



# Basic Mathematics

Teacher's Guide

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# Unit 1: Addition and Subtraction

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This unit presents the operations of addition and subtraction. In Lesson 1, students learn the basics of addition, how to add in columns, adding multi-digit numbers, carrying, and how to identify and solve word problems involving addition. In Lesson 2, they learn about subtraction, including subtracting in columns, checking answers, subtracting numbers with different numbers of digits, borrowing, and how to identify and solve word problems involving subtraction.

## Lesson 1—Addition

**Goal:** To review the addition of numbers to four digits with carrying, and to use addition in word problems

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### WORDS TO KNOW

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<b>carry</b>	when the sum of a column is more than 9, to move numbers from that column to the column of the next greater place value
<b>column</b>	numbers lined up vertically (up and down)
<b>digit</b>	any one of the symbols 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, which are used to represent numbers
<b>equal sign</b>	a sign used in place of the words “is equal to.” The sign looks like this: = .
<b>plus sign</b>	a sign used to mean add. It looks like this: +.
<b>row</b>	numbers lined up horizontally (across)
<b>sum</b>	the answer to an addition problem
<b>total</b>	the answer to an addition problem; another word for sum

## Lesson 2—Subtraction

**Goal:** To review subtraction, including borrowing, and to use subtraction in word problems

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### WORDS TO KNOW

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<b>commutative property</b>	mathematical property that says that changing the order of the numbers to be added or multiplied doesn't change the answer
<b>difference</b>	the answer in a subtraction problem
<b>minuend</b>	in a subtraction problem, the number that is being reduced, or subtracted from; in $4 - 1$ , the minuend is 4.

- minus sign** a sign used to show that the number after the sign is to be subtracted. It looks like this:  $-$ .
- place value** the value of a digit within a number is shown by where it is placed in the number, that is, whether it stands for ones, tens, hundreds, thousands, and so forth.
- subtraction** mathematical operation in which one number is taken away from another
- subtrahend** in a subtraction problem, the number to be subtracted, or taken away, to find the difference between two numbers; in  $7 - 5$ , the subtrahend is 5.

## Notes on Application Activities in Student Text

Activity	Skills Applied	Product
<b>A New Checking Account</b>	gathering information critical thinking computation skills	completed chart written opinion
<b>Counting Animals</b>	gathering information critical thinking computation skills	completed chart written conclusion
<b>Your Monthly Budget</b>	gathering information computation skills	completed chart

## Additional Activity Suggestions

- Have learners visit the admissions office of a nearby college or junior college they might consider attending. Have them gather information on the costs of attending the school (including tuition, fees, books, dormitory housing if applicable, meals, parking permits, and so on) and find the total cost. They can also learn the number of credits needed to graduate and how much the courses they would want to take count toward the total.
- Have learners visit a local food bank or soup kitchen to learn the total cost of providing such a service. They should ask about the renting of the space and the cost of the food (including the approximate value of donated food), paper goods, cleaning service, paid staff (if any), and liability insurance. Have them total the expenses and research how much of the money needed comes from organized charities (such as the United Way) and other sources. Learners may be able to suggest additional ways to procure donated food, labor, or money for the pantry or kitchen.

- Ask learners with access to cars to visit a service station for a tune-up. They should find out the basic rate and also inquire about “extras” that add to the cost. Which extra services seem legitimate, and which seem like padding? What is the total cost of the desired services? Learners without access to a car might team up with those who do; they might also complete the same assignment with a bicycle at a bicycle shop.
- Have learners attend a town meeting, city council meeting, or their church’s annual meeting to observe and participate in budget discussions. Most such meetings are open to observers. Learners could prepare for the meeting by interviewing the town or county planner or comptroller (titles vary but basically they’re looking for the financial officers). Learners should also obtain a copy of the proposed budget to study. If there is a desire to take this idea further, you could have an in-class debate about a municipal budget.



### Mental Math

- Addition and subtraction lend themselves well to lively classroom games. One easy idea is to split your learners into two teams. Then present the teams with a series of addition and subtraction problems. Learners should not use paper, pencils, or calculators—all math should be done in their heads. The first person to call out each correct answer wins a point for his or her team. You can vary the game by adding a third team. Each team then takes a turn providing addition and subtraction problems for the other two teams to solve in their heads.



### Differentiation

- As you present new concepts, demonstrate them on the board or overhead, using metacognitive strategies to explain out loud what you are thinking and doing throughout the process.
- For learners who find it difficult to think abstractly, use manipulatives to demonstrate the principles of addition.
- Give students pages from catalogs with items they are likely to find appealing, such as electronics, CDs, DVDs, and so forth. Have students work individually or in small groups to choose items from the catalog and add their cost. You may ask students to choose a certain number of items and add their prices to find the total cost, or ask them to find a minimum of three items that add up to a certain dollar value. You may want to specify whether they should include or omit tax and shipping costs in their calculations.
- To help students recall important new terms, use the Words to Know and definitions from each lesson to prepare crossword puzzles or matching activities.
- Ask students to brainstorm a list of all the ways they use addition in their daily lives. If you like, write the list on a corner of the board or on newsprint and post it in the classroom as a reminder.

# Answer Key

## Unit 1: Addition and Subtraction

### Lesson 1: Addition

#### Practice 1: Addition

- |              |      |
|--------------|------|
| 1. 9 apples  | 5. 4 |
| 2. 9 circles | 6. 5 |
| 3. 2         | 7. 4 |
| 4. 3         | 8. 7 |

#### Practice 2: Addition Problems in Columns

- |       |        |
|-------|--------|
| 1. 13 | 7. 11  |
| 2. 16 | 8. 14  |
| 3. 9  | 9. 10  |
| 4. 6  | 10. 11 |
| 5. 15 | 11. 14 |
| 6. 12 | 12. 17 |

#### Practice 3: Adding More than Two Columns

- |       |       |
|-------|-------|
| 1. 15 | 4. 10 |
| 2. 11 | 5. 16 |
| 3. 13 | 6. 15 |

#### In Real Life, page 8:

Ellis should add the lengths of the three shelves together.  
 $4 \text{ feet} + 4 \text{ feet} + 4 \text{ feet} = 12 \text{ feet}$ . Ellis should buy the board that is 12 feet long.

#### Practice 4: Adding Two-Digit Numbers

- |       |        |
|-------|--------|
| 1. 86 | 6. 83  |
| 2. 37 | 7. 69  |
| 3. 95 | 8. 59  |
| 4. 38 | 9. 28  |
| 5. 88 | 10. 99 |

#### Practice 5: Adding Three-Digit Numbers

- |        |         |
|--------|---------|
| 1. 799 | 6. 667  |
| 2. 687 | 7. 388  |
| 3. 589 | 8. 993  |
| 4. 959 | 9. 497  |
| 5. 937 | 10. 762 |

#### Practice 6: Adding Four-Digit Numbers

- |         |          |
|---------|----------|
| 1. 4799 | 6. 8187  |
| 2. 9795 | 7. 4364  |
| 3. 4243 | 8. 8537  |
| 4. 7977 | 9. 8917  |
| 5. 8998 | 10. 9999 |

#### Think About It, page 16:

When numbers are lined up in columns, it is easy to see which digits are in the ones place, tens place, and so on. This makes it much easier to add. Also, one number is right below the other,

without signs or spaces between them.

#### Practice 7: Carrying

- |           |         |
|-----------|---------|
| 1. 1307   | 4. 5385 |
| 2. 10,307 | 5. 8675 |
| 3. 9011   | 6. 5754 |

#### Think About It, page 18:

Shannon did not carry the 1 to the hundreds column. The correct answer is 314.

#### Practice 8: Word Problems

- |                   |                        |
|-------------------|------------------------|
| 1. 396 CDs        | 6. 427 new restaurants |
| 2. 200 candy bars | 7. 1984 miles          |
| 3. \$402          | 8. 4225 white cars     |
| 4. 1066 workers   | 9. 22,518 patients     |
| 5. \$418          |                        |

### Lesson 2: Subtraction

#### Think About It, page 21:

The commutative property doesn't work for subtraction. You will get a different answer if the order is changed. For example,  $5 - 3 = 2$ . But  $3 - 5 = -2$ .

#### Practice 9: Subtraction

- |      |      |
|------|------|
| 1. 4 | 4. 0 |
| 2. 6 | 5. 9 |
| 3. 7 | 6. 3 |

#### Practice 10: Subtracting in Columns

- |      |      |
|------|------|
| 1. 7 | 4. 1 |
| 2. 1 | 5. 6 |
| 3. 0 | 6. 5 |

#### Practice 11: Checking Your Answers

- |                   |                   |
|-------------------|-------------------|
| 1. 4, $4 + 4 = 8$ | 3. 4, $4 + 5 = 9$ |
| 2. 2, $2 + 3 = 5$ | 4. 6, $6 + 2 = 8$ |

#### Think About It, page 25:

Ramón thought that since zero stands for nothing, he didn't need to put it in the column. He was wrong. The zero must be used because it "holds" the ones place. The 2 actually belongs in the tens place. The correct answer is 33.

#### Practice 12: Subtracting Two-Digit Numbers

- |       |        |
|-------|--------|
| 1. 62 | 8. 23  |
| 2. 11 | 9. 14  |
| 3. 33 | 10. 22 |
| 4. 17 | 11. 53 |
| 5. 44 | 12. 63 |
| 6. 52 | 13. 22 |
| 7. 20 | 14. 52 |

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# Graphic Organizers

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## Graphic Organizers

Graphic organizers are a versatile teaching and learning tool. They can help students clarify their thinking, integrate new knowledge, reinforce their understanding of a topic, and review material for quizzes and tests. Using graphic organizers, learners can understand content more clearly and can take clear, concise notes. Graphic organizers can also act as a visual aid to make abstract concepts more concrete.

The graphic organizers provided here can be used in many ways. You can use transparencies of the organizers to introduce or review a topic with the entire class. You can photocopy the organizers and allow students to use them as they work through the student text. Here is a brief description of the organizers in this section, and their uses.

### Structured Notes

This organizer is one way of organizing notes as students read through the text. Students should write the main topic in the box at the top. In the boxes underneath they can write details about the topic, specific information, examples, and so forth.

### Concept and Definition Chart

This chart is used to keep track of new vocabulary and concepts as they are introduced in the text. Students should write the word or concept in the box at the top of the chart. They should then fill in the information in the rest of the boxes.

### Steps in a Process Chart

This graphic organizer is used to show information in order. Students will find this organizer particularly useful when taking notes of mathematical processes, showing the steps in order. They should write the process in the box at the top of the chart, then break the process down into steps and write one step in one box, adding or deleting boxes as needed.

### Table

This graphic organizer has many uses. Students should label each column, then write relevant information in each cell of the chart.

# Concept and Definition Chart

