

Course Title:	7th Grade Math
Grade(s):	7

Course Description
In Grade 7, instructional time should focus on four critical areas: (1) developing understanding of and applying proportional relationships; (2) developing understanding of operations with rational numbers and working with expressions and linear equations; (3) solving problems involving scale drawings and informal geometric constructions, and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume; and (4) drawing inferences about populations based on samples. Course Units: 1. Scale Drawings 2. Introducing Proportional Relationships 3. Measuring Circles 4. Proportional Relationships and Percentages 5. Rational Number Arithmetic 6. Expressions, Equations & Inequalities 7. Angles, Triangles, and Prisms 8. Sampling and Probability
Approved Curricular Materials/Textbook(s)
IM 360 Online Resource

Unit Title	Unit Description (Include Unit Objectives)	Unit Pacing
Unit 1:	In this unit, students learn to understand and use the terms “scaled copy,” “to	15-18 days

SCALE DRAWINGS	scale,” “scale factor,” “scale drawing,” and “scale,” and recognize when two pictures or plane figures are or are not scaled copies of each other. They use tables to reason about measurements in scaled copies, and recognize that angle measures are preserved in scaled copies, but lengths are scaled by a scale factor and areas by the square of the scale factor. They make, interpret, and reason about scale drawings. These include maps and floor plans that have scales with and without units. • Scaled Copies • Scale Drawings	(September)
Unit 2: INTRODUCING PROPORTIONAL RELATIONSHIPS	In this unit, students learn to understand and use the terms “proportional,” “constant of proportionality,” and “proportional relationship,” and recognize when a relationship is or is not proportional. They represent proportional relationships with tables, equations, and graphs. Students use these terms and representations in reasoning about situations that involve constant speed, unit pricing, and measurement conversions. • Representing Proportional Relationships with Tables • Representing Proportional Relationships with Equations • Comparing Proportional Relationships and Non-Proportional Relationships • Representing Proportional Relationships with Graphs	17-20 days (September - October)
Unit 3: MEASURING CIRCLES	In this unit, students learn to understand and use the term “circle” to mean the set of points that are equally distant from a point called the “center.” They gain an understanding of why the circumference of a circle is proportional to its diameter, with constant of proportionality π. They see informal derivations of the fact that the area of a circle is equal to π times the square of its radius. Students use the relationships of circumference, radius, diameter, and area of a circle to find lengths and areas, expressing these in terms of π or using appropriate approximations of π to express them numerically. • Circumference of a Circle • Area of a Circle	13 days (October - November)

Unit 4: PROPORTIONAL RELATIONSHIPS & PERCENTAGES	In this unit, students use ratios, scale factors, unit rates (also called constants of proportionality), and proportional relationships to solve multi-step, real-world problems that involve fractions and percentages. They use long division to write fractions presented in the form $\frac{a}{b}$ as decimals, e.g., $\frac{11}{30} = 0.3\overline{6}$. They learn to understand and use the terms “repeating decimal,” “terminating decimal,” “percent increase,” “percent decrease,” “percent error,” and “measurement error.” They represent amounts and corresponding percent rates with double number line diagrams and tables. They use these terms and representations in reasoning about situations involving sales taxes, tips, markdowns, markups, sales commissions, interest, depreciation, and scaling a picture. Students use equations to represent proportional relationships in which the constant of proportionality arises from a percentage, e.g., the relationship between price paid and amount of sales tax paid. • Proportional Relationships with Fractions • Percent Increase and Decrease • Applying Percentages	18-21 days (November - December)
Unit 5: RATIONAL NUMBER ARITHMETIC	In this unit, students interpret signed numbers in contexts (e.g., temperature, elevation, deposit and withdrawal, position, direction, speed and velocity, percent change) together with their sums, differences, products, and quotients. (“Signed numbers” include all rational numbers, written as decimals or in the form $\frac{a}{b}$). Students use tables and number line diagrams to represent sums and differences of signed numbers or changes in quantities represented by signed numbers such as temperature or elevation, becoming more fluent in writing different numerical addition and subtraction equations that express the same relationship. They compute sums and differences of signed numbers. They plot points in the plane with signed number coordinates, representing and interpreting sums and differences of coordinates. They view situations in which objects are traveling at constant speed (familiar from previous units) as proportional relationships. For these situations, students use multiplication equations to represent changes in position on number line diagrams or distance traveled, and interpret positive and negative velocities in context. They become more fluent in writing different numerical multiplication and division equations for the same relationship. Students extend their use of the	19-21 days (December - January)

	“next to” notation (which they used in expressions such as $5x$ and $6(3 + 2)$ in grade 6) to include negative numbers and products of numbers, e.g., writing $-5x$ and $(-5)(-10)$ rather than $(-5) \cdot x$ and $(-5) \cdot (-10)$. They extend their use of the fraction bar to include variables as well as numbers, writing $-8.5 \div x$ as well as $\frac{-8.5}{x}$. • Interpreting Negative Numbers • Adding and Subtracting Rational Numbers • Multiplying and Dividing Rational Numbers • Four Operations with Rational Numbers • Solving Equations when there are Negative Numbers	
Unit 6: EXPRESSIONS, EQUATIONS & INEQUALITIES	In this unit, students solve equations of the forms $px + q = r$ and $p(x + q) = r$ where p, q, and r are rational numbers. They draw, interpret, and write equations in one variable for balanced “hanger diagrams,” and write expressions for sequences of instructions, e.g., “number puzzles.” They use tape diagrams together with equations to represent situations with one unknown quantity. They learn algebraic methods for solving equations. Students solve linear inequalities in one variable and represent their solutions on the number line. They understand and use the terms “less than or equal to” and “greater than or equal to,” and the corresponding symbols. They generate expressions that are equivalent to a given numerical or linear expression. Students formulate and solve linear equations and inequalities that represent real-world situations. • Representing Situations of the form $px + q = r$ and $p(x + q) = r$. • Solving Equations of the form $px + q = r$ and $p(x + q) = r$ and Problems that lead to those Equations. • Inequalities • Writing Equivalent Expressions	25-29 days (January - March)
Unit 7: ANGLES, TRIANGLES	In this unit, students investigate whether sets of angle and side length measurements determine unique triangles or multiple triangles, or fail to determine triangles. Students also study and apply angle relationships, learning to understand and use the terms “complementary,” “supplementary,”	19 days (April)

& PRISMS	“vertical angles,” and “unique.” They practice working with rational numbers and equations for angle relationships. Students analyze and describe cross-sections of prisms, pyramids, and polyhedra. They understand and use the formula for the volume of a right rectangular prism, and solve problems involving area, surface area, and volume. • Angle Relationships • Drawing Polygons with Given Conditions • Solid Geometry	
Unit 8: SAMPLING & PROBABILITY	In this unit, students work with probability and sampling. They use their understanding of basic chance experiments to quantify how likely events are to happen and develop a working understanding of probability. Then they design and use simulations to further understand probability as the frequency of the event occurring when repeating an experiment many times. Students represent sample spaces using tables, tree diagrams, and lists, and use the number of outcomes in a sample space to calculate an expected probability. • Probabilities of Single-Step Events • Probabilities of Multi-Step Events • Sampling • Using Samples	23 days (May - June)