

Louisiana Grade-Level Expectations for Mathematics	Boardworks Middle School Math Presentations
Grade 6	
Number and Number Relations	
1. Factor whole numbers into primes (N-1-M)	Multiples and factors Prime numbers Prime factorization
2. Determine common factors and common multiples for pairs of whole numbers (N-1-M)	Multiples and factors
3. Find the greatest common factor (GCF) and least common multiple (LCM) for whole numbers in the context of problem-solving (N-1-M)	GCF and LCM
4. Recognize and compute equivalent representations of fractions and decimals (i.e., halves, thirds, fourths, fifths, eighths, tenths, hundredths) (N-1-M) (N-3-M)	Equivalent fractions Fractions and decimals Equivalent fractions, decimals and percentages
5. Decide which representation (i.e., fraction or decimal) of a positive number is appropriate in a real-life situation (N-1-M) (N-5-M)	-
6. Compare positive fractions, decimals, and positive and negative integers using symbols (i.e., $<$, $=$, $>$) and number lines (N-2-M)	Ordering fractions Ordering decimals Ordering integers Using negative numbers in context Inequalities
7. Read and write numerals and words for decimals through ten-thousandths (N-3-M)	Place value
8. Demonstrate the meaning of positive and negative numbers and their opposites in real life situations (N-3-M) (N-5-M)	Using negative numbers in context Absolute value

9. Add and subtract fractions and decimals in real-life situations (N-5-M)	Adding and subtracting simple fractions Methods for adding and subtracting fractions Written methods for addition and subtraction
10. Use and explain estimation strategies to predict computational results with positive fractions and decimals (N-6-M)	Estimation and approximation
11. Mentally multiply and divide by powers of 10 (e.g., $25/10 = 2.5$; $12.56 \times 100 = 1,256$) (N-6-M)	Mental math and place value
12. Divide 4-digit numbers by 2-digit numbers with the quotient written as a mixed number or a decimal (N-7-M)	-
13. Use models and pictures to explain concepts or solve problems involving ratio, proportion, and percent with whole numbers (N-8-M)	Ratio and rate Dividing in a given ratio Ratio and proportion problems Introducing percentages Equivalent fractions, decimals and percentages Percentage change Comparing proportions
Algebra	
14. Model and identify perfect squares up to 144 (A-1-M)	Square and triangular numbers
15. Match algebraic equations and expressions with verbal statements and vice versa (A-1-M) (A-3-M) (A-5-M) (P-2-M)	Writing expressions
16. Evaluate simple algebraic expressions using substitution (A-2-M)	Substitution
17. Find solutions to 2-step equations with positive integer solutions (e.g., $3x - 5 = 13$, $2x + 3x = 20$) (A-2-M)	Solving simple equations

Measurement	
18. Measure length and read linear measurements to the nearest sixteenth-inch and mm (M-1-M)	-
19. Calculate perimeter and area of triangles, parallelograms, and trapezoids (M-1-M)	Perimeter Area Area of irregular shapes Area problems Using formulas
20. Calculate, interpret, and compare rates such as \$/lb., mpg, and mph (M-1-M) (A-5-M)	-
21. Demonstrate an intuitive sense of relative sizes of common units for length and area of familiar objects in real-life problems (e.g., estimate the area of a desktop in square feet, the average adult is between 1.5 and 2 meters tall) (M-2-M) (G-1-M)	Estimating measurements
22. Estimate perimeter and area of any 2-dimensional figure (regular and irregular) using standard units (M-2-M)	Perimeter Area Area of irregular shapes Area problems Using formulas Area of a circle Circumference of a circle
23. Identify and select appropriate units to measure area (M-3-M)	Area Area of irregular shapes Area problems Customary unit conversions Converting metric units
Geometry	
24. Use mathematical terms to describe the basic properties of 3-dimensional objects (edges, vertices, faces, base, etc.) (G-2-M)	Solid shapes
25. Relate polyhedra to their 2-dimensional shapes by drawing or sketching their faces (G-2-M) (G-4-M)	Solid shapes 2-D representations of 3-D shapes Views of 3-D shapes

26. Apply concepts, properties, and relationships of points, lines, line segments, rays, diagonals, circles, and right, acute, and obtuse angles and triangles in real-life situations, including estimating sizes of angles (G-2-M) (G-5-M) (G-1-M)	Labeling lines and angles Parallel and perpendicular lines Circles Measuring angles Triangles Angles in a triangle Calculating angles Angles made with parallel lines
27. Make and test predictions regarding tessellations with geometric shapes (G-3-M)	Tessellations
28. Use a rectangular grid and ordered pairs to plot simple shapes and find horizontal and vertical lengths and area (G-6-M)	Introducing coordinates Quadrilaterals on a coordinate grid
Data Analysis, Probability, and Discrete Math	
29. Collect, organize, label, display, and interpret data in frequency tables, stem-and-leaf plots, and scatter plots and discuss patterns in the data verbally and in writing (D-1-M) (D-2-M) (A-3-M)	Organizing data Appropriate graphs Scatter plots
30. Describe and analyze trends and patterns observed in graphic displays (D-2-M)	Appropriate graphs Interpreting graphs Reading and plotting graphs Bar graphs Histograms Line graphs Comparing data
31. Demonstrate an understanding of precision, accuracy, and error in measurement (D-2-M) (M-2-M)	-
32. Calculate and discuss mean, median, mode, and range of a set of discrete data to solve real-life problems (D-2-M)	Calculating the mean Finding the median Finding the mode Finding the range
33. Create and use Venn diagrams with two overlapping categories to solve counting logic problems (D-3-M)	Venn diagrams

34. Use lists, tree diagrams, and tables to determine the possible combinations from two disjoint sets when choosing one item from each set (D-4-M)	Probability diagrams
35. Illustrate and apply the concept of complementary events (D-5-M)	Calculating probability part 2
36. Apply the meaning of equally likely and equally probable to real-life situations (D-5-M) (D-6-M)	The probability scale
Patterns, Relations, and Functions	
37. Describe, complete, and apply a pattern of differences found in an input-output table (P-1-M) (P-2-M) (P-3-M)	Mapping functions
38. Describe patterns in sequences of arithmetic and geometric growth and now-next relationships (i.e., growth patterns where the next term is dependent on the present term) with numbers and figures (P-3-M) (A-4-M)	Sequences from geometrical patterns Describing and continuing sequences Generating sequences and rules
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)	Equivalent fractions Fractions and decimals Equivalent fractions, decimals and percentages Introducing percentages
2. Compare positive fractions, decimals, percents, and integers using symbols (i.e., $<$, \leq , $=$, \geq , $>$) and position on a number line (N-2-M)	Ordering fractions Ordering decimals Ordering integers Inequalities Equivalent fractions, decimals and percentages
3. Solve order of operations problems involving grouping symbols and multiple operations (N-4-M)	Order of operations and PEMDAS
4. Model and apply the distributive property in real-life applications (N-4-M)	Properties of numbers

5. Multiply and divide positive fractions and decimals (N-5-M)	Multiplying fractions Finding a fraction of an amount Dividing by fractions Mental multiplication Mental division
6. Set up and solve simple percent problems using various strategies, including mental math (N-5-M) (N-6-M) (N-8-M)	Calculating percentages mentally Calculating percentages on paper Calculating percentages with a calculator Percentage change Percentages and inverse operations
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)	Calculating percentages mentally Calculating percentages on paper Calculating percentages with a calculator Percentage change Percentages and inverse operations Comparing proportions Finding a fraction of an amount Written methods for addition and subtraction Using negative numbers in context
8. Determine the reasonableness of answers involving positive fractions and decimals by comparing them to estimates (N-6-M) (N-7-M)	Estimation and approximation
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)	Calculating percentages mentally Rounding
10. Determine and apply rates and ratios (N-8-M)	Ratio and rate
11. Use proportions involving whole numbers to solve real-life problems (N-8-M)	Dividing in a given ratio Direct variations Direct proportion Using scale factors Ratio and proportion problems Conversion graphs

Algebra	
12. Evaluate algebraic expressions containing exponents (especially 2 and 3) and square roots, using substitution (A-1-M)	Powers Square roots Cubes and cube roots Substitution
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)	Square roots Estimation and approximation
14. Write a real-life meaning of a simple algebraic equation or inequality, and vice versa (A-1-M) (A-5-M)	Writing expressions Introducing formulas Solving linear inequalities Inequalities on a number line
15. Match algebraic inequalities with equivalent verbal statements and vice versa (A-1-M)	Solving linear inequalities Inequalities on a number line
16. Solve one- and two-step equations and inequalities (with one variable) in multiple ways (A-2-M)	Solving linear inequalities Solving simple equations
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)	Graphs of functions Inequalities on a number line
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)	Introducing sequences Sequences from geometrical patterns Describing and continuing sequences
19. Use function machines to determine and describe the rule that generates outputs from given inputs (A-4-M) (P-3-M)	Function machines Mapping functions
Measurement	
20. Determine the perimeter and area of composite plane figures by subdivision and area addition (M-1-M) (G-7-M)	Perimeter Area of irregular shapes
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)	Customary unit conversions Converting metric units

22. Convert between units of area in U.S. and metric units within the same system (M-5-M)	Customary unit conversions Converting metric units
23. Demonstrate an intuitive sense of comparisons between degrees Fahrenheit and Celsius in real-life situations using common reference points (M-5-M)	Using negative numbers in context
Geometry	
24. Identify and draw angles (using protractors), circles, diameters, radii, altitudes, and 2- dimensional figures with given specifications (G-2-M)	Drawing lines and angles Constructing lines and angles Circles Constructing triangles
25. Draw the results of reflections and translations of geometric shapes on a coordinate grid (G-3-M)	Reflection Translation
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)	Circumference of a circle
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)	Circles Circumference of a circle Area of a circle
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)	Introducing coordinates Quadrilaterals on a coordinate grid
30. Apply the knowledge that the measures of the interior angles in a triangle add up to 180 degrees (G-7-M)	Angles in a triangle Angles in polygons
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)	Circle graphs Appropriate graphs
32. Describe data in terms of patterns, clustered data, gaps, and outliers (D-2-M)	Scatter plots Calculating statistics

33. Analyze discrete and continuous data in real-life applications (D-2-M) (D-6-M)	Organizing data Histograms
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)	Probability diagrams
37. Determine probability from experiments and from data displayed in tables and graphs (D-5-M)	Experimental probability
38. Compare theoretical and experimental probability in real-life situations (D-5-M)	Calculating probability part 1 Experimental probability
Patterns, Relations, and Functions	
39. Analyze and describe simple exponential number patterns (e.g., 3, 9, 27 or 31, 32, 33) (P-1-M)	-
40. Analyze and verbally describe real-life additive and multiplicative patterns involving fractions and integers (P-1-M) (P-4-M)	Describing and continuing sequences Sequences from practical contexts
41. Illustrate patterns of change in length(s) of sides and corresponding changes in areas of polygons (P-3-M)	-
Grade 8	
Number and Number Relations	
	Equivalent fractions Fractions and decimals Equivalent fractions, decimals and percentages Introducing percentages Inequalities Inequalities on a number line Combined linear inequalities
1. Compare rational numbers using symbols (i.e., $<$, \leq , $=$, \geq , $>$) and position on a number line (N-1-M) (N-2-M)	Combined linear inequalities
2. Use whole number exponents (0-3) in problem-solving contexts (N-1-M) (N-5-M)	Powers

3. Estimate the answer to an operation involving rational numbers based on the original numbers (N-2-M) (N-6-M)	Estimation and approximation
4. Read and write numbers in scientific notation with positive exponents (N-3-M)	Scientific notation
5. Simplify expressions involving operations on integers, grouping symbols, and whole number exponents using order of operations (N-4-M)	Order of operations and PEMDAS
6. Identify missing information or suggest a strategy for solving a real-life, rational-number problem (N-5-M)	-
7. Use proportional reasoning to model and solve real-life problems (N-8-M)	Ratio and proportion problems Conversion graphs Customary unit conversions Direct variations Direct proportion Comparing proportions
8. Solve real-life problems involving percentages, including percentages less than 1 or greater than 100 (N-8-M) (N-5-M)	Calculating percentages mentally Calculating percentages on paper Calculating percentages with a calculator Percentage change Percentages and inverse operations Comparing proportions
9. Find unit/cost rates and apply them in real-life problems (N-8-M) (N-5-M) (A-5-M)	Ratio and rate
Algebra	
10. Write real-life meanings of expressions and equations involving rational numbers and variables (A-1-M) (A-5-M)	Writing expressions
11. Translate real-life situations that can be modeled by linear or exponential relationships to algebraic expressions, equations, and inequalities (A-1-M) (A-4-M) (A-5-M)	Writing expressions Direct variations Solving linear inequalities

	Solving linear inequalities Inequalities on a number line Combined linear inequalities Inequalities and regions Graphs of functions The equation of a straight line
12. Solve and graph solutions of multi-step linear equations and inequalities (A-2-M)	
13. Switch between functions represented as tables, equations, graphs, and verbal representations, with and without technology (A-3-M) (P-2-M) (A-4-M)	Mapping functions Graphs of functions The equation of a straight line
14. Construct a table of x- and y-values satisfying a linear equation and construct a graph of the line on the coordinate plane (A-3-M) (A-2-M)	Graphs of functions
15. Describe and compare situations with constant or varying rates of change (A-4-M)	Interpreting graphs Distance-time graphs Reading and plotting graphs
16. Explain and formulate generalizations about how a change in one variable results in a change in another variable (A-4-M)	Reading and plotting graphs Graphs of functions
Measurement	
17. Determine the volume and surface area of prisms and cylinders (M-1-M) (G-7-M)	Volume Surface area Cylinders, cones and spheres
18. Apply rate of change in real-life problems, including density, velocity, and international monetary conversions (M-1-M) (N-8-M) (M-6-M)	Conversion graphs
19. Demonstrate an intuitive sense of the relative sizes of common units of volume in relation to real-life applications and use this sense when estimating (M-2-M) (G-1-M)	Estimating measurements
20. Identify and select appropriate units for measuring volume (M-3-M)	Volume
21. Compare and estimate measurements of volume and capacity within and between the U.S. and metric systems (M-4-M) (G-1-M)	-
22. Convert units of volume/capacity within systems for U.S. and metric units (M-5-M)	Converting metric units Customary unit conversions

Geometry	
23. Define and apply the terms measure, distance, midpoint, bisect, bisector, and perpendicular bisector (G-2-M)	Finding the midpoint of a line segment Constructing lines and angles
24. Demonstrate conceptual and practical understanding of symmetry, similarity, and congruence and identify similar and congruent figures (G-2-M)	Congruence Reflection symmetry Rotational symmetry
25. Predict, draw, and discuss the resulting changes in lengths, orientation, angle measures, and coordinates when figures are translated, reflected across horizontal or vertical lines, and rotated on a grid (G-3-M) (G-6-M)	Translation Reflection Rotation Combining transformations
26. Predict, draw, and discuss the resulting changes in lengths, orientation, and angle measures that occur in figures under a similarity transformation (dilation) (G-3-M) (G-6-M)	Dilation
27. Construct polyhedra using 2-dimensional patterns (nets) (G-4-M)	Nets Constructing nets
28. Apply concepts, properties, and relationships of adjacent, corresponding, vertical, alternate interior, complementary, and supplementary angles (G-5-M)	Calculating angles Angles made with parallel lines
29. Solve problems involving lengths of sides of similar triangles (G-5-M) (A-5-M)	Finding missing lengths
30. Construct, interpret, and use scale drawings in real-life situations (G-5-M) (M-6-M) (N-8-M)	Scale drawings
31. Use area to justify the Pythagorean theorem and apply the Pythagorean theorem and its converse in real-life problems (G-5-M) (G-7-M)	Pythagorean Theorem Calculating sides of right triangles
32. Model and explain the relationship between the dimensions of a rectangular prism and its volume (i.e., how scale change in linear dimension(s) affects volume) (G-5-M)	-
33. Graph solutions to real-life problems on the coordinate plane (G-6-M)	Direct variations Conversion graphs Reading and plotting graphs

Data Analysis, Probability, and Discrete Math	
34. Determine what kind of data display is appropriate for a given situation (D-1-M)	Appropriate graphs
35. Match a data set or graph to a described situation, and vice versa (D-1-M)	Comparing data
36. Organize and display data using circle graphs (D-1-M)	Circle graphs
37. Collect and organize data using box-and-whisker plots and use the plots to interpret quartiles and range (D-1-M) (D-2-M)	Quartiles and box plots Interquartile range
38. Sketch and interpret a trend line (i.e., line of best fit) on a scatterplot (D-2-M) (A-4-M) (A-5-M)	Scatter plots
39. Analyze and make predictions from discovered data patterns (D-2-M)	Appropriate graphs
40. Explain factors in a data set that would affect measures of central tendency (e.g., impact of extreme values) and discuss which measure is most appropriate for a given situation (D-2-M)	Calculating statistics Finding the mode Finding the median Calculating the mean
41. Select random samples that are representative of the population, including sampling with and without replacement, and explain the effect of sampling on bias (D-2-M) (D-4-M)	Population and sampling
42. Use lists, tree diagrams, and tables to apply the concept of permutations to represent an ordering with and without replacement (D-4-M)	-
43. Use lists and tables to apply the concept of combinations to represent the number of possible ways a set of objects can be selected from a group (D-4-M)	Probability diagrams
44. Use experimental data presented in tables and graphs to make outcome predictions of independent events (D-5-M)	-
45. Calculate, illustrate, and apply single- and multiple-event probabilities, including mutually exclusive, independent events and non-mutually exclusive, dependent events (D-5-M)	Calculating probability part 2