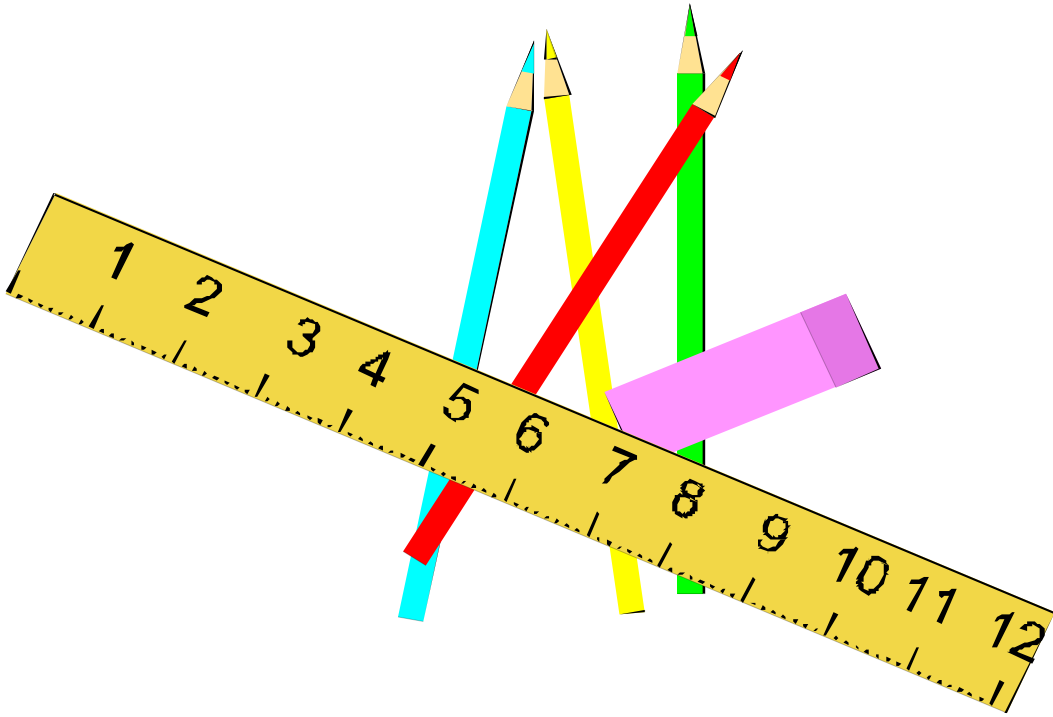


QUINCY PUBLIC SCHOOLS STANDARDS MAPS
MATHEMATICS
GRADE 8



Based on the Quincy Public Schools Design for Learning 2000

**QUINCY PUBLIC SCHOOLS STANDARDS MAPS
MATHEMATICS
GRADE 8**

STRAND #1: NUMBER SENSE		
	STATE STANDARDS	GRADE 8 OBJECTIVES
	1.6 NUMBER SENSE AND NUMBER RELATIONSHIPS Students engage in problem solving, communicating, reasoning, and connecting to:	
1.6.1	Represent and Use Equivalent Forms of Numbers	<ol style="list-style-type: none"> 1. Recognize frequently used rational and irrational numbers. 2. Identify examples of natural numbers, whole numbers, and integers.
1.6.2	Apply Ratios, Proportions, and Percents	<ol style="list-style-type: none"> 3. Find a ratio of one quantity to another. 4. Write and solve a proportion. 5. Calculate a percent equation. 6. Solve discount problems using percent.
1.6.3	Relations of Fractions, Decimals, and Percents.	<ol style="list-style-type: none"> 7. Convert decimals to fractions to percent.
1.6.4	Represent numerical relationships in one- and two-dimensional graphs.	<ol style="list-style-type: none"> 8. Identify Cartesian planes with four quadrants. 9. Label positive and negative integers.
	1.7 NUMBER SYSTEMS AND NUMBER THEORY Students engage in problem solving, communicating, reasoning, and connecting to:	
1.7.1	Explain the need for numbers other than whole numbers.	<ol style="list-style-type: none"> 10. Create and solve problems that show: division of numbers that result in numbers other than whole numbers for answers 11. Find problems and use number (other than whole numbers for real life situations) such as: money, measuring, distance etc.
1.7.2	Know and use order relations for whole numbers, fractions, decimals, integers, and rational numbers.	<ol style="list-style-type: none"> 12. Perform plotting of whole numbers, decimals, and integers as rational numbers on a number line. 13. Order rational numbers by plotting points on a number line.
1.7.3	Use operations involving fractions, decimals, integers, and rational numbers.	<ol style="list-style-type: none"> 14. Perform the four basic operations with rational numbers.
1.7.4	Demonstrate how basic operations are related to one another.	<ol style="list-style-type: none"> 15. Demonstrate the use of the order of operations. 16. Solve a real-life situation, using the distributive property.
1.7.5	Create and apply number theory concepts, including prime numbers, factors, and multiples.	<ol style="list-style-type: none"> 17. Determine what a prime number is. 18. Describe a prime number. 19. Find the Greatest Common Factor (GCF) of three numbers. 20. Find the Least Common Multiple (LCM) of three numbers.

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STRAND #1: NUMBER SENSE		
	STATE STANDARDS	GRADE 8 OBJECTIVES
	1.8 COMPUTATION AND ESTIMATION Students engage in problem solving, communicating, reasoning, and connecting to:	
1.8.1	Compute with whole numbers, fractions, decimals, integers, and rational numbers.	21. Calculate math programs using fractions and integers. 22. Solve word problems using rational numbers.
1.8.2	Develop, analyze, and explain procedures for computing, estimating, and solving proportions.	23. Given a problem, decide on a reasonable estimation as a solution. 24. Identify and compute the correct applications involving world problems.
1.8.3	Select and use an appropriate method for computing from among mental arithmetic, paper-and-pencil, calculator, and computer methods.	25. Given a problem decide on a reasonable estimate. 26. Solve a given problem, selecting the most reasonable strategy.
1.8.4	Use computation, estimation, and proportions to solve problems. Estimate to check the reasonableness of results of computations and problems involving rational numbers.	27. Interpret a graph. 28. Apply problem-solving strategies.

STRAND #2: PATTERNS, RELATIONS AND FUNCTIONS		
	STATE STANDARDS	GRADE 8 OBJECTIVES
	2.4 PATTERNS AND FUNCTIONS Students engage in problem solving, communicating, reasoning, and connecting to:	
2.4.1	Use a pattern to write the missing terms in an arithmetic and geometric sequence.	<ul style="list-style-type: none"> • Discover patterns in area.
2.4.2	Represent data in a coordinate plane to discover relationships and patterns between two variables.	<ul style="list-style-type: none"> • Create and interpret line graphs representing changes over time.
2.4.3	Evaluate expressions by substituting x values given a rule to determine y values.	<ul style="list-style-type: none"> • Analyze how change in the radius or diameter effects the circumference of a circle.
2.4.4	Write complete equations that represent problem situations with one variable.	<ul style="list-style-type: none"> • Solve world problems by applying formulas for area, volume, and circumference. • Use a pattern to find 1 %, 10 %, and 100% of a number.

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STRAND #2: PATTERNS, RELATIONS AND FUNCTIONS		
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	2.5 ALGEBRA Students engage in problem solving, communicating, reasoning, and connecting to:	
2.5.1	Translate verbal sentences into algebraic equation.	<ul style="list-style-type: none"> Simplify an equation or an expression and evaluate for a given variable.
2.5.2	Construct a chart and translate data into an algebraic equation when given a problem with two variables.	<ul style="list-style-type: none"> Demonstrate proficiency in solving linear equations and their applications using graphs and algebraic methods.
2.5.3	Justify in writing, the results of an investigation.	<ul style="list-style-type: none"> Graph inequality results on a number line on a coordinate plane.
2.5.4	Solve two-step equations by using formal rules.	<ul style="list-style-type: none"> Solve equations with variables on two sides. Solve linear equations with two variables. Use the distributive property when solving equations. Use the table method to graph linear equations. *Use the slope/intercept method to graph linear equations.
2.5.5	Shade graphs to illustrate inequalities on a number line.	<ul style="list-style-type: none"> *Shade graphs to illustrate inequalities on a coordinate plane. Solve inequalities using equation rules. Use ratio to identify similar triangles.
2.5.6	Translate verbal sentences into algebraic equations.	<ul style="list-style-type: none"> Use formulas to find perimeter, circumference, area, and volume of geometric shapes. Solve percentage problems using either proportions or equations.
2.5.7	Use complementary and supplementary rules when finding missing angles.	<ul style="list-style-type: none"> Use formulas to find the surface area of prisms and cylinders. Use vertical and corresponding angles.
2.5.8	Use locking cubes and other manipulatives to solve patterns and formulas.	<ul style="list-style-type: none"> Use graph paper to explore formulas.
2.5.9	Find the circumference of a circle.	<ul style="list-style-type: none"> Find the area of a circle. Use the Pythagorean Theorem in solving right triangle problems. Find the area of an irregular region.

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STRAND #3: GEOMETRY AND MEASUREMENT		
	STATE STANDARDS	GRADE 8 OBJECTIVES
	3.3 GEOMETRY Students engage in problem solving, communicating, reasoning, and connecting to:	
3.3.1	Classify figures in terms of congruence and similarities.	<ul style="list-style-type: none"> Apply these relationships to solution of problems.
3.3.2	Predict the results of transformations of coordinate planes and draw transformed figure.	<ul style="list-style-type: none"> Illustrate lines, rays, and points on a coordinate plane when constructing models.
3.3.3.	Construct various examples polygons using straws.	
3.3.4	Infer the results of transformations of the coordinate plane and draw the transformed figure e.g. tessellations.	<ul style="list-style-type: none"> Examine quadrilaterals by the number of lines of symmetry.
3.3.5	Create geometric models and find the surface area and volume.	<ul style="list-style-type: none"> Generate formulas from models.
3.3.6	Design the floor plan of a mall, include halls, lay out of stores, food courts, seating, etc. In the design use properties of parallel and perpendicular lines; triangles; quadrilaterals and polygons; area and perimeter.	
3.3.7	Calculate the volume of a cone and compare to the volume of a cylinder with the same base and height.	
3.3.8	Construct a scale model of pyramid and calculate the surface area using the Pythagorean theorem.	<ul style="list-style-type: none"> Calculate various heights of triangles and pyramids using the Pythagorean theorem.
	3.4 MEASUREMENT Students engage in problem solving, communicating, reasoning, and connecting to:	
3.4.1	Demonstrate the use of appropriate tools to measure angles.	<ul style="list-style-type: none"> Apply the use of a protractor to measure direction on a map. Use a protractor, compass and ruler to discover a route/distance on a map.
3.4.2	Apply skills of measurement in life skills curriculum of volume and mass.	
3.4.3	Use proportions to solve real life problems: i.e. properties of similar triangles to measure heights of trees, flagpoles, and obelisks. (Cross reference to science)	
3.4.4	Demonstrate using formulas, which of three containers have the same volume as the least surface area.	

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STRAND #4: STATISTICS AND PROBABILITY		
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	4.2 STATISTICS Students engage in problem solving, communicating, reasoning, and connecting to:	
4.2.1	Collect, organize, and describe data systematically.	<ul style="list-style-type: none"> • Graph data using box and whisker plots, scatter plots, circle graphs, horizontal and vertical bar graph, etc. • Arrange, organize, and collect data. • Make inferences and predictions about future event.
4.2.2	Construct, read, and interpret tables, charts, and graphs.	<ul style="list-style-type: none"> • Select a space sample. • Create and conduct a survey. • Graph results of a survey.
4.2.3	Make inferences and convincing arguments that are based on data analysis.	<ul style="list-style-type: none"> • Examine and debate conclusions derived from visually misleading graphs.
4.2.4	Evaluate arguments that are based on data analysis.	<ul style="list-style-type: none"> • Compare and contrast the same information from different sources. • Differentiate between continuous and discrete data. • Select ways to represent continuous and discrete data.
4.2.5	Develop and explain why statistical methods are powerful aids for decision-making.	<ul style="list-style-type: none"> • Apply statistical theories by planning a future investment bases on statistical data. • Justify decisions.
	4.3 PROBABILITY Students engage in problem solving, communicating, reasoning, and connecting to:	
4.3.1.	Model situations by devising and carrying out experiments or simulations to determine probabilities.	<ul style="list-style-type: none"> • Find the intuitive, theoretical, and experimental probability of an event (Pascal's Triangle).
4.3.2	Construct a sample space to determine probabilities.	<ul style="list-style-type: none"> • Design a space sample and generate several likely outcomes.
4.3.3	Describe the power of using a probability model by comparing experimental results with mathematical expectations.	<ul style="list-style-type: none"> • Calculate the experimental and theoretical probability of an event.

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STRAND #4: STATISTICS AND PROBABILITY		
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4.3.4	Make predictions that are based on experimental or theoretical probabilities and determine their reasonableness.	<ul style="list-style-type: none"> • Develop inferences based on the results obtained from using Pascal's Triangle to find the probability of an event, designing a space sample, generating outcomes and field-testing.
4.3.5	Develop and explain an appreciation for the pervasive use of probability in the real world.	<ul style="list-style-type: none"> • Recognize the use of probability in the real world, i.e. advertising, forecasting, public opinion polls, etc.