Math 7A

SCOPE OF COURSE

This course is divided into two semesters of study (A & B) comprised of five units each. The first-semester (A) is a study of whole numbers and integers; rational numbers; statistics; probability; and measurement.

SEQUENCE OF SKILLS

UNIT 1 – Whole Numbers and Integers

Whole numbers, integers, and absolute value
- Understand the definition of whole numbers and integers
- Use the number line to locate integers
- Find the absolute value of a number

Adding and subtracting integers
- Model single-sign addition and subtraction of integers with number line and integer chips
- Develop an algorithm for single-sign addition and subtraction of integers

Double-signed addition and subtraction
- Model double-sign addition and subtraction of integers with integer chips
- Develop an algorithm for double-sign addition and subtraction

Multiplying integers
- Represent integer multiplication with integer chips
- Develop and use an algorithm for integer multiplication

Dividing integers
- Understand the concept of division
- Algebraically perform division of positive and negative integers

Exponents
- Convert between exponents and repeated multiplication
- Simplify exponential expressions
- Develop and use the laws of exponents for multiplication and division

Square roots
- Understand the concept of a square root
- Find the square root of a given perfect square
- Estimate the square root of a non-perfect square using a number line

Order of operations
- Understand the importance of defining a particular order of math operations
- Use the correct order of operations

Properties of addition and multiplication
- Understand and identify the commutative, associative, identity, and inverse properties of addition and multiplication
- Understand and identify the zero property of multiplication

Mental math
- Understand rounding to a place value
- Estimate multiplying large numbers by rounding to the tens place and hundreds place

Prime factorization
- Understand that any whole number can be written as a product of its prime factors
- Express a given whole number as a product of its prime factors using exponents

The Least Common Multiple (LCM)
- Find the least common multiple of two whole numbers

Divisibility Rules and the Greatest Common Factor (GCF)
- Develop rules for dividing by 2, 3, 4, 5, 6, 9, and 10
- Find the greatest common factor of two numbers

Review and Problem Solving
- Solve applications involving different integer operations
- Solve applications involving arithmetic properties

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SEQUENCE OF SKILLS

UNIT 2 – Rational Numbers

Ratios
- Understand ratios as a comparison of two or more numbers
- Understand the concept of equivalent ratios
- Express ratios in simplest form

Intro to fractions
- Understand fractions as rational numbers, and the meaning behind fraction notation
- Understand the concept of equivalent fractions, and express fractions in lowest terms
- Convert between mixed numbers and improper fractions

Addition and Subtraction with Fractions
- Understand the concept of adding and subtracting fractions
- Be able to add and subtract fractions with like and unlike denominators

Multiplication and Division with Fractions
- Understand the concept of multiplying and dividing fractions
- Understand division as the inverse of multiplication

Decimals
- Understand conceptually what decimal notation means
- Be able to convert from decimals to mixed numbers and fractions
- Order decimals, fractions, and mixed numbers

Fractions as decimals
- Convert from a fraction to a terminating or repeating decimal
- Understand the concept of an irrational number

Adding and subtracting decimals
- Understand decimal addition and subtraction
- Perform decimal addition and subtraction

Multiplying and dividing decimals
- Understand decimal multiplication and division
- Perform decimal multiplication and division

Negative exponents and scientific notation
- Understand the concept of scientific notation
- Convert large whole numbers into scientific notation

Percentage
- Convert between decimals and percents
- Solve problems involving percents

Application of percents
- Apply percents to real life situations
- Solve word problems involving percents

Putting numbers in order
- Correctly order any combination of fractions, decimals, mixed numbers, percents, or scientific notation using inequality symbols or a number line

Number sets
- Identify the number sets (Natural, whole, integers, rational, and irrational numbers)
- Recognize which set certain numbers fall into

Review and Problem Solving
- Solve applications involving rational numbers and scientific notation

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SEQUENCE OF SKILLS

UNIT 3 – Statistics

Collecting Data
- Learn different sampling methods

Pie Graphs
- Interpret and read pie graphs
- Understand when pie graphs are used

Organizing Information: Frequency Tables
- Use tally to count frequency of data
- Organize data using a frequency table
- Interpret frequency tables
- Understand the concept of line plots

Stem-and-Leaf plots
- Create Stem-and-Leaf plots
- Interpret Stem-and-Leaf plots

Bar Graphs
- Use data to make bar graphs
- Interpret bar graphs

Pictographs
- Use data to make a pictograph
- Interpret pictographs

Histograms
- Use data to make a histogram
- Interpret histograms

Range, Mode, Mean, and Median
- Analyze data sets by finding the mean, median, mode, and range

Box-and-Whisker Plots
- Construct box-and-whisker plots
- Interpret box-and-whisker plots

Graphing Coordinates
- Plot points on a set of axes
- Identify coordinates of a point on the axes

Line Graphs
- Connect plotting points to data measurements
- Construct and interpret line graphs

Scatter Plots
- Plot points for scatter plots
- Determine the best fit line for a scatter plot

Using the Appropriate Data Display
- Understand when to use the correct graph
- Develop an understanding of how statistics can be misleading

Review and Problem Solving
- Solve applications involving different data displays
- Solve word problems with mean median and mode

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SEQUENCE OF SKILLS

UNIT 4 – Probability

Sample spaces
- Understand the concept of Sets and Sample Spaces
- Use the Venn diagram model for sets

Counting with Venn diagrams
- Use a Venn diagram to find a missing quantity

Counting principle
- Determine how many ways certain events can occur
- Use tree diagrams to develop the counting principle

Intro to probability
- Understand the concept of probability
- Understand that probabilities range from 0% to 100%
- Find the probability a particular outcome in a simple experiment

A deck of cards
- Understand the suits and numbers in a standard deck of cards
- Understand basic probability in a standard deck of cards

Simple events and expected outcomes
- Find the theoretical probability of simple events
- Begin to develop an understanding of theoretical probability and experimental probability
- Predict the expected outcome of a string events

Compound Probabilities
- Understand how to find the probability of two or more independent events

This or that probability
- Solve probability problems involving operations with multiple events

This then that
- Find the probability of compound events when order is specified
- Observe the effects of dependent vs. independent events

This and that
- Find the probability of compound events when order is not specified

Dependent events
- Find the probability of compound events when order is specified
- Observe the effects of dependent vs. independent events

Probability experiments
- Determine the experimental probability of an event

Theoretical vs. experimental probability
- Understand the difference between theoretical and experimental probability
- Create probability experiments and compare data to theoretical probability

Review and Problem Solving
- Solve word problems involving probability

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SEQUENCE OF SKILLS

UNIT 5 – Measurement

Reading a clock
- Read a clock

Operations with a clock
- Determine how much time has passed
- Determine the time after a certain number of hours and minutes have passed

Converting units of time
- Convert between seconds, minutes, hours, days, weeks, months, and years

Units of length
- Identify customary units of length
- Develop personal references for each unit
- Convert between units of length

Units of weight
- Identify customary units of weight
- Develop personal references for each unit
- Convert between units of weight

Units of capacity
- Identify customary units of capacity
- Develop personal references for each unit
- Convert between units of capacity

Metric system
- Understand metric units and what they represent
- Develop personal references for each unit
- Convert between different metric units

Tools of measurement
- Understand when and how to use appropriate tools for measurement

Temperature
- Understand how to read a thermometer
- Understand how to convert between Celsius and Fahrenheit

Angles
- Understand what an angle is
- Understand how to use a protractor

Rates
- Understand rates, unit rates, and equivalent rates
- Use unit rates to compare rates

Rates with changing units
- Compare rates with different units
- Solve rate word problems involving unit conversions

Operations with measurements
- Perform arithmetic with measurements

Review and Problem Solving
- Solve word problems involving measurement