

MEDFORD PUBLIC SCHOOLS

6-8 MATHEMATICS CURRICULUM HIGHLIGHTS

GRADE 6

Through problem solving, reasoning, communication, representation, and connections, students should be able to.....

NUMBER SENSE

- Represent very large positive numbers through trillions and very small positive numbers through millionths in various forms, including expanded and exponential notation
- Explore and identify integers concretely; explore computations with integers; order integers
- Solve problems involving ratios and proportions
- Compare and order whole numbers, fractions, and decimals (including percents); find equivalencies
- Compute with whole numbers, fractions, decimals and percents; apply to the solution of problems
- Estimate and check the results of computations
- Apply order of operations
- Apply number theory concepts (e.g. factors, multiples, prime, composite, CGF, LCM, divisibility)

GEOMETRY & MEASUREMENT

- Identify, compare, describe, and classify polygons
- Identify, draw, and describe the relationships among points, lines, segments, and planes
- Measure, describe, construct, and classify various angles and triangles
- Find angle sums in regular polygons
- Draw shapes from different perspectives
- Graph points on the coordinate plane

- Describe and perform transformations on shapes
- Find perimeters and areas of polygons (e.g. triangles, parallelogram); contrast perimeter/area
- Apply formula for volume of rectangular prisms
- Explore radius, diameter, circumference, area of circle; describe relationships

PATTERNS, RELATIONS & FUNCTIONS

- Recognize, describe, analyze, extend, and create geometric and numeric patterns; form generalizations
- Use patterns and functions to solve problems
- Develop conceptual understanding of variables, expressions, and equations
- Explore and solve linear equations with concrete models, tables, graphs, and paper-and-pencil methods
- Create and interpret graphical sketches representing real events; represent mathematical relationships with concrete materials, tables, graphs, and verbal rules

PROBABILITY & STATISTICS

- Collect, organize, display, and analyze data to solve problems
- Construct and interpret tables, bar graphs, line graphs, line plots, circle graphs, and stem and leaf plots
- Describe data sets using mean, mode, median, maximum, minimum, and range
- Carry out experiments and simulations to determine probability of events; use tree diagrams, lists, tables, and other models to represent outcomes

Grade 7

Through problem solving, reasoning, communication, representation, and connections, students should be able to.....

NUMBER SENSE

- Represent numbers in scientific notation
- Estimate and compute with fractions, decimals, percents, and integers
- Apply powers and roots to the solution of problems
- Solve problems involving ratios and proportions
- Apply order of operations, including with exponents
- Identify properties of operations
- Apply number theory concepts (e.g. prime factorization, GCF, LCM)
- Know when an estimate is appropriate; use a variety of estimation strategies; determine reasonableness of results

GEOMETRY & MEASUREMENT

- Compare, describe, classify, model and/or draw 2- and 3-D figures; classify triangles
- Construct and find angle measures; find sum of interior angles of polygons
- Construct and identify parallel, perpendicular, and intersecting lines
- Perform transformations on the coordinate plane; analyze the effect of the transformation
- Apply properties of congruence and similarity
- Develop, explain, and apply Pi and the Pythagorean Theorem
- Find the area and perimeter of polygons; identify radius, diameter, and circumference of circles
- Find surface area and volume of prisms, cylinders, pyramids, and cones
- Apply rates and indirect measures

PATTERNS, RELATIONS & FUNCTIONS

- Represent numeric and geometric patterns using models, tables, graphs, rules, and algebraic equations

- Explore concept of a function; use patterns and functions to represent and solve problems
- Write expressions and equations for problem situations; evaluate and simplify variable expressions; solve and graph equations and inequalities

PROBABILITY & STATISTICS

- Collect and organize data systematically; represent data in single and double line and bar graphs, stem and leaf plots, scatter plots, histograms, and circle graphs; analyze data
- Find mean, median, mode, range of data; decide which measure of central tendency is appropriate
- Compare experimental with theoretical probability
- Solve problems involving combinations and arrangements
- Use tree diagrams to solve problems

Grade 8

Through problem solving, reasoning, communication, representation, and connections, students should be able to.....

NUMBER SENSE

- Represent numbers in scientific and exponential notation, and use them to solve problems
- Define and apply common irrational numbers (e.g. Pi, Square root of 2)
- Estimate and compute with fractions (algebraically), decimals, percents, and integers
- Determine the effects of operations on different types of numbers
- Apply powers and roots to the solution of problems
- Solve problems involving ratios and proportions (e.g. indirect measurement)
- Identify properties of operations on integers and rational numbers (e.g. closure, associative, commutative, distributive, identity, inverse)

- Apply Fundamental Counting Principle

GEOMETRY & MEASUREMENT

- Classify figures in terms of congruence and similarity; solve related problems
- Describe angles formed by intersecting lines and the relationship among them
- Generalize the relationship among the number of sides and the sums of angle measures in polygons
- Apply formulas and procedures to problems involving surface area and volume
- Explore and apply relationships found in right triangles; apply Pythagorean Theorem
- Transform figures on the coordinate plane and analyze their effects
- Use technology and construction tools to formulate and test conjectures and to make geometric constructions
- Use proportional relationships in similar figures

PATTERNS, RELATIONS & FUNCTIONS

- Represent and analyze a variety of numeric and geometric patterns (iterative and recursive; linear and non linear functions)
- Use tables and graphs to compare linear, quadratic, and exponential growth patterns
- Write expressions and equations for problem situations; evaluate and simplify variable expressions; solve and graph equations (linear and non linear) and inequalities
- Identify slope and y-intercept of a line from its equation, tables, and graph; apply the concept of slope to the solution of problems
- Explain how a change in one variable effects a change in another

PROBABILITY & STATISTICS

- Collect and organize data; represent data in scatter plots, histograms, circle graphs and box-and-whisker plots; make inferences and draw conclusions

- Find mean, median, mode, range, of data; decide which measure of central tendency is appropriate
- Compute permutations and combinations
- Use tree diagrams, tables, and lists to describe sample spaces and to calculate probabilities of independent and dependent events
- Investigate concept of "fair game"
- Make inferences about a characteristic of a population from a well-constructed sample (e.g. capture-recapture)

$$50+100+250+100+500=1000$$
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