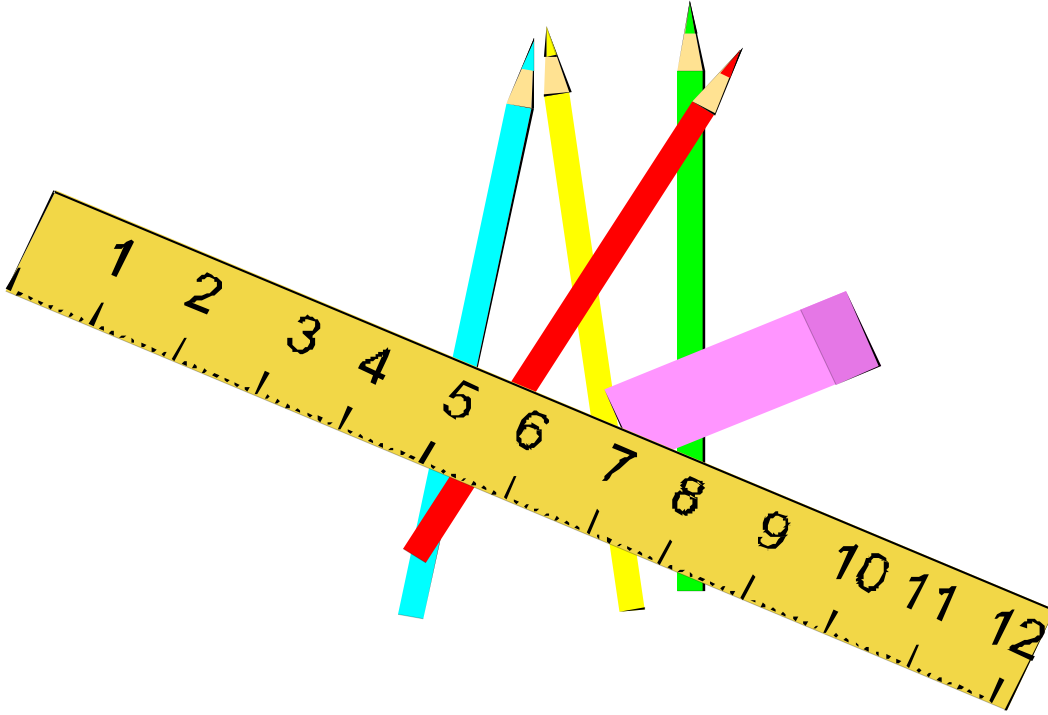


QUINCY PUBLIC SCHOOLS STANDARDS MAPS
MATHEMATICS
GRADE 6



Based on the Quincy Public Schools Design for Learning 2000

**QUINCY PUBLIC SCHOOLS STANDARDS MAPS
MATHEMATICS
GRADE 6**

STRAND #1: NUMBER SENSE		
	STATE STANDARDS	GRADE 6 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	1. Recognize very large positive numbers and very small positive numbers (billions, trillions, hundreds, and thousands) 2. Use multiples of ten to construct whole numbers and decimal numbers in expanded form. 3. Diagram two or more equivalent fractions. 4. Recognize fractions in equivalent forms. 5. Rewrite fractions in simplest form. 6. Recognize and generate least common denominators. 7. Rewrite two fractions with a common denominator. 8. Interchange improper fractions and mixed/whole numbers.
1.6.2	Apply Ratios, Proportions, and Percents	9. Use ratios to compare values. 10. Write ratios. 11. Determine if two ratios are equivalent. 12. Solve a proportion. 13. Solve real-life problems using percent. 14. Estimate percents.
1.6.3	Relations of Fractions, Decimals, and Percents.	15. Describe the relationships between a fraction, decimal, and percent. 16. Interchange: fraction to decimal. decimal to percent. fraction to percent. 17. Use percents to solve problems. 18. Rewrite: decimals as fractions. fractions as decimals. percents as decimals. percents as fractions. 19. Use real-life problems to change decimals and fractions as percents.
1.6.4	Represent numerical relationships in one- and two-dimensional graphs.	20. Use tables, graphs, and charts to organize data and solve problems. 21. Design and interpret circle graphs, line graphs, and histograms. 22. Use graphs to interpret probabilities and ratios.

STRAND #1: NUMBER SENSE

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STRAND #1: NUMBER SENSE		
	STATE STANDARDS	GRADE 6 OBJECTIVES
	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.	23. Demonstrate: using base ten pieces to show ones, tenths, hundredths, and thousandths. writing decimals in expanded notation. 24. Interchange units of measure in base ten system: ones>tenths> hundredths, dollars>cents, metric measures km>m>cm>mm 25. Design more than one part to whole model for fractions and decimals.
1.7.2	Know and use order relations for whole numbers, fractions, decimals, integers, and rational numbers.	26. Identify place values: whole numbers ones > billions decimals tenths>ten thousandths 27. Compare and order: decimals through applying decimal units to same place values. 28. Compare fractions through the use of: common denominators. cross products.
1.7.3	Use operations involving fractions, decimals, integers, and rational numbers.	29. Solve various problems involving addition, subtraction, multiplication, and division with; whole numbers. fractions. decimals. percents.
1.7.4	Demonstrate how basic operations are related to one another.	30. Apply order of operations including parentheses and exponents. 31. Demonstrate the four properties of addition and multiplication: Commutative. Associative. Distributive. Identify. 32. Solve equations through the use of inverse operations.
1.7.5	Create and apply number theory concepts, including prime numbers, factors, and multiples.	33. Determine if a number is prime or composite. 34. Develop prime factor trees. 35. Identify the Greatest Common Factor (GCF). 36. Determine the Least Common Multiple (LCM) of two or more numbers. 37. Round whole numbers and decimals to a given place value. 38. Write equations to solve problems using LCM and GCF.

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STRAND #1: NUMBER SENSE		
	STATE STANDARDS	GRADE 6 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.	39. Solve problems involving addition, subtraction, multiplication, and division using: whole numbers, fractions, decimals, percents.
1.8.2	Develop, analyze, and explain procedures for computing, estimating, and solving proportions.	40. Apply ratios and proportions to solve equations. 41. Explain the strategy used to solve problems involving ratio and proportion
1.8.3	Select and use an appropriate method for computing from among mental arithmetic, paper-and-pencil, calculator, and computer methods.	42. Decide which method of computing is most appropriate to solve a given problem. 43. Explain reasoning for selecting a method of computing to solve a given problem. 44. Compose and/or illustrate the solution to a given open response question.
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.	45. Discuss how rounding is used to estimate the reasonableness of solutions when computing. 46. Justify which problem solving technique to use when solving any problem: Looking for a Pattern. Make a Table. Make a List. Use a Graph. Draw a Diagram. Classify and Group Data. Work Backward. Solve a Simpler Problem. Guess, Check, and Revise.

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STRAND #2: PATTERNS, RELATIONS AND FUNCTIONS		
	STATE STANDARDS	GRADE 6 OBJECTIVES
	2.4 PATTERNS AND FUNCTIONS Students engage in problem solving, communicating, reasoning, and connecting to:	
2.4.1	Students identify a pattern	<ul style="list-style-type: none"> • Describe a pattern • Complete a pattern.
2.4.2	Represent the relationship with a table, graph or rule.	
2.4.3	Use a table to find an output (y) given the input (x) by substituting the (x) value.	<ul style="list-style-type: none"> • Graph the results on an input/output relationship on a coordinate plane.
2.4.4	Write simple expressions to represent problems with one variable.	<ul style="list-style-type: none"> • Determine when to use each type of representation (words, graphs, tables, equations) in solving a problem.

STRAND #2: PATTERNS, RELATIONS AND FUNCTIONS		
	STATE STANDARDS	GRADE 6 OBJECTIVES
	2.5 ALGEBRA Students engage in problem solving, communicating, reasoning, and connecting to:	
2.5.1	Identify a variable and express it in a number sentence.	<ul style="list-style-type: none"> • Evaluate a variable expression. • Evaluate a variable expression using the distributive property.
2.5.2	Plot	<ul style="list-style-type: none"> • Use pictures, tables and graphs to find, describe, and extend patterns.
2.5.3	Interpret	<ul style="list-style-type: none"> • Describe the data contained on a graph or table.
2.5.4	Demonstrate the use on inverse operations	<ul style="list-style-type: none"> • Use mental math to solve an equation • Solve multiplication and division equations by using formal rules.
2.5.5	Identify inequality symbols greater than and less than.	
2.5.6	Solve perimeter and area problems.	
2.5.7	Find missing angle measures of quadrilaterals and triangles.	
2.5.8	Demonstrate efficient use of the following manipulatives to solve problems: pattern blocks, base 10 cubes, dot paper.	

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STRAND #3: GEOMETRY AND MEASUREMENT		
	STATE STANDARDS	GRADE 6 OBJECTIVES
	3.3 GEOMETRY Students engage in problem solving, communicating, reasoning, and connecting to:	
3.3.1	Identify properties of regular polygons.	<ul style="list-style-type: none"> Demonstrate the use of manipulative material and technology to model geometric shapes.
3.3.2	Describe the relationship and differences among points, lines, and planes.	<ul style="list-style-type: none"> Associate situations in real life that can be represented by points, lines, and planes.
3.3.3.	Draw and label geometric figures.	<ul style="list-style-type: none"> Analyze the characteristics of polygons
3.3.4	Explore transformations (slides, flips, rotations).	<ul style="list-style-type: none"> Explore lines of symmetry. Construct symmetrical figures using folding and/or scissors.
3.3.5	Draw and label quadrilaterals.	<ul style="list-style-type: none"> Calculate the perimeter and area of rectangles.
3.3.6	Identify perpendicular and parallel lines using maps or building plans, etc.	
3.3.7	Discover the relationship of circumference to diameter after using the measurement of several different sized circles.	<ul style="list-style-type: none"> Find the ratio of c:d using a calculator.
3.3.8	Identify various types of triangles.	

STRAND #3: GEOMETRY AND MEASUREMENT		
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	3.4 MEASUREMENT Students engage in problem solving, communicating, reasoning, and connecting to:	
3.4.1	Demonstrate accuracy in skills to measure various lengths in customary metric units.	<ul style="list-style-type: none"> Analyze and select the most appropriate units and tools to measure an object.
3.4.2	Explain how the area of a polygon can change when the perimeter remains the same.	<ul style="list-style-type: none"> Apply this explanation to problem solving situations.
3.4.3	Recognize and understand the relationship of "a" per "b" a/b.	
3.4.4	Compare and contrast the volumes of various containers.	<ul style="list-style-type: none"> Apply formulas for area and perimeter to solve real life problems.

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STRAND #4: STATISTICS AND PROBABILITY		
	STATE STANDARDS	GRADE 6 OBJECTIVES
	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"> • Select specific problem solving strategies to organize data: graphs. tables. charts. lists. stem and leaf plots. tree diagrams.
4.2.2	Construct, read, and interpret tables, charts, and graphs.	<ul style="list-style-type: none"> • Create a questionnaire to collect data. • Select an appropriate graphic way to present data: charts. tables. graphs. stem and leaf plots. frequency tables.
4.2.3	Make inferences and convincing arguments that are based on data analysis.	<ul style="list-style-type: none"> • Draw conclusions from collected data.
4.2.4	Evaluate arguments that are based on data analysis.	<ul style="list-style-type: none"> • Interpret data from a chart or graph. • Determine that data properly supports conclusions) drawn.
4.2.5	Develop and explain why statistical methods are powerful aids for decision-making.	<ul style="list-style-type: none"> • Explain how organizations use statistical information to make choices: i.e. sports' teams businesses, finance.

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STRAND #4: STATISTICS AND PROBABILITY		
	STATE STANDARDS	GRADE 6 OBJECTIVES
	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"> • Simulate an experiment to determine the probability of an event: <div style="margin-left: 20px;">rolling dice. Spinners. Wheel of Fortune</div>
4.3.2	Construct a sample space to determine probabilities.	<ul style="list-style-type: none"> • List all possible outcome. • Create tree diagram for possible 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"> • Determine the likelihood or nonlikelihood of the occurrence of an event: <div style="margin-left: 20px;">0 _____ .5 _____ 1</div>
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 <ul style="list-style-type: none"> - simulating an experiment to determine the probability of an event. - discovering the probability of an event with equally likely outcome. - listing all possible outcomes. - creating tree diagrams for possible outcomes.
4.3.5	Develop and explain an appreciation for the pervasive use of probability in the real world.	<ul style="list-style-type: none"> • Name real life situations where probability is used.