

math

# MAMMOTH

## Grade 2-A Worktext

**S**ome review, even and odd numbers, and doubling

**R**eading the clock

**A**ddition and subtraction facts within 18

**A**dding two-digit numbers

**G**eometry and fractions



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EDITION 7/2016

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# Foreword

Math Mammoth Grade 2-A and Grade 2-B worktexts comprise a complete math curriculum for the second grade mathematics studies. This curriculum is aligned to the Common Core standards. The four main areas of study for second grade are:

1. Understanding of the base-ten system within 1000. This includes place value with three-digit numbers, skip-counting in fives, tens, and multiples of hundreds, tens, and ones (within 1000). (chapters 6 and 8);
2. Develop fluency with addition and subtraction within 100, including solving word problems, regrouping in addition, and regrouping in subtraction (chapters 1, 3, 4, and 8);
3. Using standard units of measure (chapter 7);
4. Describing and analyzing shapes (chapter 5).

Additional topics we study are time (chapter 2), money (chapter 9), introduction to multiplication (chapter 10), and bar graphs and picture graphs (in various chapters).

This book, 2-A, covers reading the clock (chapter 2), the basic addition and subtraction facts within 18 (chapter 3), regrouping in addition (chapter 4), and geometry (chapter 5). The rest of the topics are covered in the 2-B student worktext.

When you use these two books as your only or main mathematics curriculum, they are like a “framework,” but you still have a lot of liberty in planning your child's studies. While addition and subtraction topics are best studied in the order they are presented, feel free to go through the geometry, clock, and money sections in a different order. For the chapter on measuring, the child should be familiar with three-digit numbers.

This might even be advisable if your child is “stuck” on some concept, or is getting bored. Sometimes the brain “mulls it over” in the background, and the concept he/she was stuck on can become clear after a break.

Math Mammoth aims to concentrate on a few major topics at a time, and study them in depth. This is totally opposite to the continually 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 would not need 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, the download version includes 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 simply reprint some already studied pages. Also, chapter 3, which practices addition and subtraction facts within 18, contains a lot of pages with problems, so you can choose to “save” some of them for later review.

*I wish you success in teaching math!*

*Maria Miller, the author*

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# Chapter 1: Some Old, Some New

## Introduction

The first chapter of the *Math Mammoth Grade 2* contains some review, and some new topics.

In the first two lessons, we review adding and subtracting two-digit numbers from first grade. Then students get to review skip-counting using the 100-chart.

Next, the lesson Fact Families reviews the connection between addition and subtraction, and introduces a new strategy for missing subtrahend problems (of the type  $\_\_ - 5 = 4$ ). In these problems, the student can *add* to find the missing total. This actually teaches them algebraic thinking.

Then we go on to the “new”, starting with ordinal numbers, which are probably familiar from common language. Then, in the lesson Subtracting Whole Tens students subtract *mentally* any number of whole tens from a two-digit number, such as  $72 - 40$ .

Even and odd numbers are presented in the context of equal sharing: if you can share that many objects evenly (equally), then the number is even. Children may need to use manipulatives to grasp this idea.

Then we study doubling and halving. Don't skip the simple word problems included in these lessons—they are very important. Students need to learn to apply the concepts they have just learned. Also, if the student cannot solve simple word problems that involve doubling or halving, there is a good chance he/she did not actually learn those concepts.

### The Lessons in Chapter 1

	page	span
Some Review .....	9	2 pages
The 100-Chart and More Review .....	11	3 pages
Fact Families .....	14	2 pages
Ordinal Numbers .....	16	2 pages
Even and Odd Numbers .....	18	2 pages
Doubling .....	20	3 pages
One-Half .....	23	2 pages
Adding with Whole Tens .....	25	3 pages
Subtracting Whole Tens .....	28	2 pages
Review .....	30	2 pages

## Helpful Resources on the Internet

Use these free online resources to supplement the “bookwork” as you see fit.

### Balloon Rise - Empire State Monument

Help the hot-air balloons rise to the top of the Empire State Monument while counting by 5s.

<http://www.free-training-tutorial.com/skip-counting/skip-counting-by-fives-empire-state.html>

### Grab the Fact

Help the turtle jump across by identifying the missing fact for a given fact family.

<http://www.turtlediary.com/game/fact-families.html>

### More Fact Families

Enter the fact family for the numbers shown.

<http://www.gameclassroom.com/game/43857-3175/addition-facts-20/more-fact-families>

### 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>

### Fruit Shoot

Shoot a fruit with an even or odd number, whichever one your aim tells you.

[http://www.sheppardsoftware.com/mathgames/earlymath/Fruit\\_shoot\\_odd\\_even.htm](http://www.sheppardsoftware.com/mathgames/earlymath/Fruit_shoot_odd_even.htm)

### Doorway Odd and Even - Five Activities

Choose from five different activities to practice the concept of odd and even.

<http://www.doorwayonline.org.uk/number/oddandeven/>

### Doubles Cards 1

Choose the double for each number.

<http://www.ictgames.com/woodseasy.html>

### Fruit Splat Addition - Skill Builders

Practice adding doubles and near doubles.

[http://www.sheppardsoftware.com/mathgames/fruitshoot/FS\\_addition.htm](http://www.sheppardsoftware.com/mathgames/fruitshoot/FS_addition.htm)

### Doubling and Halving Practice Zone

Practice doubling and halving with a timed quiz.

<http://www.math-salamanders.com/doubling-and-halving.html>

### Best Math Friends Word Problem Game

“Friend” different animals by validating or invalidating the answers to basic word problems.

<http://mrnussbaum.com/bmf-word-problem-game/>

### Add Like Mad

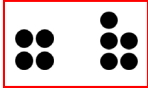
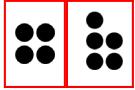
Click on the squares to add the numbers so that they add up to the target number.

[http://www.sheppardsoftware.com/mathgames/Add%20Like%20Mad%20Math/AddLikeMad\\_easy.htm](http://www.sheppardsoftware.com/mathgames/Add%20Like%20Mad%20Math/AddLikeMad_easy.htm)








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# Fact Families

<p>When two addition and two subtraction facts use the same numbers, it is called a “<i>fact family</i>.”</p>		
<p>Sometimes in a subtraction problem, the <i>total</i> is asked:</p> $\square - 8 = 20$ <p>You know 20 and 8 are the “parts,” and the total is missing. To find the total, just add the “parts”:</p> $20 + 8 = \underline{28}$	<p>4 + 5 = <span style="border: 1px solid pink; padding: 2px;">9</span></p> <p>5 + 4 = <span style="border: 1px solid pink; padding: 2px;">9</span></p> <p><span style="border: 1px solid pink; padding: 2px;">9</span> - 5 = 4</p> <p><span style="border: 1px solid pink; padding: 2px;">9</span> - 4 = 5</p> <p>Notice the TOTAL. The subtraction sentences <i>start</i> with the total.</p>	<p><span style="background-color: yellow; padding: 2px;">4</span> + <span style="background-color: yellow; padding: 2px;">5</span> = 9</p> <p><span style="background-color: yellow; padding: 2px;">5</span> + <span style="background-color: yellow; padding: 2px;">4</span> = 9</p> <p>9 - <span style="background-color: yellow; padding: 2px;">5</span> = <span style="background-color: yellow; padding: 2px;">4</span></p> <p>9 - <span style="background-color: yellow; padding: 2px;">4</span> = <span style="background-color: yellow; padding: 2px;">5</span></p> <p>Notice the PARTS. The two parts make up the total.</p>

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

<p>a.  </p> <p>_____ + _____ = _____</p> <p>_____ + _____ = _____</p> <p>_____ - _____ = _____</p> <p>_____ - _____ = _____</p>	<p>b. <span style="border: 1px solid yellow; padding: 2px;">T</span>  </p> <p>_____ + _____ = _____</p> <p>_____ + _____ = _____</p> <p>_____ - _____ = _____</p> <p>_____ - _____ = _____</p>	<p>c. <span style="border: 1px solid yellow; padding: 2px;">T</span> <span style="border: 1px solid yellow; padding: 2px;">T</span>  <span style="border: 1px solid yellow; padding: 2px;">T</span> <span style="border: 1px solid yellow; padding: 2px;">T</span></p> <p>_____ + _____ = _____</p> <p>_____ + _____ = _____</p> <p>_____ - _____ = _____</p> <p>_____ - _____ = _____</p>
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2. Fill in the missing numbers. The four problems form a fact family.

<p>a. <math>2 + \square = 8</math></p> <p><math>\square + 2 = 8</math></p> <p><math>8 - 2 = \square</math></p> <p><math>8 - \square = 2</math></p>	<p>b. _____ + _____ = 10</p> <p>_____ + _____ = 10</p> <p><math>10 - 7 = \square</math></p> <p><math>10 - \square = 7</math></p>	<p>c. _____ + _____ = _____</p> <p>_____ + _____ = _____</p> <p><math>9 - \square = 6</math></p> <p>_____ - _____ = _____</p>
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3. Write a matching addition for the subtraction. There are two possibilities.

a. $\underline{\quad} + \underline{\quad} = \underline{\quad}$ $8 - 2 = 6$	b. $\underline{\quad} + \underline{\quad} = \underline{\quad}$ $20 - 7 = 13$	c. $\underline{\quad} + \underline{\quad} = \underline{\quad}$ $60 - 20 = 40$
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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 is like “adding backwards”:

$$\begin{array}{c} \text{Add.} \\ \leftarrow + \\ \boxed{8} - 6 = 2 \end{array}$$

$$\begin{array}{c} \text{Add.} \\ \leftarrow + \\ \boxed{23} - 3 = 20 \end{array}$$

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

a. $\square - 5 = 4$	b. $\square - 7 = 2$	c. $\square - 7 = 10$
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5. Find the missing numbers.

a. $\square - 2 = 4$ $\square - 50 = 50$ $\square - 8 = 20$	b. $\square - 7 = 80$ $60 + 4 = \square$ $16 + \square = 20$	c. $9 - \square = 5$ $77 + \square = 78$ $\square - 9 = 60$
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### 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 *Math Mammoth Grade 2* 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. The child 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 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

	page	span
Review - Whole and Half Hours .....	35	<i>1 page</i>
The Minutes .....	36	<i>3 pages</i>
The Minutes, Part 2 .....	39	<i>2 pages</i>
Past and Till in Five-Minute Intervals .....	41	<i>3 pages</i>
How Many Hours Pass? .....	44	<i>2 pages</i>
The Calendar: Weekdays and Months .....	46	<i>3 pages</i>
The Calendar: Dates .....	49	<i>3 pages</i>
Review 1.....	52	<i>1 page</i>

### Helpful Resources on the Internet

Use these free online resources to supplement the “bookwork” as you see fit.

#### Flashcard Clock

Read the analog and type in the time in digital form.

[http://www.teachingtreasures.com.au/maths/FlashcardClock/flashcard\\_clock.htm](http://www.teachingtreasures.com.au/maths/FlashcardClock/flashcard_clock.htm)

#### 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/ClockWise/>

#### 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.

<http://www.thatquiz.org/tq-g/math/time>

### **Match Digital and Analog Clock**

Match the digital time with the analog time.

<http://www.turtlediary.com/game/match-digital-and-analog-clock.html>

### **Under the Sea**

Practice time and calendar topics. Finish all the topics to unlock a treasure!

<http://www.learnalberta.ca/content/me3usa/flash/index.html?goLesson=13>

### **On Time**

Set the clock's hands to the given time. Four different levels.

[http://www.sheppardsoftware.com/mathgames/earlymath/on\\_time\\_game1.htm](http://www.sheppardsoftware.com/mathgames/earlymath/on_time_game1.htm)

### **Clock Shoot**

A game where you need to click on the clock with the matching time (analog/digital). Three different levels: whole hours, half hours, or quarter hours.

[http://www.sheppardsoftware.com/mathgames/earlymath/clock\\_shoot.htm](http://www.sheppardsoftware.com/mathgames/earlymath/clock_shoot.htm)

### **Crazy Clock**

A matching game for two players where you match the analog time given by the clock to a digital time given by cards, but as in a normal matching game, you need to click on a card to flip it and see the digital time.

<http://www.counton.org/games/crazy-clock/index.html>

### **Parking Time**

Steer the car into the parking place that shows the correct time.

<http://www.mathnook.com/math/parking-time.html>

### **Matching Pairs Time**

Match analogue to analogue, analogue to digital, analogue to words, or digital to words. Choose “5 minute intervals” for this game.

<http://www.topmarks.co.uk/Flash.aspx?f=matchingpairstimev3>

### **Telling the Time in Words**

This page contains several activities to practice telling time, including word problems, worksheets, and a timetable.

[http://mathsframe.co.uk/en/resources/resource/117/telling\\_the\\_time\\_in\\_words](http://mathsframe.co.uk/en/resources/resource/117/telling_the_time_in_words)

### **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>

## **ELAPSED TIME**

### **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.

<http://www.teacherled.com/2008/10/05/elapsed-time-line/>

### **Elapsed Time Worksheets**

Generate printable worksheets for elapsed time. You can practice the elapsed time, finding the starting time, or finding the ending time. The time interval can be to the accuracy of 1 minute, 5 minutes, 10 minutes, 15 minutes, 30 minutes, or whole hours.

<http://www.mathnook.com/elapsedtimegen.html>

## **CALENDAR**

### **Days of the Week**

This page has a lesson on the days of the week, plus 3 practice exercises to reinforce the topic.

<http://www.turtlediary.com/game/days-of-the-week.html>

### **Months of the Year**

Learn about the months of the year in this interactive lesson, and practice with simple exercises to recall the names and order of the months

<http://www.turtlediary.com/game/months-of-the-year.html>

### **Calendar Clowns**

Answer questions about the calendar by clicking on the correct date.

<http://mrnussbaum.com/calendarclowns/>

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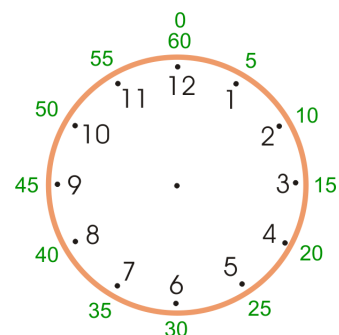


# The Minutes

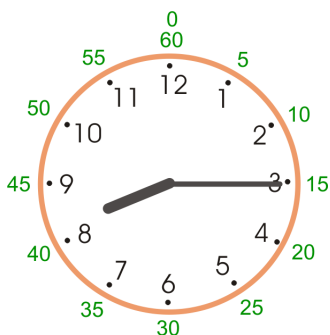
When the hour hand moves from one number to the next (from 1 to 2, or from 6 to 7, etc.), it takes one hour to do that.

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.

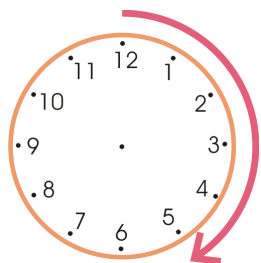


The hour hand is past 2.  
The minute hand is at 25.  
The time is 2:25.

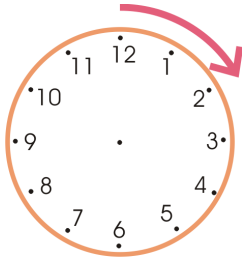


The hour hand is past 11.  
The minute hand is at 10.  
The time is 11:10.

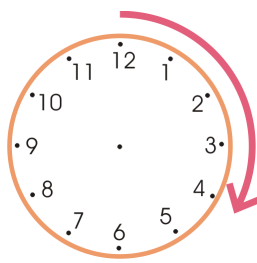
1. The arrow shows how much the minute hand travels. How many minutes pass?



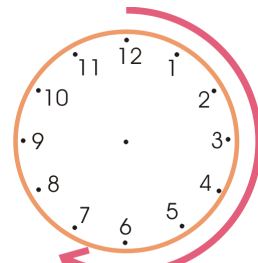
a. \_\_\_\_\_ minutes



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

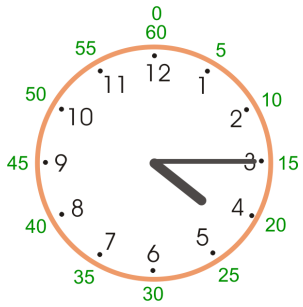
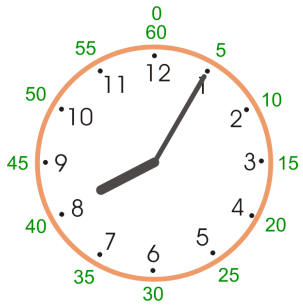


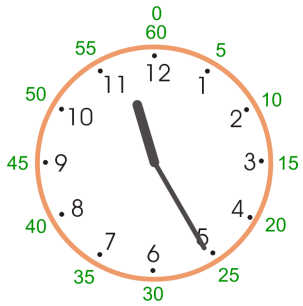
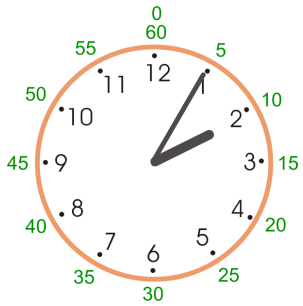
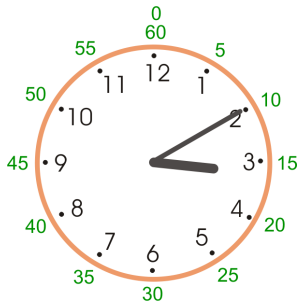
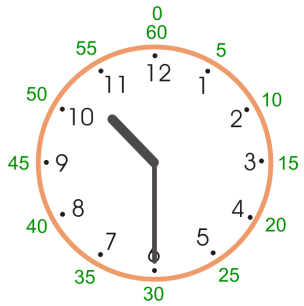


c. \_\_\_\_\_ minutes

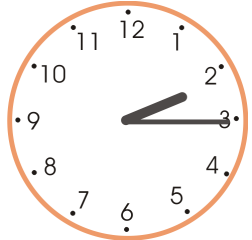
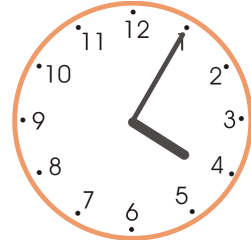

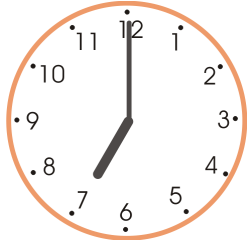
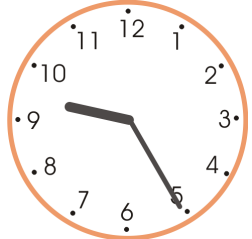

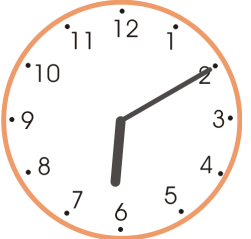
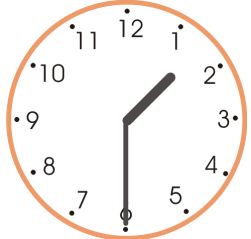


d. \_\_\_\_\_ minutes

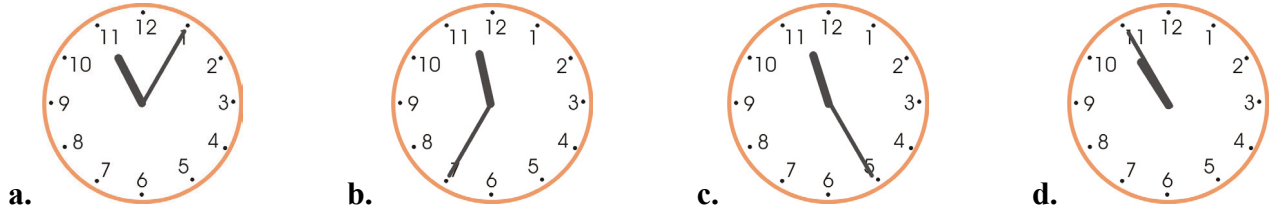
2. Write the time. This special clock shows the numbers for hours *and* for minutes.

 <p><b>a.</b> _____ : _____</p>	 <p><b>b.</b> _____ : _____</p>	 <p><b>c.</b> _____ : _____</p>	 <p><b>d.</b> _____ : _____</p>
 <p><b>e.</b> _____ : _____</p>	 <p><b>f.</b> _____ : _____</p>	 <p><b>g.</b> _____ : _____</p>	 <p><b>h.</b> _____ : _____</p>


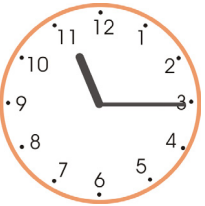
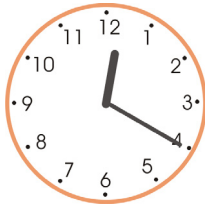
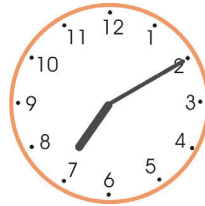
3. Write the time using the normal clock. Remember, the numbers for the minute hand are not shown, and they go by fives!

 <p><b>a.</b> _____ : _____</p>	 <p><b>b.</b> _____ : _____</p>	 <p><b>c.</b> _____ : _____</p>	 <p><b>d.</b> _____ : _____</p>
 <p><b>e.</b> _____ : _____</p>	 <p><b>f.</b> _____ : _____</p>	 <p><b>g.</b> _____ : _____</p>	 <p><b>h.</b> _____ : _____</p>

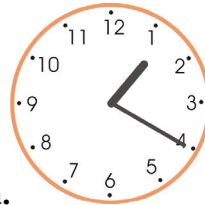
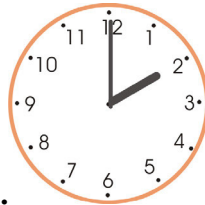
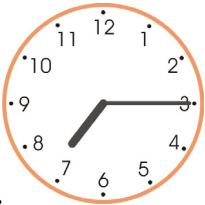
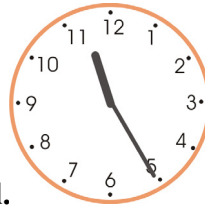

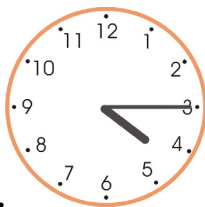
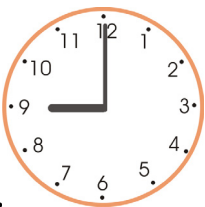

4. Find the clock that shows 11:25 and the clock that shows 11:05.



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 *Math Mammoth Grade 2* provides lots of practice for learning and memorizing the basic addition and subtraction facts of single-digit numbers where the answer is between 10 and 18.

This chapter includes lots of repetition, drill, and practice. Therefore, you are welcome to mix the lessons from this chapter with some geometry, place value, clock, or measuring, in order to prevent boredom. The goal is to memorize these facts, or at least become so fluent with them that an outsider cannot tell if the student remembers the answer or uses some mental math strategy to get the answer.

Some children will accomplish this quicker, needing less practice. Some will need more practice. You can also add in some internet-based games (a list of online games is provided below).

Learning addition and subtraction facts is very important for later study. For example, we will soon study regrouping (carrying/borrowing) in addition and in subtraction, which requires that the student be able to recall all the sums of single-digit numbers and corresponding subtraction facts efficiently and fluently.

We will start the chapter by reviewing how to complete the next whole ten. This concept is very important. For example, what number do you add to 23 to get 30? As an equation, we write:  
 $23 + \underline{\quad} = 30$ .

In the next lesson, we study sums that go over ten, doing these sums in two parts. For example, in the sum  $9 + 7$ , the child first completes 10 by adding  $9 + 1$ . Then, the child adds the rest, or 6, to 10. Learning this prepares the child for addition facts where the sum is more than 10.

The next lessons, *Adding with 9*, *Adding with 8*, *Adding with 7*, and *Adding with 6*, provide lots of practice for learning and memorizing the basic 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 study subtraction. First, the child subtracts to ten. This means subtracting from 14, 15, 16, etc. so that the answer is 10, for example  $16 - \underline{\quad} = 10$ . In the next step, we study subtractions with an answer less than 10, such as  $16 - 7$ . The student practices these by subtracting in two parts: First subtracting to ten, then the rest. For example,  $16 - 7$  becomes  $16 - 6 - 1$ , or  $14 - 6$  becomes  $14 - 4 - 2$ .

The last part of this chapter includes various lessons titled *Number Rainbows* and *Fact Families with ...*, which give lots of practice and reinforcement for the basic addition and subtraction facts. These lessons also include many word problems. They emphasize the connection between addition and subtraction to solve basic subtraction facts such as  $13 - 8$  or  $15 - 6$ . Alongside them, you can also use games or flashcards to reinforce the learning of the facts.

Please see also my videos at [http://www.youtube.com/watch?v=XSVlrkBf\\_Ns](http://www.youtube.com/watch?v=XSVlrkBf_Ns) and <http://www.youtube.com/watch?v=jdIzuGPRhRQ> (Or go to [www.youtube.com/mathmammoth](http://www.youtube.com/mathmammoth) and find the videos about addition and subtraction facts). These two videos explain several strategies for learning addition and subtraction facts, many of which are studied in this chapter.

## The Lessons in Chapter 3

	page	span
Review: Completing the Next Whole Ten .....	57	2 pages
Review: Going Over Ten .....	59	2 pages
Adding with 9 .....	61	2 pages
Adding with 8 .....	63	2 pages
Adding with 7 .....	65	2 pages
Adding with 6 .....	67	2 pages
Review—Facts with 6, 7, and 8 .....	69	2 pages
Subtract to Ten .....	71	2 pages
Difference and How Many More .....	73	3 pages
Number Rainbows—11 and 12 .....	76	2 pages
Fact Families with 11 .....	78	1 page
Fact Families with 12 .....	79	2 pages
Number Rainbows—13 and 14 .....	81	1 page
Fact Families with 13 and 14 .....	82	3 pages
Fact Families with 15 .....	85	2 pages
Fact Families with 16 .....	87	2 pages
Fact Families with 17 and 18 .....	89	3 pages
Mixed Review .....	91	2 pages
Review .....	93	3 pages

## Helpful Resources on the Internet

Use these free online resources to supplement the “bookwork” as you see fit.

### Video: Strategies for Subtraction Facts

Maria's own video that shows how to use fact families in order to facilitate the learning and memorization of the basic subtraction facts.

[http://www.youtube.com/watch?v=XSVlrkBf\\_Ns](http://www.youtube.com/watch?v=XSVlrkBf_Ns)

### Video: Strategies for Addition Facts

Maria's own video which lists several strategies to learn the basic addition facts, including the 9-trick, the 8-trick, the doubles, and doubles plus one more.

<http://www.youtube.com/watch?v=jdIzuGPRhRQ>

### 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 in the oval, and press the red button. Then type the rest that the shuttle needs to go in the other oval, and press the red button.

<http://www.ictgames.com/bridging.html>

### **Addition Surprise**

Draw the answer square in the addition table.

<http://www.hbschool.com/activity/add/add.html>

### **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>

### **Catch the Stars**

Catch the stars that add up to the number on the bucket. Click on the bucket to change the number. Don't let any of the stars fall away! You have all of the answers in your bucket.

<http://www.sheppardsoftware.com/mathgames/catchthestars/addition/catchthestarsAdd9.htm>

### **Penguin Party Addition**

Feed a fish to the penguin that has the correct answer to the addition problem. Choose level four.

[http://www.sheppardsoftware.com/mathgames/popup/popup\\_addition.htm](http://www.sheppardsoftware.com/mathgames/popup/popup_addition.htm)

### **Car Wash Addition**

Wash cars while practicing addition facts. Then, participate in a race!

<http://www.multiplication.com/games/play/car-wash-addition>

### **Bugabaloo Shoes**

How many shoes do the bugs have? This game practices basic addition facts.

<http://www.sheppardsoftware.com/mathgames/earlymath/bugabalooShoes.htm>

### **Math Downhill Slalom**

Win a gold medal by skiing through and around the correct flags.

<http://mrnussbaum.com/slalom/>

### **Number Line Jump Maker**

Illustrate jumps on the number line with this interactive tool.

<http://www.ictgames.com/numberlineJumpMaker/>

### **Digit Drop**

Drop the blocks into the empty slots to complete the subtraction sentences. Choose “Subtraction” and the level “Hard”.

<http://www.mathnook.com/math/digitdrop.html>

### **Math Lines**

Practice adding in this fun game. First, choose which number you want to practice. Then, shoot the numbered marble from the cannon into a numbered marble such that the numbers total the target number.

<http://www.mathnook.com/math/math-lines-6.html>

### **Number Twins**

First, click on the number that you want to practice. Then, match pairs of balls that add up to that number.

[http://www.sheppardsoftware.com/mathgames/numbertwins/numbertwins\\_add\\_10.htm](http://www.sheppardsoftware.com/mathgames/numbertwins/numbertwins_add_10.htm)

### **Addition Games**

Practice addition facts with these fun games!

<http://www.multiplication.com/games/addition-games>

### **Subtraction Games**

Practice subtraction facts with these fun games!

<http://www.multiplication.com/games/subtraction-games>

### **Left Turn Otto Even and Odd**

Help Otto get the even or odd numbers as required on the top of the screen.

<http://www.mathnook.com/math/left-turn-otto-even-odd.html>

### **Aplus Math Games**

Matho (math and bingo combined), concentration, hidden picture, and Planet Blaster games for the basic operations.

<http://www.aplusmath.com/games/>

### **Tux Math**

A versatile free software for math facts with many options. Includes all operations. You need to shoot falling comets that can damage penguins' igloos.

<http://sourceforge.net/projects/tuxmath>



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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.

1. Add. First, circle the ten.

 <b>a.</b> $8 + 5$ $10 + 3 = \underline{\quad}$	 <b>b.</b> $8 + 4$ $10 + \underline{\quad} = \underline{\quad}$	 <b>c.</b> $8 + \underline{\quad}$ $10 + \underline{\quad} = \underline{\quad}$
 <b>d.</b> $8 + \underline{\quad} =$ $10 + \underline{\quad} = \underline{\quad}$	 <b>e.</b> $8 + \underline{\quad} =$ $10 + \underline{\quad} = \underline{\quad}$	 <b>f.</b> $8 + \underline{\quad} =$ $10 + \underline{\quad} = \underline{\quad}$

$8 + 1 = \square$   
 $8 + 2 = \square$   
 $8 + 3 = \square$   
 $8 + 4 = \square$   
 $8 + 5 = \square$   
 $8 + 6 = \square$   
 $8 + 7 = \square$   
 $8 + 8 = \square$   
 $8 + 9 = \square$

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

$2 + 2 = \underline{\quad}$ $3 + 3 = \underline{\quad}$ $4 + 4 = \underline{\quad}$	$5 + 5 = \underline{\quad}$ $6 + 6 = \underline{\quad}$ $7 + 7 = \underline{\quad}$	$8 + 8 = \underline{\quad}$ $9 + 9 = \underline{\quad}$ $10 + 10 = \underline{\quad}$
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Addition facts with eight. Do not write the answers down, but just practice the sums.

$8 + 0 = \square$	$8 + 5 = \square$	$8 + 8 = \square$	$8 + 9 = \square$
$8 + 3 = \square$	$8 + 7 = \square$	$8 + 1 = \square$	$8 + 4 = \square$
$8 + 10 = \square$	$8 + 1 = \square$	$8 + 6 = \square$	$8 + 2 = \square$

3. Add and fill in what is missing.

a. $8 + 4 = \underline{\quad}$ $8 + 6 = \underline{\quad}$	b. $7 + 8 = \underline{\quad}$ $8 + 5 = \underline{\quad}$	c. $3 + 8 = \underline{\quad}$ $8 + 9 = \underline{\quad}$
d. $8 + \underline{\quad} = 13$ $8 + \underline{\quad} = 15$	e. $8 + \underline{\quad} = 12$ $8 + \underline{\quad} = 16$	f. $\underline{\quad} + 8 = 11$ $\underline{\quad} + 8 = 14$

4. a. Jenny ate 8 strawberries, and Jack ate 5 more than what Jenny did.

How many strawberries did Jack eat?

b. Ashley is 13 years old, and Maryann is 5.

How many years older is Ashley than Maryann?

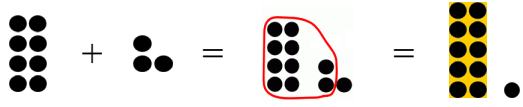
5. Find the patterns and continue them.

a. $8 + 2 = \underline{\quad}$ $8 + 4 = \underline{\quad}$ $8 + 6 = \underline{\quad}$ $8 + \underline{\quad} = \underline{\quad}$ $\underline{\quad} + \underline{\quad} = \underline{\quad}$ $\underline{\quad} + \underline{\quad} = \underline{\quad}$ $\underline{\quad} + \underline{\quad} = \underline{\quad}$	b. $18 + 2 = \underline{\quad}$ $18 + 4 = \underline{\quad}$ $18 + 6 = \underline{\quad}$ $18 + \underline{\quad} = \underline{\quad}$ $\underline{\quad} + \underline{\quad} = \underline{\quad}$ $\underline{\quad} + \underline{\quad} = \underline{\quad}$ $\underline{\quad} + \underline{\quad} = \underline{\quad}$	c. $\frac{1}{2}$ of 0 is $\underline{\quad}$ . $\frac{1}{2}$ of 2 is $\underline{\quad}$ . $\frac{1}{2}$ of 4 is $\underline{\quad}$ . $\frac{1}{2}$ of $\underline{\quad}$ is $\underline{\quad}$ . $\frac{1}{2}$ of $\underline{\quad}$ is $\underline{\quad}$ . $\frac{1}{2}$ of $\underline{\quad}$ is $\underline{\quad}$ . $\frac{1}{2}$ of $\underline{\quad}$ is $\underline{\quad}$ .
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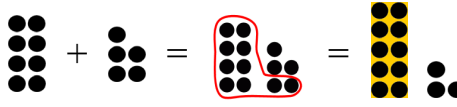
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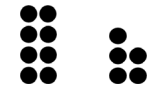
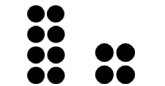
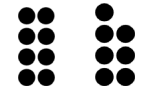
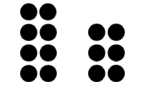
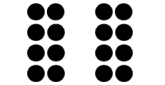
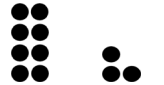
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1. Add. First, circle the ten.

 <b>a.</b> $8 + 5$ $10 + 3 = \underline{\quad}$	 <b>b.</b> $8 + 4$ $10 + \underline{\quad} = \underline{\quad}$	 <b>c.</b> $8 + \underline{\quad}$ $10 + \underline{\quad} = \underline{\quad}$
 <b>d.</b> $8 + \underline{\quad} =$ $10 + \underline{\quad} = \underline{\quad}$	 <b>e.</b> $8 + \underline{\quad} =$ $10 + \underline{\quad} = \underline{\quad}$	 <b>f.</b> $8 + \underline{\quad} =$ $10 + \underline{\quad} = \underline{\quad}$

$8 + 1 = \square$

$8 + 2 = \square$

$8 + 3 = \square$

$8 + 4 = \square$

$8 + 5 = \square$

$8 + 6 = \square$

$8 + 7 = \square$

$8 + 8 = \square$

$8 + 9 = \square$

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

$2 + 2 = \underline{\quad}$	$5 + 5 = \underline{\quad}$	$8 + 8 = \underline{\quad}$
$3 + 3 = \underline{\quad}$	$6 + 6 = \underline{\quad}$	$9 + 9 = \underline{\quad}$
$4 + 4 = \underline{\quad}$	$7 + 7 = \underline{\quad}$	$10 + 10 = \underline{\quad}$

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

$8 + 0 = \square$	$8 + 5 = \square$	$8 + 8 = \square$	$8 + 9 = \square$
$8 + 3 = \square$	$8 + 7 = \square$	$8 + 1 = \square$	$8 + 4 = \square$
$8 + 10 = \square$	$8 + 1 = \square$	$8 + 6 = \square$	$8 + 2 = \square$

3. Add and fill in what is missing.

a. $8 + 4 = \underline{\quad}$ $8 + 6 = \underline{\quad}$	b. $7 + 8 = \underline{\quad}$ $8 + 5 = \underline{\quad}$	c. $3 + 8 = \underline{\quad}$ $8 + 9 = \underline{\quad}$
d. $8 + \underline{\quad} = 13$ $8 + \underline{\quad} = 15$	e. $8 + \underline{\quad} = 12$ $8 + \underline{\quad} = 16$	f. $\underline{\quad} + 8 = 11$ $\underline{\quad} + 8 = 14$

4. a. Jenny ate 8 strawberries, and Jack ate 5 more than what Jenny did.

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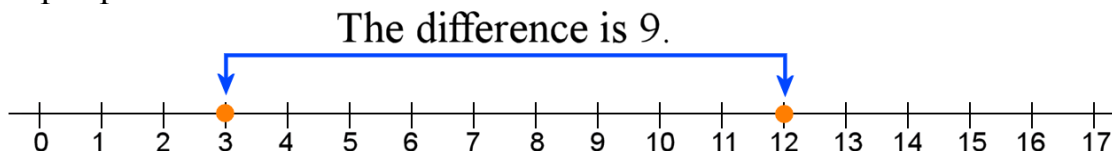
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## Difference and How Many More

**The difference** or distance between two numbers means how far apart they are from each other on the number line. The difference between 3 and 12 is 9, because they are NINE steps apart.



1. Find the differences between these numbers using the number line above.

- a. difference between 10 and 6: \_\_\_\_\_      b. difference between 12 and 8: \_\_\_\_\_
- c. difference between 14 and 2: \_\_\_\_\_      d. difference between 17 and 6: \_\_\_\_\_

We can solve the difference between two numbers by **subtracting**.

What is the difference between 10 and 4? Subtract  $10 - 4 = 6$ . The difference is 6.

2. Write a subtraction to find the difference between the numbers.

<b>a.</b> The difference between 10 and 4  _____ - _____ = _____	<b>b.</b> The difference between 2 and 9  _____ - _____ = _____	<b>c.</b> The difference between 8 and 3  _____ - _____ = _____
<b>d.</b> The difference between 20 and 50  _____ - _____ = _____	<b>e.</b> The difference between 10 and 90  _____ - _____ = _____	<b>f.</b> The difference between 19 and 8  _____ - _____ = _____

3. Solve the subtractions by thinking of the distance between the numbers—how far apart they are from each other.

<b>a.</b> $20 - 16 =$ _____	<b>b.</b> $40 - 38 =$ _____	<b>c.</b> $65 - 61 =$ _____	<b>d.</b> $36 - 31 =$ _____
<b>e.</b> $100 - 99 =$ _____	<b>f.</b> $87 - 84 =$ _____	<b>g.</b> $55 - 50 =$ _____	<b>h.</b> $79 - 78 =$ _____



You can also solve the difference between two numbers by thinking of addition: how many more do you need to add to the one number to get the other?

For example, to find the difference between 12 and 7, think:  $7 + \underline{\quad} = 12$ . (“7 and how many more makes 12?”) The answer is 5.

4. Write a “*how many more*” addition to find the difference between the numbers.

a. The difference between 10 and 6 $6 + \underline{\quad} = 10$	b. The difference between 6 and 12 $6 + \underline{\quad} = 12$
c. The difference between 15 and 8 $\underline{\quad} + \underline{\quad} = \underline{\quad}$	d. The difference between 4 and 11 $\underline{\quad} + \underline{\quad} = \underline{\quad}$

5. Subtract. Think how far apart the two numbers are from each other.

a. $15 - 12 = \underline{\quad}$ 12 and <i>how many more</i> makes 15?	b. $11 - 9 = \underline{\quad}$ 9 and <i>how many more</i> makes 11?	c. $16 - 11 = \underline{\quad}$ 11 and <i>how many more</i> makes 16?
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There are two ways to find a difference between two numbers:

**(1) Subtraction**

Find the difference between 100 and 2.  
It is easier to subtract  $100 - 2 = 98$ .  
The difference is 98.

**(2) A “*how many more*” addition**

Find the difference between 100 and 95.  
It is easier to think:  $95 + \underline{\quad} = 100$ .  
The difference is 5.

6. Find the differences.

a. The difference between 60 and 56	b. The difference between 22 and 20
c. The difference between 35 and 1	d. The difference between 67 and 3
e. The difference between 50 and 30	f. The difference between 40 and 100

Whenever a word problem asks “*how many more*,” you can solve it in two ways. You can either subtract, or you can write a “*how many more*” addition. Either way, you are finding the difference between the two numbers.

7. 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 Mom have?

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

d. Janet worked in the garden for 2 hours in the morning and 3 hours in the afternoon. Andy worked for 8 hours in the shop.  
Who worked more hours?  
  
How many more?

e. Betty is going batty with flies! She killed 28 flies. Her husband killed 5 flies.  
How many more did she kill than him?

f. The next day, Betty was again going batty with flies. She killed 5 flies in the living room, 12 in the kitchen, and 2 in her room.  
How many flies did she kill in total?

g. Matthew had \$12 and Bob had \$6. Then both brothers worked helping Dad in the garden. Matthew earned \$5 and Bob earned \$9.  
Now, who has more money?  
  
How much more?

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## Chapter 4: Regrouping in Addition

### Introduction

The fourth chapter of *Math Mammoth Grade 2* deals with addition within 0-100, both mentally and in columns, especially concentrating on regrouping in addition (carrying).

#### Mental math

Mental math is important because it builds number sense. We study adding mentally a two-digit number and a single-digit number where the answer goes to the next ten (problems such as  $36 + 8$  or  $45 + 9$ ). These additions use the helping problem composed of the single-digit numbers ( $6 + 8$  or  $5 + 9$ ). The child knows that  $6 + 8$  fills the first ten and is four more than the ten. He/she will learn to use that fact when adding  $36 + 8$ . The sum  $36 + 8$  fills the *next* whole ten (40), and is four more than that, or 44.

#### Regrouping in tens

We also study adding two-digit numbers in columns, and regrouping with tens, or “carrying,” which is illustrated and explained in detail with the help of visual models. These visual models take the place of base-ten blocks or other manipulatives. You are welcome to use actual manipulatives if you prefer. The main concept to understand is that 10 ones make a new ten, and this new ten is regrouped with the other tens, written using a little “1” in the tens column.

In order to prepare for adding three or four two-digit numbers in columns, we practice explicitly how to add 3 or 4 single-digit numbers, such as  $7 + 8 + 6 + 4$ , and the principle of adding in parts (such as  $13 + 16$  is the same as  $10 + 10$  and  $3 + 6$ ).

The lessons also include lots of word problems, review of even and odd numbers, and occasional review problems about doubling.

#### The Lessons

	page	span
Going Over to the Next Ten .....	99	3 pages
Add with Two-Digit Numbers Ending in 9 .....	102	2 pages
Add a Two-Digit Number and a Single-Digit Number Mentally.....	104	3 pages
Regrouping with Tens .....	106	3 pages
Add in Columns Practice .....	109	3 pages
Mental Addition of Two-Digit Numbers .....	112	3 pages
Adding Three or Four Numbers Mentally .....	115	2 pages
Adding Three or Four Numbers in Columns.....	117	4 pages
Mixed Review .....	121	2 pages
Review .....	123	2 pages

## Helpful Resources on the Internet

Use these free online resources to supplement the “bookwork” as you see fit.

### Number Pieces Manipulative

Drag ones, tens, and hundreds into the practice area to illustrate numbers.

<http://www.mathlearningcenter.org/web-apps/number-pieces/>

### Hundred Hunt - Add 9

Practice adding 9 to the target number.

<http://www.ictgames.com/100huntadd9.html>

### Addition Level 2

A matching game where you add a one-digit number and a two-digit number.

<http://www.quia.com/mc/65798.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 part-by-part by using 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>

### Mathionaire 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>

### Speed Grid Addition

Find numbers on the grid that add up to the given number. This uses both single-digit and two-digit numbers.

<http://www.oswego.org/ocsd-web/games/SpeedGrid/Addition/urikares.html>

### Fruit Splat Addition

Add a two-digit number to a one-digit number with regrouping. Choose Level 5.

[http://www.sheppardsoftware.com/mathgames/fruitshoot/fruitshoot\\_addition.htm](http://www.sheppardsoftware.com/mathgames/fruitshoot/fruitshoot_addition.htm)

### Adding Two Digits Concentration Game

Match each addition problem with the correct answer.

<http://www.math-play.com/two-digit-addition-game/adding-two-digits-concentration.html>

### **Canoe Puppies Addition**

Answer the addition problems correctly to help your canoe win the race.

[http://www.mathplayground.com/ASB\\_Canoe\\_Puppies.html](http://www.mathplayground.com/ASB_Canoe_Puppies.html)

### **Addition Blocks**

Combine blocks to make the target sum. How many numbers will it take?

[http://www.mathplayground.com/addition\\_blocks.html](http://www.mathplayground.com/addition_blocks.html)

### **Drag-and-Drop Math**

Practice basic addition or subtraction. Choose 2 numbers, each with 2 digits.

<http://mrnussbaum.com/drag-and-drop-math/>

### **Rock Hopper**

Help the frog get across the pond by clicking on the rocks that add up to or subtract to the target number.

[http://www.eduplace.com/kids/mw/swfs/rockhopper\\_grade2.html](http://www.eduplace.com/kids/mw/swfs/rockhopper_grade2.html)

### **Mr. Martini's Classroom: Long Addition**

Practice adding two-digit numbers in columns online.

<http://www.thegreatmartinicompany.com/longarithmetic/longaddition.html>

### **Teaching Treasures - Year 2 Math Worksheets**

Simple online addition and subtraction worksheets where the student types in the answer and can check it.

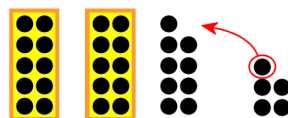
[http://www.teachingtreasures.com.au/maths/maths\\_level2.html](http://www.teachingtreasures.com.au/maths/maths_level2.html)

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## Add with Two-Digit Numbers Ending in 9


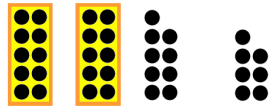
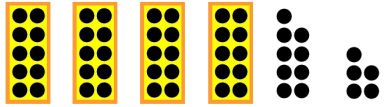
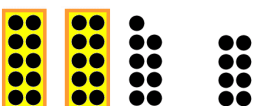
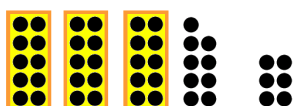
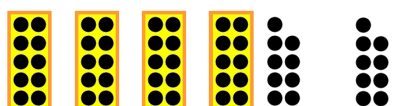
Imagine that 29 wants to be 30...  
so it “grabs” one from 5.  
Then, 29 becomes 30, and 5 becomes 4.

The addition problem is changed to  $30 + 4 = 34$ .



$$29 + 5 = \underline{\quad}$$

1. Circle the nine dots and one more dot to form a complete ten. Add.

 <p>a. <math>19 + 5 = \underline{\quad}</math></p>	 <p>b. <math>29 + 7 = \underline{\quad}</math></p>	 <p>c. <math>49 + 5 = \underline{\quad}</math></p>
 <p>d. <math>29 + 8 = \underline{\quad}</math></p>	 <p>e. <math>39 + 6 = \underline{\quad}</math></p>	 <p>f. <math>49 + 9 = \underline{\quad}</math></p>

2. Add. For each problem, write a helping problem using the “ones” from the first problem.



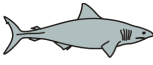

<p>a. <math>19 + 7 = \underline{\quad}</math></p> <p><u>9</u> + <u>7</u> = <u>    </u></p>	<p>b. <math>49 + 3 = \underline{\quad}</math></p> <p><u>    </u> + <u>    </u> = <u>    </u></p>	<p>c. <math>39 + 4 = \underline{\quad}</math></p> <p><u>    </u> + <u>    </u> = <u>    </u></p>
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3. Add. Compare the problems.

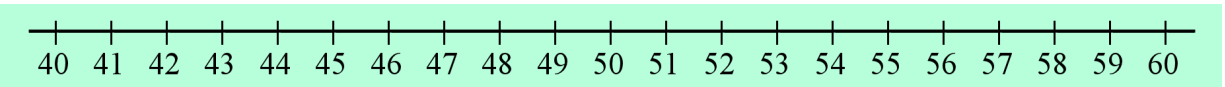
<p>a. <math>9 + 3 = \underline{\quad}</math></p> <p><math>19 + 3 = \underline{\quad}</math></p>	<p>b. <math>9 + 6 = \underline{\quad}</math></p> <p><math>39 + 6 = \underline{\quad}</math></p>	<p>c. <math>9 + 4 = \underline{\quad}</math></p> <p><math>49 + 4 = \underline{\quad}</math></p>
<p>d. <math>9 + 7 = \underline{\quad}</math></p> <p><math>39 + 7 = \underline{\quad}</math></p> <p><math>29 + 7 = \underline{\quad}</math></p>	<p>e. <math>9 + 9 = \underline{\quad}</math></p> <p><math>69 + 9 = \underline{\quad}</math></p> <p><math>79 + 9 = \underline{\quad}</math></p>	<p>f. <math>9 + 5 = \underline{\quad}</math></p> <p><math>19 + 5 = \underline{\quad}</math></p> <p><math>59 + 5 = \underline{\quad}</math></p>



4. These problems review the basic facts with 9 and 8. By this time you should already remember these addition facts. Try to remember what number will fit without counting.

































<b>a.</b> 	<b>b.</b> 	<b>c.</b> 	<b>d.</b> 
$14 - 9 = \underline{\quad}$	$4 + 9 = \underline{\quad}$	$15 - \underline{\quad} = 8$	$7 + 8 = \underline{\quad}$
$15 - 9 = \underline{\quad}$	$8 + 9 = \underline{\quad}$	$17 - \underline{\quad} = 8$	$5 + 8 = \underline{\quad}$
$13 - 9 = \underline{\quad}$	$5 + 9 = \underline{\quad}$	$12 - \underline{\quad} = 8$	$6 + 8 = \underline{\quad}$
$18 - 9 = \underline{\quad}$	$6 + 9 = \underline{\quad}$	$14 - \underline{\quad} = 8$	$3 + 8 = \underline{\quad}$
$17 - 9 = \underline{\quad}$	$9 + 9 = \underline{\quad}$	$13 - \underline{\quad} = 8$	$9 + 8 = \underline{\quad}$
$16 - 9 = \underline{\quad}$	$7 + 9 = \underline{\quad}$	$16 - \underline{\quad} = 8$	$4 + 8 = \underline{\quad}$

5. Find the difference of numbers. The number line can help.



<b>a.</b> Difference of 41 and 53  _____	<b>b.</b> Difference of 60 and 46  _____	<b>c.</b> Difference of 59 and 48  _____
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6. Find the patterns and continue them!

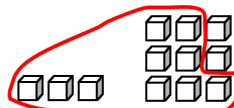
<b>a.</b>	 	 	 	 	 	 	 	 
0	1	3	6	10	_____	_____	_____	_____
<b>b.</b>	 	 	 	 	 	 	 	 
_____	_____	_____	_____	_____	44	48	52	56

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## Regrouping with Tens

When adding  $3 + 9$ , we can circle ten little ones to form a ten. We write “1” in the tens column.

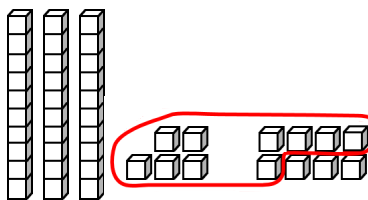
There are two little ones left over, so we write “2” in the ones column.



	tens	ones
	3	3
+	9	9
	1	2

With  $35 + 8$ , we circle ten little ones to make a ten. There already are three tens, so in total we now have four tens. So, we write “4” in the tens column.

There are three little cubes left over, so we write “3” in the ones column.

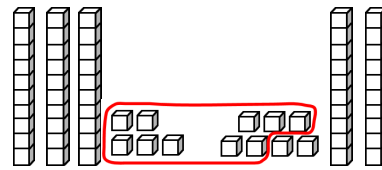


	tens	ones
	3	5
+	8	8
	4	3

1. **Circle** ten cubes to make a **new ten**. Count the tens, including the new one. Count the ones. Write the tens and ones in their own columns. You can also use manipulatives.

<p>a.</p> <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="padding: 5px;"></th> <th style="padding: 5px; text-align: center;">tens</th> <th style="padding: 5px; text-align: center;">ones</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;"></td> <td style="padding: 5px; text-align: center;">3</td> <td style="padding: 5px; text-align: center;">3</td> </tr> <tr> <td style="padding: 5px; text-align: right;">+</td> <td style="padding: 5px; text-align: center;">9</td> <td style="padding: 5px; text-align: center;">9</td> </tr> <tr> <td style="padding: 5px;"></td> <td style="padding: 5px; text-align: center; border-top: 1px solid black;"></td> <td style="padding: 5px; text-align: center; border-top: 1px solid black;"></td> </tr> </tbody> </table>		tens	ones		3	3	+	9	9				<p>b.</p> <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="padding: 5px;"></th> <th style="padding: 5px; text-align: center;">tens</th> <th style="padding: 5px; text-align: center;">ones</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;"></td> <td style="padding: 5px; text-align: center;">2</td> <td style="padding: 5px; text-align: center;">5</td> </tr> <tr> <td style="padding: 5px; text-align: right;">+</td> <td style="padding: 5px; text-align: center;">8</td> <td style="padding: 5px; text-align: center;">8</td> </tr> <tr> <td style="padding: 5px;"></td> <td style="padding: 5px; text-align: center; border-top: 1px solid black;"></td> <td style="padding: 5px; text-align: center; border-top: 1px solid black;"></td> </tr> </tbody> </table>		tens	ones		2	5	+	8	8			
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When we make a new ten from the ones, we are **regrouping**. The ten ones get grouped as a ten, and are counted with the other tens.



	tens	ones
	1	
+	3	5
	2	7
	6	2

This is also called **carrying to tens**.

Imagine someone “gathering” ten little cubes in his lap and “carrying” them over into the tens column as 1 ten.

To show this new ten, write a little “1” in the tens column above the other numbers. Then add in the tens-column as usual, adding the little “1” also.

2. Circle ten ones to make a new ten. Add the tens and ones in columns.

<p>a.  <table border="1" style="display: inline-table; vertical-align: middle;"> <thead> <tr> <th></th> <th>tens</th> <th>ones</th> </tr> </thead> <tbody> <tr> <td></td> <td>1</td> <td>3</td> </tr> <tr> <td>+</td> <td>2</td> <td>9</td> </tr> <tr> <td></td> <td></td> <td>2</td> </tr> </tbody> </table></p>		tens	ones		1	3	+	2	9			2	<p>b.  <table border="1" style="display: inline-table; vertical-align: middle;"> <thead> <tr> <th></th> <th>tens</th> <th>ones</th> </tr> </thead> <tbody> <tr> <td></td> <td>2</td> <td>4</td> </tr> <tr> <td>+</td> <td>3</td> <td>8</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table></p>		tens	ones		2	4	+	3	8			
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	tens	ones																							
+																									
	tens	ones																							
+																									

3. Add. If you can make a new ten from the ones, regroup.

$$\begin{array}{r} \text{a.} \quad 42 \\ + 15 \\ \hline \end{array}$$

$$\begin{array}{r} \text{b.} \quad 27 \\ + 45 \\ \hline \end{array}$$

$$\begin{array}{r} \text{c.} \quad 65 \\ + 26 \\ \hline \end{array}$$

$$\begin{array}{r} \text{d.} \quad 83 \\ + 15 \\ \hline \end{array}$$

$$\begin{array}{r} \text{e.} \quad 34 \\ + 19 \\ \hline \end{array}$$

$$\begin{array}{r} \text{f.} \quad 52 \\ + 41 \\ \hline \end{array}$$

$$\begin{array}{r} \text{g.} \quad 13 \\ + 44 \\ \hline \end{array}$$

$$\begin{array}{r} \text{h.} \quad 63 \\ + 27 \\ \hline \end{array}$$

$$\begin{array}{r} \text{i.} \quad 36 \\ + 51 \\ \hline \end{array}$$

$$\begin{array}{r} \text{j.} \quad 66 \\ + 29 \\ \hline \end{array}$$

We can add three numbers by writing them under each other. This is not any more difficult than adding two numbers.

On the right, first add the ones.  $2 + 7 + 5 = 14$ . You get a new ten. So, regroup and write that new ten with the other tens.

In the tens, add  $1 + 3 + 2 + 1 = 7$ .

		1
	3	2
	2	7
+	1	5
<hr/>		
	7	4

4. Add. Regroup the ones to make a new ten.

$$\begin{array}{r} \text{a.} \quad 34 \\ 19 \\ + 26 \\ \hline \end{array}$$

$$\begin{array}{r} \text{b.} \quad 15 \\ 27 \\ + 45 \\ \hline \end{array}$$

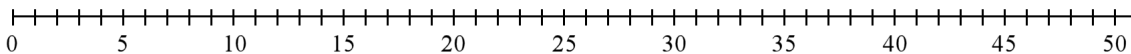
$$\begin{array}{r} \text{c.} \quad 13 \\ 27 \\ + 26 \\ \hline \end{array}$$

$$\begin{array}{r} \text{d.} \quad 26 \\ 42 \\ + 19 \\ \hline \end{array}$$

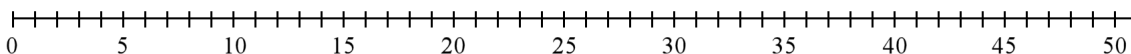
$$\begin{array}{r} \text{e.} \quad 34 \\ 21 \\ + 19 \\ \hline \end{array}$$

5. Show the additions on the number line by drawing lines that are that long.

a.  $13 + 9 + 11 = \underline{\hspace{2cm}}$



b.  $27 + 16 = \underline{\hspace{2cm}}$



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## Adding Three or Four Numbers in Columns

Sometimes we get *two or three new tens* from the ones. We need to regroup.

In the ones, we add

$$8 + 7 + 8 = 23.$$

We write the two new tens in the tens column. Complete the problem.

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

In the ones we add  $9 + 9 + 7 + 6 = 18 + 13 = 31$ . We write *three* new tens in the tens column.

In the tens, we add  $3 + 3 + 1 + 2 + 2 = 11$ . The answer is *more than one hundred*. It is 111 (one hundred eleven).

$$\begin{array}{r} 3 \\ 3 \\ 1 \\ 2 \\ + 2 \\ \hline 111 \end{array}$$

1. Add mentally. *Remember* to first try to find if any of the numbers **make 10**.

a.  $8 + 4 + 5 = \underline{\hspace{2cm}}$

b.  $3 + 8 + 7 = \underline{\hspace{2cm}}$

c.  $8 + 5 + 6 + 4 = \underline{\hspace{2cm}}$

2. Add. The answers are “hidden” in the list of numbers below the problems.

a. 
$$\begin{array}{r} 52 \\ 30 \\ + 11 \\ \hline \end{array}$$

b. 
$$\begin{array}{r} 13 \\ 25 \\ + 54 \\ \hline \end{array}$$

c. 
$$\begin{array}{r} 33 \\ 38 \\ + 27 \\ \hline \end{array}$$

d. 
$$\begin{array}{r} 36 \\ 27 \\ + 19 \\ \hline \end{array}$$

e. 
$$\begin{array}{r} 36 \\ 27 \\ 18 \\ + 16 \\ \hline \end{array}$$

f. 
$$\begin{array}{r} 40 \\ 18 \\ 16 \\ + 22 \\ \hline \end{array}$$

g. 
$$\begin{array}{r} 15 \\ 17 \\ 18 \\ + 39 \\ \hline \end{array}$$

h. 
$$\begin{array}{r} 12 \\ 29 \\ 25 \\ + 14 \\ \hline \end{array}$$

i. 
$$\begin{array}{r} 19 \\ 69 \\ + 19 \\ \hline \end{array}$$

j. 
$$\begin{array}{r} 56 \\ 32 \\ + 29 \\ \hline \end{array}$$

k. 
$$\begin{array}{r} 45 \\ 55 \\ + 19 \\ \hline \end{array}$$

l. 
$$\begin{array}{r} 59 \\ 19 \\ + 42 \\ \hline \end{array}$$

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# Chapter 5: Geometry and Fractions

## Introduction

The fifth chapter of *Math Mammoth Grade 2* covers geometry topics and an introduction to fractions.

In geometry, the emphasis is on exploring shapes. Students are supposed to recognize and draw basic shapes, and identify triangles, rectangles, squares, quadrilaterals, pentagons, hexagons, and cubes. Drawing is done by first drawing dots on paper, then connecting those with a ruler.

We also study some geometric patterns, have surprises with pentagons and hexagons, and make shapes in a tangram-like game. These topics are to provide some fun while also letting children explore geometry and helping them to memorize the terminology for basic shapes.

In the section on fractions, the student divides some basic shapes into halves, thirds, and fourths (quarters). They also learn the common notation for fractions (such as  $\frac{1}{3}$ ) and color parts to show a given fraction. We also study comparing fractions using visual models.

### The Lessons

	page	span
Shapes Review .....	128	3 pages
Surprises with Shapes .....	131	2 pages
Rectangles and Squares .....	133	3 pages
Making Shapes .....	138	1 page
Geometric Patterns .....	139	2 pages
Solids .....	141	2 pages
Printable Shapes .....	143	4 pages
Some Fractions.....	151	3 pages
Comparing Fractions .....	154	2 pages
Mixed Review .....	156	2 pages
Review .....	158	2 pages

### Helpful Resources on the Internet

Use these free online resources to supplement the “bookwork” as you see fit.

#### SHAPES

##### Shifting Shapes

Figure out what shape it is when viewing through a small opening! Click on the “eye” button to see it in its entirety.

<http://www.ictgames.com/YRshape.html>

### **Polygon Matching Game**

[http://www.mathplayground.com/matching\\_shapes.html](http://www.mathplayground.com/matching_shapes.html)

### **Polygon Playground**

Drag various colorful polygons to the work area to make your own creations!

<http://mathcats.com/explore/polygons.html>

### **Shapes Splat**

Click on the correct shapes to earn points. This game can be played with basic shapes or 3-D shapes.

[http://www.sheppardsoftware.com/mathgames/earlymath/shapes\\_shoot.htm](http://www.sheppardsoftware.com/mathgames/earlymath/shapes_shoot.htm)

### **Shapes Identification Quiz from ThatQuiz.org**

An online quiz in a multiple-choice format, asking to identify common two-dimensional shapes. You can modify the quiz parameters to your liking.

<http://www.thatquiz.org/tq-f/math/shapes/>

### **Patch Tool**

An online activity where the student designs a pattern using geometric shapes.

<http://illuminations.nctm.org/ActivityDetail.aspx?ID=27>

### **Shape Cutter**

Draw any shape (polygon), cut it, and manipulate the cut pieces. You can have the computer mix them up, and then try to recreate the original shape.

<http://illuminations.nctm.org/ActivityDetail.aspx?ID=72>

### **Construct It**

Transform the gray background into a colorful mosaic.

[http://www.mathplayground.com/logic\\_construct\\_it.html](http://www.mathplayground.com/logic_construct_it.html)

### **Pattern Blocks**

Have fun making patterns with colorful shapes!

<http://www.mathplayground.com/patternblocks.html>

### **Building Blocks**

Drag the shapes to complete the figure in the middle.

<http://www.mathplayground.com/buildingblocks.html>

### **Solid Shapes**

Watch a short tutorial about planar and solid shapes and then take a multiple-choice quiz. Choose lesson 2 and then the exercise.

<http://www.turtlediary.com/game/solid-shapes.html>

### **Tangram puzzles for kids**

Use the seven pieces of the Tangram to form the given puzzle. Complete the puzzle by moving and rotating the seven shapes.

<http://www.abcya.com/tangrams.htm>

### **Logic Tangram game**

Note: this uses four pieces only. Use logic and spatial reasoning skills to assemble the four pieces into the given shape.

<http://www.mathplayground.com/tangrams.html>

**Sample worksheet from**  
[www.mathmammoth.com](http://www.mathmammoth.com)

## FRACTIONS

### Who Wants Pizza?

Lessons and interactive exercises about fractions, based on the pizza model.

<http://math.rice.edu/~lanius/fractions/frac.html>

### Matching Fractions Level 1

Match each fraction to its visual model.

[http://www.sheppardsoftware.com/mathgames/fractions/memory\\_fractions1.htm](http://www.sheppardsoftware.com/mathgames/fractions/memory_fractions1.htm)

### Fractions Splat

Four levels: (1) Identify equal or unequal parts; (2) Identify shapes that are divided into halves, thirds, and fourths; (3) and (4) Find the visual model that matches the given fraction.

[http://www.sheppardsoftware.com/mathgames/earlymath/fractions\\_shoot.htm](http://www.sheppardsoftware.com/mathgames/earlymath/fractions_shoot.htm)

### Concentration from Illuminations

A matching game you can play by yourself or against a friend, matching fractions to equivalent visual representations. (The game also allows you to play a matching game with whole numbers, shapes, or multiplication facts.) Also available for your phone or tablet.

<http://illuminations.nctm.org/Activity.aspx?id=3563>

### Fraction Frenzy 4

Choose the pizza picture that matches the fraction shown using the four arrow keys.

<http://www.mathwarehouse.com/games/our-games/fraction-games/fraction-frenzy-4/>

### Fraction Booster

Fraction Booster contains five different activities: (1) Type in the number of children and the computer cuts a pizza into that many pieces. (2) Drag fractional pieces to a fraction mat. (3) Type the number of shaded pieces, the total number of pieces, and the actual fraction (using a slash). (4) Drag and drop fractions onto their correct positions on a fraction number line. (5) Practice equivalent fractions using a pizza as a visual model.

[http://www.bgfl.org/bgfl/custom/resources\\_ftp/client\\_ftp/ks2/maths/fractions/index.htm](http://www.bgfl.org/bgfl/custom/resources_ftp/client_ftp/ks2/maths/fractions/index.htm)

### Fractions Side by Side

Compare two fractions to see if one is larger or if they are the same. Try the different graphics to see them in different ways.

<http://www.bbc.co.uk/skillswise/game/ma17frac-game-fractions-side-by-side>

### Compare Fractions

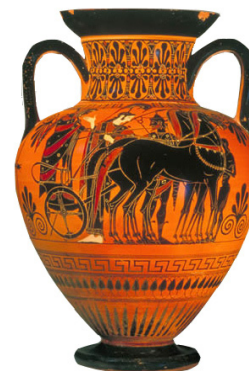
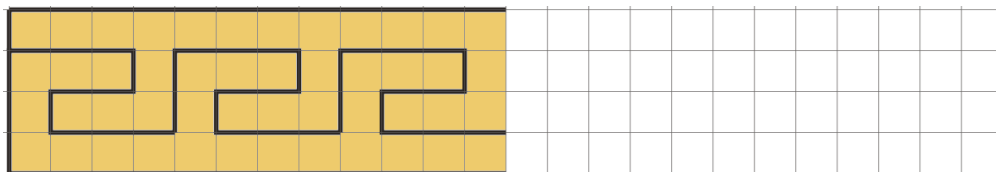
Visualize and compare the fraction of the filled circles. Determine if they are less than, greater than, or equal.

<http://www.mathgames.com/skill/1.12-compare-fractions-same-numerator-or-denominator>

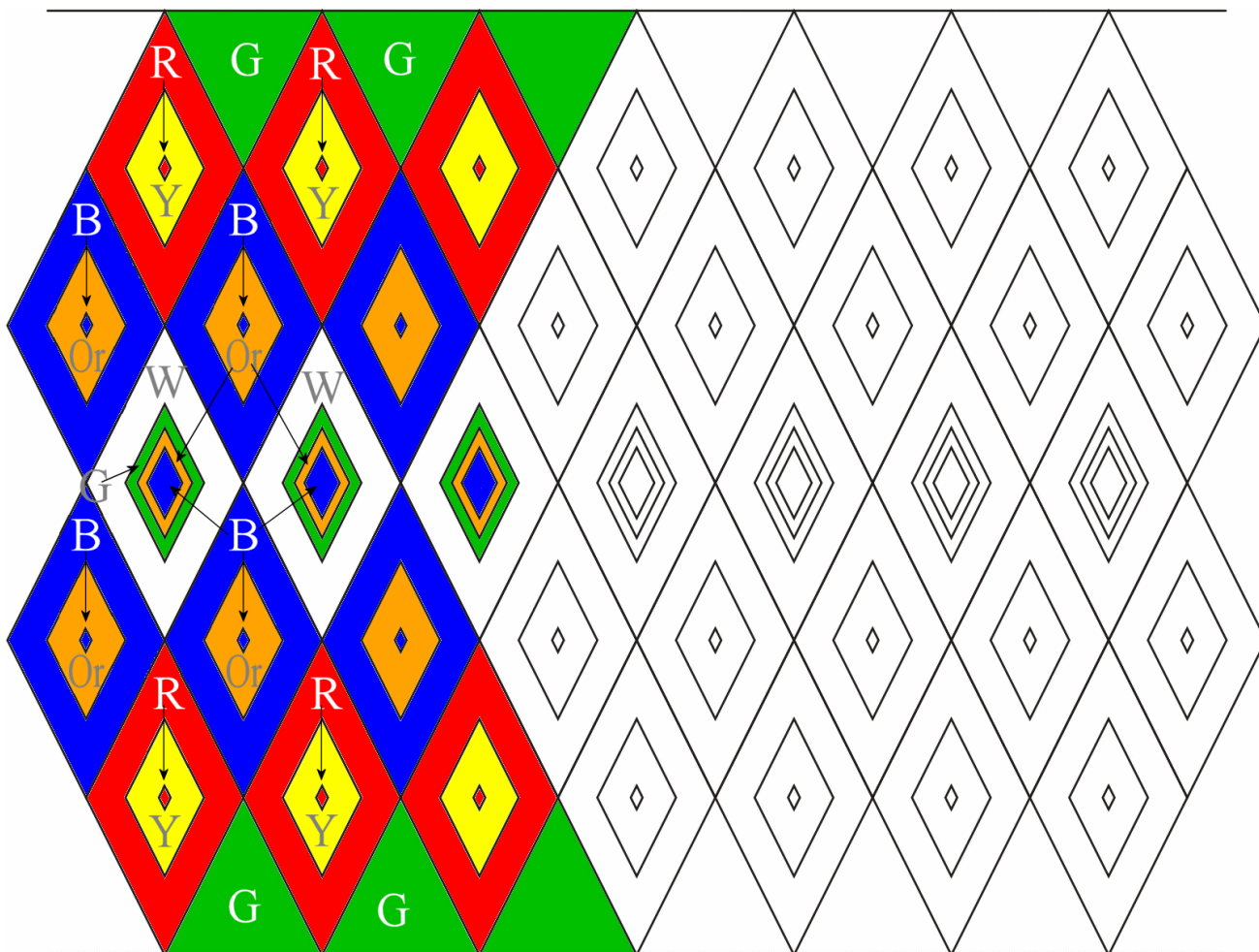
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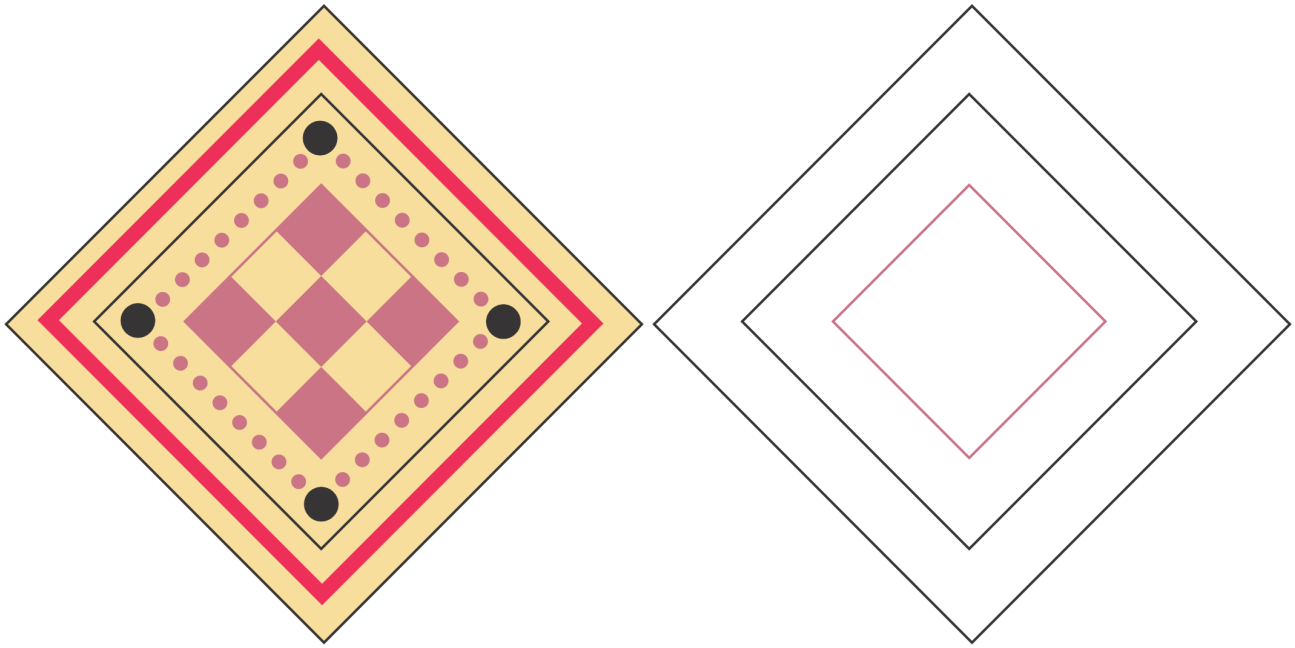
# Geometric Patterns

1. The design below is often seen on Greek vases. Continue it.



2. This is a pattern from an apron used by Kirdi people in Cameroon, Africa. Notice it uses PARALLELOGRAMS that are inside each other. Continue the coloring in the pattern. (G = green, R = red, B = blue, W = white, Or = orange, Y = yellow)



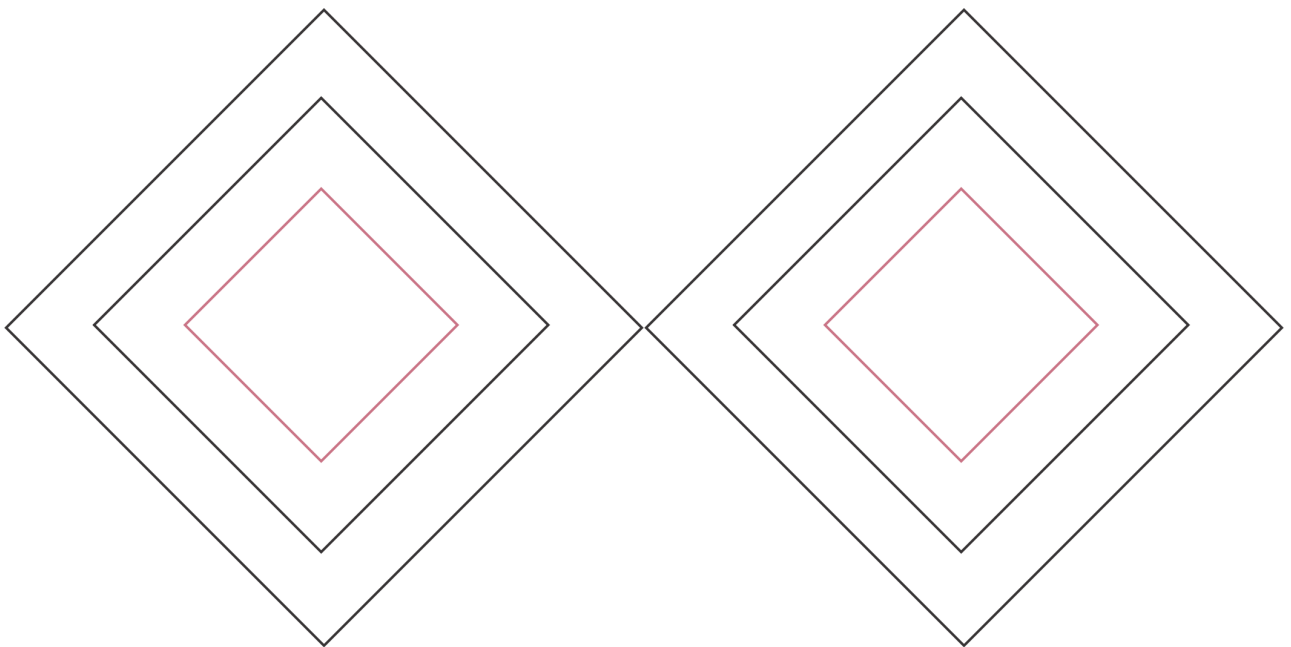


3. This is a geometric design found on a Greek vase.

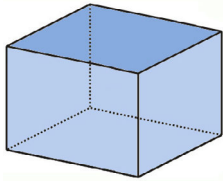
a. What two shapes are used in this design?

\_\_\_\_\_ and \_\_\_\_\_

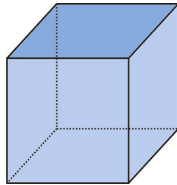
b. Copy the design at least once in the empty shapes.



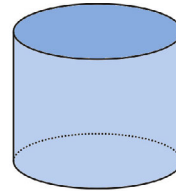
# Solids



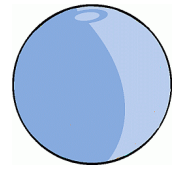
This is a **box**. It is also called a “rectangular prism.”



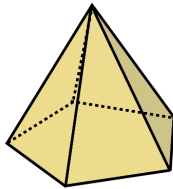
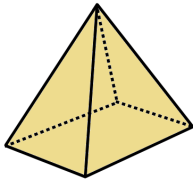
A **cube** is a box, too, but all of its sides are equal in length.



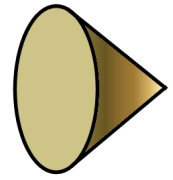
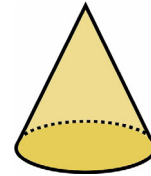
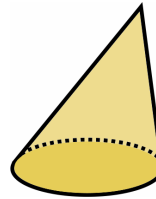
A **cylinder** has a circle on the bottom and at the top.



This is a **sphere**, or just a ball.



A **pyramid** has a pointed top. Its bottom shape can be any many-sided figure, such as a triangle, a rectangle, a square, or a pentagon.



A **cone** has a pointed top, as well, but it has a rounded shape on the bottom.

1. Make a cube, a cylinder, a cone, and a pyramid using the cut-outs provided on the following pages. Your teacher will help you.

2. A *face* is any of the flat sides of a solid.

a. Count how many faces a cube has. \_\_\_\_\_ faces

What shapes are they?

b. Count how many faces a box has. \_\_\_\_\_ faces

What shapes are they?

c. Count how many faces this pyramid has. \_\_\_\_\_ faces

What shapes are they?

