

Kolbe Academy Home School

GRADE SIX MATHEMATICS

Singapore Math ® Primary Mathematics 6A
Singapore Math ® Primary Mathematics 6B

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COURSE TITLE: Mathematics 6

COURSE TEXTS:

First Semester (6A)

- Primary Mathematics 6A Textbook, Standards Edition*
- Primary Mathematics 6A Workbook, Standards Edition*
- Primary Mathematics 6A Teacher’s Guide, Standards Edition, Optional*
- Primary Mathematics 6 Extra Practice, Standards Edition, optional*
- Primary Mathematics 6A Intensive Practice, US Edition, optional*
- Primary Mathematics 6, Challenging Word Problems, optional*

Second Semester (6B)

- Primary Mathematics 6B Textbook, Standards Edition*
- Primary Mathematics 6B Workbook, Standards Edition*
- Primary Mathematics 6B Teacher’s Guide, Standards Edition, Optional*
- Primary Mathematics 6 Extra Practice, Standards Edition, Optional*
- Primary Mathematics 6B Intensive Practice, US Edition, Optional*
- Primary Mathematics 6, 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: 6A and 6B. Answers to textbook questions are in the Teacher’s Guide.
Workbook	The workbook is consumable and should be used along with the textbook. It contains the exercises for the student to do independently after each learning task. There is a book for each semester: 6A and 6B. Answers to workbook questions are in the Teacher’s Guide
Primary Mathematics Teacher’s Guide	The Teacher’s Guides are strongly recommended. The Teacher’s Guide provides parents with the Singapore Math® methodology. The depth achieved by the Teacher’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: 6A and 6B.
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: 6A and 6B. 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 6* (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 seventh grade
- Reading, writing and solving algebraic expressions involving addition, subtraction, multiplication and division
- Identify points on a coordinate plane
- Tabulate values for linear equations
- Solve algebraic equations graphically
- Understanding and using fractions and decimals
- Understanding negative fractions and decimals
- Understand the four operations—addition, subtraction, multiplication and division of fractions
- Understanding percentage of a quantity
- Understanding percentage change and its application to interest and sales tax
- Understanding ratio and proportion in comparing quantities
- Using ratio and comparison in word problems
- Understanding the concept and calculation of rate and speed
- Using rate and speed in word problems
- Understanding properties of circles including circumference, area and composite figures
- Calculate volume of solids including prisms and cylinders

- Understanding properties of angles including vertically opposite, complementary, supplementary and angles in polygons
- Drawing lines and angles
- Drawing triangles and quadrilaterals
- Identify the mean, median, mode, and range for data sets
- Understanding experimental probability
- Understanding theoretical probability of simple events and of combined events
- Understanding the four operations when using negative numbers
- Understanding the order of operations using negative numbers
- Solving equations involving negative numbers
- Understanding graphs of functions involving negative numbers

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 Book 6A)****Unit 1: Algebra**

- Chapter 1: Algebraic Expressions I
- Chapter 2: Algebraic Expressions
- Chapter 3: Algebraic Expressions II
- Chapter 4: Graphs of Functions
- Review

Unit 2: Fractions and Decimals

- Chapter 1: Fractions and Decimals
- Chapter 2: Negative Fractions and Decimals
- Chapter 3: Comparing Numbers

Unit 3: The Four Operations of Fractions

- Chapter 1: Addition and Subtraction of Fractions
- Chapter 2: Multiplication and Division of Fractions

- Review

❖ **Quarter 2****Unit 4: Percentage**

- Chapter 1: Percentage of a Quantity
- Chapter 2: Percentage Change
- Chapter 3: Interest, Sales Tax and Discount I
- Chapter 4: Interest, Sales Tax and Discount II
- Chapter 5: More Word Problems

Unit 5: Ratio and Proportion

- Chapter 1: Comparing Quantities I
- Chapter 2: Comparing Quantities II
- Chapter 3: Comparing Three Quantities
- Chapter 4: Word Problems
- Chapter 5: Proportion
- Review

Unit 6: Rate and Speed

- Chapter 1: Rate I
- Chapter 2: Rate II
- Chapter 3: Speed
- Average Speed
- Review

❖ **Quarter 3 (Begin Book 6B)****Unit 7: Circles**

- Chapter 1: Circumference
- Chapter 2: Area
- Chapter 3: Composite Figures

Unit 8: Volume of Prisms and Cylinders

- Chapter 1: Volume of Prisms
- Chapter 2: Volume of Cylinders

Unit 9: Angles

- Chapter 1: Adjacent Angles
- Chapter 2: Vertically Opposite Angles and Angles at a Point
- Chapter 3: Complementary Angles
- Chapter 4: Supplementary Angles
- Chapter 5: Angles and Polygons I
- Chapter 6: Angles and Polygons II

Unit 10: Construction of Triangles and Quadrilaterals

- Chapter 1: Drawing Lines and Angles
- Chapter 2: Constructing Triangles and Quadrilaterals
- Chapter 3: Review

❖ **Quarter 4****Unit 11: Data Handling**

- Chapter 1: Mean
- Chapter 2: Population and Sample
- Chapter 3: Median
- Chapter 4: Mode
- Chapter 5: Range

Unit 12: Probability

- Chapter 1: Experimental Probability
- Chapter 2: Theoretical Probability of Simple Events I
- Chapter 3: Theoretical Probability of Simple Events II
- Chapter 4: Theoretical Probability of Combined Events I

- Chapter 5: Theoretical Probability of Combined Events II
- Review

Unit 13: Negative Numbers

- Chapter 1: Addition and Subtraction
- Chapter 2: Multiplication and Division
- Chapter 3: Order of Operations
- Chapter 4: Solving Equations
- Chapter 5: Graphs of Functions
- Review

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, 6A
WBA	<i>Primary Mathematics</i> Workbook, 6A
TGA	<i>Primary Mathematics</i> Teacher's Guide, 6A
PMB	<i>Primary Mathematics</i> Textbook, 6B
WBB	<i>Primary Mathematics</i> Workbook, 6B
TGB	<i>Primary Mathematics</i> Teacher's Guide, 6B
EP	<i>Primary Mathematics</i> Extra Practice 6 (optional for extra reinforcement of material)
IPA	<i>Primary Mathematics</i> Intensive Practice, 6A (optional for advanced understanding)
IPB	<i>Primary Mathematics</i> Intensive Practice, 6B (optional for advanced understanding)
CWP	<i>Primary Mathematics</i> Challenging Word Problems 6 (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 extra challenge

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/unit-pair 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, second and fourth quarters and four exams for the third quarter, for a total of thirteen exams for the year. Exams cover an entire Unit of material. Each quarter has only 8 weeks of coursework to allow a week for catching up or review as needed. It is preferable to achieve mastery at a slower pace than to feel compelled to stay on this schedule. Please feel free to adjust the pace to your own child's needs. Expect the abstract concepts of algebra to take time to 'sink in.' The schedule for the algebra unit has built in days for extra review since most students will require extra time absorbing and fully processing these ideas.

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	Understand patterns in operations of numbers and use algebra to express these patterns. Materials: HIGA, Appendix 1.1a. Use this week to familiarize yourself with the course materials and organization, particularly the Materials section (page xiii), and the Appendix of the TGA.
Notes		
Student Daily Assignments		Parent Daily Guidelines
DAY 1	PMA, pp. 8-11	Begin Unit 1, Chapter 1 by reviewing the TGA, p. 3. Refer to TGA, p. 5-7 for guidance in teaching today's lesson. Using number patterns to introduce algebraic expressions with addition and subtraction. Emphasize relationship between algebraic equations and concrete numbers. Vocab: Bar model, Variable.
	WBA pp. 5-7 (ex 1)	
OPT	EP, p. 1	Supplements to be used as needed.
	IPA, pp. 1-2	
DAY 2	PMA, p. 12	Refer to TGA, pp. 7-8 for guidance in teaching today's lesson. Using bar pattern to introduce algebraic expressions with multiplication and division.
OPT	EP, p. 2	Supplements to be used as needed.
	IPA, pp. 2-4	
DAY 3	WBA pp. 8-10 (ex 2)	Continued independent work with writing algebraic expressions using multiplication and division.
OPT	CWP, pp. 1-3	Supplements to be used as needed.
	IPA, p. 5	
DAY 4	PMA, p. 13	Refer to TGA, pp. 9-10 for guidance in teaching today's lesson. Begin to write algebraic expressions using addition, subtraction, multiplication, and division.
OPT	CWP, p. 4	Supplements to be used as needed.
DAY 5		(Use this day for catch-up or review as needed. Since algebra uses a high level of abstract thinking, take extra time for the ideas to be absorbed repeating exercises as needed.)

Week 1 Grade Book				
Assignments	Include <input checked="" type="checkbox"/>	(A) Points Earned	(B) Possible Points	A/B x100 =% (C)
PMA: Pages 8-12	<input type="checkbox"/>			
WBA: Pages 5-7	<input type="checkbox"/>			
WBA: Pages 8-10	<input type="checkbox"/>			
PMA: Page 13 (Practice A)	<input type="checkbox"/>			
Other:	<input type="checkbox"/>			
Other:	<input type="checkbox"/>			
Other:	<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 2 Chapter 3	Understanding writing and solving algebraic equations.		
Notes				
Student Daily Assignments		<input checked="" type="checkbox"/>	Parent Daily Guidelines	
DAY 1	PMA, pp. 14-15	<input type="checkbox"/>	Begin Chapter 2 by reviewing the TGA, p. 11. Refer to TGA, pp. 12-13 for guidance in teaching today's lesson. Writing and solving simple algebraic equations.	
	WBB pp. 11-12 (ex 3)	<input type="checkbox"/>		
OPT	EP, pp. 11-12	<input type="radio"/>	Supplements to be used as needed.	
	IPA, pp. 5-7	<input type="radio"/>		
DAY 2	PMA, p. 16	<input type="checkbox"/>	Refer to TGA, pp. 14-15 for guidance in teaching today's lesson. Continued work writing and solving simple algebraic equations.	
	WBA pp. 13-14 (ex 4)	<input type="checkbox"/>		
OPT	EP, pp. 3-4	<input type="radio"/>	Supplements to be used as needed.	
	IPA, pp. 8-9	<input type="radio"/>		
DAY 3	PMA, pp. 17-18	<input type="checkbox"/>	Refer to TGA, p. 16 for guidance in teaching today's lesson. Review and practice	
OPT	EP, pp. 13-14	<input type="radio"/>	Supplements to be used as needed.	
DAY 4	PMA, pp. 19-20	<input type="checkbox"/>	Begin Chapter 3 by reviewing the TGA, p. 17. Refer to TGA, pp. 18-19 for guidance in teaching today's lesson. Writing and solving algebraic expressions with two variables.	
	WBA pp. 15-16 (ex 5)	<input type="checkbox"/>		
OPT	CWP, pp. 5-7	<input type="radio"/>	Supplements to be used as needed.	

◆ COURSE PLAN ◆

DAY 5		<input type="checkbox"/>	(Use this day for catch-up or review as needed.)	
OPT	EP, pp. 5-7	<input type="radio"/>	Supplements to be used as needed.	
	CWP, p. 8	<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 14-20	<input type="checkbox"/>			
WBA: Pages 11-12	<input type="checkbox"/>			
WBA: Pages 13-14	<input type="checkbox"/>			
PMA: Pages 17-18 (Practice B)	<input type="checkbox"/>			
WBA: Pages 15-16	<input type="checkbox"/>			
Other:	<input type="checkbox"/>			
Other:	<input type="checkbox"/>			
Other:	<input type="checkbox"/>			
Other:	<input type="checkbox"/>			
Week 2 Average	Add up column C & divide by number of included <input checked="" type="checkbox"/> assignments =			%
WEEK 3				
Book	Weekly Breakdown	Goals and Notes for the Week		
PMA	Finish Chapter 3 Chapter 4	<p>Understanding writing and solving algebraic expressions with up to three variables. Understanding graphs of linear equations. Using the coordinate plane to graph algebraic equations.</p> <p>Materials: Appendix 1.4a and Appendix 1.3b-Mental Math 1. *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.*</p>		
Notes				
Student Daily Assignments		<input checked="" type="checkbox"/>	Parent Daily Guidelines	
DAY 1	PMA, p. 20	<input type="checkbox"/>	Refer to the TGA, p. 19 for guidance in teaching today's lesson. More practice writing and solving algebraic expressions with two variables.	
	WBA pp. 17-18 (ex 6)	<input type="checkbox"/>		
DAY 2	PMA, pp. 21-22	<input type="checkbox"/>	Refer to TGA, pp. 20-21 for guidance in teaching today's lesson. Writing and solving algebraic expressions with three variables. Do Mental Math 1- Appendix 1.3b.	
	WBA pp. 19-20 (ex 7)	<input type="checkbox"/>		
OPT	IPA, pp. 10-11	<input type="radio"/>	Supplements to be used as needed.	
	CWP, pp. 9-11	<input type="radio"/>		

DAY 3	PMA, pp. 23-25	<input type="checkbox"/>	Refer to TGA, pp. 22-23 for guidance in teaching today's lesson. Review and practice.
OPT	EP, pp. 15-16	<input type="radio"/>	Supplements to be used as needed.
	CWP, pp. 12-14	<input type="radio"/>	
DAY 4	PMA, pp. 26-27	<input type="checkbox"/>	Begin Chapter 4 by reviewing the TGA, p. 24. Refer to TGA, pp. 25-27 for guidance in teaching today's lesson. Understanding the coordinate plane and begin to graph equations. Vocab: Graph, Coordinate, Ordered pairs
	WBA pp. 21-24 (ex 8)	<input type="checkbox"/>	
OPT		<input type="radio"/>	Supplements to be used as needed.
DAY 5	PMA, p. 28	<input type="checkbox"/>	Refer to TGA, pp. 28-29 for guidance in teaching today's lesson. Using graphs to solve algebraic equations. Vocab: Integer
	WBA pp. 25-28 (ex 9)	<input type="checkbox"/>	
OPT	EP, pp. 8-10	<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: Pages 21-28	<input type="checkbox"/>			
WBA: Pages 17-18	<input type="checkbox"/>			
WBA: Pages 19-20	<input type="checkbox"/>			
PMA: Pages 23-25(Practice C)	<input type="checkbox"/>			
WBA: Pages 21-24	<input type="checkbox"/>			
WBA: Pages 25-29	<input type="checkbox"/>			
Other:	<input type="checkbox"/>			
Other:	<input type="checkbox"/>			
Other:	<input type="checkbox"/>			
Other:	<input type="checkbox"/>			
Week 3 Average	Add up column C & divide by number of included <input checked="" type="checkbox"/> assignments =			%

WEEK 4

Book	Weekly Breakdown	Goals and Notes for the Week
PMA	Review Unit 1 EXAM 1	Review Unit 1, Exam 1 covering Unit 1.

Notes

Student Daily Assignments	<input checked="" type="checkbox"/>	Parent Daily Guidelines
DAY 1	PMA, pp. 29-30	<input type="checkbox"/> Refer to TGA, p. 30 for guidance in teaching today's lesson. Review and practice.
OPT	EP, pp. 17-20	<input type="radio"/> Supplements to be used as needed.