

Math Achievement Indicators

Grade 7

Content Standard 7.0

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...
<p>1.7.1. Identify and use place value in mathematical and practical situations.</p> <p>Write, identify, and use powers of 10 from 10^{-3} through 10^6.</p>	<p>ability to identify place value of whole numbers and decimals to the tenths.</p> <p>difficulty writing positive powers of 10 through 10^3. Students cannot identify, write, and use negative powers of 10 through 10^{-3}.</p>	<p>difficultly identifying correct place value.</p> <p>inability to apply place value to practical situations.</p> <p>ability to write, identify and use powers of 10 raised to positive exponents though 10^6.</p> <p>difficulty identifying, writing, and using powers of 10 to express negative powers of 10 through 10^{-3}.</p>	<p>identification and use of place value in mathematical and practical situations.</p> <p>ability to write, identify, and use powers of 10 to express 10^{-3} through 10^6.</p>	<p>expression of numbers in scientific notation in written and verbal forms in mathematical and practical situations.</p>
<p>1.7.2 Translate among fractions, decimals, and percents, including fractional percents.</p>	<p>ability to translate among decimals and percents.</p> <p>difficulty translating among all three representations.</p> <p>inability to use fractional percents.</p>	<p>ability to use fractions, decimals, and percents within the same number family (fourths, fifths...).</p> <p>difficulty translating among all three representations.</p> <p>difficulty using fractional percents.</p>	<p>translation among fractions, decimals and percents, including fractional percents.</p>	<p>ability to translate and explain the relationship among fractions, decimals and percents, including fractional percents.</p>

Achievement Indicators for Math
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Content Standard 7.0 (continued)				
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...
1.7.3 Compare and order a combination of rational numbers, including fractions, decimals, percents, and integers in mathematical and practical situations.	ability to compare and order decimals and percents. difficulty with mixed representations. difficulty comparing and ordering fractions.	ability to compare and order fractions, decimals, and percents. difficulty with mixed representations. difficulty making conversions to compare and order groups of mixed fractions, decimals and percents in practical situations.	ability to compare and order a combination of rational numbers. ability to compare and order fractions, decimals, percents, and integers in any combination of mathematical and in practical situations.	ability to compare and order real numbers using mental math.
1.7.5 Identify absolute values of integers.	inability to understand the concept of absolute value.	difficulty identifying the absolute value of integers.	identify of absolute values of integers.	ability to explain the mathematical concept of absolute value. ability to correctly simplify with absolute value expressions including negative values outside the absolute value symbol.

Math Achievement Indicators Grade 7

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...
2.7.1 Use and create tables, charts, and graphs to extend a pattern in order to describe a linear rule, including integer values.	<p>use of tables, charts and graphs to extend a pattern.</p> <p>difficulty recognizing a linear relation.</p> <p>inability to describe a linear rule.</p>	<p>use and creation of tables, charts and graphs to extend a pattern.</p> <p>ability to recognize a linear relation</p> <p>inability to describe a linear rule.</p>	<p>use and creation of tables, charts and graphs to extend a pattern in order to describe a linear rule, including integer values.</p>	<p>use and creation of tables, charts and graphs to extend a pattern.</p> <p>ability to describe a situation verbally.</p> <p>ability to make a table from the information; graph it and represent it with an algebraic equation.</p>
<p>2.7.2 Evaluate formulas and algebraic expressions for given integer values.</p> <p>Solve and graphically represent equations and inequalities in one variable with integer solutions.</p>	<p>difficulty evaluating expressions containing integer values.</p> <p>inability to solve and graphically represent equations and inequalities in one variable integer solutions.</p>	<p>difficulty evaluating expressions containing integer values.</p> <p>difficulty solving and graphically representing equations and inequalities in one variable with integer solutions.</p>	<p>evaluation of formulas and algebraic expressions for given integer values.</p> <p>ability to solve and graphically represent one-variable equations and inequalities with integer solutions.</p>	<p>evaluation of formulas and algebraic expressions containing rational numbers.</p> <p>ability to solve and graph solutions to equations and inequalities containing rational numbers.</p>
2.7.3 Simplify algebraic expressions by combining like terms.	inability to combine like terms.	difficulty combining like terms when simplifying algebraic expressions.	ability to simplify algebraic expressions by combining like terms.	ability to simplify algebraic equations by combining like terms on either side of the equal sign.

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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...
2.7.4 Generate and graph a set of ordered pairs to represent a linear equation.	ability to graph a set of ordered pairs to represent a linear equation when given a table. inability to generate sets of ordered pairs from a linear equation.	ability to graph a set of ordered pairs to represent a linear equation difficulty generating sets of ordered pairs from a linear equation.	ability to generate and graph a set of ordered pairs to represent a linear equation.	ability to generate a graph of a linear function and can describe the relationship between the independent and dependent variables.
2.7.5 Identify linear equations and inequalities. Model and solve equations using concrete and visual representations.	difficulty identifying linear equations and inequalities. inability to model or solve equations using concrete and visual representations.	identification of linear equations. difficulty identifying linear inequalities. ability to solve equations using concrete and visual representations. inability to model concrete and visual representations.	ability to identify equations and inequalities. ability to model and solve equations using concrete and visual representations.	ability to identify linear equations and inequalities with more than one variable. ability to model and solve equations with technology.

Math Achievement Indicators Grade 7

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...
3.7.1 Estimate and compare corresponding units of measure for area and volume/capacity between customary and metric systems.	inability to estimate or compare area and volume/capacity between measurement systems.	difficulty making reasonable estimates or comparisons for area and volume/capacity between measurement systems.	ability to estimate and compare corresponding units of measure for area and volume/capacity between customary and metric systems.	ability to convert the area or volume/capacity of objects using a formula or a conversion ratio. They easily move between measurement systems.
3.7.2 Given a measurement, identify the greatest possible error.	inability to understand the concept of greatest possible error.	misidentification of the unit of measure needed to identify the greatest possible error.	ability to identify the greatest possible error, given a measurement.	understanding of precision, error, and tolerance when using appropriate measurement tools.
3.7.3 Select, model, and apply formulas to find the volume and surface area of solid figures.	difficulty modeling solid figures to represent volume and surface area. inability to apply the correct formula to find volume and surface area.	ability to model solid figures to represent volume and surface area. difficulty in applying the correct formula.	ability to select, model, and apply formulas to find the volume and surface area of solid figures.	ability to model solid figures two-dimensionally to demonstrate surface area. ability to explain and use formulas correctly.
3.7.4 Calculate simple interest in monetary problems.	difficulty evaluating simple interest when the formula is given.	ability to evaluate the simple interest formula. difficulty evaluating simple interest formula with fractions and decimals.	ability to calculate simple interest in monetary problems.	ability to calculate simple interest on money problems using the formula. Interest is calculated in years and portions of years. ability to calculate simple Interest rates that include fractions and decimals.

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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...
3.7.5 Write and apply proportions to solve mathematical and practical problems involving measurement and monetary conversions.	difficulty writing proportions to solve mathematical and practical problems involving measurement and monetary conversions.	ability to write proportions. difficulty applying proportions to solve mathematical and practical problems involving measurement and monetary conversions.	ability to write and apply proportions to solve mathematical and practical problems involving measurement and monetary conversions.	ability to formulate and write word problems applying proportions to find answers to real situations.
3.7.6 Use elapsed time to solve practical problems.	difficulty determining elapsed time.	ability to determine elapsed time. difficulty in applying elapsed time in practical problems.	use of elapsed time to solve practical problems.	use of elapsed time to plan an event that lasts longer than 24 hrs. They determine when to start the project, when during the project other activities should begin and finish listing the time of the activity as both a time in the day and as the elapsed time from the start of the project.

Math Achievement Indicators Grade 7

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...
<p>4.7.1 Identify, classify, compare, and draw regular and irregular polygons.</p> <p>Find and verify the sum of the measures of interior angles of triangles and quadrilaterals.</p>	<p>difficulty identifying, classifying, drawing and comparing polygons.</p> <p>inability to find the sum of the measures of interior angles of triangles and quadrilaterals.</p>	<p>ability to identify and draw polygons.</p> <p>difficulty classifying and comparing polygons.</p> <p>difficulty finding and verifying the sum of the measures of interior angles of triangles and quadrilaterals.</p>	<p>ability to identify, classify, compare and draw regular and irregular polygons.</p> <p>ability to find and verify the sum of the measures of interior angles of triangles and quadrilaterals.</p>	<p>construction of polygons.</p> <p>ability to find and verify the sum of the measures of interior angles of any polygon.</p>
<p>4.7.2 Make scale drawings using ratios and proportions.</p>	<p>inability to identify the concept of scale drawings.</p>	<p>difficulty applying ratios and proportions to make accurate scale drawings</p>	<p>ability to make scale drawings using ratios and proportions.</p>	<p>use of ratios and proportions to create multiple scale drawings of the original.</p>
<p>4.7.3 Demonstrate translation, reflection, and rotation using coordinate geometry and models.</p> <p>Describe the location of the original figure and its transformation on a coordinate plane.</p>	<p>difficulty distinguishing between translations, reflections, and rotations.</p> <p>inability to describe the location of the original figure and its transformation on the coordinate plane.</p>	<p>ability to translate and reflect figures using coordinate geometry.</p> <p>difficulty rotating figures using coordinate geometry.</p> <p>ability to describe the location of the original figure and its transformation on a coordinate plane in the first quadrant.</p>	<p>ability to demonstrate translation, reflection, and rotation using coordinate geometry and models.</p> <p>ability to describe the location of the original figure and its transformation on a coordinate plane.</p>	<p>a combination of translation, reflection and rotation on an original figure using coordinate geometry.</p> <p>ability to predict the location of the transformed figure before multiple transformations.</p>

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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...
4.7.4 Make a model of a three-dimensional figure from a two-dimensional drawing. Make a two-dimensional drawing of a three-dimensional figure.	difficulty recognizing a rectangular prism from a two-dimensional drawing	difficulty building a rectangular prism from a two-dimensional drawing.	modeling of a three-dimensional figure from a two-dimensional drawing.	ability to build more than one three-dimensional figure, combine the figures into a single three-dimensional model and then draw the model as a two-dimensional drawing.
	difficulty recognizing a two-dimensional drawing of a three-dimensional figure.	difficulty making a two-dimensional drawing from a rectangular prism.	ability to create a two-dimensional drawing of a three-dimensional figure.	
4.7.5 Determine slope of a line, midpoint of a segment, and the horizontal and vertical distance between two points using coordinate geometry.	inability to determine the slope of a line, midpoint of a segment.	difficulty determining the midpoint of a segment and finding the slope of a line.	ability to determine slope of a line accurately.	ability to determine the slope of a line, midpoint of a segment
	difficulty determining the vertical and horizontal distance between two points using coordinate geometry.	ability to determine the horizontal or vertical distance between two points using coordinate geometry.	ability to determine the midpoint of a segment and the distance between two points of horizontal or vertical line using coordinate geometry.	ability to determine distance between two points using given formulas.
4.7.6 Describe the geometric relationships of parallel lines, perpendicular lines, triangles, quadrilaterals and bisectors.	inability to describe the geometric relationship of parallel lines, perpendicular lines, and bisectors.	difficulty describing the geometric relationship of parallel lines, perpendicular lines, and bisectors.	ability to describe geometric relationships of parallel lines, perpendicular lines, triangles, quadrilaterals, and bisectors.	ability to generalize about geometric relationships of parallel lines, perpendicular lines, and bisectors.
				ability to apply generalizations to triangles and quadrilaterals.

Achievement Indicators for Math
Grade 7

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...
4.7.7 Model the Pythagorean Theorem and solve for the hypotenuse.	inability to model the Pythagorean Theorem.	ability to model the Pythagorean Theorem. difficulty solving for the hypotenuse.	ability to model the Pythagorean Theorem and solve for the hypotenuse (answer must be a perfect square root).	application of the Pythagorean Theorem to solve for any side of a right triangle (leaving the answer for the hypotenuse in radical form).
4.7.8 Construct and identify congruent angles, parallel lines, and perpendicular lines.	difficulty identifying congruent angles, parallel and perpendicular lines. inability to construct congruent angles, parallel and perpendicular lines.	ability to identify congruent angles, parallel and perpendicular lines. difficulty constructing congruent angles, parallel and perpendicular lines.	ability to construct and identify congruent angles, parallel lines, and perpendicular lines.	ability to construct and identify congruent angles, parallel and perpendicular lines with and without technology.
4.7.9 Make and test conjectures to explain observed mathematical relationships and to develop logical arguments to justify conclusions.	difficulty testing conjectures on a given mathematical relationship. inability to develop logical arguments to justify conclusions.	ability to test conjectures on a given mathematical relationship. difficulty making conjectures. difficulty developing logical arguments to justify conclusions.	ability to make and test conjectures to explain observed mathematical relationships and to develop logical arguments to justify conclusions.	ability to make, test, and justify conjectures to explain mathematical relationships. maintaining a geometry log of proven conjectures.

Math Achievement Indicators

Grade 7

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>5.7.1 Formulate questions that guide the collection of data.</p> <p>Organize, display, and read data using the appropriate graphical representation (with and without technology).</p>	<p>difficulty formulating questions to guide the collection of data.</p> <p>ability to collect minimal (1 to 40 data units) amounts of data and put the data into a given table.</p>	<p>ability to formulate questions to guide the collection of data.</p> <p>ability to collect data and put the data in a table.</p> <p>ability to organize, display and read data from bar graph.</p> <p>difficulty with other graphical representations (with and without technology).</p>	<p>ability to formulate questions that guide the collection of data.</p> <p>ability to organize, display, and read data using the appropriate graphical representation (with and without technology).</p>	<p>ability to formulate questions and pick the appropriate ones that will give the best data for the problem.</p> <p>ability to collect the data and use various graphical representations to emphasize different aspects of the data to their audience (with and without technology).</p>
<p>5.7.2 Interpret graphical representations of data to describe patterns, trends, and data distribution.</p>	<p>difficulty describing and interpreting patterns, trends, and data distribution.</p>	<p>ability to describe patterns and data distribution in graphical representations.</p> <p>difficulty interpreting trends in data.</p>	<p>ability to interpret graphical representations of data to describe patterns, trends, and data distribution.</p>	<p>ability to interpret graphical representations of data and use patterns, trends, and data distribution to make predications through interpolations and extrapolations.</p>

Achievement Indicators for Math
Grade 7

Content Standard 5.0 (continued)				
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...
5.7.3 Analyze the effect a change of scale will have on statistical charts and graphs.	difficulty in determining the effect of a change of scale.	ability to display data in different scales. difficulty drawing generalizations about how a change in scale effects the interpretation of the data.	ability to analyze the effect a change of scale will have on statistical charts and graphs.	ability to make representations of data using misleading scales to demonstrate how data can be misinterpreted. ability to create and explain why examples of data are not displayed appropriately.
5.7.4 Find the number of permutations possible for an event in mathematical and practical situations.	difficulty listing permutations.	difficulty applying permutations to mathematical and practical situations.	ability to find the number of permutations possible for an event in mathematical and practical situations.	ability to find applications for permutations and apply their knowledge to find out how many ways real situation can occur. ability to explore the definition for combinations to distinguish between permutations and combinations.

Achievement Indicators for Math
Grade 7

Content Standard 5.0 (continued)				
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...
5.7.5 Find the theoretical probability of an event using different counting methods including sample spaces and compare that probability with experimental results.	ability to find sample spaces for an event designed within limited parameters.	ability to find sample spaces for an event.	ability to find the theoretical probability of an event using different counting methods including sample spaces and compare that probability with experimental results.	ability of developing strategies for finding both experimental and theoretical probabilities, perform experiments,
Represent the probability of an event as a number between 0 and 1.	difficulty differentiating the relationship between theoretical and experiment results. difficulty representing the probability of the event as a probability between 0 and 1.	difficulty differentiating the relationship between theoretical and experiment results. ability to represent the probability of the event as a probability between 0 and 1.	ability to interpret the results to make decisions or answer questions about the data. ability to interpret experimental and theoretical probabilities and the relationship between them. ability to represent the probability of the event as a probability between 0 and 1.	ability to represent the probability of the event as a probability between 0 and 1.
5.7.6 Interpolate and extrapolate from data to make predictions for a given set of data.	difficulty interpolating and extrapolating from data.	ability to interpolate. difficulty extrapolation from data.	ability to interpolate and extrapolate from data to make predictions for a given set of data.	ability to examine data points and make predictions of where data is likely to fall between data points and can defend these data when asked to. ability to extend the data using various methods to extrapolate points beyond the given set of points.