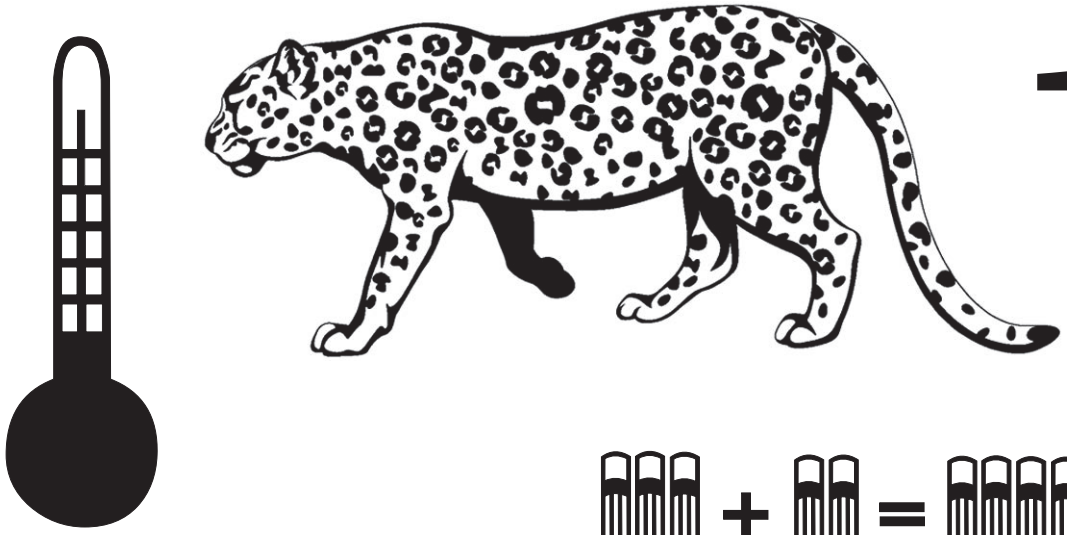
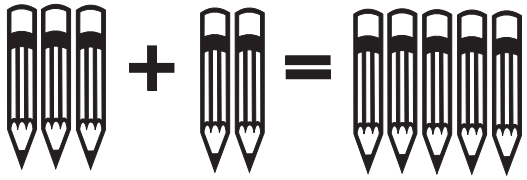
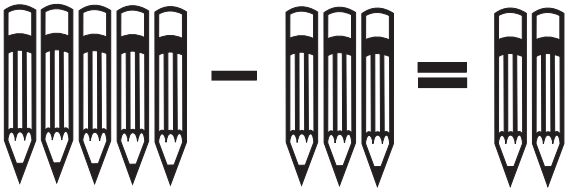
Arithmetic 1

SECOND EDITION







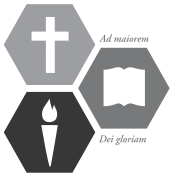
TEACHER'S MANUAL

50216 R2/20

Copyright © 2018 Christian Liberty Press

Second Edition
Copyright © 2018 Christian Liberty Press
February 2020 edition

All rights reserved. No part of this teacher's manual may be reproduced or transmitted in any form or by any means, electronic or mechanical, without written permission from the publisher. Brief quotations embodied in critical articles or reviews are permitted.



Christian Liberty Press
502 West Euclid Avenue
Arlington Heights, Illinois 60004-5402
www.christianlibertypress.com

Copyright © 2018 Christian Liberty Press

Author: Sheila Brennan, Ph.D. (A.B.D.) and Maggie Detweiler
Layout and editing: Eric L. Pfeiffelman and James D. Lellman
Copyediting: Diane C. Olson
Cover image: "Leopard" – *ClickArt Incredible Image Pak 65,000*, copyright © 1996 T/Maker Company

Printed with permission of Pensacola Christian College, Inc.
Abeka is a registered trademark of Pensacola Christian College, Inc.
Pensacola Christian College does not necessarily endorse all the content in this product.

Printed in the United States of America

TABLE OF CONTENTS

Introduction ..... *iv*

Unit 1: Components of a Daily Lesson 1

Component 1—Counting and Numbers 1
Component 2—Number Families 1
Component 3—*Chapter Topics* 1
Component 4—Workbook Page Topics 2
Component 5—Workbook Assignment 2

Unit 2: Learning Objectives by Chapter 4

Chapter 1 *(ZOO)—Learning Objectives*
(Workbook Pages 1–70; Lessons 1–35) 4
Chapter 2 *(FARM)—Learning Objectives*
(Workbook Pages 71–160; Lessons 36–80) 5
Chapter 3 *(OCEAN)—Learning Objectives*
(Workbook Pages 161–250; Lessons 81–125) 7
Chapter 4 *(SPRING)—Learning Objectives*
(Workbook Pages 251–340; Lessons 126–170) 9

Unit 3: Sample Lesson Plans for the First Week 10

Week 1/Day 1 10
Week 1/Day 2 12
Week 1/Day 3 13
Week 1/Day 4 14
Week 1/Day 5 16

Unit 4: Sample Lesson Plans for the Second Week 18

Week 2/Day 1 18
Week 2/Day 2 20
Week 2/Day 3 22
Week 2/Day 4 23
Week 2/Day 5 25

Unit 5: Ideas and Strategies for Teaching 28

Manipulatives 28
Other Teaching Tools 29
Concepts 31
Everyday Arithmetic 36
Summary of Concepts and Teaching Strategies 37

Unit 6: Addition and Subtraction Families 38

Teaching Schedule for Addition and Subtraction Families 38
Addition and Subtraction Families 39

Copyright © 2018 Christian Liberty Press

Introduction

Teaching your child arithmetic need not be frightening, and it need not be dull. You can make all the difference in how your child perceives numerical realities, and you are most qualified for the task. Why? No person has the intense interest in your child's education, the intimate knowledge of your child's abilities and personality, or the "everyday-life" teaching opportunities that you, as his parent, possess. Remember, too, that in leading your child into these truths, you are leading him into an understanding of some of the aspects of the very nature of God Himself! The God of the Bible reveals Himself as one God in three Persons; His is a numerical nature. The mathematical aspects of His creation are reflections of the mathematical aspects of His nature. Scripture also insists (Colossians 2:2–3) that in Christ Himself are hidden all the treasures of wisdom and knowledge, and in Him all things hold together (Colossians 1:17). Education is, therefore, fundamentally and uniquely a Christian adventure! Lift your heart to the Savior for His strength, His perseverance, and His wisdom as you undertake this singularly Christian endeavor. May the Lord be with you as you follow Him in teaching your child.

If you glance at the concepts listed in the Table of Contents of the *Arithmetic 1* workbook, you will see that this list is eclipsed by the objectives listed in Unit 2 of this guide. This emphasizes that your first grade arithmetic course includes more than is reflected or required in the *Arithmetic 1* workbook. Your workbook is only a part of your student's study. In fact, we have prepared this teaching guide to enumerate for you the educational objectives of your first grade arithmetic course, the components of a particular arithmetic lesson, and the exact role of the *Arithmetic 1* workbook in your teaching.

We provide, in Unit 3, detailed lesson plans for your first five lessons of this course. In Unit 4, we provide detailed lesson plans for the next five lessons of the course—the second "week" of the course. Keep in mind that the first ten lessons of the course are laying a foundation for all that will be taught in *Arithmetic 1*. Little can be accomplished until this foundation is in place, and little more can be accomplished if that foundation is not as firm and as deep as it needs to be. Thus, we urge you to take the time you need (regardless of the "day" or "week" count given in the sample lesson plans) in order to be sure that this foundation is securely in place.

After Lesson 10, you must write your own lesson plans. Hopefully, the lesson plans and the Remarks that follow will gently ease you into the process of choosing objectives from the appropriate lists in Unit 2 and building your lesson components as discussed in Unit 1. Within Unit 5, you will find a wealth of ideas and methods for teaching the various concepts included in this course.

Copyright © 2018 Christian Liberty Press

Unit 1
Components of a Daily Lesson

The workbook is a significant part of your daily work with your student, but it is definitely only part of that work. It is essentially the "last stop" at the end of each arithmetic lesson. The concepts and skills to be taught in this course are listed in Unit 2 "Learning Objectives by Chapter" of this teacher's manual. In that unit, objectives are listed in detail, with respect to each workbook chapter. These objectives will be important in developing your lesson plans.

Each day's lesson should consist of five major components. The relationship between these components of your daily lesson and your student's successful completion of the written work is much like the relationship between phonics and reading. Just as basic phonics drills and exercises lay the foundation for reading, so do the rehearsal of counting drills and the memorization of addition and subtraction facts prepare the student to successfully complete the workbook pages and corresponding tests.

♦ Component 1—Counting and Numbers

Your student needs to practice counting by ones, by twos, by threes, by fives, by tens, and by twenty-fives, according to the objectives of the particular chapter. This can be accomplished in many ways, such as counting a jar of pennies, counting via the hundred chart or a number line, and oral recital of sequences.[1] Counting exercises are especially helpful in preparing students to understand the concepts of addition and subtraction, to compare numbers (greater/greatest, less/least, between), and to count money and ultimately to memorize the multiplication tables in the second grade (e.g., the "times 2" facts follow readily once the student can count by twos).

♦ Component 2—Number Families

The term "family" is used in this course for the organization of addition and subtraction facts. ***The facts in these families must be memorized.*** Rehearsing the facts may be accomplished in different formats, such as reciting the facts, writing the facts, singing the facts, demonstrating the facts with manipulatives, answering random quiz questions on the facts, working with flashcards, and posing "missing number" problems. Be creative, but be thorough and consistent. These families are a core part of this course, and they need to be rehearsed each day. All are provided for you at the end of this manual, including a chart that specifies by which lesson each of the addition and subtraction families should be introduced.[2]

♦ Component 3—*Chapter Topics*

In the next unit, lists of topics are given under the chapter heading that corresponds to the student's workbook.[3] These lists of topics will set your goals for what you are to teach while studying each respective chapter. Not every topic must be (or can be) discussed every day, but a systematic and thorough tour through the list is required. If place value, for example, is one learning objective for your chapter, then practice and discussion of this topic should be a part

[1] For details, see Unit 5, "Ideas and Strategies for Teaching," pp. 28–37.

[2] See Unit 6, "Addition and Subtraction Families," pp. 38–46.

[3] See Unit 2, "Learning Objectives by Chapter," p. 4.

Copyright © 2018 Christian Liberty Press

Unit 2
Learning Objectives by Chapter

This unit specifies the concepts and skills to be taught in this course according to each chapter in the workbook. Since workbook pages are also given lesson numbers,[6] both designations will be provided. These objectives will be important in developing your lesson plans. The list of topics given under each chapter heading will set your goals for what you are to teach while studying that chapter. Not every topic must be (or can be) discussed every day, but a systematic and thorough tour through the list is expected. For example, if recognizing *doubles* (1 + 1, 2 + 2, 3 + 3, etc.) is one learning objective for your particular chapter, then you should practice and discuss this topic as part of your teaching time for several days while progressing through that chapter.

Begin by familiarizing yourself with the student workbook (i.e., the Table of Contents and the concepts taught in each chapter), noting how the material becomes more challenging as the student completes each successive chapter. Then examine the learning objectives for each chapter mentioned below. Use this information as a guide when you are ready to compose your lesson plans for this course.

Copyright © 2018 Christian Liberty Press

♦ Chapter 1 *(ZOO)—Learning Objectives* (Workbook Pages 1–70; Lessons 1–35)

COUNTING	When counting to 100…
	• count forward and backward by ones and tens
	• identify the numbers that come before and after a given number
	• identify missing numbers by ones and twos
	• count on a number line and on a number chart
WRITING NUMERALS	Write numerals from 1 to 70
READING NUMBER WORDS	Recognize cardinal number words for 1–20 (“one,” “two,” “three,” etc.)
	Recognize ordinal number words for 1–20 (“first,” “second,” “third,” etc.)
PLACE VALUE & COMPARISON	Understand ones and tens[7] (beginning with Lesson 10, which requires knowing left from right)
	Illustrate place value with objects
	Use place value to understand the concepts of greater than, less than, greatest, and least (beginning with Lesson 12)
	Use place value to find the number that is between

[6] Lesson numbers are indicated in fine print at the bottom, right-hand side of each workbook page.

[7] See Unit 5, “Ideas and Strategies for Teaching,” p. 33.

ADDITION AND SUBTRACTION	Understand concepts of addition and subtraction, developing foundations in these concepts during the very first week
	Memorize Addition and Subtraction Families 1–6[8]
	Find missing terms (*addends*)
	Recognize *doubles* (1 + 1, 2 + 2, 3 + 3, etc.)
	Recognize *twins* (1 + 2 = 3 and 2 + 1 = 3)
	Write addition and subtraction number sentences, both vertically and horizontally
PROBLEM SOLVING	Solve addition and subtraction word problems
	Illustrate story problems
	Create story problems
	Continue patterns
	Learn directions (left, right, top, and bottom)
GEOMETRY	Recognize and draw plane geometric shapes (squares and circles)
	Identify shapes that are the same size
CALENDAR	Read a calendar using ordinal numbers
	Put dates on a blank calendar (Lesson 19)
	Memorize the days of the week
MONEY	Differentiate pennies and dimes by Lesson 22
	Count pennies and dimes
GRAPHS	Read horizontal bar graphs, analyze information, and draw bars (Lesson 34)
	Complete a bar graph

Copyright © 2018 Christian Liberty Press

Administer Test 1 after page 46.

♦ Chapter 2 *(FARM)—Learning Objectives* (Workbook Pages 71–160; Lessons 36–80)

COUNTING	When counting to 200…
	• count forward and backward by ones, twos, fives, and tens
	• count forward by twenty-fives
	• identify the numbers that come before and after a given number by ones, twos, fives, and tens
	• identify missing numbers by ones, twos, fives, and tens
WRITING NUMERALS	Write numerals from 1 to 200
	Write numerals for even and odd numbers

[8] Addition Families are introduced in Lesson 7. Subtraction Families are introduced in Lesson 15, though formal subtraction notation should be discussed by Lesson 17.

Unit 3
Sample Lesson Plans for the First Week

The lesson plans given here require the application of a number line and a hundred chart, as well as objects (coins, crackers, etc.) for counting. Details about how to make the number line and hundred chart are given in Unit 5, "Ideas and Strategies for Teaching" of this manual. Details about making and using numeral and number word cards are provided within the lesson plans themselves. Manipulatives developed for this course will also be useful throughout the remainder of first grade and subsequent grades.

We urge you not to rush through these lessons. Should you find that your student is having difficulty making the transition from one level to the next, do not rush the process (regardless of the "day" count given in the lesson plans). Remain at the level where your student is understanding the concepts for another day or two. Continue to reinforce what he does understand. Provide additional practice with the number line, the hundred chart, counting objects, increasing by one, and removing by one. The *concepts* of addition and subtraction are being developed at each lesson, but do not move solidly to the next level with any student who is having difficulties. For instance, if you need to repeat the work of Week 1/Day 2 for another day or two, by all means do so before proceeding to the work planned for Week 1/Day 3. The first ten lessons are designed to launch your student into arithmetic. Take the time you need in order to make a safe and accurate launch.

Copyright © 2018 Christian Liberty Press

♦ Week 1/Day 1

COMPONENT 1 ***Counting***

Have the student count aloud, along with you, from 1 to 20.

Have the student count out 10 objects (pennies, buttons, toothpicks, etc.).

Have the student count out 10 animal crackers or oyster crackers. Then have the student eat all the crackers. "Since the crackers are all gone, we now have *zero* crackers left."

Count on the number line from 1 to 20.

Now count backwards from 10 to 1 along the number line.

Ask your student to recite the numbers from 1 to 10.

Numbers 1–5

Teach the numerals and number words.

Have the student practice writing numerals 1 and 2.

Write the numerals 1–5 on individual index cards ahead of time.

Show each one to your student as you say the number word.

Write the number words on individual index cards ahead of time.

Teach them to your student, as well.

COMPONENT 2 ***Number Families***

This component will not appear until the lesson on Week 2/Day 4 once preparation has been made.

COMPONENT 3 ***Chapter Topics***

Discuss "left" and "right" with your student. (Ask him to raise his left arm, cover his right eye, hop on his left foot, etc.)

Use the number line, asking the following questions: What number is after 3? What number is to the right of 3? What number is after 1? What number is to the right of 1? etc.

Use the number line, asking the following questions: What number is before 3? What number is to the left of 3? What number is before 2? What number is to the left of 2? etc.

Recite the days of the week.

COMPONENT 4 ***Workbook Page Topics***

No additional work is required within this component.

COMPONENT 5 ***Workbook Assignment—Page 1***

Read the poem "Visit the Zoo" to your student. Name each animal, and have your student look at each printed name. Ask your student to count the animals. Coloring the animals is optional.

Remarks

The length of this lesson may seem overwhelming, but the idea is that you touch on the various concepts rather briskly, since no topic is developed exhaustively in a given sitting. For these steps to proceed smoothly and briskly, however, it is essential that your teaching aids be prepared ahead of time and assembled nearby for your immediate use. The entire math period should not usually extend beyond sixty minutes. As you gain increased experience with the various arithmetic tasks, with your student's needs and abilities, and with the course materials and objectives, you will be better able to judge the amount of time needed for each component.

Obviously, the animal or oyster cracker exercise can be fulfilled with some other item (raisins, grapes, even inedible objects) as long as the counting and subsequent removal can be accomplished readily.

You can see that in the first day's lesson plans, the subjects for recital, review, or teaching are only a small selection from the list given in Unit 2, "Learning Objectives by Chapter." During the next thirty-two lessons, the goal is to eventually exhaust that list several times over, reviewing from the earlier material and enlarging with the newer.

Copyright © 2018 Christian Liberty Press