

Mathematics
Grade-Level Expectations: Grade 7

Number and Number Relations

1. Recognize and compute equivalent representations of fractions, decimals, and percents (i.e., halves, thirds, fourths, fifths, eighths, tenths, hundredths) (N-1-M)
2. Compare positive fractions, decimals, percents, and integers using symbols (i.e., $<$, \leq , $=$, \geq , $>$) and position on a number line (N-2-M)
3. Solve order of operations problems involving grouping symbols and multiple operations (N-4-M)
4. Model and apply the distributive property in real-life applications (N-4-M)
5. Multiply and divide positive fractions and decimals (N-5-M)
6. Set up and solve simple percent problems using various strategies, including mental math (N-5-M) (N-6-M) (N-8-M)
7. Select and discuss appropriate operations and solve single- and multi-step, real-life problems involving positive fractions, percents, mixed numbers, decimals, and positive and negative integers (N-5-M) (N-3-M) (N-4-M)
8. Determine the reasonableness of answers involving positive fractions and decimals by comparing them to estimates (N-6-M) (N-7-M)
9. Determine when an estimate is sufficient and when an exact answer is needed in real-life problems using decimals and percents (N-7-M) (N-5-M)
10. Determine and apply rates and ratios (N-8-M)
11. Use proportions involving whole numbers to solve real-life problems (N-8-M)

Algebra

12. Evaluate algebraic expressions containing exponents (especially 2 and 3) and square roots, using substitution (A-1-M)
13. Determine the square root of perfect squares and mentally approximate other square roots by identifying the two whole numbers between which they fall (A-1-M)
14. Write a real-life meaning of a simple algebraic equation or inequality, and vice versa (A-1-M) (A-5-M)
15. Match algebraic inequalities with equivalent verbal statements and vice versa (A-1-M)
16. Solve one- and two-step equations and inequalities (with one variable) in multiple ways (A-2-M)
17. Graph solutions sets of one-step equations and inequalities as points, or open and closed rays on a number line (e.g., $x = 5$, $x < 5$, $x \leq 5$, $x > 5$, $x \geq 5$) (A-2-M)
18. Describe linear, multiplicative, or changing growth relationships (e.g., 1, 3, 6, 10, 15, 21, ...) verbally and algebraically (A-3-M) (A-4-M) (P-1-M)
19. Use *function machines* to determine and describe the rule that generates outputs from given inputs (A-4-M) (P-3-M)

Measurement

20. Determine the perimeter and area of composite plane figures by subdivision and area addition (M-1-M) (G-7-M)
21. Compare and order measurements within and between the U.S. and metric systems in terms of common reference points (e.g., weight/mass and area) (M-4-M) (G-1-M)
22. Convert between units of area in U.S. and metric units within the **same** system (M-5-M)
23. Demonstrate an intuitive sense of comparisons between degrees Fahrenheit and Celsius in real-life situations using common reference points (M-5-M)

Geometry

24. Identify and draw angles (using protractors), circles, diameters, radii, altitudes, and 2-dimensional figures with given specifications (G-2-M)
25. Draw the results of reflections and translations of geometric shapes on a coordinate grid (G-3-M)

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26. Recognize π as the ratio between the circumference and diameter of any circle (i.e., $\pi = C/d$ or $\pi = C/2r$) (G-5-M)
27. Model and explain the relationship between perimeter and area (how scale change in a linear dimension affects perimeter and area) and between circumference and area of a circle (G-5-M)
28. Determine the radius, diameter, circumference, and area of a circle and apply these measures in real-life problems (G-5-M) (G-7-M) (M-6-M)
29. Plot points on a coordinate grid in all 4 quadrants and locate the coordinates of a missing vertex in a parallelogram (G-6-M) (A-5-M)
30. Apply the knowledge that the measures of the interior angles in a triangle add up to 180 degrees (G-7-M)

Data Analysis, Probability, and Discrete Math

31. Analyze and interpret circle graphs, and determine when a circle graph is the most appropriate type of graph to use (D-2-M)
32. Describe data in terms of patterns, clustered data, gaps, and outliers (D-2-M)
33. Analyze discrete and continuous data in real-life applications (D-2-M) (D-6-M)
34. Create and use Venn diagrams with three overlapping categories to solve counting logic problems (D-3-M)
35. Use informal thinking procedures of elementary logic involving *if/then* statements (D-3-M)
36. Apply the fundamental counting principle in real-life situations (D-4-M)
37. Determine probability from experiments and from data displayed in tables and graphs (D-5-M)
38. Compare theoretical and experimental probability in real-life situations (D-5-M)

Patterns, Relations, and Functions

39. Analyze and describe simple exponential number patterns (e.g., 3, 9, 27 or 3^1 , 3^2 , 3^3) (P-1-M)
40. Analyze and verbally describe real-life additive and multiplicative patterns involving fractions and integers (P-1-M) (P-4-M)
41. Illustrate patterns of change in length(s) of sides and corresponding changes in areas of polygons (P-3-M)