

Colorado Academic Standards - Mathematics
Fifth Grade Proficiency Level Descriptions

Standard: Number Sense, Properties, and Operations			
Grade Level Expectation: The characteristics of numbers can be used to classify them in various ways			
DCSD Progress Report: <i>Applies properties, rules, concepts of numbers to solve problems</i>			
1: Beginning Understanding	2: Meets Some Aspects of GLE	3: Meets GLE	4: Exceeds GLE
Explains what concepts of squares, primes, composites, factors, and multiples; Can tell you what the identity, associative, commutative, and distributive properties are for mathematics; Identifies the divisibility rules for two, three, four, five, six, nine, and 10 to solve problems.	Applies concepts of squares, primes, composites, factors, and multiples to solve problems with help; Uses the identity, associative, commutative, and distributive properties to solve problems with help and not complete understanding of why we use these properties; Describes and use divisibility rules for two, three, four, five, six, nine, and 10.	Applies concepts of squares, primes, composites, factors, and multiples to solve problems; Uses the identity, associative, commutative, and distributive properties to solve problems; Describes and use divisibility rules for two, three, four, five, six, nine, and 10 to solve problems.	Applies concepts of squares, primes, composites, factors, and multiples to solve problems and can explain the relationship between them; Uses the identity, associative, commutative, and distributive properties to solve problems with justification why these properties help simplify problem solutions; Use divisibility rules for two, three, four, five, six, nine, and 10 to solve problems and explain why they work .

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Standard: Number Sense, Properties, and Operations			
Grade Level Expectation: In the real number system, commonly used rational numbers have multiple equivalent representations DCSD Progress Report: <i>Represents numbers w/ equivalent representations (% , expanded notation)</i>			
1: Beginning Understanding	2: Meets Some Aspects of GLE	3: Meets GLE	4: Exceeds GLE
<p>Finds equivalent forms of commonly used fractions, decimals, and percents using models; Uses common fractions and percents to calculate parts of whole numbers in problem situations with help; Infrequently models addition, subtraction, and multiplication of fractions, decimals, and percents with help; Compose and decompose multi-digit whole numbers and decimals based on place value with help and difficulty; Represent numbers to 100,000 with expanded notation</p>	<p>Finds equivalent forms of commonly used fractions, decimals, and percents using models, drawings, and/or computational strategies without the understanding of how the models and drawings link to the computational strategies; Uses common fractions and percents to calculate parts of whole numbers in problem situations; Model addition, subtraction, and multiplication of fractions, decimals, and percents with help; Compose and decompose multi-digit whole numbers and decimals based on place value with help; Represent numbers to 100,000 with expanded notation and exponents</p>	<p>Finds equivalent forms of commonly used fractions, decimals, and percents using models, drawings, and computational strategies; Uses common fractions and percents to calculate parts of whole numbers in problem situations including comparisons of savings rates at different financial institutions (PFL); Model addition, subtraction, and multiplication of fractions, decimals, and percents; Compose and decompose multi-digit whole numbers and decimals based on place value; Represent numbers to 1,000,000 with expanded notation and exponents</p>	<p>Finds equivalent forms of commonly used fractions, decimals, and percents using models, drawings, and computational strategies and can fluently in the conversion of the three; Uses and justifies solutions with using fractions and percents to calculate parts of whole numbers in problem situations including comparisons of savings rates at different financial institutions (PFL); Model, justify, and record thinking with addition, subtraction, and multiplication of fractions, decimals, and percents; Compose and decompose multi-digit whole numbers and decimals based on place value showing an understanding that there is not unique next number when dealing with decimals; Represent and justify the value of numbers to 1,000,000 with expanded notation and exponents</p>

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Standard: Number Sense, Properties, and Operations			
Grade Level Expectation: Formulate, represent, and use algorithms to multiply and divide multi-digit whole numbers with flexibility, accuracy, and efficiency DCSD Progress Report: <i>Estimate, model, apply algorithm to solve multi-digit mult/div problems</i>			
<p align="center">1: Beginning Understanding</p> <p>Uses one method of computing to multiply and divide multi-digit numbers by two-digit factors or divisors without clear understanding of how that method works; Model multiplication and division using area, linear, or grouping models with help; Sees the remainder as part of the quotient with no understanding that the correct answer could be a form of the quotient in division problems; Uses a method to estimate products and quotients without reasoning or calculates them mentally depending on the context and numbers involved with help.</p>	<p align="center">2: Meets Some Aspects of GLE</p> <p>Uses flexible methods of computing including standard algorithms to multiply and divide multi-digit numbers by two-digit factors or divisors with difficulty and help; Model multiplication and division using area, linear, and grouping models with difficulty and help; With help, interprets remainders and selects a form of the quotient in division problems; Selects and uses a method to estimate products and quotients or calculates them mentally depending on the context and numbers involved with help.</p>	<p align="center">3: Meets GLE</p> <p>Uses flexible methods of computing including standard algorithms to multiply and divide multi-digit numbers by two-digit factors or divisors; Model multiplication and division using area, linear, and grouping models; Interprets remainders and select the most useful form of the quotient in division problems; Selects and uses appropriate methods to estimate products and quotients or calculate them mentally depending on the context and numbers involved.</p>	<p align="center">4: Exceeds GLE</p> <p>Uses flexible methods of computing including standard algorithms to multiply and divide multi-digit numbers by three-digit factors or divisors justifying the chose of method; Model multiplication and division using area, linear, and grouping models understanding the relationship between the two and using this relationship to solve the problem; Interprets remainders and select the most useful form of the quotient in division problems based on situations; Selects, uses, and justifies appropriate methods to estimate products and quotients or calculate them mentally depending on the context and numbers involved understanding that sometimes the estimate is a better answer.</p>

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Standard: Patterns, Functions, and Algebraic Structures			
Grade Level Expectation: Number patterns and relationships can be described using a variety of tools DCSD Progress Report: <i>Analyzes, represents, and extends patterns in a variety of ways</i>			
1: Beginning Understanding	2: Meets Some Aspects of GLE	3: Meets GLE	4: Exceeds GLE
Analyzes and describes patterns and relationships using words, tables, graphs, symbols, or technology; Uses patterns and relationships in solving problems, including those involving saving and checking accounts such as understanding that spending more means saving less (PFL).	Analyzes and describes patterns and relationships using words, tables, graphs, symbols, or technology; Explains, extends, and uses patterns and relationships in solving problems, including those involving saving and checking accounts such as understanding that spending more means saving less (PFL).	Analyzes and describes patterns and relationships using words, tables, graphs, symbols, and technology; Explains, extends, and uses patterns and relationships in solving problems, including those involving saving and checking accounts such as understanding that spending more means saving less (PFL).	Analyzes, describes, and explains patterns and relationships using words, tables, graphs, symbols, and technology; Explains, extends, and uses patterns and relationships in solving problems, including those involving saving and checking accounts such as understanding that spending more means saving less (PFL).

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Standard: Patterns, Functions, and Algebraic Structures			
Grade Level Expectation: When a relationship exists between two quantities, a change in one results in a change in the other DCSD Progress Report: Shows how a change in one quantity causes a change in a related quantity			
1: Beginning Understanding	2: Meets Some Aspects of GLE	3: Meets GLE	4: Exceeds GLE
Expresses change relationships involving whole numbers with if/then statements, input/output boxes, function tables, or rule statements; Uses patterns to solve problems including those involving saving and checking accounts such as the pattern created when saving \$10 a month (PFL).	Expresses change relationships involving whole numbers with if/then statements, input/output boxes, function tables, or rule statements; Uses symbols to express unknown quantities; Uses patterns to solve problems including those involving saving and checking accounts such as the pattern created when saving \$10 a month (PFL).	Expresses change relationships involving whole numbers with if/then statements, input/output boxes, function tables, and rule statements; Selects, describes, and uses symbols to express unknown quantities; Uses patterns to solve problems including those involving saving and checking accounts such as the pattern created when saving \$10 a month (PFL).	Expresses change relationships involving whole numbers with if/then statements, input/output boxes, function tables, and rule statements; Selects, describes, and uses symbols to express unknown quantities; Uses patterns to solve problems including those involving saving and checking accounts such as the pattern created when saving \$10 a month (PFL).

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Standard: Data Analysis, Statistics, and Probability			
Grade Level Expectation: Visual displays and summary statistics are used to describe and interpret data DCSD Progress Report: <i>Collect, display, interpret data using concepts of mean, median, mode</i>			
1: Beginning Understanding	2: Meets Some Aspects of GLE	3: Meets GLE	4: Exceeds GLE
Interprets data using the concepts of shape of distribution, range, mode, median and mean; Draws conclusions.	Formulates a question and hypothesis to design appropriate data collection and display methods; Interprets data using the concepts of shape of distribution, range, mode, median and mean; Draws conclusions, and makes convincing arguments based on categorical and numerical data analysis.	Formulates a question and hypothesis to design appropriate data collection and display methods; Selects and creates appropriate displays of data including double bar graphs, time plots, and line graphs; Interprets data using the concepts of shape of distribution, range, mode, median and mean; Draws conclusions, and makes convincing arguments based on categorical and numerical data analysis.	Formulates a question and hypothesis to design appropriate data collection and display methods; Selects and creates appropriate displays of data including double bar graphs, time plots, and line graphs; Interprets data using the concepts of shape of distribution, range, mode, median and mean; Discusses which measure of central tendency (mean, median, mode) best describes the data. Draws conclusions, and makes convincing arguments based on categorical and numerical data analysis.

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Standard: Data Analysis, Statistics, and Probability			
Grade Level Expectation: Mathematical models are used to determine probability, analyze and describe the outcomes of events			
DCSD Progress Report: <i>Determines probability and outcomes of events using mathematical models</i>			
1: Beginning Understanding	2: Meets Some Aspects of GLE	3: Meets GLE	4: Exceeds GLE
Organizes all possible outcomes of events in a list or chart; Explains why a game involving chance devices such as number cubes or spinners is fair or unfair; Compares individual data to class data collected from chance devices to describe the differences in outcomes based on sample size.	Organizes all possible outcomes of events in a list or chart; Uses fractions, decimals, or percents to quantify the likelihood of events; Explains why a game involving chance devices such as number cubes or spinners is fair or unfair; Compares individual data to class data collected from chance devices to describe the differences in outcomes based on sample size.	Organizes all possible outcomes of events in a list or chart; Uses fractions, decimals, and percents to quantify the likelihood of events; Explains why a game involving chance devices such as number cubes or spinners is fair or unfair; Compares individual data to class data collected from chance devices to describe the differences in outcomes based on sample size.	Organizes all possible outcomes of events in a list or chart; Why is it important to consider all of the possible outcomes of an event? Uses fractions, decimals, and percents to quantify the likelihood of events; Explains why a game involving chance devices such as number cubes or spinners is fair or unfair; Compares individual data to class data collected from chance devices to describe the differences in outcomes based on sample size. What are situations in which probability cannot be used?

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Standard: Shape, Dimension, and Geometric Relationships			
Grade Level Expectation: Geometric figures in the plane and in space are described and analyzed by their attributes			
DCSD Progress Report: <i>Compares attributes of 2D & 3D shapes (lines, angles, transformations)</i>			
1: Beginning Understanding	2: Meets Some Aspects of GLE	3: Meets GLE	4: Exceeds GLE
Predicts or describes the results of transformations: translations, reflections, rotations; Classifies or compares angles; Applies concepts of parallel, perpendicular, congruence or line symmetry.	Relates two-dimensional shapes to three-dimensional shapes using faces, edges, or vertices; Predicts or describes the results of transformations: translations, reflections, rotations; Classifies or compares angles; Applies concepts of parallel, perpendicular, congruence or line symmetry.	Relates two-dimensional shapes to three-dimensional shapes using faces, edges, and vertices; Predicts and describes the results of transformations: translations, reflections, rotations; Classifies and compares angles; Applies concepts of parallel, perpendicular, congruence and line symmetry.	Relates two-dimensional shapes to three-dimensional shapes using faces, edges, and vertices; Predicts and describes the results of transformations: translations, reflections, rotations; Classifies and compares angles; Applies concepts of parallel, perpendicular, congruence and line symmetry. Is a square still a square if it's tilted on its side? What would life be like in a two-dimensional world?

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Standard: Shape, Dimension, and Geometric Relationships			
Grade Level Expectation: Linear measure, area, and volume are fundamentally different and require different units of measure DCSD Progress Report: <i>Uses appropriate measuring unit (linear, area, volume) to 1/8"/millimeter</i>			
<p align="center">1: Beginning Understanding</p> <p>Accurately measures length to the nearest 1/8 inch or millimeter; Determines the perimeter of polygons; Uses, applies, or selects appropriate scales on number lines, graphs, and maps.</p>	<p align="center">2: Meets Some Aspects of GLE</p> <p>Accurately measures length to the nearest 1/8 inch or millimeter; Determines the perimeter of polygons or area of rectangles; Distinguishes between appropriate units for area and linear measures; Models volume using cubic units; Uses, applies, or selects appropriate scales on number lines, graphs, and maps.</p>	<p align="center">3: Meets GLE</p> <p>Accurately measures length to the nearest 1/8 inch or millimeter; Determines the perimeter of polygons and area of rectangles; Distinguishes between appropriate units for area and linear measures; Models volume using cubic units; Uses, applies, and selects appropriate scales on number lines, graphs, and maps.</p>	<p align="center">4: Exceeds GLE</p> <p>Accurately measures length to the nearest 1/8 inch or millimeter; Determines the perimeter of polygons and area of rectangles; Distinguishes between appropriate units for area and linear measures; Models volume using cubic units; Uses, applies, and selects appropriate scales on number lines, graphs, and maps. What kinds of questions can be answered by measuring? What would the world be like without a common system of measurement?</p>