

Math Achievement Indicators

Grade 6

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...
1.6.1 Identify and use place value positions to thousandths.	ability to identify place value to the hundredths.	ability to identify place value to the thousandths.	ability to identify and use place value to the thousandths.	ability to identify and use place value beyond the thousandths.
1.6.2 Add and subtract fractions with unlike denominators.	difficulty finding common denominators and/or equivalent fractions.	difficulty adding and subtracting fractions with unlike denominators.	ability to add and subtract fractions with unlike denominators.	ability to add and subtract fractions including improper fractions and mixed numbers.
Multiply and divide with fractions.	difficulty with applying computational rules.	difficulty multiplying and dividing fractions.	ability to multiply and divide fractions.	ability to multiply and divide fractions including improper fractions and mixed numbers.
Use models to translate among fractions, decimals, and percents.	difficulty (with models) changing decimals to percents inability to translate from or to fractions.	difficulty (with models) translating among fractions, decimals and percents.	translation among fractions, decimals and percents using models.	translation among fractions, decimals and percents in practical situations.
1.6.3 Read, write, compare, and order groups of fractions, groups of decimals, and groups of percents.	ability to read and write simple fractions, decimals and percents. difficulty when comparing and ordering.	ability to read, write, compare, and order groups of fractions with like denominators, groups of decimals, and groups of simple percents.	ability to read, write, compare, and order groups of fractions, groups of decimals, and groups of percents.	ability to order mixed groups of fractions, decimals, and percents.

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Content Standard 1.0 (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...
1.6.5 Identify equivalent expressions between and among fractions, decimals, and percents.	difficulty identifying equivalent expressions containing decimals and percents.	difficulty identifying equivalent expressions containing fractions, decimals, and percents.	identification of equivalent expressions between and among fractions, decimals, and percents.	ability to recognize and mentally convert common fractions to percents and decimals.
1.6.6 Estimate using fractions, decimals, and percents. Use estimation strategies in mathematical and practical situations.	difficulty applying the rules of estimation. difficulty estimating.	difficulty in estimating fractions, decimals, and percents. difficulty estimating in practical situations.	estimation using fractions, decimals, and percents. correct use estimation strategies in mathematical and practical situations.	use of immediate recall to estimate fractions, decimals, and percents. ability to select and use a variety of estimation strategies.
1.6.7 Calculate using fractions, decimals, and percents in mathematical and practical situations. Use order of operations to evaluate expressions with integers.	difficulty calculating with decimals and percents. inability to calculate with fractions. difficulty with order of operations to evaluate expressions with integers.	ability to calculate using fractions, decimals, and percents in mathematical situations. difficulty using order of operations to evaluate expressions with integers.	calculating using fractions, decimals, and percents in mathematical and practical problems. use order of operations to evaluate expressions with integers.	comprehension and flexibility in a wide application of fraction, decimal, and percent problems. use order of operations to evaluate expressions and solve one step equations (containing rational numbers).

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Content Standard 1.0 (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...
1.6.8 Use the concepts of number theory, including prime and composite numbers, factors, multiples, and the rules of divisibility to solve problems.	difficulty with number theory, including prime and composite numbers, factors, multiples, and the rules of divisibility.	difficulty with number theory, including prime and composite numbers, factors, multiples, and the rules of divisibility in problem solving.	ability to use the concepts of number theory, including prime and composite numbers, factors, multiples, and the rules of divisibility to solve problems.	ability to apply the concepts of number theory including prime and composite numbers, factors, multiples, and the rules of divisibility with flexibility in application to practical problems.

Math Achievement Indicators

Grade 6

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...
2.6.1 Use and create tables and charts to extend a pattern in order to describe a rule for input/output tables and to find missing terms in a sequence.	difficulty creating tables and charts to extend a pattern in order to describe a rule.	ability to create tables and charts to extend a pattern in order to describe a rule.	ability to create tables and use charts to extend a pattern or describe a rule and find missing terms in a sequence.	ability to determine the rule used to create a table or chart and find missing terms in a sequence.
2.6.2 Evaluate formulas and algebraic expressions using whole number values. Solve and graphically represent equations and simple inequalities in one variable.	difficulty evaluating formulas using whole number values and cannot evaluate algebraic expressions. difficulty solving and graphically representing equations in one variable.	difficulty evaluating formulas and algebraic expressions using whole number values. ability to solve and graphically represent equations in one variable.	evaluation of formulas and algebraic expressions using whole number values. ability to solve and graphically represent equations and simple inequalities in one variable.	evaluation of formulas and algebraic expressions using integer values. ability to solve and graphically represent equations and simple inequalities in mathematical and practical situations.
2.6.3 Write simple expressions and equations using variables to represent mathematical situations.	difficulty writing simple expressions.	ability to write simple expressions using variables to represent mathematical situations.	ability to write simple expressions and equations using variables to represent mathematical situations.	ability to write expressions and equations using variables to represent mathematical and practical situations.
2.6.4 When given a rule relating two variables, create a table and represent the ordered pairs on a coordinate plane.	difficulty graphing ordered pairs.	ability to graph ordered pairs when given a table.	ability to create a table and graph the ordered pairs on a coordinate plane when given a rule relating two variables	ability to determine the rule that was used to create a table and/or graph.

Math Achievement Indicators

Grade 6

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...
3.6.1 Estimate and compare corresponding units of measure for temperature, length, and weight/mass between customary and metric systems.	ability to compare corresponding units of measure for temperature and length within the same measurement system.	ability to estimate and compare corresponding units of measure for temperature, length, and weight/mass in the customary or metric system.	ability to estimate and compare corresponding units of measure for temperature, length, and weight/mass between customary and metric systems.	ability to estimate and compare corresponding units of measure for temperature, length, and weight/mass between customary and metric systems in practical situations.
3.6.2 Given two measurements of the same object, select the one that is more precise.	inability to understand precision.	difficulty selecting the more precise measurement from two given measurements.	ability to select the more precise measurement from two given measurements of the same object.	ability to justify the choice of a specific unit of measurement.
Explain how the size of the unit of measure used effects precision.	inability to differentiate differences in the size of the unit.	difficulty explaining how the size of the unit effects precision.	ability to explain how the size of the unit used effects precision.	ability to justify how the size of the unit used effects precision.
3.6.3 Select, model, and apply formulas to find the perimeter, circumference, and area of plane figures.	inability to select the appropriate formula to find the perimeter, circumference, and area of plane figures.	difficulty selecting, modeling, and applying appropriate formulas to find the perimeter, circumference, and area of plane figures.	ability to select, model, and apply formulas to find the perimeter, circumference, and area of plane figures	ability to apply formulas relating to perimeter, circumference and the area of plane figures to irregular plane figures.
3.6.4 Compare and use unit cost in practical situations.	difficulty computing unit cost.	difficulty comparing and using unit cost in practical situations.	ability to compare and use unit cost in practical situations.	ability to compare and use unit costs to analyze data and justify consumer decisions 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...
3.6.5 Write and apply ratios in mathematical and practical problems involving measurement and monetary conversions.	difficulty writing ratios in mathematical and practical problems.	ability to write ratios involving measurement and monetary conversions. difficulty applying these ratios to problems.	ability to write and apply ratios involving measurement and monetary conversions.	ability to write and apply ratios involving real world situations with large and/or number amounts.
3.6.6 Use equivalent periods of time to solve practical problems.	difficulty using equivalent periods of time.	ability to determine equivalent periods of time. difficulty applying them to practical problems.	use of equivalent periods of time to solve practical problems.	use of equivalent periods of time to solve multi-step problems.

Math Achievement Indicators

Grade 6

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...
4.6.1 Measure angles using a protractor.	<p>ability to identify right and straight angles.</p> <p>inability to properly use a protractor.</p>	<p>ability to measure right and straight angles using a protractor.</p> <p>difficulty using a protractor to measure angles limited to multiples of five degrees.</p>	measurement of angles using a protractor.	ability to generate examples of angles using a protractor.
Identify, classify, compare, and draw regular and irregular quadrilaterals.	<p>ability to identify and draw regular quadrilaterals.</p> <p>difficulty classifying and comparing.</p>	ability to identify, classify, compare, and draw regular quadrilaterals.	ability to identify, classify, compare, and draw regular and irregular quadrilaterals.	ability to generate examples of regular and irregular quadrilaterals and relate these figures in a variety of representations.
Identify, draw, and use central angles to represent fractions of a circle.	<p>ability to identify central angles.</p> <p>inability to draw or use central angles.</p>	ability to identify, draw, and use central angles to represent simple fractions of a circle.	ability to identify, draw, and use central angles to represent fractions of a circle.	ability to generate examples of central angles and relate these angles in a variety of applications.

Achievement Indicators for Math
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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...
4.6.2 Determine actual measurements represented on scale drawings.	difficulty recognizing the relationship between ratio and the scale used to create scale drawings.	ability to determine the scale used to create scale drawings.	ability to determine actual measurements represented on scale drawings.	ability to determine and create measurements on scale drawings.
Convert actual measurements to scale.	confusion with actual and scale measurements.	difficulty converting actual measurements to scale.	ability to convert actual measurements to scale.	ability to convert actual measurements to scale in a variety of applications.
4.6.3 Using a coordinate plane identify and locate points.	difficulty identifying and locating points in the first quadrant.	ability to identify and locate points in the first and second quadrant.	use of a coordinate plane, students identify and locate points.	use of a coordinate plane, student describes relationships between points.
Graph coordinates representing geometric shapes in all four quadrants on a coordinate plane.	difficulty graphing coordinates in the first quadrant to represent simple geometric shapes.	ability to graph coordinates in two quadrants to represent simple geometric shapes.	ability to graph coordinates in all four quadrants to represent geometric shapes.	ability to graph coordinates in all four quadrants to represent and compare geometric shapes.
4.6.4 Make a model of a three-dimensional prism from a two-dimensional drawing.	inability to recognize a model of a three-dimensional prism created from a two-dimensional drawing.	ability to recognize a model of a three-dimensional prism created from a two-dimensional drawing.	modeling of a three-dimensional prism from a two-dimensional drawing.	ability to describe the steps in writing of how to make a model of any three-dimensional shape from any two-dimensional drawing.
Make a two-dimensional drawing of a three-dimensional prism.	inability to recognize a two-dimensional drawing created from a three-dimensional prism.	ability to recognize a two-dimensional drawing created from a three-dimensional prism.	ability to create a two-dimensional drawing of a 3-dimensional prism.	ability to describe the steps in writing of how to make two-dimensional drawings of any three-dimensional prism.

Achievement Indicators for Math
Grade 6

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...
4.6.5 Model slope (pitch, angle of inclination) using concrete objects and practical examples.	inability to understand the concept of slope.	ability to recognize the concept of slope.	correct modeling of slope using concrete objects and practical applications.	correct identification of slope without concrete objects.
4.6.6 Draw, identify and find measures of complementary and supplementary angles using arithmetic and geometric methods.	inability to recognize or draw complementary and supplementary angles.	ability to draw and identify complementary and supplementary angles.	ability to draw, identify, and find measures of complementary and supplementary angles using arithmetic and geometric methods.	ability to apply complementary and supplementary angles in a variety of applications.
4.6.7 Determine the measures of missing angles of triangles based on the Triangle Sum Theorem.	inability to recognize there are 180° in a triangle (Triangle Sum Theorem).	ability to determine the measures of missing angles of triangles with difficulty (Triangle Sum Theorem).	ability to determine the measures of missing angles of triangles based on the Triangle Sum Theorem.	ability to extend the Triangle Sum Theorem to determine missing angles in other polygons.
4.6.8 Construct circles, angles, and triangles based on given measurements using a variety of methods and tools including compass, straight edge, paper folding, and technology.	inability to construct circles, angles, and triangles based on given measurements using a particular tool.	ability to construct circles and angles based on given measurements using a variety of methods and tools. difficulty constructing triangles.	construction of circles, angles, and triangles based on given measurements using a variety of methods including protractor, compass, straight edge, paper folding and technology.	accurately constructed figures and polygons using a variety of methods.

Achievement Indicators for Math
Grade 6

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...
4.6.9 Identify counterexamples to disprove a conditional statement.	inability to recognize counterexamples.	ability to recognize counterexamples. difficulty identifying how counterexamples disprove a conditional statement.	identification of counterexamples to disprove a conditional statement.	creation of counterexamples to disprove a conditional statement.

Math Achievement Indicators

Grade 6

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...
5.6.1 Pose questions that guide the collection of data. Organize and represent data using a variety of graphical representations including circle graphs and scatter plots.	inability to develop relevant questions that guide the collection of data. inability to display data on an appropriate graph.	difficulty developing relevant questions that guide the collection of data. difficulty displaying data on the appropriate graph.	relevant questions that guide the collection of data. organization and representation of data using a variety of graphical representations including circle graphs and scatter plots.	relevant questions and informed decisions about data. representation of data using a variety of graphical representations to draw conclusions and make informed decisions.
5.6.2 Select and apply the measures of central tendency to interpret data.	difficulty determining mean, median, and mode of a set of data.	ability to determine mean, median, and mode of a set of data.	ability to select and apply the measures of central tendency to interpret data.	performance of basic calculations relating to central tendency. a clear understanding of when to select each measure and utilize this information to make valid predictions.
5.6.3 Analyze the effect a change of graph type has on the interpretation of a set of data. Interpret data and make predictions using circle graphs and scatter plots.	difficulty analyzing data on different types of graphs. inability to make predictions using data displayed on circle graphs and scatter plots.	ability to analyze data on different types of graphs. difficulty making predictions using data displayed on circle graphs and scatter plots.	ability to analyze the effect a change in graph type has on the interpretation a set of data. ability to interpret data and make predictions based on circle graphs and scatter plots.	ability to analyze and justify the interpretation of the effect a change in graph type will have on the data. use of circle graphs and scatter plots to make predictions and justify their conclusions.

Achievement Indicators for Math
Grade 6

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...
5.6.4 Find the number of outcomes for a specific event by constructing sample spaces and tree diagrams.	difficulty constructing sample spaces and tree diagrams.	ability to construct sample spaces and tree diagrams.	ability to find the number of outcomes for a specific event by constructing sample spaces and tree diagrams.	accurate representation of the total number of outcomes for an event in a well-organized format that allows predictions to be made.
5.6.5 Find experimental probability using concrete materials.	difficulty conducting probability experiments using concrete materials.	ability to conduct probability experiments using concrete materials.	ability to find experimental probability using concrete materials.	ability to create and conduct probability experiments to test hypotheses.
Represent the results of simple probability experiments as fractions, decimals, percents, and ratios to make predictions about future events.	difficulty representing the results of simple probability experiments. inability to convert answer values into fractions, decimals, percents, and ratios.	ability to represent the results of simple probability experiments. difficulties converting answer values into fractions, decimals, percents, and ratios.	representation of the results of simple probability experiments with a variety of numeric representations. use of this information to make predictions about future events.	representation of the results of simple probability experiments in a variety of mathematical representations. use this information to make sound data predictions.
5.6.6 Analyze various representations of a set of data to draw conclusions and make predictions.	ability to read data displayed on various graphical representation. difficulty understanding data displayed on various graphical representations.	ability to read and understand data displayed on various graphical representations.	ability to analyze various representations of a set of data to draw conclusions and make predictions.	ability to analyze and justify the use of a variety of graphical representations based on the type of data and comparisons needed.
Describe the limitations of various graphical representations.	difficulty graphing data using various graphical representations.	ability to graph data using various graphical representations.	ability to describe the limitations of various graphical representations.	ability to describe the limitations of various graphical representations and select the most appropriate format for representing data.