

**5th Grade
Math Pacing Guide (2010-2011)**

Timeline	Topics	Indicators	Benchmarks	Aligned Instructional Resources	Assessments
8/18/10 to 9/10/10 (17 days)	Students practice and investigate various strategies (place-value relationships, multiples of 10, algorithms) to add and subtract large numbers.	N7. Use commutative, associative, distributive, identity and inverse properties to simplify and perform computations.	NF. Apply number system properties when performing computations	Investigations Unit 3 <i>Thousands of Miles, Thousands of Seats</i>	
		N8. Identify and use relationships between operations to solve problems.	NE. Use order of operations, including use of parenthesis and exponents to solve multi-step problems, and verify and interpret the results.		
		N9. Use order of operations, including use of parentheses, to simplify numerical expressions.			
		N13. Estimate the results of computations involving whole numbers, fractions and decimals, using a variety of strategies.			
9/13/2010 to 10/13/10 (23 days)	Students develop strategies for solving 2-digit by 2-digit multiplication problems including arrays, breaking numbers apart, solving an equivalent problem and solving related problems. Students develop strategies for solving division problems with 2-digit divisors and for interpreting the results.	N5. Recognize and identify perfect squares and their roots.	NG. Apply and explain the use of prime factorizations, common factors, and common multiples in problem situations.	Investigations Unit 1 <i>Number Puzzles and Multiple Towers</i>	Oct. 4 to Oct. 8 Math Benchmark
		N7. Use commutative, associative, distributive, identity and inverse properties to simplify and perform computations.	NF. Apply number system properties when performing computations.		
		N8. Identify and use relationships between operations to solve problems.	NE. Use order of operations, including use of parenthesis and exponents to solve multi-step problems, and verify and interpret the results.		
		N9. Use order of operations, including use of parentheses, to simplify numerical expressions.			
		N13. Estimate the results of computations involving whole numbers, fractions and decimals, using a variety of strategies.			
		M4. Demonstrate understanding of the differences among linear units, square units and cubic units.	MF. Analyze and explain what happens to area and perimeter or surface area and volume when the dimensions of an object are changed.		
		M6. Use strategies to develop formulas for determining perimeter and area of triangles, rectangles and parallelograms, and volume of rectangular prisms.	MG. Understand and demonstrate the independence of perimeter and area for two-dimensional shapes and of surface area and volume for three-dimensional shapes.		
P4. Create and interpret the meaning of equations and inequalities representing problem situations.	PC. Use variables to create and solve equations and inequalities representing problem situations.				
10/14/10 to 11/8/10 (18 days)	Students build models of prisms, pyramids, cylinders, and cones. Students investigate how dimensions of prisms change when the volume is doubled or halved. Students investigate the relationship between the volume of prisms and pyramids, and the volume of cylinders and cones that have the same base and height.	N13. Estimate the results of computations involving whole numbers, fractions and decimals, using a variety of strategies.	NI. Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents.	Investigations Unit 2 <i>Prisms and Pyramids</i>	
		M3. Demonstrate and describe the differences between covering the faces (surface area) and filling the interior (volume) of three-dimensional objects.	MF. Analyze and explain what happens to area and perimeter or surface area and volume when the dimensions of an object are changed.		
		M4. Demonstrate understanding of the differences among linear units, square units and cubic units.			
		M6. Use strategies to develop formulas for determining perimeter and area of triangles, rectangles and parallelograms, and volume of rectangular prisms.	MC. Identify appropriate tools and apply appropriate techniques for measuring angles, perimeter or circumference and area of triangles, quadrilaterals, circles and composite shapes, and surface area and volume of prisms and cylinders.		

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	that have the same base and height.	G8. Predict what three-dimensional object will result from folding a two-dimensional net, then confirm the prediction by folding the net.	GI. Identify and draw three-dimensional objects from different views (top, side, front and perspective).		
11/9/10 to 12/10/10 (21 days)	Students identify equivalent fractions and percents. Students use fraction equivalents, fraction-percent equivalents, and relationships to landmarks such as 1/2 and 1 to solve real world problems. Students use rectangles, rotation on a clock, and number lines to represent addition and subtraction of fractions.	N1. Use models and visual representation to develop the concept of ratio as part-to-part and part-to-whole, and the concept of percent as part-to-whole. N2. Use various forms of “one” to demonstrate the equivalence of fractions; e.g., $18/24 = 9/12 \times 2/2 = 3/4 \times 6/6$. N3. Identify and generate equivalent forms of fractions, decimals and percents. N10. Justify why fractions need common denominators to be added or subtracted. N12. Use physical models, points of reference, and equivalent forms to add and subtract commonly used fractions with like and unlike denominators and decimals. N13. Estimate the results of computations involving whole numbers, fractions and decimals, using a variety of strategies.	NB. Compare, order and convert among fractions, decimals and percents. ND. Use models and pictures to relate concepts of ratio, proportion and percent. NB. Compare, order and convert among fractions, decimals and percents. NH. Use and analyze the steps in standard and non-standard algorithms for computing with fractions, decimals and integers. NI. Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents.	Investigations Unit 4 <i>What's That Portion?</i>	Dec. 6 to Dec. 10 Math Benchmark
11/9/10 to 12/10/10 (Cont.)		G1. Draw circles, and identify and determine relationships among the radius, diameter, center and circumference; e.g., radius is half the diameter, the ratio of the circumference of a circle to its diameter is an approximation of π .	GB. Draw circles, and identify and determine the relationships among the radius, diameter, center and circumference.	Investigations Unit 4 <i>What's That Portion?</i> (Cont.)	
12/13/10 to 1/20/11 (18 days)	Students use their understanding of fractions and the number system to order and compare decimals to the thousandths. Using a variety of contexts, students add decimal fractions.	N1. Use models and visual representation to develop the concept of ratio as part-to-part and part-to-whole, and the concept of percent as part-to-whole. N3. Identify and generate equivalent forms of fractions, decimals and percents. N4. Round decimals to a given place value and round fractions (including mixed numbers) to the nearest half. N12. Use physical models, points of reference, and equivalent forms to add and subtract commonly used fractions with like and unlike denominators and decimals. N13. Estimate the results of computations involving whole numbers, fractions and decimals, using a variety of strategies. N11. Explain how place value is related to addition and subtraction of decimals; e.g., $0.2 + 0.14$; the two tenths is added to the one tenth because they are both tenths.	NB. Compare, order and convert among fractions, decimals and percents. NI. Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents. NH. Use and analyze the steps in standard and non-standard algorithms for computing with fractions, decimals and integers.	Investigations Unit 6 <i>Decimals on Grids and Number Lines</i>	

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1/21/11 to 2/23/11 (22 days)	Students classify polygons by looking at attributes including number of sides, lengths of sides, sizes of angles, and similarity. Students build sequences of related polygons in order to learn about area, perimeter, and the relationship between them.	M1. Identify and select appropriate units to measure angles; i.e., degrees.	MA. Select appropriate units to measure angles, circumference, surface area, mass and volume, using: • U.S. customary units; e.g., degrees, square feet, pounds, and other units as appropriate; • metric units; e.g., square meters, kilograms and other units as appropriate.	Investigations Unit 5 <i>Measuring Polygons</i>	
		M2. Identify paths between points on a grid or coordinate plane and compare the lengths of the paths; e.g., shortest path, paths of equal length.	MC. Identify appropriate tools and apply appropriate techniques for measuring angles, perimeter or circumference and area of triangles, quadrilaterals, circles and composite shapes, and surface area and volume of prisms and cylinders.		
		M4. Demonstrate understanding of the differences among linear units, square units and cubic units.	MF. Analyze and explain what happens to area and perimeter or surface area and volume when the dimensions of an object are changed.		
			MG. Understand and demonstrate the independence of perimeter and area for two-dimensional shapes and of surface area and volume for three-dimensional shapes.		
		M6. Use strategies to develop formulas for determining perimeter and area of triangles, rectangles and parallelograms, and volume of rectangular prisms.	MC. Identify appropriate tools and apply appropriate techniques for measuring angles, perimeter or circumference and area of triangles, quadrilaterals, circles and composite shapes, and surface area and volume of prisms and cylinders.		
		M7. Use benchmark angles (e.g.; 45°, 90°, 120°) to estimate the measure of angles, and use a tool to measure and draw angles.			
		G2. Use standard language to describe line, segment, ray, angle, skew, parallel and perpendicular.	GA. Identify and label angle parts and the regions defined within the plane where the angle resides.		
		G3. Label vertex, rays, interior and exterior for an angle.			
		G4. Describe and use properties of congruent figures to solve problems.	GF. Describe and use the concepts of congruence, similarity and symmetry to solve problems.		
		G5. Use physical models to determine the sum of the interior angles of triangles and quadrilaterals.	GD. Identify, describe and classify types of line pairs, angles, two-dimensional figures and three-dimensional objects using their properties.		
		G7. Understand that the measure of an angle is determined by the degree of rotation of an angle side rather than the length of either side.			
		D1. Read, construct and interpret frequency tables, circle graphs and line graphs.	DA. Read, create and use line graphs, histograms, circle graphs, box-and-whisker plots, stem-and-leaf plots, and other representations when appropriate.		
		D4. Determine appropriate data to be collected to answer questions posed by students or teacher, collect and display data, and clearly communicate findings.	DE. Collect, organize, display and interpret data for a specific purpose or need.		
D5. Modify initial conclusions, propose and justify new interpretations and predictions as additional data are collected.	DC. Evaluate interpretations and conclusions as additional data are collected, modify conclusions and predictions, and justify new findings.				
2/24/11 to 3/15/11 (13 days)	Students represent and compare growth patterns using tables, graphs, rectangular arrays, Penny Jar situations and staircase towers.	M4. Demonstrate understanding of the differences among linear units, square units and cubic units.	MF. Analyze and explain what happens to area and perimeter or surface area and volume when the dimensions of an object are changed.	Investigations Unit 8 <i>Growth Patterns</i>	Mar. 1 to Mar. 4 Math Benchmark
		M5. Make conversions within the same measurement system while performing computations.	MB. Convert units of length, area, volume, mass and time within the same measurement system.		

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2/24/11 to 3/15/11 (Con't.)	Students represent and compare growth patterns using tables, graphs, rectangular arrays, Penny Jar situations and staircase towers.	M6. Use strategies to develop formulas for determining perimeter and area of triangles, rectangles and parallelograms, and volume of rectangular prisms.	MC. Identify appropriate tools and apply appropriate techniques for measuring angles, perimeter or circumference and area of triangles, quadrilaterals, circles and composite shapes, and surface area and volume of prisms and cylinders.	Investigations Unit 8 <i>Growth Patterns</i> (Con't.)	Mar. 1 to Mar. 4 Math Benchmark
		G6. Extend understanding of coordinate system to include points whose x or y values may be negative numbers.	GC. Specify locations and plot ordered pairs on a coordinate plane.		
		P1. Justify a general rule for a pattern or a function by using physical materials, visual representations, words, tables or graphs.	PA. Describe, extend and determine the rule for patterns and relationships occurring in numeric patterns, computation, geometry, graphs and other applications.		
		P2. Use calculators or computers to develop patterns, and generalize them using tables and graphs.	PB. Represent, analyze and generalize a variety of patterns and functions with tables, graphs, words and symbolic rules.		
		P3. Use variables as unknown quantities in general rules when describing patterns and other relationships.	PC. Use variables to create and solve equations and inequalities representing problem situations.		
		P4. Create and interpret the meaning of equations and inequalities representing problem situations.	PF. Use representations, such as tables, graphs and equations, to model situations and to solve problems, especially those that involve linear relationships.		
		P5. Model problems with physical materials and visual representations, and use models, graphs and tables to draw conclusions and make predictions.	PL. Analyze functional relationships, and explain how a change in one quantity results in a change in the other.		
		P6. Describe how the quantitative change in a variable affects the value of a related variable; e.g., describe how the rate of growth varies over time, based upon data in a table or graph.	DA. Read, create and use line graphs, histograms, circle graphs, box-and-whisker plots, stem-and-leaf plots, and other representations when appropriate.		
		D1. Read, construct and interpret frequency tables, circle graphs and line graphs.	DE. Collect, organize, display and interpret data for a specific purpose or need.		
		D2. Select and use a graph that is appropriate for the type of data to be displayed; e.g., numerical vs. categorical data, discrete vs. continuous data.	DD. Compare increasingly complex displays of data, such as multiple sets of data on the same graph.		
		D4. Determine appropriate data to be collected to answer questions posed by students or teacher, collect and display data, and clearly communicate findings.	DC. Evaluate interpretations and conclusions as additional data are collected, modify conclusions and predictions, and justify new findings.		
		D3. Read and interpret increasingly complex displays of data, such as double bar graphs.			
D5. Modify initial conclusions, propose and justify new interpretations and predictions as additional data are collected.					
		G1. Draw circles, and identify and determine relationships among the radius, diameter, center and circumference; e.g., radius is half the diameter, the ratio of the circumference of a circle to its diameter is an approximation of π .	GB. Draw circles, and identify and determine the relationships among the radius, diameter, center and circumference.	Investigations Unit 9 <i>How Long Can You Stand On One Foot?</i>	
		P5. Model problems with physical materials and visual representations, and use models, graphs and tables to draw conclusions and make predictions.	PF. Use representations, such as tables, graphs and equations, to model situations and to solve problems, especially those that involve linear relationships.		
		D1. Read, construct and interpret frequency tables, circle graphs and line graphs.	DA. Read, create and use line graphs, histograms, circle graphs, box-and-whisker plots, stem-and-leaf plots, and other representations when appropriate.		
		D2. Select and use a graph that is appropriate for the type of data to be displayed; e.g., numerical vs. categorical data, discrete vs. continuous data.			

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Timeline	Topics	Indicators	Benchmarks	Aligned Instructional Resources	Assessments
3/16/11 to 4/20/11 (21 days)	Students design experiments and collect, represent, and analyze data. Students conduct multiple trials of different probability experiments as they discuss and learn the difference between theoretical and experimental probability.	D4. Determine appropriate data to be collected to answer questions posed by students or teacher, collect and display data, and clearly communicate findings.	DE. Collect, organize, display and interpret data for a specific purpose or need.		
		D3. Read and interpret increasingly complex displays of data, such as double bar graphs.	DD. Compare increasingly complex displays of data, such as multiple sets of data on the same graph.		
		D5. Modify initial conclusions, propose and justify new interpretations and predictions as additional data are collected.	DC. Evaluate interpretations and conclusions as additional data are collected, modify conclusions and predictions, and justify new findings.		
		D6. Determine and use the range, mean, median and mode, and explain what each does and does not indicate about the set of data.	DF. Determine and use the range, mean, median and mode to analyze and compare data, and explain what each indicates about the data.		
		D7. List and explain all possible outcomes in a given situation.	DH. Find all possible outcomes of simple experiments or problem situations, using methods such as lists, arrays and tree diagrams.		
		D8. Identify the probability of events within a simple experiment, such as three chances out of eight.	DI. Describe the probability of an event using ratios, including fractional notation.		
		D9. Use 0, 1 and ratios between 0 and 1 to represent the probability of outcomes for an event, and associate the ratio with the likelihood of the outcome.			
3/16/11 to 4/20/11 (Cont.)	Students design experiments and collect, represent, and analyze data. Students conduct multiple trials of different probability experiments as they discuss and learn the difference between theoretical and experimental probability.	D10. Compare what should happen (theoretical/expected results) with what did happen (experimental/actual results) in a simple experiment.	DJ. Compare experimental and theoretical results for a variety of simple experiments.	Investigations Unit 9 <i>How Long Can You Stand On One Foot?</i> (Cont.)	
		D11. Make predictions based on experimental and theoretical probabilities.	DK. Make and justify predictions based on experimental and theoretical probabilities.		
4/25/11 to 5/26/11 (24 days)	Students find equivalent multiplication and division expressions. Students review and practice various strategies for multiplying by 2-digit numbers, and for solving division problems with 2-digit divisors. Students use all four operations to solve real world problems.	N7. Use commutative, associative, distributive, identity and inverse properties to simplify and perform computations.	NF. Apply number system properties when performing computations.	Investigations Unit 7 <i>How Many People? How Many Teams?</i>	Apr. 25 to May 3 OAA State Testing
		N8. Identify and use relationships between operations to solve problems.	NE. Use order of operations, including use of parenthesis and exponents to solve multi-step problems, and verify and interpret the results.		
		N9. Use order of operations, including use of parentheses, to simplify numerical expressions.			
		N13. Estimate the results of computations involving whole numbers, fractions and decimals, using a variety of strategies.	NI. Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents.		
		P4. Create and interpret the meaning of equations and inequalities representing problem situations.	PC. Use variables to create and solve equations and inequalities representing problem situations.		