

## Math Achievement Indicators Grade 5

### 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 <b>Emergent/Developing</b> level may indicate...	Work at the <b>Approaches</b> level may indicate...	Work at the <b>Meets</b> level demonstrates...	Work at the <b>Exceeds</b> level demonstrates...
1.5.1 Identify and use place value positions of whole numbers and decimals to hundredths.	identification and use place value of whole numbers only.	identification and use of place value of whole numbers to the tenths.	identification and use of place value positions of whole numbers and decimals to hundredths.	identification and use of place value of decimals beyond the hundredths.
1.5.2 Add and subtract fractions with like denominators using models, drawings, and numbers.	addition and subtraction of fractions with like denominators using models and/or drawings.	difficulty adding and subtracting fractions with like denominators using numbers.	addition and subtraction of fractions with like denominators using models, drawings, and numbers.	addition and subtraction of fractions with unlike denominators using models, drawings, and numbers.
Compare fractions with unlike denominators using models and drawings, and by finding common denominators.	comparing fractions with like denominators using models and drawings.	difficulty finding common denominators.	comparing fractions with unlike denominators using models and drawings, and by finding common denominators.	comparing fractions with unlike denominators.
Identify, model, and compare improper fractions and mixed numbers.	difficulty identifying and modeling mixed numbers.	difficulty identifying, and modeling improper fractions and/or mixed numbers.	identification, modeling, and comparing improper fractions and mixed numbers.	ability to translate between improper fractions and mixed numbers.
1.5.3 Read, write, compare, and order integers in mathematical and practical situations.	difficulty reading and writing integers.	difficulty comparing and ordering integers.	ability to read, write, compare, and order integers in mathematical and practical situations.	ability to use and apply integers in mathematical and practical situations.

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Content Standard <b>1.0</b> (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 <b>Emergent/Developing</b> level may indicate...	Work at the <b>Approaches</b> level may indicate...	Work at the <b>Meets</b> level demonstrates...	Work at the <b>Exceeds</b> level demonstrates...
1.5.5 Use multiples of 10 to expand knowledge of basic multiplication and division facts.	difficulty recalling and using multiplication and division facts.	difficulty using multiples of 10.	use of multiples of 10 to expand knowledge of basic multiplication and division facts.	ability to multiply and divide using multiples of 10 beyond the basic facts.
1.5.6 Estimate to determine the reasonableness of an answer in mathematical and practical situations involving decimals.	difficulty estimating whole numbers in mathematical and practical situations.	ability to estimate to determine the reasonableness of an answer involving decimals to the tenths.	ability to estimate to determine the reasonableness of an answer in mathematical and practical situations involving decimals.	ability to understand estimating decimals and reasonableness of an answer in practical situations.
1.5.7 Add and subtract decimals.  Multiply and divide decimals by whole numbers in problems representing practical situations.  Use order of operations to evaluate expressions with whole numbers.	difficulty adding and subtracting decimals to the tenths.  difficulty multiplying decimals by whole numbers.  confusion or ignoring of the rules for the order of operations.	ability to add and subtract decimals to the tenths.  difficulty dividing decimals by whole numbers in problems representing practical situations.  difficulty using order of operations to evaluate expressions with whole numbers.	ability to add and subtract decimals to the hundredths.  ability to multiply and divide decimals by whole numbers in problems representing practical situations.  ability to use order of operations to evaluate expressions with whole numbers.	ability to add and subtract decimals beyond the hundredths.  ability to multiply and divide decimals in problems representing practical situations.  ability to use order of operations to evaluate expressions with decimals.

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Content Standard <b>1.0</b> (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 <b>Emergent/Developing</b> level may indicate...	Work at the <b>Approaches</b> level may indicate...	Work at the <b>Meets</b> level demonstrates...	Work at the <b>Exceeds</b> level demonstrates...
1.5.8 Generate and solve addition, subtraction, multiplication, and division problems using whole numbers and decimals in practical situations.	difficulty solving problems using decimals to the tenths in practical situations.	ability to generate and solve problems in practical situations using whole numbers.  difficulty with decimals beyond the tenths.	ability to generate and solve addition, subtraction, multiplication, and division problems using whole numbers and decimals in practical situations.	ability to apply knowledge of addition, subtraction, multiplication, and division using whole numbers and decimals in multi-step practical situations.

## Math Achievement Indicators Grade 5

### 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 <b>Emergent/Developing</b> level may indicate...	Work at the <b>Approaches</b> level may indicate...	Work at the <b>Meets</b> level demonstrates...	Work at the <b>Exceeds</b> level demonstrates...
2.5.1 Identify, describe, and represent patterns and relationships in the number system, including triangular numbers and perfect squares.	difficulty identifying triangular numbers and perfect squares.	difficulty describing and/or representing triangular numbers and perfect squares.	identification, description, and representation of patterns and relationships in the number system, including triangular numbers and perfect squares.	creation of patterns and analyzes of relationships in the number system, including triangular numbers and perfect squares.
2.5.2 Find possible solutions to an inequality involving a variable using whole numbers as a replacement set.	ability to find possible solutions to inequalities not including variables.	difficulty finding possible solutions to inequalities involving variables when given a replacement set.	ability to find possible solutions to an inequality involving a variable using whole numbers as a replacement set.	ability to generate possible solutions to an inequality beyond the replacement set.
Solve equations with whole numbers using a variety of methods, including inverse operations, mental math, and guess and check.	difficulty solving equations with whole numbers.	ability to solve equations with whole numbers using limited methods.	ability to solve equations with whole numbers including a variety of methods, using inverse operations, mental math, and guess and check.	ability to generate and graphically represent equations and simple inequalities on a number line involving one variable.
2.5.3 Complete number sentences with the appropriate words and symbols including $\geq$ , $\leq$ and $\neq$ .	confusion of words and incorrectly apply symbols in number sentences.	ability to complete number sentences with appropriate words.  confusion of the symbols.	ability to complete number sentences with the appropriate words and symbols including $\geq$ , $\leq$ and $\neq$ .	ability to generate number sentences with the appropriate words and symbols including $\geq$ , $\leq$ and $\neq$ .

## Math Achievement Indicators Grade 5

### 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 <b>Emergent/Developing</b> level may indicate...	Work at the <b>Approaches</b> level may indicate...	Work at the <b>Meets</b> level demonstrates...	Work at the <b>Exceeds</b> level demonstrates...
3.5.1. Estimate and convert units of measure for weight and volume/capacity within the same measurement system (customary and metric).	difficulty estimating and/or converting units of measure for weight and volume/capacity within the same measurement system.	ability to estimate and convert units of measure within only one measurement system.	ability to estimate and convert units of measure for weight and volume/capacity within the same measurement system (customary and metric).	ability to distinguish between various units of measure (weight and volume/capacity) and explain their relevance in practical situations.
3.5.2. Measure volume and weight to a required degree of accuracy in the customary and metric systems.	difficulty measuring volume and weight. Students demonstrate a misunderstanding of the required degree of accuracy in measurement.	ability to measure weight but demonstrate difficulty measuring volume. Students demonstrate difficulty measuring to a required degree of accuracy in the metric system.	ability to measure volume and weight to a required degree of accuracy. (customary and metric)	ability to determine the appropriate measurement tool for measurement of volume and weight for problems solving situations. (customary and metric)
3.5.3 Describe the difference between perimeter and area, including the difference in units of measure.	ability to describe perimeter or area only.	difficulty distinguishing the difference in units of measurement between perimeter and area.	description of the difference between perimeter and area, including the difference in units of measure.	ability to find perimeter and area of polygons with accurate notation of units of measure.
3.5.4 Determine totals, differences, and change due for monetary amounts in practical situations.	difficulty determining totals and differences of monetary amounts.	ability to determine totals and differences of monetary amount.  difficulty in computing change in practical situations.	ability to determine totals, differences, and change due for monetary amounts in practical situations.	ability to apply knowledge of monetary tasks in non-routine situations. (checkbook/balance sheet)

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Content Standard <b>3.0</b> (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 <b>Emergent/Developing</b> level may indicate...	Work at the <b>Approaches</b> level may indicate...	Work at the <b>Meets</b> level demonstrates...	Work at the <b>Exceeds</b> level demonstrates...
3.5.6 Determine equivalent periods of time, including relationships between and among seconds, minutes, hours, days, months, and years.	difficulty determining some equivalent periods of time and their relationships.	recognition of two consecutive periods of time.  difficulty applying the relationship to the third period of time. (seconds to minutes, but not seconds to hours)	ability to determine equivalent periods of time, including relationships between and among seconds, minutes, hours, days, months, and years.	use of equivalent periods of time to solve problems.

## Math Achievement Indicators

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#### Content Standard 5.0

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 <b>Emergent/Developing</b> level may indicate...	Work at the <b>Approaches</b> level may indicate...	Work at the <b>Meets</b> level demonstrates...	Work at the <b>Exceeds</b> level demonstrates...
<p>4.5.1. Identify, classify, compare, and draw triangles and quadrilaterals based on their properties.</p> <p>Identify and draw circles and parts of circles, describing the relationships between the various parts.</p>	<p>ability to identify and draw triangles and quadrilaterals.</p> <p>ability to identify and draw circles.</p> <p>difficulty identifying the parts of circles.</p>	<p>ability to identify and draw triangles and quadrilaterals.</p> <p>difficulty classifying and comparing.</p> <p>ability to identify and draw circles and parts of circles.</p> <p>difficulty describing the relationships between the various parts.</p>	<p>ability to identify, classify, compare, and draw triangles and quadrilaterals based on their properties.</p> <p>ability to identify and draw circles and parts of circles, describing the relationships between the various parts.</p>	<p>ability to identify, classify, compare, and draw regular and irregular quadrilaterals.</p> <p>ability to identify and draw circles and parts of circles; and students understand that central angles are a part of a circle.</p>
<p>4.5.2 Represent concepts of congruency, similarity, and/or symmetry using a variety of methods including dilation (enlargement/reduction) and transformational motions.</p>	<p>confusion of concepts of congruency, similarity, and/or symmetry.</p>	<p>ability to recognize the concepts of congruency, similarity, and/or symmetry using transformational motions.</p>	<p>representation of concepts of congruency, similarity, and/or symmetry using a variety of methods including dilation (enlargement/reduction) and transformational motions.</p>	<p>use of concepts of congruency, similarity, and/or symmetry using a variety of methods including dilation and transformational motions in practical situations.</p>
<p>4.5.3. Graph coordinates representing geometric shapes in the first quadrant.</p>	<p>difficulty graphing coordinates in the first quadrant.</p>	<p>ability to identify coordinates on a graph.</p> <p>difficulty representing geometric shapes in the first quadrant.</p>	<p>ability to graph coordinates representing geometric shapes in the first quadrant.</p>	<p>ability to graph coordinates representing geometric shapes beyond the first quadrant.</p>

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Content Standard <b>5.0</b> (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 <b>Emergent/Developing</b> level may indicate...	Work at the <b>Approaches</b> level may indicate...	Work at the <b>Meets</b> level demonstrates...	Work at the <b>Exceeds</b> level demonstrates...
4.5.4 Predict and describe the effects of combining, dividing, and changing shapes into other shapes.	difficulty recognizing the changes created by combining and/or dividing shapes.	ability to recognize the changes created by combining and/or dividing shapes.	ability to predict and describe the effects of combining, dividing, and changing shapes into other shapes.	ability to combine or divide multiple shapes to create a new shape.
4.5.6 Identify, draw, label, and describe planes, parallel lines, intersecting lines, and perpendicular lines.	difficulty identifying, drawing, and labeling perpendicular lines, parallel lines, and intersecting lines.	difficulty and/or confusion identifying, drawing, labeling, and describing planes, parallel lines, intersecting lines, and perpendicular lines.	ability to identify, draw, label, and describe planes, parallel lines, intersecting lines, and perpendicular lines.	ability to identify, draw, label, and describe planes, parallel lines, intersecting lines, perpendicular lines, and the angles created by perpendicular and intersecting lines.
4.5.7 Describe characteristics of right, acute, obtuse, scalene, equilateral, and isosceles triangles.	difficulty describing characteristics of right, acute, obtuse, scalene, equilateral, and isosceles triangles.	ability to describe characteristics of right, acute, obtuse, and equilateral triangles; but demonstrate difficulty describing characteristics of scalene and isosceles triangles.	ability to describe characteristics of right, acute, obtuse, scalene, equilateral, and isosceles triangles.	ability to draw right, acute, obtuse, scalene, equilateral, and isosceles triangles.
4.5.9 Represent relationships using Venn diagrams.	difficulty recognizing relationships using Venn diagrams.	ability to identify relationships using Venn diagrams.	ability to represent relationships using Venn diagrams.	ability to generate examples of relationships using Venn diagrams.



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Content Standard <b>5.0</b> (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 <b>Emergent/Developing</b> level may indicate...	Work at the <b>Approaches</b> level may indicate...	Work at the <b>Meets</b> level demonstrates...	Work at the <b>Exceeds</b> level demonstrates...
5.5.3 Interpret data and make predictions using stem-and-leaf plots and histograms.	ability to identify stem-and-leaf plots and histograms.  difficulty interpreting data and making predictions.	ability to interpret data using stem-and-leaf plots and histograms.  difficulty making predictions.	interpretation of data and predictions using stem-and-leaf plots and histograms.	interpretation of data and logical predictions in practical situations.
5.5.4 Represent and solve problems involving combinations using a variety of methods.	difficulty representing problems involving combinations.	difficulty solving problems involving combinations.	ability to represent and solve problems involving combinations using a variety of methods.	ability to generate or explore problems involving combinations using a variety of methods.
5.5.5 Conduct simple probability experiments using concrete materials.  Represent the results of simple probability experiments as decimals to make predictions about future events.	ability to identify basic probability terms  inability to conduct an experiment.  difficulty representing the results of simple probability experiments as fractions.	ability to conduct simple probability experiments using concrete materials.  ability to represent the results of simple probability experiments as fractions  difficulties converting answer values into decimals.	ability to conduct simple probability experiments using concrete materials.  ability to represent the results of simple probability experiments as decimals to make predictions about future events.	use of probability data to predict and justify their reasoning.  ability to extend representations of the results of simple probability experiments.

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Content Standard <b>5.0</b> (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 <b>Emergent/Developing</b> level may indicate...	Work at the <b>Approaches</b> level may indicate...	Work at the <b>Meets</b> level demonstrates...	Work at the <b>Exceeds</b> level demonstrates...
5.5.6 Select an appropriate type of graph to accurately represent the data and justify the selection.	difficulty selecting a graph to represent the data.	ability to select an appropriate graph.  difficulty justifying the selection.	selection of an appropriate type of graph to accurately represent the data and justify the selection.	creation of a graphical representation of the data given and justify their creation.