

Grade 5 Benchmark Proficiencies to Master

I. NUMBER SENSE

By the end of the Grade 5, students will be able to...

	Degree of mastery: A= 75% or more of the students B=about half C=fewer than 25%	Q 1	Q 2	Q 3	Q 4
STI.1	estimate, name, write, count, order, and round numbers up to 9,999,999				
STI.2	know $>$, \geq , $<$, \square , $=$, \neq and use them appropriately when comparing numbers or writing number sentences up to 9,999,999				
STI.3	construct, read, and write numbers through 999,999 and draw multi-digit numbers on a place value chart				
STI.4	identify the place value of a digit in a number counting up to seven digits				
STI.5	write multi-digit numbers in expanded notation from a place value chart				
STI.6	rewrite 5- and 6-digit numbers in standard, expanded, or word form when given one of the forms				
STI.7	identify the place value of a digit in a decimal up to the 1000th's place				
STI.8	identify and use prime and composite numbers using an array or factor tree				
STI.9	identify and use the least common multiple (LCM), or greatest common factor (GCF) of two given numbers				
STI.10	round to the nearer 1, 10, 100, 1000, or 10th, 100th, or 1000th place				
STI.11	explore the divisibility rules for 3, 6, and 9				
STI.12	explore the idea of square and square root in the context of area of squares				
STI.13	read and use Roman numerals between I, V, X, L				
STI.14	know multiplication and division facts for the table of 2 through 12				
STI.15	multiply 3-digit factors by a 2-digit factors, using the 0-digit				
STI.16	find the quotient of 4-digit dividend by a 2- or 3-digit divisor				
STI.17	add and subtract decimals				
STI.18	find the quotient of a whole number dividend and a decimal divisor e.g. 8 divided by .025				
STI.19	estimate amount (sums/differences/products/quotients) by using compatible numbers and multiples of ten				
STI.20	estimate an amount by rounding to the nearer unit (nearer thousand, hundred, ten, tenth, hundredth, or thousandth)				
STI.21	use a four function calculator to verify estimates and solutions				
STI.22	estimate the value of a given collection of monies and the expected amount of change				
STI.23	using real life experiences, use $\frac{1}{4}$, $\frac{1}{2}$, and $\frac{3}{4}$ of quantities as benchmarks to estimate				
STI.24	compute mentally				
STI.25	understand exponents as repeated multiplication e.g. $3^3 = 3 \times 3 \times 3$				
STI.26	compute problems using natural numbers and positive exponents e.g. $2^3 = 8$ and $10^0 = 1$ and $4^2 = 16$				

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STI.27	determine the prime factors for 2 through 50				
STI.28	write numbers 2 through 50 as a product of prime numbers using exponents e.g. $12 = 3 \times 2$				
STI.29	add and subtract positive and negative integers				
STI.30	verify the reasonableness of an answer when computing addition and subtraction of integers				
STI.31	explore the concept and use of ratio relative to scaling and record findings in three different formats: 2 to 3, $\frac{2}{3}$, or 2:3				
STI.32	simplify fractions to their lowest (simplest) term				
STI.33	order and compare combinations of whole numbers, fractions and decimals, for halves, thirds, fourths, and tenths, using the symbols $<$, \square , $>$, \geq , $=$ and \neq by placing them on the number line				
STI.34	read, write, and order decimals up the 1000ths place, and rewrite in standard, in fraction, in word, or in expanded form, given one of the forms				
STI.35	show that decimals are fractions with denominators of 10ths, 100ths, or 1000ths				
STI.36	convert a fraction to a mixed number and vice versa				
STI.37	add and subtract fractions with unlike denominators up to 20, with regrouping, and record in simplest terms				
STI.38	solve simple (including real life) problems using addition and subtraction of fractions and mixes numbers				
STI.39	multiply a simple fraction by a whole number and by a simple fraction				
STI.40	understand the concept of multiplying a simple fraction by a simple fraction				
STI.41	compute simple multiplication and division of fractions				
STI.42	solve problems involving multiplication and division of fractions				
STI.43	understand percents as a part of a hundred				
STI.44	find decimal and percent equivalents for fractions				
STI.45	explain how a decimal and percent are equivalent for a given fraction				
STI.46	compute the percents of whole numbers e.g. 670 of 350				
STI.47	identify and represent decimals, fractions, mixed numbers, and integers on a number line				
STI.48	solve problems involving multiplication and division of fractions				
STI.49	estimate amount (sums/differences/products/quotients) by using compatible numbers and multiples of ten				
STI.50	estimate an amount by rounding to the nearer unit (nearer thousand, hundred, ten, tenth, hundredth, or thousandth)				
STI.51	estimate the value of a given collection of monies and the expected amount of change				

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I. NUMBER SENSE (Continued)

By the end of the Grade 5, students will be able to...

	Degree of mastery: A= 75% or more of the students B=about half C=fewer than 25%	Q 1	Q 2	Q 3	Q 4
STI.52	using real life experiences, use $1/4$, $1/2$, and $3/4$ of quantities as benchmarks to estimate				
STI.53	read and write money amounts up to \$1,000,000				
STI.54	determine the coins and bills which represent a given amount of money(to \$50)				
STI.55	assemble coins and bills to represent a given amount up to \$1000				
STI.56	make change for purchases for less than \$100				
STI.57	estimate and solve money problems by rounding to the nearer dollar and the nearer cent				
STI.58	play trading games to show equivalencies for pennies, nickels, dimes, quarters, and half dollars				
STI.59	explore creating a budget in ledger format				

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II. ALGEBRA and FUNCTIONS

By the end of the Grade 5, students will be able to...

	Degree of mastery: A= 75% or more of the students B=about half C=fewer than 25%	Q 1	Q 2	Q 3	Q 4
STII.1	write and evaluate algebraic expressions in one variable e.g. $2x + 7 = 15$; $x = ?$				
STII.2	use information from an equation to answer questions about a problem situation				
STII.3	know and use the distributive property in equations and expressions e.g. $3(x + 4) = 3x + 12$				
STII.4	given the coordinates (ordered pair) , identify locations on a rectangular grid				
STII.5	given the location on a rectangular grid, find the coordinates (ordered pair)				
STII.6	know how to write ordered pairs correctly e.g. (x, y)				
STII.7	graph ordered pairs in the four quadrants of the coordinate plane				
STII.8	use information from a graph to answer questions about a problem situation				
STII.9	solve problems that use linear functions and integer answers				
STII.10	given a problem, be able to write the equation and graph the results on a grid				
STII.11	name and use the associative and commutative properties of addition and multiplication				
STII.12	explain in words and use the role of 0 and 1 in addition and multiplication				
STII.13	explore the order of operations for addition, subtraction, multiplication, and division				

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III. MEASUREMENT and GEOMETRY

By the end of the Grade 5, students will be able to...

	Degree of mastery: A= 75% or more of the students B=about half C=fewer than 25%	Q 1	Q 2	Q 3	Q 4
STIII.1	find time equivalencies: second, minute, quarter hour, half hour, hour, day, week, month, year, decade				
STIII.2	choose an appropriate measure of time and explain the choice add and subtract time with regrouping				
STIII.3	Estimate elapsed time to the second				
STIII.4	estimate and measure weight using the standard unit of gram, kilograms, ounce, and pound, and ton				
STIII.5	identify the freezing point of water, boiling point of water, and normal body temperature in Fahrenheit and Celsius				
STIII.6	identify and describe a trapezoid				
STIII.7	calculate the perimeter of a polygon using standard units of measurement				
STIII.8	Estimate the length or distance to include miles and kilometers				
STIII.9	estimate and calculate the areas of squares and rectangles using the formula, and record the findings in square units				
STIII.10	name the circumference of a circle?				
STIII.11	explore calculating the area of a circle				
STIII.12	identify, name, and describe everyday objects as cube, rectangular prism, pyramid, cone, sphere, or cylinder				
STIII.13	derive the formula for the area of a triangle and parallelogram by comparing them to the area of a rectangle				
STIII.14	use the formulas for area of triangles, rectangles, and parallelograms				
STIII.15	use formulas to find areas and perimeters of complex shapes by dividing it into smaller shapes				
STIII.16	calculate the surface area of the faces of cubes, rectangular prisms, and pyramids				
STIII.17	create a 2-dimensional figure with a given perimeter				
STIII.18	construct a circle with a given center and a given radius				
STIII.19	construct a cube and a rectangular box from a 2-dimensional pattern.				
STIII.20	use patterns to calculate a 2-dimensional pattern				
STIII.21	use patterns to calculate the surface areas of the box and cube				
	compute the volume of a rectangular prism, using concrete materials, and record findings in cubic units				
STIII.22	estimate capacity in liters, cups, pints, quarts, and ounces				
STIII.23	compute the volume of a rectangular prism, using appropriate unites (cm , m , in , yd)				
STIII.24	differentiate between, and use appropriate measures when finding area, perimeter, and volume				
STIII.25	identify lines of symmetry in real life situations				

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III. MEASUREMENT and GEOMETRY (Continued)

By the end of the Grade 5, students will be able to...

	Degree of mastery: A= 75% or more of the students B=about half C=fewer than 25%	Q 1	Q 2	Q 3	Q 4
STIII.26	visualize and draw 2-dimensional views of 3-dimensional rectangular prisms				
STIII.27	identify a location using a political map containing a key, a scale, and a compass				
STIII.28	identify, match, and create congruent figures, such as triangles, squares, rectangles, and other polygons, using graph paper, patterns, and geoboards				
STIII.29	explore the concept of similarity by enlarging shapes with pattern blocks				
STIII.30	find the attributes of right angles and find right, obtuse, and acute angled objects in real life				
STIII.31	draw, identify, and measure angles, parallel and perpendicular lines, rectangles and triangles by using drawing tools (compass, straight edge, protractor, computer software)				
STIII.32	know the sum of the interior angles of a triangle and quadrilateral , and use this information to solve problems				
STIII.33	identify position of objects involving turns, slides, or flips				
STIII.34	identify patterns that result from combinations of reflections, rotations, or translations of geometric figures				

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IV. STATISTICS, DATA ANALYSIS, and PROBABILITY

By the end of the Grade 5, students will be able to...

	Degree of mastery: A= 75% or more of the students B=about half C=fewer than 25%	Q 1	Q 2	Q 3	Q 4
STIV.1	understand the concepts of the mean, median, mode, and range of sets of numbers				
STIV.2	compute and compare examples of mean, mode, median, and show how they differ				
STIV.3	explore the effect of changing scales on bar graphs				
STIV.4	make predictions from samplings and verify predictions by further exploration				
STIV.5	organize and display single variable data using histograms, circle graphs				
STIV.6	explain which types of graphs are appropriate for different types of data sets				
STIV.7	use percents and fractions to compare data sets of differing sizes				
STIV.8	interpret the meaning of data described in a graph				
STIV.9	identify and know the meaning of ordered pairs of data from a graph (scattergram)				
STIV.10	know how to write ordered pairs (x, y, on a scattergram)				

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V. MATHEMATICAL REASONING

By the end of the Grade 5, students will be able to...

	Degree of mastery: A= 75% or more of the students B=about half C=fewer than 25%	Q 1	Q 2	Q 3	Q 4
STV.1	understand and approach a problem by...				
	identifying relationships				
	distinguishing relevant from irrelevant information				
	identifying sequence of steps to be taken to solve a multi-step problem				
	prioritizing information				
	observing patterns				
	know how to break a problem into simpler parts				
STV.2	use appropriate problem solving strategy from the list below				
	use manipulatives or other concrete materials to sort information, predict or calculate solutions				
	make a list, a graph, a table, or a chart to sort information and solve problems				
	make a diagram, model, words, umbers or symbols, to illustrate the problem or explain the solution				
	act the problem out or role play to find a solution				
	extend guess and check solutions to help make logical guesses until the solution is reached				
	look for a pattern to predict a solution				
	draw a picture to clarify relationships and to illustrate the problem				
	use daily experiences to apply problem solving skills				
	work backwards to find a solution				
	apply strategies and results from simpler problems to solve complex problems				
STV.3	interpret the remainder in problem solving situations				
STV.4	use a number a sentence to represent the solution				
STV.5	identify needed information and check for too little or too much information				
STV.6	choose the correct operations to find a solution				
STV.7	explore solving multi-step problems taken from real life situations				
STV.8	determine whether an exact or estimated answer is required				
STV.9	create original problems from real life experiences, share and solve				
STV.10	test and explain the reasonableness of the answer				
STV.11	explain the reasonableness of estimated quantities				
STV.12	make precise calculations and check reasonableness of answer from the context of the problem				
STV.13	give answers to a specified degree of accuracy				
STV.14	verify estimates by using the most appropriate method of computing: mental computation, paper and pencil, calculator				
STV.15	explain a solution clearly and logically				
STV.16	use correct mathematical notations, terms, language when expressing and explaining a solution				
STV.17	use previous methods of deriving a solution to solve a similar problem				
STV.18	generalize results of a problem and apply them to other situations				
STV.19	identify needed information and check for too little or too much information				

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**VI. NCTM STANDARD
MATHEMATICAL CONNECTIONS**

By the end of the Grade 5, students will be able to...

	Degree of mastery: A= 75% or more of the students B=about half C=fewer than 25%	Q 1	Q 2	Q 3	Q 4
STVI.1	write and spell correctly all vocabulary and expressions learned in math classes				
STVI.2	write and spell correctly numbers to 10,000 in order				
STVI.3	listen for mathematical ideas and words in literature				
STVI.4	explore and describe in words simple and complex patterns in nature, music, art, poetry, and science				
STVI.5	use a fraction calculator to:				
	find the cost of selected items (in dollars and cents)				
	count by a fraction (ex: counting by eighth's)				
	change fractions to decimals and vice versa				
	explore finding decimal patterns on a calculator				
STVI.6	use a computer and drawing program to:				
	draw shapes, patterns, pictures				
	draw congruent 2-dimensional figures, using the copy and paste function of a computer drawing program				
	copy and flip a figure to create a design that has a line of symmetry				
STVI.7	use a computer software program to:				
	run trials on a computer program to test predictions				
	calculate and graph data				
	explore working with a data base or spreadsheet to organize and calculate sums, differences, products, quotients, and averages				

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**VII . NCTM STANDARD
MATHEMATICS AS COMMUNICATION**

By the end of the Grade 5, students will be able to...

	Degree of mastery: A= 75% or more of the students B=about half C=fewer than 25%	Q 1	Q 2	Q 3	Q 4
STVII.1	understand oral and written directions for appropriate mathematical activities				
STVII.2	use correctly all of the grade level math terms and expressions learned				
STVII.3	think and talk about math using verbs such as: analyze solve, decide, evaluate, classify, create, predict, estimate, compare, plan, organize, collect, record, represent, interpret, investigate, construct, explore, present, persuade, demonstrate, explain, defend, consider, conduct, persist, simplify, conclude, research, envision, brainstorm, etc				
STVII.4	verbalize mathematical thinking and explain activities				
STVII.5	develop convincing written arguments for the correctness of the solution				
STVII.6	explain reasoning and solutions not only to teachers, but also to peers and younger students				
STVII.7	show ideas or solutions in a variety of ways, including words, numbers, equations, symbols, pictures, charts, graphs, tables, diagrams, and by building with a variety of concrete materials				
STVII.8	explain strategies and show evidence used in solving problems				
STVII.9	explain the reasonableness of estimated quantities				
STVII.10	explain the meaning of remainders in division problems				
STVII.11	explain in own words the meaning of addition, subtraction, multiplication, and division, fraction, decimal				
STVII.12	explain the difference between prime and composite numbers, between LCF and GCD				
STVII.13	describe in own words a perpendicular, parallel, and intersecting lines				
STVII.14	work cooperatively in groups or with a partner to apply strategies in problem solving situations				
STVII.15	be able to set goals and plan to reach them				