math MAMMOTH

Grade 3-B Worktext
South African Version

Light Blue Series

- **P**lace value with thousands
- **G**eometry
- **M**easuring
- **D**ivision
- **F**ractions

By Maria Miller

Sample worksheet from
www.mathmammoth.com

Contents

Foreword 5

Chapter 6: Place Value with Thousands

Introduction 7

Thousands 9

Four-Digit Numbers and Place Value 13

Which Number Is Greater? 17

Mental Adding and Subtracting 19

Add 4-Digit Numbers with Regrouping 23

Subtract 4-Digit Numbers with Regrouping 25

Rounding to the Nearest Hundred 29

Estimating 32

Word Problems 35

Mixed Revision, Chapters 1 - 6 38

Revision, Chapter 6 40

Chapter 7: Geometry

Introduction 42

Shapes 46

Some Special Quadrilaterals 50

Perimeter 53

Problems with Perimeter 56

Getting Started with Area 59

More about Area 61

Multiplying by Whole Tens 65

Area Units and Problems 69

Area and Perimeter Problems 72

More Area and Perimeter Problems 74

Solids 77

Mixed Revision, Chapters 1 - 7 79

Geometry Revision 81

Sample worksheet from
www.mathmammoth.com

Chapter 8: Measuring

Introduction 83
Centimetres and Millimetres 85
Line Plots and More Measuring 89
Metres and Kilometres 92
Grams and Kilograms..... 94
Millilitres and Litres 98
Mixed Revision, Chapters 1 - 8 100
Revision, Chapter 8 102

Chapter 9: Division

Introduction 104
Division as Making Groups 107
Division and Multiplication 111
Division and Multiplication Facts 115
Dividing Evenly into Groups 118
Division Word Problems 122
Zero in Division 125
When Division Is Not Exact 128
More Practice with the Remainder 131
Mixed Revision, Chapters 1 - 9 133
Revision, Chapter 9 135

Chapter 10: Fractions

Introduction 138
Understanding Fractions 142
Fractions on a Number Line 144
Mixed Numbers 148
Equivalent Fractions 152
Comparing Fractions 1 155
Comparing Fractions 2 158
Mixed Revision, Chapters 1 - 10 160
Fractions Revision 162

Sample worksheet from
www.mathmammoth.com

Foreword

Math Mammoth Grade 3-A and Grade 3-B worktexts comprise a complete maths curriculum for the third grade mathematics studies. This South African version has been **customized to South Africa** in the following manners:

- The names used are South African names (instead of Jack and Jill, there are Ansie and Mampho).
- The currency used in word problems is rand. The money chapter teaches both rand and cents.
- The material is "all metric." In other words, the US customary measuring units are not used.
- Spelling is British English instead of American English.
- Paper size is A4.
- Geographic locations used emphasize South African locations (such as Pretoria, Johannesburg).

Please note that the curriculum is not following the South African official syllabus for 3rd grade maths. Instead, it simply is a copy of the US version of Math Mammoth Grade 3, aligned to the US Common Core Standards. This decision was made because of the great amount of work that would be involved in writing new lessons and reorganizing old ones to match all the standards in the South African syllabus. For the most part, Math Mammoth is exceeding South African standards. Some standards may not be covered.

Third grade is a time for learning and mastering two (mostly new) operations: multiplication and division within 100. The student also deepens his understanding of addition and subtraction, and uses those in many different contexts, such as with money, time, and geometry.

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 use visual fraction models and study fractions on a number line. Students also compare fractions by using visual fraction 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 (with regrouping). They learn to add and subtract 4-digit numbers, and use addition and subtraction in problem solving (chapters 1 and 6).

Additional topics we study are time (chapter 4), money (chapter 5), measuring (chapter 8), and bar graphs and picture graphs (in various chapters).

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.

When you use these two books as your only or main mathematics curriculum, they are like a "framework," but you still have a lot of liberty in planning your child's studies. While multiplication and

Sample worksheet from
www.mathmammoth.com

division chapters are best studied in the order they are presented, feel free to go through the geometry, clock, measuring, and fraction sections in a different order. For the geometry chapter, the student should already know the multiplication tables. This might even be advisable if your child is "stuck" on some concept, or is getting bored. Sometimes the brain "mulls it over" in the background, and the concept the student was stuck on can become clear after a break.

Math Mammoth aims to concentrate on a few major topics at a time, and study them in depth. This is totally opposite to the continually spiralling step-by-step curricula, in which each lesson typically is about a different topic from the previous or next lesson, and includes a lot of revision problems from past topics.

This does not mean that your child would not need an occasional revision. However, when each major topic is presented in its own chapter, this gives you more freedom to plan the course of study *and* choose the revision times yourself. In fact, I totally encourage you to plan your mathematics school year as a set of certain topics, instead of a certain book or certain pages from a book.

For revision, the download version includes an html page called *Make_extra_worksheets_grade3.htm* that you can use to make additional worksheets for computation or for number charts. You can simply reprint some previously studied pages.

I wish you success in your maths teaching!

Maria Miller, the author

Chapter 6: Place Value with Thousands

Introduction

This chapter of *Math Mammoth Grade 3 South African Version* covers 4-digit numbers (numbers with thousands), and adding and subtracting them. We also study rounding and estimating, which are very important skills for everyday life.

First, children learn 4-digit numbers, place value—breaking numbers such as 3 498 into thousands, hundreds, tens, and ones—and comparing 4-digit numbers. Next, they practise some mental addition and subtraction with 4-digit numbers. The lesson stresses the similarities between adding and subtracting 4-digit numbers and adding and subtracting smaller numbers. Practising mental maths also helps to build number sense.

We also study regrouping in addition and subtraction, using 4-digit numbers. If you purchased the download version, you can make more worksheets for addition and subtraction using the accompanying worksheet maker.

The last major topics in this chapter are rounding numbers to the nearest hundred and estimating. Students also get to do some more word problems in one lesson.

The Lessons

	page	span
Thousands	9	*4 pages*
Four-Digit Numbers and Place Value	13	*4 pages*
Which Number is Greater?	17	*2 pages*
Mental Adding and Subtracting	19	*4 pages*
Add 4-Digit Numbers with Regrouping	23	*2 pages*
Subtract 4-Digit Numbers with Regrouping	25	*4 pages*
Rounding to the Nearest Hundred	29	*3 pages*
Estimating	32	*3 pages*
Word Problems	35	*3 pages*
Mixed Revision, Chapters 1 - 6	38	*2 pages*
Revision, Chapter 6	40	*2 pages*

Sample worksheet from
www.mathmammoth.com

Helpful Resources on the Internet

Use these free online resources to supplement the "bookwork" as you see fit.
Disclaimer: *These links were valid at the time of the writing of this book, and to the best of our knowledge we believe these websites to have what is described. However, we cannot guarantee that the links have not changed. Parental supervision is recommended.*

Base Blocks from National Library of Virtual Manipulatives
Place enough thousand cubes, hundred-flats, ten-sticks, and one-blocks in the work area to show the given numbers. Choose "Columns = 4" to restrict the program to four-digit numbers.
http://nlvm.usu.edu/en/nav/frames_asid_152_g_1_t_1.html?from=category_g_1_t_1.html

Maths Teacher's Toolkit
Use the place value calculator for this level to practise place value with 4-digit numbers. Some of the other tools are too easy for the focus of this chapter.
http://www.crick.northants.sch.uk/Flash%20Studio/cfsmaths/Toolkit/Toolkit.htm

Cookie Dough
Practise naming big numbers.
http://www.funbrain.com/numwords/index.html

Can you say really big numbers?
Enter a really big number, try to say it out loud, and see it written.
http://www.mathcats.com/explore/reallybignumbers.html

Line Dry Game
Fill in a missing number on the clothesline based on different skip-counting patterns.
http://www.fuelthebrain.com/Game/play.php?ID=15

Maximum Capacity
Drag as many gorillas as you can into the elevator without exceeding the weight capacity of the elevator. You will have to use your quick addition, estimation, and number sense skills.
http://www.mrnussbaum.com/maximumcapacity.htm

Place value puzzler
Place value or rounding game. Choose "easy" place value or "easy" rounding for this level. You will need to click on the required place value in a number, or type in the answer for rounding.
http://www.funbrain.com/tens/index.html

Rounding Sharks
You will be asked to round numbers in the thousands to the nearest hundred. Click on the shark that has the number rounded correctly.
http://www.aaamath.com/B/est.htm

This page left blank intentionally.

Sample worksheet from
www.mathmammoth.com

Four-Digit Numbers and Place Value

Here the numbers 2 467, 1 090, and 5 602 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

2 000 + 400 + 60 + 7

thou-sands	hund-reds	tens	ones
1	0	9	0

1 000 + 0 + 90 + 0

thou-sands	hund-reds	tens	ones
5	6	0	2

5 000 + 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

= 1 000 + ___0___ + __3 0__ + _4_

b. 5 670 = ____ thousand ____ hundreds ____ tens ____ ones

= 5 000 + _____ + _____ + ____

c. 3 508 = ____ thousand ____ hundreds ____ tens ____ ones

= _____ + _____ + _____ + ____

d. 8 389 = ____ thousand ____ hundreds ____ tens ____ ones

= _____ + _____ + _____ + ____

e. 9 007 = ____ thousand ____ hundreds ____ tens ____ ones

= _____ + _____ + _____ + ____

f. 7 214 = ____ thousand ____ hundreds ____ tens ____ ones

= _____ + _____ + _____ + ____

2. Fill in the table.

a. Five thousand nine hundred and ninety T H T O	**b.** Six thousand and sixteen T H T O	**c.** Six thousand three hundred and three T H T O
d. Eight thousand seven hundred T H T O	**e.** Nine thousand two hundred and forty-five T H T O	**f.** Ten thousand ten thou-sands T H T O 1 0 0 0 0

3. These numbers are written as sums. Write them in the normal way.

a. 2 000 + 90 = _____ 3 000 + 200 = _____	**b.** 8 000 + 5 = _____ 1 000 + 80 + 7 = _____
c. 8 000 + 200 + 20 = _____ 2 000 + 500 + 90 + 8 = _____	**d.** 4 000 + 50 = _____ 2 000 + 800 + 7 = _____

4. What part of these numbers is missing?

a. 5 000 + 80 + _____ = 5 083	**b.** 7 000 + _____ + 5 = 7 605
c. _____ + 3 000 = 3 050	**d.** _____ + 700 + 1 = 2 701

5. Write the numbers immediately after and before the given number.

a. _____ , 6 049 , _____

b. _____ , 2 324 , _____

c. _____ , 1 800 , _____

d. _____ , 8 809 , _____

e. _____ , 7 385 , _____

f. _____ , 9 244 , _____

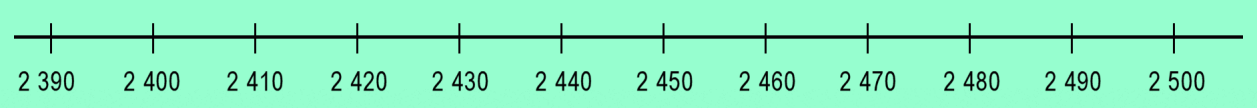
6. These numbers are written as sums, but in a scrambled order! Write them as normal numbers.

a. 4 000 + 900 + 7 = _____	**b.** 80 + 500 + 8 000 + 6 = _____
c. 2 thousand 7 ones 4 tens	**d.** 2 tens 6 hundred 4 thousand
e. 7 thousand 8 hundred 8 ones	**f.** 5 thousand 6 tens
g. 3 thousand 4 ones	**h.** 5 hundred 9 thousand

7. What part of these numbers is missing?

a. 900 + 2 + _____ = 8 902	**b.** 5 000 + 40 + _____ = 5 046
c. _____ + 6 000 + 40 = 6 540	**d.** _____ + 4 000 + 300 = 4 340

8. Here is a number line from 2 390 to 2 500 with tick-marks for every 10.

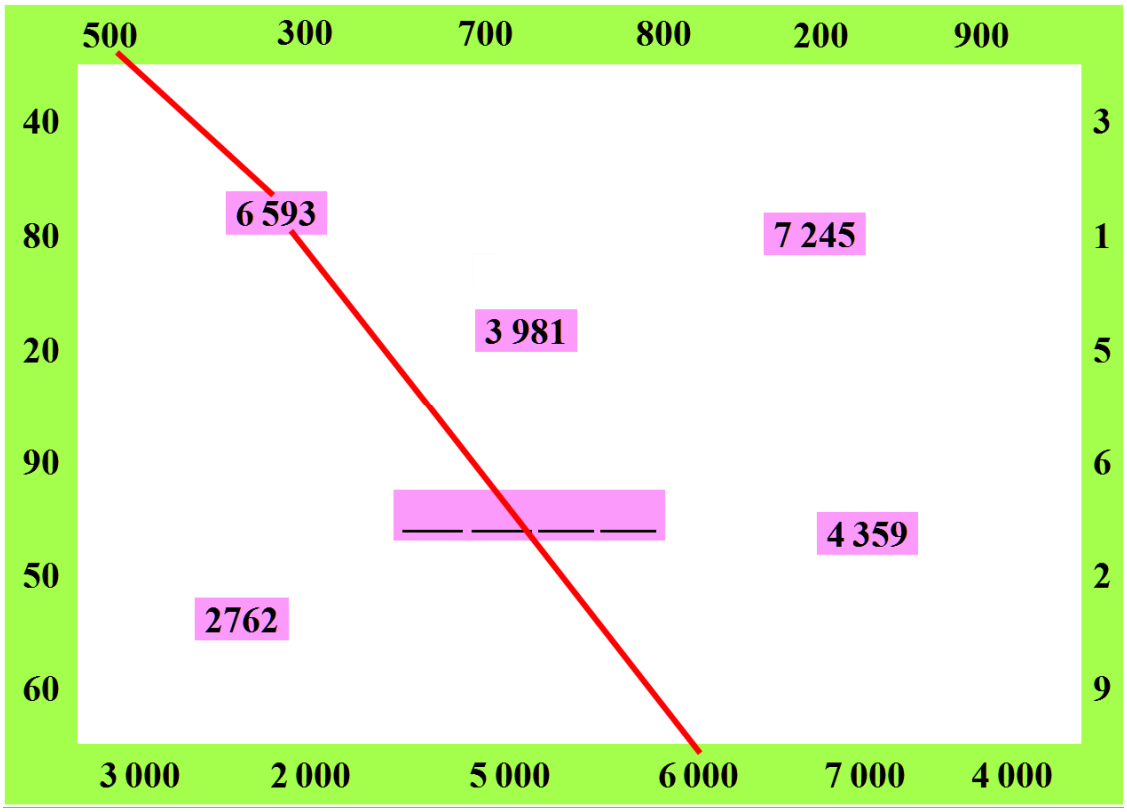


Mark these numbers on the number line (approximately):
2 415 2 398 2 441 2 476 2 483 2 499.

9. Draw a number line from 7 650 to 7 800 with tick marks at every 10.

Mark these numbers on the number line (approximately):
7 659, 7 672, 7 745, 7 758, 7 777, 7 796

10. Connect each number inside the puzzle to its whole thousands, hundreds, tens, and ones that it contains. For example, 6 593 is connected to 6 000 and to 500 (for starters).
Add the unused numbers from the border to form the missing number inside.



11. Solve the puzzle. Think of breaking the numbers into thousands, hundreds, tens, and ones.

	+		+		+		=	5 206
+		+		+		+		
	+		+		+		=	3 078
+		+		+		+		
	+		+		+		=	1 925
+		+		+		+		
	+		+		+		=	432
=		=		=		=		
5 022		3 235		1 408		976		

This page left blank intentionally.

Sample worksheet from
www.mathmammoth.com

Chapter 7: Geometry
Introduction

The seventh chapter of *Math Mammoth Grade 3 South African Version* deals with geometry. The emphasis is on two new concepts: area and perimeter.

First, we study and revise shapes in one lesson where the student divides shapes into new ones, and also encounters some tilings (also known as tessellations). Next, we study in more detail about some quadrilaterals, namely squares, rectangles, and rhombi (plural of rhombus).

Then comes the focus of this chapter: perimeter and area. Students find perimeters of polygons, including finding the perimeter when the side lengths are given, and finding an unknown side length when the perimeter is given.

They learn about area, and how to measure it in square centimetres, square metres, or in just square units if no unit of length is specified.

Students also relate area to the operations of multiplication and addition. They learn to find the area of a rectangle by multiplying the side lengths, and to find the area of rectilinear figures by dividing them into rectangles and adding the areas.

We also study the distributive property "in disguise." This means using an area model to represent $a \times (b + c)$ as being equal to $a \times b$ plus $a \times$ c. The expression $a \times (b + c)$ is the area of a rectangle with side lengths a and $(b + c)$, which is equal to the areas of two rectangles, one with sides a and b, and the other with sides a and c.

Multiplying by Whole Tens is a lesson about multiplication such as 3×40 or 90×7. It is put here so that students can then use their multiplication skills to calculate areas of bigger rectangles.

Then we solve many area and perimeter problems. That is necessary so that students are able to distinguish between these two concepts. They also get to see rectangles with the same perimeter and different areas or with the same area and different perimeters.

Lastly, we touch on solids, such as cubes, rectangular prisms, pyramids, cones, and cylinders, and study their faces, edges, and vertices. You can make paper models for them from the printouts provided in the download version of the curriculum. Alternatively you can buy them, usually made in plastic. Search on the internet for "geometric solids."

Sample worksheet from
www.mathmammoth.com

The Lessons

	page	span
Shapes	46	*4 pages*
Some Special Quadrilaterals	50	*3 pages*
Perimeter	53	*3 pages*
Problems with Perimeter	56	*3 pages*
Getting Started with Area	59	*2 pages*
More About Area	61	*4 pages*
Multiplying by Whole Tens	65	*4 pages*
Area Units and Problems	69	*4 pages*
Area and Perimeter Problems	72	*2 pages*
More Area and Perimeter Problems	74	*3 pages*
Solids	77	*2 pages*
Mixed Revision, Chapters 1 - 7	79	*2 pages*
Geometry Revision	81	*2 pages*

Helpful Resources on the Internet

Use these online resources as you see fit to supplement the main text.
Disclaimer: *These links were valid at the time of the writing of this book, and to the best of our knowledge we believe these websites to have what is described. However, we cannot guarantee that the links have not changed. Parental supervision is recommended.*

SHAPES

Shape Cutter
Draw any shape (polygon), cut it, and manipulate the cut pieces. You can have the computer mix them up, and then try to recreate the original shape.
http://illuminations.nctm.org/ActivityDetail.aspx?ID=72

Patch Tool
An online activity where the student designs a pattern using geometric shapes.
http://illuminations.nctm.org/ActivityDetail.aspx?ID=27

Polygon Playground
Drag various colourful polygons to the work area to make your own creations!
http://www.mathcats.com/explore/polygons.html

Interactive Quadrilaterals
Drag the corners to play with squares, rectangles, rhombi, and more.
http://www.mathsisfun.com/geometry/quadrilaterals-interactive.html

Shapes Identification Quiz from ThatQuiz.org
An online quiz in a multiple-choice format, asking to identify common two-dimensional shapes. You can modify the quiz parameters to your liking.
www.thatquiz.org/tq-f/math/shapes/

Sample worksheet from
www.mathmammoth.com

Tangram puzzles for kids
Use the seven pieces of the Tangram to form the given puzzle.
Complete the puzzle by moving and rotating the seven shapes.
http://www.abcya.com/tangrams.htm

Interactive Tangram Puzzle
Place the tangram pieces so they form the given shape.
http://nlvm.usu.edu/en/nav/frames_asid_112_g_2_t_1.html

Tangram set
Cut out your Tangram set by folding paper.
http://tangrams.ca/fold-set

Interactivate! Tessellate
An online, interactive tool for creating your own tessellations. Choose a shape, then edit its corners or edges. The program automatically changes the shape so that it will tessellate (tile) the plane. Then push the tessellate button to see your creation!
http://www.shodor.org/interactivate/activities/Tessellate

Online Kaleidoscope
Create your own kaleidoscope creation with this interactive tool.
http://www.zefrank.com/dtoy_vs_byokal/

AREA AND PERIMETER

Everything you wanted to know about area and perimeter
Short explanations of how to find the perimeter of simple shapes and the area of rectangles, followed by quizzes on three levels. In perimeter, level two, some side lengths are not given. In level three, you calculate the perimeter of compound shapes. In area of rectangles, level 1 has just rectangles, and levels 2 and 3 have compound shapes made of rectangles.
www.bgfl.org/custom/resources_ftp/client_ftp/ks2/maths/perimeter_and_area/index.html

Shape Explorer
Find the perimeter and area of odd shapes on a rectangular grid.
http://www.shodor.org/interactivate/activities/ShapeExplorer/

Math Playground: Measuring the Area and Perimeter of Rectangles
Amy and her brother, Ben, explain how to find the area and perimeter of rectangles and show you how changing the perimeter of a rectangle affects its area. After the lesson, you will use an interactive ruler to measure the length and width of 10 rectangles, and to calculate the perimeter and area of each.
http://www.mathplayground.com/area_perimeter.html

Math Playground: Party Designer
You need to design areas for the party, such as a crafts table, food table, seesaw, and so on, so that they have the given perimeters and areas.
http://www.mathplayground.com/PartyDesigner/PartyDesigner.html

BBC Bitesize - Perimeter
A simple revision “bite” for perimeter that includes short explanations and a few quiz questions.
http://www.bbc.co.uk/schools/ks3bitesize/maths/measures/perimeter/revise1.shtml

BBC Bitesize - Area
Brief revision "bites", including a few interactive questions, about area: counting squares, area of rectangles, area of triangles, parallelograms, and of compound shapes. Includes an activity and a test.
http://www.bbc.co.uk/schools/ks3bitesize/maths/measures/area/revise1.shtml

Geometry Area/Perimeter Quiz from ThatQuiz.org
An online quiz, asking either the area or perimeter of rectangles, triangles, and circles. You can modify the quiz parameters to your liking, for example to omit the circle, or instead of solving for area, you solve for an unknown side when the perimeter/area is given.
http://www.thatquiz.org/tq-4/?-j201v-lc-m2kc0-na-p0

Perimeter Game from Cyram.org
A simple online quiz for finding the perimeter of rectangles, triangles, or compound rectangles where not all side lengths are given.
http://www.cyram.org/Projects/perimetergame/index.html

FunBrain: Shape Surveyor Geometry Game
A simple and easy game that practises finding either the perimeter or area of rectangles.
http://www.funbrain.com/poly/index.html

Area of Rectangle
Drag the corners of the rectangle and see how the side lengths and areas change.
http://illuminations.nctm.org/ActivityDetail.aspx?ID=46

XP Math: Find Perimeters of Parallelograms
This online quiz shows you parallelograms and rectangles, and you need to calculate the perimeter, including typing in the right unit, and not using the altitude of the parallelogram.
http://www.xpmath.com/forums/arcade.php?do=play&gameid=10

SOLIDS

Identify Solids
Select the name and drop it on the correct solid.
http://www.softschools.com/math/geometry/shapes/solids/games/

Geometric Solids
Manipulate various geometric solids. Colour in the solid to investigate properties such as the number of faces, edges, and vertices.
http://illuminations.nctm.org/ActivityDetail.aspx?ID=70

2-D and 3-D Shapes
Learn about different solids and see them rotate.
http://www.bgfl.org/bgfl/custom/resources_ftp/client_ftp/ks2/maths/3d/index.htm

Identify solids
Click to identify the partially buried 3-dimensional shapes.
http://www.primaryresources.co.uk/online/longshape3d.html

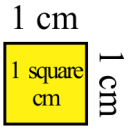
Space Blocks
Build with blocks to illustrate three-dimensional shapes.
http://nlvm.usu.edu/en/nav/frames_asid_195_g_2_t_2.html

This page left blank intentionally.

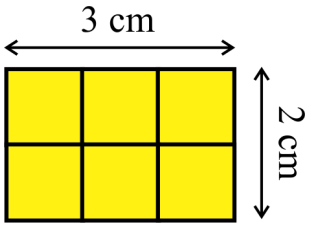
Sample worksheet from
www.mathmammoth.com

Area Units and Problems

Area is always measured in *squares of some size*. To find the area of a shape, we check how many squares are needed to cover the shape.



Each side of this square measures 1 centimetre. It is a special square. It is called **a square centimetre**. We can use it to measure areas of other shapes.

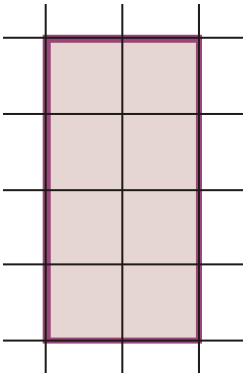


We need 6 square centimetres to cover this rectangle. So, its area is just that: 6 square centimetres. We abbreviate this as 6 cm^2. The elevated ^{2} indicates the "squaring."

We can also use *multiplication* to find the area:

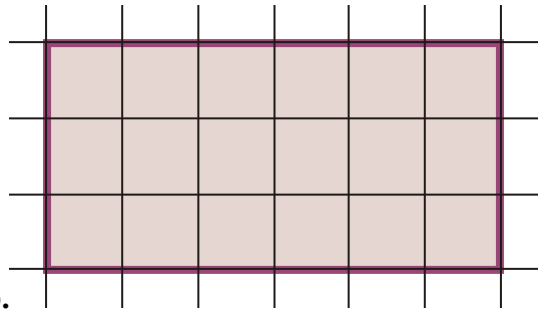
$$3 \text{ cm} \times 2 \text{ cm} = 6 \text{ cm}^2$$

1. Write a multiplication for the area of each rectangle. Measure the sides of the rectangles in centimetres using a ruler. Do not forget the units (cm and cm^2)!



a.

A = ____ cm × ____ cm = _____ cm^2



b.

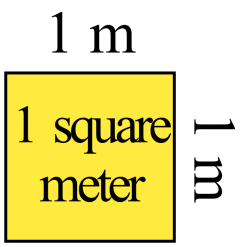
A = ____ cm × ____ cm = _____ cm^2

c.

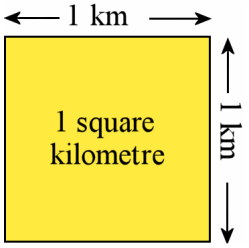
A = _____

d.

A = _____



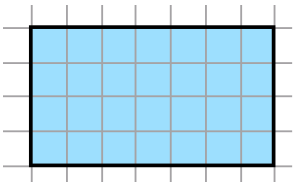
This is one square metre, or 1 m^2.
(The picture is *not* to scale.)



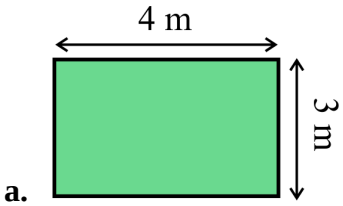
This is one square kilometre, or 1 km^2.
(The picture is *not* to scale.)

If no particular unit of length is given for the sides of a rectangle, we just use the word "unit."

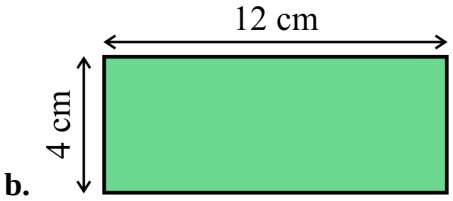
The sides are 7 and 4 units, and the area is 28 *square units*.



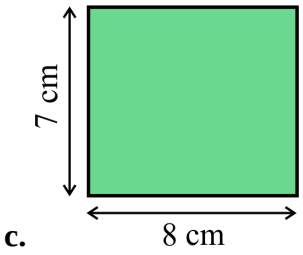
2. Find the areas of the rectangles. Be very careful about the unit you need to use, whether square centimetres (cm^2), square metres (m^2), or square units.



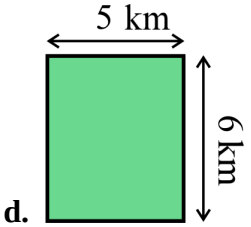
A = _____



A = _____

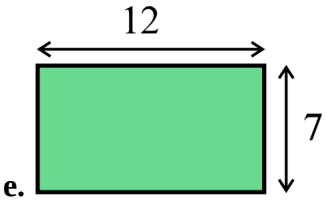


A = _____

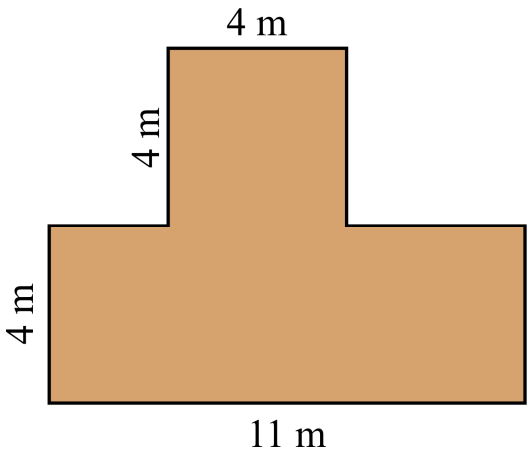


A = _____

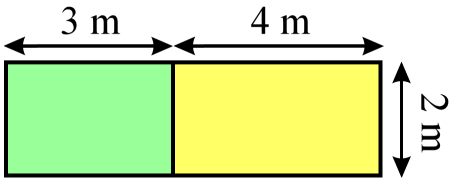
A = _____



3. Find the area of this children's playground.



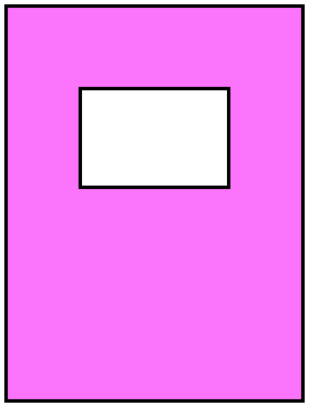
4. Find the area of Mary's garden.



5. Daniel's room measures 4 m by 4 m. His brother Jali's room is 5 m by 3 m.
Whose room is bigger in area? How much bigger?

6. A notebook measures 15 cm by 20 cm. On its cover is a white square. The white square is 7 cm by 5 cm.
How many square centimetres is the white square?

How many square centimetres is the shaded (pink) area?



Sample worksheet from
www.mathmammoth.com

This page left blank intentionally.

Sample worksheet from
www.mathmammoth.com

Chapter 8: Measuring
Introduction

The eighth chapter of *Math Mammoth Grade 3 South African Version* covers measuring-related topics.

If you have the downloadable version of this book (PDF file), you need to print this file as 100%, not "shrink to fit," "print to fit," or similar. If you print "shrink to fit," some exercises about measuring in centimetres will not come out right, but will be "shrunk" compared to reality.

First, children learn about units of length in the metric system. Then, in the following lesson, they measure using centimetres and millimetres.

Later, students study line plots and get more practice measuring objects at home or in the classroom.

The next lesson helps students become familiar with metres and kilometres—the units for measuring medium and long distances.

Then it is time to measure weight. The lesson deals with grams and kilograms. It is very helpful if you can use a kitchen scale for this lesson, perhaps borrowing one if you do not own one.

Lastly, we study the metric units of liquid volume (litre and millilitre). The emphasis is on becoming familiar with measuring volume in millilitres.

Many of the lessons in this chapter also have an optional section about conversions between measuring units, such as changing three metres into centimetres. Converting between units is beyond the Common Core standards for third grade (it is actually included in the 4th and 5th grade standards), but I have included some easy conversion problems here because I feel many third graders are ready for them.

We all use various measuring units in our everyday lives, and using them is the key to remembering what they are, how big they are, and what the conversion factors are. The units your child is not using are likely to be forgotten easily. So encourage the student(s) to have free play time with measuring devices such as a scale, measuring cups, measuring tapes, and rulers.

The Lessons

	page	span
Centimetres and Millimetres	85	*4 pages*
Line Plots and More Measuring	89	*3 pages*
Metres and Kilometres	92	*2 pages*
Grams and Kilograms	94	*4 pages*
Millilitres and Litres	98	*2 pages*
Mixed Revision, Chapters 1 - 8	100	*2 pages*
Revision, Chapter 8	102	*2 pages*

Sample worksheet from
www.mathmammoth.com

Helpful Resources on the Internet

Use these online resources as you see fit to supplement the main text.
Disclaimer: *These links were valid at the time of the writing of this book, and to the best of our knowledge we believe these websites to have what is described. However, we cannot guarantee that the links have not changed. Parental supervision is recommended.*

Measure It!
Practise measuring lines with either centimetres or inches. Multiple choice questions.
http://www.funbrain.com/measure

Sal's Sub Shop
Customers order subs, and you need to cut them to the given measurements - sometimes in metric units, sometimes in inches.
http://www.mrnussbaum.com/sal.htm

Measurement Game for Kids
Measure the length and weight of various parcels using the interactive scale and ruler so you can give them a stamp with the correct postage rate. Uses grams and centimetres.
http://www.kidsmathgamesonline.com/geometry/measurement.html

Reading Scales
You can illustrate a variety of measuring devices, such as scales, measuring cup, thermometer, and speedometer, and how to read them. Generate examples using different scales on different devices at the press of a button.
http://www.teacherled.com/2008/01/28/reading-scales

Reading Scales
Weigh objects on this virtual balance scale, using weights of 10 g, 50 g, 250 g, and 500 g.
http://www.teacherled.com/resources/oldscales/oldscalesload.html

Measures
An online activity about metric measuring units and how to read scales, a measuring cup, and a ruler. Uses British spelling.
http://www.bgfl.org/bgfl/custom/resources_ftp/client_ftp/ks2/maths/measures

Sample worksheet from
www.mathmammoth.com

Chapter 8: Measuring
Introduction

The eighth chapter of *Math Mammoth Grade 3 South African Version* covers measuring-related topics.

If you have the downloadable version of this book (PDF file), you need to print this file as 100%, not "shrink to fit," "print to fit," or similar. If you print "shrink to fit," some exercises about measuring in centimetres will not come out right, but will be "shrunk" compared to reality.

First, children learn about units of length in the metric system. Then, in the following lesson, they measure using centimetres and millimetres.

Later, students study line plots and get more practice measuring objects at home or in the classroom.

The next lesson helps students become familiar with metres and kilometres—the units for measuring medium and long distances.

Then it is time to measure weight. The lesson deals with grams and kilograms. It is very helpful if you can use a kitchen scale for this lesson, perhaps borrowing one if you do not own one.

Lastly, we study the metric units of liquid volume (litre and millilitre). The emphasis is on becoming familiar with measuring volume in millilitres.

Many of the lessons in this chapter also have an optional section about conversions between measuring units, such as changing three metres into centimetres. Converting between units is beyond the Common Core standards for third grade (it is actually included in the 4th and 5th grade standards), but I have included some easy conversion problems here because I feel many third graders are ready for them.

We all use various measuring units in our everyday lives, and using them is the key to remembering what they are, how big they are, and what the conversion factors are. The units your child is not using are likely to be forgotten easily. So encourage the student(s) to have free play time with measuring devices such as a scale, measuring cups, measuring tapes, and rulers.

The Lessons

	page	span
Centimetres and Millimetres	85	*4 pages*
Line Plots and More Measuring	89	*3 pages*
Metres and Kilometres	92	*2 pages*
Grams and Kilograms	94	*4 pages*
Millilitres and Litres	98	*2 pages*
Mixed Revision, Chapters 1 - 8	100	*2 pages*
Revision, Chapter 8	102	*2 pages*

Sample worksheet from
www.mathmammoth.com

Helpful Resources on the Internet

Use these online resources as you see fit to supplement the main text.
Disclaimer: *These links were valid at the time of the writing of this book, and to the best of our knowledge we believe these websites to have what is described. However, we cannot guarantee that the links have not changed. Parental supervision is recommended.*

Measure It!
Practise measuring lines with either centimetres or inches. Multiple choice questions.
http://www.funbrain.com/measure

Sal's Sub Shop
Customers order subs, and you need to cut them to the given measurements - sometimes in metric units, sometimes in inches.
http://www.mrnussbaum.com/sal.htm

Measurement Game for Kids
Measure the length and weight of various parcels using the interactive scale and ruler so you can give them a stamp with the correct postage rate. Uses grams and centimetres.
http://www.kidsmathgamesonline.com/geometry/measurement.html

Reading Scales
You can illustrate a variety of measuring devices, such as scales, measuring cup, thermometer, and speedometer, and how to read them. Generate examples using different scales on different devices at the press of a button.
http://www.teacherled.com/2008/01/28/reading-scales

Reading Scales
Weigh objects on this virtual balance scale, using weights of 10 g, 50 g, 250 g, and 500 g.
http://www.teacherled.com/resources/oldscales/oldscalesload.html

Measures
An online activity about metric measuring units and how to read scales, a measuring cup, and a ruler. Uses British spelling.
http://www.bgfl.org/bgfl/custom/resources_ftp/client_ftp/ks2/maths/measures

Sample worksheet from
www.mathmammoth.com

Chapter 8: Measuring
Introduction

The eighth chapter of *Math Mammoth Grade 3 South African Version* covers measuring-related topics.

If you have the downloadable version of this book (PDF file), you need to print this file as 100%, not "shrink to fit," "print to fit," or similar. If you print "shrink to fit," some exercises about measuring in centimetres will not come out right, but will be "shrunk" compared to reality.

First, children learn about units of length in the metric system. Then, in the following lesson, they measure using centimetres and millimetres.

Later, students study line plots and get more practice measuring objects at home or in the classroom.

The next lesson helps students become familiar with metres and kilometres—the units for measuring medium and long distances.

Then it is time to measure weight. The lesson deals with grams and kilograms. It is very helpful if you can use a kitchen scale for this lesson, perhaps borrowing one if you do not own one.

Lastly, we study the metric units of liquid volume (litre and millilitre). The emphasis is on becoming familiar with measuring volume in millilitres.

Many of the lessons in this chapter also have an optional section about conversions between measuring units, such as changing three metres into centimetres. Converting between units is beyond the Common Core standards for third grade (it is actually included in the 4th and 5th grade standards), but I have included some easy conversion problems here because I feel many third graders are ready for them.

We all use various measuring units in our everyday lives, and using them is the key to remembering what they are, how big they are, and what the conversion factors are. The units your child is not using are likely to be forgotten easily. So encourage the student(s) to have free play time with measuring devices such as a scale, measuring cups, measuring tapes, and rulers.

The Lessons

	page	span
Centimetres and Millimetres	85	*4 pages*
Line Plots and More Measuring	89	*3 pages*
Metres and Kilometres	92	*2 pages*
Grams and Kilograms	94	*4 pages*
Millilitres and Litres	98	*2 pages*
Mixed Revision, Chapters 1 - 8	100	*2 pages*
Revision, Chapter 8	102	*2 pages*

Sample worksheet from
www.mathmammoth.com

Helpful Resources on the Internet

Use these online resources as you see fit to supplement the main text.
Disclaimer: *These links were valid at the time of the writing of this book, and to the best of our knowledge we believe these websites to have what is described. However, we cannot guarantee that the links have not changed. Parental supervision is recommended.*

Measure It!
Practise measuring lines with either centimetres or inches. Multiple choice questions.
http://www.funbrain.com/measure

Sal's Sub Shop
Customers order subs, and you need to cut them to the given measurements - sometimes in metric units, sometimes in inches.
http://www.mrnussbaum.com/sal.htm

Measurement Game for Kids
Measure the length and weight of various parcels using the interactive scale and ruler so you can give them a stamp with the correct postage rate. Uses grams and centimetres.
http://www.kidsmathgamesonline.com/geometry/measurement.html

Reading Scales
You can illustrate a variety of measuring devices, such as scales, measuring cup, thermometer, and speedometer, and how to read them. Generate examples using different scales on different devices at the press of a button.
http://www.teacherled.com/2008/01/28/reading-scales

Reading Scales
Weigh objects on this virtual balance scale, using weights of 10 g, 50 g, 250 g, and 500 g.
http://www.teacherled.com/resources/oldscales/oldscalesload.html

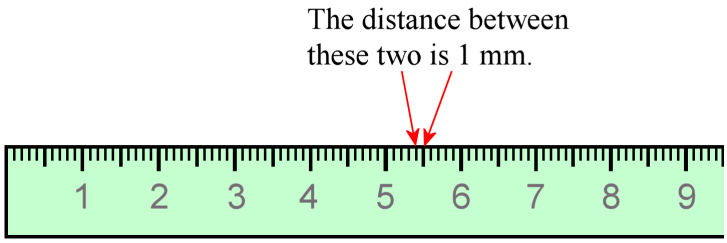
Measures
An online activity about metric measuring units and how to read scales, a measuring cup, and a ruler. Uses British spelling.
http://www.bgfl.org/bgfl/custom/resources_ftp/client_ftp/ks2/maths/measures

Sample worksheet from
www.mathmammoth.com

Centimetres and Millimetres

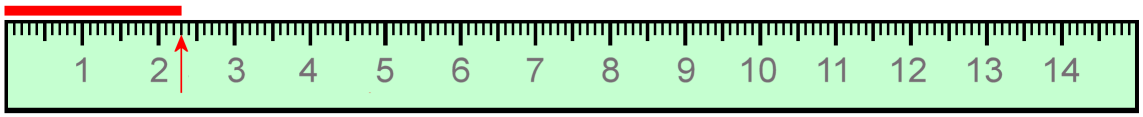
This ruler measures in centimetres.
The numbers signify whole centimetres.
All the shorter lines between those are for *millimetres*.

The distance from one short line to the next line is *1 millimetre*. We write 1 mm. Millimetres are very tiny!



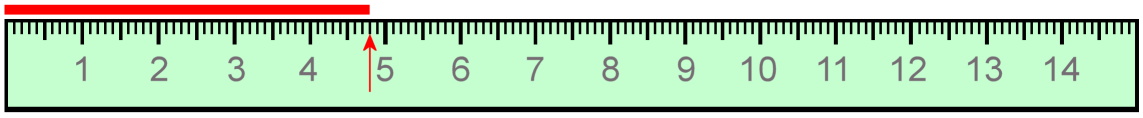
Look at the ruler: **there are 10 millimetres in each centimetre.**

Measuring lines: First see how many whole centimetres long the line is. Then count how many little millimetre-lines beyond that it reaches.



This line is 2 cm 3 mm long. At the same time, it is 23 mm long. Why?

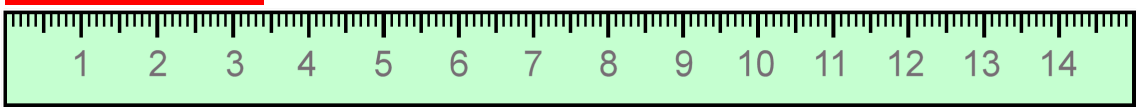
Each centimetre is 10 mm, so 2 cm is 20 mm. That means 2 cm 3 mm makes 23 mm in total.



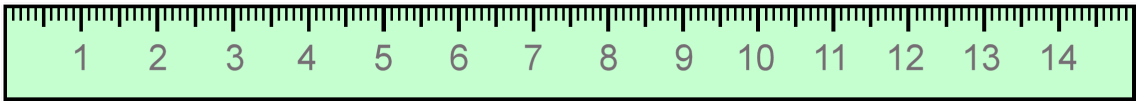
This line is 4 cm 8 mm long. At the same time, it is 48 mm long.

1. Measure the lines using the ruler, first in whole centimetres and millimetres. Then write their lengths using millimetres only.

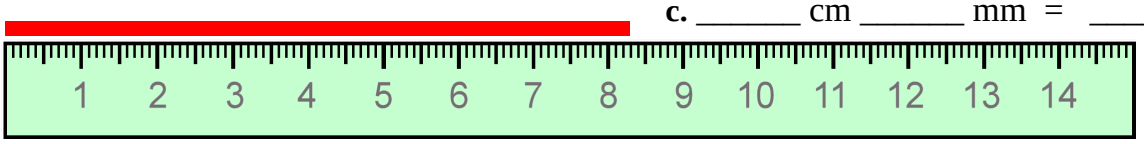
a. _____ cm _____ mm = _____ mm



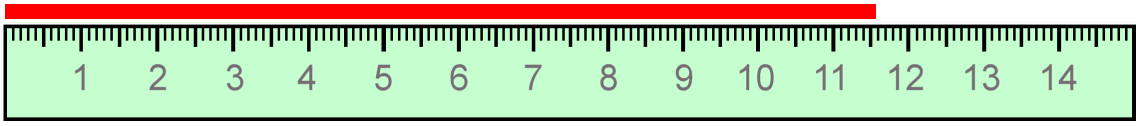
b. _____ cm _____ mm = _____ mm



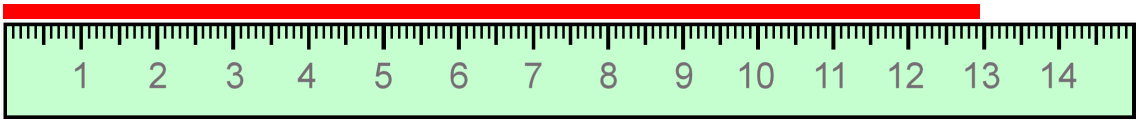
c. _____ cm _____ mm = _____ mm



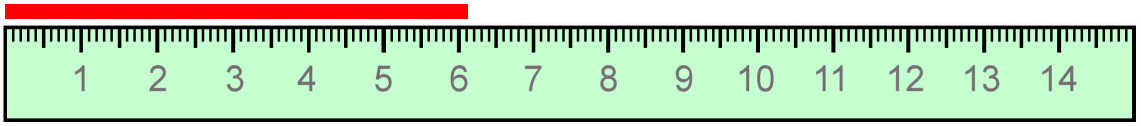
Sample worksheet from
www.mathmammoth.com



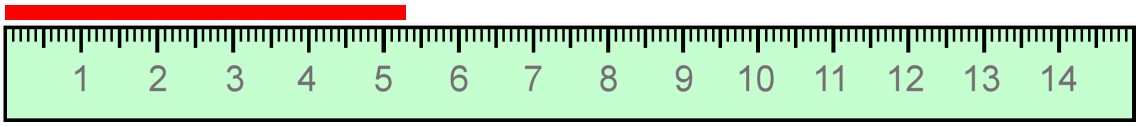
d. _____ cm _____ mm = _____ mm



e. _____ cm _____ mm = _____ mm



f. _____ cm _____ mm = _____ mm



g. _____ cm _____ mm = _____ mm

2. Draw lines using a ruler.

a. 7 cm 8 mm

b. 10 cm 5 mm

c. 14 mm

d. 55 mm

e. 126 mm

Sample worksheet from
www.mathmammoth.com

3. Measure items you can find at home, using a centimetre-millimetre ruler.
If the item is not exactly as long as the markers on the ruler, choose the nearest mark.

Item	Length

4. Change between centimetres and millimetres.

a.	b.	c.
1 cm = _____ mm	1 cm 1 mm = *11* mm	4 cm 5 mm = _____ mm
2 cm = _____ mm	1 cm 2 mm = _____ mm	2 cm 5 mm = _____ mm
5 cm = _____ mm	1 cm 8 mm = _____ mm	7 cm 8 mm = _____ mm
8 cm = _____ mm	2 cm 3 mm = _____ mm	10 cm 4 mm = _____ mm

5. Change between millimetres and centimetres.

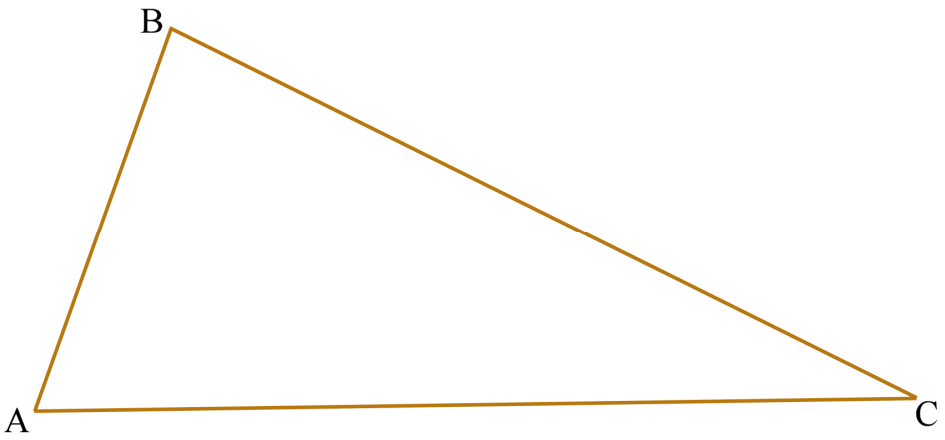
a.	b.	c.
70 mm = _____ cm	12 mm = ____ cm _____ mm	89 mm = ____ cm _____ mm
100 mm = _____ cm	45 mm = ____ cm _____ mm	102 mm = ____ cm _____ mm

6. Measure the sides of this triangle in millimetres.

Side AB _____ mm

Side BC _____ mm

Side CA _____ mm

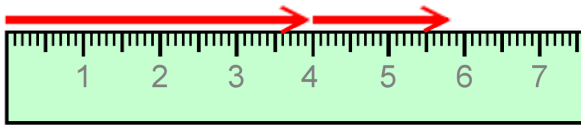


Sample worksheet from
www.mathmammoth.com

7. Find the perimeter of the triangle in the previous exercise.

8. Draw the third side of this triangle.
   Then measure its sides.
   Lastly, find its perimeter in millimetres.

The first arrow is 4 cm. The second arrow is 1 cm 8 mm. How long are they together? Add, giving your answer in millimetres.



4 cm + 1 cm 8 mm = 5 cm 8 mm = 58 mm

Add centimetres with centimetres, and millimetres with millimetres.
Remember that 10 millimetres makes 1 centimetre.

9 mm + 6 cm + 2 mm = 6 cm 11 mm = 7 cm 1 mm = 71 mm

If you have both millimetres and centimetres, change the centimetres to millimetres first:

84 mm + 3 cm + 9 mm = 84 mm + 30 mm + 9 mm = 123 mm (which is also 12 cm 3 mm)

9. Work out these "line additions." Give your answers in millimetres.

a. 1 cm 5 mm + 5 mm	**b.** 28 mm + 7 cm
c. 5 mm + 5 cm 8 mm	**d.** 2 cm 4 mm + 4 cm 5 mm
e. 52 mm + 2 cm 4 mm	**f.** 6 cm + 8 mm + 17 mm
g. 9 mm + 17 mm + 2 cm	**h.** 139 mm + 50 cm + 2 mm

This page left blank intentionally.

Sample worksheet from
www.mathmammoth.com

Chapter 9: Division
Introduction

The ninth chapter of *Math Mammoth Grade 3 South African Version* covers the concept of division, basic division facts that are based on the multiplication tables, and the concept of remainder. The aim is to lay a good foundation for the concept of division, cementing the link between multiplication and division.

The concept of division in itself is not difficult—after all, it is like backwards multiplication. The student needs to know the multiplication tables well as a prerequisite for this chapter. The student can start studying the lessons in this chapter even if he still needs some practice with the multiplication tables, but if he is a long way from mastering them, he should not study this chapter yet.

There are basically two ways to illustrate division with concrete objects. The first way is equal sharing: we divide or share items equally among people. For example, the problem 12 ÷ 3 would mean, "If you share 12 bananas equally among 3 people, how many bananas does each one get?"

The second way has to do with grouping. The problem 12 ÷ 3 would be, "If you have 12 items, how many groups of three items can you make?" These two interpretations of division are important to understand so that the student can solve real-life and mathematical problems involving division.

We also study division by zero. From studying that lesson, students should recognize that division by zero "does not work." I realize that in higher forms of mathematics, division by zero may be defined (such as 1 ÷ 0 = infinity). For now, this is the understanding that a third grader should get.

Lastly, students study the concept of remainder, or division that is not exact. We start by letting the students find the remainder using visual models (you could also use manipulatives). Then they learn how to find the remainder by calculating. This concept will be studied again in fourth grade.

The Lessons

	page	span
Division as Making Groups	107	*4 pages*
Division and Multiplication	111	*4 pages*
Division and Multiplication Facts	115	*3 pages*
Dividing Evenly into Groups	118	*4 pages*
Division Word Problems	122	*3 pages*
Zero in Division	125	*3 pages*
When Division Is Not Exact	128	*3 pages*
More Practice with the Remainder	131	*2 pages*
Mixed Revision, Chapters 1 - 9	133	*2 pages*
Revision, Chapter 9	135	*2 pages*

Sample worksheet from
www.mathmammoth.com

Helpful Resources on the Internet

Use these online resources as you see fit to supplement the main text.
Disclaimer: *These links were valid at the time of the writing of this book, and to the best of our knowledge we believe these websites to have what is described. However, we cannot guarantee that the links have not changed. Parental supervision is recommended.*

Rectangle Division
Practise division with remainders using a rectangle model.
http://nlvm.usu.edu/en/nav/frames_asid_193_g_2_t_1.html

Mr. Martini's Classroom: Multiplication and Division Inequalities
Compare expressions involving basic multiplication and division. The first number from the left (below the screen) lets you control the maximum number in the problems.
http://www.thegreatmartinicompany.com/inequalities/multiplicationdivinequality.html

Mystery Picture Game
Using division and addition.
http://www.dositey.com/2008/math/m/mystery2AD.htm

Fun 4 the Brain
Practise your basic facts with these simple games that appeal to students.
http://www.fun4thebrain.com/division.html

Math Magician Games
Flashcard problems in all four operations. Answer 20 questions in one minute.
http://www.oswego.org/ocsd-web/games/Mathmagician/cathymath.html

Cross the Swamp
Help Little Ron move from log to log across the swamp and practise multiplication/division or addition/subtraction.
http://www.bbc.co.uk/schools/starship/maths/crosstheswamp.shtml

Arithme-Tiles
Use the four operations and numbers on neighbouring tiles to make target numbers.
http://www.primarygames.com/math/arithmetiles/index.htm

Math Games at Sheppard Software
A bunch of different games to practise addition, subtraction, multiplication, and division facts: Fruit Shoot, Pop Up Math, Math MahJong, Matching games, Make 24, and many more. The site also has games for place value, coins, fractions, and other topics.
http://www.sheppardsoftware.com/math.htm

Arcademic Skill Builders
Website with fun, arcade-type games to practise the four basic operations. Both single- and multi-user games.
http://www.arcademicskillbuilders.com

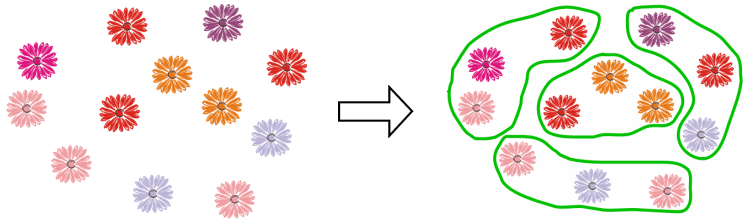
MathCar Racing
Keep ahead of the computer car by thinking logically, and practise any of the four operations at the same time.
http://www.funbrain.com/osa/index.html

Sample worksheet from
www.mathmammoth.com

Tux Math
A free software. This is a versatile arcade game for maths facts with many options. Includes all operations. You need to shoot falling comets that can damage penguins' igloos.
http://sourceforge.net/projects/tuxmath
Read also my review at http://homeschoolmath.blogspot.com/2011/05/tux-math.html

Division as Making Groups

There are 12 daisies. Make groups of 3.

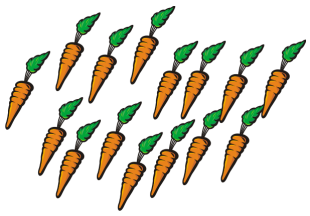


How many groups? *Four groups.*

How many 3's are there in 12? *Four.*

1. Divide into groups.

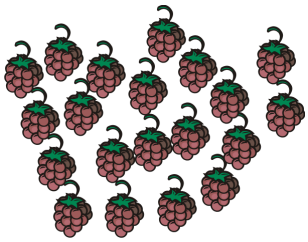
a. There are 15 carrots. Make groups of 5.



How many groups? _____

How many 5's are there in 15? _____

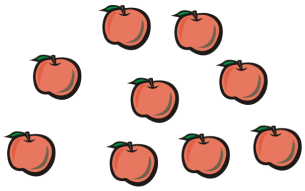
b. There are _____ berries. Make groups of 4.



How many groups? _____

How many 4's are there in _____? _____

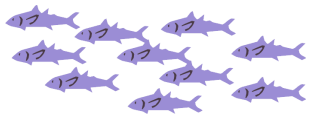
c. There are _____ apples. Make groups of 3.



How many groups? _____

How many 3's are there in _____? _____

d. There are _____ fish. Make groups of 2.



How many groups? _____

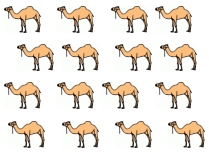
How many 2's are there in _____? _____

e. There are _____ daisies. Make groups of 6.

How many groups? _____

How many 6's are there in _____? _____

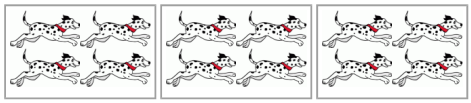
f. There are _____ camels. Make groups of 4.



How many groups? _____

How many 4's are there in _____? _____

Sample worksheet from
www.mathmammoth.com



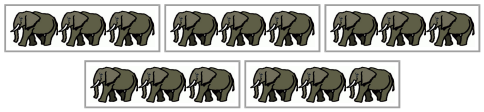
DIVIDE... 12 dogs into groups of **four**.

How many groups? *Three*

How many 4's in 12? _____

12 ÷ 4 = 3

"Twelve divided by four is three."



DIVIDE... 15 elephants into groups of **three**.

How many groups? _____

How many 3's in 15? _____

15 ÷ 3 = 5

"Fifteen divided by three is five."

18 ÷ 6 = ? *Think*: If you DIVIDE 18 into groups of six, how many groups are there? How many groups of six are there in 18? How many sixes are there in 18?

Since 6 + 6 + 6 = 18, there are THREE sixes in 18. So, 18 ÷ 6 = 3

2. Write a division sentence to fit the pictures in exercise 1.

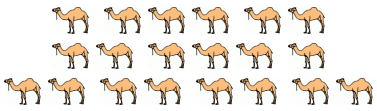
a. _____ ÷ _____ = _____	**b.** _____ ÷ _____ = _____	**c.** _____ ÷ _____ = _____
d. _____ ÷ _____ = _____	**e.** _____ ÷ _____ = _____	**f.** _____ ÷ _____ = _____

3. Make a division sentence.

a. Divide 10 rams into groups of two. How many groups?

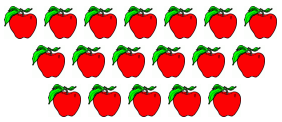
_____ ÷ _____ = _____

b. Divide _____ camels into groups of four. How many groups?



_____ ÷ _____ = _____

c. Divide _____ apples into groups of six. How many groups?

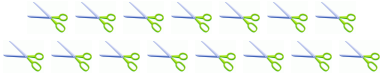


_____ ÷ _____ = _____

d. Divide _____ books into groups of three. How many groups?

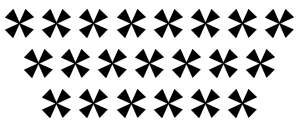
_____ ÷ _____ = _____

e. Divide _____ pairs of scissors into groups of five. How many groups?



_____ ÷ _____ = _____

f. Divide _____ crosses into groups of three. How many groups?



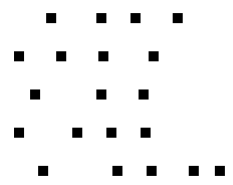
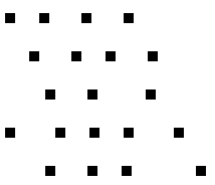
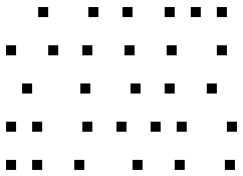
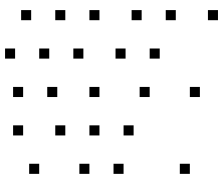
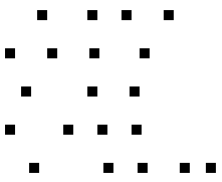
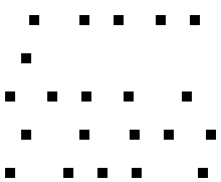
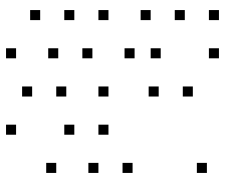
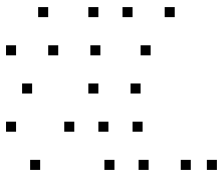
_____ ÷ _____ = _____

Sample worksheet from
www.mathmammoth.com

4. Draw sticks. Divide them into groups to fit the division sentence.

a. 18 ÷ 3 = _____	**b.** 24 ÷ 2 = _____
c. 21 ÷ 3 = _____	**d.** 25 ÷ 5 = _____
e. 15 ÷ 5 = _____	**f.** 24 ÷ 8 = _____

5. Make groups by circling dots and write a division sentence.

a. Make groups of 4  _____ ÷ 4 = _____	**b.** Make groups of 2  _____ ÷ 2 = _____	**c.** Make groups of 6  _____ ÷ 6 = _____	**d.** Make groups of 3  _____ ÷ 3 = _____
e. Make groups of 5  _____ ÷ 5 = _____	**f.** Make groups of 7  _____ ÷ 7 = _____	**g.** Make groups of 6  _____ ÷ 6 = _____	**h.** Make groups of 10  _____ ÷ 10 = _____

Sample worksheet from
www.mathmammoth.com

6. Solve the word problems. Write a division or a multiplication for each problem.

The box ☐ is for the × or ÷ symbol.

a. The class has 20 children. Each minibus will hold five children. How many minibuses are needed for the class? _____ ☐ _____ = _____	**b.** Kgotso placed 30 marbles in rows of 5. How many rows did he get? _____ ☐ _____ = _____
c. Erika packed hairpins in bags. She put 20 pins in each bag and filled four bags. How many pins were there? _____ ☐ _____ = _____	**d.** Karen packed 28 T-shirts in bags. She put four shirts in each bag. How many bags did she use? _____ ☐ _____ = _____
e. Bonga has 16 poster boards. He needs four of them to make a big poster. How many big ones can he make? _____ ☐ _____ = _____	**f.** Moipone studied three hours each day for seven days. How many hours did she spend studying in total? _____ ☐ _____ = _____

7. Solve. You can draw to help. Can you find a pattern?

a.	**b.**	**c.**
4 ÷ 2 = _____	20 ÷ 10 = _____	10 ÷ 5 = _____
6 ÷ 2 = _____	30 ÷ 10 = _____	15 ÷ 5 = _____
8 ÷ 2 = _____	40 ÷ 10 = _____	20 ÷ 5 = _____
10 ÷ 2 = _____	50 ÷ 10 = _____	25 ÷ 5 = _____
12 ÷ 2 = _____	_____ ÷ 10 = _____	_____ ÷ 5 = _____
14 ÷ 2 = _____	_____ ÷ 10 = _____	_____ ÷ 5 = _____
16 ÷ 2 = _____	_____ ÷ 10 = _____	_____ ÷ 5 = _____
_____ ÷ 2 = _____	_____ ÷ 10 = _____	_____ ÷ 5 = _____
_____ ÷ 2 = _____	_____ ÷ 10 = _____	_____ ÷ 5 = _____

Sample worksheet from
www.mathmammoth.com

This page left blank intentionally.

Sample worksheet from
www.mathmammoth.com

Chapter 10: Fractions
Introduction

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

First, the child learns to identify fractions in visual models, and to draw "pie models" for some common fractions. You can also use manipulatives or the fraction cut-outs provided. In the download 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 not introducing the various rules for calculations 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 introduced on this level.

Next, we study equivalent fractions. Students recognise 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	142	*4 pages*
Fractions on a Number Line	144	*4 pages*
Mixed Numbers	148	*4 pages*
Equivalent Fractions	152	*3 pages*
Comparing Fractions 1	155	*3 pages*
Comparing Fractions 2	158	*2 pages*
Mixed Revision, Chapters 1 - 10	160	*2 pages*
Fractions Revision	162	*3 pages*

Sample worksheet from
www.mathmammoth.com

Helpful Resources on the Internet

Use these online resources as you see fit to supplement the main text.
Disclaimer: *These links were valid at the time of the writing of this book, and to the best of our knowledge we believe these websites to have what is described. However, we cannot guarantee that the links have not changed. Parental supervision is needed.*

Conceptua Fractions: Identify Fractions
A visual tool that shows fractions or mixed numbers using a pie, a bar, dots, and a number line.
http://www.conceptuamath.com/fractions.html#IdentifyingFractions

Visualizing Fractions
This tool shows you a fraction, and you divide the pie and colour the pieces.
http://nlvm.usu.edu/en/nav/frames_asid_103_g_2_t_1.html

Pattern Blocks - Parts as Wholes
Click on the "Activities" in the top menu, and click on arrows until you find the "Parts as Wholes" activity.
http://nlvm.usu.edu/en/nav/frames_asid_170_g_2_t_3.html

Fraction Model
Adjust the the numerator and the denominator, and the applet shows the fraction as a pie/rectangle/set model, as a decimal, and as a percent.
http://illuminations.nctm.org/ActivityDetail.aspx?ID=44

Clara Fraction's Ice Cream Shop
Convert improper fractions into mixed numbers and scoop the right amount of ice cream flavours onto the cone.
http://www.mrnussbaum.com/icecream/index.html

Equivalent Fractions from National Library of Virtual Manipulatives (NLVM)
See the equivalency of two fractions as the applet divides the whole into more pieces.
http://nlvm.usu.edu/en/nav/frames_asid_105_g_2_t_1.html

Equivalent Fractions
Construct two other, equivalent fractions to the given fraction using a circle or a square. Use the sliders to divide your shape into a certain amount of parts, then click on the parts to colour in some of them. Click the check mark to check if you got the equivalent fractions right. The fractions are also shown on the number line.
http://illuminations.nctm.org/ActivityDetail.aspx?ID=80

Conceptua Math: Equivalent Fractions
A visual tool to illustrate the equivalency of fractions. You can use pie, rectangular, or number line model. Divide each shape into parts using the sliders. Click on parts to colour in or remove the colour from them. Use two or three fractions. Free registration required.
http://www.conceptuamath.com/fractions/equivalent-fractions.html

Conceptua Math: Order Fractions on a Number Line
First create fractions using the button on the top right, then lock them. Use the "dot" button to see them placed on the number line. Then you can use the buttons on the left to see the fractions represented in different ways. Lastly, drag the fractions under the number line dots, and press the check mark.
http://www.conceptuamath.com/fractions/ordering-fractions-number-line.html

Sample worksheet from
www.mathmammoth.com

Fraction Games at Sheppard Software
Many games for fraction maths. For this level, use the first four games: simple fractions matching, mixed fractions matching, equivalent fractions matching, and comparing fractions balloon pop.
http://www.sheppardsoftware.com/math.htm#fractions

Visual Fractions
Great site for studying all aspects of fractions: identifying, renaming, comparing, addition, subtraction, multiplication, division. Each topic is illustrated by either a number line or a circle with a Java applet. Also a couple of games, for example: make cookies for Grampy.
http://www.visualfractions.com/

Who Wants pizza?
Explains the concept of a fraction, teaches addition and multiplication with a pizza example, then has some interactive exercises.
http://math.rice.edu/~lanius/fractions/index.html

Fractioncity
Make "fraction streets" and help students with comparing fractions, equivalent fractions, addition of fractions of like and unlike denominators while they drive toy cars on the streets. This is not an online activity but has instructions of how to do it at home or at school.
http://www.teachnet.com/lesson/math/fractioncity.html

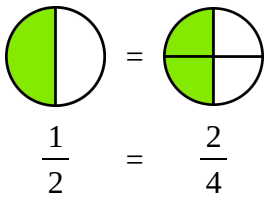
This page left blank intentionally.

Sample worksheet from
www.mathmammoth.com

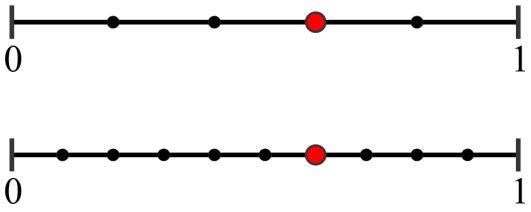
Equivalent Fractions

If you eat half of a pizza, or 2/4 of a pizza, you have eaten the same amount. The two fractions are ***equivalent***.

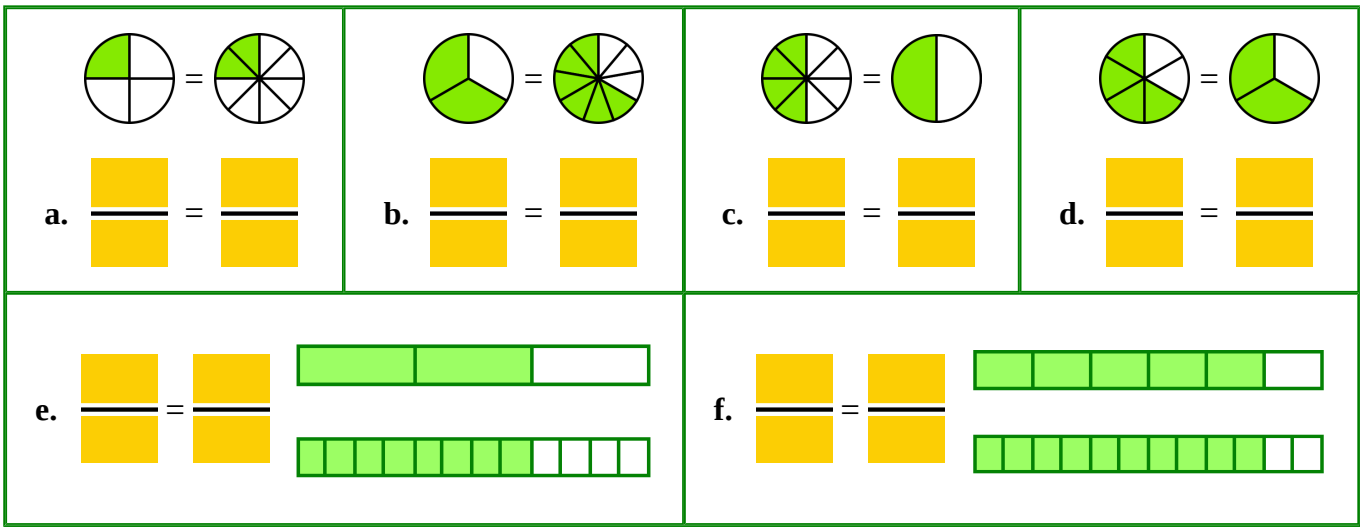
We write an equal sign between them: $\frac{1}{2} = \frac{2}{4}$.



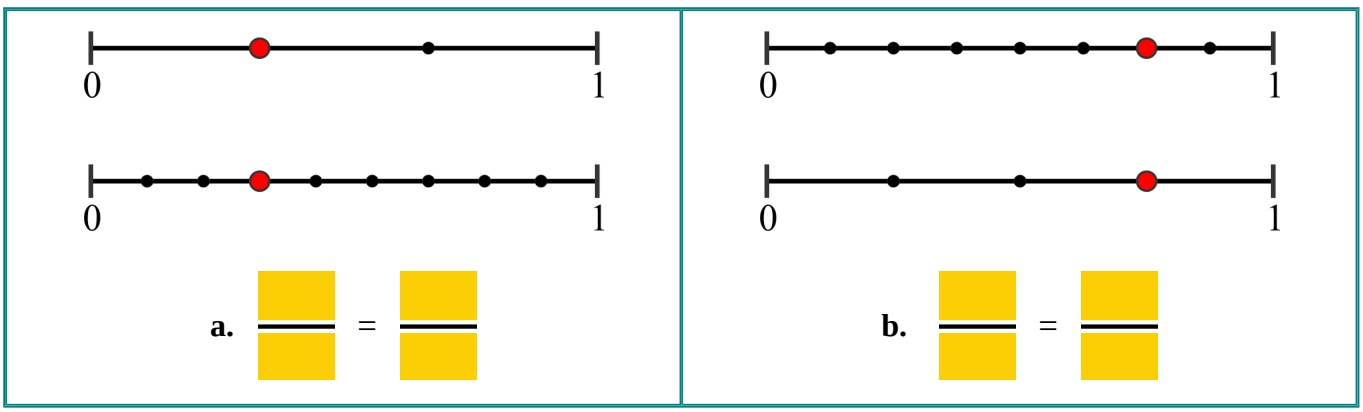
The dot for $\frac{3}{5}$ is in the same place on the number line as the dot for $\frac{6}{10}$. Again, the two fractions are *equivalent*. We can write $\frac{3}{5} = \frac{6}{10}$.



1. Write the equivalent fractions.

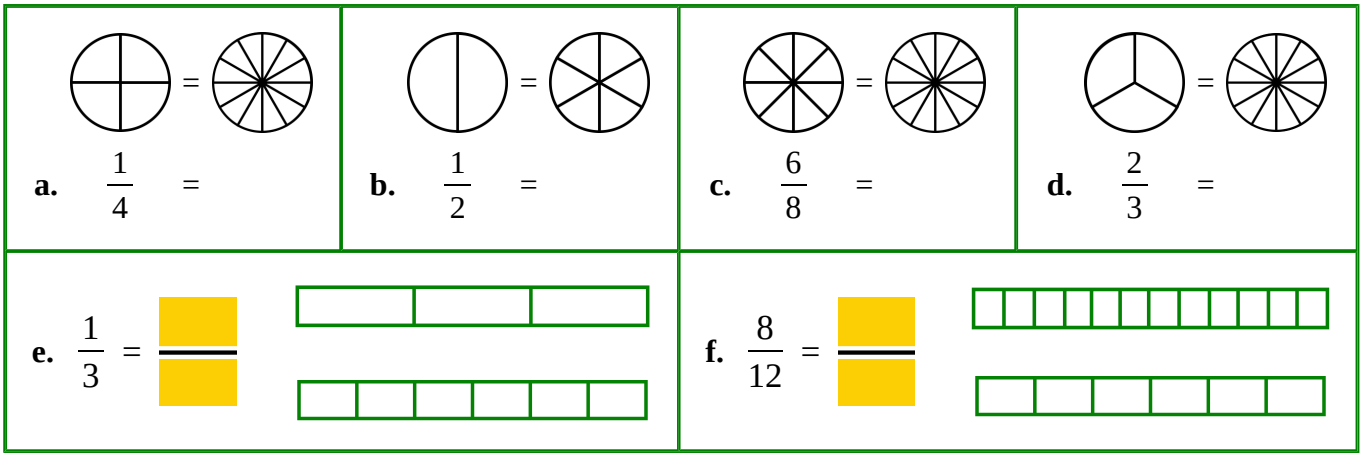


2. Write the equivalent fractions.

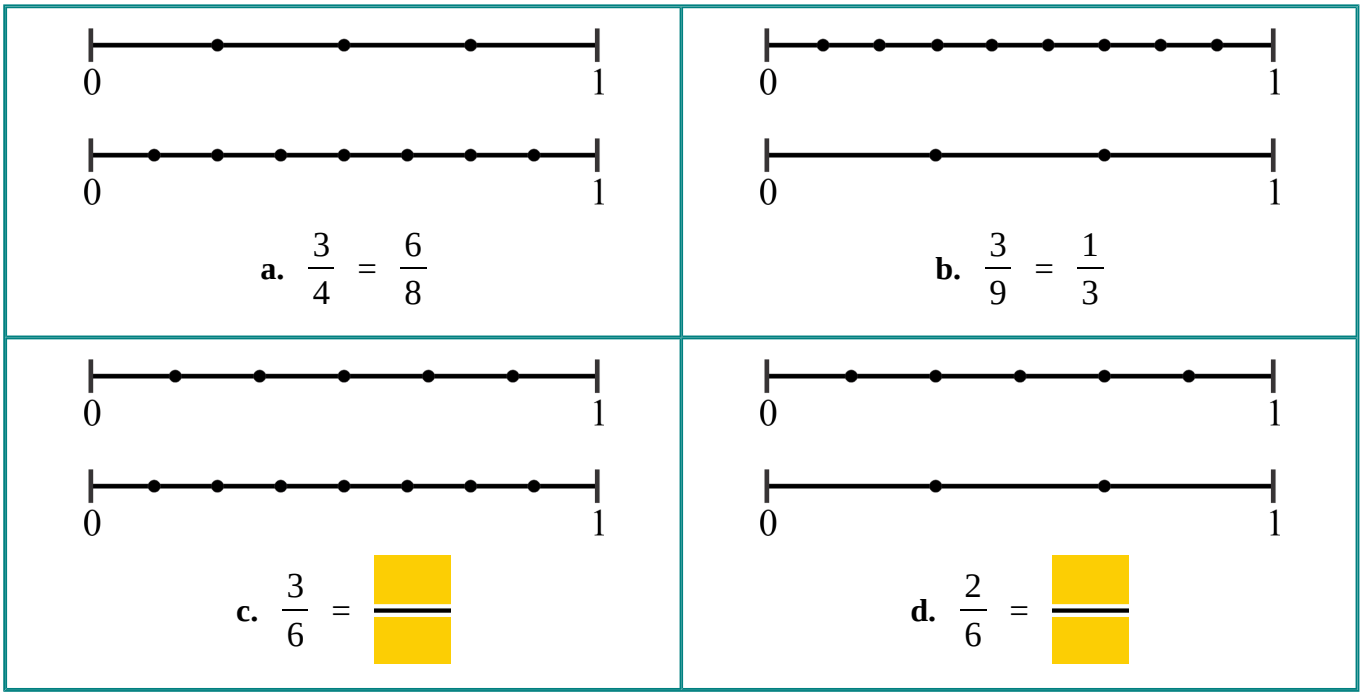


Sample worksheet from
www.mathmammoth.com

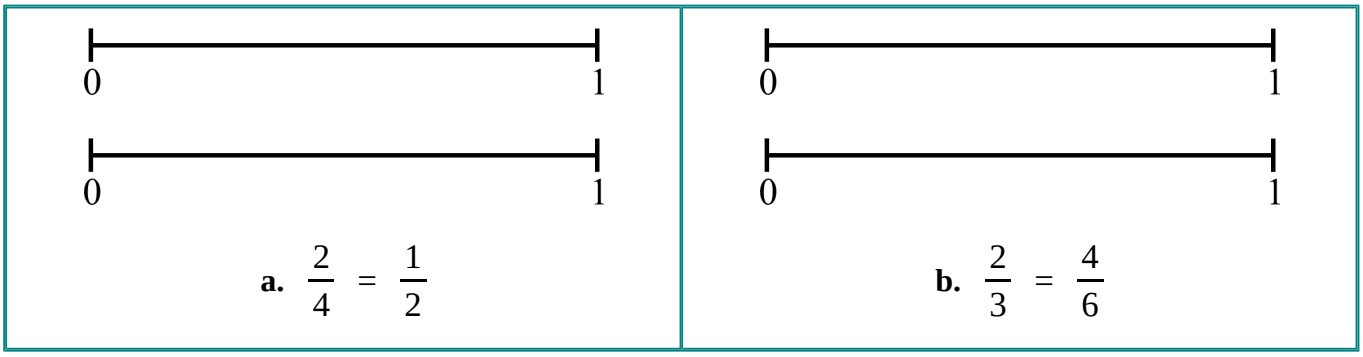
3. Shade the parts for the first fraction. Shade the same *amount* in the second picture. Write the second fraction.



4. Mark the equivalent fractions on the number lines.

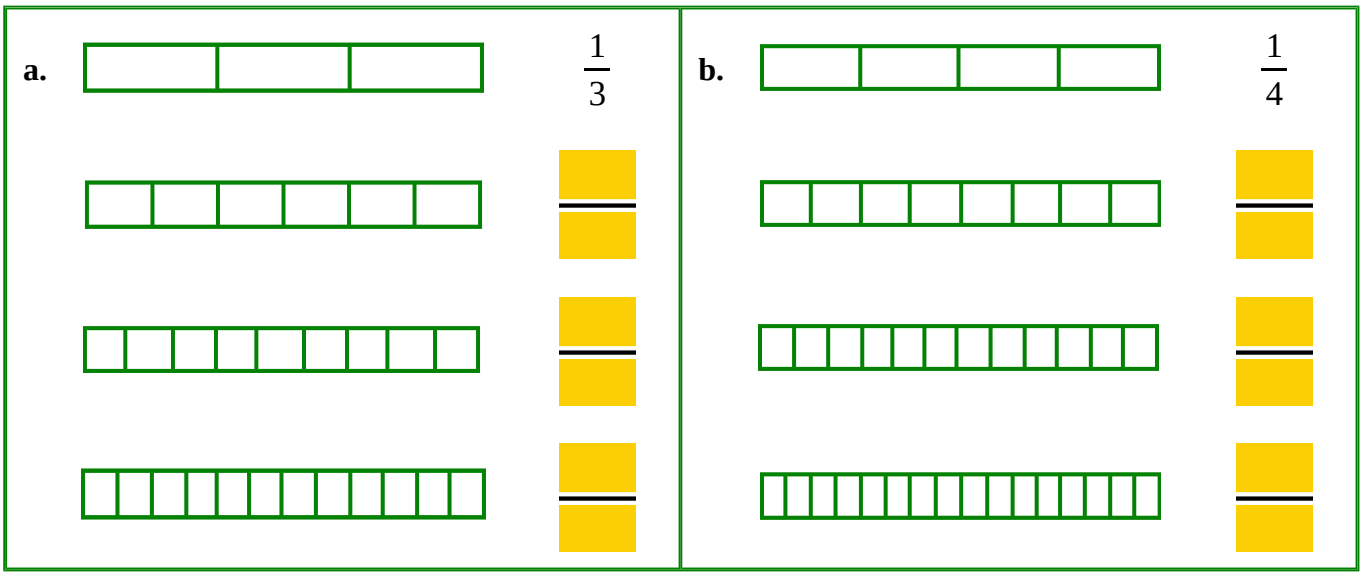


5. Mark the equivalent fractions on the number lines. This time, you need to first divide each number line into equal parts.



Sample worksheet from
www.mathmammoth.com

6. Colour in and write many fractions that are equivalent to the first fraction.



7. Four children have a chocolate bar to share. Lerato says, "Let's divide it into four equal pieces, and everybody gets one piece." Ansie says, "No, let's divide it into twelve equal pieces and everybody gets three pieces."

Whose idea lets everybody get a fair share?

8. Draw a picture to show that 1/2 = 4/8.

9. **a.** Half of the pie is left. Show in the picture how three persons can share it equally.

b. What two equivalent fractions can you write from your "cutting"?

10. Are 5/5 and 4/4 equivalent fractions?
Why or why not?

Puzzle Corner

Which is longer, a line that is 3 1/2 centimetres long or a line that is 3 1/4 centimetres long? How much longer is it?