



## Math - Grade 7

### **Course Description:**

The Indian Community School cultivates an enduring cultural identity and critical thinking by weaving indigenous teachings with a distinguished learning environment. The curriculum for this course is developed from the [Common Core State Standards for Mathematics](#) and the framework of the [ICS Our Ways Cultural Calendar](#). In this course, seventh grade students will focus on four critical areas: (1) developing understanding of operations with rational numbers and working with expressions and linear equations; (2) developing understanding of and applying proportional relationships; (3) solving problems involving scale drawings and informal geometric constructions, and working with two- and three-dimensional shapes to solve problems involving areas, surface area, and volume; and (4) drawing inferences about populations based on samples.

### **Enduring Understandings:**

- Solving equations and inequalities with multiple steps can be used to solve different kinds of problems and applied to real life situations that include integers.
- Drawing and constructions of Geometric figures can be used to understand the relationship between different and similar figures.
- Graphs and data can be used to describe a set of data from a sample using measures of central tendencies and variation.
- Formulas can be used to calculate surface area and volume of 3 dimensional shapes to solve real-life problems.
- Operations with all Rational Numbers can be used to solve real world situations.
- Mathematical properties can be used to generate equivalent expressions and equations.
- Proportional reasoning can be used to solve multiple real world problems such as tax, interest, markups, and unit rates.
- The probability of a simple event or compound event will be represented as a fraction or decimal to determine the likelihood of its occurrence.

### **RATIOS AND PROPORTIONAL RELATIONSHIPS**

- I can compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units. (7.RP.A.1)
- I can represent proportional relationships between quantities. (7.RP.A.2)
- I can decide whether two quantities are in a proportional relationship by testing for equivalent ratios in a table or graphing on a coordinate plane and observing the straight line going through the origin. (7.RP.A.2.A)
- I can solve a problem to find the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. (7.RP.A.2.B)
- I can represent proportional relationships by equations. (7.RP.A.2.C)
- I can explain what a point  $(x, y)$  on the graph of a proportional relationship means in terms of the situation with special attention to the points  $(0,0)$  and  $(1, r)$  where  $r$  is the unit rate. (7.RP.A.2.D)
- I can use proportional relationships to solve multistep ratio and percent problems. (7.RP.A.3)



## THE NUMBER SYSTEM

- I can solve problems by applying and extending previous understandings of addition and subtraction to add and subtract rational numbers. (7.NS.A.1)
- I can represent addition and subtraction on a horizontal or vertical number line diagram. (7.NS.A.1)
- I can solve problems to show  $p + q$  are numbers located from a distance  $|q|$  from  $p$ , in the positive or negative direction. (7.NS.A.1.B)
- I can solve problems where a number and its opposite have a sum of 0 (additive inverses) and interpret sums of rational numbers by describing real-world contexts. (7.NS.A.1.B)
- I can solve subtraction of rational numbers as adding the additive inverse,  $p - q = p + (-q)$ . (7.NS.A.1.C)
- I can apply through a real-world context that the distance between two rational numbers on the number line is the absolute value of their difference. (7.NS.A.1.C)
- I can apply properties of operations as strategies to add and subtract rational numbers. (7.NS.A.1.D)
- I can apply and extend previous understanding of multiplication and division and of fractions to multiply and divide rational numbers. (7.NS.A.2)
- I can solve problems and interpret real-world contexts by using multiplication to extend fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, and the rules for multiplying signed numbers. (7.NS.A.2.A)
- I can solve problems where integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. (7.NS.A.2B)
- I can interpret real-world contexts by knowing that If  $p$  and  $q$  are integers, then  $-(p/q) = (-p)/q = p/(-q)$ . (7.NS.A.2.B)
- I can apply properties of operations as strategies to multiply and divide rational numbers. (7.NS.A.2.C)
- I can convert a rational number to a decimal using long division. (7.NS.A.2D)
- I can demonstrate how the decimal form of a rational number terminates in 0s or eventually repeats. (7.NS.A.2.D)
- I can solve real-world and math problems involving the four operations with rational numbers including fractions. (7.NS.A.3)

## EXPRESSIONS AND EQUATIONS

- I can apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. (7.EE.A.1)
- I can rewrite an expression in different forms in a problem context to shed light on the problem and how the quantities in it are related. (7.EE.A.2)
- I can solve multi-step real-world problems with positive and negative rational numbers in many forms using tools strategically. (7.EE.B.3)



## EXPRESSIONS AND EQUATIONS (continued)

- I can apply properties of operations to calculate with numbers in any form. (7.EE.B.3)
- I can convert between fractions, decimals, percents, and whole numbers using tools strategically. (7.EE.B.3)
- I can use estimation to justify my answers. (7.EE.B.3)
- I can use variables to write inequalities representing real-world situations. (7.EE.B.4)
- I can solve word problems leading to equations of the form  $px + q = r$  and  $p(x + q) = r$ , where  $p$ ,  $q$ , and  $r$  are specific rational numbers. (7.EE.B.4.A)
- I can compare algebraic solutions with arithmetic solutions. (7.EE.B.4.A)
- I can solve word problems that include situations that have linear inequalities. (7.EE.B.4.B)
- I can graph the solution set of the inequality and interpret it in the context of the problem. (7.EE.B.4.B)

## GEOMETRY

- I can solve problems involving scale drawings of geometric figures by computing actual lengths and areas from scale drawings. (7.G.A.1)
- I can solve problems involving scale drawings by reproducing a scale drawing at a different scale. (7.G.A.1)
- I can draw geometric shapes with given conditions. (7.G.A.2)
- I can focus on constructing triangles from three measures of angles or sides and show when the conditions determine a unique triangle, more than one triangle, or no triangle. (7.G.A.2)
- I can describe two-dimensional figures that result from slicing three-dimensional figures as plane sections of right rectangular prisms and right rectangular pyramids. (7.G.A.3)
- I can solve problems using the formula for area and circumference of a circle. (7.G.B.4)
- I can give an informal derivation of the relationship between the circumference and area of a circle. (7.G.B.4)
- I can use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for unknown angles in a figure. (7.G.B.5)
- I can solve real-world and mathematical problems involving area, volume, and surface area of two-dimensional and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. (7.G.B.6)

## STATISTICS AND PROBABILITY

- I can use statistics to gain information and make generalizations about a population by examining a sample of the population. (7.SP.A.1)
- I can describe random sampling trends to produce representative samples and support valid inferences. (7.SP.A.1)
- I can use data from a random sample to draw inferences about a population with an unknown characteristic of interest. (7.SP.A.2)
- I can gauge how far off an estimate or prediction might be. (7.SP.A.2)



## STATISTICS AND PROBABILITY (continued)

- I can generate multiple samples and simulated samples of the same size to gauge variation in estimates or predictions. (7.SP.B.3)
- I can assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of measure of variability. (7.SP.B.3)
- I can use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. (7.SP.B.4)
- I can solve problems to show the probability of a chance event is a number between 0-1 and express the likelihood of that event occurring. (7.SP.C.5)
- I can approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency to predict the approximate relative frequency given the probability. (7.SP.C.6)
- I can develop a probability model and use it to find probabilities of events. (7.SP.C.7)
- I can compare probabilities from a model to observed frequencies and discuss agreements or explain possible sources of discrepancy. (7.SP.C.7)
- I can develop a uniform probability model by assigning equal probability to all outcomes and use the model to determine probabilities of events. (7.SP.C.7.A)
- I can develop a probability model by observing frequencies in data generated from a chance process. (7.SP.C.7.B)
- I can solve problems including probability of compound events using organized lists, tables, tree diagrams, and simulation. (7.SP.C.8)
- I can solve problems that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. (7.SP.C.8.A)
- I can represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. (7.SP.C.8.B)
- I can describe everyday language events to identify the outcomes of organized lists, tables and tree diagrams. (7.SP.C.8.B)
- I can design and use a simulation to generate frequencies for compound events. (7.SP.C.8.C)