

*beauty & truth*  
MATH

Mathematics in a  
Charlotte Mason Education

# ARITHMETIC

SAMPLE

YEAR 6 • TERM 1

**SAMPLE**

# Beauty & Truth Math

- Mathematics in a Charlotte Mason Education -

# ARITHMETIC

YEAR 6 • TERM 1

Used in conjunction with

STRAYER-UPTON PRACTICAL ARITHMETICS, SECOND BOOK

by George Drayton Strayer and Clifford Brewster Upton

ARITHMETIC • YEAR 6 • TERM 1

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*“Never are the operations of Reason more perfect and more delightful than in mathematics. Here, men do not begin to reason with a notion that causes them to lean to this side or to that. By degrees, absolute truth unfolds itself. We are so made that truth, absolute and certain truth, is a perfect joy to us; and that is the joy that mathematics affords.”*

*(Charlotte Mason, Vol. 4, pp. 62-63)*

*“How sad that this subject, ethereal as faery and powerful beyond telling, should find no other adjective than ‘useful’ to justify us in imparting it to our children. Number to the philosophers of old was a touchstone of learning; it was worthy of their greatest respect and deepest thought. Let us take this gift with the others they have given us; this thought of Number as worthy of our best, aesthetically satisfying as an art, beckoning onward as a science, and luring us ever forward towards increasingly enchanting prospects ahead.”*

*(Stephens, Number: A Figure and a Step Onward, p. 4)*

*“And if our boys and girls can be brought to feel that arithmetic is a game—a noble game—one of the noblest though not one of the most spectacular that the human race has played—and that it is an honour and a privilege to play at it; and if we can keep that feeling alive by the right exercise and the apt stimulus, cunningly applied with a smile and a jest, as becomes so noble a game, the arithmetic lesson will cease to be a dismal grind and become a grand pursuit full of glamour and excitement.”*

*(Ballard, Teaching the Essentials of Arithmetic, p. 34)*

**SAMPLE**

# WELCOME

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Thank you for purchasing this guide! We are humbled and honored by your support. Please read through this introduction carefully. Understanding our approach is vital to maximizing the benefits of each guide.

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## THE VISION

Beauty & Truth Math exists to assist students AND teachers in the realm of mathematics in a Charlotte Mason education. It is possible to simply read the scripted lessons and check your students' answers. However, this keeps the teacher from being an engaged and involved partner in the learning process.

These lessons are written with the idea that the teacher will be *working with* the students, asking questions, having discussions, and monitoring progress. Each lesson is an opportunity for building relationships between you, your students, and the Lord. Please make the most of this time together, walking beside your students in exploring and understanding mathematical ideas.

We thoroughly believe that math done completely in isolation misses opportunities to make deep connections. Just like a foreign language needs to be communicated and spoken to make connections, math is its own language with its own big ideas that are best learned through discussion.

You are working with *living* born persons; our aim is to provide a *living* education. *Living* involves changes and adaptations. These lessons are guides and servants, not masters you must follow. Please use the Spirit's wisdom when discerning what you should modify, skip altogether, push forward on, or slow down on as you and your students are on this journey.

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## CONTACTING US

We welcome feedback and questions! For general inquiries, please email us at [contact@beautyandtruthmath.com](mailto:contact@beautyandtruthmath.com).

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These guides have been a labor of love. Please respect our hard work and do not share any content and links that are not publicly available on our site.

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## **WEBSITE LINKS DISCLAIMER**

PLEASE PREVIEW LINKS BEFORE USING! While we have done our best to ensure all sites we link to are appropriate, we do not have any control over changes made to them.

We are thankful for the free resources other sites make available and want to support them whenever possible. As they generate revenue through traffic on their sites, we link directly to their pages.

In many cases, there will be multiple worksheets provided on the pages linked. Most of the time, we will specify which worksheet is needed in the guide. Sometimes, you will need to choose the worksheet. This will be stated in the guide as well.

It is the teacher's final responsibility to ensure the content is age-appropriate for the lessons. Please email us at [contact@beautyandtruthmath.com](mailto:contact@beautyandtruthmath.com) to report broken links.



# READY, SET, GO!

*"Putting in the work up front to make the school days run easy."*

We have created three folders to easily access the teacher help documents and printables included in this guide. Their unique QR codes and links are included in multiple places in this introduction and are shown here for easy identification.

We will walk you through how to use these linked folders in the following few pages, so please don't worry about viewing them now. This page is simply an introduction to them.

**Important Teacher Helps** – This folder contains helpful resources to assist and support you as you implement math in a Charlotte Mason education. It includes the following documents:

- A CHARLOTTE MASON MATH EDUCATION lays out a vision for a Charlotte Mason math education.
- THE ARITHMETIC PROGRESSION provides an overview of arithmetic in the Beauty & Truth Math Guides using Charlotte Mason's philosophy. Sources include PR articles & books recommended in the PUS Programmes.
- ALL ABOUT THE GUIDES is everything you need to know about the guide's setup.
- FORMS 1&2 REVIEW ACTIVITIES is a treasure trove of various review activities organized by topic. Use these to keep review time lively and engaging.
- FAQs is a list of questions we frequently answer from our customers. This document is a living document and will be updated occasionally.
- SUPPORT VIDEOS LIST is a compiled, linked list of support videos in this guide.
- ADDITIONAL SUPPLEMENTAL RESOURCES provide extra teacher support.



**Cardstock Printables** – This folder contains all resources that need to be printed on cardstock, as these will be used with your students multiple times throughout the lessons.






**Printables** – This folder contains all of the consumable printables for your students. Sometimes, you will need several copies.



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## GET READY!

- **SEE** the **Materials Needed** section in this guide to determine what materials you have and still need to purchase.
- **BUY** Strayer-Upton, Book 2 in physical and/or digital form. **Our Favorites**  page provides links to the Strayer-Upton Book Series and other recommendations we have compiled to help you prepare and organize your materials.
- **PRINT** the FORMS 1&2 REVIEW ACTIVITIES document in the **Important Teacher Helps** folder.
  - We recommend printing it on colored paper to make it easy to find. *You only need to print this document once for all your Form 1&2 students.*
- **PRINT ALL OF THE DOCUMENTS** in the **Cardstock Printables** folder. You will use these documents multiple times, so we recommend using cardstock paper. Some may need to be cut apart as well. 
- **PRINT AT LEAST THE FIRST TWO WEEKS** of materials in the **Printables** folder. In the **Materials Needed**, we list how many copies you need for the entire term. Feel free to print all of them ahead of time or print them only a week or two in advance. You can find these documents listed under the Special Materials Needed section of the Weekly Resources Pages for Weeks 1 and 2. 
- **DECIDE** if you will print the guide or use it on a screen.

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## GET SET!

- **READ THROUGH THE FOLLOWING IMPORTANT TEACHER HELPS:**

- A CHARLOTTE MASON MATH EDUCATION
- THE ARITHMETIC PROGRESSION
- ALL ABOUT THE GUIDES



- **Learn how to implement the guides in daily life.** Read through the Putting It Altogether section of this guide.

- **Prepare your materials.** There is no one right way to do this! The following list is simply a compilation of ideas Beauty & Truth Math users have found helpful.

- **Create a student math notebook for each student.**

- Fill it with grid or graph paper. In general, we recommend  $\frac{1}{2}$ " or  $\frac{1}{4}$ " squares. Some students may need larger squares based on their writing ability.
- Create sections in the notebook for daily assignments, a math vocabulary page, and a reference section. It is up to you and your student how to order these. If applicable, create different sections for the different streams of math.
- Decide if you will have your student write headings for each assignment. Information such as the date and page number are great things to include. Writing the problem number and showing the final answer, either with a box or a circle around it, is also strongly encouraged. We recommend starting this in Year 2 or 3.

- **Put together a teacher math notebook for yourself.**

- Create sections for your personal calendar, the lessons from the guides, printable & supplementary resources, exams, notes, etc.

- **Find a place for the Cardstock Printables.**

- These could be stored in a folder in your teacher notebook or an accordion file folder. The goal is to keep them accessible and in good condition since you will use them often.

- **Use tabs to label and easily find what you need!**

- Tab each topic in the FORMS 1&2 REVIEW ACTIVITIES document (from the Important Teacher Helps folder).
- In the Strayer-Upton books, tab the following:
  - Where you are at for the current lesson, and the corresponding answer key section in the back
  - Review & mental math pages

- **Have individual containers for each of your student's supplies.**

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## GO!

Any author of math textbooks or guides will tell you that we write in order to accommodate as many students as possible, and we provide more than is needed. You have complete freedom not only to modify the lessons, but also to adjust the number of problems assigned to meet the needs of your students.

Each week, you will need to do the following:

- Look over the new lessons to be covered with your student. Understand the big ideas and objectives.
- Choose review assignments to use with your students. These assignments build depth in highlighting and understanding different number relationships. When choosing what to review, consider three things:
  - 1) What areas do my students require more practice to solidify concepts?
  - 2) What topics have we not reviewed in a while?
  - 3) What assignments would give my students a reprieve and easier lesson to build their confidence and enjoyment of math?
- Choose mental math problems to use throughout the week, if needed.
- Take the Beauty & Truth Math Guide Vow – I do solemnly promise that I will remember and implement the following statements:
  - I have permission from Charlotte Mason and the authors of these lessons to adjust or modify any lesson, at any time, to provide a living education to my unique, born persons.
  - I have permission from Charlotte Mason and the authors of these lessons to assign fewer problems than written in the lessons to provide a living education to my unique, born persons.
  - I have permission from Charlotte Mason and the authors of these lessons to assign more problems than written in the lessons to provide a living education to my unique, born persons.

“...the educator has to deal with a self-acting, self-developing being, and his business is to guide, and assist in, the production of the latent good in that being, the dissipation of the latent evil, the preparation of the child to take his place in the world at his best, with every capacity for good that is in him developed into a power.” (Mason, Vol. 1, p. 9)

- Pray for joy and wisdom as you set out each day exploring mathematical truths with your students. Now dive right into using the lessons, confident that the Lord is with you and for you!

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# ALL ABOUT THE TERM

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## SEEING THE BIG PICTURE

There is NOT a one size fits all way to teach math using the Charlotte Mason method. Our guides are one option for teachers to use. We have created them to be adaptable to each unique student, both in the big picture and in the guides' details.

We have designed our curriculum to imitate the math streams used in Charlotte Mason's schools. Students have several options for the tracks and combinations of these streams. For more information, see our [Scope & Sequence](#) page on our website.



Additionally, [The Guides' Big Ideas](#) page on our website shows the main ideas throughout the years.



## TERM OVERVIEW

This term students recap a lot of big ideas they've learned so far, as well as learn some new ways of solving arithmetic problems. They also explore types of graphs and properties of decimals when dividing.

This year we recommend that students always write a heading on their papers, including their name, the date, and the assignment (page number). Also, the students should number each problem and show the final answer by boxing or circling it.

The **maximum** lesson time for students in Year 6 is 30 minutes.

## EVERY DAY & SPECIAL MATERIALS

We assume students will always have their pencil, math notebook with grid paper, grid dry-erase board, and dry-erase marker handy for lesson time. Any additional materials beyond these items are listed in the Special Materials Needed sections.

## CARDSTOCK PRINTABLES VS. PRINTABLES

The teacher must prepare all cardstock printables before the term begins. The cardstock printables are listed as special materials, but links are not provided. Links for the Printables Folder are always provided in the special materials.

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## MANIPULATIVES

At this point, students are expected to conceptually understand the place value of numbers, so manipulatives are not assigned. If this is still a struggle for your students, please feel free to use real and play money to show place value as done in the Arithmetic Years 1-5 Guides.

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## THE DETAILS MATTER

In Year 2, students learned about a costly mistake NASA engineers made in 1999. Throughout this guide, references are made to that story to remind students to label their answers. If your students are unaware of the Mars Climate Orbiter disaster, please read The Details Matter (NASA's Costly Mistake) to them.



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## MATH JEOPARDY

Math Jeopardy is a game we play each year in Beauty & Truth Math during lessons. In Year 6, students will create their own problems for the teacher to solve.

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## RECORDING PROGRESS

Throughout this term students will track their computing speed and record their scores (and improvement!) on a line graph. Read p. 16 and p. 497 in Strayer-Upton, Book 2 to see how to get started. Each week will have one Improvement Test listed in the Suggested Review section. Each Improvement Test page includes several tests. **Only one small test should be assigned in one day.** The students will spend more than one week on the same Improvement Test page. Ideally, they will complete each section at least twice, so that progress can be tracked. You can find all the Improvement Test page numbers and answers on p. xlii at the back of the book.

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## ALL ABOUT PAGES

The All About Pages are used by students throughout the school year. As such, they are printed on cardstock paper for durability. These sheets may be referenced to jog the students' memories about ideas they have already learned. Students may also add to them at any point as they continue to grow in their knowledge of mathematics.

# TERM AT A GLANCE

1	<u>Method of Equal Additions, Ls. 1</u>	<u>Method of Equal Additions, Ls. 2</u>	Review/ Catch-Up
2	<u>Method of Equal Additions, Ls. 3</u>	<u>Properties, Ls. 1</u>	Review/ Catch-Up
3	<u>A New Way of Multiplication</u>	<u>Properties, Ls. 2</u>	Review/ Catch-Up
4	<u>Finding Parts, Ls. 1</u>	<u>Finding Parts, Ls. 2</u>	Review/ Catch-Up
5	<u>Exploring Graphs</u>	<u>Bar Graphs, Ls. 1</u>	Review/ Catch-Up
6	<u>Bar Graphs, Ls. 2</u>	<u>Line Graphs, Ls. 1</u>	Review/ Catch-Up
7	<u>Line Graphs, Ls. 2</u>	<u>Dividing Decimals, Ls. 1</u>	Review/ Catch-Up
8	<u>Special Types of Division, Ls. 1</u>	<u>Dividing Decimals, Ls. 2</u>	Review/ Catch-Up
9	<u>Special Types of Division, Ls. 2</u>	<u>Exploring Reciprocals</u>	Review/ Catch-Up
10	<u>Percents, Ls. 1</u>	<u>Percents, Ls. 2</u>	Review/ Catch-Up
11	Bar & Line Graphs/ Catch-Up	Fractions & Dividing Decimals/Catch-Up	Percents & Properties/ Catch-Up
12	--- <u>Exam Week</u> ---		



# MATERIALS NEEDED

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- Blank Sheet of Paper

**Our Favorites** provides links to the Strayer-Upton Book Series as well as other recommendations that may be helpful to you in preparing and organizing your materials.



## **Textbook**

Strayer-Upton, Book 2

## **Everyday Materials**

- Dry-Erase Marker
- Grid Dry-Erase Board
- Notebook with  $\frac{1}{2}$ " Grid (or Graph Paper)
- Pencil

## **Cardstock Printables**

- All About Capstone
- Properties Summary



## **Printables**

- Exploring Graphs
- Exploring Reciprocals



## • WEEK 6 RESOURCES •

### YEAR 6. TERM 1. WEEK 6

#### OVERVIEW

This week the students will continue learning about bar and line graphs.

If you purchased the full-year guide, this is an excellent week to have your students do their service project.

#### BIG IDEAS NEEDED BEFORE BEGINNING

- Bar Graphs

#### SUGGESTED PACE

Day 1: Bar Graphs, Ls. 2

Day 2: Line Graphs, Ls. 1

Day 3: Review/Catch-Up

#### ONGOING REFERENCE PAGES

- All About Capstone

#### MENTAL MATH IDEAS

- 70 (4-23)

#### SPECIAL MATERIALS NEEDED

- None

#### SUGGESTED REVIEW

- Improvement Test: 357
- Dividing Decimals (Y5.T3.W6): 348
- Bar Graphs (Y6.T1.W5): 233
- Mixed Review: 36

## • Bar Graphs, Ls. 2 •

Y6. T1. W6. L1

### SUBJECT

Arithmetic



### RESOURCES USED

Strayer-Upton, Book 2 (p. 452-453)

### OBJECTIVES

Students will be able to answer questions about and draw bar graphs.

### SPECIAL MATERIALS NEEDED

None

### SPECIAL NOTE

There is no student response section for this lesson.

### THE PLAN

1. Today you have one more lesson about bar graphs. Why are bar graphs useful? (They are an organized way of displaying data to help us learn information about it.) Excellent!
2. In the previous two lessons, you looked at bar graphs where the category was time. One of the great things about bar graphs is that they work for any category. The reason the bars don't touch is that they are distinct categories.
3. Read the top section of p. 452 and answer the questions. Use your dry-erase board to write out any calculations. If the fractions are troublesome, discuss how much one-fourth of one hundred is. For an extra connection, tie the value of a quarter to a dollar to one-fourth of one hundred.
4. Complete p. 453: 1-3 orally.
5. Complete p. 452: 3 in your math notebook using a horizontal bar graph. Ensure the student labels everything clearly, uses a reasonable scale, and draws it accurately. Well done! 🚚
6. Now let's have you do one more. Complete p. 453: 5 in your math notebook using a vertical bar graph.

## • Line Graphs, Ls. 1 •

Y6. T1. W6. L2

### SUBJECT

Arithmetic



### RESOURCES USED

Strayer-Upton, Book 2 (p. 454)

### OBJECTIVES

Students will be able to read and create a line graph.

### SPECIAL MATERIALS NEEDED

None

### THE PLAN

1. In the last lesson, you finished studying bar graphs. Why don't the bars touch? (Because they are distinct categories)
2. Today we will transition to line graphs. Read p. 454: 1.
3. Look at the line graph at the top of p. 454. Let's compare the axes to a bar graph. Are the x-axis values numbers or categories? (Numbers)
4. Sometimes bar graphs have category values that are numbers. On a line graph, the values are ALWAYS a numerical progression. That's why the lines connect!
5. Let's look at the y-axis. Does the y-axis begin at zero, like the bar graphs did? (No)
  - a. Is there a scale to the values? (Yes)
  - b. What is the labeled scale of this graph along the y-axis? (2)
  - c. What is the scale of each square? (1) Excellent!
6. While points get plotted similarly between a bar and a line graph, the x-axis for line graphs are always numbers. Also, the y-axis are numbers that don't have to start at zero. That is why labeling correctly is so important. Do p. 454: 2-3 orally.
7. Now it's time to draw a line graph in your math notebook! Do p. 454: 4. Do your best to decide upon a helpful scale, and don't miss Mars! *For this graph, the students should go from 1-12 hours on the x-axis. Also, the y-values could go from around 40 to 55 (or 56) with a scale of 5 (or 2).* 🚀
8. Do p. 454: 5 orally.

### STUDENT RESPONSE

1. How are bar and line graphs different? (Bar graphs are categories that don't connect, and their values start at zero. Line graphs are connected numerical data, and their values don't have to start at zero.)
2. How are they similar? (They display data in an organized way.)