

GRADE 5: MATHEMATICS CURRICULUM

Renewed 8/2006

LEARNING OUTCOME	NJCCCS
4.1 Number and Numerical Operations	4.1...
Constructs meaning for:	
1- All Whole Numbers	A.1
2- All Decimals	A.1
3- All Fractions	A.1
a- Part of a whole	A.1
b- Subset of a set	A.1
c- Location on a number line	A.1
d- Division of Whole Numbers	A.1
4- Absolute Value	B
Can use all operations to compute with money	A.2
Demonstrates a sense of the relative magnitudes of numbers and compares and orders numbers	A.3, A.6
Rounds whole numbers and decimals	A
Develops and applies number theory concepts	A.5
1- Prime numbers	
2- Factors	
3- Multiples	
Explores the use of ratio and proportions in a variety of situations	A
1- scale drawings	
Understands and calculates percent of a whole number	B
Uses paper-pencil methods, mental math, <u>calculators</u> to complete the following:	
1- Performs multiplication of 4-digit by 3-digit numbers	B.1
2- Performs division of 4-digit by 2-digit number (remainder as fraction and or decimal)	B.3
3- Performs addition and subtraction of whole numbers and decimals	
4- Performs multiplication of decimals (hundredths and thousandths)	B.2
5- Performs division of decimals (decimal divided by a whole number)	
6- Performs conversions between whole numbers, fractions and decimals	B.2
7- Performs addition of fractions (unlike denominators)	B.2
8- Performs subtraction of fractions (unlike denominators)	
9- Performs addition of mixed numbers (unlike denominators)	A.4
10- Performs subtraction of mixed numbers (unlike denominators & renaming)	B.2
11- Performs multiplication of fractions	
12- Performs division of fractions	B.2
13- Performs multiplication of mixed numbers	
14- Performs division of mixed numbers	B.2

<p>15- Performs addition of positive and negative numbers (integers)</p> <p>16- Performs subtraction of positive and negative numbers (integers)</p> <p>17- Simplifies a numerical expression using the standard algebraic order of operations, including parentheses</p> <p>18- Converts measurements within a system</p> <p>19- Recalls multiplication and division facts (0-12) (math minutes)</p>	<p>B.2</p> <p>B.2</p> <p>B.2</p> <p>B.2</p> <p>B.2</p> <p>B</p> <p>B</p> <p>B.6</p> <p>4.2.D.2</p> <p>B</p>
Checks for reasonableness of results of computations by estimating	B.5, C.3
Recognizes value of estimate vs. exact answer	C.2
Uses a variety of estimation strategies	C.1, C.4
1- Recognizes an overestimate vs. underestimate	
4.2 Geometry and Measurement:	4.2...
<p>Applies concepts involving Lines and Angles:</p> <p>1- notation for ...</p> <p> a. line</p> <p> b. ray</p> <p> c. line segment</p> <p> d. angle</p> <p>2- properties of ... lines</p> <p> e. parallel</p> <p> f. perpendicular</p> <p> g. intersecting</p> <p>3- sum of measures of interior angles of a triangle is 180 degrees</p>	<p>A.1</p> <p>A.1</p> <p>A.1</p>
<p>Identifies, describes, compares and classifies polygons:</p> <p>1- triangles by angles and sides</p> <p>2- quadrilaterals:</p> <p> a. squares</p> <p> b. rectangles</p> <p> c. parallelograms</p> <p> d. trapezoids</p> <p> e. rhombi</p> <p>3- polygons by number of sides</p> <p>4- equilateral, equiangular, regular</p> <p>5- circle = points equidistant from a given point</p>	<p>A.2</p> <p>A.2</p> <p>A.2</p> <p>A.2</p> <p>A.2</p>

Identifies similar figures	A.3
Understands and applies line and rotational symmetry	A.4
Understands and applies concept of congruence	A.4
Uses ... to map one figure onto another congruent figure: 1- translation 2- reflection 3- rotation	B.1
Recognizes and describes geometric relationships as they exist in nature, art and other real world settings	B.2
Creates geometric shapes with specific properties on a coordinate grid (first quadrant)	C.1
Uses appropriate units and strategies to measure: 1- angles (uses protractors) 2- perimeter a- square b- rectangle 3- area a- square b- rectangle 4- volume	D.1, E.1 E.2 D.1, E.2 E
Converts measurement units within a system (e.g. 3 ft = ___inches)	D.2
Knows approximate equivalents between metric and standard systems (e.g. 1km=@6/10 mi)	D.3
Recognizes that rectangles with the same perimeter do not necessarily have the same area	E.3
Uses and identifies measurement tools and units: Incorporates estimation 1- <u>Length</u> : Ruler: fraction of inch ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$), mile, centimeter, decimeter, kilometer 2- <u>Area</u> : Ruler/Graph paper: Square inch/square centimeter 3- <u>Volume</u> : Cubic inch/cubic centimeter (using rice or cubes) 4- <u>Weight</u> : Scale: Ounce, gram 5- <u>Capacity</u> : Cubes: Fluid ounce, cup, gallon, and milliliter	D/E D/E D/E D/E D/E
4.3 Patterns and Algebra:	4.3...
Recognizes, describes, extends and creates patterns with <u>Whole Numbers</u> using: 1- tables 2- verbal rules 3- simple equations 4- graphs	A.1
Describes computational operations as functions: 1- combining operations 2- reversing operations	B.1

Graphs points satisfying a function from: 1- T-charts 2- verbal rules 3- simple equations	B.2
Uses number sentences to model situations using 1- variables 2- concrete materials 3- tables 4- graphs 5- verbal rules 6- algebraic expressions/equations	C.1
Solves simple linear equations informally and with manipulatives 1- Whole-number coefficients 2- Whole-number solutions 3- Variables on one side of equation	D.1
Draws freehand sketches as models to interpret events	C.2
Utilizes graphs to predict and interpret: 1- changes over time 2- rates of change	C.2
Applies properties of operations and numbers (including divisibility rules)	D
4.4 Data Analysis, Probability & Discrete Mathematics:	4.4...
Collects, generates, organizes and displays data obtained from surveys	A.1
Reads, interprets, selects, constructs, analyzes, generates questions about and draws inferences from: 1- bar graphs 2- line graphs 3- circle graphs 4- tables 5- Venn diagrams 6- histogram	A.2
Determines ... from the 5 data display instruments above: 1- range 2- median/mode 3- mean	A.2
Responds to data displays by creating questions/hypotheses	A.3
Determines probability of an event and expresses it as a fraction	B.1
Understands that probability of certain event is 1 and of impossible event is 0	B.1
Determines probability using ... methods (items of different colors in a bag) 1- intuitive 2- <u>theoretical</u> - "Given the number of various types of items in a bag, what is the probability that a specific item will be selected?" (# of specific item/total # in bag) 3- <u>experimental</u> - "Given data obtained experimentally, what is the likely distribution of items in the bag?" (2 red/2 blue/4 white)	B.2

Investigates /determines probability using simulations (spinners/dice)	B.3
Represents all possibilities in a simple counting situation via 1- organized lists 2- tree diagrams 3- tables 4- charts	C.1
Utilizes the multiplication principal of counting all possibilities in an organized way (How many different outfits can 3 shirts and 4 pants create? $3 \times 4 = 12$)	C.2
Devises strategies for winning simple games and expresses those strategies as sets of directions	D.1
4.5 Mathematics Process:	4.5...
Learns mathematics through 1- problem solving 2- inquiry 3- discovery	A.1
Solves problems of various types and difficulty level 1- open-ended 2- non-routine 3- multiple solutions 4- multiple problem solving strategies	A.2, A.4
Selects and applies a variety of problem-solving strategies: 1- try a simpler problem 2- make a diagram 3- work backwards 4- act it out 5- write an equation 6- draw conclusions and generalizations 7- make decisions 8- interpret remainder 9- predict and test 10- choose an operation 11- compare strategies 12- make a model 13- sequence and prioritize information 14- find a pattern 15- estimate vs. actual measurement 16- too much/too little information 17- make a graph	A.3
Reflects on their problem solving process	A.5
Organizes, clarifies and clearly communicates mathematical thinking through 1- reading and writing 2- discussion 3- listening	B.1, B.2

4- questioning	
Analyzes and evaluates the mathematical thinking and strategies of others	B.3
Uses the language of mathematics to express mathematical ideas	B.4
Recognizes recurring themes across mathematical domains (e.g. patterns in number, algebra and geometry)	C.1
Uses connections among mathematical ideas to explain concepts (e.g. 2 linear equations have a unique solution because the lines they represent intersect at a single point)	C.2
Recognizes the larger context of mathematics and applies mathematics accordingly	C.3, C.4
Makes connections between mathematical ideas and builds on one another	C.6
Traces the development of mathematical concepts over time and across cultures (world languages and social studies standards)	C.5
Recognizes that mathematical facts, procedures and claims must be justified	D.1
Uses various types of reasoning and methods of proof to support their mathematical conclusions and problem solutions	D.2, D.3
Uses reasoning, rather than answer keys, teachers or peers, to check the correctness of their solutions	D.4
Evaluates mathematical reasoning and determines validity	D.6
Makes and investigates mathematical conjectures 1- Counterexamples as a means of disproving conjectures 2- Verifying conjectures using informal reasoning or proofs	D.5
Uses representations to organize, record and communicate mathematical ideas 1- Concrete representations (e.g. base-ten blocks or algebra tiles) 2- Pictorial representations (e.g. diagrams, charts or tables) 3- Symbolic representations (e.g. a formula) 4- Graphical representations (e.g. a line graph)	E.1
Selects, applies and translates among mathematical representations to solve problems and to model and interpret physical, social and mathematical phenomena	E.2, E.3
Uses technology to gather, analyze and communicate mathematical information	F.1
Uses computer spreadsheets, software and graphing utilities to organize and display quantitative information	F.2
Uses graphing calculators and computer software to investigate properties of functions and their graphs	F.3
Uses calculators as problem-solving tools (e.g. to explore patterns, to validate solutions)	F.4
Uses computer software to make and verify conjectures about geometric objects	F.5
Uses computer-based laboratory technology for mathematical applications in the sciences	F.6