2015

Curriculum

JK-Grade 8

Mathematics

M

INTRODUCTION

This curriculum document shall hereby supersede all use of the Ontario curriculum in this particular subject area at Sudbury Christian Academy (SCA). After years of aiming to "meet and exceed" the Ontario curriculum, the SCA curriculum committee ultimately deemed it necessary to establish its own set of benchmarks.   Several independent studies have shown Ontario math standards to be subpar in recent years. SCA's mandate as a private school, therefore, should be to consistently exceed, not just to meet, the Ontario curriculum.

This curriculum document is to be a living document, continually updated to reflect the goals and objectives established by the SCA curriculum committee.   It is deliberately modelled after the contents of the A Beka and Singapore Math (Standards Edition) series that the committee has chosen as the main set of resources for SCA's math program.   Kindergarten teachers are expected to utilize the A Beka series primarily, and to supplement with other resources as needed, especially to introduce Canadian money. Teachers in grades 1 through 8 are expected to utilize the Singapore series primarily, and to supplement with other resources as needed, especially to introduce Canadian money, and to add extra practice or challenge. In most cases, however, supplementation will not be as necessary as it was under the Ontario curriculum, as the main resources are so advanced, and as the curriculum intentionally matches the assigned resources.

This document is deliberately simple and direct, outlining basic proficiency objectives for each grade without going into superfluous detail and philosophy. As the document is matched to a specific set of resources, additional information may be found in the teacher's manuals (and, to a lesser extent, the student copies) for those resources.

"Study to show thyself approved unto God, a worker who needeth not to be ashamed, rightly dividing the word of truth" (2 Timothy 2:15).

KINDERGARTEN

The junior kindergarten class shall use the A Beka Number Skills K5 workbook to meet its objectives.   The senior kindergarten class shall use the A Beka Arithmetic 1 workbook to meet its objectives. The kindergarten teacher is encouraged to use other resources as supplements for those students who are able to go beyond.

PROFICIENCY OBJECTIVES

Junior Kindergarten:

- Number recognition, counting and writing from 1-100
- Number concepts 1-100
- Numbers before and after 1-100
- Numbers largest and smallest 1-100
- Counting and writing by tens to 100
- Counting and writing by fives to 100
- Counting and writing by twos to 100
- Number sequences by ones
- Using number words 1-10 and first to tenth
- Value of coins and dollar bill
- Telling time
- Using the calendar
- Days of the week
- Addition facts through 10
- One-step story problems in addition
- Beginning subtraction

Senior Kindergarten:

- Number recognition, counting and writing from 1-100
- Greatest and least
- Counting and writing by tens, fives, twos, and threes
- Number sequences
- Ordinal numbers
- Addition facts through 13 and three-digit addition with carrying
- Subtraction facts through 13 and two-digit subtraction
- Story problems
- Numbers before and after by ones, twos, and tens
- Between numbers
- Counting and combining coins
- Telling time to the nearest five minutes
- Recognizing odd and even numbers
- English and some metric measures
- Place value in ones, tens, and hundreds
- Unit fractions
- Reading a thermometer
- Using a ruler
- Multiple combinations
- Concept of multiplication
- Calendars
- Reading pictographs and bar graphs
- Developing listening skills
- Roman numerals

GRADE 1

The grade one class shall use the Singapore Math (Standards Edition) 1A and 1B textbooks and workbooks to meet its objectives. The grade 1 teacher is strongly encouraged to use the Singapore Extra Practice as a supplement for those students who need the extra practice, and the Challenging Problems as a supplement for those students who are able to go beyond.

PROFICIENCY OBJECTIVES

1. Numbers 0 to 10
   • Counting
2. Number Bonds
   • Making Number Stories
   • Addition
   • Making Addition Stories
   • Addition with Number Bonds
   • Other Methods of Addition
3. Subtraction
   • Making Subtraction Stories
   • Methods of Subtraction
4. Position
   • Position and Direction
   • Ordinal Numbers — Naming Position
5. Numbers to 20
   • Counting and Comparing
   • Addition and Subtraction
6. Shapes
   • Common Shapes
7. Length
   • Comparing Length
   • Measuring Length
8. Weight
   • Comparing Weight
   • Measuring Weight
9. Capacity
   • Comparing Capacity
   • Measuring Capacity

11. Comparing Numbers
    • Comparing Numbers
    • Comparison by Subtraction
12. Graphs
    • Graphs
13. Numbers to 40
    • Counting
    • Tens and Ones
    • Addition and Subtraction
    • Adding Three Numbers
    • Counting by 2s
14. Multiplication
    • Adding Equal Groups
    • Making Multiplication Stories
    • Multiplication Within 40
15. Division
    • Sharing and Grouping
16. Halves and Fourths
    • Making Halves and Fourths
17. Time
    • Telling Time
    • Estimating Time
18. Numbers to 100
    • Tens and Ones
    • Estimation
    • Order of Numbers
    • Comparing Numbers
    • Addition Within 100
    • Subtraction Within 100
19. Money
    • Bills and Coins
    • Shopping

GRADE 2

The grade two class shall use the Singapore Math (Standards Edition) 2A and 2B textbooks and workbooks to meet its objectives. The grade 2 teacher is strongly encouraged to use the Singapore Extra Practice as a supplement for those students who need the extra practice, and the Challenging Problems as a supplement for those students who are able to go beyond.

PROFICIENCY OBJECTIVES

1. Numbers to 1000
   - Looking Back
   - Hundreds, Tens, and Ones
   - Comparing Numbers
2. Addition and Subtraction
   - Meanings of Addition and Subtraction
   - Addition With/Without Renaming
   - Subtraction With/Without Renaming
3. Length
   - Measuring Length
   - Measuring Length in Metres
   - Measuring Length in Centimetres
   - Measuring Length Yards and Feet
   - Measuring Length in Inches
4. Weight
   - Measuring Weight in Kilograms
   - Measuring Weight in Grams
   - Measuring Weight in pounds and ounces
5. Multiplication and Division
   - Multiplication
   - Division
6. Multiplication Tables of 2 and 3
   - Multiplication Table of 2
   - Multiplication Table of 3
   - Dividing by 2
   - Dividing by 3

7. Addition and Subtraction
   - Finding the Missing Number
   - Methods for Mental Addition
   - Methods for Mental Subtraction
8. Multiplication and Division
   - Multiplying and Dividing by 4
   - Multiplying and Dividing by 5
   - Multiplying and Dividing by 10
   - Division with Remainder
9. Money
   - Dollars and Cents
   - Adding Money
   - Subtracting Money
10. Fractions
    - Halves and Quarters
    - Writing Fractions
    - Fraction of a Set
11. Time
    - Telling Time After the Hour
    - Telling Time Before the Hour
    - Time Intervals
    - Other Units of Time
12. Capacity
    - Comparing Capacity
    - Litres
    - Gallons, Quarts, Pints, and Cups
13. Tables and Graphs
    - Picture Graphs
    - Bar Graphs
14. Geometry
    - Flat and Curved Faces
    - Making Shapes

GRADE 3

For the 2015-2016 school year, the grade three class shall use the Singapore Math (Standards Edition) 3A and 3B textbooks and workbooks to meet its objectives. The grade 3 teacher is strongly encouraged to use the Singapore Extra Practice as a supplement for those students who need the extra practice, and the Challenging Problems as a supplement for those students who are able to go beyond.

PROFICIENCY OBJECTIVES

1. Numbers to 10,000
   - Thousands, Hundreds, Tens and Ones
   - Number Patterns
   - Rounding Numbers
2. Addition and Subtraction
   - Mental Calculation
   - Sum and Difference
   - Estimation
   - Word Problems
   - Adding up to Thousands
   - Subtracting up to Thousands
   - Two-Step Word Problems
3. Multiplication and Division
   - Looking Back
   - More Word Problems
   - Multiplying up to Thousands
   - Quotient and Remainder
   - Dividing Hundreds, Tens, and Ones
4. Multiplication Tables of 6, 7, 8, and 9
   - Multiplying and Dividing by 6
   - Multiplying and Dividing by 7
   - Multiplying and Dividing by 8
   - Multiplying and Dividing by 9
   - Other Multiplication and Division
5. Data Analysis
   - Presenting Data
   - Probability

6. Length
   - Metres and Centimetres
   - Kilometres
   - Yards, Feet, and Inches
   - Miles
7. Weight
   - Kilograms and Grams
   - Word Problems
   - Pounds and Ounces
8. Capacity
   - Litres and Milliltres
   - Gallons, Quarts, Pints, and Cups
9. Money
   - Dollars and Cents
   - Addition
   - Subtraction
   - Multiplication and Division
10. Fractions
    - Fraction of a Whole
    - Equivalent Fractions
    - Adding Fractions
    - Subtracting Fractions
    - Fraction of a Set
    - Fractions and Money
11. Time
    - Hours and Minutes
    - Other Units of Time
12. Geometry
    - Angles
    - Right Angles
    - Quadrilaterals and Triangles
    - Solid Figures
13. Area, Perimeter, and Volume
    - Area
    - Perimeter
    - Volume

Quick Review:
- Temperatures
- Coordinates
- Transformations

GRADE 4

The grade four class shall use the Singapore Math (Standards Edition) 4A and 4B textbooks and workbooks to meet its objectives. The grade 4 teacher is strongly encouraged to use the Singapore Extra Practice as a supplement for those students who need the extra practice, and the Challenging Problems as a supplement for those students who are able to go beyond.

PROFICIENCY OBJECTIVES

1. Whole Numbers
   • Ten Thousands, Hundred Thousands, and Millions
   • Approximation
   • Factors
   • Multiples
   • Order of Operations
   • Negative Numbers
2. Four Operations of Whole Numbers
   • Addition and Subtraction
   • Multiplication and Division
   • Multiplication by a Two-Digit Number
3. Fractions
   • Equivalent Fractions
   • Adding and Subtracting Fractions
   • Mixed Numbers
   • Improper Fractions
   • Fractions and Division
   • Fraction of a Set
4. Geometry
   • Right Angles
   • Measuring Angles
   • Perpendicular Lines
   • Quadrilaterals
   • Triangles
   • Circles
   • Solid Figures
   • Nets
5. Area and Perimeter
   • Area of Rectangles
   • Perimeter of Rectangles
   • Composite Figures

6. Decimals
   • Tenths
   • Hundredths
   • Thousandths
7. Four Operations of Decimals
   • Addition and Subtraction
   • Multiplication and Division
8. Congruent and Symmetric Figures
   • Congruent Figures
   • Tiling Patterns
   • Line Symmetry
   • Rotational Symmetry
9. Coordinate Graphs and Changes in Quantities
   • Coordinate Grids
   • Changes in Quantities
   • Graphing Changes in Quantities
10. Data Analysis and Probability
   • Organizing and Analyzing Data
   • Probability Experiments
   • Order of Outcomes
   • Bar Graphs
   • Line Graphs
11. Measures and Volume
   • Adding and Subtracting Measures
   • Multiplying Measures
   • Dividing Measures
   • Cubic Units
   • Volume of Rectangular Prisms

GRADE 5

The grade five class shall use the Singapore Math (Standards Edition) 5A and 5B textbooks and workbooks to meet its objectives. The grade 5 teacher is strongly encouraged to use the Singapore Extra Practice as a supplement for those students who need the extra practice, and the Challenging Problems as a supplement for those students who are able to go beyond.

PROFICIENCY OBJECTIVES

1. Whole Numbers
   - Billions Approximation and Estimation
   - Factors and Multiples
   - Prime Factorization
   - Multiplying and Dividing by Tens, Hundreds, and Thousands
2. More Calculations with Whole Numbers
   - Calculations with Parentheses
   - Methods for Mental Calculation
   - Word Problems
   - Multiplication by a 2-Digit Whole Number
   - Division by a 2-Digit Whole Number
3. Fractions
   - Comparing Fractions
   - Fractions and Division
   - Addition and Subtraction of Unlike Fractions
   - Addition and Subtraction of Mixed Numbers
   - Multiplying a Fraction and a Whole Number
   - Fraction of a Set
   - Word Problems
4. Multiply and Divide Fractions
   - Product of Fractions
   - Word Problems
   - Dividing a Fraction by a Whole Number
   - Dividing by a Fraction
   - More Word Problems
5. Perimeter, Area, and Surface Area
   - Square Units
   - Rectangles and Squares
   - Area of a Triangle
   - Area of a Parallelogram
   - Suface Area
6. Ratio
   - Finding Ratio
   - Equivalent Ratios
   - Combining Three Quantities

7. Decimals
   - Tenths, Hundredths, and Thousandths
   - Approximation
   - Add and Subtract Decimals
   - Multiply and Divide Decimals by a 1-Digit Whole Number
   - Multiplication by Tens, Hundreds, or Thousands
   - Division by Tens, Hundreds, or Thousands
   - Multiplication by a 2-Digit Whole Number
   - Multiplication by a Decimal
   - Division by a Decimal
8. Measures and Volume
   - Conversion of Measures
   - Volume of Rectangular Prisms
9. Percentage
   - Percent
   - Writing Fractions as Percentages
   - Percentage of a Quantity
10. Angles
   - Measuring Angles
   - Finding Unknown Angles
   - Sun of Angles of a Triangle
   - Isosceles and Equilateral Triangles
   - Drawing Triangles
   - Sum of Angles of a Quadrilateral
   - Parallelograms, Rhombuses, and Trapezoids
   - Drawing Parallelograms and Rhombuses
11. Average and Rate
   - Average
   - Rate
12. Data Analysis
   - Mean, Median, and Mode
   - Histograms
   - Line Graphs
   - Pies Charts
13. Algebra
   - Algebraic Expressions
   - Integers
   - Coordinate Graphs

GRADE 6

The grade six class shall use the Singapore Math (Standards Edition) 6A and 6B textbooks and workbooks to meet its objectives. The grade 6 teacher is strongly encouraged to use the Singapore Extra Practice as a supplement for those students who need the extra practice, and the Challenging Problems as a supplement for those students who are able to go beyond.

PROFICIENCY OBJECTIVES

1. Algebra
   - Algebraic Expressions
   - Algebraic Equations
   - Graphs of Functions
2. Fractions and Decimals
   - Fractions and Decimals
   - Negative Fractions and Decimals
   - Comparing Numbers
3. The Four Operations
   - Addition and Subtraction of Fractions
   - Multiplication and Division of Fractions
4. Percentage
   - Percentage of a Quantity
   - Percentage of Change
   - Simple Interest, Sales Tax, and Discount
5. Ratio and Proportion
   - Comparing Two Quantities
   - Comparing Three Quantities
   - Word Problems
   - Proportion
6. Rate and Speed
   - Rate
   - Speed
   - Average Speed

7. Circle
   - Circumference
   - Area
   - Composite Figures
8. Volume of Prisms and Cylinders
   - Volume of Prisms
   - Volume of Cylinders
9. Angles
   - Adjacent Angles
   - Vertically opposite Angles
   - Angles at a Point
   - Complementary Angles
   - Supplementary Angles
   - Angles and Polygons
10. Construction of Triangles and Quadrilaterals
    - Drawing Lines and Angles
    - Constructing Triangles and Quadrilaterals
11. Data Handling
    - Mean
    - Population and Sample
    - Median
    - Mode
    - Range
12. Probability
    - Experimental Probability
    - Theoretical Probability of Simple Events
    - Theoretical Probability of Combined Events
13. Negative Numbers
    - Addition and Subtraction
    - Multiplication and Division
    - Order of Operations
    - Solving Equations
    - Graph of Functions

Quick Review:
- Composite/Prime Numbers
- Rotational Symmetry
- Transformational Geometry

GRADE 7

The grade seven class shall use the Singapore New Elementary Math 1 textbook and workbook to meet its objectives. The grade 7 teacher is strongly encouraged to use other resources as supplements for those students who are able to go beyond.

PROFICIENCY OBJECTIVES

1. Whole Numbers
   - System of Numeration
   - Four Operations
   - Factors and Multiples
   - Prime Numbers and Prime Factorization
   - Highest Common Factor
   - Least Common Factor
   - Number Patterns
   - Variables
   - Basic Number Laws
2. Fractions, Decimals, and Approximation
   - Fractions
   - Addition and Subtraction of Fractions
   - Multiplication and Division of Fractions
   - Decimals
   - Approximation
   - Conversion Between Fractions and Decimals
   - Estimation
3. Arithmetic Problems
   - Units of Measure
   - Simple Word Problems
   - Multi-Step Word Problems
   - Estimation in Daily Life Situations
4. Real Numbers
   - Negative Numbers
   - Addition and Subtraction of Integers
   - Multiplication of Integers
   - Division of Integers
   - Real Numbers
   - Order of Calculation
   - Mental Calculation
5. Simple Algebraic Expressions
   - Algebraic Expressions
   - Evaluation of Algebraic Expressions
   - Algebraic Terms
   - Use of Brackets
   - Collecting Like Terms
6. Open Sentences and Equations
   - Open Sentences and Equations
   - Equations with Fractional and Decimal Coefficients
   - Evaluation of Formulae and Problems

7. Ratio, Rate, and Percentage
   - Ratio
   - Rate and Speed
   - Direct and Inverse Proportions
   - Percentage
   - Applications of Percentage
8. Solving Problems Involving Financial Transactions
   - Earnings, Profit and Loss, Commissions and Discounts
   - Interest and Hire Purchase
   - Taxation and Money Exchange
9. Introducing Geometry
   - Line Segment, Line, and Angles
   - Angle Properties Related to Straight Lines
   - Perpendicular and Parallel Lines
   - Angle Properties Related to Parallel Lines
10. Polygons
    - Triangles
    - Angle Properties of a Triangle
    - Isosceles and Equilateral Triangles
    - Angle Properties of a Polygon
    - Quadrilaterals
    - Properties of Quadrilaterals
11. Symmetries and Solid Figure Nets
    - Line Symmetry
    - Rotational Symmetry
    - Patterns
    - Symmetries of Solid Figures
    - Nets of Solid Figures
12. Area and Perimeter
    - Perimeter and Area of Polygons
    - Circumference and Area of Circles
    - Area and Perimeter Problems
13. Volume and Surface Area of Prisms and Cylinders
    - Cylinders
    - Density
    - Volume and Surface Area Problems
14. Similarity and Congruence
    - Similar and Congruent Figures
    - Designs and Tessellations
    - Scale Drawings

GRADE 8

For the 2015/2016 school year, the grade eight class shall use the Singapore New Elementary Math 1 textbook and workbook (see page 10) or the New Elementary Math 2 textbook and workbook (see objectives below), depending on assessment.

PROFICIENCY OBJECTIVES

1. Indices
   - Positive Integral Indices
   - Zero and Negative Integral Indices
   - Indices Involving Variables
   - Standard Form
2. Algebraic Manipulations
   - Special Algebraic Rules for Calculations
   - Expanding Products
   - Factorization
   - Addition and Subtraction & Multiplication and Division of Algebraic Fractions
   - Fractional Equations
   - Problems Involving Fractional Equations
3. Literal and Quadratic Equations
   - Literal Equations
   - Transformation of Formulae
   - Quadratic Equations
   - Quadratic Factorization
   - Solving Quadratic Equations by Factorization
   - Word Problems Leading to Quadratic Equations
4. Word Problems
   - Problems on Ratio, Rate, and Percentage
   - Problems Involving Financial Transactions
5. Graphs
   - Coordinate Planes
   - Graphs of Linear Equations with Two Variables
   - Simple Application of Straight Line Graphs
   - Solving Linear Equations with Graphs
   - Quadratic Graphs
6. Simultaneous Linear Equations
   - Simple Elimination Method
   - Elimination Method
   - Substitution Method
   - Word Problems Using Simultaneous Equations
7. Inequalities
   - Sets of Numbers on the Number Line
   - Properties of Order
   - Solving Inequalities
8. Congruent and Similar Triangles
   - Congruent Triangles
   - Similar Triangles
9. Mensuration
   - Sectors
   - Cones and Pyramids
   - Sphere
   - Areas of Similar Solids
   - Volumes of Similar Solids
10. Pythagoras' Theorem and Trigonometry
    - Pythagoras' Theorem
    - Indirect Measure
    - Trigonometrical Ratios
    - Trigonometrical Ratios by Using a Calculator
    - Solution of Right-Angles Triangles
    - Applications of Trigonometrical Ratios to Simple Problems
11. Motion Geometry
    - Reflection, Rotation, and Translation
    - Enlargement
    - Combination of Transformations
12. Statistics
    - Collection and Presentation of Data
    - Reading and Drawing of Bar Graphs, Pie Charts, Line Graphs, and Pictograms
    - Frequency Distribution
    - Mean, Median, and Mode of Frequency Distribution
    - Types of Averages
13. Other Algebraic Manipulations
    - Addition and Subtraction of Polynomials
    - Multiplication of Polynomials
    - Division of Polynomials (Optional)
    - Algebraic Fractions and Fractional Equations
    - Algebraic Manipulation
    - Manipulation of Expressions