

Illinois Learning Standards for Mathematics	Boardworks Middle School Math Presentations
Middle/Junior High Math	
STATE GOAL 6: Demonstrate and apply a knowledge and sense of numbers, including numeration and operations (addition, subtraction, multiplication, division), patterns, ratios and proportions.	
A. Demonstrate knowledge and use of numbers and their representations in a broad range of theoretical and practical settings.	
6.A.3 Represent fractions, decimals, percentages, exponents and scientific notation in equivalent forms.	Equivalent fractions Equivalent fractions, decimals and percentages Powers Scientific notation Fractions and decimals Introducing percentages
B. Investigate, represent and solve problems using number facts, operations (addition, subtraction, multiplication, division) and their properties, algorithms and relationships.	
6.B.3a Solve practical computation problems involving whole numbers, integers and rational numbers.	Adding and subtracting integers Adding and subtracting integers activities Multiplying and dividing integers Rational and irrational numbers Written methods for addition and subtraction Written methods for multiplication Written methods for division Mental math puzzles Mental multiplication Mental division Mental addition and subtraction Mental math and place value

6.B.3b Apply primes, factors, divisors, multiples, common factors and common multiples in solving problems.	Divisibility Multiples and factors Prime numbers Prime factorization GCF and LCM
6.B.3c Identify and apply properties of real numbers including pi, squares, and square roots.	Square roots Square and triangular numbers Circumference of a circle
C. Compute and estimate using mental mathematics, paper-and-pencil methods, calculators and computers.	
6.C.3a Select computational procedures and solve problems with whole numbers, fractions, decimals, percents and proportions.	Adding and subtracting integers Adding and subtracting integers activities Multiplying and dividing integers Mental division Mental multiplication Adding and subtracting simple fractions Methods for adding and subtracting fractions Multiplying fractions Dividing by fractions Finding a fraction of an amount Introducing percentages Calculating percentages mentally Calculating percentages on paper Calculating percentages with a calculator Comparing proportions Percentage change Percentages and inverse operations Written methods for addition and subtraction Written methods for multiplication Written methods for division Mental addition and subtraction
6.C.3b Show evidence that computational results using whole numbers, fractions, decimals, percents and proportions are correct and/or that estimates are reasonable.	Checking results Estimation and approximation

	Ordering integers Ordering decimals Ordering fractions Introducing percentages Equivalent fractions, decimals and percentages Comparing proportions Percentage change Percents and inverse operations Ratio and rate Dividing in a given ratio Direct proportion Using scale factors Ratio and proportion problems
D. Solve problems using comparison of quantities, ratios, proportions and percents.	Ratio and proportion problems Direct proportion Dividing in a given ratio
6.D.3 Apply ratios and proportions to solve practical problems.	Ratio and proportion problems Direct proportion Dividing in a given ratio
STATE GOAL 7: Estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.	
A. Measure and compare quantities using appropriate units, instruments and methods.	
7.A.3a Measure length, capacity, weight/mass and angles using sophisticated instruments (e.g., compass, protractor, trundle wheel).	Measuring angles Reading scales Drawing lines and angles
7.A.3b Apply the concepts and attributes of length, capacity, weight/mass, perimeter, area, volume, time, temperature and angle measures in practical situations.	Perimeter Area Volume Measuring angles Area problems Surface area Reading scales
B. Estimate measurements and determine acceptable levels of accuracy.	
7.B.3 Select and apply instruments including rulers and protractors and units of measure to the degree of accuracy required.	Measuring angles Customary unit conversions Converting metric units Estimating measurements

C. Select and use appropriate technology, instruments and formulas to solve problems, interpret results and communicate findings.	
7.C.3a Construct a simple scale drawing for a given situation.	Scale drawings
7.C.3b Use concrete and graphic models and appropriate formulas to find perimeters, areas, surface areas and volumes of two- and three-dimensional regions.	Perimeter Area Volume Area problems Surface area Cylinders, cones and spheres Area of a circle Area of irregular shapes Circumference of a circle
STATE GOAL 8: Use algebraic and analytical methods to identify and describe patterns and relationships in data, solve problems and predict results.	
A. Describe numerical relationships using variables and patterns.	
8.A.3a Apply the basic properties of commutative, associative, distributive, transitive, inverse, identity, zero, equality and order of operations to solve problems.	Properties of numbers
8.A.3b Solve problems using linear expressions, equations and inequalities.	Solving simple equations Inequalities Inequalities on a number line Integer solutions for inequalities Solving linear inequalities Combined linear inequalities Inequalities and regions Systems of linear equations Equations with variables on both sides Substitution Equations involving parentheses and division
B. Interpret and describe numerical relationships using tables, graphs and symbols.	
8.B.3 Use graphing technology and algebraic methods to analyze and predict linear relationships and make generalizations from linear patterns.	The equation of a straight line Reading and plotting graphs Conversion graphs Distance-time graphs Interpreting graphs

C. Solve problems using systems of numbers and their properties.	
8.C.3 Apply the properties of numbers and operations including inverses in algebraic settings derived from economics, business and the sciences.	-
D. Use algebraic concepts and procedures to represent and solve problems.	
8.D.3a Solve problems using numeric, graphic or symbolic representations of variables, expressions, equations and inequalities.	Writing expressions Combining like terms Multiplying algebraic terms Dividing algebraic terms Factoring expressions Substitution Solving simple equations Equations with variables on both sides Equations involving parentheses and division Nonlinear equations Nonlinear equations and spreadsheets The equation of a straight line Reading and plotting graphs Conversion graphs Distance-time graphs Interpreting graphs Graphs of nonlinear functions Exploring nonlinear graphs Inequalities Inequalities on a number line Integer solutions for inequalities Solving linear inequalities Combined linear inequalities Inequalities and regions Systems of linear equations

8.D.3b Propose and solve problems using proportions, formulas and linear functions.	Introducing formulas Using formulas Transforming formulas Deriving formulas Mapping functions Inverse functions Graphs of functions Direct proportion Ratio and proportion problems
8.D.3c Apply properties of powers, perfect squares and square roots.	Powers Square and triangular numbers Square roots
STATE GOAL 9: Use geometric methods to analyze, categorize and draw conclusions about points, lines, planes and space.	
A. Demonstrate and apply geometric concepts involving points, lines, planes and space.	
9.A.3a Draw or construct two- and three- dimensional geometric figures including prisms, pyramids, cylinders and cones.	Solid shapes Nets Constructing nets 2-D representations of 3-D shapes Constructing triangles Triangles Quadrilaterals Circles Polygons
9.A.3b Draw transformation images of figures, with and without the use of technology.	Reflection Reflection symmetry Rotation Rotational symmetry Translations Dilation Combining transformations

<p>9.A.3c Use concepts of symmetry, congruency, similarity, scale, perspective, and angles to describe and analyze two- and three-dimensional shapes found in practical applications (e.g., geodesic domes, A-frame houses, basketball courts, inclined planes, art forms, blueprints).</p>	<p>Congruence Reflection symmetry Rotational symmetry Reflection Rotation Scale drawings Labeling lines and angles Parallel and perpendicular lines Angles made with parallel lines Angles in a triangle Angles in polygons The sum of interior and exterior angles Tessellations Views of 3-D shapes Measuring angles</p>
<p>B. Identify, describe, classify and compare relationships using points, lines, planes and solids.</p>	
<p>9.B.3 Identify, describe, classify and compare two- and three- dimensional geometric figures and models according to their properties.</p>	<p>Triangles Quadrilaterals Circles Polygons Solid shapes Cylinders, cones and spheres Formulas for shapes</p>

C. Construct convincing arguments and proofs to solve problems.	
<p>9.C.3a Construct, develop and communicate logical arguments (informal proofs) about geometric figures and patterns.</p>	<ul style="list-style-type: none"> Triangles Quadrilaterals Circles Polygons Solid shapes Cylinders, cones and spheres Formulas for shapes Angles in polygons Angles in a triangle The sum of interior and exterior angles Tessellations Labeling lines and angles Parallel and perpendicular lines Calculating angles Angles made with parallel lines
<p>9.C.3b Develop and solve problems using geometric relationships and models, with and without the use of technology.</p>	<ul style="list-style-type: none"> Triangles Quadrilaterals Circles Polygons Solid shapes Cylinders, cones and spheres Formulas for shapes Angles in polygons Angles in a triangle The sum of interior and exterior angles Tessellations Labeling lines and angles Parallel and perpendicular lines Calculating angles Angles made with parallel lines

D. Use trigonometric ratios and circular functions to solve problems.	
9.D.3 Compute distances, lengths and measures of angles using proportions, the Pythagorean theorem and its converse.	Estimating measures Converting metric units Customary unit conversions Pythagorean Theorem Pythagorean triples Calculating sides of right triangles Finding missing lengths
STATE GOAL 10: Collect, organize and analyze data using statistical methods; predict results; and interpret uncertainty using concepts of probability.	
A. Organize, describe and make predictions from existing data.	
10.A.3a Construct, read and interpret tables, graphs (including circle graphs) and charts to organize and represent data.	Organizing data Bar graphs Circle graphs Line graphs Scatter plots Histograms Venn diagrams Appropriate graphs Quartiles and box plots
10.A.3b Compare the mean, median, mode and range, with and without the use of technology.	Calculating the mean Finding the median Finding the mode Finding the range Calculating statistics
10.A.3c Test the reasonableness of an argument based on data and communicate their findings.	Writing a statistical report Calculating statistics Comparing data

B. Formulate questions, design data collection methods, gather and analyze data and communicate findings.	
10.B.3 Formulate questions (e.g., relationships between car age and mileage, average incomes and years of schooling), devise and conduct experiments or simulations, gather data, draw conclusions and communicate results to an audience using traditional methods and contemporary technologies.	Population and sampling Collecting data Organizing data Writing a statistical report Calculating statistics Comparing data Calculating the mean Finding the median Finding the mode Finding the range Bar graphs Circle graphs Line graphs Scatter plots Histograms Venn diagrams Appropriate graphs Quartiles and box plots
C. Determine, describe and apply the probabilities of events.	
10.C.3a Determine the probability and odds of events using fundamental counting principles.	Probability diagrams
10.C.3b Analyze problem situations (e.g., board games, grading scales) and make predictions about results.	The language of probability The probability scale Calculating probability part 1 Calculating probability part 2 Probability diagrams Experimental probability