OaklandSchools

Mathematics Prioritization of Learning by Grade Level/Course

Oakland Schools understands that interrupted schooling brings new challenges for many educators, and that teaching and learning during and after an interruption involves more than just printing non-digital materials, uploading files, sharing links to media content, and reteaching the previous grade level's content. These recommendations provide support for the teaching and learning of mathematics.

Content Delivery Recommendations:

As we engage in learning opportunities during and after a long-term closure and plan for upcoming school years, we recognize learning will look different for everyone. We recommend that educators:

- Make sure to provide opportunities for students to utilize the Standards for Mathematical Practice.
- Consider a variety of methods to connect with, reassure, and provide students with encouragement to support their well being.
- Work within grade-level and or content-specific teams to support learning. Working in teams will provide opportunities for district-wide decisions to be made on what is taught now and how to address missed learning when students return to school.
- Find a balance between practice and inquiry when planning lessons and activities.
- Remain flexible with pacing and student assignments.
- Consider equitable practices and offering student choice; each student's situation is going to be unique.
- Adhere to state and district recommendations.
- Be mindful of continuing to build students' proficiency with content not yet mastered.

The Oakland Schools Mathematics Team has used the following documents to inform their identification of suggested "Prioritized Standards": The introduction to each grade level in the Michigan K-12 Standards, Achieve the Core's identified mastery standards, the SBAC blueprint, and the PSAT/SAT item specifications. The list of priority standards below is not intended to be an exhaustive list but rather a starting point for instruction and decisions made at a local level.

Grade	Prioritized Standards: Starting Points for Instruction
K	• Oral counting to 100 by 1 and 10 (K.CC.1). • Count to tell the number of objects up to 20 (K.CC.4, K.CC.5). • Read and write numbers to 20 (K.CC.3). • Solve problems using objects or drawings to add and subtract within 10 (K.OA.2). • Understand that teen numbers always have a group of 10 ones and some more ones (K.NBT.1). • Recognize combinations within 5 (e.g., 1 and 3 more is 4; 2 goes with what quantity to make 5) (K.OA.A.3). • Name and describe shapes (squares, circles, triangles, rectangles, cubes, cones, cylinders, and spheres) and see them in their world (K.G.2).
1	• Fluently add and subtract within 10 (1.OA.6). • Solve word and bare number problems that involve adding and subtracting within 20 using strategies (e.g., making a ten and counting on) and tools. (1.OA.1, 1.OA.6). • Count forward and backward from any number within 120 (1.NBT.1). • Read and write numerals and represent a number of objects with a written numeral. (1.NBT.1). • Understand that a “ten” can be thought of as 10 ones and/or a bundle of ten (1.NBT.2.A) • The numbers from 11-99 are composed of some number of tens and some more ones (1.NBT.B.2B, 1.NBT.B.2C). • Students develop, discuss, and use efficient, accurate, and generalizable methods to add within 100 and subtract multiples of 10. (1.NBT.C.4, 1.NBT.C.6). • Use non-standard units (paperclips, toothpicks, pennies, gummy bears, etc) to measure the length of an object by placing them end to end. Understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. (1.MD.2). • Interpret data and answer questions about the total number of data points in each category. (1.MD.4).

Grade	Prioritized Standards: Starting Points for Instruction
2	• Fluently add and subtract within 20 (2.OA.B.2). • Count within 1,000 by 1, 10, and 100 (2.NBT.2). • Read and write numbers up to 1,000 (2.NBT.3). • Understand that a "hundred" can be thought of as 1 hundred, 10 tens, and/or a bundle of 100 ones (2.NBT.A.1A). • The numbers from 101-999 are composed of some number of hundreds, tens, and ones (2.NBT.A.1). • Use addition and subtraction within 100 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions (2.OA.1, 2.NBT.5). • Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction (2.NBT.6, 2.NBT.7). • Relate addition and subtraction to length. Measure to determine how much longer one object is than another, using cm and inches. (2.MD.4) • Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape. (2.G.A.3).
3	• Use multiplication and division within 100 to solve [bare number and] word problems in situations involving equal groups, arrays, and measurement quantities (3.OA.A.3). • Add and subtract within 1000 using strategies and algorithms based on place value (3.NBT.2). • Understand fractions as numbers (3.NF.1, 3.NF.2). • Explain equivalent fractions* and compare fractions by reasoning about their size (3.NF.3). • Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. (3.G.2). • Describing and analyzing two-dimensional shapes (3.G.1). • Understand the concept of area and relate it to multiplication and addition (3.MD.5, 3.MD.6, 3.MD.7). *Grade 3 expectations are limited to fractions with denominators 2, 3, 4, 6, and 8.

Grade	Prioritized Standards: Starting Points for Instruction
4	• Add, subtract fluently to solve bare number and word problems (4.NBT.4, 4.OA.3). • Multiply and divide multi-digit numbers using conceptually-based models and algorithms (e.g., area model, partial product/quotient) to solve bare number and word problems (4.NBT.5, 4.NBT.6, 4.OA.3). • Apply the area and perimeter formulas for rectangles in real world problems (4.MD.3). • Use models to recognize and generate equivalent fractions* (4.NF.A.1). • Use models to recognize and generate equivalent fractions to illustrate connections between decimal fractions (*n*/10 and *n*/100) and decimal notation. (4.NF.6). • Add, and subtract fractions and mixed numbers with like denominators (4.NF.3A, 4.NF.3B, 4.NF.3C, 4.NF.3D). *Grade 4 expectations are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.
5	• Consolidate understanding of and fluently use algorithms for multi-digit multiplication. 5.NBT.5. • Make sense of and justify answers to multi-digit division problems using equations, rectangular arrays, and/or area models. 5.NBT.6. • Add, subtract, multiply and divide decimals to the hundredths using models and strategies (5.NBT.7). • Use equivalent fractions as a strategy to add and subtract fractions (5.NF.1, 5.NF.2). • Apply and extend previous understandings of multiplication and division to multiply and divide fractions and mixed numbers (5.NF.3, 5.NF.4, 5.NF.5, 5.NF.6, 5.NF.7). • Relate volume to multiplication and addition and use this to find the volume of rectangular prisms (5.MD.3, 5.MD.4, 5.MD.5).

Grade	Prioritized Standards: Starting Points for Instruction
6	• Understand ratio concepts and use ratio reasoning to solve problems including unit rate and percent (6.RP.1, 6.RP2, 6.RP.3). • Understand ordering of integers and rational numbers and locate them on the number line and in all four quadrants of the coordinate plane (6.NS.5, 6.NS.6, 6.NS.7 6.NS.8). • Solve problems in the form x+p = q and px = q (6.EE.7). • Identify and generate equivalent expressions applying properties including the distributive property (6.EE.3, 6.EE.4). • Use independent and dependent variables to represent and analyze two quantities in a real-world problem (6.EE.9). • Find and use measures of center and range for a data set to introduce distributions (6.SP.5). • Find the area of triangles and quadrilaterals by composing or decomposing into triangles and other shapes (6.G.1). • Find the surface area and volume of rectangular prisms (6.G.2,6.G.4). • Look for opportunities for students to strengthen their fluency with operations with fractions that were introduced in 5th grade including 6.NS.1
7	• Analyze proportional relationships to solve real-world math problems including finding unit rate and probability (7.RP.1). • Identify the constant of proportionality (unit rate) in tables, graphs, equations, and verbal descriptions(7.RP.2). • Use proportional relationships to solve multistep ratio and percent problems including scale drawings and simple probability (7.RP3, 7.G.1, 7.SP.5). • Apply and extend understanding of addition, subtraction, multiplication, and division of integers and rational numbers using a variety of strategies including number lines, colored chips, and area models (7.NS.1, 7.NS.2). • Solve problems using numerical and algebraic expressions and equations (7.EE.3, 7.EE.4). • Use measures of center and variability to draw inferences from data and compare data from more than one data set represented in multiple ways in formats (e.g., dot plots, histograms, numerical data) (7.SP.4).

Grade	Prioritized Standards: Starting Points for Instruction
8	• Understand and interpret the connections between proportional relationships and rate of change and use them to create linear models including equations, tables, and graphs (8.EE.5, 8.EE.6, 8.F.4). • Analyze and solve linear equations and pairs of simultaneous linear equations using multiple representations (i.e., tables, graphs, and equations) (8.EE.7, 8.EE.8). • Know and apply the properties of integer exponents to generate equivalent numerical expressions (8.EE.1). • Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally (8.F.5). • Investigate patterns of association in bivariate data using scatterplots, line of best fit, and two-way tables (8.SP.1, 8.SP.2, 8.SP.3 8.SP.4). • Apply the Pythagorean Theorem to determine unknown side lengths in right triangles including distance between points in the coordinate plane (8.G.7, 8.G.8).

High School Introduction

Districts have local control to determine how the collection of high school mathematics standards are assigned to courses. Therefore, the content assigned to particular courses in the tables below might be associated with different courses depending on the district. (For example, District A might teach probability standards in its Geometry course while District B teaches probability in Algebra 2, and District C allocates some mathematics standards to CTE experiences.) As such, users of this high school list might first examine the content as a whole and rearrange concepts and skills contained here according to their own course content.

Course	Prioritized Standards: Starting Points for Instruction
Algebra 1	• Interpret the structure of expressions and generate equivalent forms for linear, quadratic, and exponential functions (e.g., using the distributive property, factoring, properties of exponents) (A.SSE.1, A.SSE.2, A.SSE.3, N.RN.2). • Create equations and inequalities that describe numbers or relationships and use them to solve problems (A.CED.1, A.CED.2, A.CED.4). • Solve systems of equations algebraically and graphically (A.REI.6). • Solve quadratic equations in one variable using multiple representations (A.REI.4). • Understand the concept of a function and use function notation (F.IF.1, F.IF.2). • Interpret functions and the key features of their tables, graphs, and equations (F.IF.4, F.IF.7a, F.LE.2). • Distinguish between situations that can be modeled with linear and exponential functions (F.LE.1, F.LE.5).
Geometry	• Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures (G.SRT.5, G.CO.8). • Use Pythagorean Theorem and trigonometric ratios to solve problems involving right triangles (G.SRT.6, G.SRT.8). • Use coordinates to prove simple geometric theorems (i.e., slope criteria for parallel and perpendicular lines, computing perimeters of polygons, and areas of triangles and rectangles) (G.GPE.4, G.GPE.5, G.GPE.7). • Use transformations to map a geometric figure to another figure and determine if they are congruent or similar (G.CO.5, G.CO.6, G.SRT.2). • Prove and apply geometric theorems and definitions (e.g., lines, angles, triangles, parallelograms) (G.CO.9, G.CO.10, G.CO.11). • Construct, interpret, and summarize data in two-way tables (S.CP.4, S.ID.5).

Course	Prioritized Standards: Starting Points for Instruction
Algebra 2	• Interpret functions (i.e., exponential, logarithmic, polynomial, rational, and radical) and the key features of their tables, graphs, and equations by hand and using technology (F.IF.4, F.IF.7). • Identify and describe transformations of functions in graphs and equations. Use knowledge of transformations to solve problems in multiple representations (F.BF.3). • Work with trigonometric functions and the unit circle (F.TF.1, F.TF.2). • Perform operations on polynomial expressions and use strategies to identify zeros (A.APR.1, A.APR.3). • Solve advanced algebraic equations (i.e., polynomial, exponential, radical, rational, logarithmic) using multiple representations (A.REI.2, A.REI.11, A.APR.2, A.APR.3). • Use appropriate tools (e.g., spreadsheets, calculators, and tables) strategically to interpret quantitative data using measures of center, spread, and distribution shape (S.ID.2, S.ID.3, S.ID.4). • Fit a function to a given data set, and use it to solve problems and identify trends (S.ID.6). • Make inferences and justify conclusions from sample surveys, experiments, and observational studies (S.IC.3, S.IC.4, S.IC.5, S.IC.6).