POWER BASICS®

Basic Mathematics

Robert Taggart

WALCH PUBLISHING

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UNIT 1

Addition and Subtraction

LESSON 1: Addition

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

WORDS TO KNOW

carry	plus sign
column	row
digit	sum
equal sign	total

What Is Addition?

When you add, you combine two or more groups into one group. These groups can include one thing or more than one thing. The number of things in one group can be added to the number of things in another group. Adding is quicker than counting.

You have three apples in one group below and two apples in the other.

Group One

Group Two

How many apples do you have altogether?

To answer this question, you can count:

1 → 2 → 3 → 4 → 5

Or, even faster, you can add:

3 → + → 2 → = 5

The sign for addition is + . It is called the **plus sign.** The plus sign tells you to add the numbers before and after the sign. The answer in an addition problem is called the **sum** or **total.** The result of addition equals the sum or total. The **equal sign** is = .

Look at the examples below.

Example 1

3 + 7 = 10 Three plus seven equals ten. The sum or total is 10.

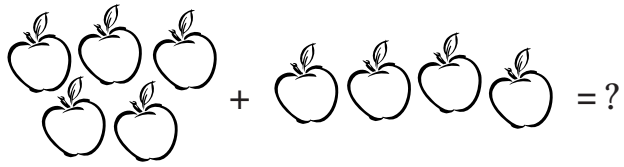
Example 2

8 + 4 = 12 Eight plus four equals twelve. The sum or total is 12.

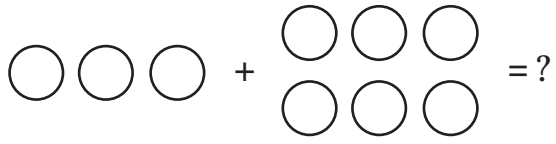
PRACTICE 1: Addition

Answer the question about each set of pictures. Write your answer on the line after each question.

1. Look at the apples below. How many apples are there altogether? _____ apples



2. Look at the circles below. How many circles are there altogether? _____ circles



Find the sum for each addition problem. Write your answer on the line after each problem.

3. 1 + 1 = _____ **4.** 2 + 1 = _____

5. 2 + 2 = _____ **6.** 2 + 3 = _____

7. 3 + 1 = _____ **8.** 4 + 3 = _____

Addition Problems in Columns

Addition problems can be written in different ways. You can write an addition problem in a **row,** in which the numbers are lined up horizontally. Look at the example below.

Example 1

8 + 6 = 14

However, you will more often write an addition problem in a **column.** Put the addition sign to the left of the last number to be added. Then put a line under the last number, separating it from the total. Look at the example below.

Example 2

$$\begin{array}{r} 8 \\ +\ 6 \\ \hline 14 \end{array}$$

Addition problems are easier to solve when they are written in columns, especially if you are adding large numbers.

TIP

The word *sum* comes from a Latin word that means "highest." So when we say "The sum of 6 and 3 is 9," we mean that the sum (9) is the highest number in the problem.

PRACTICE 3: Adding More Than Two Numbers

Find the sum for each problem. Circle your answer when you have finished.

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

2. $1 + 5 + 3 + 2 =$ _____

3.
$$\begin{array}{r} 1 \\ 3 \\ 4 \\ +\ 5 \\ \hline \end{array}$$

4. $4 + 2 + 1 + 3 =$ _____

5.
$$\begin{array}{r} 5 \\ 2 \\ 2 \\ +\ 7 \\ \hline \end{array}$$

6. $3 + 4 + 2 + 6 =$ _____

IN REAL LIFE

Addition skills can help you do work around the house. Ellis wants to make some shelves for his living room. He measures his living room wall and decides that each shelf should be 4 feet long. At the lumber yard, he notices that boards are sold in lengths of 6 feet, 8 feet, 10 feet, 12 feet, and 16 feet. The salesperson tells him he can buy one piece of wood and cut it into three pieces. If Ellis wants three shelves, each 4 feet long, which length of board should he buy? Write your answer on a separate sheet of paper.

Adding Two-Digit Numbers

A **digit** is any of the symbols used to write numbers: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. So far we have added numbers with one digit. Numbers from 10 to 99 have two digits.

Some One-Digit Numbers	Some Two-Digit Numbers
1, 3, 7, 6	10, 36, 21, 55

To add two-digit numbers, follow the steps below.

Example

35 + 54

Step 1. Line up the ones and tens digits in columns.

```
  tens ones
   3  5
+  5  4
```

Step 2. Add the digits in the ones column.

```
   35
+  54
    9
```

Step 3. Add the digits in the tens column.

```
   35
+  54
   89
```

The sum is 89.

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Basic Mathematics

Teacher's Guide

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Unit 1: Addition and Subtraction

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

WORDS TO KNOW

carry	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
column	numbers lined up vertically (up and down)
digit	any one of the symbols 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, which are used to represent numbers
equal sign	a sign used in place of the words "is equal to." The sign looks like this: = .
plus sign	a sign used to mean add. It looks like this: +.
row	numbers lined up horizontally (across)
sum	the answer to an addition problem
total	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

WORDS TO KNOW

commutative property	mathematical property that says that changing the order of the numbers to be added or multiplied doesn't change the answer
difference	the answer in a subtraction problem
minuend	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
A New Checking Account	gathering information critical thinking computation skills	completed chart written opinion
Counting Animals	gathering information critical thinking computation skills	completed chart written conclusion
Your Monthly Budget	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.

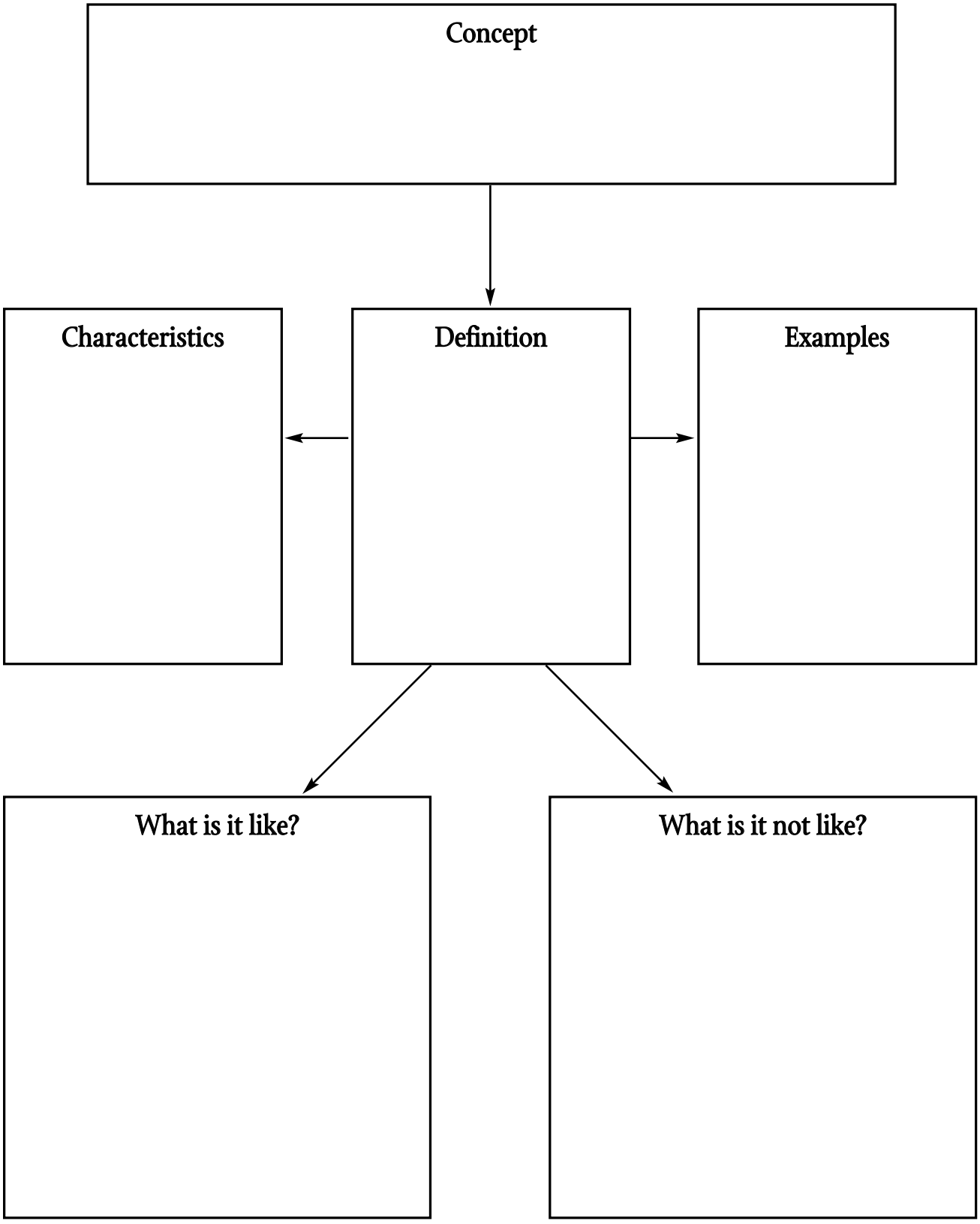
Mental Math

- 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.

Concept and Definition Chart



POWER BASICS PLUS

Basic Mathematics

Workbook

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Unit 3: Fractions and Decimals

Unit 4: Percents, Powers, and Roots

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NAME:

UNIT 2 • ACTIVITY 24
Multiplication Bingo

Your class has decided to play a game of multiplication bingo. Your teacher will roll the two dice and will multiply the two numbers together. Your teacher will continue to do this until someone has bingo. You are allowed to fill out the spaces of your bingo card with the numbers 1 to 36. Numbers can be repeated on your card up to five times.

1. On a separate sheet, create a chart showing all of the possible products of the two dice.

2. Would any numbers in the range you're allowed to use be more useful on a bingo card than others? Explain.

_____

3. Are any numbers between 1 and 36 impossible to get? Explain.

_____

_____

4. How would you fill out your card?

		Free Space		

NAME:

UNIT 2 • ACTIVITY 25
Partner Facts

Choose a partner for the following activity. Plan to help each other learn multiplication facts!

First, as a team, write down every multiplication fact from 0 to 12. This means you need to write down $0 \times 0 = 0$, $0 \times 1 = 0$, through $12 \times 0 = 0$. Then write down $12 \times 1 = 12$ through $12 \times 12 = 144$. Write each fact on a separate slip of paper. Placed all the slips face down.

Next, you will take turns quizzing each other using these slips of paper.

Decide who will go first. The other partner will then choose a slip of paper and quiz the first player. For instance, you may pick up the slip of paper that reads: $6 \times 7 = 42$. You would say: "Six times seven equals . . ." and wait for your partner to answer. If your partner answers correctly, choose another slip of paper and read the problem. Continue for 2 minutes or until your partner has given three incorrect responses. If your partner answers incorrectly, write the complete corrected multiplication fact below.

Once 2 minutes is up (or three wrong answers have been given), change roles. The quizzer will now give answers. Whoever answers more problems correctly during his or her turn wins the round.

After each round, discuss your wrong answers and review the correct multiplication facts you wrote below. Try to help each other improve. Continue to play until your teacher ends the game.

Correct multiplication fact 1: _____

Correct multiplication fact 2: _____

Correct multiplication fact 3: _____

NAME:

UNIT 2 • ACTIVITY 26
Multiplication Chart

Complete the multiplication chart by filling in the missing values.

×	1	2	3	4	5	6	7	8	9	10	11	12	13
1	1	2	3	4	5	6	7	8	9	10	11	12	13
2	2		6		10	12			18		22		
3				12	15					30			
4		8				24					44		52
5		10			25			40		50			
6	6		18		30		42					72	
7			21				49				77		91
8	8			32		48			72				
9			27							90		108	
10	10				50			80			110		
11	11		33				77						143
12				48			84			120			
13		26			65				117				169

1. Are there any patterns that you found? _____

_____

2. What do you notice about the middle diagonal starting at the top left corner?_____

_____

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Basic Mathematics

Test Pack

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NAME: DATE:

BASIC MATHEMATICS • PRETEST

Circle the correct answer for the problem. Show your work.

1.
$$\begin{array}{r} 147 \\ 756 \\ +\,377 \\ \hline ? \end{array}$$

a. 1180
b. 1260
c. 1270
d. 1280

Circle the correct answer for the problem. Show your work.

2. $(542 + 727) - 215 = ?$

a. 400
b. 1054
c. 1344
d. 1484

Solve the following problem, and write your answer on the line. Show your work.

3. Mr. and Mrs. Cordero have three vacations planned for this year. The first vacation costs $1435. The second costs $4989. The third costs $2750. How much will they spend on vacations during the year? $ _____

Circle the correct answer for the problem. Show your work.

4.
$$\begin{array}{r} 4145 \\ \times\ 139 \\ \hline ? \end{array}$$

a. 576,045
b. 576,155
c. 587,255
d. 672,555

Solve the following problem, and write your answer on the line. Show your work.

5. $45{,}512 \times 17 = ?$ _____

Circle the correct answer for the problem. Show your work.

6. Mr. Johnson has $5500 in his bank account. He has three bills to pay. Each bill is for $400. How much will he have left in his bank account after he pays the three bills?

- **a.** $4300
- **b.** $5100
- **c.** $5300
- **d.** $5380

Circle the correct answer for the problem. Show your work.

7. Mrs. Paletta gets a pension of $450 each month. She also gets $620 each month from Social Security. How much does she get each year?

- **a.** $5400
- **b.** $7400
- **c.** $10,740
- **d.** $12,840

Circle the correct answer for the problem. Show your work.

8.
$$17\overline{)\,3443}$$

- **a.** 34 R 3
- **b.** 22 R 9
- **c.** 202 R 9
- **d.** 2029

Circle the correct answer for the problem. Show your work.

9. $82{,}698 \div 33 = ?$

- **a.** 2312
- **b.** 2506
- **c.** 2016
- **d.** 3506

UNIT 2 TEST • MULTIPLICATION AND DIVISION

Circle the correct answer for the problem. Show your work.

1.
$$\begin{array}{r} 12 \\ \times\ 17 \\ \hline ? \end{array}$$

a. 29
b. 46
c. 204
d. 354

Solve the following problem, and write your answer on the line. Show your work.

2.
$$\begin{array}{r} 26 \\ \times\ 42 \\ \hline ? \end{array}$$
_____

Solve the following problem, and write your answer on the line. Show your work.

3. $569 \times 95 = ?$ _____

Circle the correct answer for the problem. Show your work.

4. $48 \times 785 = ?$

a. 37,680
b. 37,737
c. 737
d. 36,680

Circle the correct answer for the problem. Show your work.

5.
$$\begin{array}{r} 1461 \\ \times 211 \\ \hline ? \end{array}$$

a. 5844
b. 308,271
c. 32,142
d. 207,271

Solve the following problem, and write your answer on the line. Show your work.

6.
$$\begin{array}{r} 98 \\ \times\ 53 \\ \hline ? \end{array}$$
_____

Circle the correct answer for the problem. Show your work.

7. $825 \times 37 = ?$

a. 8200
b. 8250
c. 29,395
d. 30,525

Circle the correct answer for the problem. Show your work.

8. $145 \times 6562 = ?$

a. 951,290
b. 951,497
c. 951,490
d. 45.25

Solve the following problem, and write your answer on the line. Show your work.

1.
$$\begin{array}{r} 1245 \\ 3299 \\ +\ 309 \\ \hline ? \end{array}$$
_____

Solve the following problem, and write your answer on the line. Show your work.

2. $(128 + 404) - 499 = ?$ _____

Circle the correct answer for the problem. Show your work.

3. Janek is a car salesman. He sold three cars this month. He made $1324 for his first commission, $1560 for his second, and $1233 for his third. How much did he make in commissions this month?

a. $3997

b. $4007

c. $4237

d. $4117

Circle the correct answer for the problem. Show your work.

4. $1625 - 1228 = ?$

a. 397

b. 407

c. 497

d. 2853

Solve the following problem, and write your answer on the line. Show your work.

5. Yin bought three pairs of socks for $2 a pair. He also bought a pair of shoes for $40 and two ties for $12 each. What was his total bill? _____

Circle the correct answer for the problem. Show your work.

6. $469 \times 92 = ?$

- **a.** 4315
- **b.** 41,480
- **c.** 42,148
- **d.** 43,148

Circle the correct answer for the problem. Show your work.

7.
$$\begin{array}{r} 1302 \\ \times 202 \\ \hline ? \end{array}$$

- **a.** 253,004
- **b.** 263,004
- **c.** 263,994
- **d.** 277,900

Circle the correct answer for the problem. Show your work.

8. Petra paid $2200 a month for her office space last year. This year she moved to larger offices. She is now paying $2650 a month. How much more will she pay in rent this year compared to last year?

- **a.** $450
- **b.** $4500
- **c.** $5400
- **d.** $31,800