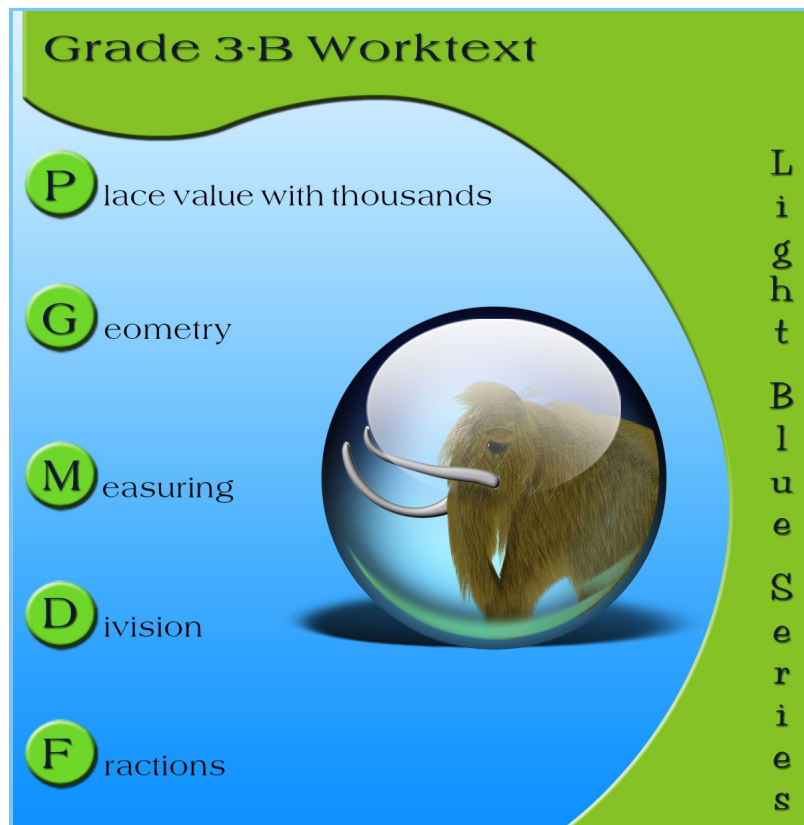


Math Mammoth

Grade 3-B Worktext



By Maria Miller

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Foreword

Math Mammoth Grade 3 comprises a complete math curriculum for the third grade mathematics studies. The curriculum meets and exceeds the Common Core standards.

The main areas of study in Math Mammoth Grade 3 are:

1. Students develop an understanding of multiplication and division of whole numbers through problems involving equal-sized groups, arrays, and area models. They learn the relationship between multiplication and division, and solve many word problems involving multiplication and division (chapters 2, 3, and 9).
2. Students develop an understanding of fractions, beginning with unit fractions. They compare fractions by using visual models and strategies based on noticing equal numerators or denominators (chapter 10).
3. Students learn the concepts of area and perimeter. They relate area to multiplication and to addition, recognize perimeter as a linear measure (in contrast with area), and solve problems involving area and perimeter (chapter 7).
4. Students fluently add and subtract within 1,000, both mentally and in columns. They also learn to add and subtract 4-digit numbers, and use addition and subtraction in problem solving in many contexts, such as with money, time, and geometry.

Additional topics we study are time, money, measuring, and bar graphs and picture graphs.

This book, 3-B, covers place value and 4-digit numbers (chapter 6), geometry (chapter 7), measuring (chapter 8), division (chapter 9), and fractions (chapter 10). The rest of the topics are covered in the 3-A student worktext.

Some important points to keep in mind when using the curriculum:

- The two books (parts A and B) are like a “framework”, but you still have a lot of liberty in planning your child’s studies. While addition and subtraction topics are best studied in the order they are presented, feel free to go through the sections on shapes, measurement, clock, and money in any order you like.

This is especially advisable if your child is either “stuck” or is perhaps getting bored with some particular topic. Sometimes the concept the child was stuck on can become clear after a break from the topic.

- Math Mammoth is mastery-based, which means it concentrates on a few major topics at a time, in order to study them in depth. However, you can still use it in a *spiral* manner, if you prefer. Simply have your child study in 2-3 chapters simultaneously. This type of flexible use of the curriculum enables you to truly individualize the instruction for your child.
- Don’t automatically assign all the exercises. Use your judgment, trying to assign just enough for your child’s needs. You can use the skipped exercises later for review. For most children, I recommend to start out by assigning about half of the available exercises. Adjust as necessary.
- For review, the curriculum includes a worksheet maker (Internet access required), mixed review lessons, additional cumulative review lessons, and the word problems continually require usage of past concepts. Please see more information about review (and other topics) in the FAQ at <https://www.mathmammoth.com/faq-lightblue.php>

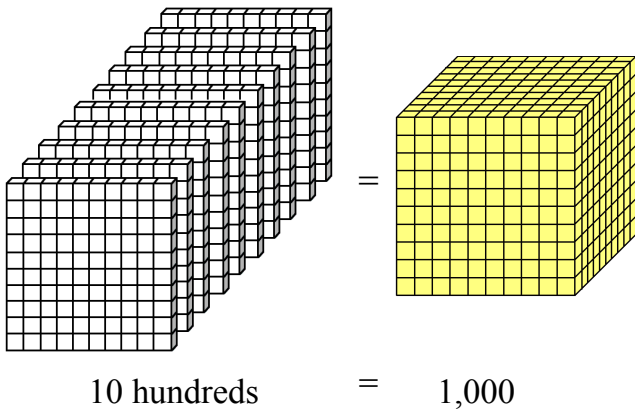
I heartily recommend that you view the full user guide for your grade level, available at <https://www.mathmammoth.com/userguides/>

And lastly, you can find free videos matched to the curriculum at <https://www.mathmammoth.com/videos/>

I wish you success in teaching math!

Maria Miller, the author

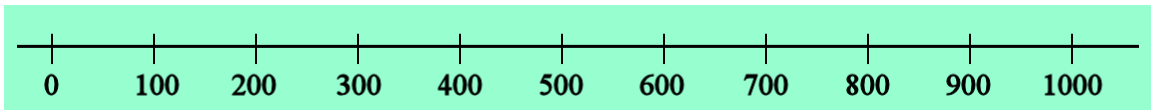
Thousands



When we take ten hundred-flats and stack them end-to-end, we get one thousand.

Ten hundreds = One thousand.

We write a *thousand* as 1000 or 1,000. The comma , is used to separate the “1” of the thousands from the three other digits. It just makes it easier to read.



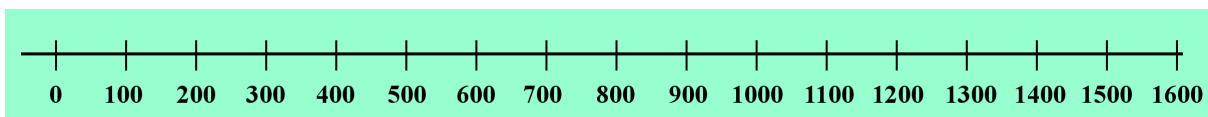
On this number line, you see only whole hundreds marked. In between each two marks are 99 numbers. Imagine those 99 little lines between 300 and 400!

After nine hundred, the next whole hundred is “ten hundreds” or A THOUSAND, 1,000. Remember: Ten hundreds make a thousand.

Numbers with four digits are very easy to read. The first of the four digits is in the thousands place. Just read it as “one thousand”, “two thousand”, “five thousand”, and so on.

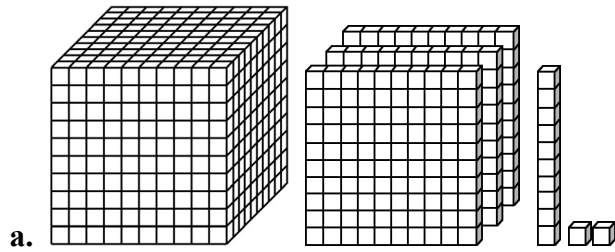
The rest of the three digits you can read just like you are used to reading three-digit numbers.

One thousand four hundred fifty-nine				Two thousand eighteen				Four thousand seven hundred six			
thou- sands	hund- reds	tens	ones	thou- sands	hund- reds	tens	ones	thou- sands	hund- reds	tens	ones
1	4	5	9	2	0	1	8	4	7	0	6

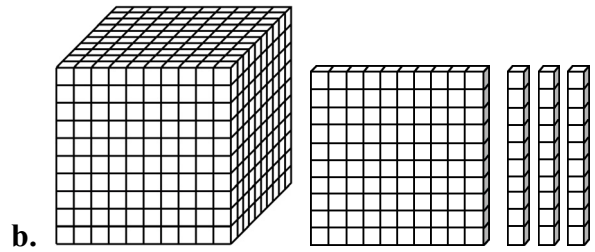


The whole hundreds after one thousand continue as: *one thousand*, *one thousand one hundred*, *one thousand two hundred*, etc. Many times, people also read these numbers this way: *a thousand*, *eleven hundred*, *twelve hundred*, *thirteen hundred*, etc.

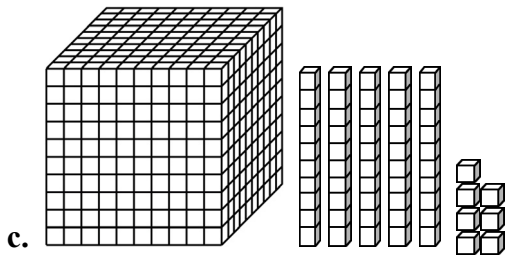
1. Write the numbers that are illustrated by the models. Sometimes you will need a zero or zeros.



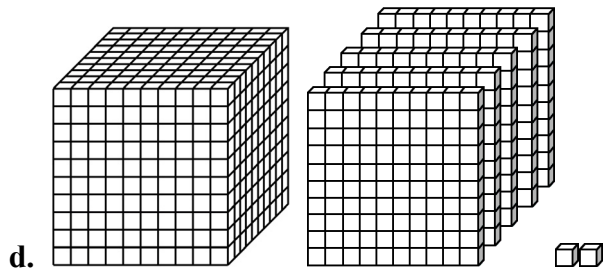
thou- sands	hund- reds	tens	ones
1	3	1	2



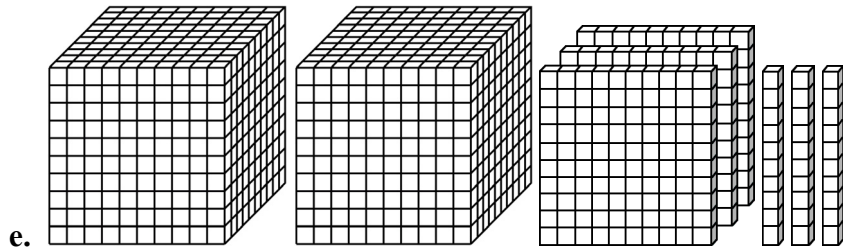
thou- sands	hund- reds	tens	ones



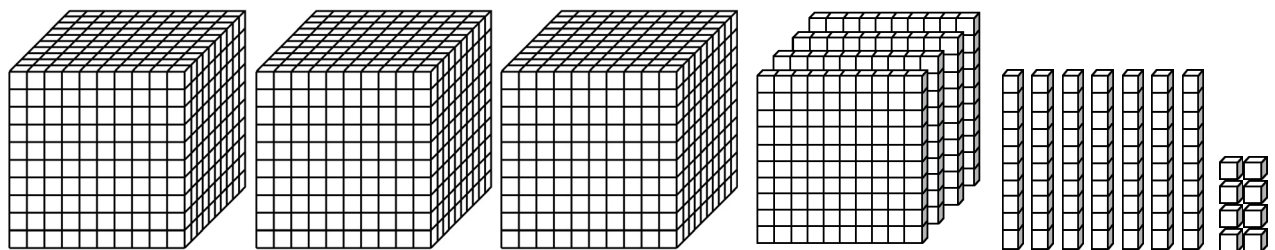
thou- sands	hund- reds	tens	ones



thou- sands	hund- reds	tens	ones



thou- sands	hund- reds	tens	ones



thou- sands	hund- reds	tens	ones

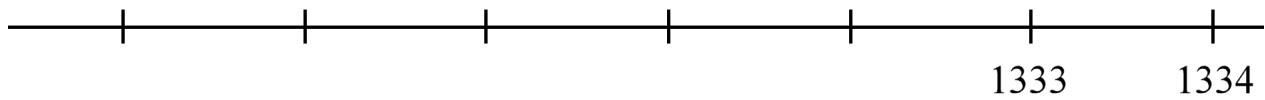
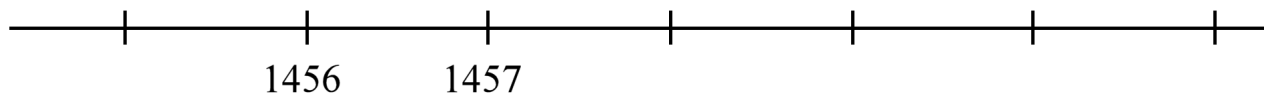
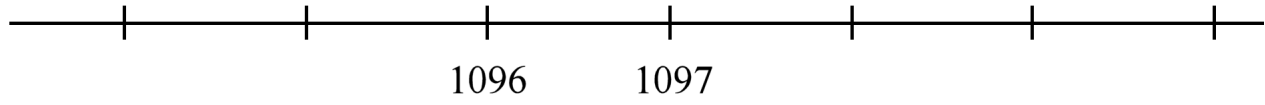
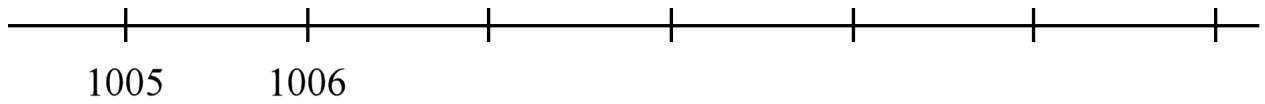
2. Fill in the table.

<p>a. One thousand two hundred fifty-six</p> <table border="1"> <thead> <tr> <th>thou- sands</th> <th>hund- reds</th> <th>tens</th> <th>ones</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2</td> <td>5</td> <td>6</td> </tr> </tbody> </table>	thou- sands	hund- reds	tens	ones	1	2	5	6	<p>b. Three thousand five hundred ninety-four</p> <table border="1"> <thead> <tr> <th>thou- sands</th> <th>hund- reds</th> <th>tens</th> <th>ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	thou- sands	hund- reds	tens	ones					<p>c. Four thousand six hundred seventeen</p> <table border="1"> <thead> <tr> <th>thou- sands</th> <th>hund- reds</th> <th>tens</th> <th>ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	thou- sands	hund- reds	tens	ones				
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3. Fill in the table. Now you will need to use a zero or zeros, so be careful!

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4. Fill in the numbers for these number lines.



5. Fill in the number chart and count by whole tens.

1 0 1 0	1 0 2 0			
1 0 6 0	1 0 7 0			

Four-Digit Numbers and Place Value

Here the numbers 2467, 1090, and 5602 are written as a *sum* of their different place values.

It is like writing each part of the number out in full: the thousands, the hundreds, the tens, and the ones. **Notice the zeros!** When there are *no* hundreds, or tens, or ones, we write a zero.

thou- sands	hund- reds	tens	ones
2	4	6	7
$2000 + 400 + 60 + 7$			

thou- sands	hund- reds	tens	ones
1	0	9	0
$1000 + 0 + 90 + 0$			

thou- sands	hund- reds	tens	ones
5	6	0	2
$5000 + 600 + 0 + 2$			

1. Fill in the blanks, and write the numbers as a sum of the different place values.

a. $1,034 =$ ___ thousand ___ hundreds ___ tens ___ ones
 $= 1000 + \underline{\quad 0 \quad} + \underline{\quad 30 \quad} + \underline{\quad 4 \quad}$

b. $5,670 =$ ___ thousand ___ hundreds ___ tens ___ ones
 $= 5000 + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$

c. $3,508 =$ ___ thousand ___ hundreds ___ tens ___ ones
 $= \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$

d. $8,389 =$ ___ thousand ___ hundreds ___ tens ___ ones
 $= \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$

e. $9,007 =$ ___ thousand ___ hundreds ___ tens ___ ones
 $= \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$

f. $7,214 =$ ___ thousand ___ hundreds ___ tens ___ ones
 $= \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$

Chapter 10: Fractions

Introduction

The last chapter of *Math Mammoth Grade 3* deals with a few elementary fraction topics: the concepts of a fraction and of a mixed number, fractions on a number line, equivalent fractions, and comparing fractions.

First, the student learns to identify fractions in visual models, and to draw “pie models” for some common fractions. You can also use manipulatives or the fraction cutouts provided. In the digital version, they are found in their separate folder, and in the printed version, they are appended to the answer key.

Next, students represent fractions on a number-line diagram by partitioning the interval from 0 to 1 into equal parts. They also study fractions on number lines that go up to 3 and learn to write whole numbers as fractions.

The lesson about mixed numbers relies on visual models and number lines. I strongly feel that students first need to understand fraction operations and concepts with the help of visual models or manipulatives, and that the various rules for calculations should not be introduced too soon. Students match fractions and mixed numbers, and even convert mixed numbers back into fractions, using visual models. The actual rule for the conversion is not included on this level.


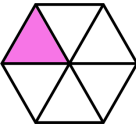
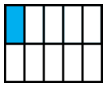
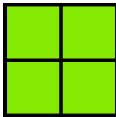

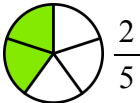
Next, we study equivalent fractions. Students recognize and generate simple equivalent fractions using visual models and number lines.


Lastly, students compare fractions in special cases, such as when they have the same numerator or the same denominator, or when the comparison can be made from visual models. They also learn that comparisons are valid only when the two fractions refer to the same whole.

The Lessons

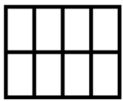
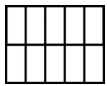
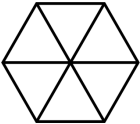

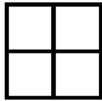
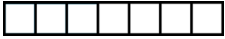
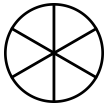
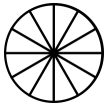
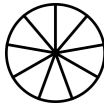
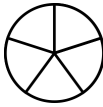
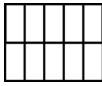

	page	span
Understanding Fractions	155	<i>4 pages</i>
Fractions on a Number Line	159	<i>4 pages</i>
Mixed Numbers	163	<i>4 pages</i>
Equivalent Fractions	167	<i>3 pages</i>
Comparing Fractions 1	170	<i>3 pages</i>
Comparing Fractions 2	173	<i>2 pages</i>
Mixed Review Chapter 10	175	<i>2 pages</i>
Fractions Review	177	<i>3 pages</i>

Understanding Fractions

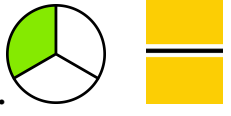
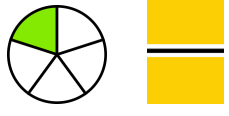
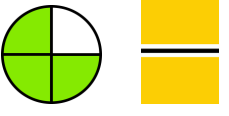
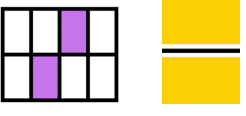
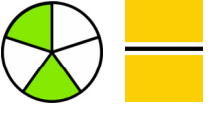

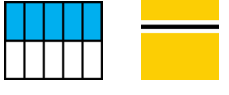
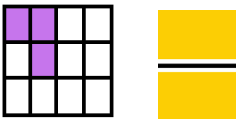

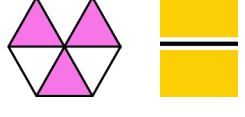

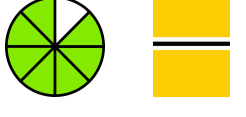
Fractions are formed when we have a WHOLE that is divided into so many EQUAL parts.	
<p>A whole is divided into <i>two</i> equal parts.</p> <p>One part is one half.</p>	 $\frac{1}{2}$
<p>A whole is divided into <i>six</i> equal parts.</p> <p>One part is one sixth.</p>	 $\frac{1}{6}$
<p>A whole is divided into <i>ten</i> equal parts.</p> <p>One part is one tenth.</p>	 $\frac{1}{10}$
<p>Four parts are colored, and the whole has four equal parts.</p> <p>Four fourths.</p>	 $\frac{4}{4}$
<p>Three parts are colored.</p> <p>There are seven equal parts.</p> <p>Three sevenths.</p>	 $\frac{3}{7}$
<p>Two parts are colored, and the whole has five equal parts.</p> <p>Two fifths.</p>	 $\frac{2}{5}$

 $\frac{3}{8}$ “three eighths”	<p>The number ABOVE the line tells how many parts we have (the colored parts).</p> <p>The number BELOW the line tells how many equal parts the whole is divided into.</p> <p>After halves, we use ordinal numbers to name the fractional parts (thirds, fourths, fifths, sixths, sevenths, and so on).</p>
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1. Color the parts to illustrate the fraction.

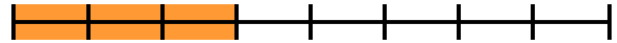
a. 	b. 	c. 	d. 	e. 	f. 
$\frac{7}{8}$	$\frac{6}{10}$	$\frac{4}{6}$	$\frac{4}{5}$	$\frac{2}{4}$	$\frac{4}{7}$
g. 	h. 	i. 	j. 	k. 	l. 
$\frac{2}{6}$	$\frac{11}{12}$	$\frac{5}{9}$	$\frac{1}{5}$	$\frac{9}{10}$	$\frac{2}{7}$


2. Write the fractions, and read them aloud.

a. 	b. 	c. 	d. 
e. 	f. 	g. 	h. 
i. 	j. 	k. 	l. 

How many parts is this “whole” divided into?

Count. You should get 8 parts.

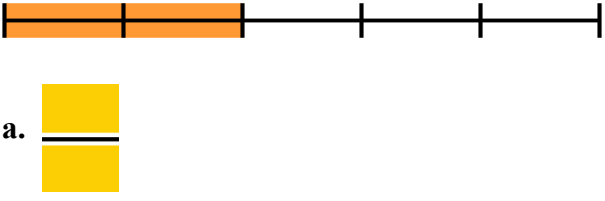

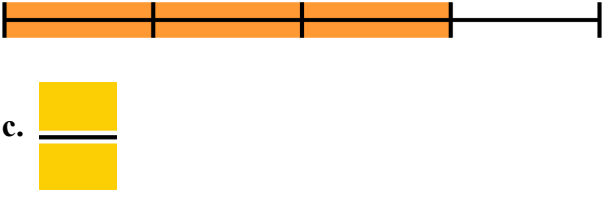
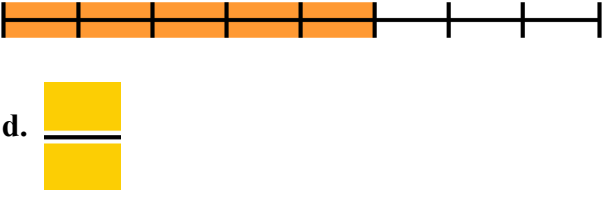
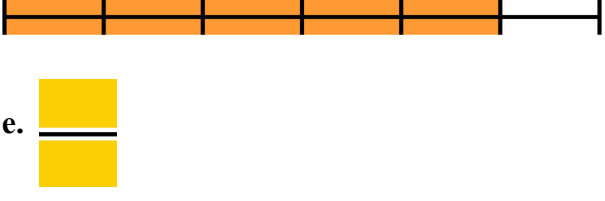


Don't count the little lines. Count the “units” or the parts. One of them is like this: 

How many of them are colored?

You should get 3 colored parts out of 8 in total. So, the fraction is $\frac{3}{8}$.

3. Write the fractions, and read them aloud.

a. 	b. 
c. 	d. 
e. 	f. 