

# MATH

## 6<sup>th</sup> GRADE

### *Rates, Ratios, Proportions, Scaling, Similarity*

The students will:

- Solve rate and ratio problems.
- Find unit rates.
- Apply rate model for division.
- Divide fractions, with and without a calculator.
- Multiply and divide signed numbers, with and without a calculator.
- Use rate situations as natural contexts for practicing multiplication and division with signed numbers.
- Investigate Golden Ratio/rectangle.
- Complete a ratio table.
- Investigate percents as a special case of ratios.
- Use proportional reasoning to solve problems involving similar figures and scale drawings.

### *Scientific Notation*

The students will:

- Write, use, translate and compare number word notation, exponential notation, scientific notation and standard notation for large and small numbers.
- Use calculators for exponential notation and scientific notation.
- Use scientific notation for multiplication and division, with and without calculator.

### *Pre- Algebra I: Uses of Variables and Coordinate Numbers*

The students will:

- Use variables to write patterns and algebraic expressions.
- Translate English expressions to algebraic expressions.
- Use variables in formulas, substitute and evaluate formulas, and derive simple formulas from data.
- Graph rule and formula data and data from tables.
- Construct simple spreadsheets on the computer.
- Add signed numbers.
- Tell a story from a graph and interpret graphs.

### *Rational Number Uses and Operations*

The students will:

- Extend their understanding of fractions, decimals, percent uses and scientific notation.

- Convert between different representations of rational numbers (percents, fractions and decimals).
- Simplify fractions.
- Compare fractions and decimals.
- Find common denominators.
- Locate and read fractions, decimals and percents on a number line.
- Multiply by powers of ten.
- Multiply, add, divide and subtract decimals.
- Estimate decimal products.
- Add and subtract fractions.
- Estimate sums of fractions.
- Convert between mixed numbers and fractions: add, subtract, multiply and divide mixed numbers.

### **Measurement and Geometry**

The students will:

- Read metric ruler: millimeters, centimeters and meters.
- Read a ruler;  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{1}{2}$  inch.
- Give and use appropriate units for measuring mass, length and capacity in US and metric system of measure.
- Convert within the US system, the metric system and between systems, show formula for Celsius  $\rightarrow$  Fahrenheit.
- Identify parts and name quadrilaterals and triangles.
- Find perimeter and area of triangles and quadrilaterals.
- Identify parts of a circle and find circumference and area.
- Measure and identify angles.
- Find measures of angles in figures with parallel lines and transversals.
- Use triangle-sum property to find measures of angles.
- Identify complimentary and supplementary angles.
- Find surface area and volume of cylinders, prisms and spheres.

### **Measures of Area, Surface Area and Volume**

The students will:

- Simplify Algebraic expressions:  $1x + w = A$ ,  $2l + 2w = P$ .
- Solve equations.
- Investigate and solve perimeter, area and volume problems.
- Graph formulas (plot points).
- Evaluate formulas and find square roots and squares using a calculator.
- Investigate and apply the Pythagorean Theorem.

## **Geometry 2: Symmetry, Transformation, More on Coordinates**

The students will:

- Investigate reflection and rotational symmetry.
- Use the coordinate grid to summarize properties of reflections, translations, and similarity transformations (dilatations).
- Visualize cross sections of solids.
- Construct given angles using a protractor.

## **Collection, Display and Interpretation Data**

The students will:

- Find the median, mean, mode, minimum, maximum, range/spread of a set of data.
- Read and construct visual display: line plots, broken line graphs, step graphs, circle graphs, double bar graphs, double line graphs, leaf and stem box and whiskers, scatter plot.
- Evaluate the reasonableness of statements about data.
- Apply knowledge about graphs in a variety of contexts.
- Collect, interpret and analyze data.
- Use formulas, measurements and data plots.

## **Probability with Fractions**

The students will:

- Create and analyze tree diagrams.
- Multiply probabilities (fraction multiplication).
- Construct Venn diagrams to model compound events.
- Analyze fair and unfair games.
- Use models of probability to predict events based on actual data.

## **Pre-Calculus**

The students will:

- Recognize and express the difference between linear and exponential growth.
- Investigate, represent and use non-terminating decimals.
- Develop informal ways of approximating the surface area and volume of objects, and discuss if it makes sense.
- Represent, analyze and predict relations between quantities, especially over time.
- Approximate quantities with an increasing degree of accuracy.
- Understand and use the concept of significant digits.
- Explain the relationship of an object's linear measurement on its surface area and volume.

## 7<sup>th</sup> GRADE

### Pre-Algebra 2: Signed Numbers and Solving Equations

The students will:

- Find reciprocals.
- Graph equations that use operations on positive/negative numbers.
- Graph inequalities on a number line.
- Solve linear equations.
- Apply rules for order of operations in number sentences.
- Solve equations including two equations in two unknowns.
- Use formulas to calculate cell entries in spreadsheets.
- Graph solutions for equations and fit a straight line to data.
- Use formulas.

### Pre-Algebra

The students will:

- Represent numerical relationships stated in words by mathematical expressions or equations.
- Represent problem situations by mathematical expressions or equations.
- Solve problems involving ratios and proportions.
- Solve equations by addition, subtraction, multiplication and division.
- Solve equations having variables on both sides.
- Graph real numbers on a number line.
- Divide real numbers and simplify expressions involving quotients.
- Add and multiply real numbers.
- Write and simplify exponential expressions.
- Multiply monomials.
- Find powers of a monomial.
- Simplify numerical expressions and evaluate variable expressions.
- Solve problems using a general method.
- Add and subtract polynomials.

### Algebra

The students will:

- Use order of operations to evaluate numerical expressions.
- Find solution of simple open sentences.
- Evaluate algebraic expressions given the value of all variables.
- Find surface area for cylinders, prisms and spheres.
- Use means-extremes property to solve proportions.
- Use formulas for work, area, volume, spreadsheets and rate.

## Numerical Operations

The students will:

- Add, subtract, multiply and divide, positive or negative whole numbers, fractions and decimal.
- Convert fractions and decimals to percents and vice versa.
- Use calculator to perform arithmetic operations where appropriate.
- Convert large and small positive numbers into scientific notation.
- Apply the general strategies used by a good problem solver.
- Determine mean, median, mode and a range of a set of numbers.
- Find percents of quantities in real situations.
- Identify prime and composite numbers.
- Convert powers to decimals.
- Use =,  $\cong$ , <, >, symbols correctly.
- Use appropriate estimates in real situations.
- Identify and use the following properties of addition and multiplication: commutative, associative, identity, property of zero, properties of equality, property of opposites, distributive.

## Pre-Calculus

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- Develop informal ways of approximating the surface area and volume of objects, and discuss if it makes sense.
- Represent, analyze and predict relations between quantities, especially over time.
- Understand and use the concept of significant digits and explain the relationship of an object's linear measurement on its surface area and volume.

## Statistics And Probability

The students will:

- Determine mean, median, mode and range of a set of number.
- Calculate the probability of mutually exclusive events, complements of events, and independent events.
- Interpret and display information in bar graphs, circle graphs, line graphs, and in coordinate graphs, leaf design and scatter clusters.
- Know when to display data in a particular graph

## **8<sup>th</sup> GRADE**

### Algebra 1

The students will:

- Find missing number patterns.
- Find compound interest.
- Use probability to solve problems.
- Read spreadsheets.
- Find relative frequency and the probability of an outcome.
- Find and express union and intersection of sets and use concepts to find solution sets of combined inequalities.
- Express order of real numbers, transform inequalities to find and graph their solution sets, and apply skills to solve problems.
- Simplify radicals, find absolute value, and use distance formula, apply Pythagorean Theorem.
- Solve proportions and apply them to geometric problems.
- Add, subtract, multiply and divide real numbers and use the necessary transformation of addition, subtraction, multiplication and division to solve simple equations.
- Use the distributive property to simplify algebraic expressions and to solve equations containing similar terms.
- Graph linear equations on a coordinate plane.
- Use the graphing calculator to graph linear equations and quadratic equations.
- Use order of operations to simplify numerical expressions and evaluate variable expressions and formulas involving powers.
- Find solution sets of simple open sentences.
- Add, subtract and multiply polynomial.
- Apply the triangle inequality theorem.
- Solve equations with fractional coefficients.
- Multiply a polynomial by a polynomial, including FOIL and special products, polynomial factoring.
- Use the slope-intercept form of an equation of a line.
- Solve quadratic equations.
- Solve systems of equations by addition and subtraction and the use of multiplication.

### *Pre- Calculus*

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- Develop informal ways of approximating the surface area and volume of objects, and discuss if it makes sense.
- Represent, analyze and predict relations between quantities, especially over time.
- Approximate quantities with an increasing degree of accuracy.
- Understand and use the concept of significant digits.