

Kolbe Academy Home School

GRADE FIVE MATHEMATICS

Singapore Math ® Primary Mathematics 5A
Singapore Math ® Primary Mathematics 5B

TABLE OF CONTENTS

I. Syllabus	2
II. Daily Course Plan	
A. Quarter 1	8
B. Quarter 2	19
C. Quarter 3	29
D. Quarter 4	40
III. Unit Exams 1-13	52
IV. Exam Answer Keys	83

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COURSE TITLE: Mathematics 5**COURSE TEXTS:****First Semester (5A)**

Primary Mathematics 5A Textbook, Standards Edition (T8505)
Primary Mathematics 5A Workbook, Standards Edition (T8505A)
Primary Mathematics 5A Home Instructor's Guide, Standards Edition (T8505B), optional
Primary Mathematics 5 Extra Practice, Standards Edition, optional
Primary Mathematics 5A Intensive Practice, US Edition, optional
Primary Mathematics 5, Challenging Word Problems, optional

Second Semester (5B)

Primary Mathematics 5B Textbook, Standards Edition (T8505C)
Primary Mathematics 5B Workbook, Standards Edition (T8505D)
Primary Mathematics 5B Home Instructor's Guide, Standards Edition (T8505E), optional
Primary Mathematics 5 Extra Practice, Standards Edition, optional
Primary Mathematics 5B Intensive Practice, US Edition, optional
Primary Mathematics 5, Challenging Word Problems, optional

TEXT DESCRIPTIONS

Descriptions below adapted from Singapore Math ®

Components	
Textbook	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: 5A and 5B. Answers to textbook questions are in the Home Instructor's Guide.
Workbook	The workbook is consumable and should be used along with the textbook. It contains the exercises the student does independently after each learning task. There is a book for each semester: 5A and 5B. Answers to workbook questions are in the Home Instructor's Guide
Home Instructor's Guide	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 worksheets, 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: 5A and 5B.
Extra Practice	This optional supplement consolidates and reinforces the mathematical concepts taught in the 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.

Intensive Practice	This optional 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: 5A and 5B. Answers are in the back of the book.
Challenging Word Problems	This optional 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 5* (Standards Edition) is to develop student's mathematical problem solving skills both in practical and abstract concepts and to prepare students for higher level mathematics courses by establishing a firm foundation of number sense. 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 then 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 sixth grade
- Read, write, understand place value, compare and order numbers from 0.001 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
- Calculate sum of angles and find unknown angles
- Identify and draw polygons, rectangles, squares, rhombuses, parallelograms and trapezoids
- Understand properties of triangles and circles
- Identify and name solid figures including cubes, prisms, pyramids and cylinders
- Understand how to calculate perimeter, area, surface area, and volume
- Understand the coordinate grid and identify and graph ordered pairs on a coordinate grid
- Graphing histograms and pie charts
- Calculate average and average rate

- Identify the median and mode for data sets
- Represent and interpret data in line graphs, bar graphs, and pie charts
- Finding ratios and equivalent ratios
- Define the term 'integers'
- Begin to understand setting up and solving algebraic expressions
- Relate algebraic equations to word problems
- Relate algebraic equations to coordinate graphs

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. The beauty and power of mathematics as a language is emphasized in Michael Guillen's *Five Equations that Changed the World*. He gives a detailed chronological development of five important equations. And finally, *The Great Equations* by Robert P. Crease gives a historical account of the development of mathematics from ancient to modern times. 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 5A)****Unit 1: Whole Numbers**

- Chapter 1: Billions
- Chapter 2: Approximation and Estimation
- Chapter 3: Factors and Multiples
- Chapter 4: Prime Factorization
- Chapter 5: Multiplying by Tens, Hundreds or Thousands
- Chapter 6: Dividing by Tens, Hundreds or Thousands

Unit 2: More Calculations with Whole Numbers

- Chapter 1: Calculations with Parentheses
- Chapter 2: Methods for Mental Calculation
- Chapter 3: Word Problems
- Chapter 4: Multiplication by a 2-Digit Whole Number
- Chapter 5: Division by a 2-Digit Whole Number

Unit 3: Fractions

- Chapter 1: Comparing Fractions
- Chapter 2: Fractions and Division
- Chapter 3: Addition and Subtraction of Unlike Fractions
- Chapter 4: Addition and Subtraction of Mixed Numbers
- Chapter 5: Multiplying a Fraction and a Whole Number
- Chapter 6: Fraction of a Set
- Chapter 7: Word Problems

❖ Quarter 2

Unit 4: Multiply and Divide Fractions

- Chapter 1: Product of Fractions
- Chapter 2: Word Problems
- Chapter 3: Dividing a Fraction by a Whole Number
- Chapter 4: Dividing by a Fraction
- Chapter 5: More Word Problems

Unit 5: Perimeter, Area and Surface Area

- Chapter 1: Square Units
- Chapter 2: Rectangles and Squares
- Chapter 3: Area of a Triangle
- Chapter 4: Area of a Parallelogram
- Chapter 5: Surface Area

Unit 6: Ratio

- Chapter 1: Finding Ratios
- Chapter 2: Equivalent Ratios
- Chapter 3: Combining Three Quantities

❖ Quarter 3 (Begin Book 5B)

Unit 7: Decimals

- Chapter 1: Tenths, Hundredths and Thousandths
- Chapter 2: Approximation
- Chapter 3: Add and Subtract Decimals
- Chapter 4: Multiply and Divide Decimals by a 1-Digit Whole Number
- Chapter 5: Multiplication by Tens, Hundreds or Thousands
- Chapter 6: Division by Tens, Hundreds or Thousands
- Chapter 7: Multiplication by a 2-Digit Whole Number
- Chapter 8: Division by a 2-Digit Whole Number
- Chapter 9: Multiplication by a Decimal
- Chapter 10: Division by a Decimal

Unit 8: Measures and Volume

- Chapter 1: Conversion of Measures
- Chapter 2: Volume of Rectangular Prism

Unit 9: Percentage

- Chapter 1: Percent
- Chapter 2: Writing Fractions as Percentages
- Chapter 3: Percentage of a Quantity

❖ Quarter 4

Unit 10: Angles

- Chapter 1: Measuring Angles
- Chapter 2: Finding Unknown Angles
- Chapter 3: Sum of Angles of a Triangle
- Chapter 4: Isosceles and Equilateral Triangles
- Chapter 5: Drawing Triangles
- Chapter 6: Sum of Angles of a Quadrilateral

- Chapter 7: Parallelograms, Rhombuses and Trapezoids
- Chapter 8: Drawing Parallelograms and Rhombuses

Unit 11: Average and Rate

- Chapter 1: Average
- Chapter 2: Rate

Unit 12: Data Analysis

- Chapter 1: Mean, Median and Mode
- Chapter 2: Histograms
- Chapter 3: Line Graphs
- Chapter 4: Pie Charts

Unit 13: Algebra

- Chapter 1: Algebraic Expressions
- Chapter 2: Integers
- Chapter 3: Coordinate Graphs

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.

Legend	
PMA	<i>Primary Mathematics</i> Textbook, 5A
WBA	<i>Primary Mathematics</i> Textbook, 5A
HIGA	<i>Primary Mathematics</i> Home Instructor’s Guide, 5A
PMB	<i>Primary Mathematics</i> Textbook, 5B
WBB	<i>Primary Mathematics</i> Textbook, 5B
HIGB	<i>Primary Mathematics</i> Home Instructor’s Guide, 5B
EP	<i>Primary Mathematics</i> Extra Practice 5 (optional for extra reinforcement of material)
IPA	<i>Primary Mathematics</i> Intensive Practice, 5A (optional for advanced understanding)
IPB	<i>Primary Mathematics</i> Intensive Practice, 5B (optional for advanced understanding)
CWP	<i>Primary Mathematics</i> Challenging Word Problems 5 (optional for extra challenge)
☐	Assignments and activities that are a recommended part of the course
○	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.

Each weekly assignment is summarized in the first box 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 boxes indicated by **DAY 1, DAY 2, DAY 3, DAY 4, and DAY 5**. 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. Occasionally parent daily guidelines also include notes on vocabulary to incorporate into the daily lessons when appropriate. Mathematics is very precise in its use of terminology, and familiarity with proper use of terms will be beneficial as a student progresses to higher levels of mathematics. The assignments included as part of this course are indicated by the symbol □, and the optional assignments/activities that are included for reinforcement or enrichment are indicated with the symbol ○. Note that all assignments indicated by the ○ are **optional** for mastering the concepts in the course. Use the supplemental assignments as needed to insure your child fully grasps the concepts covered. When using the supplemental materials, keep in mind that you may choose to do only part of the assignments as time permits. In this course plan most weeks will have five days of assigned work.

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 of the first three quarters and four exams for the fourth quarter, for a total of thirteen exams for the year. Exams cover an entire Unit of material. The first semester has only 17 weeks of coursework to allow a week for catching up or review as needed. The second semester has a full 18 weeks of coursework since there is one extra chapter.

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 Chapter 1 Chapter 2 Chapter 3	Understand whole numbers and be able to name, compare and make estimates using whole numbers. Understand factors and Multiples. Materials: Place-value chart (HIGA, p.xviii describes how to make), Number discs. Use this week to familiarize yourself with the course materials and organization, particularly the Materials section (page xviii), and the Appendix of the HIGA.
Notes		
Student Daily Assignments		Parent Daily Guidelines
DAY 1	PMA, pp. 8-10	Begin Unit 1, Chapter 1 by reviewing the HIGA, pp 1- 6 for guidance in teaching today's lesson. Read, write and compare very large numbers. Examples on page 3 of HIGA give examples of very large numbers for interest. Vocab: Billion, Period.
	WBA pp. 5-6 (ex 1)	
OPT	EP, pp. 13-16	Supplements to be used as needed.
	IPA, pp. 1-3	
DAY 2	PMA, pp. 11-13	Begin Ch. 2 by reviewing the HIGA, pp. 7-8 for guidance in teaching today's lesson. Approximation and estimation using number lines to illustrate.
	WBA pp. 7-8 (ex 2)	
OPT	EP, pp. 1-4	Supplements to be used as needed.
	IPA, pp. 4-6	
DAY 3	PMA, pp. 14-15	Refer to HIGA, pp. 9-11 for guidance in teaching today's lesson. More estimation.
	WBA pp. 9-11 (ex 3)	
OPT	EP, pp. 5-12	Supplements to be used as needed.
	IPA, pp. 6-7	
DAY 4	PMA, pp. 15-16	Refer to HIGA, p. 12 for guidance in teaching today's lesson. Review.
OPT	EP, pp. 17-20	Supplements to be used as needed.
DAY 5	PMA, pp. 17-18	Begin Ch. 3 by reviewing the HIGA, pp. 14--18 for guidance in teaching this lesson. Understanding factors and multiples. Vocab: Greatest Common Factor and Lowest Common Multiple.
	WBA pp. 12-13 (ex 4)	
OPT	EP, pp. 21-22	Supplements to be used as needed.

Week 1 Grade Book				
Assignments	Include <input checked="" type="checkbox"/>	(A) Points Earned	(B) Possible Points	A/B x100 =% (C)
PMA: Pages 8-18	<input type="checkbox"/>			
WBA: Pages 5-6	<input type="checkbox"/>			
WBA: Pages 7-8	<input type="checkbox"/>			
WBA: Pages 9-11	<input type="checkbox"/>			
PMA: Pages 15-16(Practice A)	<input type="checkbox"/>			
WBA: Pages 12-13	<input type="checkbox"/>			
Other:	<input type="checkbox"/>			
Week 1 Average	Add up column C & divide by number of included <input checked="" type="checkbox"/> assignments =			%
WEEK 2				
Book	Weekly Breakdown	Goals and Notes for the Week		
PMA	Chapter 4 Chapter 5 Chapter 6	Recognize prime numbers between 1 and 50. Prime factorization. Show prime factorization using exponents. Multiplying and dividing by 10, 100, 1000 and multiples of these. Materials: Appendix A1 Mental Math. *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.*		
Notes				
Student Daily Assignments		<input checked="" type="checkbox"/>	Parent Daily Guidelines	
DAY 1	PMA, pp. 19-21	<input type="checkbox"/>	Begin Ch. 4 by reviewing the HIGA, pp. 19-21 for guidance in teaching today's lesson. Prime numbers and factors. Vocab: Prime factor, Exponent, Base, Power	
	WBA pp. 14-15 (ex 5)	<input type="checkbox"/>		
OPT		<input type="radio"/>	Supplements to be used as needed.	
DAY 2	PMA, p. 22	<input type="checkbox"/>	Refer to HIGA, pp. 22-23 for guidance in teaching today's lesson. More practice with finding factors, multiples, greatest common factors, lowest common multiples and expressing numbers using exponents.	
OPT	EP, pp. 23-24	<input type="radio"/>	Supplements to be used as needed.	
DAY 3	PMA, pp. 23-24	<input type="checkbox"/>	Begin Ch. 5 by reviewing the HIGA, pp. 24-25 in teaching today's lesson. Multiplying by 10, 100, or 1000 or multiples of these and estimating answers by rounding.	
	WBA pp. 16-17 (ex 6)	<input type="checkbox"/>		
OPT	EP, pp. 25-26	<input type="radio"/>	Supplements to be used as needed.	
	IPA, p. 8	<input type="radio"/>		
DAY	PMA, p. 25-26	<input type="checkbox"/>	Begin Ch. 6 by reviewing the HIGA, p. 26-28 for guidance in teaching	

◆ COURSE PLAN ◆

4	WBA pp. 18-19 (ex 7)	<input type="checkbox"/>	today's lesson. Dividing by 10, 100, or 1000 or multiples of these and estimating answers by rounding.
OPT	IPA, p. 9	<input type="radio"/>	Supplements to be used as needed.
	CWP, p. 1	<input type="radio"/>	
DAY 5	PMA, p. 27	<input type="checkbox"/>	Refer to HIGA, p. 29 for guidance in teaching today's lesson. Review.
OPT	EP, pp. 27-28	<input type="radio"/>	Supplements to be used as needed.
	CWP, p. 2	<input type="radio"/>	

Week 2 Grade Book

Assignments	Include <input checked="" type="checkbox"/>	(A) Points Earned	(B) Possible Points	A/B x100 =% (C)
PMA: Pages 19-26	<input type="checkbox"/>			
WBA: Pages 14-15	<input type="checkbox"/>			
WBA: Pages 16-17	<input type="checkbox"/>			
WBA: Pages 18-19	<input type="checkbox"/>			
PMA: Page 22 (Practice B)	<input type="checkbox"/>			
PMA: Page 27 (Practice C)	<input type="checkbox"/>			
Other:	<input type="checkbox"/>			

Week 2 Average	Add up column C & divide by number of included <input checked="" type="checkbox"/> assignments =	%
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WEEK 3

Book	Weekly Breakdown	Goals and Notes for the Week
PMA	Review Unit 1 Exam 1 Unit 2 Chapter 1 Begin Chapter 2	Review material covered in Unit 1, and administer exam covering Unit 1. Begin Unit 2 which covers the important topic of Order of Operations—while this may seem trivial; it turns out to be a crucial concept for future algebra courses and all higher level mathematics. It is part of the exactness of mathematics. Continue to work on mental addition, subtraction, multiplication, and division with an emphasis on word problem solving. Materials: counters

Notes

Student Daily Assignments		<input checked="" type="checkbox"/>	Parent Daily Guidelines
DAY 1	PMA, p. 28	<input type="checkbox"/>	Refer to HIGA, p. 30-31 for guidance in teaching today's lesson. Review Unit 1 material for exam
	WBA pp. 20-21 (Rev1)	<input type="checkbox"/>	
OPT	IPA, p. 10	<input type="radio"/>	Supplements to be used as needed.
DAY 2	Exam 1	<input type="checkbox"/>	Administer Exam 1 over Unit 1 material (exam can be found at end of course plans).

◆ COURSE PLAN ◆

DAY 3	PMA, pp. 29-31	<input type="checkbox"/>	Begin Unit 2, Ch. 1 by reviewing the HIGA, pp. 32-33. Refer to HIGA, pp. 34-37 for guidance in teaching today's lesson. Understanding the Order of Operations especially parentheses. Vocab: Operation signs, Order of Operations, Parentheses.
	WBA pp. 22-23 (ex 1)	<input type="checkbox"/>	
OPT	EP, pp. 28-34	<input type="radio"/>	Supplements to be used as needed.
	IPA, pp. 11-12	<input type="radio"/>	
DAY 4	PMA, pp. 32-33	<input type="checkbox"/>	Refer to HIGA, pp. 38-40 for guidance in teaching today's lesson. Understanding the distributive property and practice translating word problems into equations.
	WBA p. 24 (ex 2)	<input type="checkbox"/>	
OPT	EP, pp.35-36	<input type="radio"/>	Supplements to be used as needed.
	IPA, pp. 12-13	<input type="radio"/>	
DAY 5	PMA, pp. 34-35	<input type="checkbox"/>	Begin Ch. 2 by reviewing the HIGA, pp. 41-42 for guidance in teaching today's lesson. Practice mental calculation. (We will finish this chapter next week.)
	WBA pp. 25-26 (ex 3)	<input type="checkbox"/>	
OPT	CWP, pp. 3-4	<input type="radio"/>	Supplements to be used as needed.

Week 3 Grade Book

Assignments	Include <input checked="" type="checkbox"/>	(A) Points Earned	(B) Possible Points	A/B x100 =% (C)
PMA: Page 28 (Review1)	<input type="checkbox"/>			
WBA: Pages 20-21 (Review1)	<input type="checkbox"/>			
PMA: Pages 29-35	<input type="checkbox"/>			
WBA: Pages 22-23	<input type="checkbox"/>			
PMA: Page 33 (Practice A)	<input type="checkbox"/>			
WBA: Page 24	<input type="checkbox"/>			
WBA: Pages 25-26	<input type="checkbox"/>			
EXAM 1: Unit 1	<input type="checkbox"/>			
Other:	<input type="checkbox"/>			
Week 3 Average	Add up column C & divide by number of included <input checked="" type="checkbox"/> assignments =			%