

Math Achievement Indicators Grade 4

Content Standard 1.0

Students will accurately calculate and use estimation techniques, number relationships, operation rules, and algorithm; they will determine the reasonableness of answers and the accuracy of solutions to solve problems, communicate reason and make connections within and beyond the field of mathematics.

Content Standard Indicator	Work at the Emergent/Developing level may indicate...	Work at the Approaches level may indicate...	Work at the Meets level demonstrates...	Work at the Exceeds level demonstrates...
1.4.1 Identify and use place value positions of whole numbers to one million.	difficulty identifying place value of whole numbers beyond the hundreds.	identification of place value positions of whole numbers. difficulty using place value beyond the thousands.	identification and use of place value positions of whole numbers to one million with consistency.	identification and use of place value positions beyond one million and less than one.
1.4.2 Identify fractions and compare fractions with like denominators using models, drawings, and numbers.	difficulty identifying fractions. inability to compare fractions with like denominators.	identification of fractions with like denominators. difficulty in comparing fractions.	identification and comparison of fractions with like denominators using numbers, models, and drawings.	comparison of fractions with unlike denominators and begin to manipulate equivalent fractions.
1.4.3 Read, write, compare, and order whole numbers. Read and write number words.	ability to read whole numbers. difficulty writing numbers beyond 100. difficulty reading and writing number words.	ability to read and write whole numbers. difficulty ordering and comparing them. ability to read number words. difficulty writing number words.	ability to read, write, compare, and order whole numbers. ability to read and write number words.	ability to read, write, compare, order, and use whole numbers in mathematical and practical situations. ability to read and write multi-digit number words.

Math Achievement Indicators

Grade 4

Content Standard 2.0

Students will use various algebraic methods to analyze, illustrate, extend, and create numerous representations (words, numbers, tables, and graphs) of patterns, functions, and algebraic relations as modeled in practical situations to solve problems, communicate, reason, and make connections within and beyond the field of mathematics.

Content Standard Indicator	Work at the Emergent/Developing level may indicate...	Work at the Approaches level may indicate...	Work at the Meets level demonstrates...	Work at the Exceeds level demonstrates...
2.4.1 Identify, describe, and represent patterns and relationships in the number system including arithmetic and geometric sequences.	ability to identify patterns and relationships in the number system using models.	ability to identify patterns and relationships in the number system using models. difficulty describing and representing arithmetic and geometric sequences.	identification, description, and representation of patterns and relationships in the number system including arithmetic and geometric sequences.	ability to create, extend and describe patterns in the number system including arithmetic and geometric sequences.
2.4.2 Model, explain, and solve open number sentences involving addition, subtraction, multiplication, and division. Select the solution to an equation from a given set of numbers.	modeling and solving open number sentences involving addition. difficulty with subtraction, multiplication, and division. difficulty recognizing a given set of numbers and the need to substitute values into a given equation to find a solution.	modeling, explaining, and solving open number sentences involving addition, subtraction, and multiplication. difficulty solving open number sentences involving division. ability to recognize a given set of numbers and the need to substitute values into a given equation to find a solution. difficulty identifying the answer.	modeling, explaining, and solving open number sentences involving addition, subtraction, multiplication, and division. selecting the solution to an equation from a given set of numbers.	generating, modeling, explaining, and solving open number sentences with whole numbers involving addition, subtraction, multiplication and division. ability to generate a variety of solutions when given an equation.

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Content Standard 2.0 (continued)				
Students will use various algebraic methods to analyze, illustrate, extend, and create numerous representations (words, numbers, tables, and graphs) of patterns, functions, and algebraic relations as modeled in practical situations to solve problems, communicate, reason, and make connections within and beyond the field of mathematics.				
Content Standard Indicator	Work at the Emergent/Developing level may indicate...	Work at the Approaches level may indicate...	Work at the Meets level demonstrates...	Work at the Exceeds level demonstrates...
2.4.3 Complete number sentences with the appropriate words and symbols (+, -, x, ÷, >, <, =).	ability to complete number sentences using addition and subtraction symbols. difficulty completing number sentences with the appropriate symbols. (>, <, x, ÷)	ability to understand symbols for multiplication and division. difficulty comparing numbers and/or using the symbols for greater than and less than (>, <).	complete number sentences with the appropriate words and symbols (+, -, =, >, <, x, ÷).	ability to generate number sentences using appropriate mathematical symbols.

Math Achievement Indicators Grade 4

Content Standard 3.0

Students will use appropriate tools and techniques of measurement to determine estimate, record, and verify direct and indirect measurements to solve problems, communicate, reason and make connections within and beyond the field of mathematics.

Content Standard Indicator	Work at the Emergent/Developing level may indicate...	Work at the Approaches level may indicate...	Work at the Meets level demonstrates...	Work at the Exceeds level demonstrates...
3.4.1 Estimate and convert units of measure for length, area, and weight within the same measurement system (customary and metric).	difficulty estimating units of measure for length, area, and weight and/or are unable to convert within the same measurement system.	ability to estimate units of measure for length. difficulty estimating units of measure for weight and area and/or converting within the same measurement system.	estimating and converting units of measure for length, area, and weight within the same measurement system (customary and metric).	ability to distinguish between various units of measure (length, area, and weight) and explain their relevance in practical situations.
Estimate temperature in practical situations.	inability to estimate temperature in practical situations.	difficulty estimating temperature in practical situations.	estimating temperature in practical situations.	prediction of temperature trends in practical situations.
3.4.2 Measure length, area, temperature, and weight to a required degree of accuracy in customary and metric systems.	difficulty measuring length, area, temperature, and weight using the customary system. misunderstanding of the required degree of accuracy in measurement.	ability to measure length, area, temperature, and weight in the customary systems. difficulty measuring in the metric system. Students demonstrate difficulty measuring to a required degree of accuracy.	ability to measure length, area, temperature, and weight to a required degree of accuracy in customary and metric systems.	explanations of the importance of the degree of accuracy for a given measurement. (Is a measurement of a cup and a quarter close enough to a cup? How accurate do you need to be in various situations?)

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Content Standard 3.0 (continued)				
Students will use appropriate tools and techniques of measurement to determine estimate, record, and verify direct and indirect measurements to solve problems, communicate, reason and make connections within and beyond the field of mathematics.				
Content Standard Indicator	Work at the Emergent/Developing level may indicate...	Work at the Approaches level may indicate...	Work at the Meets level demonstrates...	Work at the Exceeds level demonstrates...
3.4.3 Define and determine the perimeter of polygons and the area of rectangles, including squares.	difficulty understanding the concepts of perimeter and area.	an ability to recognize a difference between perimeter and area of rectangles, including squares.	ability to define and determine the perimeter of polygons and the area of rectangles, including squares (with a grid).	ability to define and determine the perimeter of polygons and the area of rectangles without the use of a grid.
3.4.4 Determine totals for monetary amounts in practical situations.	ability to recognize coins and bills. difficulty determining the value of a collection of coins and bills.	ability to recognize combinations of coins and bills. difficulty making computations in practical situations.	ability to determine money amounts in practical situations.	ability to calculate money amounts in practical situations and determine if they have a sufficient amount of money for the desired purchase.
Use money notation to add and subtract given monetary amounts.	inability to use monetary notation when adding or subtracting money.	difficulty using the decimal appropriately in monetary amounts.	ability to use money notation to add and subtract given monetary amounts.	ability to use money notation in practical situations.

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Content Standard 3.0 (continued)				
Students will use appropriate tools and techniques of measurement to determine estimate, record, and verify direct and indirect measurements to solve problems, communicate, reason and make connections within and beyond the field of mathematics.				
Content Standard Indicator	Work at the Emergent/Developing level may indicate...	Work at the Approaches level may indicate...	Work at the Meets level demonstrates...	Work at the Exceeds level demonstrates...
3.4.6 Use A.M. and P.M. appropriately in describing time.	ability to associate A.M. and P.M. as daytime (light) and nighttime (dark).	use of A.M. and P.M. symbols, but may confuse.	use of A.M. and P.M. appropriately in describing time.	ability to use A.M. and P.M. in different locations of the world at the same time. (time zones)
Use elapsed time in quarter-hour increments, beginning on the quarter-hour, to determine start, end, and elapsed time.	difficulty in using A.M. and P.M. symbols unless asked.	difficulty describing time beyond daytime (light) and nighttime (dark) for A.M. and P.M.	use of elapsed time in quarter hour increments beginning on the quarter hour to determine start, end, and elapsed time.	use of elapsed time accurately in practical situations moving from A.M. to P.M. and visa versa.
Recognize the number of weeks in a year, days in a year, and days in a month.	difficulty determining elapsed time from the quarter-hour given the start time.	ability to determine elapsed time from the hour given the start time.	use of elapsed time in quarter hour increments beginning on the quarter hour to determine start, end, and elapsed time.	use of elapsed time accurately in practical situations moving from A.M. to P.M. and visa versa.
	difficulty determining elapsed time from the quarter hour.	difficulty calculating elapsed time when given the end time.	ability to recognize the number of weeks in a year, days in a year and days in a month.	ability to convert between days, weeks, and months in a year.
	ability to recognize the number of days in a week.	ability to recognize the days in a year.	ability to recognize the number of weeks in a year, days in a year and days in a month.	ability to convert between days, weeks, and months in a year.
	difficulty recognizing the number of weeks in a year, days in a year, and days in a month.	difficulty recognizing the days in a month and weeks in a year.		

Math Achievement Indicators Grade 4

Content Standard 4.0

Students will identify, represent, verify, and apply spatial relationships and geometric properties to solve problems, communicate, reason and make connections within and beyond the field of mathematics.

Content Standard Indicator	Work at the Emergent/Developing level may indicate...	Work at the Approaches level may indicate...	Work at the Meets level demonstrates...	Work at the Exceeds level demonstrates...
4.4.1 Identify, draw, and classify angles, including straight, right, obtuse, and acute.	ability to recognize the term, angle. difficulty classifying any angles	ability to identify and draw right angles. difficulty identifying and classifying straight, obtuse, and acute angles.	identifying, drawing, and classifying angles according to their measurement, including straight, right, obtuse, and acute.	examination and communication of various situations where angles are utilized in practical situations (angles on a baseball field).
4.4.2 Identify shapes that are congruent, similar, and/or symmetrical using a variety of methods including transformational motions.	difficulty identifying congruent shapes that are not the same orientation and using transformational motion.	developing understanding of vocabulary: similar and congruent.	identification of shapes that are congruent, similar, and/or symmetrical using a variety of methods including transformational motions.	ability to identify and demonstrate a clear understanding of the properties of congruent and similar polygons and how they relate to transformations.
4.4.3 Identify coordinates for a given point in the first quadrant. Locate points of given coordinates on a grid in the first quadrant.	difficulty understanding the use of a grid as a tool to locate points.	inaccuracy in locating and plotting points on a grid in the first quadrant. (reversed order).	identification of the correct coordinate for a given point in the first quadrant. location of points of given coordinates on a grid in the first quadrant.	identification of coordinates of whole number vertices of a given polygon on a grid.

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Content Standard 4.0 (continued)				
Students will identify, represent, verify, and apply spatial relationships and geometric properties to solve problems, communicate, reason and make connections within and beyond the field of mathematics.				
Content Standard Indicator	Work at the Emergent/Developing level may indicate...	Work at the Approaches level may indicate...	Work at the Meets level demonstrates...	Work at the Exceeds level demonstrates...
4.4.4 Identify, describe, and classify two- and three-dimensional figures by relevant properties including the number of vertices, edges, and faces using models.	difficulty differentiating between the terms, vertices, edges, and faces. difficulty naming vertices, edges, and faces on a given model.	ability to identify, describe, and classify two-dimensional figures by counting the number of vertices and edges using models. difficulty visualizing hidden vertices, edges, and faces in a three-dimensional figure.	ability to identify, describe, and classify two- and three-dimensional figures by counting the number of vertices, edges, and faces using models.	understanding of two- and three- dimensional figures by sketching practical and mathematical models using relevant properties, including the number of vertices, edges, and faces.
4.4.6 Identify, draw, label, and describe points, line segments, rays, and angles.	difficulty defining and describing points, line segments and angles.	ability to identify and draw points and angles. difficulty distinguishing between line segments and rays.	ability to identify, draw, label, and describe points, line segments, rays, and angles.	ability to draw geometric figures using points, lines, segments, rays, and angles that are recognizable in a practical setting.
4.4.9 Use the connectors and, or, and not to describe the members of a set.	difficulty recognizing attributes to classify members of a set.	ability to recognize the members of a set. difficulty describing their relationships.	use of the connectors and, or, and not, to describe the members of a set.	use of a graphical representation such as a Venn Diagram to describe the members of a set.

Math Achievement Indicators Grade 4

Content Standard 5.0

Students will collect, organize, display, interpret, and analyze data to determine statistical relationships and probability projections to solve problems, communicate, reason and make connections within and beyond the field of mathematics.

Content Standard Indicator	Work at the Emergent/Developing level may indicate...	Work at the Approaches level may indicate...	Work at the Meets level demonstrates...	Work at the Exceeds level demonstrates...
<p>5.4.1 Pose questions that can be used to guide the collection of categorical and numerical data.</p> <p>Organize and represent data using a variety of graphical representations including frequency tables and line plots.</p>	<p>failure to pose a question for the collection of categorical and numerical data.</p> <p>failure to pose an appropriate question for the collection of categorical and numerical data.</p> <p>difficulty sorting and organizing data.</p>	<p>ability to pose appropriate questions.</p> <p>difficulty manipulating categorical and numerical data.</p> <p>difficulty organizing the collected data and selecting the appropriate graphical representation.</p>	<p>ability to pose questions that can be used to guide the collection of categorical and numerical data.</p> <p>ability to organize and represent data using a variety of graphical representations including frequency tables and line plots.</p>	<p>ability to compare collected data and graphical representations with other sets of data provided.</p> <p>independent organization and representation of data using a variety of graphical representations.</p>
<p>5.4.2 Model and compute range.</p> <p>Model the measures of central tendency for mode and median.</p>	<p>ability to order a set of data.</p> <p>difficulty with terminology associated with measures of central tendency.</p>	<p>ability to order a set of data.</p> <p>ability to identify the mode of a given set of data.</p>	<p>modeling and computing range from a given set of data.</p> <p>modeling measures of central tendency for mode and median.</p>	<p>explanation of the differences between the measures of central tendency.</p>
<p>5.4.3 Interpret data and make predictions using frequency tables and line plots.</p>	<p>ability to read a frequency table.</p> <p>difficulty reading a line plot, interpreting data and making</p>	<p>ability to read frequency tables and line plots.</p> <p>difficulty making logical predictions.</p>	<p>ability to interpret data and make predictions based on frequency tables and line plots.</p>	<p>ability to interpret data and make logical predictions comparing graphs and/or sets of data.</p>

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