

math

MAMMOTH

Grade 1-A Worktext South African Version

Addition concept and facts within 0 - 10

Subtraction within 0 - 10

Connection between addition and subtraction

Graphs

Two digit numbers and place value within 0 - 100



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Foreword

Math Mammoth South African Version Grade 1-A and *Grade 1-B* worktexts comprise a complete maths curriculum for the first grade mathematics studies.

Math Mammoth South African version has been **customised to South Africa** in the following manners:

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

Please note that the curriculum is not following the South African official syllabus for 1st grade maths. Instead, it is a copy of the US version of Math Mammoth Grade 1, aligned to the US Common Core Standards. This decision was made because of the great amount of work that would be involved in writing new lessons and reorganising old ones to match all the standards in the South African syllabus. For the most part, Math Mammoth is exceeding South African standards.

The four main areas of study for first grade are:

1. The concepts of addition and subtraction, and strategies for addition and subtraction facts (chapters 1-2 and chapter 4);
2. Developing understanding of whole number relationships and place value up to 100 (chapter 3 and chapter 7);
3. Developing understanding of measuring lengths as iterating length units (chapter 6); and
4. Reasoning about attributes of geometric shapes, such as the number of sides and the number of corners, and composing and decomposing geometric shapes (chapter 6).

Additional topics we study in the first grade are the clock to the half hour (chapter 5) and counting coins (chapter 8).

This book, *Grade 1-A*, covers the concepts of addition and subtraction (chapters 1 and 2), and place value with two-digit numbers (chapter 3). The book *Grade 1-B* covers strategies for addition and subtraction facts, the clock, shapes and measuring, adding and subtracting with two-digit numbers, and counting coins.

When you use these two books as your main or only 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. This might even be advisable if your child is “stuck” on some concept, or is getting bored. Given more time, 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 and includes a lot of revision problems from past topics. This is totally the opposite to the continually spiralling step-by-step curricula, in which each lesson typically is about a different topic from the previous or next lesson.

This does not mean that your child would not need revision occasionally. 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 time for revision. In fact, I totally encourage you to plan your mathematics school year as a set of certain topics, instead of a certain book or certain pages from a book.

For revision, the download version includes an html page called *Make_extra_worksheets_grade1.htm* that you can use to make additional worksheets for computation or for number charts. You can also reprint some previously studied pages. The third chapter that practises addition and subtraction facts contains a lot of pages with problems, so you might choose to “save” some of them for later revision.

I wish you success in your maths teaching!

Maria Miller, the author

Chapter 0: Grade R Maths Revision

Introduction

This chapter is optional, and can be used to revise the most important concepts of grade R maths:

- writing the numerals 0 to 9;
- counting up to 20;
- position words, colour words, and some shapes (circle, triangle, square);
- simple patterns.

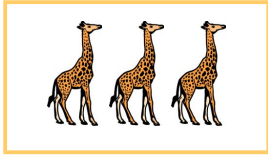
The Lessons in Chapter 0

	page	span
Equal Amounts; Same and Different	8	<i>1 page</i>
Writing Numbers	9	<i>2 pages</i>
Counting	11	<i>2 pages</i>
Position Words, Colours, and Shapes	13	<i>2 pages</i>
Patterns	15	<i>1 page</i>

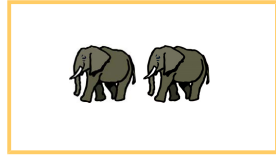
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Counting

1. Count. Write the number in the box.



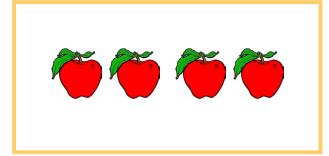
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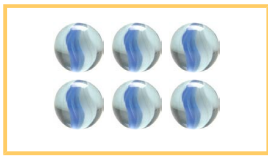
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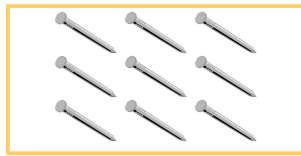
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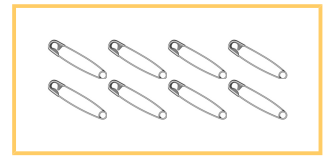
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g.

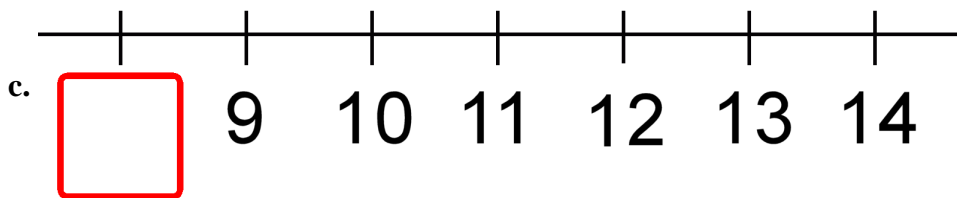
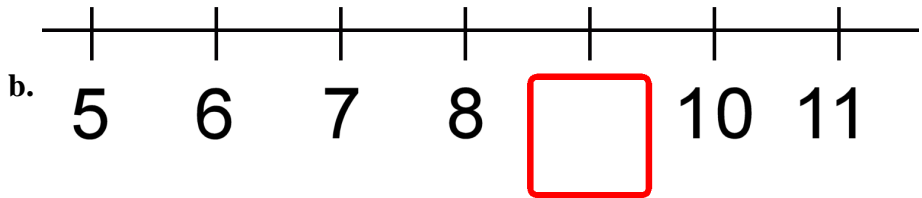
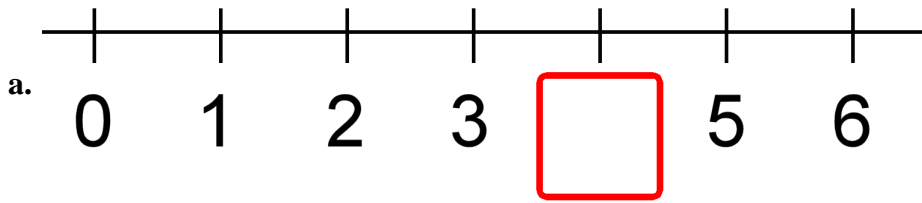


h.

2. Count. Write the number. Then circle the number that is MORE.

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3. Write the missing number below the number line.

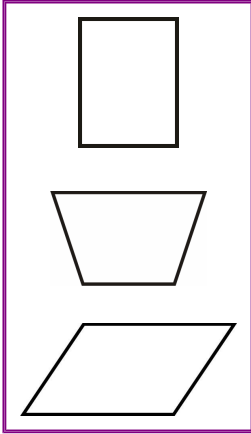


4. Circle the group that has more things. Then count them ALL (both groups). Write the number in the box below.

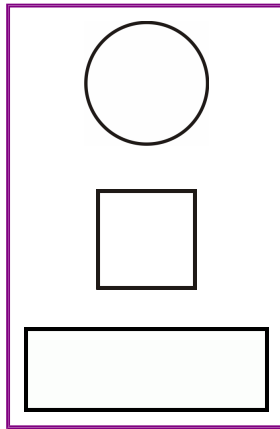
<p>a.</p> <input type="text"/>	<p>b.</p> <input type="text"/>	<p>c.</p> <input type="text"/>
<p>d.</p> <input type="text"/>	<p>e.</p> <input type="text"/>	<p>f.</p> <input type="text"/>

Position Words, Colours, and Shapes

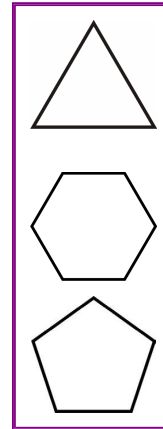
1. a. Colour in RED the top shape.



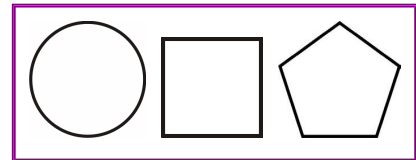
b. Colour in BLUE the bottom shape.



c. Colour in YELLOW the middle shape.



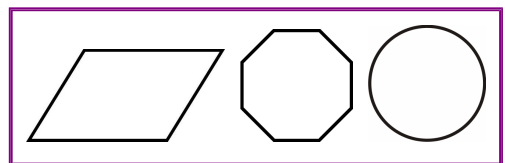
2. a. Colour in GREEN the shape on the right.



b. Colour in BLUE the shape in the middle.



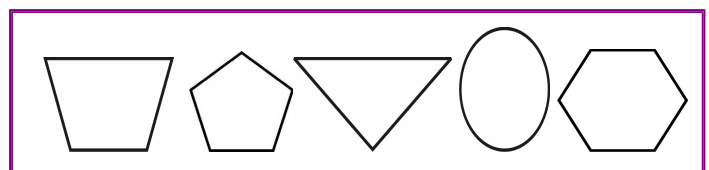
c. Colour in YELLOW the shape on the left.



d. Colour in ORANGE the two shapes on the right.



e. Colour in PURPLE the two shapes on the left.



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Chapter 1: Addition Within 0-10

Introduction

The first chapter covers the concept of addition and then practises addition facts within 0-10.

The chapter starts out with very easy addition problems within 0-5, using pictures. If the student does not yet know the symbols “+” and “=”, you can introduce them *orally* at first. Use blocks or rocks to make addition problems where you say: “*Three blocks and four blocks makes seven blocks. Three blocks PLUS four blocks EQUALS seven blocks.*” Play like that until the child can use the words PLUS and EQUALS in his/her own speech. This will make it easier for him/her to use the written symbols.

Soon the lessons start including “missing addend” problems. This means problems such as $1 + \underline{\quad} = 5$, or $\underline{\quad} + 3 = 8$, where a number to be added is missing. First, we use pictures, and then gradually use only symbols. I feel problems with the missing addends are very important, as they lead the child to learn the connection between addition and subtraction.

Keep in mind that children *may* confuse this problem with $1 + 5 = \underline{\quad}$. To help the child see the difference, you can word these problems like this: “*One and how many more makes five?*” You can model them by drawing. First draw one ball. Tell the child that we need a total of five balls. He/she needs to draw more until there are five balls.

In the missing addend problem ($1 + \underline{\quad} = 5$), however many balls the child draws is the number that goes on the empty line. So, first there is one ball, then we need to add (draw) some more to make 5. How many more were drawn?

After that, the chapter contains many lessons called *Sums with...* whose goal is to help the child memorise addition facts.

My approach to memorisation is many-fold:

1. Structured drill, such as you see in the lessons *Sums with 5*, *Sums with 6*, and so on. These are not random drills, because you will start by showing the pattern or the structure in the facts. This will help the child to tie the addition facts in with a context and help him/her understand the facts on a conceptual level, instead of merely memorising them at random. In *Sums with 5*, the child learns the number combinations that add up to 5: 0 and 5, 1 and 4, and 2 and 3. This understanding is the basis for the drills.
2. The use of addition facts in games, in maths problems, everyday life, or anywhere else. Games are especially useful because they help children like mathematics.
3. Random drilling may also be used as a tool among others.
4. Memory helps, such as silly mnemonics or writing maths facts on a poster and hanging it on the wall. These are not needed for all children.

However, keep in mind that children will need LOTS of opportunities to add to memorise the facts, so the memorisation may not occur totally as the child works through this chapter. These same addition facts are further studied and used in the chapter about subtraction, and they are constantly used in all later maths work. At the latest, the students should memorise addition facts during second grade.

Please see the following page for a few games that I recommend using while studying this chapter.

Games

10 Out (or 5 Out or 6 Out etc.)

You need: lots of number cards with numbers 1-10, such as regular playing cards without the picture cards, or some other cards that have numbers.

Rules: Give seven cards to each player. Place the rest in a stack in the middle, face down.

At his turn, each player *may* first take one card from the deck. Then, each player *may* ask for one card from the player on their right (as in 'Go Fish'), and the person has to give it if he has it. Then the player may discard any two cards in his hand that add up to 10, or the card 10 itself.

The player who first discards all cards from his hand, wins.

Adaptations:

- * Give more cards instead of seven.
- * Give fewer cards if there are very many players or the players are young.
- * Allow players to discard three cards that add up to 10.
- * Instead of ten, players discard cards that add up to 9, 8, 11, or some other number.
Use the picture cards for 11, 12, and 13.

Some Went Hiding

You need: As many small objects as is the sum you are studying. For example, to study the sums with 5, you need 5 marbles, or 5 blocks, etc.

Rules: The first player shows the objects, and quickly hides SOME behind his/her back without showing how many. Then he/she shows the remaining objects to the next player, who has to tell how many went hiding. If the player gives the right answer, it is then his/her turn to hide some and ask the next player to answer. If he gives the wrong answer, he misses his turn. This game appeals best to young children.

Adaptations:

- * Instead of getting a turn, the player may gain points or other rewards for the right answer.

Addition Battle

You need: A standard deck of playing cards from which you remove the picture cards, and perhaps also some of the other higher number cards such as tens, nines, and eights. Alternatively, a set of dominoes works well for children who do not yet know their numbers beyond 12.

Rules: In each round, each player is given two cards face up, and has to calculate the sum. The player with the highest sum gets all of the cards from the other players. After enough rounds so that all of the cards are used, the player with the most cards wins.

If there is a tie, such as two players have the sum of 11, those players get an additional two cards and "battle" with those to resolve the tie.

Adaptations:

- * This game is easily adapted for subtraction, multiplication, and fractions.
You can also use dominoes instead of two playing cards.

Any *board game* where you move the piece by rolling two dice also works to practise addition.

The Lessons in Chapter 1

	page	span
Two Groups and a Total	20	3 pages
Learn Symbols “ + ” and “ = ”	23	3 pages
Addition Practice 1	26	2 pages
Which is More?	28	2 pages
Missing Items	30	5 pages
Sums with 5	35	2 pages
Sums with 6	37	2 pages
Adding on Number Line	39	4 pages
Sums with 7	43	3 pages
Sums with 8	46	3 pages
Adding Many Numbers	49	3 pages
Addition Practice 2	52	2 pages
Sums with 9	54	4 pages
Sums with 10	58	4 pages
Comparisons	62	3 pages
Revision of Addition Facts	65	3 pages

Helpful Resources on the Internet

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

Disclaimer: These links were valid at the time of the writing of this book, and to the best of our knowledge we believe these websites to have what is described. However, we cannot guarantee that the links have not changed. Parental supervision is recommended.

Addition Exercise from Dositey.com

Write how many worms are on each of two leaves, and how many together.

<http://www.dositey.com/addsub/addex1.htm>

Children's Addition Quiz

A set of five interactive addition problems that you answer online.

<http://www.thegreatmartinicompany.com/Math-Quick-Quiz/addition-kid-quiz.html>

Number Bond Machines

Practise which two numbers add up to a given number.

<http://www.amblesideprimary.com/ableweb/mentalmaths/numberbond.html>

Save the Whale

Find how much the given “pipe” length is missing from 10 and save the whale.

http://www.ictgames.com/save_the_whale_v4.html

Sample worksheet from
www.mathmammoth.com

Fun 4 The Brain

Practise your basic facts with these simple games that appeal to children.

<http://www.fun4thebrain.com/addition.html>

Children Compare Numbers from Mr. Martini's Classroom

Compare two numbers. Press the number below to choose the biggest number that will appear.

<http://www.thegreatmartinicompany.com/Children-Math/compare-number.html>

Addition and Subtraction Game from The Little Animals Activity Centre

Solve simple addition and subtraction problems by clicking on the ladybug with the right answer.

<http://www.bbc.co.uk/schools/laac/numbers/chi.shtml>

Number Line Arithmetic

Use this virtual manipulative to illustrate addition on a number line.

http://nlvm.usu.edu/en/nav/frames_asid_156_g_1_t_1.html

Line Jumper

Addition questions on a number line.

<http://www.funbrain.com/funbrain/linejump/index.html>

Sum Stacker

Drag dice from stack to stack until the sums of each stack equal the sums given.

<http://www.carstensstudios.com/mathdoodles/sumsstacker.html>

Tux Math

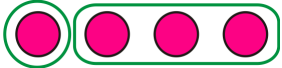





A versatile arcade game for maths facts with many options. Includes all operations. You need to shoot falling comets that can damage the penguins' igloos. **Price:** Free.

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










See also my review: <http://homeschoolmath.blogspot.com/2011/05/tux-math.html>

Two Groups and a Total

1. Make two groups.

<p>a. 4</p>  <p>1 and 3</p>	<p>b. 4</p>  <p>2 and 2</p>	<p>c. 4</p>  <p>3 and 1</p>
<p>d. 5</p>  <p>3 and 2</p>	<p>e. 5</p>  <p>2 and 3</p>	<p>f. 5</p>  <p>1 and 4</p>

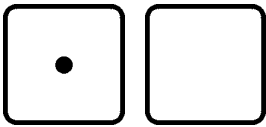
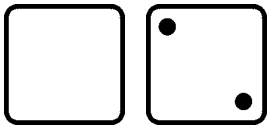
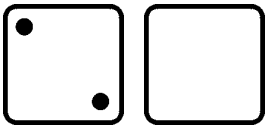
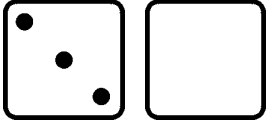
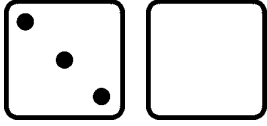
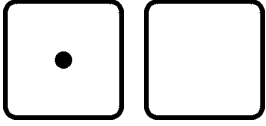
2. Make two groups. Write how many are in the second group.


<p>a. 4</p>  <p>1 and _____</p>	<p>b. 4</p>  <p>2 and _____</p>	<p>c. 4</p>  <p>3 and _____</p>
<p>d. 5</p>  <p>4 and _____</p>	<p>e. 5</p>  <p>3 and _____</p>	<p>f. 5</p>  <p>2 and _____</p>
<p>g. 5</p>  <p>1 and _____</p>	<p>h. 5</p>  <p>5 and _____</p>	<p>i. 5</p>  <p>0 and _____</p>

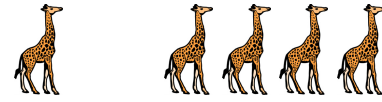
3. Draw as many dots as the number shows. Then make two groups however you like. Write how many are in each group.

<p>a. 3</p> <p>_____ and _____</p>	<p>b. 5</p> <p>_____ and _____</p>	<p>c. 4</p> <p>_____ and _____</p>
<p>d. 2</p> <p>_____ and _____</p>	<p>e. 6</p> <p>_____ and _____</p>	<p>f. 8</p> <p>_____ and _____</p>



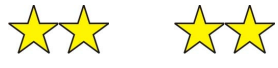

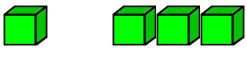




4. The number at the top is the total. Draw the missing dots on the empty dice face. Write on the lines how many dots are on each dice face.

<p>a. 3</p>  <p>_____ and _____</p>	<p>b. 6</p>  <p>_____ and _____</p>	<p>c. 5</p>  <p>_____ and _____</p>
<p>d. 4</p>  <p>_____ and _____</p>	<p>e. 6</p>  <p>_____ and _____</p>	<p>f. 5</p>  <p>_____ and _____</p>


 2 and 2
 "Two and two makes four."


 1 and 4
 "One and four makes five."

5. Write how many are in each group. Write the total in the box.

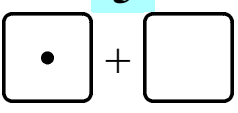
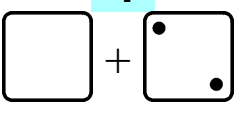
<p>a.  _____ and _____ <input data-bbox="438 705 550 817" type="text"/></p>	<p>b.  _____ and _____ <input data-bbox="885 705 997 817" type="text"/></p>	<p>c.  _____ and _____ <input data-bbox="1340 705 1452 817" type="text"/></p>
<p>d.  _____ and _____ <input data-bbox="438 929 550 1041" type="text"/></p>	<p>e.  _____ and _____ <input data-bbox="885 929 997 1041" type="text"/></p>	<p>f.  _____ and _____ <input data-bbox="1340 929 1452 1041" type="text"/></p>
<p>g.  _____ and _____ <input data-bbox="438 1209 550 1321" type="text"/></p>	<p>h.  _____ and _____ <input data-bbox="885 1209 997 1321" type="text"/></p>	<p>i.  _____ and _____ <input data-bbox="1340 1209 1452 1321" type="text"/></p>

6. Draw circles for each number. Write the total in the box.

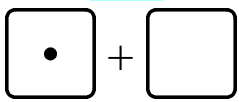
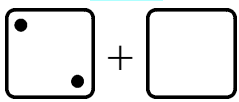
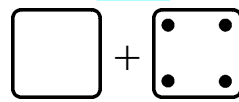
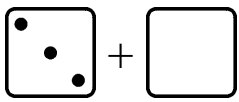
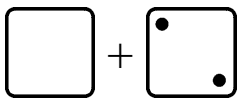
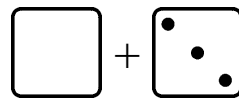
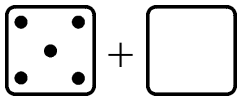
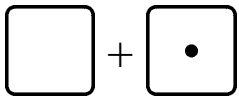
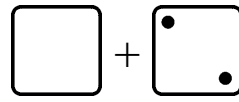
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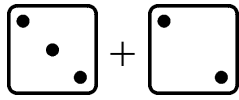
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Missing Items

<p>Something is missing from the addition. The TOTAL is not missing. The total is 5.</p> <p>How many are in the second group? That is what is missing!</p> <p>There should be a total of 5 dots. Draw 4 in the second dice face.</p>	<div style="margin-bottom: 10px;"> 5  </div> <div> $1 + \underline{\quad}$ </div>
<p>There should be a total of 4 dots. The second dice face has two. There are none in the first dice face, so you need to draw them.</p> <p>Read: “2 plus what number makes 4?” or, “2 and how many more makes 4?” or, “What number and 2 makes 4?”</p>	<div style="margin-bottom: 10px;"> 4  </div> <div> $\underline{\quad} + 2$ </div>

1. Draw more dots for the addition. Write the missing number. The total is on top.

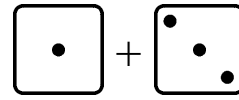
3  a. $1 + \underline{\quad}$	3  b. $2 + \underline{\quad}$	5  c. $\underline{\quad} + 4$
5  d. $3 + \underline{\quad}$	5  e. $\underline{\quad} + 2$	4  f. $\underline{\quad} + 3$
5  g. $5 + \underline{\quad}$	4  h. $\underline{\quad} + 1$	4  i. $\underline{\quad} + 2$



$$3 + \underline{\quad} = 5$$

The **TOTAL** is now written after the equal sign “=”.

The answer is $3 + \underline{2} = 5$

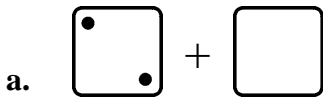


$$\underline{\quad} + 3 = 4$$

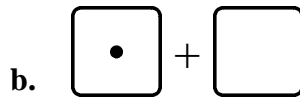
See the **TOTAL** written after the equal sign “=”.

The answer is $\underline{1} + 3 = 4$

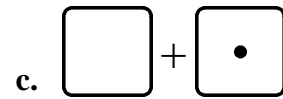
2. Draw more dots to show the missing number. Write the missing number.



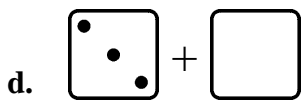
$$2 + \underline{\quad} = 4$$



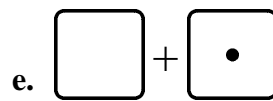
$$1 + \underline{\quad} = 1$$



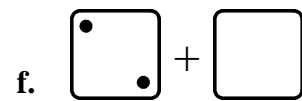
$$\underline{\quad} + 1 = 5$$



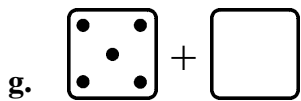
$$3 + \underline{\quad} = 5$$



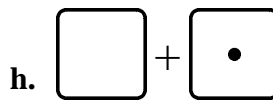
$$\underline{\quad} + 1 = 4$$



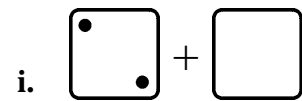
$$2 + \underline{\quad} = 3$$



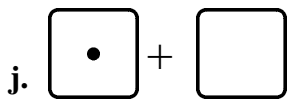
$$5 + \underline{\quad} = 5$$



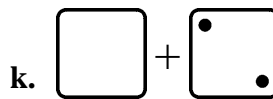
$$\underline{\quad} + 1 = 3$$



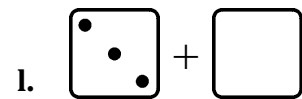
$$2 + \underline{\quad} = 5$$



$$1 + \underline{\quad} = 5$$



$$\underline{\quad} + 2 = 2$$





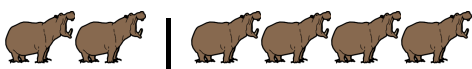




$$3 + \underline{\quad} = 4$$

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Sums with 6

1. Six hippos are grouped into two groups, in different ways. Write the addition sentences.

 _____ + _____ = _____	 _____ + _____ = _____
 _____ + _____ = _____	 _____ + _____ = _____
 _____ + _____ = _____	 _____ + _____ = _____
 _____ + _____ = _____	

2. Play “6 Out” *and/or* “Some Went Hiding” with 6 objects (see the introduction).

3. **Drill.** Don't write the answers but just solve them in your head.

$1 + \square = 6$

$4 + \square = 6$

$\square + 2 = 6$

$\square + 3 = 6$

$2 + \square = 6$

$3 + \square = 6$

$\square + 0 = 6$

$\square + 1 = 6$

$6 + \square = 6$

$5 + \square = 6$

$\square + 4 = 6$

$\square + 5 = 6$



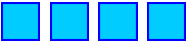
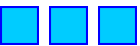

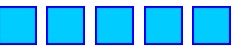


4. Add the numbers and write the total on the line.

a. $1 + 5 = \underline{\hspace{2cm}}$

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



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

5. Draw more boxes to illustrate the missing number and write it on the line.

<p>a. </p> <p>$2 + \underline{\quad} = 6$</p>	<p>b. </p> <p>$2 + \underline{\quad} = 5$</p>	<p>c. </p> <p>$4 + \underline{\quad} = 6$</p>
<p>d. </p> <p>$3 + \underline{\quad} = 6$</p>	<p>e. </p> <p>$1 + \underline{\quad} = 6$</p>	<p>f. </p> <p>$5 + \underline{\quad} = 6$</p>
<p>g. </p> <p>$1 + \underline{\quad} = 5$</p>	<p>h.</p> <p>$0 + \underline{\quad} = 6$</p>	<p>i. </p> <p>$3 + \underline{\quad} = 5$</p>

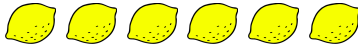

6. Leon and Emma share 5 cucumbers and 6 lemons in different ways. Find how many Emma gets. For the number shown, you can cover the cucumbers or lemons with your hand to see how many Emma gets.

a. 5

Leon gets:	Emma gets:
2	
1	
5	
3	
0	
4	

b. 6

Leon gets:	Emma gets:
1	
4	
5	
0	
2	
3	

7. Add.

$2 + 3 = \underline{\quad}$

$4 + 1 = \underline{\quad}$

$3 + 3 = \underline{\quad}$

$4 + 2 = \underline{\quad}$

$1 + 3 = \underline{\quad}$

$1 + 5 = \underline{\quad}$

$2 + 2 = \underline{\quad}$

$2 + 4 = \underline{\quad}$

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Chapter 2: Subtraction Within 0-10

Introduction

The second chapter covers the concept of subtraction, its various meanings, and the addition/subtraction connection.

The concept of subtraction

If the student does not yet know the word “minus,” it is a good idea to introduce it *first orally*. Simply use blocks, rocks, or other concrete objects. For example, show the child eight blocks, and take away three blocks. Then use both kinds of wordings: “*Eight blocks, take away three blocks, leaves five blocks. Eight blocks minus three blocks equals five blocks.*”

Let the child practise with the blocks or other concrete objects until the child can use the words “minus” and “equals” in his/her own speech. This will make it much easier to introduce the actual written symbols.

In the first lessons, the child can figure out the subtraction problems by simply counting how many objects are left.

Subtraction vs. addition

So, how does the child learn how to subtract without actually counting concrete objects or pictures? As a transitional strategy, we will study **counting down**: the student solves $9 - 3$, for example, by counting down three steps from nine: eight, seven, six. So the answer is six.

However, the final goal is to learn to *use the addition facts* to find the answer to subtraction problems. For example, once the student knows that $5 + 5 = 10$, then this fact is used to solve $10 - 5 = 5$. For this purpose, the child must learn well the connection between addition and subtraction. This is why this book concentrates heavily on the connection between addition and subtraction with several lessons, ending up with the concept of fact families.

Other meanings of subtraction

Besides “taking away”, subtraction is also used for these two situations:

- **Finding how much more one number is than another.** Note that no one “takes away” anything in this situation. For example, if you have three rand and you need six rand, how many more rand do you need? The student is instructed to write a “*how many more*” addition problem for this, which looks like this: $3 + \underline{\quad} = 6$. We also call these problems “missing addend” problems. It can be solved by remembering the addition fact $3 + 3 = 6$, or by subtracting $6 - 3 = 3$.
- **Two (or more) parts (of something) make up a whole.** If you know the whole and one of its parts, you can figure out the other part. For example, if there are 10 white and red flowers, and seven of them are white, how many are red? We know the “parts” (the red and white flowers) add up to 10, so we write an addition $7 + \underline{\quad} = 10$. Again, this can be solved by subtracting, or simply by knowing the addition fact $7 + 3 = 10$.

These two situations are taught explicitly and can be found in the word problems throughout this chapter.

The Lessons in Chapter 2

	page	span
Subtraction Is “Taking Away”	72	3 pages
Count Down to Subtract	75	4 pages
Subtraction and Addition in the Same Picture	79	4 pages
When Can You Subtract?	83	4 pages
Two Subtractions from One Addition	87	3 pages
Two Parts — One Total	90	3 pages
Fact Families	93	4 pages
How Many More	97	3 pages
“How Many More” Problems and Difference	100	4 pages
“How Many More” Problems and Subtraction	104	3 pages
Revision	108	1 page

Helpful Resources on the Internet

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

Disclaimer: These links were valid at the time of the writing of this book, and to the best of our knowledge we believe these websites to have what is described. However, we cannot guarantee that the links have not changed. Parental supervision is recommended.

Kids' Subtraction Quiz from Mr. Martini's Classroom

Five problems to solve online. You can choose the highest number used from the list of numbers below the quiz.

<http://www.thegreatmartinicompany.com/Math-Quick-Quiz/subtraction-kid-quiz.html>

Subtraction Mystery Picture

Find out the picture behind the tiles by solving subtraction questions within 0-10.

<http://www.dositey.com/addsub/Mystery4.htm>

Matching Pictures to Number Sentences

Find the correct number sentence to go along with the picture.

http://www.haelmedia.com/html/mc_m1_001.html

Match Pictures to Number Sentences

Match pictures to either addition or subtraction number sentences.

http://www.haelmedia.com/html/mc_m1_001.html

Addition and Subtraction Game from The Little Animals Activity Centre

Solve simple addition and subtraction problems by clicking on the ladybug with the right answer.

<http://www.bbc.co.uk/schools/laac/numbers/chi.shtml>

Subtraction Game from Count Us In

Subtract two numbers which rolls a ball down a bowling-alley lane.

<http://www.abc.net.au/countusin/games/game8.htm>

Sample worksheet from
www.mathmammoth.com

Take It Away

Subtract and click on the correct answer.

<http://www.primarygames.com/takeaway/start.htm>

Subtraction Pinball

When the ball hits numbers, it defines a problem. Next you choose the correct answer.

<http://www.playkidsgames.com/games/pinball/subtraction/defaultk1.htm>

Simple Subtraction

Help the duck fly faster by clicking on the cloud with the correct answer.

<http://www.toonuniversity.com/flash.asp?err=513&engine=12>

Save the Apples!

Click on the correct basket to get the monkey to carry the apple basket. A crocodile is waiting!

<http://www.playkidsgames.com/games/apples/savetheApples.htm>

Busy Bees

Figure out how many of the 10 bees went inside the hive.

http://www.hbschool.com/activity/busy_bees/index.html

Soccer Subtraction

Click to make the players disappear until the subtraction sentence is true.

http://www.ictgames.com/soccer_subtraction.html

Maths Carts

A downloadable racing game for young students to memorise addition and subtraction facts. Children choose various animal themed carts and unlock new carts and race tracks as they progress through the facts. There are three difficulty levels.

Price: Free

<http://sandbox.yoyogames.com/games/163070-math-carts>

Tux Math

A versatile arcade game for maths facts with many options. Includes all operations. You need to shoot falling comets that can damage the penguins' igloos. See also my revision at





<http://homeschoolmath.blogspot.com/2011/05/tux-math.html>

Price: Free






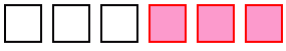
<http://sourceforge.net/projects/tuxmath>

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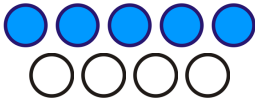

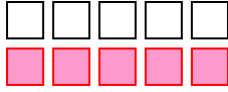

Subtraction and Addition in the Same Picture

<p>How many coloured circles? How many white ones?</p>  <p><u>4</u> + <u>6</u> = 10</p>	 <p><u>3</u> + <u>4</u> = 7</p>
<p>Cover the coloured circles. Write a subtraction sentence.</p>  <p>10 - <u>4</u> = <u>6</u></p>	<p>Cover the coloured circles.</p>  <p>7 - <u>3</u> = <u>4</u></p>

1. Make an addition sentence and a subtraction sentence from the same picture.

<p>a. </p> <p>_____ + _____ = _____</p> <p>7 - _____ = _____</p>	<p>b. </p> <p>_____ + _____ = _____</p> <p>6 - _____ = _____</p>
<p>c. </p> <p>_____ + _____ = _____</p> <p>5 - _____ = _____</p>	<p>d. </p> <p>_____ + _____ = _____</p> <p>6 - _____ = _____</p>
<p>e. </p> <p>_____ + _____ = _____</p> <p>8 - _____ = _____</p>	<p>f. </p> <p>_____ + _____ = _____</p> <p>6 - _____ = _____</p>

2. Make an addition sentence and a subtraction sentence for the same picture.


<p>a.</p>  <p>_____ + _____ = _____</p> <p>_____ - _____ = _____</p>	<p>b.</p>  <p>_____ + _____ = _____</p> <p>_____ - _____ = _____</p>
<p>c.</p>  <p>_____ + _____ = _____</p> <p>_____ - _____ = _____</p>	<p>d.</p>  <p>_____ + _____ = _____</p> <p>_____ - _____ = _____</p>

3. In each problem, draw circles and then colour some circles to fit the addition sentence. Then cover the **COLOURED** circles and make a subtraction sentence.

<p>a. $7 + 1 =$ _____</p> <p>_____ - _____ = _____</p>	<p>b. $6 + 3 =$ _____</p> <p>_____ - _____ = _____</p>
<p>c. $2 + 3 =$ _____</p> <p>_____ - _____ = _____</p>	<p>d. $2 + 5 =$ _____</p> <p>_____ - _____ = _____</p>
<p>e. $7 + 4 =$ _____</p> <p>_____ - _____ = _____</p>	<p>f. $3 + 3 =$ _____</p> <p>_____ - _____ = _____</p>

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Two Parts — One Total

<p>There are ten marbles. Some are blue and seven are yellow. How many are blue?</p> <p>You can write an addition sentence. You can ALSO write a subtraction sentence, even though nothing is taken away.</p>	 $\underline{\quad\quad} + 7 = 10$ $10 - 7 = \underline{\quad\quad}$ <p>Cover part of the total (the yellow marbles), and you will see the other part (the blue marbles).</p>
<p>There are five blue marbles and some white marbles in a bag. There is a total of nine marbles. How many are white?</p> <p>Draw the marbles. Write an addition sentence AND a subtraction sentence.</p>	$\underline{\quad\quad} + \underline{\quad\quad} = \underline{\quad\quad}$ $\underline{\quad\quad} - \underline{\quad\quad} = \underline{\quad\quad}$

1. Solve the word problems. Write an addition sentence AND a subtraction sentence.

<p>a. Mum put some blue and red flowers in a vase. Jen counted five red flowers, and a total of ten flowers. How many of the flowers are blue?</p>	$\underline{\quad\quad} + \underline{\quad\quad} = \underline{\quad\quad}$ $\underline{\quad\quad} - \underline{\quad\quad} = \underline{\quad\quad}$
<p>b. There are nine children on a team, and four of them are boys. How many are girls?</p>	$\underline{\quad\quad} + \underline{\quad\quad} = \underline{\quad\quad}$ $\underline{\quad\quad} - \underline{\quad\quad} = \underline{\quad\quad}$

c. Johan has ten socks in his basket. Eight of them are white, and the rest are black.
How many are black?

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

$$\underline{\quad\quad} - \underline{\quad\quad} = \underline{\quad\quad}$$

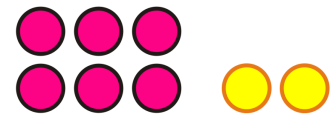
d. Griet saw eight chairs on the lawn, and two had blown over.
How many were still sitting upright?

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

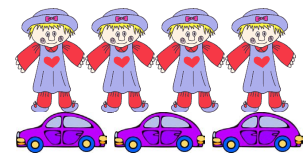
$$\underline{\quad\quad} - \underline{\quad\quad} = \underline{\quad\quad}$$

2. For each picture, make a word problem that is solved by subtraction.





a.





b.



3. Write an addition sentence for the pictures.

 <p>a. _____ + _____ + _____ = _____</p>	 <p>b. _____ + _____ + _____ = _____</p>
 <p>c. _____ + _____ + _____ = _____</p>	 <p>d. _____ + _____ + _____ = _____</p>

4. Draw the missing marbles to match the addition sentence.

 <p>a. $3 + 2 + \underline{\hspace{1cm}} = 8$</p>	 <p>b. $1 + 5 + \underline{\hspace{1cm}} = 10$</p>
---	---

5. Draw a picture to solve these problems.

a. Thandi had some red, blue, and yellow roses in a vase. Two roses were blue, and two were red. If she had a total of ten roses, how many of them were yellow?

b. Seven birds sat in a tree. One of them was black, two were blue, and the rest were brown. How many were brown?

c. Buhle has two long pencils, two medium-size pencils, and the rest of her pencils are short. If she owns nine pencils, how many of her pencils are short?

Fact Families

Two addition facts and two subtraction facts form a fact family if they use the same three numbers.

For example, with 5, 3, and 2 we get a fact family on the right:

5



$$2 + 3 = 5$$

$$5 - 3 = 2$$

$$3 + 2 = 5$$

$$5 - 2 = 3$$

1. Write the fact families to match the pictures.

a. 6



$$1 + 5 = 6$$

$$5 + 1 = 6$$

$$6 - \underline{\quad} = \underline{\quad}$$

$$6 - \underline{\quad} = \underline{\quad}$$

b. 8



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

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

$$\underline{\quad} - \underline{\quad} = \underline{\quad}$$

$$\underline{\quad} - \underline{\quad} = \underline{\quad}$$

c. 9



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

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

$$\underline{\quad} - \underline{\quad} = \underline{\quad}$$

$$\underline{\quad} - \underline{\quad} = \underline{\quad}$$

d. 10



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

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

$$\underline{\quad} - \underline{\quad} = \underline{\quad}$$

$$\underline{\quad} - \underline{\quad} = \underline{\quad}$$

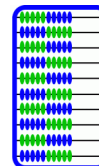
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Chapter 3: Place Value Within 0-100

Introduction

The third chapter teaches students two-digit numbers, or place value with tens and ones.

The initial lessons that introduce tens and ones use a 100-bead abacus extensively. A 100-bead abacus or school abacus simply contains 10 beads on 10 rods with a total of 100. It is *not* a special abacus as used by the Chinese or the Russians. In the school abacus, each bead simply represents one. It can look, for example, like the picture on the right. The 100-bead abacus lets children both “see” the numbers and use their touch while making them.



Amazon has many abaci, for example this Melissa & Doug Classic Wooden Abacus:
<http://www.amazon.com/exec/obidos/ASIN/B00005BVRQ/?tag=homeschoolmath-20>

Shops like Toys-R-us and Reggies may supply abaci from time to time. Other shops stock abaci as well. If you cannot obtain a real abacus, you can probably use this virtual abacus:
<http://illuminations.nctm.org/ActivityDetail.aspx?ID=8>

The abacus is not the only model used in the chapter. We also use a visual model of blocks where ten of them “snap” together to form a stick. If you already have so-called base-ten blocks, you can use them along with the visual exercises, if you want to.

Then, we also use the 100-chart and number lines. Number lines help visualise how the numbers continue indefinitely and also connect with the concept of measuring. The 100-chart helps the child to be familiar with the numbers below 100 and find patterns in the number system.

When children count, they basically just learn numbers as some kind of continuum that continues and continues. With simple counting, your child might not catch on to the inherent structure and how it goes into groups of tens and hundreds and thousands.

For children to understand place value, they first need to know their numbers up to 10, do simple addition with small numbers, and understand about counting in groups. Our whole number system is based on the idea that if you have lots and lots of objects, the efficient way is to count them in groups of tens, hundreds, and thousands - not individually.

The crucial point in understanding the concept of place value is that a **certain position** *represents* a **certain size group**. Then the digit in that position tells you how many of that size group there are. For example, in the number 2 381, we adults already know that 8 represents eight tens, and not just “8”. The number 3 represents three hundreds, and not just “3”. The placing or positioning of the digit tells us what size the group is that we mean, and the digit tells how many of those groups.

In this chapter, children learn this idea for just two digits, or two place values.

For that matter, we could start a different system of writing numbers where font size tells you the place value: for example $7\mathbf{8}_2$ would be 7 tens, 8 hundreds, and 2 ones = 872. Please note that this idea is NOT developed here. It is just an example to let *you* see that the place value concept is about something abstract (certain positioning) representing a certain size group.

The Lessons

	page	span
Counting in Groups of 10	112	2 pages
Naming and Writing Numbers	114	4 pages
The “Teen” Numbers	118	3 pages
Building Numbers 11-40.....	121	2 pages
Building Numbers 41-100.....	123	2 pages
A 100-Chart	125	2 pages
Add and Subtract Whole Tens	127	2 pages
Practising with Numbers	129	2 pages
Which Number is Greater?	131	3 pages
Numbers Beyond 100	134	2 pages
More Practice with Numbers	136	2 pages
Skip-Counting Practice	138	3 pages
Bar Graphs	141	2 pages
Tally Marks	143	2 pages
Revision	145	2 pages

Helpful Resources on the Internet

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

Disclaimer: These links were valid at the time of the writing of this book, and to the best of our knowledge we believe these websites to have what is described. However, we cannot guarantee that the links have not changed. Parental supervision is recommended.

Base Blocks from National Library of Virtual Manipulatives

Place enough ten-sticks and one-blocks into the work area to show given numbers. Choose “Columns = 2” to restrict the program to two-digit numbers.

http://nlvm.usu.edu/en/nav/frames_asid_152_g_1_t_1.html?from=category_g_1_t_1.html

Electronic Abacus

Use this to illustrate two-digit numbers. It shows the amount of beads with a number and with a format “2-ten 5”.

<http://illuminations.nctm.org/ActivityDetail.aspx?ID=8>

Tens and Ones Exercise

Enter the two-digit number displayed by the ten-bags and one-counters

<http://www.dositey.com/addsub/tenoneex.htm>

Shark Pool Place Value

Click on the number shown by the ten-stacks and individual blocks.

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

Count to 99!

Enter the number shown by the coloured blocks of a hundred chart.

<http://www.thegreatmartinicompany.com/Kids-Math/kids-count-99.html>

Sample worksheet from

www.mathmammoth.com

Give the Dog a Bone

Find the hidden bones on a 100-chart.

<http://www.oswego.org/ocsd-web/games/DogBone/gamebone.html>

Number Charts

Create different kinds of printable number charts.

<http://www.homeschoolmath.net/worksheets/number-charts.php>

Base 10

Build the given number using ten-sticks and blocks.

<http://www.learningbox.com/Base10/BaseTen.html>

Two-Digit Numbers in English

Draw the number name to the correct number.

<http://www.crickweb.co.uk/numbers2-english.html>

Number Track

Place the number tiles in the correct order in the track.

<http://www.crickweb.co.uk/assets/resources/flash.php?&file=ntrack>

Number Comparison at Mr. Martini's Classroom

Click on the $<$, $>$, or $=$ sign to be put in between two numbers.

<http://www.thegreatmartinicompany.com/inequalities/number-comparison.html>

Techno Tortoise

Move the tortoise in steps of 10s, 5s, and 1s on the number line to the target number.

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

Number Line

Useful for illustrating two-digit numbers. Draw leaps and click on the line to reveal number tags. Change lines to get to two-digit numbers and more.

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

Connect the Dots

Connect the dots by counting in twos.

http://www.abcy.com/connect_the_dots_bear_2s.htm

Octopus Game

Find the shell that contains a number 10 more than the given number.

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

Froggy Hop

Find 10 more or 1 more of a given number.

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

Football

Click the ball that shows the number 10 less than the shirt.

<http://www.ictgames.com/football2.html>

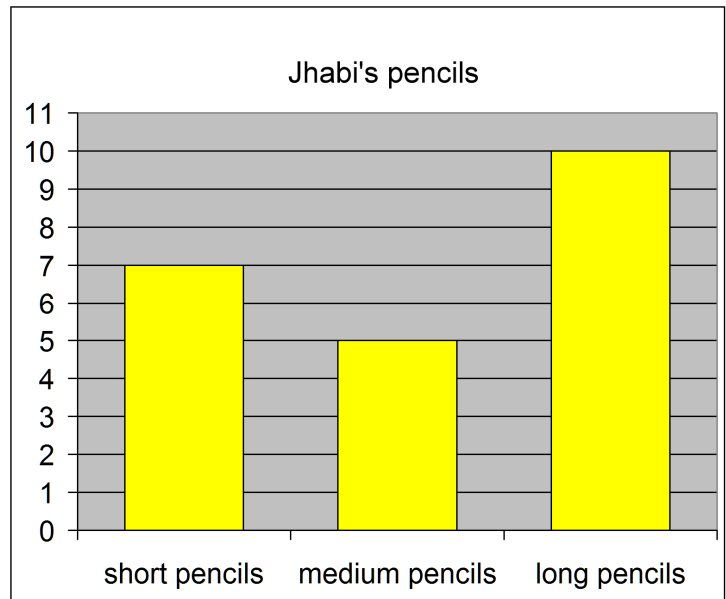
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Bar Graphs

This is a **bar graph**. Read it this way: look at the **TOP** of each column (bar), and look towards the left. How high does the top of the bar reach? Read the number.

Look at the first bar, for short pencils. Where does the top of that bar reach?

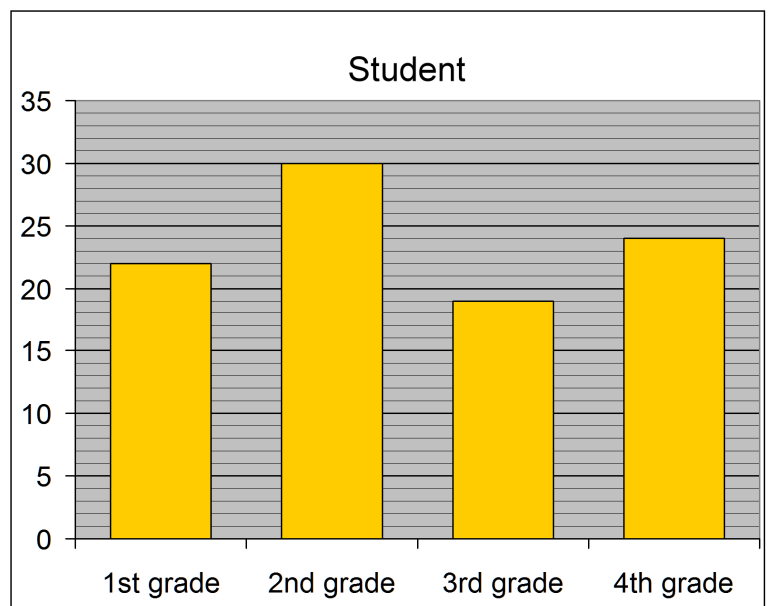
It reaches to 7. So, Jabhi has 7 short pencils.

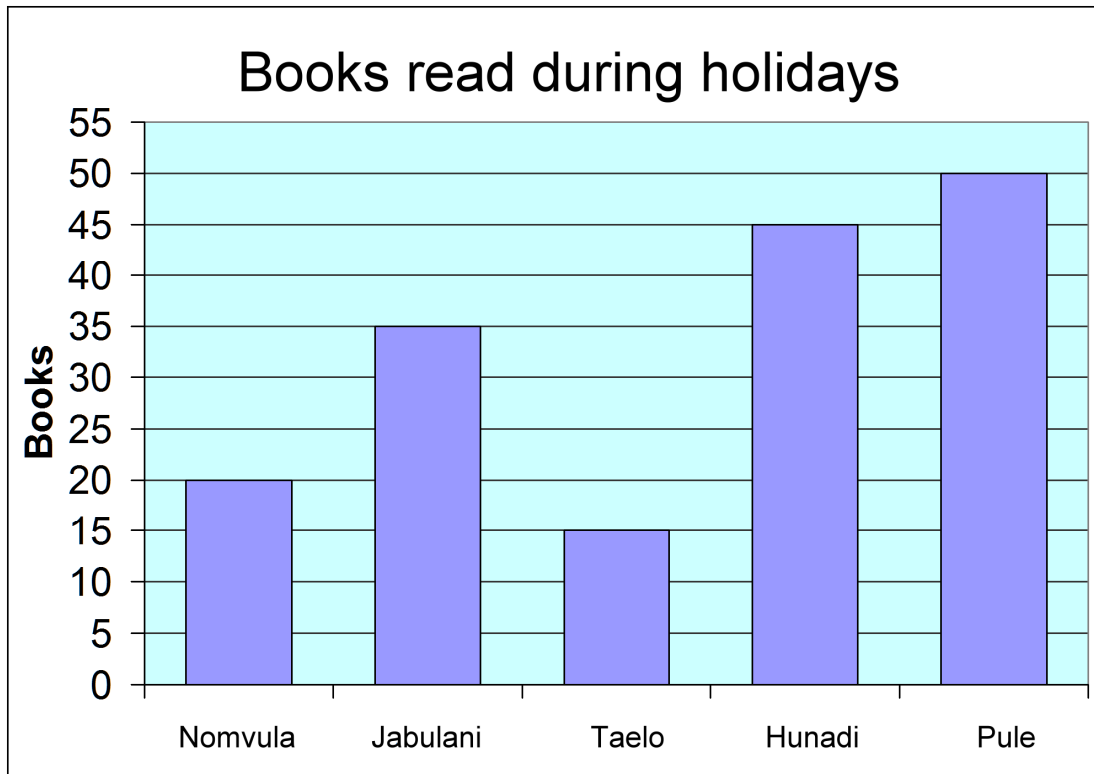


- How many medium pencils does Jabhi have?
 - How many long pencils does Jabhi have?
 - How many short and medium pencils does Jabhi have in total?
 - How many more long pencils does he have than short ones?

2. Here, the bar for first grade students reaches two little lines past 20. It is 22 students.

- How many students are in 2nd grade?
- How many students are in 3rd grade?
- How many students are in 4th grade?





3. a. How many books did each child read?

Nomvula _____ Jabulani _____ Taelo _____ Hunadi _____ Pule _____

b. _____ read the least books.

_____ read the most books.

c. The two children who read the most books were _____

and _____.

The two children who read the least books were _____

and _____.


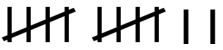
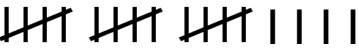

d. How many books did Nomvula and Pule read together? _____ books

(Challenge) How many books did Taelo and Hunadi read together? _____ books

Tally Marks

1. **Tally marks.** Tally marks are counting marks. When people count they make one tally mark for each thing they count. For one item or thing, draw one tally mark as “|”. The fifth tally mark is drawn across the four others like “**||||**”.

Write the number that the tally marks mean.

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

2. Draw tally marks for these numbers.

a. 7	b. 14
c. 16	d. 32
e. 41	f. 28

3. Count the fish. Use tally marks. Mark the fish you are counting, and write a tally mark for it. That way you won't count the same fish twice. Then write the number under “Count”.

	Tally Marks	Count
Red		
Blue		
Yellow		

