

# Kolbe Academy Home School

## GRADE FOUR MATHEMATICS

*Singapore Math ® Primary Mathematics 4A*  
*Singapore Math ® Primary Mathematics 4B*

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**COURSE TITLE:** Mathematics 4**COURSE TEXTS:****First Semester (4A)***Primary Mathematics 4A Textbook, Standards Edition (T8504)**Primary Mathematics 4A Workbook, Standards Edition (T8504A)**Primary Mathematics 4A Home Instructor's Guide, Standards Edition (T8504B)***Optional Texts (available from Singapore Math ®)***Primary Mathematics 4 Extra Practice, Standards Edition**Primary Mathematics 4A Intensive Practice, US Edition**Primary Mathematics 4, Challenging Word Problems***Second Semester (4B)***Primary Mathematics 4B Textbook, Standards Edition (T8504C)**Primary Mathematics 4B Workbook, Standards Edition (T8504D)**Primary Mathematics 4B Home Instructor's Guide, Standards Edition (T8504E)***Optional Texts (available from Singapore Math ®)***Primary Mathematics 4 Extra Practice, Standards Edition**Primary Mathematics 4B Intensive Practice, US Edition**Primary Mathematics 4, Challenging Word Problems***TEXT DESCRIPTIONS**

Descriptions below adapted from Singapore Math ®

<b>Components</b>	
<b>Textbook</b>	The textbook contains the learning tasks for students to do with adult supervision and interaction, along with practice and review problems. This text is a non-consumable book and to be used along with the workbook, at minimum. There is a book for each semester: 4A and 4B. Answers to textbook questions are in the Home Instructor's Guide.
<b>Workbook</b>	The workbook is consumable and should be used along with the textbook. They contain the exercises the student does independently after each learning task. There is a book for each semester: 4A and 4B. Answers to workbook questions are in the Home Instructor's Guide
<b>Home Instructor's Guide</b>	The Home Instructor's Guides are strongly recommended. The Home Instructor's Guide provides parents with the Singapore Math® methodology. The depth achieved by the Home Instructor's Guides can help the parent understand and handle misconceptions or lack of comprehension early before they become problematic. It prepares parents to initiate discussions on various approaches to understanding a concept or solving a problem and aids the parent in using the textbook most effectively. The guide contains mathematical background and objectives for each unit, objectives for each chapter, activities using manipulatives where appropriate, reinforcement and enrichment activities. It also includes answers and solutions to textbook pages and learning tasks for the chapter, answers to the workbook exercises and solutions to many of the problems. It also includes several Mental Math pages. There is a book for each semester: 4A and 4B.
<b>Extra</b>	This <b>optional</b> supplement consolidates and reinforces the mathematical concepts taught in the

<b>Practice</b>	textbook. Extra practice problems in this text allow students to master concepts presented in the textbook or provide review after long period away from school such as summer break. The exercises are short and topic-specific to make it easy to assign work in those topics in which the student needs more practice. This, together with the simple language used, allows students to review mathematics with minimal guidance. There is only one book for the entire year. Answers are in the back of the book.
<b>Intensive Practice</b>	This <b>optional</b> supplement is recommended for advanced students as a source of interesting review and challenging questions. The problems are arranged in topics corresponding to each unit in the US edition. However, they can easily be used with the Standards edition. However, note that it does not include all topics and the sequence of topics will be different in places than the Standards edition. Kolbe accounts for this within the course plan. There is a book for each semester: 4A and 4B. Answers are in the back of the book.
<b>Challenging Word Problems</b>	This <b>optional</b> supplement provides not only ample practice of graded exercises for students of mixed abilities but also offers advanced math students with challenging questions to promote problem-solving skills. It includes worked examples, additional practice questions, challenging word problems, and miscellaneous questions for review. There is only one book for the entire year. Answers are in the back of the book.

**COURSE DESCRIPTION:**

The goal of *Primary Mathematics 4*(Standards Edition) is to develop student's mathematical problem solving skills both in practical and abstract concepts. Mathematics concepts will be applied in both practical, real-life situations and in abstract, mathematical formulations. Lessons begin with a concrete representation of a concept, followed by pictorial representation and finally a symbolic representation of the general or abstract concept so that students will achieve mastery of each concept and be able to apply the abstract ideas to a range of practical problem solving situations. This program aims to convey the elegance and power of numbers so that students begin to build an appreciation of mathematics. Reasoning and understanding patterns and concepts are emphasized throughout the course. It is hoped that students will develop important logic and reasoning skills that will be invaluable in future mathematics courses and throughout life.

**SKILLS TO BE DEVELOPED:**

- Readiness for fifth grade
- Read, write, understand place value, compare and order numbers from 0 to 1,000,000,000
- Approximation and mental problem solving
- Understand factors, prime numbers, composite numbers and multiples
- Understand four operations—addition, subtraction, multiplication and division
- Use the four operations with multi-digit numbers, fractions, decimals and word problems
- Understand order of operations with four operations and parentheses
- Understand negative numbers
- Understand fractions, equivalent fractions and improper fractions
- Recognize fraction of a set and use to solve word problems
- Classify right angles, acute angles, obtuse angles, and draw and measure angles

- Identify and construct perpendicular and parallel lines
- Identify polygons, rectangles, squares, rhombuses, parallelograms and trapezoids
- Understand properties of triangles and circles
- Recognize and name solid figures including cubes, prisms, pyramids and cylinders
- Ability to calculate area and perimeter of polygons
- Understand decimal numbers including tenths, hundredths and thousandths
- Identify congruent figures and name corresponding vertices, sides and angles
- Understand line symmetry and rotational symmetry
- Understand the coordinate grid and identify and graph ordered pairs on a coordinate grid
- Graphing simple linear functions, creating table of values for points on a given line and deriving an equation for the line
- Understand some data analysis and probability
- Ability to represent data on tally charts and line plots
- Identify the median and mode for data sets
- Represent and interpret data in line graphs and bar graphs
- Understand measures and volumes and manipulating these quantities

**OPTIONAL ENRICHMENT SUGGESTIONS:**

Depending on your student's interest, you may find some of these sources -helpful for further enrichment material: For a student who particularly likes history, *Mathematicians Are People, Too* by Luetta Reimer and Wilbert Reimer (Dale Seymour Publications, 1990) adds historical context and personal stories to many of the important developments in mathematics. It tells the stories of great mathematicians throughout history beginning with the Greeks up to modern times. *The Joy of Mathematics* by Theoni Pappas (Wide World Publishing, 1989) demonstrates the application of mathematics to a wide-ranging, diverse collection of topics in our world including astronomy, earthquakes, architecture, soap bubbles, and optical illusions. Another book that relates the famed number pattern called Fibonacci in nature, art and engineering is: *Fascinating Fibonacci: Mystery and Magic in Numbers* by Trudy Hammel Garland (Dale Seymour Publications, 1990). The Fibonacci topic is also entertainingly presented at this website: (\*Note\* while this topic is purely mathematical, other articles on this blogspot carry political/moral ideology contradicting our Catholic faith)

<http://allbleedingstops.blogspot.com/2012/01/spirals-and-fibonacci-series-and-pine.html>

These are optional enrichment materials which may be included if you think they would add interest and better understanding for your student, but they are not part of the Singapore Math® course.

**SCOPE AND SEQUENCE:**❖ **Quarter 1 (Begin 4A)****Unit 1: Whole Numbers**

- Chapter 1: Ten Thousands, Hundred Thousands and Millions
- Chapter 2: Approximations
- Chapter 3: Factors
- Chapter 4: Multiples
- Chapter 5: Order of Operations
- Chapter 6: Negative Numbers

**Unit 2: The Four Operations of Whole Numbers**

- Chapter 1: Addition and Subtraction
- Chapter 2: Multiplication and Division
- Chapter 3: Multiplication by a 2-Digit Number

**Unit 3: Fractions**

- Chapter 1: Equivalent Fractions
- Chapter 2: Adding and Subtracting Fractions

❖ **Quarter 2****Unit 3: Fractions**

- Chapter 1: Equivalent Fractions
- Chapter 2: Adding and Subtracting Fractions
- Chapter 3: Mixed Numbers
- Chapter 4: Improper Fractions
- Chapter 5: Fractions and Division
- Chapter 6: Fraction of a Set

**Unit 4: Geometry**

- Chapter 1: Right Angles
- Chapter 2: Measuring Angles
- Chapter 3: Perpendicular Lines
- Chapter 4: Parallel Lines
- Chapter 5: Quadrilaterals
- Chapter 6: Triangles
- Chapter 7: Circles
- Chapter 8: Solid Figures
- Chapter 9: Nets

**Unit 5: Area and Perimeter**

- Chapter 1: Area of Rectangles
- Chapter 2: Perimeter of Rectangles
- Chapter 3: Composite Figures

❖ **Quarter 3 (Begin Book 4B)****Unit 6: Decimals**

- Chapter 1: Tenths
- Chapter 2: Hundredths
- Chapter 3: Thousandths
- Chapter 4: Rounding

**Unit 7: The Four Operations on Decimals**

- Chapter 1: Addition and Subtraction
- Chapter 2: Multiplication
- Chapter 3: Division

**Unit 8: Congruent and Symmetric Figures**

- Chapter 1: Congruent Figures
- Chapter 2: Tiling Patterns
- Chapter 3: Line Symmetry
- Chapter 4: Rotational Symmetry

**Unit 9: Coordinate Graphs and Changes in Quantity**

- Chapter 1: The Coordinate Grid
- Chapter 2: Changes in Quantities
- Chapter 3: Graphing Changes in Quantity

❖ **Quarter 4****Unit 10: Data Analysis and Probability**

- Chapter 1: Organizing and Analyzing Data
- Chapter 2: Probability Experiments
- Chapter 3: Order of Outcomes
- Chapter 4: Bar Graphs
- Chapter 5: Line Graphs

**Unit 11: Measure and Volume**

- Chapter 1: Adding and Subtracting Measures
- Chapter 2: Multiplying Measures
- Chapter 3: Dividing Measures
- Chapter 4: Cubic Units
- Chapter 5: Volume of Rectangular Prisms

**COURSE PLAN METHODOLOGY:**

Kolbe Academy has worked diligently to create the best possible course plans with the home schooling family in mind. Remember, however, that our program is intended to be flexible. Per the principle of subsidiarity, these course plans are a **suggested** course of study. As the teacher, you should adapt and modify these course plans to meet the individual learning needs of your child. **Do not feel obligated to follow these course plans exactly.**

The optional supplements in the Singapore® program enable a parent to customize instruction based on needs and ability of each particular student. Most students will use only the required texts, but the optional supplements allow a parent to provide extra reinforcement for most students, assistance for a struggling student or extra challenge and interest for a particularly advanced student.

There are several books used in this course. A list of abbreviations follow to help aid you in reading the Kolbe Academy course plan.

<b>Legend</b>	
<b>PMA</b>	<i>Primary Mathematics</i> Textbook, 4A
<b>WBA</b>	<i>Primary Mathematics</i> Textbook, 4A
<b>HIGA</b>	<i>Primary Mathematics</i> Home Instructor’s Guide, 4A
<b>PMB</b>	<i>Primary Mathematics</i> Textbook, 4B
<b>WBB</b>	<i>Primary Mathematics</i> Textbook, 4B
<b>HIGB</b>	<i>Primary Mathematics</i> Home Instructor’s Guide, 4B
<b>EP</b>	<i>Primary Mathematics</i> Extra Practice 4 (optional for extra reinforcement of material)
<b>IPA</b>	<i>Primary Mathematics</i> Intensive Practice, 4A (optional for advanced understanding)
<b>IPB</b>	<i>Primary Mathematics</i> Intensive Practice, 4B (optional for advanced understanding)
<b>CWP</b>	<i>Primary Mathematics</i> Challenging Word Problems 4 (optional for extra challenge)
<b>DAY</b>	<input type="checkbox"/> Assignments and activities that are a recommended part of the course are included in each day’s schedule.
<b>OPT</b>	<input type="radio"/> Optional assignments and/or activities that can be used as reinforcement for a skill not yet mastered or enrichment for a child that wants to go that extra step. These are located in each day’s optional schedule indicated by “OPT.”

Each weekly assignment is summarized in the first rows of the week’s daily course plan along with the goals, notes, and suggested materials for that week. The specific daily assignments for the student are outlined in the following lines indicated by the **DAY 1**, **DAY 2**, **DAY 3**, **DAY 4**, and **DAY 5** abbreviations and include a  checkbox.. The assignments in the **OPT** box are meant to be **OPTIONAL** and coincide with that particular day’s assignments. These optional assignment that are included for reinforcement or enrichment are indicated with the symbol . See the legend above to help you determine whether your child might benefit from the optional assignments. Parent daily guidelines are given to the right of the student assignments. These guidelines are meant to be flexible. Feel free to combine lessons when able, or slow down where desired. A family’s schedule can and should vary as needed. Most weeks will have five days of lessons assigned, however, for some weeks

there are only four days of assignments. You may either use the extra day as a 'catch-up' day or to review material for extra reinforcement.

This mathematics course contains 36 weeks broken into four 9-week quarters. Review lessons at the end of each unit provide cumulative review of all material covered up to that point so that students maintain thorough retention of all material throughout the course. The exams focus on the material covered in each unit for in-depth examination of that specific material. Three exams are given for each Quarter 1 and Quarter 2, two exams for Quarter 3 and four exams for Quarter 4, for a total of twelve exams for the year. Exams generally cover an entire Unit of material, except for Exam 3 which only covers the first four chapters of the third Unit.

Finally, begin every class with a prayer. This is a good way to help the child memorize new prayers. Repeat the same ones every day until they are known. Be sure to explain the meanings of the prayers. Repetition in all areas of study is most beneficial.

◆◆◆ FIRST QUARTER ◆◆◆

WEEK 1		
Book	Weekly Breakdown	Goals and Notes for the Week
PMA	Unit 1 Begin Chapter 1	Understand place value, read and write, and locate on a number line numbers from 1 to 1 billion. Materials: Place-value discs or Place-value cards (HIGA, p. a9-a14). Much of this material should be review and building on previous concepts from 3 <sup>rd</sup> grade, so use this time to familiarize yourself with the course materials and organization, particularly the Materials section of the HIGA and the Appendix of the HIGA.
Notes		
Student Daily Assignments		<input checked="" type="checkbox"/> Parent Daily Guidelines
DAY 1	PMA, pp. 8-13	<input type="checkbox"/> Begin Unit 1, Chapter 1 by reviewing the HIGA, pp. 1-6. Refer to HIGA, p. 7-8 for guidance in teaching today's lesson. Understand place value, read and write numbers up to 1 million.
	WBA pp. 7-9 (ex 1)	
OPT	IPA, pp. 1-2	<input type="radio"/> Supplements to be used as needed.
DAY 2	PMA, pp. 13-15	<input type="checkbox"/> Refer to HIGA, p. 5 for guidance in teaching today's lesson. Place value for 5-digit and 6-digit numbers.
	WBA pp. 10-11 (ex 2)	
OPT	IPA, pp. 3-4	<input type="radio"/> Supplements to be used as needed.
DAY 3	PMA, pp. 15-17	<input type="checkbox"/> Refer to HIGA, pp. 10-11 for guidance in teaching today's lesson. Understand place value, read and write numbers up to 1 billion.
	WBA pp. 13-14 (ex 3)	
OPT	EP, p. 1	<input type="radio"/> Supplements to be used as needed.
	CWP, p. 4	
DAY 4	PMA, pp. 17-19	<input type="checkbox"/> Refer to HIGA, pp. 12-13 for guidance in teaching today's lesson. Recognize number patterns, compare and order numbers within 1 billion. For task 25, p. 17, there is a copy in the HIGA appendix, p. a15 that can be copied and filled in by the student.
	WBA pp. 15-16 (ex 4)	
OPT	EP, pp. 7-10	<input type="radio"/> Supplements to be used as needed.
	CWP, p. 1	

◆ COURSE PLAN ◆

<b>DAY 5</b>	<b>Review</b>	<input type="checkbox"/>	Refer to HIGA, pp. 14-15 for guidance in teaching today's lesson. Review mental math strategies for addition and subtraction. Mental Math 1-4 (HIGA, p. a1-a2). *Note that Mental Math can be done daily as you see appropriate throughout the year, not just on the days that it is assigned. It is advised to make copies of the appendix pages for this use. Mental Math is meant to be written down, not done orally.*			
<b>Week 1 Grade Book</b>						
<b>Assignments</b>		<b>Include <input checked="" type="checkbox"/></b>	<b>(A) Points Earned</b>	<b>(B) Possible Points</b>	<b>A/B x100 =% (C)</b>	
PMA: Pages 8-19		<input type="checkbox"/>				
WBA: Pages 7-9		<input type="checkbox"/>				
WBA: Pages 10-12		<input type="checkbox"/>				
WBA: Pages 13-14		<input type="checkbox"/>				
WBA: Pages 15-16		<input type="checkbox"/>				
Other:		<input type="checkbox"/>				
Other:		<input type="checkbox"/>				
Other:		<input type="checkbox"/>				
<b>Week 1 Average</b>		<b>Add up column C &amp; divide by number of included <input checked="" type="checkbox"/> assignments =</b>			<b>%</b>	

◆ COURSE PLAN ◆

WEEK 2				
Book	Weekly Breakdown	Goals and Notes for the Week		
PMA	Finish Chapter 1 Chapter 2	Mental computation, substituting letters in simple equations and finding missing parts of equations. Rounding numbers to nearest ten, hundred, thousand, ten thousand, hundred thousand and billion. Materials: Number lines (HIGA p. a16).		
Notes				
Student Daily Assignments		<input checked="" type="checkbox"/>	Parent Daily Guidelines	
DAY 1	PMA, p. 19	<input type="checkbox"/>	Refer to HIGA, pp. 16-17 for guidance in teaching today's lesson. Use place value in mental computations, and substituting a letter for an unknown value in a simple equation which will aid in algebraic manipulation in future years. Mental Math 5, HIGA, p. a2.	
OPT	IP, p. 5	<input type="radio"/>	Supplements to be used as needed.	
DAY 2	PMA, pp. 19-21	<input type="checkbox"/>	Refer to HIGA, pp. 18-20 for guidance in teaching today's lesson. Solving for missing part in an equation. This concept will be built upon in future algebra courses. Mental Math 9, HIGA, p. a4. Mental math 6, HIGA, p. a3.	
	WBA pp. 17-18 (ex 5)	<input type="checkbox"/>		
DAY 3	PMA, pp. 22-24	<input type="checkbox"/>	Begin Chapter 2 by reviewing the HIGA, p. 23. Refer to HIGA, p. 24 for guidance in teaching today's lesson. Rounding numbers to the nearest 10, 100, 1000, 10,000, 100,000 and billion and locating numbers on a number line (HIGA appendix, p a16). Mental Math 7, HIGA, p. a3.	
	WBA pp. 19-20 (ex 6)	<input type="checkbox"/>		
OPT	CWP, p. 5	<input type="radio"/>	Supplements to be used as needed.	
	IP, pp. 6-7	<input type="radio"/>		
DAY 4	PMA, p. 25	<input type="checkbox"/>	Refer to HIGA, p. 25 for guidance in teaching today's lesson. Practice and reinforce concepts covered thus far. Mental Math 8, HIGA, p. a4.	
		<input type="checkbox"/>		
OPT	EP, pp.11-12(ex2)	<input type="radio"/>	Supplements to be used as needed.	
Week 2 Grade Book				
Assignments	Include <input checked="" type="checkbox"/>	(A) Points Earned	(B) Possible Points	A/B x100 =% (C)
PMA: Pages 19-25	<input type="checkbox"/>			
WBA: Pages 17-18	<input type="checkbox"/>			
WBA: Pages 19-20	<input type="checkbox"/>			
Other:	<input type="checkbox"/>			
Other:	<input type="checkbox"/>			
Other:	<input type="checkbox"/>			
<b>Week 2 Average</b>	<b>Add up column C &amp; divide by number of included <input checked="" type="checkbox"/> assignments =</b>			<b>%</b>

WEEK 3		
Book	Weekly Breakdown	Goals and Notes for the Week
PMA	Chapter 3 Chapter 4	Understanding factors, prime numbers and composite numbers. Finding missing factors in equations. Understanding multiples and divisibility rules. Materials: Multilink cubes, Graph paper (HIGA, p. a17), two number cubes, Factor game board (HIGA, p. a18), Hundred chart (HIGA, p. a19).
Notes		
Student Daily Assignments		Parent Daily Guidelines
DAY 1	PMA, pp. 26-28	<input type="checkbox"/> Begin Chapter 3 by reviewing the HIGA, pp. 26-27. Refer to HIGA, p. 28 for guidance in teaching today's lesson. Understanding factors, prime numbers and composite numbers. Mental Math 9, HIGA, p. a4.
	WBA pp. 21-22 (ex 7)	<input type="checkbox"/>
OPT	IPA, pp. 8-9	<input type="radio"/> Supplements to be used as needed.
DAY 2	PMA, pp. 29-30	<input type="checkbox"/> Refer to HIGA, p. 29 for guidance in teaching today's lesson. Using division to determine factors. Finding missing factors. Finding common factors.
	WBA pp. 23-24 (ex 8a)	<input type="checkbox"/>
OPT	IPA, pp. 10-11	<input type="radio"/>
	CWP, pp. 2-3	<input type="radio"/>
DAY 3	PMA, p. 31	<input type="checkbox"/> Refer to HIGA, p. 30 for guidance in teaching today's lesson. More finding missing factors. Play factor game with number cubes board (HIGA, p. a18).
	WBA p. 25 (ex 8b)	<input type="checkbox"/>
OPT	EP, pp.13-14	<input type="radio"/> Supplements to be used as needed.
DAY 4	PMA, pp. 32-35	<input type="checkbox"/> Begin Chapter 4 by reviewing the HIGA, pp. 31-32. Refer to HIGA, pp. 33-34 for guidance in teaching today's lesson. Understanding multiples. Finding common multiples. Learn divisibility rules for 2, 3 and 5.
	WBA pp.26-27 (ex 9)	<input type="checkbox"/>
OPT	EP, pp.15-16	<input type="radio"/>
	CWP, pp. 8-11	<input type="radio"/>
DAY 5	PMA, pp. 36-37	<input type="checkbox"/> Refer to HIGA, p. 35 for guidance in teaching today's lesson. Learn divisibility rules for 6 and 9.
OPT	CWP, pp. 12-13	<input type="radio"/>
	IPA, pp. 12-17	<input type="radio"/>