# MATH MAMMOTH
# Grade 2-A
## Complete Worktext

- Halves, fourths, and other parts
- Clock
- Addition and subtraction facts
- Carrying
- Borrowing
- Coins

By Maria Miller

www.MathMammoth.com

Please visit **www.MathMammoth.com** for more information about Maria Miller's math books.

**Create free math worksheets at www.HomeschoolMath.net/worksheets/**

**Sample worksheet from**
**www.mathmammoth.com**

# Contents

## Chapter 4: Adding and Subtracting with Two-Digit Numbers

## Chapter 5: Counting Money

# Foreword

The Math Mammoth Grade 2-A and Grade 2-B worktexts comprise a complete math curriculum for the second grade mathematics studies.

The main topics during second grade, as in first grade, are the study of addition and subtraction and place value up to 1000.

In the second grade, children learn to add and subtract two and three-digit numbers mentally and in columns (under each other). They learn to carry to tens and to hundreds (also called regrouping), and how to borrow either from the tens or from the hundreds. The topics of borrowing two times and borrowing over zero tens are in this curriculum left for the third grade.

Mental math is very important, as it builds number sense and solidifies the understanding of place value. Children learn by heart the common addition and subtraction facts, and understand how to use them when adding two-digit numbers. They practice many kinds of mental math with three-digit numbers as well (in the 2B book).

Other topics studied are reading the clock to the five-minute intervals; measuring length, weight, and volume; shapes and a few simple geometry concepts; and money topics. These topics are important as well, since they are everyday applications of mathematics.

When you use these books as your only or main mathematics curriculum, they can be like a "framework", but you still have liberty in planning your child's studies. While addition, subtraction, and place value topics are best studied in the order they are presented, you can choose to study clock, coins, and geometry topics in a different order. This does not totally apply to the chapter on measuring, as it uses 3-digit numbers.

Changing the topic might even be advisable if your child is "stuck" on some concept. Sometimes the brain mulls it over in the background, and the concept they were stuck on becomes clear after a break.

This curriculum aims to concentrate on a few major topics at a time and study them in depth. This is totally opposite to the continually spiraling 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 review problems from past topics.

This does not mean that your child wouldn't need an occasional review. 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 review 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 review, I have included an html page called *Make_extra_worksheets_grade2.htm* that you can use to make additional worksheets for computation or for number charts. You can also always simply reprint some pages that were already studied .

I wish you success in your math teaching!

Maria Miller, the author

# Chapter 1: Getting Started
## Introduction

The first chapter of the *Math Mammoth Grade 2-A Complete Worktext* has addition and subtraction review from the first grade, plus a few new topics that should be easy. The chapter starts out with review. Ordinal numbers are probably familiar from common language. The lesson *Fact Families* practices addition/subtraction connection, and introduces missing subtrahend problems such as $\_\_ - 5 = 4$ where the total is missing. This is an early prelude to algebraic thinking.

The last two lessons introduce some easy parts, such as one-half, one-fourth, two-fourths and three-fourths. These lessons also practice finding half of a number or a fourth of a number. This is done for a good reason: First of all, the idea of finding part of a number is of paramount importance throughout elementary mathematics. Second, it prevents the fixation that half is "half of a pie" or that one-fourth is "one-fourth of a pie", when halves and fourths apply to all kinds of "totals". Third, the child will soon encounter the idea of a quarter of an hour when studying the clock, which is just one-fourth of an hour.

## The Lessons in Chapter 1

## Helpful Resources on the Internet

*Use these free online resources to supplement the "bookwork" as you see fit.*

**Number Cracker**
Help Mr. Cracker obtain the secret code before the insidious Prof. Soup catches him by guessing what number comes next in a series of numbers.
http://www.funbrain.com/cracker/index.html

**Squigly**
Squigly is hiding in one of the apples. Click on the ordinal number that tells the order of Squigly's apple.
http://www.primarygames.com/squigly/start.htm

**MathBlox**
Click on two falling blocks that add up to the given number and they disappear. With various levels and number ranges.
http://www.primarygames.com/com/L3?Area=Mathblox

**Number Jump**
Move the ball along the number line to smash the flies.
http://www.carstensstudios.com/mathdoodles/numberjump.htm

**Connect Sums**
Click on the neighboring die-faces/numbers/coins so that the points add up to the given target sum.
http://www.carstensstudios.com/mathdoodles/connectsums.html
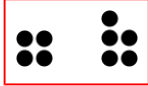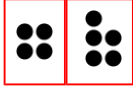
**Sum Stacker**
Drag dies from stack to stack until the sums of each stack equal the sums given.
http://www.carstensstudios.com/mathdoodles/sumsstacker.html

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# Fact Families

When you have two addition and two subtraction facts that use the same numbers, it is called a "*fact family*".

Sometimes in a subtraction problem, the *total* is asked:

$\boxed{\phantom{0}} - 8 = 20$

You know 20 and 8 are the "parts", and the total is missing. To find the total, just add the "parts":

$20 + 8 = \underline{\ 28\ }$

$4 + 5 = \boxed{9}$

$5 + 4 = \boxed{9}$

$\boxed{9} - 5 = 4$

$\boxed{9} - 4 = 5$

Notice the TOTAL. The subtraction sentences *start* with the total.

$\boxed{4} + \boxed{5} = 9$

$\boxed{5} + \boxed{4} = 9$

$9 - \boxed{5} = \boxed{4}$

$9 - \boxed{4} = \boxed{5}$

Notice the PARTS. The two parts make up the total.

1. Write two addition and two subtraction sentences - a fact family!

**a.**

____ + ____ = ____

____ + ____ = ____

____ − ____ = ____

____ − ____ = ____

**b.**

____ + ____ = ____

____ + ____ = ____

____ − ____ = ____

____ − ____ = ____

**c.**

____ + ____ = ____

____ + ____ = ____

____ − ____ = ____

____ − ____ = ____

2. Fill in the missing numbers. The four problems form a fact family.

**a.**

$2 + \boxed{\phantom{0}} = 8$

$\boxed{\phantom{0}} + 2 = 8$

$8 - 2 = \boxed{\phantom{0}}$

$8 - \boxed{\phantom{0}} = 2$

**b.**

____ + ____ = 10

____ + ____ = 10

$10 - 7 = \boxed{\phantom{0}}$

$10 - \boxed{\phantom{0}} = 7$

**c.**

____ + ____ = ____

____ + ____ = ____

$9 - \boxed{\phantom{0}} = 6$

____ − ____ = ____

3. Write a matching addition sentence for the subtraction sentence. There are two possibilities.

| a. _____ + _____ = _____ | b. _____ + _____ = _____ | c. _____ + _____ = _____ |
|---|---|---|
| 8 − 2 = 6 | 20 − 7 = 13 | 60 − 20 = 40 |

When the first number is missing in a subtraction, it is the TOTAL that is missing.

You can find the TOTAL by adding the two numbers (those are the "parts").

$\square$ − 6 = 2

The total is missing. 6 and 2 are the "parts". So we add them. 2 + 6 = 8. The missing number is 8!

It's like "adding backwards":

Add.
+
**8** − 6 = 2

Add.
+
**23** − 3 = 20

4. The total is missing from the subtraction sentence. Solve.

| a. $\square$ − 5 = 4 | b. $\square$ − 7 = 2 | c. $\square$ − 7 = 10 |
|---|---|---|

5. Find the missing numbers.

| a. $\square$ − 2 = 4 | b. $\square$ − 7 = 80 | c. 9 − $\square$ = 5 |
|---|---|---|
| $\square$ − 50 = 50 | 60 + 4 = $\square$ | 77 + $\square$ = 78 |
| $\square$ − 8 = 20 | 16 + $\square$ = 20 | $\square$ − 9 = 60 |

**Puzzle Corner**    Find the missing numbers. This time adding backwards will NOT work!

a. 50 − $\square$ = 10    b. 100 − $\square$ = 91    c. 10 − $\square$ − 2 = 1

33 − $\square$ = 31    76 − $\square$ = 72    9 − $\square$ − 5 = 2

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# Chapter 2: Clock
## Introduction

The second chapter of the *Math Mammoth Grade 2-A Complete Worktext* deals with reading the clock to the five-minute intervals, and finding simple time intervals.

It is helpful to have a practice clock, such as an alarm clock, where the child can turn the clock hands.

First we practice telling time in the *hours:minutes* form (such as 10:20), and then using the colloquial phrases "ten after", "quarter till", and so on.

Also studied are simple time intervals, or how much time passes. When practicing these, tell the child to imagine moving the minute (or hour) hand on a clock. He/she can initially use a practice clock for this.

The section also has one lesson about the calendar. Of course the calendar and the months are best learned just in the context of everyday life, as the months pass. Hang a wall calendar on the wall and instruct your child to look at it every day, and to cross out days as they pass.

## The Lessons in Chapter 2

## Helpful Resources on the Internet

*Use these free online resources to supplement the "bookwork" as you see fit.*

**Analog and Digital Clocks**
These clocks show you the current time, side by side. Useful for illustration.
http://nlvm.usu.edu/en/nav/frames_asid_316_g_2_t_4.html

**What Time Will it Be?**
Move the hands on the clock to show what time it will be after a certain amount of minutes.
http://nlvm.usu.edu/en/nav/frames_asid_318_g_2_t_4.html

**Match Clocks**
Make the digital clock to show the time given with the analog clock.
http://nlvm.usu.edu/en/nav/frames_asid_317_g_2_t_4.html

**Time Flies**
Practice telling time with two types of watches. In the second part, practice what you have learned by selecting the digital time that matches the time displayed.
http://www.alfy.com/Games/playgame.aspx?gameID=354&gameName=Time+Flies

**Flashcard Clock**
Read the analog and type in the time in digital form. Very clear clock and good fast response!
http://www.teachingtreasures.com.au/maths/FlashcardClock/flashcard_clock.htm

**Telling Time Practice**
Interactive online practice: you drag the hands of the clock to show the correct time.
http://www.worsleyschool.net/socialarts/telling/time.html

**Teaching Time**
Analogue/digital clock games and worksheets. Also an interactive "class clock" to demonstrate time.
http://www.teachingtime.co.uk/

**Time-for-time**
Resource site to learn about time: worksheets, games, quizzes, time zones.
http://www.time-for-time.com/default.htm

**A Matter of Time**
Lesson plans for telling time, interactive activities, and some materials to print.
http://www.fi.edu/time/Journey/JustInTime/contents.html

**Elapsed Time Line**
This interactive tool shows 2 clocks that have draggable fingers to set a "from" and "to" time, and a number line. You can demonstrate how to use a number line to calculate elapsed time.
www.teacherled.com/2008/10/05/elapsed-time-line/

**Clockwise**
Plug in a time, and the clock runs till it, or clock runs to a time and you type it in.
http://www.shodor.org/interactivate/activities/clock2/index.html

**Clock** (evaluation version words across the screen)
Use the buttons to advance the clock in 5, 10, 15, 30 minute increments or drag the hands.  Shows digital time also. For illustrations only, does not have any quiz or questions.
http://www.interactive-resources.co.uk/mathspack1/clock/clock.html

**The Right Time**
A couple of interactive exercises about reading the clock.
http://www.pitara.com/activities/math/time/time.asp?QNum=3

**What Time Is It?**
Look at the analog clock and pick the digital clock that shows the same time.
http://www.primarygames.com/time/start.htm

**That Quiz: Time**
Online quizzes for all time-related topics: reading the clock, time passed, adding/subtracting with time, conversion of time units, and time zones practice. The quizzes have many levels, can be timed or not, and include lots of options for customization. Easy to use and set up.
www.thatquiz.org/tq-g/math/time

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# The Minutes

When the hour hand moves from one number to the next (from 1 to 2, or from 6 to 7, etc.), it takes one hour to do that.

In that same one hour of time, the *minute hand* travels **from 0 to 60 minutes**. So one hour is 60 minutes. A half-hour is 30 minutes.

When you read the minute hand, you use the green numbers (marked outside the clock face of the clock on the right). They go by fives, and are not normally marked on clocks. You need to know them. Just skip-count by fives!
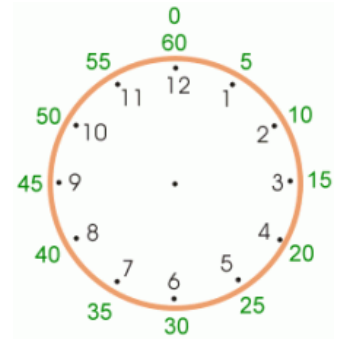
1 hour = 60 minutes.
1/2 hour = 30 minutes.

The hour hand is past 8.
The minute hand is at 15.
The time is 8:15.

The hour hand is past 2.
The minute hand is at 25.
The time is 2:25.

The hour hand is past 11.
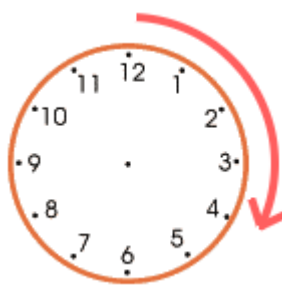The minute hand is at 10.
The time is 11:10.

1. The arrow shows how much the minute hand travels. How many minutes of time passes?
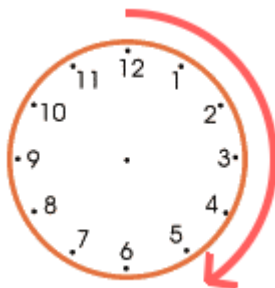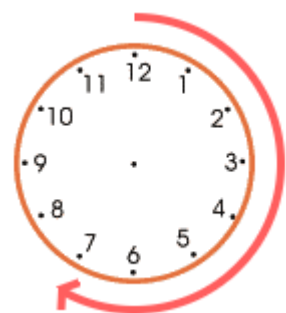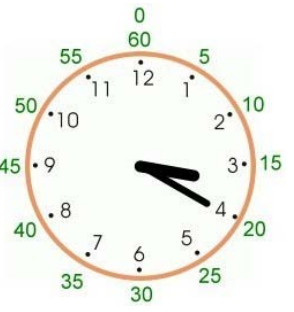
**a.** _____ minutes

**b.** _____ minutes
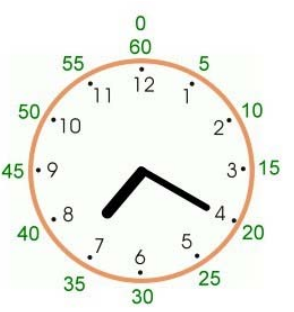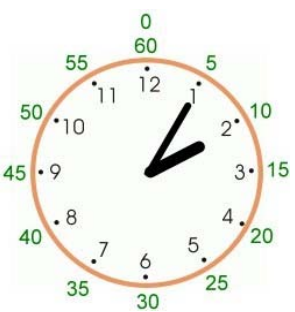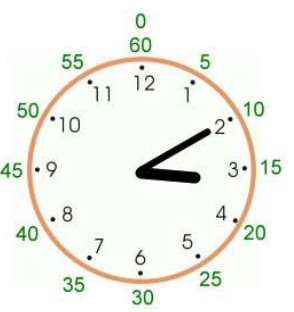
**c.** _____ minutes

**d.** _____ minutes

2. Write the time using the special clock that shows the numbers for hours and for minutes.

a. _____ : _____    b. _____ : _____    c. _____ : _____    d. _____ : _____

e. _____ : _____    f. _____ : _____    g. _____ : _____    h. _____ : _____

3. Write the time using the normal clock. Remember, the numbers for the minute hand are not shown, and they go by fives!

a. _____ : _____    b. _____ : _____    c. _____ : _____    d. _____ : _____

e. _____ : _____    f. _____ : _____    g. _____ : _____    h. _____ : _____

**Sample worksheet from**
**www.mathmammoth.com**

27

4. Find the clock that shows 11:25 and the clock that shows 11:05.

**a.**

**b.**

**c.**

**d.**

5. Write the time.

**a.** _____ : _____

**b.** _____ : _____

**c.** _____ : _____

**d.** _____ : _____
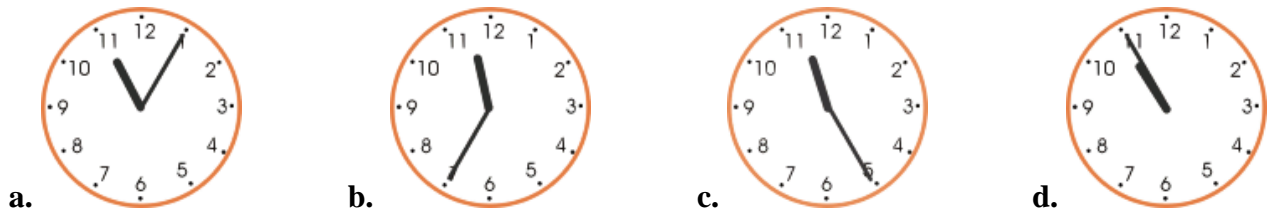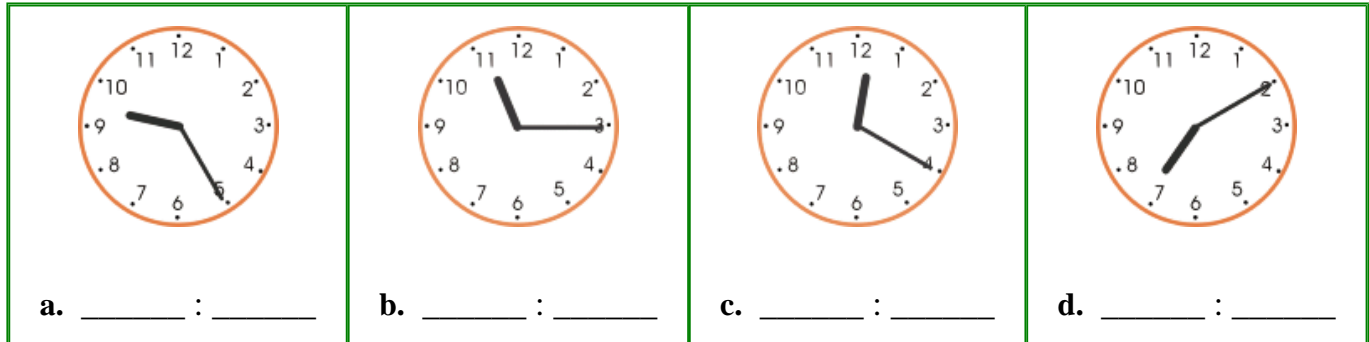
6. Write the time that the clock shows, and the time 5 minutes later. Imagine the minute hand moving one "step" further. You can use your practice clock.

| | **a.** | **b.** | **c.** | **d.** |
|---|---|---|---|---|
| | \_\_\_\_ : \_\_\_\_ | \_\_\_\_ : \_\_\_\_ | \_\_\_\_ : \_\_\_\_ | \_\_\_\_ : \_\_\_\_ |
| 5 min. later → | \_\_\_\_ : \_\_\_\_ | \_\_\_\_ : \_\_\_\_ | \_\_\_\_ : \_\_\_\_ | \_\_\_\_ : \_\_\_\_ |
| | **e.** | **f.** | **g.** | **h.** |
| | \_\_\_\_ : \_\_\_\_ | \_\_\_\_ : \_\_\_\_ | \_\_\_\_ : \_\_\_\_ | \_\_\_\_ : \_\_\_\_ |
| 5 min. later → | \_\_\_\_ : \_\_\_\_ | \_\_\_\_ : \_\_\_\_ | \_\_\_\_ : \_\_\_\_ | \_\_\_\_ : \_\_\_\_ |
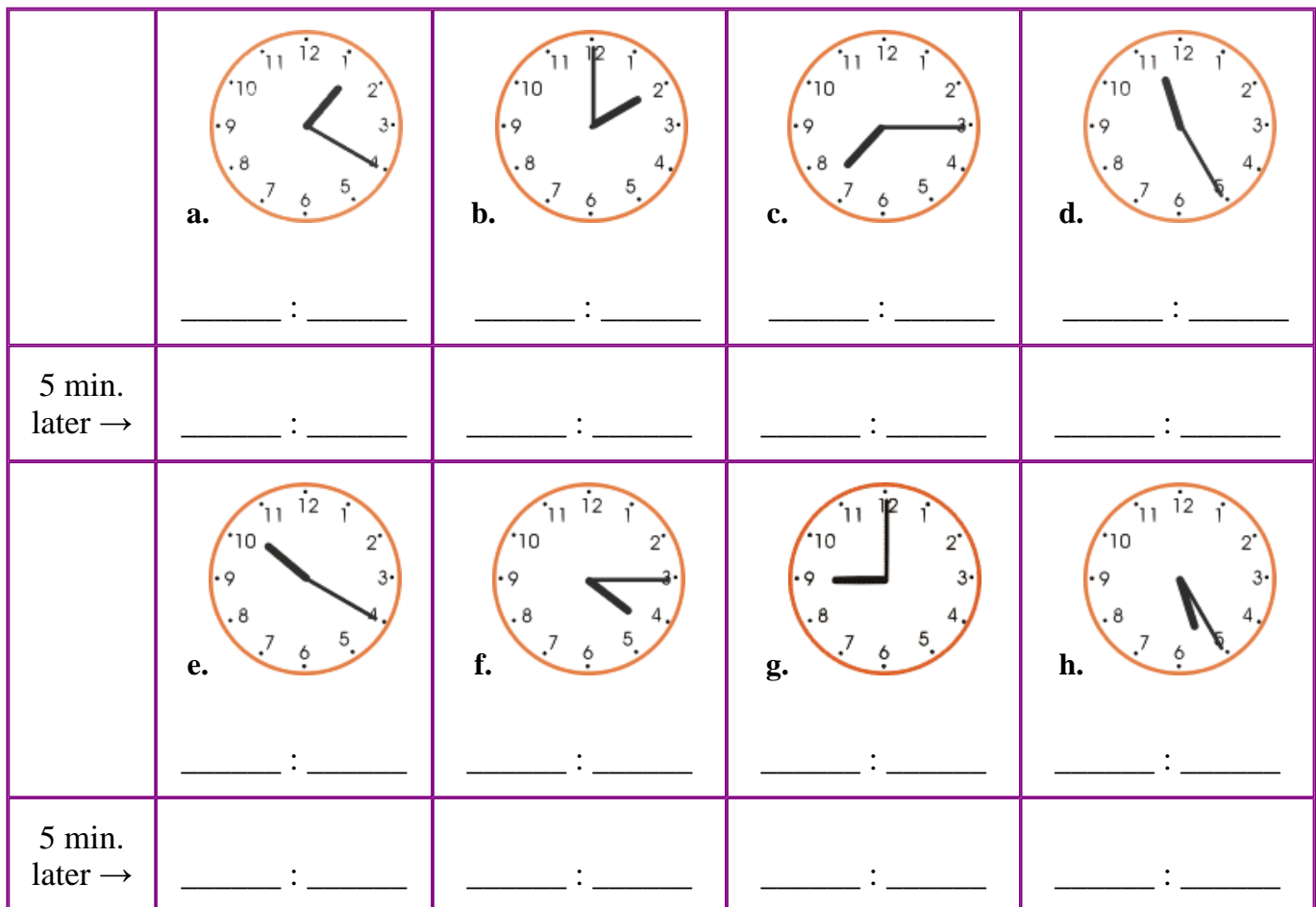
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# Chapter 3: Addition and Subtraction Facts Within 0-18
## Introduction

The third chapter of the *Math Mammoth Grade 2-A Complete Worktext* provides lots of practice for learning and memorizing the basic addition facts of single-digit numbers where the answer is between 10 and 18, and learning to use them with subtraction.

## Completing the ten - concept

This concept is important to learn. The child learns what number is needed to complete the next whole ten. For example, what number do you add to 23 to get 30, or 23 + __ = 30. The next step is to study what happens when the sum goes over the next ten.

In the lesson "Going Over Ten", the child learns to add 8 + 5 by first adding 8 + 2 (which completes the ten) and then the "leftover" 3. These prepare the child for addition facts where the sum is more than 10.

## Memorizing the facts

The National Council of Teachers of Mathematics (NCTM) recommends in their Grade 2 Curriculum Focal Points that children "...*develop quick recall of basic addition facts and related subtraction facts*".

Mathematics builds upon previously learned concepts and facts. Learning addition and subtraction facts is essential for later study. For example, the child will soon study double-digit addition and subtraction, and needs to be able to add and subtract small numbers efficiently.

The next lessons in the book provide lots of practice for learning and memorizing the addition facts. There are 20 such facts:

9 + 2 till 9 + 9:  8 facts
8 + 3 till 8 + 8:  6 facts
7 + 4 till 7 + 7:  4 facts
6 + 5 till 6 + 6:  2 facts

After those lessons, we reverse the process and practice subtracting. First, the child subtracts TO ten with problems such as 16 − __ = 10. Then come subtraction problems which "cross" the ten the other direction, such as 16 − 7. Again the student first practices these by subtracting in two parts: First subtracting to ten, then the rest. For example, 16 − 7 becomes 16 − 6 − 1.

The various lessons about **the fact families** give lots of practice and further reinforce memorizing the facts. These lessons also include many word problems. You can choose to skip some of these lessons or problems, or use them later for review. They do not contain any new concepts.

Alongside this book, you can also use math games or flashcards to reinforce the addition and subtraction facts. You can find a list of some free online games at
**www.homeschoolmath.net/addition_subtraction.php**
**http://www.homeschoolmath.net/online/math_facts.php**

# The Lessons in Chapter 3

# Helpful Resources on the Internet

*Use these free online resources to supplement the "bookwork" as you see fit.*

**Math Games at Sheppard Software**
A bunch of different games to practice 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.
www.sheppardsoftware.com/math.htm

**ArithmeTick**
Solve math problems against the clock! Four difficulty levels, can tick or untick all four operations.
www.pompuzzle.com/ArithmeTick

**Space Jumps**
Adding two single-digit numbers, first jump to ten, then the rest to the spaceship. Practices addition that goes over ten.
http://www.ictgames.com/spacejumps.html

**Bridging Shuttle**
Bridging Through Ten means the same as adding to ten first, then the rest. Get a "flight plan", then first add to ten by typing the number needed into the oval, and press the red button. Then type the rest that the shuttle needs to go, into the other oval, and press the red button.
http://www.ictgames.com/bridging.html

**Speedy Sums**
Click on numbers that add to the target sum. The more numbers you use, the higher your score will be.
http://www.mathplayground.com/speedy_sums.html

**Math Magician Games**
Flashcard problems in all 4 operations, including subtraction. Answer 20 questions in 1 minute.
http://www.oswego.org/ocsd-web/games/Mathmagician/mathssub.html

**AplusMath Games**
Matho (math and bingo combined), concentration, hidden picture, and Planet Blaster games for the basic operations.
http://www.aplusmath.com/games/

**Addition Surprise**
Draw the answer square in the addition table.
http://www.hbschool.com/activity/add/add.html

**Math Fact Bubble Blast**
Click and burst the bubble showing the right answer to math questions. Choose addition, subtraction, or multiplication. Various levels and speeds.
www.lickitysplitlearning.com/free-online-math-fact-game.html

**Exuberant Eye Games**
Practice your basic facts with these kid-appealing simple games.
http://www.games.exuberanteye.com/

**Power Lines Puzzle**
Arrange the numbers into the pattern so that the numbers on the "lines" add up to the given sum.
http://www.primarygames.co.uk/pg2/powerlines/powerlines1.html

**Online Addition Flashcards**
http://www.thegreatmartinicompany.com/additionfill.html

**Online Math Flashcards**
Addition, subtraction, and multiplication interactive online flashcards. A variety of number ranges, both timed and untimed versions.
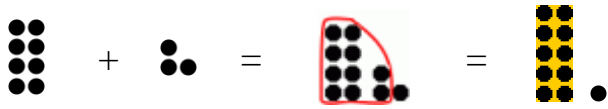http://www.mathflashcardssoftware.info

**Number Bond Machines**
Practice which two numbers add up to a given number. Set the number to be 11, 12, ... 18 to practice basic facts as in this chapter.
http://www.amblesideprimary.com/ambleweb/mentalmaths/numberbond.html

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# Adding with 8

Imagine that 8 wants to be a 10! It takes two from the other number (from 3). So, 8 becomes 10, and only 1 is left over.
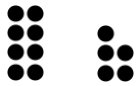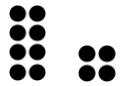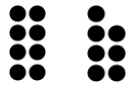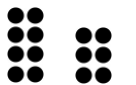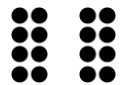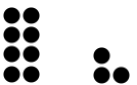
$$8 + 3 = 10 + 1 = 11$$

8 wants to be a 10! So, it takes two from the other number (from 5). So, 8 becomes 10, and 3 are left over.

$$8 + 5 = 10 + 3 = 13$$

Use the list on the right to practice. Don't write the answers there. Just point to different problems and say the answer aloud.

$8 + 1 = \square$

$8 + 2 = \square$

$8 + 3 = \square$

$8 + 4 = \square$

$8 + 5 = \square$

$8 + 6 = \square$

$8 + 7 = \square$

$8 + 8 = \square$

$8 + 9 = \square$

1. Add. First, circle the ten.

| **a.** $8 + 5$ | **b.** $8 + 4$ | **c.** $8 + \rule{1cm}{0.1pt}$ |
|---|---|---|
| $10 + 3 = \rule{1cm}{0.1pt}$ | $10 + \rule{1cm}{0.1pt} = \rule{1cm}{0.1pt}$ | $10 + \rule{1cm}{0.1pt} = \rule{1cm}{0.1pt}$ |
| **d.** $8 + \rule{1cm}{0.1pt} =$ | **e.** $8 + \rule{1cm}{0.1pt} =$ | **f.** $8 + \rule{1cm}{0.1pt} =$ |
| $10 + \rule{1cm}{0.1pt} = \rule{1cm}{0.1pt}$ | $10 + \rule{1cm}{0.1pt} = \rule{1cm}{0.1pt}$ | $10 + \rule{1cm}{0.1pt} = \rule{1cm}{0.1pt}$ |

2. It is good to memorise the doubles, also. Fill in.

| | | |
|---|---|---|
| $2 + 2 = \rule{1.5cm}{0.1pt}$ | $5 + 5 = \rule{1.5cm}{0.1pt}$ | $8 + 8 = \rule{1.5cm}{0.1pt}$ |
| $3 + 3 = \rule{1.5cm}{0.1pt}$ | $6 + 6 = \rule{1.5cm}{0.1pt}$ | $9 + 9 = \rule{1.5cm}{0.1pt}$ |
| $4 + 4 = \rule{1.5cm}{0.1pt}$ | $7 + 7 = \rule{1.5cm}{0.1pt}$ | $10 + 10 = \rule{1.5cm}{0.1pt}$ |

Addition facts with eight. Do not write the answers down, but just practice the sums.

| | | | |
|---|---|---|---|
| $8 + 0 =$ ⬜ | $8 + 5 =$ ⬜ | $8 + 8 =$ ⬜ | $8 + 9 =$ ⬜ |
| $8 + 3 =$ ⬜ | $8 + 7 =$ ⬜ | $8 + 1 =$ ⬜ | $8 + 4 =$ ⬜ |
| $8 + 10 =$ ⬜ | $8 + 1 =$ ⬜ | $8 + 6 =$ ⬜ | $8 + 2 =$ ⬜ |

3. Add and fill in what is missing.

| | | |
|---|---|---|
| **a.** $8 + 4 =$ _____ <br><br> $8 + 6 =$ _____ <br><br> $8 + 2 =$ _____ | **b.** $8 + 8 =$ _____ <br><br> $8 + 5 =$ _____ <br><br> $8 + 7 =$ _____ | **c.** $8 +$ ____ $= 14$ <br><br> $8 +$ ____ $= 16$ <br><br> $8 +$ ____ $= 17$ |
| **d.** $8 +$ ____ $= 13$ <br><br> $8 +$ ____ $= 12$ <br><br> $8 +$ ____ $= 11$ | **e.** $5 + 8 =$ _____ <br><br> $8 + 7 =$ _____ <br><br> $3 + 8 =$ _____ | **f.** $6 + 8 =$ _____ <br><br> $8 + 9 =$ _____ <br><br> $8 + 8 =$ _____ |

4. Find the pattern and continue it.

| a. | b. | c. |
|---|---|---|
| $8 + 2 =$ _____ | $18 + 2 =$ _____ | $\frac{1}{2}$ of 0 is _____. |
| $8 + 4 =$ _____ | $18 + 4 =$ _____ | $\frac{1}{2}$ of 2 is _____. |
| $8 + 6 =$ _____ | $18 + 6 =$ _____ | $\frac{1}{2}$ of 4 is _____. |
| $8 +$ ____ $=$ _____ | $18 +$ ____ $=$ _____ | $\frac{1}{2}$ of ____ is _____. |
| ____ $+$ ____ $=$ _____ | ____ $+$ ____ $=$ _____ | $\frac{1}{2}$ of ____ is _____. |
| ____ $+$ ____ $=$ _____ | ____ $+$ ____ $=$ _____ | $\frac{1}{2}$ of ____ is _____. |
| ____ $+$ ____ $=$ _____ | ____ $+$ ____ $=$ _____ | $\frac{1}{2}$ of ____ is _____. |

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# Subtraction and the Difference

**The difference** of two numbers on the number line means <u>how far apart</u> they are from each other. The difference of 7 and 3 is 4, because 7 and 3 are four steps apart.

```
 ┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼
 0  1  2  3  4  5  6  7  8  9  10 11 12 13 14 15 16 17
```
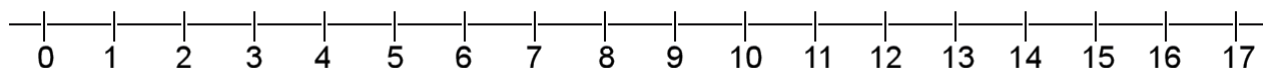
We can solve the difference of two numbers by subtracting *or* adding:

1. Subtract the numbers. OR

2. Write a "*how many more*" addition (missing addend).

Find the difference of 12 and 8 in two ways:

1. Subtract:  $12 - 8 =$ _____.  OR

2. Think: "*8* and *how many more* make *12?*" You can write an addition  $8 +$ _____ $= 12$

Either way, the answer is **4**.

1. Write a subtraction to find the difference of the numbers.

| Numbers | | Subtraction | | Difference |
|---|---|---|---|---|
| 7 | 2 | 7 – 2 | = | 5 |
| 10 | 4 | ____ – ____ | = | |
| 9 | 5 | ____ – ____ | = | |

| Numbers | | Subtraction | | Difference |
|---|---|---|---|---|
| 6 | 3 | ____ – ____ | = | |
| 10 | 5 | ____ – ____ | = | |
| 9 | 6 | ____ – ____ | = | |

2. Think of adding more to find the differences of two numbers.

| The difference of 10 and 6 | The difference of 7 and 12 | The difference of 9 and 4 |
|---|---|---|
| **a.** $6 +$ ____ $= 10$ | **b.** $7 +$ ____ $= 12$ | **c.** $4 +$ ____ $= 9$ |
| The difference of 15 and 8 | The difference of 5 and 12 | The difference of 9 and 17 |
| **d.** $8 +$ ____ $= 15$ | **e.** $5 +$ ____ $= 12$ | **f.** $9 +$ ____ $= 17$ |
| The difference of 6 and 12 | The difference of 8 and 18 | The difference of 9 and 13 |
| **g.** ____ $+$ ____ $= 12$ | **h.** ____ $+$ ____ $= 18$ | **i.** ____ $+$ ____ $= 13$ |

3. Subtract. Think of the *differences* or "*how many more*".

| +3⌒<br>**a.** 15 – 12 = _____<br><br>12 and *how many more* makes 15? | +___⌒<br>**b.** 11 – 9 = _____<br><br>9 and *how many more* makes 11? | +___⌒<br>**c.** 16 – 11 = _____<br><br>11 and *how many more* makes 16? |
|---|---|---|

4. Solve these subtraction problems by thinking of the *differences* or "*how many more*".

| **a.**<br>+___⌒<br>14 – 11 = _____ | **b.**<br>+___⌒<br>20 – 19 = _____ | **c.**<br>+___⌒<br>17 – 15 = _____ | **d.**<br>+___⌒<br>13 – 10 = _____ |
|---|---|---|---|
| **e.**<br>+___⌒<br>20 – 15 = _____ | **f.**<br>+___⌒<br>15 – 11 = _____ | **g.**<br>+___⌒<br>12 – 8 = _____ | **h.**<br>+___⌒<br>18 – 14 = _____ |

5. Subtract by thinking how far apart the two numbers are (the difference).

| **a.**<br>20 – 16 = _____ | **b.**<br>40 – 38 = _____ | **c.**<br>65 – 61 = _____ | **d.**<br>33 – 31 = _____ |
|---|---|---|---|
| **e.**<br>100 – 99 = _____ | **f.**<br>87 – 84 = _____ | **g.**<br>53 – 50 = _____ | **h.**<br>79 – 78 = _____ |

6. Solve the word problems.

**a.** Jane is on page 20 and Boyd is on page 17 of the same book.
How many more pages has Jane read?

**b.** Mom has one dozen eggs plus five in another carton. A dozen means 12.
How many eggs does mum have?

**c.** Barb is reading a 50-page book. She is on page 42.
How many more pages does she have left to read?

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# Chapter 4: Adding and Subtracting with Two-Digit Numbers
## Introduction

The fourth chapter of the *Math Mammoth Grade 2-A Complete Worktext* deals with addition and subtraction within 0-100, both mentally and in columns, especially concentrating on how to carry when adding in columns (trading) and how to borrow when subtracting in columns (regrouping).

### Mental math

Mental math is important because it builds number sense. Chapter 4 includes many lessons that practice mental math. For example, the child practices adding and subtracting 2-digit numbers when one of the numbers is a whole ten (problems such as 30 + 14, or 66 - 20).

Also studied are problems such as 36 + 8 or 45 + 9. These problems connect with the idea of going over ten as in problems 6 + 8 and 5 + 9. So, just as the child knows that 6 + 8 fills the first ten and is 14, he/she will learn that 36 + 8 fills the next whole ten (40) and is 44.

### Carrying to tens

Simultaneously with this, the child learns adding two-digit numbers in columns, and "carrying" to tens, which is illustrated and explained in detail with the help of pictures. Some people call it trading, as in trading 10 ones into 1 ten.

As a "stepping stone" into the usual way of adding in columns with a carry, you can show the child the method below. This can be used if the child does not readily understand why the little "1" that is carried corresponds to a ten. In the process below, the ones are added, and the answer is written using both columns. Then, the tens are added and the answer is written under the sum from ones. Lastly, both sums are added.

```
        tens ones              tens ones              tens ones
           3   6                   3   6                  3    6
       +   1   8               +   1   8              +   1    8
      _____             _____            _____
add ones first →  1   4                1   4                1    4
                        add tens here →  4   0              4    0
                                                    _____
                                            total →  5    4
```

The lesson *Add in Columns Practice* contains problems where the sum is more than 100.

### Borrowing or regrouping

The next lessons teach subtracting in columns. First we only deal with the easy problems where you don't need to regroup (borrow). Then the following lessons practice in detail the process of regrouping (borrowing). You can use either term with your child, or even choose not to use either if you feel it is confusing. You can alternatively use the phrase "breaking a ten into ten ones".

First, the lesson *Regrouping* practices breaking down a ten into ten ones because we cannot subtract from the ones. It is crucial that the child understands what happens here. Otherwise, he/she might end up learning the procedure of borrowing as a memorized algorithm only, and will probably at some point misremember how it was done. That is why this lesson deals with the regrouping process in detail with

plenty of visual exercises.

If you notice that the child does not understand the concept of borrowing, he/she may need more practice with concrete manipulatives or visual exercises before proceeding.

## More mental math

After learning regrouping, we practice mental subtraction in three separate lessons. One of them expounds on several methods for mental subtracting. Another is about Euclid's game - a fun game that also practices subtraction of two-digit numbers.

## The Lessons

# Helpful Resources on the Internet

*Use these free online resources to supplement the "bookwork" as you see fit.*

**Base Blocks Addition**
A virtual manipulative that shows regrouping in addition. You can either solve addition problems that are provided, or create your own. "Lasso" with a mouse ten units, ten tens, or ten hundreds to regroup them. Choose "Columns = 2" to restrict the work to two-digit numbers.
http://nlvm.usu.edu/en/nav/frames_asid_154_g_1_t_1.html?from=category_g_1_t_1.html

**Base Blocks Subtraction**
A virtual manipulative that helps teach borrowing in subtraction. Choose "Create Problem", then click on the red and blue blocks to create a problem. The number to be subtracted (the subtrahend) is illustrated by the RED blocks whereas the minuend is by the BLUE blocks. Click BEGIN problem to start solving. Drag a red block on top of a blue to "subtract" —they cancel each other. Drag bigger place values to the column on their right to "break them up"—in other words regroup or borrow.
http://nlvm.usu.edu/en/nav/frames_asid_155_g_1_t_1.html?from=category_g_1_t_1.html

**Callum's Addition Pyramid**
Add the pairs of numbers to get a number on the next level and finally the top number. Three difficulty levels.
http://www.amblesideprimary.com/ambleweb/mentalmaths/pyramid.html

**Techno Tortoise**
Practice adding 2 two-digit numbers into parts on a number line.
http://www.ictgames.com/technowithflock.html

**Mr. Martini's Classroom: Addition and Subtraction Inequalities**
Compare expressions that involve addition and subtraction of one and two-digit numbers.
http://www.thegreatmartinicompany.com/inequalities/number-comparison.html
and
http://www.thegreatmartinicompany.com/inequalities/add-subtract-comparison.html

**Mr. Martini's Classroom: Long Addition**
Practice adding two-digit numbers in columns online.
http://www.thegreatmartinicompany.com/longarithmetic/longaddition.html

**Simple Kids Math**
Online practice of math problems.
http://www.simplekidsmath.com/Default.aspx?level=2 - addition
http://www.simplekidsmath.com/Default.aspx?level=3 - subtraction

**Mathionare Addition Quiz**
Answer increasingly more difficult addition questions (one and two-digit numbers), and win a million!
http://www.mathsisfun.com/games/mathionaire-addition-quiz.html

**Button Beach Challenge**
Figure out what number the various colored buttons represent.
http://www.amblesideprimary.com/ambleweb/mentalmaths/buttons.html

**Teaching Treasures - Year 2 Math Worksheets**
Simple online addition and subtraction worksheets where the student types in the answer and can check it.
http://www.teachingtreasures.com.au/maths/maths_level2.html

**Count on Convict**
Practice "adding up" strategy for mental subtraction. First type the amount to move on to the next whole ten, then count on tens, then the rest.
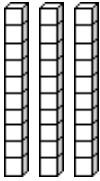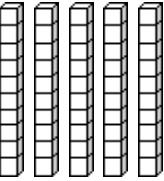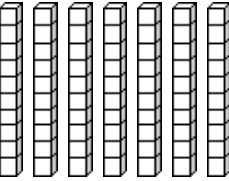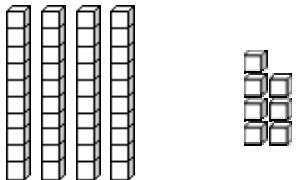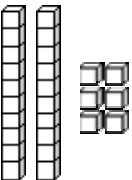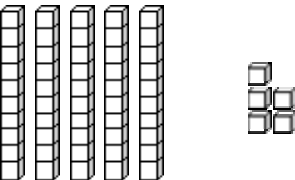http://www.ictgames.com/countonconvict.html

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# Subtracting Whole Tens

1. Cross out as many ten-pillars as the problem indicates. What is left?

**a.**

$30 - 10 =$ _____

**b.**

$50 - 30 =$ _____

**c.** $70 - 40 =$ _____

**d.** $47 - 20 =$ _____

**e.** $26 - 10 =$ _____

**f.** $55 - 30 =$ _____

What can you notice?

2. Count by tens backwards.

**a.** 76, 66, _____ , _____ , _____ , _____ , _____

**b.** _____ , _____ , 52, 42, _____ , _____ , _____

**c.** _____ , _____ , _____ , _____ , 27 , 17, _____

3. Subtract.

| a. | b. | c. |
|---|---|---|
| $23 - 10 =$ _____ | $48 - 20 =$ _____ | $56 - 10 =$ _____ |
| $23 - 20 =$ _____ | $48 - 30 =$ _____ | $56 - 30 =$ _____ |
| **d.** | **e.** | **f.** |
| $75 - 10 =$ _____ | $31 - 10 =$ _____ | $81 - 40 =$ _____ |
| $75 - 20 =$ _____ | $31 - 20 =$ _____ | $81 - 50 =$ _____ |

4. Find the pattern and continue it.

**a.** $88 - 10 = $ _____

$88 - 20 = $ _____

$88 - 30 = $ _____

$88 - $ _____ $= $ _____

$88 - $ _____ $= $ _____

$88 - $ _____ $= $ _____

$88 - $ _____ $= $ _____

**b.** $100 - 60 = $ _____

$90 - 50 = $ _____

$80 - 40 = $ _____

_____ $- $ _____ $= $ _____

_____ $- $ _____ $= $ _____

_____ $- $ _____ $= $ _____

_____ $- $ _____ $= $ _____

**c.** $34 - 10 = $ _____

$44 - 20 = $ _____

$54 - 30 = $ _____

_____ $- $ _____ $= $ _____

_____ $- $ _____ $= $ _____

_____ $- $ _____ $= $ _____

_____ $- $ _____ $= $ _____

5. Use <u>rounded numbers</u> to solve these problems.

**a.** Three suitcases weigh 29 kg, 18 kg, and 31 kg.
*About* how much is their total weight?

**b.** Chairs cost $29 apiece. Can
Dale buy three of them with $80?

**c.** Henry received $50 for his birthday.
If he buys three books that cost $9 each,
*about* how much will he have left?

**Puzzle Corner**

Find numbers for the puzzles.

| | + | | = | 90 |
| --- | --- | --- | --- | --- |
| − | | − | | |
| | + | | = | 30 |
| = | | = | | |
| 30 | | 30 | | |

| | − | | = | 40 |
| --- | --- | --- | --- | --- |
| + | | + | | |
| | − | | = | 30 |
| = | | = | | |
| 80 | | 10 | | |

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# Regrouping (Borrowing), Part 1

We will now study regrouping ("borrowing") in subtraction.

As a first step, we study breaking a ten-pillar into ten little cubes. This is called *regrouping*, because one ten "changes groups" from the tens group into the ones.

4 tens 5 ones

Break a ten.

3 tens 15 ones

First we have 45. We "break" one ten-pillar into little cubes.
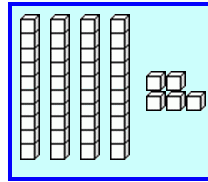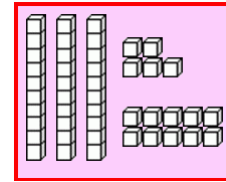
Now we have 3 tens and 15 ones. It is still 45, but written in a different way.

Here is another example. First we have 5 tens 3 ones. We "break" one ten-pillar into 10 little cubes. We end up with 4 tens 13 ones.
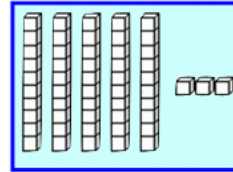
5 tens 3 ones

Break a ten.
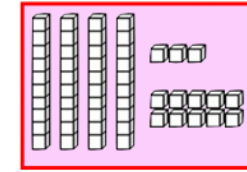
4 tens 13 ones

1. Break a ten into 10 ones. What do you get? Draw or use manipulatives to help.

**a.**
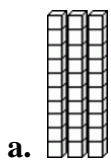
3 tens  0 ones  ⟹  ___tens ____ones
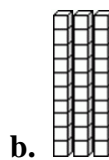
**b.**

___tens ___ones  ⟹  ___tens ____ones

**c.**

___tens ___ones  ⟹  ___tens ____ones

**d.**

___tens ___ones  ⟹  ___tens ____ones

**e.**

___tens ___ones  ⟹  ___tens ____ones

**f.**
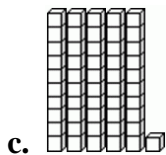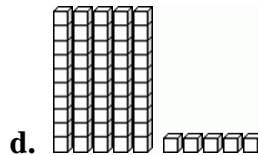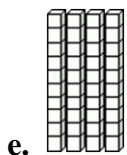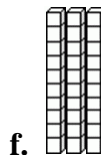
___tens ___ones  ⟹  ___tens ____ones

Let's study subtraction. The pictures on the right illustrate 45 – 17.

First, a ten is broken into 10 ones. So, 4 tens 5 ones becomes 3 tens 15 ones.

After that, cross out (subtract) 1 ten 7 ones.
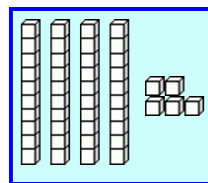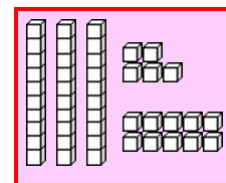
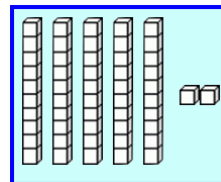4 tens 5 ones          **Break a ten.**          3 tens 15 ones

Cross out 1 ten 7 ones (from the *second* picture).

What is left? _____ tens _____ ones
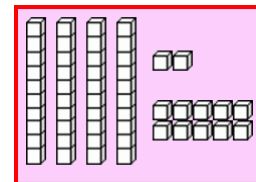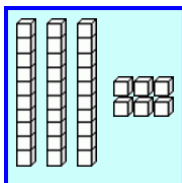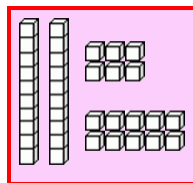
---

The pictures on the right illustrate 52 – 39.

First, a ten is broken into 10 ones. So, 5 tens 2 ones becomes 4 tens 12 ones.

After that, cross out (subtract) 3 tens 9 ones.

5 tens 2 ones          **Break a ten.**          4 tens 12 ones

Cross out 3 tens 9 ones (from the *second* picture).

What is left? _____ tens _____ ones

2. Fill in. Always subtract (cross out some) from the *second* picture.

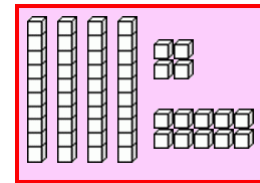3 tens   6 ones          **Break a ten.**          2 tens   16 ones

**a.** Subtract 8 ones (from the *second* picture).

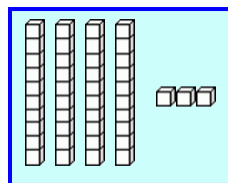What is left? _____ tens _____ ones
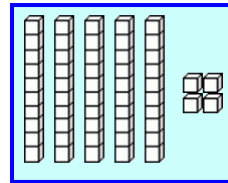
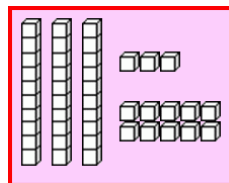___ tens ___ ones          **Break a ten.**          ___ tens ___ ones

**b.** Subtract 2 tens 7 ones.

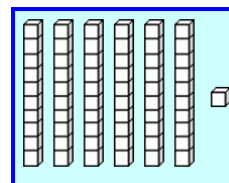What is left? _____ tens _____ ones

___ tens ___ ones          **Break a ten.**          ___ tens ___ ones

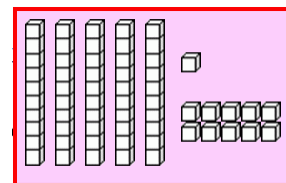**c.** Cross out 2 tens 5 ones.

What is left? _____ tens _____ ones

___ tens ___ ones          **Break a ten.**          ___ tens ___ ones

**d.** Cross out 4 tens 4 ones.

What is left? _____ tens _____ ones

3. First, break a ten. Then subtract ones and tens separately. Look at the example.

| a. | b. |
|---|---|
| 5 tens 5 ones ⟹    **4** tens **15** ones<br>    −   3   tens    5   ones<br>            **3** tens   **8** ones | 7 tens 2 ones ⟹    ___ tens ___ ones<br>    −   3   tens    5   ones<br>            ___ tens ___ ones |
| c. | d. |
| 6 tens 0 ones ⟹    ___ tens ___ ones<br>    −   2   tens    7   ones<br>            ___ tens ___ ones | 6 tens 4 ones ⟹    ___ tens ___ ones<br>    −   3   tens    8   ones<br>            ___ tens ___ ones |
| e. | f. |
| 7 tens 6 ones ⟹    ___ tens ___ ones<br>    −   4   tens    7   ones<br>            ___ tens ___ ones | 5 tens 0 ones ⟹    ___ tens ___ ones<br>    −   2   tens    2   ones<br>            ___ tens ___ ones |
| g. | h. |
| 8 tens 1 one ⟹    ___ tens ___ ones<br>    −   6   tens    5   ones<br>            ___ tens ___ ones | 6 tens 3 ones ⟹    ___ tens ___ ones<br>    −   2   tens    8   ones<br>            ___ tens ___ ones |

4. Jessica had 37 colored pencils. Then she gave 12 colored
   pencils to her brother, and 6 pencils to her sister.

   **a.** How many pencils does Jessica have now?


   **b.** How many more pencils does Jessica have than her brother?


   **c.** How many more pencils does Jessica have than her sister?

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# Chapter 5: Counting Money
## Introduction

The fifth chapter of the *Math Mammoth Grade 2-A Complete Worktext* covers counting quarters, dimes, nickels, and pennies. Also, the one-dollar bill and the five-dollar bill are introduced.

## Counting Coins

The main goal of this chapter is to be able to count coins and find the amount of money in cents or dollars.

Also practiced is finding change by counting up. Only small money amounts are used.

In one lesson, the one-dollar bill and the five-dollar bill are introduced, and the student learns to write money amounts using dollars and cents, with the decimal point in between.

The latter part of second grade also includes a lesson about adding money amounts.

You can make free worksheets for counting coins at **www.homeschoolmath.net/worksheets/money.php**, or using the worksheets generator that comes with the supportive materials of this curriculum.

## The Lessons

# Helpful Resources on the Internet

*Use these free online resources to supplement the "bookwork" as you see fit.*

**US Money Worksheets**
Count common US coins or bills. You can choose which coins/bills will be used, and how many coins/bills are shown at most. Other currencies are available at www.homeschoolmath.net/worksheets
http://www.homeschoolmath.net/worksheets/money.php

**Change Maker**
Determine how many of each denomination you need to make the exact change. Good and clear pictures! Playable in US, Canadian, Mexican, UK, or Australian money.
http://www.funbrain.com/cashreg/index.html

**Using Money**
Drag the right amount of coins and bills (US) to the answer space to match the given amount. The pictures look a little fuzzy.
http://www.mathcats.com/microworlds/usingmoney.html

**Counting Money Activity from Harcourt**
Count the coin value and type it into the box and click "Check".
http://www.hbschool.com/activity/counting_money/

**Cash Out**
Give the correct change by clicking on the bills and coins.
http://www.mrnussbaum.com/cashd.htm

**Piggy bank**
When the coins fall from the top of the screen, choose those that add up to the given amount, and the piggy bank fills.
http://fen.com/studentactivities/Piggybank/piggybank.html

**Coins and Medals from U.S. Mint**
History and pictures of the circulating coins, commemorative coins, Native American $1 Coin Program, and the Presidential $1 Coin Program. Learn also how coins are made and take a virtual tour around the mint.
www.usmint.gov/kids/coinsMedals

**Money Instructor**
Checkbook math exercises and worksheets. Includes a checkbook to print, writing dollars and cents worksheet, checking account deposit, checkbook transactions, and word problems.
http://www.moneyinstructor.com/checks.asp

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# Change

When you buy something in a store, you often do not have the exact amount of money to pay for it. Instead, you give the clerk *more* money than what the item costs. The clerk then gives you some money back. This is called your *change*.

A pen costs 40¢. You don't have the coins to make exactly 40¢, so you give the clerk 50¢. That is 10¢ too much! But then the clerk gives you back 10¢ — your change.

**You give:**    **Your change:**

**Price: 40¢**    **50¢**    **10¢**
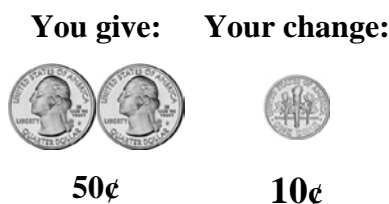
The clerk gives you back the *difference* between the price and what you paid.

In each problem below, find the change you get back. Think of the DIFFERENCE between the price and what you pay. Or, think how many cents you paid "too much". That will be your change.

You can set up a "play store" to do these problems, using real money, one person as a clerk, and one person as a customer.

1. Write how many cents you give, and how many cents is your change.

| a. | You give: | Your change: | b. | You give: | Your change: |
|---|---|---|---|---|---|
| **Price: 20¢** | _____¢ | _____¢ | **Price: 30¢** | _____¢ | _____¢ |

| c. | You give: | Your change: | d. | You give: | Your change: |
|---|---|---|---|---|---|
| **Price: 35¢** | _____¢ | _____¢ | **Price: 17¢** | _____¢ | _____¢ |

| e. | You give: | Your change: | f. | You give: | Your change: |
|---|---|---|---|---|---|

**e.** You give: Your change:

GLUE

Price: 22¢ _____¢  _____¢

**f.** You give: Your change:

Price: 11¢ _____¢  _____¢

**g.** You give: Your change:

Price: 60¢ _____¢  _____¢

**h.** You give: Your change:

Price: 80¢ _____¢  _____¢

2. Circle the coins you use to pay. Write how many cents your change is.

**a.** You buy a drink for 55¢.
You have:
Change: _____ ¢

**b.** You buy raisins for 33¢.
You have:
Change: _____ ¢

**c.** You buy a toy for 46¢.
You have:
Change: _____ ¢

**d.** You buy a book for 88¢.
You have:
Change: _____ ¢

**e.** You buy a basket for 75¢.
You have:
Change: _____ ¢

**f.** You buy crayons for 63¢.
You have:
Change: _____ ¢

3. Practice some more! Figure out the change.

| | | |
|---|---|---|
| **a.** Paper costs 70¢.<br>You give $1.<br><br>Change: _____ ¢ | **b.** A banana costs 41¢.<br>You give 50¢.<br><br>Change: _____ ¢ | **c.** A book costs 94¢.<br>You give $1.<br><br>Change: _____ ¢ |
| **d.** A toy costs 20¢.<br>You give 50¢.<br><br>Change: _____ ¢ | **e.** A drink costs 70¢.<br>You give $1.<br><br>Change: _____ ¢ | **f.** A towel costs 62¢.<br>You give 75¢.<br><br>Change: _____ ¢ |

4. Now you buy many items. First add their prices to find the total. Then find the change.
   Draw the coins that could be your change.

**a.** A magazine costs 20¢. You buy three of them. You give $1.

*Total cost: 60¢*

*Change: 40¢*

**b.** A toy costs 15¢ and another toy 20¢. You give 50¢.

Total cost: _____ ¢

Change: _____ ¢

**c.** A lollipop costs 8¢. You buy two of them. You give 20¢.

Total cost: _____ ¢

Change: _____ ¢

**d.** A pencil costs 5¢. You buy four of them. You give 25¢.

Total cost: _____ ¢

Change: _____ ¢

**e.** An eraser costs 35¢ and a pencil 10¢. You give 50¢.

Total cost: _____ ¢

Change: _____ ¢

# MATH MAMMOTH

# Grade 2-B

## Complete Worktext

- Geometry
- Fractions
- Place value till 1000
- Mental math
- Measuring
- Carrying, borrowing
- Multiplication

By Maria Miller

www.MathMammoth.com

# Contents

## Chapter 9: Measuring

## Chapter 10: Adding and Subtracting in Columns

## Chapter 11: Exploring Multiplication

# Chapter 6: Geometry and Fractions
## Introduction

The sixth chapter of the *Math Mammoth Grade 2-B Complete Worktext* covers geometry topics and an introduction to fractions.

In geometry, the emphasis is still on exploring shapes: Combining shapes to get new ones, and dividing shapes with lines to get other shapes.

The student also learns the concepts of right angle and parallel lines. These two concepts get the child started on the road to classifying shapes by their angles and sides.

For example, later the child will classify triangles into right triangles, acute triangles, and obtuse triangles. Quadrilaterals are classified into rectangles, parallelograms, kites, trapezoids, and so on. Finding a right angle or parallel sides in a shape is therefore important.

### Introduction to fractions

In the section on fractions, the student learns to identify fractions from pictures, or color parts to show a fraction. We also study comparing fractions. The student should learn that when comparing unit fractions, the one with the largest denominator is actually the smallest part. The child does not need to know this language yet, of course. The basic idea is simple: One-half is a bigger part than one-fifth.

The last lesson explores finding a fractional part of many objects. It is important that children do not "fixate" the idea of a fraction to just pies or other shapes divided into parts. They need to also understand that fractions can be used when the "whole" is a group of things.

### The Lessons

# Helpful Resources on the Internet

*Use these free online resources to supplement the "bookwork" as you see fit.*

**Buzzing with Shapes**
Tic tac toe with shapes; drag the counter to the shape that has that amount of sides.
http://www.harcourtschool.com/activity/buzz/buzz.html

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

**Pattern Blocks**
This program is designed to help with fractions, but kids will enjoy just playing with the polygon shapes.
http://www.arcytech.org/java/patterns/patterns_j.shtml

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

**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/inner/foldtan.htm

**Make Your Own Mandala**
A mandala is a circular symmetrical design based on eights. Make your own and experiment with symmetry.
http://www.girlsgotech.org/world_around_us.html

**Fractions - Part of a Whole**
Divide the pie into pieces and color some. The computer shows the fraction.
http://nlvm.usu.edu/en/nav/frames_asid_102_g_2_t_1.html

**Visualizing Fractions**
The other way around as in the previous activity: the computer shows a fraction, and you divide the pie and color the pieces.
http://nlvm.usu.edu/en/nav/frames_asid_103_g_2_t_1.html

**Naming Fractions**
An interactive activity that asks the student to name the fraction shown.
http://nlvm.usu.edu/en/nav/frames_asid_104_g_2_t_1.html

**Who Wants Pizza?**
Lessons and interactive exercises about fractions, based on the pizza model.
http://math.rice.edu/~lanius/fractions/frac.html

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# Right Angles

These look like corners, but in math we call them *angles*.

Imagine sitting inside of each angle, and the walls going up around you in the shape of the "corner."

In which angle would you have lots of space to sit?

In which angle would you have only a little space to sit?

Find two "square corners." In mathematics we call them *right angles*.

Sometimes we draw a round line (an arc) inside of the angle to mark it.

Right angles are marked this way.

Corners of books are examples of right angles.

1. Write how many angles each shape has. Write how many **right** angles each shape has.

a.

_____ angles
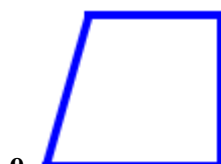
_____ right angles

b.

_____ angles

_____ right angles

c.

_____ angles

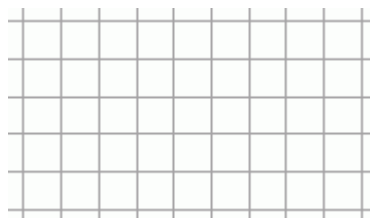_____ right angles

d.

_____ angles

_____ right angles

e.

_____ angles

_____ right angles

f.
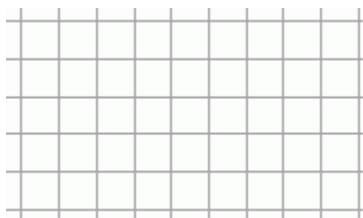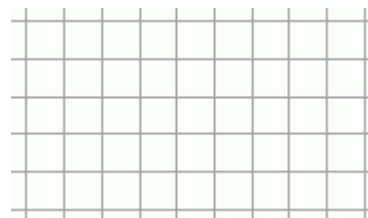
_____ angles

_____ right angles

2. Draw the shapes below. First draw dots for the corners. Then connect those with lines.

**a.** a rectangle

**b.** a square

**c.** a triangle with one right angle
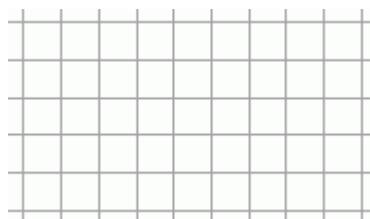
**d.** a triangle with no right angles
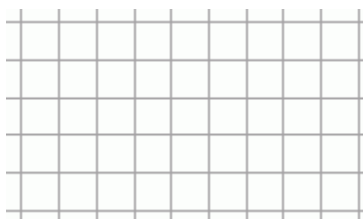
**e.** a quadrilateral with one right angle
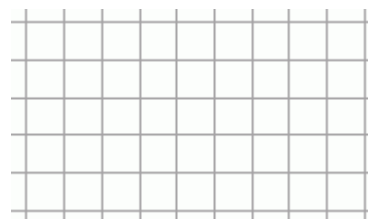
**f.** a pentagon with one right angle
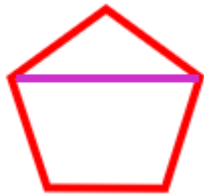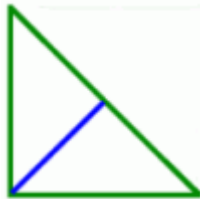
3. Continue this pretty pattern. Look carefully. Where in the pattern (not in the grid) can you find right angles?
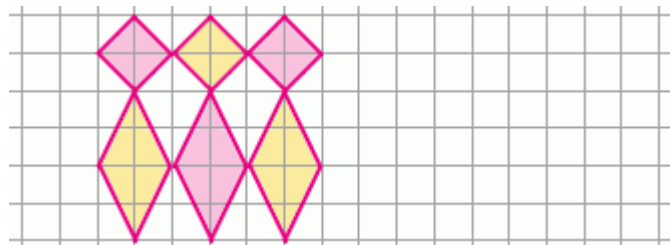
4. Which of these shapes has to ALWAYS have a right angle?

   a) triangle   b) square   c) pentagon   d) hexagon   e) rectangle

5. The shapes are divided into parts. Write how many right angles there are.

| a. | b. |
|---|---|
| _____ right angles in the big shape. <br><br> _____ right angles in each part. | _____ right angles in the big shape. <br><br> _____ right angles in each part. |
| **c.** | **d.** |
| _____ right angles in the big shape. <br><br> _____ right angles in each part. | _____ right angles in the big shape. <br><br> _____ right angles in each part. |

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# Chapter 7: Place Value Till 1000
## Introduction

The seventh chapter of the *Math Mammoth Grade 2-B Complete Worktext* deals with three-digit place value - ones, tens, and hundreds.

The first lessons present three-digit numbers with hundred-flats, ten-pillars, and one-cubes. The child practices separating three-digit numbers into the different "parts": hundreds, tens, and ones. Number lines will help visualize the numbers and build number sense. These lessons provide the basis for understanding three-digit place value.

The lesson *Skip-Counting Practice* shows how to add or subtract a ten: you look at the tens digit in the number, and add or subtract 1 from it. In counting practice, emphasize the similarity to numbers that are less than 100. For example, in counting by fives from 305, the sequence is essentially the same as if counting by fives from 5, but just with the "three hundred" added each time.

The *Counting and Adding* lesson has further practice. The student forms three-digit numbers from their parts, compares, fills number charts, and adds.

The lesson, *Which Number is Greater,* has very simple exercises about comparing numbers. Then, the *Comparing and Ordering* lesson has further practice, plus some more advanced exercises. For example, the student compares sums, and finds a number on the empty line so that the comparison sentence is true. This last lesson also has a fun domino game where students build three-digit numbers and try to get them as close as possible to a given whole hundred.

We also briefly study rounding to the nearest ten and to the nearest hundred.

### The Lessons

# Helpful Resources on the Internet

*Use these free online resources to supplement the "bookwork" as you see fit.*

**Base Blocks from the National Library of Virtual Manipulatives**
Place enough hundred-flats, ten-sticks, and one-blocks into the work area to show given numbers. Choose "Columns = 3" to restrict the program to three-digit numbers.
http://nlvm.usu.edu/en/nav/frames_asid_152_g_1_t_1.html?from=category_g_1_t_1.html

**Place Value to Thousands**
Multiple choice questions; help the duck swing his golf club.
http://www.toonuniversity.com/flash.asp?err=496&engine=5

**Arithmetic Workshop Place Values Tool**
Drag models of ones, tens, hundreds, or thousands to the work area, group them, break them up, or practice any of the four operations using the same visual models.
http://www.iknowthat.com/com/L3?Area=EarlyMathWorkbench and choose "Place Value".

**Cookie Dough**
Either spell the number in words or write the digits.
http://www.funbrain.com/numwords/index.html

**Inequalities**
Arrange the digits to make two numbers so that the comparison is true. Use six digits for two 3-digit numbers.
http://www.primarygames.co.uk/PG5/Inequal/sidequal.html

**Naming Numbers**
These pages teach number naming skills covered in K8 math courses. Each page has an explanation, interactive practice and challenge games about naming numbers.
http://www.aaamath.com/B/nam.htm

**Mostly Postie**
Drag the parcel onto the scales, then enter the value shown to deliver your letter or parcel. Practices counting in 10s and 100s
http://www.ictgames.com/mostlyPostie.html

**Helipad Hops**
Read the "number" of the SOS message, add/subtract to make it the nearest whole ten, and click on the whole ten helipad where the helicopter should land.
http://www.ictgames.com/helipad%20hops7.html

**Place Value at AAAMath.com**
Read, practice, and play with 3-digit numbers.
http://www.aaaknow.com/plc21ax2.htm

**Place value puzzler**
Place value or rounding game, click on the asked place value in a number or type in the asked rounding.
http://www.funbrain.com/tens/index.html
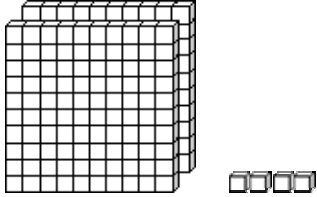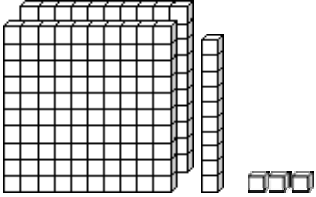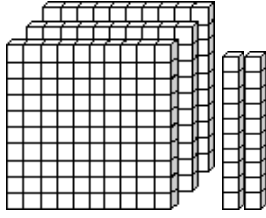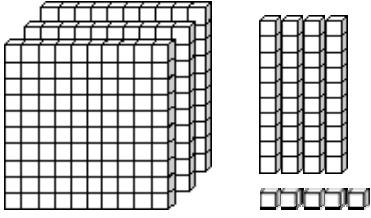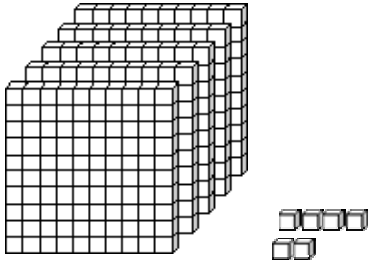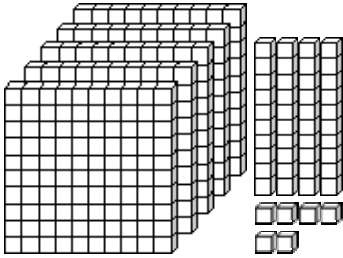
**Line Dry Game**
Fill in a missing number on the clothes line based on different skip counting patterns.
www.fuelthebrain.com/Game/play.php?ID=15

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# Hundreds, Part 2

1. Fill in the chart.

| | | |
|---|---|---|
| **a. Two hundred four** | **b. Two hundred thirteen** | **c. _____** |

**a.**

$200 + 0 + 4$

| hundreds | tens | ones |
|---|---|---|
| 2 | 0 | 4 |

**b.**

$200 + 10 + 3$

| hundreds | tens | ones |
|---|---|---|
| | | |

**c.** _____

_____ + _____ + ____

| hundreds | tens | ones |
|---|---|---|
| | | |

**d.** _____

_____

_____ + _____ + ____

| H | T | O |
|---|---|---|
| | | |

**e.** _____

_____

_____ + _____ + ____

| H | T | O |
|---|---|---|
| | | |

**f.** _____

_____

_____ + _____ + ____

| H | T | O |
|---|---|---|
| | | |

2. Mark on the number line: 244,  256,  301,  308,  299,  245,  255,  262,  223,  211.
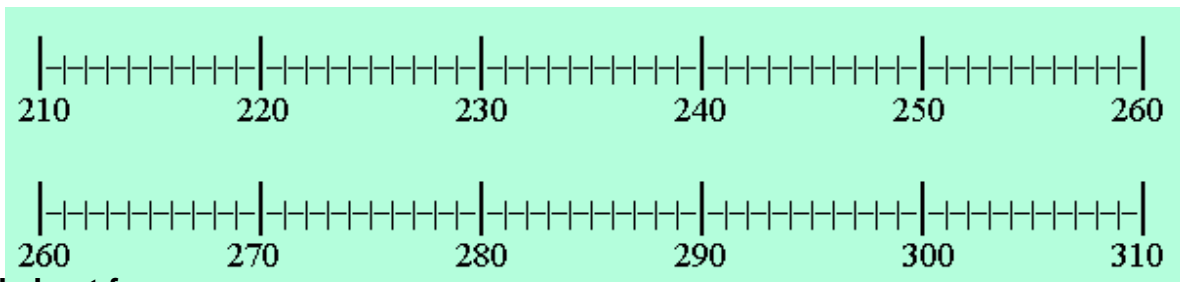
3. **a.** Draw a number line from 400 to 500, similar to the one in (2).
   Only write the numbers below the whole tens.

   **b.** Mark on your number line these numbers: 413, 498, 460, 402, 456, 415, 436, 468.

4. Break these numbers down into hundreds, tens, and ones.

| **a.** 276 | **b.** 867 |
|---|---|
| = ____ hundreds ____ tens ____ ones | = ____ hundreds ____ tens ____ ones |
| = 200 + 70 + 6 | = 800 + _____ + _____ |
| **c.** 350 | **d.** 770 |
| = ____ hundreds ____ tens ____ ones | = ____ hundreds ____ tens ____ ones |
| = _____ + _____ + ____ | = _____ + _____ + ____ |
| **e.** 409 = _____ + _____ + ____ | **f.** 940 = _____ + _____ + ____ |
| **g.** 700 = _____ + _____ + ____ | **h.** 542 = _____ + _____ + ____ |
| **i.** 601 = _____ + _____ + ____ | **j.** 383 = _____ + _____ + ____ |

5. These numbers have been "broken down." Collect the parts and write them as numbers.

| | |
|---|---|
| **a.** 5 tens 1 hundred 3 ones = _153_ | **f.** 5 ones 5 hundreds = _____ |
| **b.** 2 ones 1 hundred 4 tens = _____ | **g.** 9 ones 2 hundreds = _____ |
| **c.** 2 hundreds 2 ones 0 tens = _____ | **h.** 9 hundreds 3 ones 7 tens = _____ |
| **d.** 8 tens 0 ones 1 hundred = _____ | **i.** 3 hundreds 3 tens = _____ |
| **e.** 4 ones 4 hundreds 2 tens = _____ | **j.** 9 ones 5 hundreds = _____ |

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# Chapter 8: Mental Addition and Subtraction
## Introduction

The eighth chapter of the *Math Mammoth Grade 2-B Complete Worktext* covers mental adding and subtracting topics with 3-digit numbers.

The goal of this whole chapter is to solidify children's understanding of 3-digit place value, since being able to add and subtract whole hundreds, whole tens, and ones is based on understanding well the 3-digit place value. These problems build number sense and also build children's understanding of addition and subtraction.

In most lessons, the addition or subtraction is first illustrated with pictures so the student can learn the concepts relating to the different place values. You can obviously also use base ten blocks or other similar manipulatives to this end.

The lesson on graphs uses three-digit numbers in context with the problems.

### The Lessons

# Helpful Resources on the Internet

**Random Stop 1000**
Place digits strategically into the addition problem so that the sum is as close as 1000 as possible.
http://www.primarygames.co.uk/pg4/SpeedStop/randomstop.html
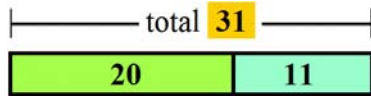
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# Addition / Subtraction Connection

Two PARTS make a TOTAL. You can:

- add the parts to get the total; or
- subtract a part from the total, and get the second part.

Remember: The subtraction sentence <u>starts</u> with the <u>total</u>.
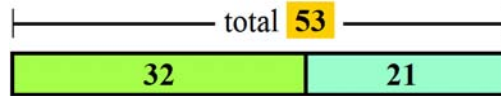
| total **31** | total **53** |
|---|---|
| 20 \| 11 | 32 \| 21 |
| $20 + 11 = $ **31** | $32 + 21 = $ **53** |
| **31** $ - 11 = $ _____ | **53** $ - 21 = $ _____ |
| **31** $ - 20 = $ _____ | **53** $ - 32 = $ _____ |

1. For each addition sentence, write two subtraction sentences. Fill in the missing parts.

total _____
700 | 100

**a.** $700 + 100 = $ _____

_____ $ - 100 = $ _____

_____ $ - 700 = $ _____

total _____

**b.** $69 + 24 = $ _____

_____ $ - $ _____ $ = $ _____

_____ $ - $ _____ $ = $ _____

total _____

**c.** $450 + 400 = $ _____

_____ $ - $ _____ $ = $ _____

_____ $ - $ _____ $ = $ _____

total _____

**d.** _____ $ + $ _____ $ = $ _____

$86 - 40 = $ _____

_____ $ - $ _____ $ = $ _____

total _____

**e.** _____ $ + $ _____ $ = $ _____

_____ $ - $ _____ $ = $ _____

$604 - 400 = $ _____

total _____

**f.** _____ $ + $ _____ $ = $ _____
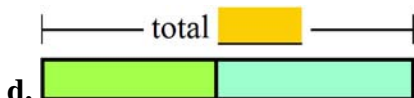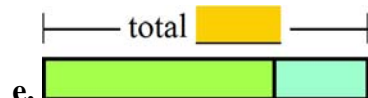
$98 - 50 = $ _____

_____ $ - $ _____ $ = $ _____

2. A store has 605 chairs. Some are blue chairs and 200 are green.
   How many are blue?

| Sometimes you know the total and you don't know one part.<br><br>You can write a missing addend sentence, and a subtraction sentence. | total **96**<br>┠──────────────┨<br>`16` \| `?`<br><br>16 + _?_ = 96<br><br>96 – 16 = _____ |
| --- | --- |

3. Write a missing addend problem and a subtraction problem with the same numbers.

| total ▭<br>`560` \| `100`<br><br>**a.** 560 + <u>100</u> = 660<br><br>660 – 560 = <u>100</u> | total ▭<br><br>**b.** 200 + _____ = 900<br><br>_____ – _____ = _____ | total ▭<br><br>**c.** _____ + _____ = _____<br><br>750 – 150 = _____ |
| --- | --- | --- |
| total ▭<br><br>**d.** 32 + _____ = 76<br><br>_____ – _____ = _____ | total ▭<br>`29` \| `80`<br><br>**e.** _____ + _____ = _____<br><br>_____ – _____ = _____ | total **260**<br>`120` \|<br><br>**f.** _____ + _____ = _____<br><br>_____ – _____ = _____ |

4. Solve.
   **a.** A basket contains 26 vegetables: 6 carrots, 10 radishes, and _____ tomatoes.

   **b.** Mom took 8 potatoes from a bowl, and now there are 16 left.
   How many potatoes were in the bowl?

   **c.** In a bouquet of 36 roses, 15 are white and 10 are red. The rest are yellow.
   How many are yellow?

   **d.** Juan went shopping and used $300. He used $120 for food,
   $70 to buy gasoline, and the rest for buying a bicycle.
   How much did the bicycle cost?

5. Find the difference.

   **a.** 10 and 49          **b.** 400 and 705          **c.** 200 and 650

6. Solve the word problems. You can draw pictures to illustrate them!

**a.** Ryan bought three carpets for $200 <u>each</u>, and one small carpet for $9.

What was Ryan's total bill?


The store owner then gave him a $100 discount (lowered the price by $100).
How much was the bill after the discount?


**b.** A piece of wood is 510 centimeters long.
Brian cut off two pieces, 200 cm each.

How long a piece is left?


**c.** A factory sells 300 car tires in a day.

How many tires do they sell in two days?

How many tires do they sell in three days?

How many days does it take for them to sell at least one thousand tires?


**d.** Anita had 566 stamps. Her aunt gave her 300 new ones for her birthday.
After that she decided to give 100 of her stamps to her brother.

How many stamps does Anita have now?


**e.** A table-and-chairs set costs $100. James bought one of those,
and also a kiddy swimming pool for $50.

What was James' total bill?


He paid with $200. How much money does he have left now?

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# Chapter 9: Measuring
## Introduction

The ninth chapter of the *Math Mammoth Grade 2-B Complete Worktext* covers measuring length, weight, and volume.

The student measures length in inches and half-inches, and learns to measure to the nearest half-inch or to the nearest centimeter. The bigger units—feet, miles, meters, and kilometers—are introduced, but in this grade level the students do not yet study conversions between the units.

The lessons on measuring weight have several activities to do at home using a bathroom scales. The goal is to let students become familiar with pounds and kilograms, and have an idea of how many pounds or kilograms some common things weigh. In order to estimate weight, a child has to know the approximate weights of some objects, and then compare the weight of the unknown object to some known weight. This knowledge is gained through experience.

Similarly, in studying volume, the lessons include many hands-on activities so that the student gets first-hand experience in measuring, and has a basic knowledge of how "big" the units cup, pint, quart, gallon, milliliter, and liter are.

When it comes to measuring, experience is the best teacher. So, encourage your child to use measuring devices (such as a measuring tape, scales, and measuring cups), and to "play" with them. In this way the various measuring units start to become a normal part of his/her life, and are never forgotten.

The concrete activities we do in second grade are laying an important foundation for familiarizing the students with measuring units. In third grade, the study of measuring then turns toward conversions between the different units.

### The Lessons

# Helpful Resources on the Internet

*Use these free online resources to supplement the "bookwork" as you see fit.*

**Measuring Scales**
An interactive scales. You can put weights on it, change the maximum and the interval, and thus show the student how to read the scales.
http://www.rsc-northwest.ac.uk/acl/eMagArchive/RSCeMag0910/FunctionalSkillsResources/measuring_scales.html

**Scales Reader**
Practice reading the scales in grams and/or kilograms.
http://www.ictgames.com/weight.html

**Measure It!**
Click on the ruler to measure a red bar.
http://www.funbrain.com/measure/index.html

**Reading Scales**
Helps teachers to illustrate a variety of measuring devices and how to read them.
http://www.teacherled.com/2009/02/18/reading-scales-2/

**Measurements**
Online lessons with interactive exercises on metric prefixes, symbols, number values, metric mass, length, volume, US length and volume, and temperature conversions.
http://www.aaamath.com/B/mea.htm

**Reading a tape measure worksheets**
Worksheet generator - you can choose to hat accuracy to measure - inches, or inches & feet.
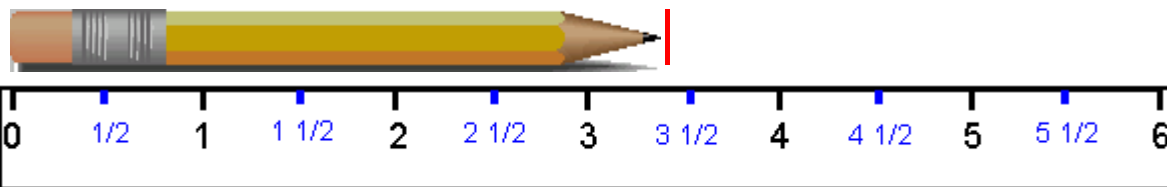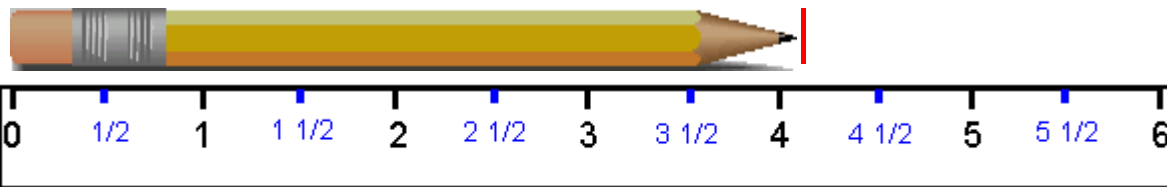http://themathworksheetsite.com/read_tape.html

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# Measuring to the Nearest Half-Inch

1. Circle the whole-inch or half-inch number that is nearest to each arrow.

| 0 | 1/2 | 1 | 1 1/2 | 2 | 2 1/2 | 3 | 3 1/2 | 4 | 4 1/2 | 5 | 5 1/2 | 6 |
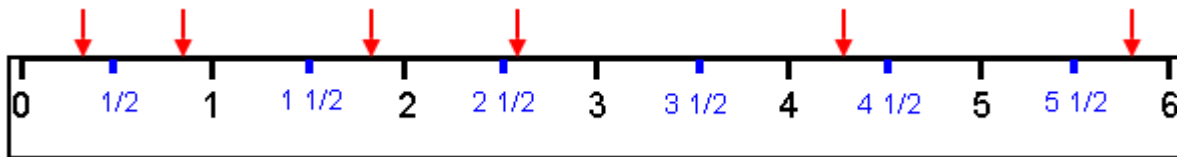
Most objects are NOT exactly a certain number of whole inches, or even whole and half inches. You can measure them to the nearest inch, or to the nearest half-inch.

The pencil below is a little over 4 inches long. It is *about* 4 inches long.

| 0 | 1/2 | 1 | 1 1/2 | 2 | 2 1/2 | 3 | 3 1/2 | 4 | 4 1/2 | 5 | 5 1/2 | 6 |

| 0 | 1/2 | 1 | 1 1/2 | 2 | 2 1/2 | 3 | 3 1/2 | 4 | 4 1/2 | 5 | 5 1/2 | 6 |

The pencil above is about 3 1/2 inches long.
The red line showing the end of the pencil is closer to 3 1/2 than to 3.

2. Measure the pencils to the nearest half-inch.

**a.** about _____ inches

| 0 | 1/2 | 1 | 1 1/2 | 2 | 2 1/2 | 3 | 3 1/2 | 4 | 4 1/2 | 5 | 5 1/2 | 6 |

**b.** about _____ inches

| 0 | 1/2 | 1 | 1 1/2 | 2 | 2 1/2 | 3 | 3 1/2 | 4 | 4 1/2 | 5 | 5 1/2 | 6 |

**c.** about _____ in.

| 0 | 1/2 | 1 | 1 1/2 | 2 | 2 1/2 | 3 | 3 1/2 | 4 | 4 1/2 | 5 | 5 1/2 | 6 |

**d.** about _____ in.

| 0 | 1/2 | 1 | 1 1/2 | 2 | 2 1/2 | 3 | 3 1/2 | 4 | 4 1/2 | 5 | 5 1/2 | 6 |
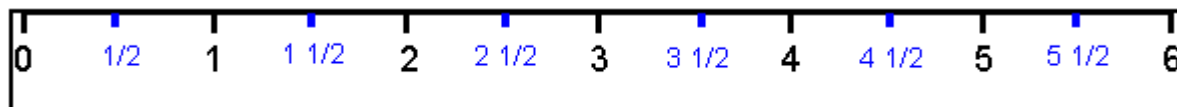
3. Find some small objects and measure how long or how tall they are. Write your results
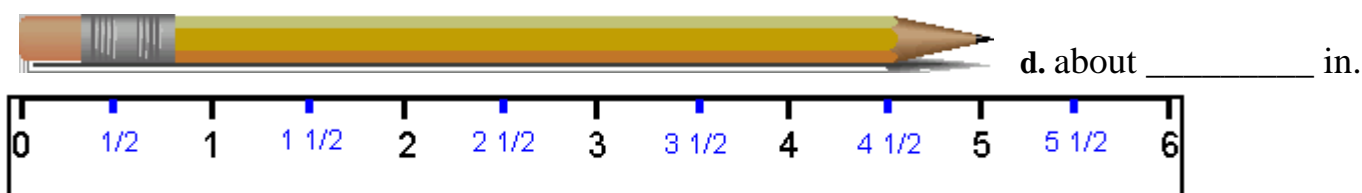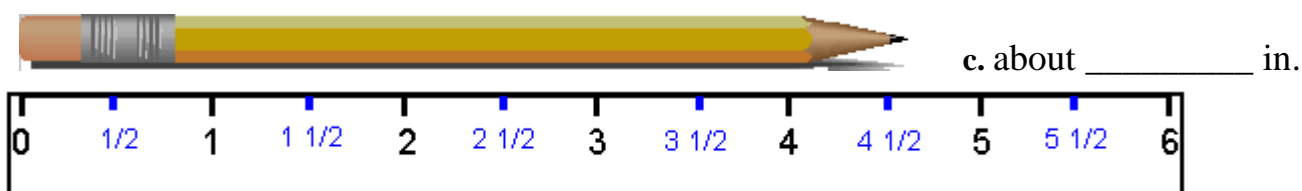   in the table. If the item is not exactly so-many inches or half-inches long, then measure
   it to the nearest whole or half-inch, and write "about" before your inch-number.
   For example: *about 8 inches.*

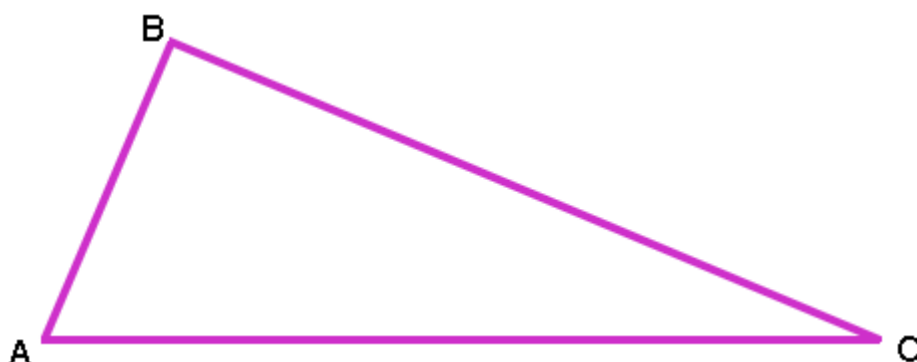| Item | How long |
|------|----------|
|      |          |
|      |          |
|      |          |
|      |          |
|      |          |

4. Measure all the sides of this triangle to the nearest half-inch.
   Find also the *perimeter* (all the way around the triangle).

Side AB _____ in.

Side BC _____ in.

Side CA _____ in.

Perimeter _____ in.

94

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# Chapter 10: Adding and Subtracting in Columns
## Introduction

The tenth chapter of the *Math Mammoth Grade 2-B Complete Worktext* deals with addition and subtraction in columns using three-digit numbers.

In the first lesson, the student adds three-digit numbers, carrying to tens when it is necessary. The next lesson is about the situation when there are more than ten tens, so carrying to hundreds is necessary. This is first illustrated with pictures, and then practice problems follow.

In the third lesson, the student carries two times - both to tens and to hundreds. The pictures in the beginning of the lesson show ten ones grouped to form a new ten, and 10 tens grouped to form a new hundred. Please spend some time studying with these pictures. There are two processes happening in the same situation.

Next comes subtracting in columns. In the first lesson, *Subtracting in Columns*, the student borrows one time per problem - either from the tens or from the hundreds. The pictures show how a ten is broken into ten ones or how a hundred is broken into 10 tens.

The concept of borrowing two times can be a bit tricky. This is studied more in third grade.

Lastly, the chapter includes a lesson in adding money amounts, which is probably easy after the previous addition practice.


## The Lessons

# Helpful Resources on the Internet

*Use these free online resources to supplement the "bookwork" as you see fit.*

**Base Blocks Addition**
A virtual manipulative that shows regrouping in addition. You can either solve addition problems that are provided, or create your own. "Lasso" with a mouse ten units, ten tens, or ten hundreds to regroup them. Choose "Columns = 3" to restrict the work to three-digit numbers.
http://nlvm.usu.edu/en/nav/frames_asid_154_g_1_t_1.html?from=category_g_1_t_1.html

**Base Blocks Subtraction**
A virtual manipulative that helps teach borrowing in subtraction. Choose "Create Problem", then click on the red and blue blocks to create a problem. The number to be subtracted (the subtrahend) is illustrated by the RED blocks whereas the minuend is by the BLUE blocks. Click BEGIN problem to start solving. Drag a red block on top of a blue to "subtract" —they cancel each other. Drag bigger place values to the column on their right to "break them up"—in other words regroup or borrow. Choose "Columns = 3" to restrict the work to three-digit numbers.
http://nlvm.usu.edu/en/nav/frames_asid_155_g_1_t_1.html?from=category_g_1_t_1.html

**Regrouping in vertical addition**
Shows hundreds, tens, ones as pictures, and asks you to regroup if needed.
http://www.harcourtschool.com/justforkids/math/elab/samplepages/g3a02.htm

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# Regrouping in Subtraction

If you can't subtract in the ones column, you "break down" one ten into ten ones. (You **regroup** one ten as ten ones - also called borrowing a ten.) If you don't have enough *tens*, the process is similar. Study the pictures.

## 365 – 229 = ?

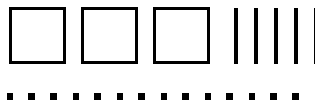We can't cross out nine ones because there are only five ones.
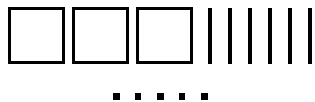
**365**

→

Regroup ("break down") one ten as 10 ones. Now we can subtract! Cross out 2 hundreds, 2 tens and 9 ones.
What is left? _____

**3 hundreds + 5 tens + 15**

$$
\begin{array}{ccc}
h & t & o \\
 & 5 & 15 \\
3 & \cancel{6} & \cancel{5} \\
-\ 2 & 2 & 9 \\
\hline
1 & 3 & 6 \\
\end{array}
$$

Regroup one ten as 10 ones.

## 320 – 170 = ?

We can't cross out seven ten-sticks because there are only two tens.

**320**

→

Regroup ("break down") one hundred as 10 tens. Now we can subtract! Cross out 1 hundred and 7 tens.
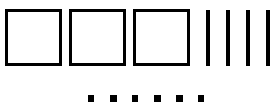What is left? _____

**2 hundreds + 12 tens**

$$
\begin{array}{ccc}
2 & 12 & \\
\cancel{3} & \cancel{2} & 0 \\
-\ 1 & 7 & 0 \\
\hline
1 & 5 & 0 \\
\end{array}
$$

Regroup one hundred as 10 tens.

## 346 – 152 = ?

We can't cross out five ten-sticks because there are only four tens.

**346**

→

Regroup ("break down") one hundred as 10 tens. Now we can subtract! Cross out 1 hundred, 5 tens, and 2 ones. What is left? _____
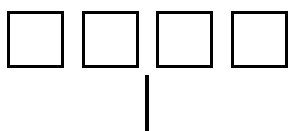
**2 hundreds + 14 tens + 6**

$$
\begin{array}{ccc}
2 & 14 & \\
\cancel{3} & \cancel{4} & 6 \\
-\ 1 & 5 & 2 \\
\hline
\end{array}
$$

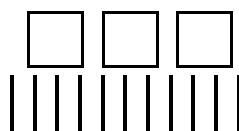Regroup one hundred as 10 tens.

1. Fill in. Draw squares, sticks and dots. Break down the minuend (the number you
   subtract from) as needed. Cross out what is subtracted.

**a.** Cross out 90
First break down one hundred into 10 tens.

→

410        →        3 hundreds  11 tens

$$\begin{array}{r} 4\ \ 1\ \ 0 \\ -\ \ \ \ 9\ \ 0 \\ \hline \end{array}$$

**b.** Cross out 170
First break down one hundred into 10 tens.

→
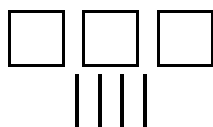
340        →        __ hundreds ___ tens

$$\begin{array}{r} 3\ \ 4\ \ 0 \\ -\ 1\ \ 7\ \ 0 \\ \hline \end{array}$$

**c.** Cross out 280

→
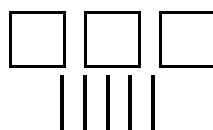
350        →        __ hundreds ___ tens

$$\begin{array}{r} 3\ \ 5\ \ 0 \\ -\ 2\ \ 8\ \ 0 \\ \hline \end{array}$$

**d.** Cross out 286

→

457        →        __ hundreds ___ tens ___ ones

$$\begin{array}{r} 4\ \ 5\ \ 7 \\ -\ 2\ \ 8\ \ 6 \\ \hline \end{array}$$

**e.** Cross out 164

→

326        →        __ hundreds ___ tens ___ ones

$$\begin{array}{r} 3\ \ 2\ \ 6 \\ -\ 1\ \ 6\ \ 4 \\ \hline \end{array}$$

125

2. Subtract.

| a.    9 0 6 <br> –     4 6 | b.    5 9 9 <br> – 2 2 5 | c.    4 1 4 <br> – 3 2 2 | d.    7 7 3 <br> – 5 3 6 |
|---|---|---|---|
| e.    6 7 0 <br> – 2 2 6 | f.    7 0 8 <br> – 1 5 6 | g.    5 6 0 <br> – 3 4 1 | h.    7 4 8 <br> – 3 7 6 |
| i.    9 7 3 <br> – 6 4 6 | j.    9 0 7 <br> – 5 7 6 | k.    5 1 1 <br> – 2 5 0 | l.    7 5 7 <br> – 3 8 4 |

3. Continue the patterns.

| a. | b. | d. |
|---|---|---|
| 120 + 120 = 240 | 230 + 230 = 460 | 1 + 119 = 120 |
| 121 + _____ = 240 | 235 + _____ = 460 | 2 + _____ = 120 |
| 122 + _____ = 240 | 240 + _____ = 460 | 3 + _____ = 120 |
| _____ + _____ = 240 | _____ + _____ = 460 | _____ + _____ = 120 |
| _____ + _____ = 240 | _____ + _____ = 460 | _____ + _____ = 120 |
| _____ + _____ = 240 | _____ + _____ = 460 | _____ + _____ = 120 |
| _____ + _____ = 240 | _____ + _____ = 460 | _____ + _____ = 120 |
| _____ + _____ = 240 | _____ + _____ = 460 | _____ + _____ = 120 |
| How long can you continue this pattern? | How long can you continue this pattern? | How long can you continue this pattern? |

4. Solve the problems.

**a.** There are 365 days in one year. How many days are there in two years?

In three years?

**b.** Max read two books in a week. The first book had 237 pages, and the second book had 156. What was the total number of pages Max read that week?

**c.** There are 207 school days in one year. How many school days are there in two years?

**d.** Mike is on page 235 of his book. The book has 518 pages. How many pages does he still have to read?

**e.** Middletown is in between Easttown and Westtown. From Easttown to Westtown is 425 km. From Easttown to Middletown is 173 km.

Draw dots for the three cities, and mark the distances in it.

How long is it from Middletown to Westtown?

**f.** Jack's family is driving from Easttown to Middletown. The car's odometer shows they have driven 69 kilometers. How far do they still have to go?

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# Chapter 11: Exploring Multiplication
## Introduction

The eleventh and last chapter of the *Math Mammoth Grade 2-B worktext* covers the concept of multiplication, its connection with repeated addition and some easy multiplication practice.

The lessons here are self-explanatory. The student first learns the meaning of multiplication as "many times the same size group". Then there is practice writing multiplication as repeated addition and vice versa. Number line jumps are another way to illustrate multiplication.

The actual study and memorization of the multiplication tables is in the third grade. However, you can certainly help your child to notice the patterns in the easy tables of 2, 5, and 10, and encourage their memorization.

If the time allows and the child is receptive, you can study multiplication tables even further at this time.

## The Lessons

# Helpful Resources on the Internet

*Use these free online resources to supplement the "bookwork" as you see fit.*

**Math Dice Game for Addition and Multiplication**
Instructions for three simple games with dice; one to learn the concept of multiplication, another to practice the times tables, and one more for addition facts.
http://www.teachingwithtlc.blogspot.com/2007/09/math-dice-games-for-addition-and.html

**Explore the Multiplication Table**
This applet visualizes multiplication as a rectangle.
http://www.mathcats.com/explore/multiplicationtable.html

**Multiple Counting Practice**
Click on the numbers on the grid to skip count.
http://www.hsuppappserv.com/multiplecounting/multiplecounting/

**Multiplication Memory Game**
Click on corresponding pairs (problem-answer).
http://www.dositey.com/addsub/memorymult.html

**Multiplication Mystery**
Drag the answer tiles to the right places in the grid as they are given, and a picture is revealed
http://www.harcourtschool.com/activity/mult/mult.html

**Multiplication.com Interactive Games**
A bunch of online games just for the times tables.
http://www.multiplication.com/interactive_games.htm
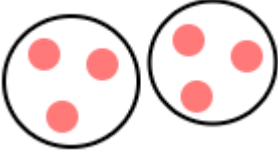
# Many Times the Same Group
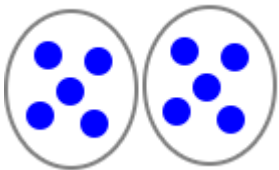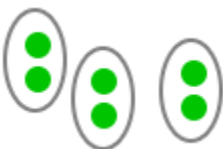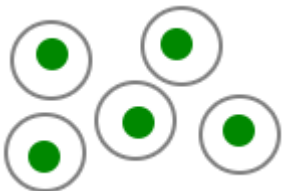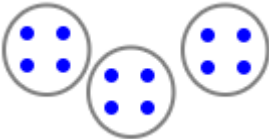
1. Write.

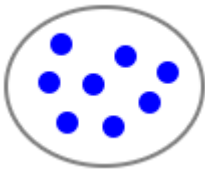| | | |
|---|---|---|
| **a.** 2 times the word "CAT" | **b.** 3 times the word "ME" | **c.** 5 times the word "YOU" |
| **d.** 0 times the word "FROG" | **e.** 4 times the word "SCHOOL" | **f.** 1 time the word "HERE" |

2. Draw groups of balls.

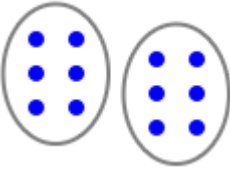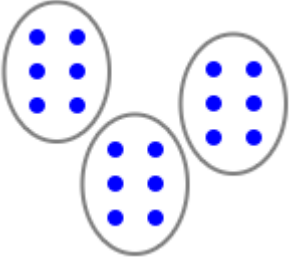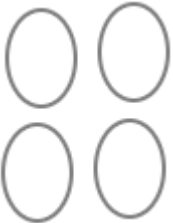| | | |
|---|---|---|
| **a.** 2 times a group of 3 balls | **b.** 3 times a group of 5 balls | **c.** 1 time a group of 7 balls |
| **d.** 4 times a group of 1 balls | **e.** 0 times a group of 2 balls | **f.** 3 times a group of 3 balls |
| **g.** 0 times a group of 8 balls | **h.** 4 times a group of 0 balls | **i.** 5 time a group of 2 balls |

3. Fill in the missing parts.
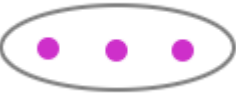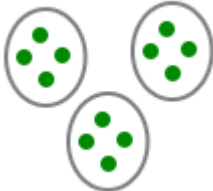
**a.** _2_ times _5_

**b.** _____ times _____

**c.** _____ times _____

**d.** _____ times _____

**e.** _____ times _____

**f.** _____ times _____

| $5 \times 3$ | $2 \times 7$ |
|---|---|
| This means "5 times a group of 3." | This means "2 times a group of 7." |
| It is called **multiplication**. | You *multiply* 2 times 7. |

4. Now it's your turn to draw! Notice also the symbol $\times$ which is read "times."

**a.** 2 times 4
$2 \times 4$

**b.** 3 times 6
$3 \times 6$

**c.** 1 times 7
$1 \times 7$

**d.** 6 times 1
$6 \times 1$

**e.** 4 times 0
$4 \times 0$

**f.** 2 times 2
$2 \times 2$

5. Write the multiplication sentence. Write the total after the " = " sign.

**a.**

$2 \times 6 = 12$

**b.**

_____ × _____ = _____

**c.**

_____ × _____ = _____

**d.**

_____ × _____ = _____

**e.**

_____ × _____ = _____

**f.**

_____ × _____ = _____

6. Draw the groups. Write the total.

**a.** $8 \times 1 = $ _____

**b.** $1 \times 10 = $ _____

**c.** $2 \times 2 = $ _____

**d.** $5 \times 2 = $ _____

**e.** $2 \times 8 = $ _____

**f.** $3 \times 3 = $ _____