

Grade 7 Mathematics: *Open Up Course*

Syllabus

Unit 1: Scale Drawings • Approx. 4 weeks	<ul style="list-style-type: none">• Study scaled copies of pictures and plane figures• Apply concepts to scaled drawings, e.g., maps and floor plans.
Unit 2: Introducing Proportional Relationships • Approx. 4 weeks	<ul style="list-style-type: none">• Understand and use the terms “proportional,” “constant of proportionality,” and “proportional relationships,” and recognize when a relationship is or is not proportional.• Represent proportional relationships with tables, equations, and graphs.• Use these terms and representations in reasoning about situations that involve constant speed, unit pricing, and measurement conversions.
Unit 3: Measuring Circles • Approx. 4 weeks	<ul style="list-style-type: none">• Understand and use the terms “circle,” to mean a set of points that are equally distant from a point called the “center.”• Gain an understanding of what the circumference of a circle is proportional to its diameter, with constant of proportionality π.• Recognize informal derivations of the fact that the area of a circle is equal to π times the square of its radius.• Use the relationships of circumference, radius, diameter, and area of a circle to find the length and areas, expressing these in terms of π or using appropriate approximations of π to express them numerically.
Unit 4: Proportional Relationships and Percentages • Approx. 4 weeks	<ul style="list-style-type: none">• 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.• Use long division to write fractions presented in the form of a/b as decimals, e.g., $11/30 = 0.36$.• Understand and use the terms “repeating decimal,” “terminating decimal,” “percent increase,” “percent decrease,” “percent error,” and “measurement error.”• Represent rates with double number line diagrams and tables.• Use reasoning for situations involving sales taxes, tips, markdowns, markups, sales commissions, interest, depreciation, and scaling a picture.• Use equations to represent proportional relationships in which the constant of proportionality arises from a percentage, e.g., relationship between price paid and amount of sales tax paid.
Unit 5: Rational Number Arithmetic • Approx. 4 weeks	<ul style="list-style-type: none">• 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 a/b.)• Use tables and number line diagrams to represent sums and differences of signed numbers or changes in quantities represented by signed numbers.• Become more fluent in writing different numerical addition and subtraction equations that express the same relationship.• Compute sums and differences of signed numbers.• Plot points in the plane with signed number coordinates, representing and interpreting sums and difference of coordinates.• View situations in which objects are traveling at constant speed as proportional relationships.

	<ul style="list-style-type: none"> • Use multiplication equations to represent changes in position on number line diagrams or distance traveled, and interpret positive and negative velocities in context. • Become more fluent in writing different numerical multiplication and division equations for the same relationship. • Extend their use of the “next to” notation to include negative numbers and products of numbers. • Extend their use of the fraction bar to include variables as well as numbers.
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<p>Unit 6: Expressions, Equations, and Inequalities • Approx. 5.5 weeks</p>	<ul style="list-style-type: none"> • Solve equations of the forms $px + q = r$ and $p(x+q) = r$ where p, q, and r are rational numbers. • Draw, interpret, and write equations in one variable for balanced “hanger diagrams,” and write expressions for sequences of instructions, e.g., “number puzzles.” • Use tape diagrams together with equations to represent situations with one unknown quantity. • Learn algebraic methods for solving equations. • Solve linear inequalities in one variable and represent their solutions on the number line. • Understand and use the terms “less than or equal to” and “greater than or equal to,” and the corresponding symbols. • Generate expressions that are equivalent to a given numerical or linear expression. • Formulate and solve linear equations and inequalities that represent real-world situations.
<p>Unit 7: Angles, Triangles, and Prisms • Approx. 4 weeks</p>	<ul style="list-style-type: none"> • Investigate whether sets of angle and side length measurements determine unique triangles or multiple triangles, or fail to determine triangles. • Study and apply angle relationships, learning to understand and use the terms “complementary,” “supplementary,” “vertical angles,” and “unique.” • Analyze and describe cross-sections of prisms, pyramids, and polyhedra. • Understand and use the formula for the volume of a right rectangular prism, and solve problems involving area, surface area, and volume.
<p>Unit 8: Probability and Sampling • Approx. 5.5 weeks</p>	<ul style="list-style-type: none"> • Understand and use the terms “event,” “sample space,” “outcome,” “chance experiment,” “probability,” “simulation,” “random,” “sample,” “random sample,” “representative sample,” “overrepresented,” “underrepresented,” “population,” and “proportion.” • Design and use simulations to estimate probabilities of outcomes of chance experiments and understand the probability of an outcome and its long-run relative frequency. • Represent sample spaces in tables and tree diagrams and as lists. • Calculate the number of outcomes in a given sample space to find the probability of a given event. • Consider the strengths and weaknesses of different methods for obtaining a representative sample from a give population. • Generate samples from a given population. • Compare two populations by comparing samples from each population.