

The CHARLOTTE MASON
ELEMENTARY ARITHMETIC

S E R I E S

SAMPLE



Richele R. Baburina

BOOK 3

The Charlotte Mason
Elementary Arithmetic Series

Book 3

by Richele Baburina

Special thanks to Allison Durham for her help in writing the sums.

The Charlotte Mason Elementary Arithmetic Series, Book 3
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“The Principality of *Mathematics* is a mountainous land, but the air is very fine and health-giving, though some people find it too rare for their breathing. It differs from most mountainous countries in this, that you cannot lose your way, and that every step taken is on firm ground. People who seek their work or play in this principality find themselves braced by effort and satisfied with truth.”

(*Ourselves*, Book 1, p. 38).

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Introduction

Charlotte Mason tells us “Education is the science of relations.” As you continue exploring ever higher places with your child, the desire remains that she is led into an inspiring relationship with Number, full of good experiences, and that the effort involved results in wonder and enjoyment as well as understanding.

Miss Mason recognized the three educational keys of *atmosphere*, *discipline*, and *life*. In this book, as well as the previous in the series, you will see a number of methods distinct to her principles and practices of education throughout. Some to keep in mind:

Atmosphere. Concentrated lessons of just 20 minutes—with 5 of those set aside for a time of lively review with mental math—make for a lesson happily begun and quickly over. To show that numbers belong to everything and are not exclusive to the math lesson or bound to specialized manipulatives, everyday objects are used along with a variety of questions. A large contribution toward the atmosphere of the arithmetic lesson is, of course, the parent’s overall attitude. Allow this to be a time of exploration that leads to more and more discovery of the power of numbers rather than something to dread or merely get through. If your own experience with math in school was less than desirable, perhaps you can regain a sense of wonder by seeing it through your child’s eyes.

Discipline. Interesting and efficient arithmetic lessons are a training-ground for the cultivation of good habits. Questions that spark the imagination, the liveliness of mental math, simple objects that demonstrate ideas but are put away before boredom sets in, neat and orderly writing increasingly yet sparingly used—these are just a few of the ways the arithmetic lesson becomes the means of developing habits such as clear thinking, alertness, accuracy, orderliness, and attention. Using Miss Mason’s methods, these good habits become second nature to a child—and will be a help to her not only as she progresses to more complex mathematics but for life.

Tip: More detail on habit training and mathematics can be found in the handbook Mathematics: An Instrument for Living Teaching by Richele Baburina.

Life. Miss Mason tells us that each child “has a natural affinity for all knowledge” and that includes the knowledge of Number (*Parents and Children*, p. 247). She recognized that mathematics, like music, is a living language that rings clearly with undeniable logic. Just as a child need not be the next Mozart to appreciate music or benefit from musical training, every child can be placed in a right relationship with Numbers. The beauty and joy found in mathematics is not just for the gifted few to experience as Charlotte reminds, “We are so made that truth, absolute and certain truth, is a perfect joy to us; and that is the joy that mathematics afford” (*Ourselves*, Book 1, p. 63).

Arithmetic Concepts in Book 3

- Review of work covered in Book 2
- The idea and operation of addition within 10,000
- The idea and operation of subtraction within 10,000
- Addition and subtraction with money
- Addition and subtraction in interesting story problems
- Addition and subtraction with pure number
- Longer sums with three or four sets of figures
- Review of multiplication tables up to 6×10
- Construction of multiplication tables up to 10×10
- Mastery of multiplication tables up to 10×10
- Multiplication with zero
- Longer multiplication by 7 through 10
- Double-digit multiplication
- Multiplication and division with money
- Multiplication and division in interesting story problems
- Multiplication and division with pure number
- Multiplication by 10s, 100s, 1,000s, and 10,000s
- Review of short division
- Long division with a small divisor with money
- Long division with a small divisor in interesting story problems
- Long division with a small divisor in pure number
- The idea of division as fractional parts
- The idea of fractions
- Simple fraction work
- Numeration and notation of fractions
- Numeration and notation of numbers up to 10,000
- Introduction to weights and measures

Overview of Lessons

In Book 2, the student received a formal introduction to the four rules and tables, mastering addition and subtraction tables up to 20 ($10 + 10$) and multiplication tables up to 6×10 . She embarked on division and learned to read, write, and work with numbers up to 1,000.

In this third book, your student will have further practice in the processes of addition, subtraction, multiplication, and division; master multiplication tables for the numbers 7 through 10; delve further into division with long division and an introduction to fractions; and read, write, and work with numbers up to 10,000. She will also have an introduction to weights and measures with an active hands-on approach—including measures of volume, weight, distance, and time.

Multiplication Tables

At this point, your child has proven many facts in the concrete and has mastered tables through 6×10 . Further practice in these tables is given in the form of review in the five minutes set aside for rapid oral exercises during each lesson. Your child will now construct multiplication tables for 7 through 10 and then be given time to explore them. Charlotte Mason's written tables are distinctive, allowing a child to discover each number's relationship with the others while also advancing certain ideas, such as multiplication as repeated addition and division as the complement of multiplication.

At this point, your child may have moved past the need to create a table using concrete objects. She might construct a table with dots or hash marks on graph paper before advancing to making the written table, or she may proceed directly to the construction of the written table. The use or disuse of manipulatives should never worry a child, so feel free to put them away or get them back out as needed. If your child needs more work with a particular table, allow plenty of practice using both the written table (including the steps laid out for visualization of the table) and mental work. The variety of questions and proceeding to multiplying larger numbers with the one being studied before moving to the next table

will help ensure lessons remain interesting. This is a foundational time for your child. Giving her plenty of opportunity to investigate, discover, and make connections with each table will provide the groundwork necessary as she progresses to more advanced arithmetic.

Writing

As your child gains ease in manipulating numbers and her ability to connect between concrete objects, mental images, and written symbols is furthered, she may be able to do more written work than in previous years. We never want the act of writing to outweigh the ideas contained in the lessons, though. Balance your student's lessons with a mix of continued oral work—to train habits such as attention and concentration—and written work—to provide necessary practice in notation, neatness, and ordered thinking.

Manipulatives or Concrete Objects

As in the previous books, concrete objects are used to explore ideas, prove facts, and build a comfort level working with a concept. Use everyday objects that can easily be grouped into ten-bundles; for example, ten craft sticks with an elastic band around the bundle or ten beads strung on a chenille stem. Your child will also receive much practice working with money. Children progress naturally from working in the concrete to mental images to more abstract work, but each child will progress at her own rate.

Mental Arithmetic

The five minutes set apart for review via mental arithmetic is fundamental to Charlotte Mason's living teaching. Since arithmetic lessons are largely oral, this time is somewhat distinguished by the liveliness of the questions given in order to stimulate a child's thinking and increase speed and accuracy. If you notice your child's attention flagging during an arithmetic lesson, turning to this engaging activity can quickly regain her attention. In Book 3, the questions concentrate mainly on rapid table work in the operations of addition, subtraction, multiplication,

and division while also providing opportunity for working with multiple operations and numeration. While many of the questions found in the *Table Work* and *Review* sections may be used for this activity, you will also find more in the back of the book. Mental arithmetic need not be relegated strictly to the classroom and can happily take place out of doors, in the car, or around the table with the child making up questions of her own or multiple students taking turns posing questions to each other.

Introduction to Weights and Measures

Weights and measures make up a part of our everyday life and have surrounded a child long before formal lessons. In this and the previous books in this series, your child will have already worked simple sums that involved measures of time, length, and weight, while money—as a measure of value—has been worked with extensively.

Now begins a more formal foray into weights and measures, starting with hands-on activities that explore measures of time, and the U.S. Standard measures of length, weight, and cooking and liquid measures. Your student will also draw up simple tables of weights and measures in the back of her math notebook. Further measures and the metric system will be taken in subsequent books in this series.

Tip: You may want to take time outside of the arithmetic lesson to notice with your child the position of the sun at sunrise and sunset and at various times throughout the day, along with the position of your shadows when outside. These experiences will help with understanding the idea of time.

When to Advance

No book can determine the exact number of equations needed for each child in every area. As you work with your student, ensure that she has either a solid understanding of a concept or confidence working with a number before moving on. If, at any point, you find you have advanced too quickly, simply go back a step or two until your child has regained confidence and is working without difficulty. The use of concrete objects in a lesson is also determined by the child's needs; so, if at any time, your child needs them to find or to verify an answer or understand a concept,

allow their use with a view to putting them away just as soon as they are no longer needed. Questions found in the lessons are written in such a way as to allow you to expand the amount if needed as well as to easily adapt the numbers, names, and objects to relate to your own child's life and interests. Use more or less as needed. Adequate review will help reinforce her understanding while she gains in speed, readiness, and her agility in working with numbers and concepts.

Pacing

Charlotte Mason told us in her educational philosophy, “we are very tenacious of the dignity and individuality of our children” (*Parents and Children*, p. 232). The charts provided here are given as an example and loose guide for planning purposes only. It is perfectly normal for your child to move more quickly through certain sections and more slowly through others. Consistency in daily arithmetic lessons is essential to progress, but the charts should be adapted according to the child and not the other way around. The following is based on lessons that are 20 minutes in length with 5 minutes of those given to mental arithmetic. Each week's work should include work in the newest concept, in review, and in mental arithmetic.

Term 1												
<i>Suggested Weeks</i>	1	2	3	4	5	6	7	8	9	10	11	12
Review of Previous Year's Work												
Addition within 10,000												
Subtraction within 10,000												
Multiplication Tables												
Larger Multiplication												
Exam												

Term 2													
<i>Suggested Weeks</i>	13	14	15	16	17	18	19	20	21	22	23	24	
Multiplication Tables													
Larger Multiplication & Multiplication by 10s, 100s, 1,000s, 10,000s													
Division													
Exam													

Term 3													
<i>Suggested Weeks</i>	25	26	27	28	29	30	31	32	33	34	35	36	
Fractions													
Weights & Measures													
Review of Year's Work													
Exam													

Exams

Three end-of-term exams are provided in the back of this book. These exams are designed for you to customize to reflect where your child is in the lessons. See page 259 for details.

Supplies Needed

- Gridded math notebook (sized according to child's handwriting: $\frac{3}{4}$ ", $\frac{1}{2}$ ", or $\frac{1}{4}$ "). Available from Simply Charlotte Mason.
- Personal chalkboard, dry-erase board, or the like together with its appropriate writing instrument. For brevity, it will be referred to as *the slate* in the lessons. *
- Variety of everyday objects: beans, candy-coated chocolates, buttons, popcorn kernels, beads, etc.
- 100 craft sticks or other objects bundled into groups of ten *
 - » Ten-bundles are objects the child has counted out and bundled together in groups of ten. Used to convey ideas of place value and exchanging, they also make hands-on work with larger numbers easier. You will need 10 ten-bundles for work in this book.
- Analog clock *
- Traditional 12-month wall calendar
- 12-inch ruler *
- Yardstick
- Tape measure at least 60 inches long *
- Piece of string at least 66 inches long *
- Cardboard or heavy card stock with a length of at least 12 inches *
- Coin purse containing 100 pennies, 20 nickels, 10 dimes, and 4 quarters
- 20 one-dollar bills, either real or play *
- 10 ten-dollar bills, either real or play *
- Kitchen scale, either analog or digital *
- Liquid measuring cups: 1 ounce, 1 cup (8 ounces), 2 cups (16 ounces/1 pint), and 4 cups (32 ounces/1 quart) *
- Dry measuring cups: $\frac{1}{4}$ cup, $\frac{1}{3}$ cup, $\frac{1}{2}$ cup, and 1 cup *
- An empty gallon-size container, clear or translucent *

- Dry rice or dry beans
- Zip-top bags
- A pound of butter in four sticks

Optional

- The parent reference book, *Mathematics: An Instrument for Living Teaching*, explains more fully Charlotte Mason's unique approach in mathematics, including the principles upon which the methods found in this book rest. Available from Simply Charlotte Mason.
- The video series, *Charlotte Mason's Living Math: A Guided Journey*, demonstrates the methods used in these lessons. Available from Simply Charlotte Mason.
- A collection of number sentence cards with clearly printed number sentences that include both a combination of numbers already studied as well as the various compositions of the numbers currently being taken. Before the lesson begins, pull out an applicable card or two so that your child may continue work on her own without interruption if you unexpectedly must attend to something else for a few moments. The child may write the answers on her slate, using manipulatives as necessary. Preprinted Number Sentence Cards are provided in *The Charlotte Mason Elementary Arithmetic Series, Kits 2 & 3*, or sold separately.*

**All items marked with an asterisk are included in The Charlotte Mason Elementary Arithmetic Series, Kit 3, from Simply Charlotte Mason.*

Review from Book 2

We begin with a review of work already covered in Book 2 before progressing to larger numbers. Review is normal and oftentimes necessary at the beginning of a new school year, so be patient with your child as the ideas with which she met previously and worked with fluency are now refreshed in her mind. The ease with which she can work these smaller numbers ensures she should be able to take the larger without much difficulty.

The initial review sections are to be taken orally unless otherwise noted. Always encourage fully worded answers as a review of the addition and subtraction facts, modeling as necessary. For example, *Connor checked 7 books out from the library and his mother checked out 4. How many books did they check out altogether?* may be answered, “7 plus 4 equals 11” or “11, because 7 and 4 make 11” or “7 books and 4 books equals 11 books,” etc.

Tip: If you are continuing straight from Book 2 without a long break, this review may be found unnecessary and bookmarked for extra practice.

Review Addition and Subtraction with Smaller Numbers

These problems are to be taken orally and answered with fully worded number sentences.

1. There are 5 cookies in the cookie jar and 2 on a plate. How many cookies in all?

Tip: This question may be answered in a variety of ways; such as, "5 plus 2 equals 7" or "7, because 5 and 2 are 7," etc.

2. There were 9 birds on a branch. If 4 flew away, how many remain on the branch?
3. There were 7 turtles on a log. If 4 more turtles joined them, how many turtles were there in all?
4. 3 children were playing tag. If 6 more children joined in, how many children were playing?
5. There were 14 children in class. If 3 left to go to the library, how many children remain?
6. There are 8 deer in a field and 4 in the woods. How many deer are there altogether?
7. There were 7 apples on a tree. If 2 are picked, how many apples remain on the tree?
8. There were 12 cupcakes made for a party. If 4 are eaten, how many remain?
9. There are 9 toy cars in a box and 6 on the table. How many toy cars in all?
10. If 5 butterflies were on a bush and 1 flew away, how many butterflies remain?

Answers

1. 7 cookies
2. 5 birds
3. 11 turtles
4. 9 children
5. 11 children
6. 12 deer
7. 5 apples
8. 8 cupcakes
9. 15 toy cars
10. 4 butterflies

Review Small Sums with and without Exchanging (to be worked orally)

Objects used: coins as necessary

Tip: As a help, pull a Number Sentence Card out before a lesson begins so your student's work can continue uninterrupted if you get called away for a moment.

Continue to encourage fully worded answers as a way of solidifying facts, i.e., 3 pennies + 4 pennies = might be answered “3 pennies plus 4 pennies equals 7 pennies” or “3 plus 4 equals 7.”

For any answers 10 or above, be sure to have your child exchange the pennies for dimes and pennies either orally, in the concrete, or both. This will act as an aid in understanding place value and a review of adding in tens; e.g., 6 pennies + 7 pennies = 13 pennies, that's 1 dime and 3 pennies.

1. 4 pennies + 9 pennies =
2. Hudson and Luke each had 8¢. How much had they in all?
3. Bailey had 13¢ and spent 3¢. How much did Bailey have left?
4. 6 pennies + 8 pennies =
5. 2 pennies + 5 pennies =
6. Richard had 12¢ and Jerry had 6¢. How much did they have together?
7. 9 pennies – 2 pennies =
8. Linda had 14¢ and lost 5¢. How much did she have left?
9. 5 pennies + 4 pennies =
10. 12 pennies – 4 pennies =

Answers

1. 13 pennies or 1 dime and 3 pennies
2. 16¢ or 1 dime and 6 pennies
3. 10¢ or 1 dime
4. 14 pennies or 1 dime and 4 pennies
5. 7 pennies
6. 18¢ or 1 dime and 8 cents
7. 7 pennies
8. 9¢
9. 9 pennies
10. 8 pennies

Review Addition and Subtraction with Pure Number

(to be worked orally)

Objects used: beads, buttons, or craft sticks (in ten-bundles and loose units)
as necessary

*Tip: Requiring fully worded answers will help a child gain math facts as well
as keep them fluent.*

1. $4 + 5 =$

2. $14 - 5 =$

3. $6 + 8 =$

4. $10 - 3 =$

5. $15 + 2 =$

6. $19 - 3 =$

7. $3 + 7 =$

8. $12 - 3 =$

9. $7 + 5 =$

10. $18 - 5 =$

Answers

1. 9

2. 9

3. 14

4. 7

5. 17

6. 16
7. 10
8. 9
9. 12
10. 13

Review Longer Money Sums with Exchanging and Notation

Objects used: coins as necessary

The first five questions may be taken orally, being sure to speak as slowly as necessary, just as you would in dictation. Since these questions involve coins, answers should be given in either dimes and pennies or tens and units at the end; i.e., “14 pennies, or 1 dime and 4 pennies,” or “14, that’s 1 ten and 4 units.”

Tip: If using coins to help obtain the answer, make sure your child keeps dimes on her left and pennies on her right to solidify the idea of place value.

1. 4 pennies + 4 pennies + 2 pennies =
2. 6 pennies + 8 pennies + 3 pennies =
3. 5 pennies + 3 pennies + 2 pennies + 4 pennies =
4. 2 pennies + 3 pennies + 4 pennies + 5 pennies + 6 pennies =
5. 1 penny + 4 pennies + 7 pennies + 3 pennies =

Next, ask your child if she remembers how to write problems in columns using the symbol for addition. If not, simply show how to do so using a gridded slate or piece of graph paper. (Be sure to leave enough room on the left for the tens place.) Now have her write as many problems as she is

Numeration and Notation of Money

(instructions to the parent)

Objects used: dollars, dimes, and pennies as necessary

Tip: Read through these steps before beginning so you are able to focus on your child. Be sure to allow plenty of time for her to give answers either orally or written. Be sure to adjust the following lesson to fit your child and her responses.

1. Ask your student if she knows the symbols for dollars and cents. If so, she may write them on her slate to show you. If a formal introduction or review is needed, work through the steps below and adjust accordingly.

Tip: If at any time you need to get out dollar bills, dimes, and pennies to make this more concrete for your child, feel free to do so.

2. Write a cent symbol (¢), being sure to leave room for numbers to be placed to the left of it.
3. Say to your child: When placed to the right of numbers it shows the amount in “cents.”
4. Write and ask your child to read the following: 3¢, 8¢, 11¢, 27¢, 35¢.
5. Write a dollar symbol (\$) on the slate.
6. Say to your child: You know the sign for dollar is \$ and is placed to the left of a number so that when you see this —
7. Write 44 to the right of the \$ sign so that it shows \$44.
8. Say: — it is read *forty-four dollars*.
9. Write and ask your child to read the following: \$62, \$9, \$45, \$17, \$83.
10. Write 444.

Review Addition Using Dollars with and without Exchanging to \$10.00

Objects used: dollars, dimes, and pennies as necessary

Begin the questions in the concrete in order to reinforce place value, making sure your child always keeps dollars on her left, followed by dimes, then pennies to the right.

Tip. The idea of carrying will be reinforced by having the student say she is carrying one ten or one hundred, rather than simply carrying one.

1. Notebooks are \$1.29 and pencils are \$1.54 per pack. How much for a notebook and pack of pencils altogether?
2. Chocolate cake is \$2.99 per slice, strawberry cake is \$1.69 per slice, and vanilla cake is \$1.59 per slice. How much altogether to get a slice of each cake?
3. A new ball is \$1.22 and a new bat is \$6.25. How much for both?

Tip: Have your student write out one or two of the following equations in her math notebook, either as it is solved or after it is solved.

4. Potatoes cost \$1.09 per pound and onions cost \$3.99 per bag. How much would a pound of potatoes and a bag of onions cost in all?
5. Markers cost \$2.20 per pack, paint brushes cost \$2.43 per pack, and a journal costs \$4.26. How much will one of each cost altogether?

$$\begin{array}{r} 6. \quad \$3.56 \\ + \quad 3.25 \\ \hline \end{array}$$

$$\begin{array}{r} 7. \quad \$4.22 \\ + \quad 1.35 \\ \hline \end{array}$$

$$\begin{array}{r} 8. \quad \$6.38 \\ + \quad 1.21 \\ \hline \end{array}$$

$$\begin{array}{r} 9. \quad \$1.88 \\ + \quad 2.55 \\ \hline \end{array}$$

$$\begin{array}{r} 10. \quad \$4.61 \\ + \quad 1.51 \\ \hline \end{array}$$

Answers

1. \$2.83
2. \$6.27
3. \$7.47
4. \$5.08
5. \$8.89
6. \$6.81
7. \$5.57
8. \$7.59
9. \$4.43
10. \$6.12

Review Exchanging Dimes and Dollars

Objects used: dollars, dimes, and pennies

1. If you have 15 dimes but don't want to carry so much change, what could you exchange it for?
2. Exchange 13 dimes for dollars and dimes.
3. If you saved 900 pennies in a jar, how many dollars could you exchange them for?
4. If you have 18 dimes, how many dollars could you exchange them for and how many dimes remain?
5. Show me \$6.32 in dollars, dimes, and pennies.
6. If you have \$6.32 all in pennies, how many pennies would you have?

7. Show me \$1.20 in dimes.
8. Exchange that for dollars and dimes.
9. How many pennies make up \$1.20?
10. If you had saved 541 pennies in a piggybank, how many dollars, dimes, and pennies could it be exchanged for?

Answers

1. One dollar and two quarters or one dollar and five dimes
2. One dollar and three dimes
3. 9 dollars
4. One dollar with eight dimes remaining
5. 6 dollars, 3 dimes, 2 pennies
6. 632 pennies
7. 12 dimes
8. 1 dollar and 2 dimes
9. 120 pennies
10. 5 dollars, 4 dimes, 1 penny

Review Numeration and Notation to 1,000

(instructions to the parent)

Tip: When your student is asked to write, have her write the numbers in a column, being sure she keeps proper place value and the work remains as neat and orderly as is in her power.

Tip: Further detail on the teaching of numeration and notation to 1,000 is found in Book 2, pages 161–163.

Review Addition of Longer Sums

with and without Carrying

Tip: When working these problems, encourage your child to always add and carry in tens or hundreds until it is second nature; e.g., 7 units and 7 units are “1 ten and 4 units” or “14 units, which is 1 ten and 4 units”; and doing the same in the tens place; e.g., “6 tens and 5 tens are 11 tens, which gives us 1 hundred and 1 ten” or “6 tens and 5 tens are 1 hundred and 1 ten.”

$$\begin{array}{r} 1. \quad 333 \\ + 421 \\ \hline \end{array}$$

$$\begin{array}{r} 2. \quad 134 \\ \quad 211 \\ + 410 \\ \hline \end{array}$$

$$\begin{array}{r} 3. \quad 223 \\ + 347 \\ \hline \end{array}$$

$$\begin{array}{r} 4. \quad 112 \\ \quad 115 \\ + 117 \\ \hline \end{array}$$

$$\begin{array}{r} 5. \quad 612 \\ + 208 \\ \hline \end{array}$$

$$\begin{array}{r} 6. \quad 218 \\ \quad 302 \\ + 190 \\ \hline \end{array}$$

$$\begin{array}{r} 7. \quad 521 \\ + 227 \\ \hline \end{array}$$

$$\begin{array}{r} 8. \quad 333 \\ + 284 \\ \hline \end{array}$$

$$\begin{array}{r} 9. \quad 201 \\ \quad 385 \\ + 282 \\ \hline \end{array}$$

$$\begin{array}{r} 10. \quad 403 \\ + 299 \\ \hline \end{array}$$

Answers

1. 754

2. 755

3. 570

4. 344

5. 820

6. 710
7. 748
8. 617
9. 868
10. 702

Addition with Larger Numbers

With your child's addition tables and work in addition up to 1,000 solidified, she will now transition to even larger numbers. Ten-dollar bills are now to be used with dollars, dimes, and pennies. This will expand your student's understanding of place value, while changing dollar bills to ten-dollar bills will form a bridge to the process of regrouping or carrying. Students will be working with numbers through 10,000.

As always, keep lessons to 15 minutes of work in either the newest concept or a mixed review, with another 5 minutes set aside for rapid table work to increase accuracy and readiness. If you notice your child's attention waning at any time during the lesson, you may switch to the questions found at the back of the book, beginning on page 227, to fix her concentration and rouse her effort of mind before renewing her efforts with longer addition questions.



Before beginning these lessons, you may wish to view the demonstrations in the *Charlotte Mason's Living Math: A Guided Journey* session on "Addition with Larger Numbers" to familiarize yourself further with the methods.

Addition Using Ten-Dollar Bills without Carrying

Tip: As a help, pull a Number Sentence Card out before a lesson begins so your student's work can continue uninterrupted if you get called away for a moment.

Sample *(instructions to the parent)*

Objects used: ten-dollar bills, dollar bills, dimes, and pennies

Read aloud the equation below and have your student speak through the process as she solves it using ten-dollar bills, dollars, dimes, and pennies.

Aurav bought a model ship for \$55.12 and a model airplane for \$34.23. How much did he give for both?

Tip: Be sure ten-dollar bills are kept on the student's left, followed by dollars, dimes, and pennies all in their proper places.

After the money is placed on the table, help your student get in the habit of starting with the pennies, or units, then moving to the dimes, then dollars, then ten-dollars; for example, 2 pennies plus 3 pennies are 5 pennies; 1 dime plus 2 dimes are 3 dimes; 5 dollars plus 4 dollars are 9 dollars; 5 ten-dollar bills plus 3 ten-dollar bills make 8 ten-dollar bills. (Answer: \$89.35)

Now show your student how the equation is written (see below). At this point, your student knows the decimal point or dot “.” differentiates between the dollars and cents. Decimals will be formally introduced and more fully explored in subsequent books.

$$\begin{array}{r} \$55.12 \\ + \quad 34.23 \\ \hline \$89.35 \end{array}$$

Sums

Say these sums slowly enough for your child to take out the appropriate amount of money and arrange it on the table. The majority of these equations should be solved in the concrete to solidify the “why” behind them.

Tip: A child using Charlotte Mason’s approach to arithmetic may surprise you with how many numbers she is able to keep in her head, but feel free to write the numbers on a slate or on graph paper as necessary.

1. Charlotte bought a tent for \$45.34 and a sleeping bag for \$22.34. How much did she give for both?
2. Max bought a box of chalk for \$3.31, a chalkboard for \$14.02, and an eraser for \$2.14. How much did he spend altogether?
3. A fishing pole costs \$28.40 and fishing lures cost \$11.10. How much for both?
4. Jeanne bought a bicycle for \$55.76 and a helmet for \$21.23. How much did she spend on both together?
5. A new shirt costs \$17.24 and a new pair of shorts costs \$11.25. How much will they cost altogether?

Tip: Have your student write #5 and #10 in her math notebook after solving, keeping her work as neat and orderly as possible.

$$\begin{array}{r} 6. \quad \$22.58 \\ + \quad 17.20 \\ \hline \end{array}$$

$$\begin{array}{r} 7. \quad \$39.45 \\ + \quad 20.30 \\ \hline \end{array}$$

$$\begin{array}{r} 8. \quad \$77.21 \\ + \quad 21.32 \\ \hline \end{array}$$

$$\begin{array}{r} 9. \quad \$62.33 \\ + \quad 23.14 \\ \hline \end{array}$$

$$\begin{array}{r} 10. \quad \$36.44 \\ + \quad 22.12 \\ \hline \end{array}$$

Answers

1. \$67.68
2. \$19.47
3. \$39.50
4. \$76.99
5. \$28.49
6. \$39.78
7. \$59.75
8. \$98.53
9. \$85.47
10. \$58.56

Addition Using Ten-Dollar Bills with Carrying

Tip: Keep lessons to 15 minutes of work on this new concept with 5 minutes of review given at the end, keeping each day's math time 20 minutes total.

Two sample problems will be written out by the teacher to show how problems of this type are written, while the student solves the problem using ten-dollar bills, dollar bills, dimes, and pennies—exchanging pennies for dimes, dimes for dollars, and dollars for ten-dollars as necessary.

Tip: Be sure ten-dollar bills are kept on the student's left, followed by dollars, dimes, and pennies to the right.

Samples (*instructions to the parent*)

Objects used: ten-dollar bills, dollars, dimes, and pennies

1. Say and write this equation on the slate or grid paper.

A dollhouse costs \$37.00 and a family of dolls costs \$29.00. How much for both?

$$\begin{array}{r} \$37.00 \\ + \underline{29.00} \end{array}$$

The child places 3 ten-dollar bills and 7 dollars on the table then places 2 ten-dollar bills and 9 dollars below it. Since there are no pennies or dimes, she should start solving by adding the dollars together, speaking through the process (i.e., 7 dollars plus 9 dollars make 16 dollars. That means 1 ten-dollar bill and 6 dollars.) Show how to notate that step on the equation:

$$\begin{array}{r} \overset{1}{\$37.00} \\ + \underline{29.00} \\ 6.00 \end{array}$$

Now have the student add the ten-dollar bills, talking through that step and giving the final answer (i.e., 1 ten-dollar bill and 3 ten-dollar bills and 2 ten-dollar bills make 6 ten-dollar bills. The answer is \$66.00). Show how to notate that step.

$$\begin{array}{r} \overset{1}{\$37.00} \\ + \underline{29.00} \\ \$66.00 \end{array}$$

2. Do the next sample equation the same way, allowing the child to notate as much as she is able. Be careful, though, that the writing does not overshadow her thinking process.

Say and write the equation. (The child gets out 2 ten-dollar bills, 8 dollars, 9 dimes, and 9 pennies then places below it 1 ten-dollar bill, 3 dollars, 9 dimes, and 9 pennies.)

A toolbox costs \$28.99 and a tool belt costs \$13.99. How much for both?

$$\begin{array}{r} \$28.99 \\ + 13.99 \\ \hline \end{array}$$

Have the student tell and show how to add the units, or pennies, first (i.e., 9 pennies plus 9 pennies make 18 pennies. That's 1 dime and 8 pennies).

$$\begin{array}{r} \overset{1}{\$28.99} \\ + \overset{1}{13.99} \\ \hline 8 \end{array}$$

Next do the tens column, or dimes, this time adding in tens (i.e., 1 dime and 9 dimes are 10 dimes plus 9 dimes. That's 19 dimes or 1 dollar and 9 dimes).

$$\begin{array}{r} \overset{1}{\$28.99} \\ + \overset{1}{13.99} \\ \hline .98 \end{array}$$

Now do the hundreds column, or dollars (i.e., 1 dollar plus 8 dollars plus 3 dollars equals 12 dollars. That's 1 ten-dollar bill and 2 dollars).

$$\begin{array}{r} \overset{1}{\$28.99} \\ + \overset{1}{13.99} \\ \hline 2.98 \end{array}$$

Last, do the thousands column, or ten-dollar bills (i.e., 1 ten plus 2 tens plus 1 ten make 4 tens. The answer is \$42.98.)

$$\begin{array}{r} ^1^1 \\ \$28.99 \\ + 13.99 \\ \hline \$42.98 \end{array}$$

Sums

Tip: The student should speak aloud as she solves the equations.

1. A backpack costs \$18.38 and a lunchbox costs \$12.23. How much would they cost altogether?
2. A soccer ball costs \$5.45, a pack of tennis balls costs \$3.67, a football costs \$7.23, and a tennis racket costs \$18.60. How much do they cost altogether?
3. Sarina was planning a party and purchased balloons for \$15.60, streamers for \$7.89, cake for \$17.20, and ice cream for \$7.36. How much did she spend in all?
4. Simon purchased a movie ticket for \$7.34, popcorn for \$4.35, a drink at \$1.26, and candy for \$2.28. How much did Simon spend in all?
5. A baseball hat costs \$15.51, a baseball jersey costs \$22.30, and a pack of baseball cards costs \$2.25. How much do they cost altogether?

Tip: Have your student write #5 and #10 in her math notebook after solving, keeping her work as neat and orderly as possible.

$$\begin{array}{r} 6. \quad \$13.23 \\ + 29.24 \\ \hline \end{array}$$

$$\begin{array}{r} 7. \quad \$45.44 \\ + 46.74 \\ \hline \end{array}$$

$$\begin{array}{r} 8. \quad \$28.52 \\ + 31.67 \\ \hline \end{array}$$

Multiplication Table for 7

Tip: If at any time your child needs to build a table in concrete objects to prove or work out these facts, allow her to do so.

Tip: Keep lessons to 15 minutes of work on the newest concept and 5 minutes of review at the end, making each day's math time 20 minutes total.

Step 1: Construct the table. *(instructions to the parent)*

Objects used: gridded paper, coins, and gridded slate as needed

Your child will make a simple multiplication table using either concrete objects or putting dots, hash marks, or short lines (1 per square) on a gridded paper or slate. This will help her see the rationale before creating written tables and also prove the facts before committing them to memory.

Say: Let's take our coins and make a multiplication table for 7. We'll make 10 rows of coins with 7 coins in each row. Let your student read down the column of coins and answer as you guide her:

•••••••
••••••• 7 and 7 are (14),
••••••• and 7 are (21),
••••••• and 7 are (28),
••••••• and 7 are (35),
••••••• and 7 are (42),
••••••• and 7 are (49),
••••••• and 7 are (56),
••••••• and 7 are (63),
••••••• and 7 are (70).

Ask questions that cover the lines of the table out of order.

1. How many 7s are in 14? (2) Remark: So it is right to say $7 \times 2 = 14$.

2. If a honey stick costs 7¢ each, how much would 5 honey sticks cost? (35¢)
3. $7 \times 7 =$ (49)
4. How many 7s are in 70? (10)
5. 7 taken 3 times? (21)
6. 7 taken 8 times? (56)
7. How much are 6 stickers at 7¢ apiece? (42¢)
8. $7 \times 4 =$ (28)
9. How many 7s are in 63? (9)
10. How many 7s are in 7? (1)

Now your child will construct a written multiplication table using a slate or gridded math notebook turned to the horizontal position.

Follow the detailed instructions below to walk your child through creating this table little by little. The finished table is pictured here. *Note that the multiplier (here in the top line) is written smaller than the multiplicand, in order to focus attention on the main number of the particular table.*

1	2	3	4	5	6	7	8	9	10
7	7	7	7	7	7	7	7	7	7
7	14	21	28	35	42	49	56	63	70

Write the numeral 7 on the (horizontal) slate or graph paper, leaving room both above and below:

7

Ask: How many 7s have we?
Write a small 1 above the 7:

Child answers: 1

1
7

Ask: One 7 is how many?
Write a 7 below:

Child answers: 7

1
7
7

Next write another 7 beside the first one. Point to the middle line and ask, How many 7s have we? Child answers: Two 7s. Write down a small 2 above the second 7:

1 2
7 7
7

Ask: How much is two 7s?

Child answers: 14

Write 14 underneath the second 7:

1 2
7 7
7 14

Now add a third 7 to the middle line:

1 2
7 7 7
7 14

Say something like, Having three 7s, or 7 “three times,” we now have how many altogether?

Child answers: 21

Tip: If, at any time, this is not clear, get out objects such as pennies or beans to show it in the concrete.

1	2	3
7	7	7
7	14	21

Continue in the same way until the whole table is written.

Tip: The multiplication tables in this book will go through 10 x the number. If you prefer, feel free to extend it through 12 x the number.

1	2	3	4	5	6	7	8	9	10
7	7	7	7	7	7	7	7	7	7
7	14	21	28	35	42	49	56	63	70

Step 2: Say the table and write it. *(instructions to the parent)*

Once the entire multiplication table for 7 is constructed, give your child a few minutes to look at it and try to visualize it in her head; then have her say it through several times: One 7 is 7, two 7s are 14, three 7s are 21, four 7s are 28, etc.

Erase a few numbers and ask your child to fill them in. For example:

1	2	3	4		6	7		9	10
7	7	7		7	7	7	7	7	
7		21	28	35		49	56		70

Have your child say the table through again. Now erase different numbers and allow her to fill the table in again, then have her repeat the table aloud once more. For example:

1		3	4	5	6		8		10
7	7		7	7	7	7	7	7	7
7	14	21		35		49		63	

Tip: The partial tables given here are only samples. Feel free to erase whichever numbers, and how many numbers, you prefer each time you repeat the process.

Have the child write the table in her gridded math notebook, turned in a horizontal position, for ease in referral and as an aid in committing it to

memory. As she writes her table, be sure she pays attention to neatness and keeping the proper place value with one number per square.

1	2	3	4	5	6	7	8	9	10
7	7	7	7	7	7	7	7	7	7
7	14	21	28	35	42	49	56	63	70

Step 3: Practice with Table Work until learned.

The next step is to give your child a variety of questions. Give only as many as you are able in the time allotted. Questions may be spread out over a few days. She may refer to her written table until it is learned by heart.

1. Five 7s are?
2. How many 7s in 63?
3. How many 7s in 42?
4. What is 7 multiplied by 8?
5. How many 7s in 28?
6. 7 taken 3 times is?
7. There are 7 books on each shelf. How many books on 8 shelves?
8. How many 7s in 14?
9. How many 7s in 49?
10. Nine 7s are?
11. 7 taken 5 times is?
12. How many 7s in 70?
13. 7 taken 6 times is?
14. 7 taken 4 times is?

2. 10 candies
3. 6 jump ropes
4. 8 dog treats
5. 8 erasers
6. 9 notecards
7. 9 hats
8. 5 baseball bats
9. 5 cakes
10. 7 balls

Longer Division with Money

Objects used: ten-dollar bills, dollars, and coins

Now longer division problems are worked in the concrete—using ten-dollar bills, dollar bills, and coins—by having your student divide the money into equal groups. Be patient, as each equation will take some time to work through.

Tip: Keep lessons to 15 minutes of work on the newest concept and 5 minutes of lively review with mental arithmetic at the end, making each day's math time 20 minutes total.

Sums

1. Mr. Fairfax gave \$12.35 for 5 candles. How much did each candle cost?
2. Caroline bought 3 boxes of tea for \$13.32 total. How much did she give for each?
3. Ella bought 7 sundaes for \$15.47. How much did each sundae cost?

4. Mackay gave \$18.75 for 5 dolls. How much did each doll cost?
5. Edmund gave \$24.64 for 8 boxes of candy. How much did each box cost?
6. What is \$14.49 divided by 7?
7. What is \$56.96 divided by 4?
8. What is \$50.20 divided by 10?
9. What is \$36.06 divided by 6?
10. What is \$47.16 divided by 2?

Answers

1. \$2.47
2. \$4.44
3. \$2.21
4. \$3.75
5. \$3.08
6. \$2.07
7. \$14.24
8. \$5.02
9. \$6.01
10. \$23.58

Review Subtraction

1. Jane had 7,437 stamps and gave Lizzie 2,215 of them. How many stamps did Jane have remaining?
2. Anne jumped rope 3,468 times without stopping and Diana jumped 2,544 times. How many more jumps did Anne make than Diana?

Weights and Measures

In addition to the weights and measures that have surrounded your child since infancy, she will have worked simple sums involving measures of time, distance, weight, and value in this and previous books in *The Charlotte Mason Elementary Arithmetic Series*. Now we begin a hands-on exploration of measures of time in hours, days, months, and a year; measures of length in feet, inches, and yards; measures of weight in ounces and pounds; as well as exploring liquid measures in fluid ounces, cups, pints, quarts, and gallons, and dry measures in $\frac{1}{4}$ cup, $\frac{1}{3}$ cup, $\frac{1}{2}$ cup, and 1 cup.

Read through the lessons ahead of time to gather any needed supplies. The complete list is found on pages 15 and 16. Each section will show the specific “Objects used” from that list.

Allow your child plenty of time to explore and discover by making these measurements herself. These sections may span a number of days to ensure your child has plenty of time to explore the ideas within.

Near the end of each section, your child will make a simple table of measures at the back of her math notebook to which she may then refer. One page should be reserved for each table as additions may be made as your child progresses in *The Charlotte Mason Elementary Arithmetic Series*.

Tip: As your child advances to a new notebook, she may copy her tables neatly into the back of the new notebook. Alternately, you might photocopy and insert the tables pages into subsequent notebooks.

Measures of Time

The Calendar (*instructions to the parent*)

Objects used: traditional 12-month wall calendar

Tip: Read through the lesson before beginning in order to change any wording to make it more natural or engaging to your child. Be sure to let her tell what she already knows and give her ample time to explore the calendar.

1. Say: You were born on (insert child's birthdate to include the day, month, and the year) while I was born on (insert your own birthdate).
2. Now invite your child to name any particular dates she knows. Then you may name dates your child may be familiar with, such as siblings' birthdates, days of holidays you celebrate, etc.
3. Explain that we use days, weeks, months, and years to measure time.

Though we usually speak of a *day* as the time when it is light, between sunrise and sunset, a *day* is actually measured from midnight to midnight again. This *day* is 24 hours.

A *week* is made up of seven of these days. They are named Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday.

We have 12 months in a year. The names of the months are January, February, March, April, May, June, July, August, September, October, November, and December.

Not all of our months have the same number of days. Seven months have 31 days each, four months have 30 days, and one month usually has just 28 days. And this shorter month, once every four years, has 29 days instead of 28.

4. To add interest you may give a short history. Very simply put, the Romans previously used a calendar that calculated months according to the phases of the moon. The word *month* even comes from the

word *moon*. These shorter months, of which the Romans had only ten, meant the calendar would fall out of sync with the seasons. In 46 B.C. the Roman emperor, Julius Caesar, created a standardized calendar by syncing it with the sun and the earth's rotation around it—changing it from a lunar calendar to a solar calendar. In order to follow the seasons and the earth's orbit more accurately, both months and days were added to this new calendar.

5. Using a calendar, have your child read aloud the days of the week several times. Now ask her to visualize them in her head and, when she is ready, say them through in order.

Tip: If your child is not reading, ask her to repeat the days of the week after you.

Next, name a day of the week and ask her what day comes before it and then ask what day comes after. Do this a number of times using different days. Have your child say the days of the week through one more time.

Tip: The calendar may be referred to at any time.

6. Using a calendar, ask your child to read aloud through the months of the year, beginning with January. Repeat this several times.

Tip: If your child is not reading, ask her to repeat the months of the year after you.

Name a month and ask your child which month comes before and which month comes after. Do this a number of times using different months. Have your child say the months through one more time.

Tip: The calendar may be referred to at any time.

7. Using the calendar, ask your child to find and tell you how many days each month has.

Now tell her that, as she has seen, January, March, May, July, August, October, and December have 31 days each; while April, June, September, and November have 30 days each.

February has either 28 or 29 days. We call the extra day in February a *Leap Day* and a year that February has 29 days, a *Leap Year*. In general, we can tell if a year is a Leap Year by dividing it by 4. If it divides evenly, that is, with no numbers left over or remaining, then it is usually a Leap Year.

8. Give two simple division sums by saying: Let's see if 2012 was a Leap Year.

Your child should divide 2012 by 4. (Answer: 503, with nothing left over. It divides evenly, so it was a Leap Year.)

Was 2020 a Leap Year?

Your child should divide 2020 by 4. (Answer: 505, with nothing left over. It divides evenly, so it was a Leap Year.)

Tip: Division with remainders will be formally introduced in Book 4. If you would like to take this informally and experientially with your child, you may give her a year—perhaps her birth year—that isn't divided evenly by 4.

9. Ask: Looking at our calendar, which month begins the year and which month ends the year? (January, December)

Explain that we also have seasons to measure time. In the Northern Hemisphere:

Spring is March, April, and May.

Summer is June, July, and August.

Autumn or Fall is September, October, and November.

Winter is December, January, and February.

Tip: These season divisions are general, without detailing the exact date within the months that a new season begins.

10. Some simple sums are now given to see which season is the longest and which is the shortest by saying: Let's add up the numbers of days in each of the seasons to see which is the longest and which is the shortest.

Spring

March: 31
April: 30
May: 31

Summer

June: 30
July: 31
August: 31

Autumn

September: 30
October: 31
November: 30

Winter

December: 31
January: 31
February: 28 or 29

Answers

Spring: 92 days
Summer: 92 days
Autumn: 91 days
Winter: 90 or 91 days

11. Say: Now let's find out how many days are in a year by adding the days of our seasons:

$$\begin{array}{r}
 92 \\
 92 \\
 91 \\
 + 90 \text{ or } 91 \\
 \hline
 365 \text{ or } 366
 \end{array}$$

Usually there are 365 days in a calendar year but when there is a Leap Year, we have 366 days.

Tip: While a year is 365 days, it really takes 365 days and 6 hours for the earth to orbit the sun. Every four years, those extra hours add up to 24 hours (6 hours