



## DLM<sup>®</sup> Performance Level Descriptors–Math: Grade 3

### Year-End Model

<b>Emerging</b>	<p>A student who achieves at the <b>emerging</b> performance level typically attends to objects and people and uses attributes or characteristics to identify and sort familiar objects into sets.</p> <p>The student attends to objects and people by</p> <ul style="list-style-type: none"><li>• attending to new and different objects and people in the environment</li></ul> <p>The student uses attributes or characteristics to identify and sort familiar objects into sets by</p> <ul style="list-style-type: none"><li>• understanding the difference between parts of objects and whole objects</li><li>• recognizing sets of objects and determining if the objects in a set are the same or different based on a given attribute (for example, size, shape, or texture)</li><li>• understanding the combining and dividing of objects by attending to a particular set of objects and then moving the objects either to create a group or to create separate sets</li></ul>
<b>Approaching the Target</b>	<p>A student who achieves at the <b>approaching the target</b> performance level typically represents and solves problems using an understanding of abstract math concepts and symbols.</p> <p>The student represents and solves problems using an understanding of abstract math concepts and symbols by</p> <ul style="list-style-type: none"><li>• recognizing how numbers appear in a sequence (for example, 5, 6, 7) and counting to 30</li><li>• identifying symbols used in equations (for example, =, -, +)</li><li>• solving basic addition and subtraction problems with solutions up to 20</li><li>• communicating basic place-value knowledge by recognizing ten objects as a tens unit</li><li>• comparing length when shown two similar objects</li><li>• classifying shapes based on a given attribute (for example, number of sides)</li><li>• identifying shapes divided into equal parts from shapes that are divided into unequal parts</li></ul>



<b>At Target</b>	<p>A student who achieves at the <b>at target</b> performance level typically makes sense of problems and perseveres in solving them, and identifies repeating calculations or patterns.</p> <p>The student makes sense of problems and solves them by</p> <ul style="list-style-type: none"><li>• identifying the place value of two-digit numbers to the tens place</li><li>• selecting appropriate tools for measuring</li><li>• calculating the length of objects using informal units of measurement</li><li>• identifying shapes divided into fractional parts and shapes that are whole</li><li>• recognizing the hour and minute on a digital clock display and telling time to the nearest hour</li><li>• recognizing the structure of a picture or bar graph</li><li>• answering questions about the data displayed in a graph</li></ul> <p>The student identifies repeating calculations or patterns by</p> <ul style="list-style-type: none"><li>• solving repeated addition problems (for example, <math>2 + 2 + 2</math> or <math>3 + 3 + 3</math>)</li><li>• classifying data based on given attributes (for example, number of objects)</li><li>• skip counting by tens (for example, 10, 20, 30)</li></ul>
<b>Advanced</b>	<p>A student who achieves at the <b>advanced</b> performance level typically calculates accurately, understands mathematical terms, and uses that understanding to identify connections between mathematical concepts.</p> <p>The student calculates accurately by</p> <ul style="list-style-type: none"><li>• multiplying numbers 1 through 5</li><li>• solving two-step addition and subtraction word problems with solutions up to 20</li><li>• extending a pattern of symbols or numbers</li><li>• identifying shapes divided into fractional parts up to one-half</li></ul> <p>The student uses mathematical terms and identifies connections between mathematical concepts by</p> <ul style="list-style-type: none"><li>• comparing and rounding numbers to the nearest ten</li><li>• communicating length in inches and feet</li><li>• communicating time to the half hour on a digital or analog clock</li></ul>

## DLM Performance Level Descriptors–Math: Grade 4

### Year-End Model

<p><b>Emerging</b></p>	<p>A student who achieves at the <b>emerging</b> performance level typically looks for and makes use of mathematical structures (for example, patterns and attributes of shapes).</p> <p>The student looks for and makes use of mathematical structures by</p> <ul style="list-style-type: none"> <li>• attending to objects and shapes</li> <li>• recognizing objects or shapes that are whole or in separate parts</li> <li>• recognizing that a set is a group of objects or shapes with similar or different characteristics</li> <li>• understanding the combining and dividing of objects by moving them to create a group or to create separate sets</li> <li>• recognizing enclosures or boundaries and arranging objects or shapes into pairs based on attributes within the enclosure (for example, moving similar blocks into a box)</li> <li>• combining or separating groups of objects to demonstrate the beginning concepts of addition and subtraction</li> </ul>
<p><b>Approaching the Target</b></p>	<p>A student who achieves at the <b>approaching the target</b> performance level typically identifies repeated calculations, calculates accurately, and attends to precision in computation and measurement.</p> <p>The student identifies repeated calculations by</p> <ul style="list-style-type: none"> <li>• solving repeated addition problems (for example, <math>2 + 2 + 2</math>)</li> </ul> <p>The student calculates accurately by</p> <ul style="list-style-type: none"> <li>• adding and subtracting numbers within 20</li> </ul> <p>The student attends to precision in computation and measurement by</p> <ul style="list-style-type: none"> <li>• counting objects, ordering numbers, and classifying objects based on attributes</li> <li>• communicating place value of numbers to the tens place</li> <li>• recognizing patterns of numbers and symbols</li> <li>• ordering numbers</li> <li>• classifying objects based on attributes</li> <li>• recognizing shapes divided into two or more parts</li> <li>• recognizing math symbols (for example, symbols for lines, rays, and line segments)</li> <li>• comparing the weight or volume of two objects</li> <li>• identifying the value of coins (pennies, nickels, dimes, and quarters)</li> <li>• recognizing the hour hand and minute hand on an analog clock</li> <li>• recognizing hours and minutes on a digital clock</li> </ul>



<b>At Target</b>	<p>A student who achieves at the <b>at target</b> performance level typically calculates accurately, reasons abstractly, interprets data, and makes sense of problems and perseveres in solving them.</p> <p>The student calculates accurately by</p> <ul style="list-style-type: none"><li>• adding or subtracting two-digit numbers up to 100</li><li>• rounding two-digit numbers to the nearest ten</li></ul> <p>The student reasons abstractly, interprets data, makes sense of problems, and perseveres in solving them by</p> <ul style="list-style-type: none"><li>• solving word problems with solutions up to 100</li><li>• identifying the core unit of a repeating number or symbol pattern (for example, in 123123123, the core unit is 123)</li><li>• recognizing parallel lines and intersecting lines in shapes</li><li>• comparing types of angles (for example, acute, obtuse, and right)</li><li>• counting unit squares to calculate area</li><li>• using appropriate tools (for example, scales, tiles, or measuring cups) to measure the weight, area, or volume of different objects</li><li>• identifying fractions up to one-fourth</li><li>• telling time to the hour and half hour on a digital or analog clock</li><li>• identifying coin names and values of coins (pennies, nickels, dimes, and quarters) and one dollar bills</li><li>• interpreting information on a graph and using that information to answer questions</li></ul>
<b>Advanced</b>	<p>A student who achieves at the <b>advanced</b> performance level typically calculates accurately, reasons abstractly, explains reasoning, and uses appropriate tools to solve problems.</p> <p>The student calculates accurately by</p> <ul style="list-style-type: none"><li>• adding or subtracting two-digit numbers with regrouping</li><li>• solving two-step addition or subtraction word problems</li><li>• multiplying numbers up to 12 by numbers 1 through 5</li></ul> <p>The student reasons abstractly and explains reasoning by</p> <ul style="list-style-type: none"><li>• rounding three-digit numbers to the nearest ten or hundred</li><li>• identifying the core unit of a repeating pattern (for example, in 123123123, the core unit is 123)</li><li>• extending a pattern that uses numbers or symbols</li><li>• comparing and ordering angles from largest to smallest or smallest to largest</li><li>• estimating the weight or volume of objects by comparing them to familiar objects in the environment</li><li>• calculating coin equivalency (for example, the number of nickels equal to one quarter)</li></ul> <p>The student uses appropriate tools to solve problems by</p> <ul style="list-style-type: none"><li>• telling time to the quarter hour on a digital and analog clock</li><li>• making predictions about data after interpreting a line graph</li></ul>

## DLM Performance Level Descriptors–Math: Grade 5

### Year-End Model

<p><b>Emerging</b></p>	<p>A student who achieves at the <b>emerging</b> performance level typically attends to objects and looks for and makes use of mathematical structures (for example, patterns and attributes of shapes).</p> <p>The student attends to and seeks objects by</p> <ul style="list-style-type: none"> <li>• attending to new objects in the environment</li> <li>• identifying familiar objects and communicating whether the objects are grouped together or are separate</li> <li>• recognizing objects that are the same or different based on measureable attributes (for example, size of shape and number of sides)</li> </ul> <p>The student looks for and makes use of mathematical structures by</p> <ul style="list-style-type: none"> <li>• identifying objects that are in a set</li> <li>• identifying a pattern of objects</li> <li>• arranging objects in pairs</li> <li>• recognizing the number of objects in a set and classifying objects or shapes by a given attribute (for example, number of sides)</li> </ul>
<p><b>Approaching the Target</b></p>	<p>A student who achieves at the <b>approaching the target</b> performance level typically identifies repeated calculations, models with mathematics, and makes sense of problems and perseveres in solving them.</p> <p>The student identifies repeated calculations by</p> <ul style="list-style-type: none"> <li>• recognizing that repeated addition problems are made up of a set of numbers (for example, <math>2 + 2 + 2</math>)</li> <li>• demonstrating the concept of multiplication</li> <li>• identifying a number or symbol pattern</li> </ul> <p>The student models with mathematics by</p> <ul style="list-style-type: none"> <li>• recognizing coins (pennies, nickels, dimes, and quarters)</li> <li>• identifying two-dimensional and three-dimensional shapes and their attributes</li> <li>• recognizing equal shares of objects (for example, a shape divided into two equal parts) and recognizing fractions</li> </ul> <p>The student makes sense of problems and perseveres in solving them by</p> <ul style="list-style-type: none"> <li>• demonstrating number sense with numbers up to 10</li> <li>• communicating place value of numbers to the tens place</li> <li>• comparing numerals up to 10 and comparing two sets of up to ten objects</li> <li>• knowing the difference between coins and dollar bills, and communicating coin and bill values</li> <li>• recognizing the hour and minute on a digital clock or analog clock and telling time to the hour</li> <li>• interpreting data from a graph or chart</li> </ul>



<b>At Target</b>	<p>A student who achieves at the <b>at target</b> performance level typically calculates accurately, reasons abstractly, interprets data, and uses mathematical tools to solve problems.</p> <p>The student calculates accurately by</p> <ul style="list-style-type: none"><li>• multiplying numbers by 1 through 5</li><li>• demonstrating beginning division skills (for example, repeated subtraction, dividing groups of objects)</li><li>• identifying two- and three-dimensional shapes</li><li>• identifying fractions with denominators to 10</li><li>• calculating coin equivalency (for example, the number of nickels equal to one quarter)</li></ul> <p>The student reasons abstractly by</p> <ul style="list-style-type: none"><li>• demonstrating number sense up to 100 by comparing two sets of objects or numerals up to 100</li><li>• communicating the place value of numerals up to the tens place</li><li>• recognizing and extending patterns of numbers or symbols</li></ul> <p>The student interprets data by</p> <ul style="list-style-type: none"><li>• using information from bar, picture, or line plot graphs to answer questions</li><li>• represent data on bar, picture, or line plot graphs</li></ul> <p>The student uses mathematical tools to solve problems by</p> <ul style="list-style-type: none"><li>• measuring objects using appropriate tools (for example, a scale to weigh objects or a ruler to measure length)</li><li>• comparing the length or weight of two or more objects</li><li>• telling time to the hour, half hour, and quarter hour on a digital or analog clock</li></ul>
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<b>Advanced</b>	<p>A student who achieves at the <b>advanced</b> performance level typically calculates accurately, reasons abstractly, explains reasoning, interprets real-world problems, and models solutions.</p> <p>The student calculates accurately by</p> <ul style="list-style-type: none"><li>• identifying sets of objects that have been equally distributed in images to demonstrate beginning division</li></ul> <p>The student reasons abstractly by</p> <ul style="list-style-type: none"><li>• identifying and supplying missing numbers in a pattern</li><li>• ordering numbers from least to greatest</li><li>• recognizing proper fractions on an area-model representation (for example, a garden divided into four equal parts)</li><li>• recognizing whether an object is two-dimensional or three-dimensional</li><li>• sorting two-dimensional shapes that are the same size</li><li>• recognizing attributes and characteristics of three-dimensional shapes</li><li>• recognizing measurable attributes (for example, size and shape)</li></ul> <p>The student explains reasoning by</p> <ul style="list-style-type: none"><li>• demonstrating and expanding math vocabulary by using terms (for example, <i>same</i>, <i>different</i>, <i>more</i>, and <i>fewer</i>)</li><li>• communicating the relationship between multiplication and division (for example, connecting <math>2 \times 5 = 10</math> and <math>10 \div 2 = 5</math>)</li></ul> <p>The student interprets real-world problems and models their solutions by</p> <ul style="list-style-type: none"><li>• rounding whole numbers to the nearest hundred</li><li>• estimating measures of length and weight</li><li>• determining the volume of a rectangular prism</li><li>• adding money using mixed coins</li><li>• telling time to the quarter hour on a digital or analog clock</li><li>• making predictions about data displayed in a graph</li></ul>
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## DLM Performance Level Descriptors–Math: Grade 6

### Year-End Model

<b>Emerging</b>	<p>A student who achieves at the <b>emerging</b> performance level typically attends to and seeks objects or people and looks for and makes use of mathematical structures (for example, patterns and attributes of shapes).</p> <p>The student attends to and seeks objects by</p> <ul style="list-style-type: none"><li>• arranging objects into sets</li><li>• recognizing sets and subsets of objects</li><li>• recognizing groups of objects that are separated</li><li>• recognizing the amount <i>some</i></li><li>• recognizing objects that are whole and objects in parts</li><li>• recognizing a unit</li></ul> <p>The student looks for and makes use of mathematical structures by</p> <ul style="list-style-type: none"><li>• identifying equal parts of objects (for example, shapes, markers, and toys)</li><li>• partitioning, or dividing, sets of objects into equal groups</li><li>• combining and comparing sets of objects</li><li>• classifying objects by attributes (for example, size and shape)</li><li>• ordering objects using a rule or pattern</li><li>• recognizing objects inside and outside of an enclosure</li></ul>
<b>Approaching the Target</b>	<p>A student who achieves at the <b>approaching the target</b> performance level typically identifies repeated calculations, models with mathematics, and reasons abstractly.</p> <p>The student identifies repeated calculations by</p> <ul style="list-style-type: none"><li>• solving repeated addition problems (for example, <math>2 + 2 + 2</math> or <math>4 + 4 + 4</math>)</li><li>• solving repeated subtraction problems (for example, <math>10 - 2 - 2 - 2 - 2</math>)</li></ul> <p>The student models with mathematics by</p> <ul style="list-style-type: none"><li>• representing addition and subtraction in equations</li></ul> <p>The student reasons abstractly by</p> <ul style="list-style-type: none"><li>• explaining volume as a composition of unit cubes</li><li>• recognizing the distribution of data by its shape</li><li>• explaining the relationship between a unit square and area</li></ul>





<b>At Target</b>	<p>A student who achieves at the <b>at target</b> performance level typically calculates accurately, reasons abstractly, interprets data, and uses mathematical tools to solve problems.</p> <p>The student calculates accurately by</p> <ul style="list-style-type: none"><li>• solving word problems involving the area of rectangles</li><li>• multiplying numbers up to 12 by 1, 2, 3, 4, or 5</li><li>• solving equations with positive and negative numbers</li><li>• solving for the unknown value in expressions</li><li>• packing unit cubes to calculate volume of rectangular prisms</li><li>• demonstrating the concept of division</li></ul> <p>The student reasons abstractly by</p> <ul style="list-style-type: none"><li>• explaining the relationships between unit fractions and decimals</li><li>• representing unknown values in expressions with variables</li><li>• explaining opposite numbers (for example, <math>-2</math> and <math>2</math>)</li><li>• recognizing equivalent expressions that involve addition or subtraction</li></ul> <p>The student interprets data by</p> <ul style="list-style-type: none"><li>• recognizing the overall shape of data in a graph</li><li>• identifying outliers in a data distribution</li></ul> <p>The student uses mathematical tools to solve problems by</p> <ul style="list-style-type: none"><li>• calculating area with unit squares and tiling</li></ul>
<b>Advanced</b>	<p>A student who achieves at the <b>advanced</b> performance level typically calculates accurately, reasons abstractly, explains reasoning, and interprets real-world problems and models their solutions.</p> <p>The student calculates accurately by</p> <ul style="list-style-type: none"><li>• using tiling and formulas to find the area of a rectangle</li><li>• using a formula to calculate the volume of rectangular prisms</li><li>• dividing numbers up to 12 by 1, 2, 3, 4, or 5</li><li>• recognizing and representing ratios of many to one and many to many (for example, 3:1 or 4:6)</li><li>• adding, comparing, and decomposing fractions (for example, <math>2/4 = 1/4 + 1/4</math>)</li></ul> <p>The student reasons abstractly by</p> <ul style="list-style-type: none"><li>• recognizing the overall shape of data on a graph</li></ul> <p>The student explains reasoning by</p> <ul style="list-style-type: none"><li>• communicating measurements of center by using data distribution (for example, a graph or line plot)</li></ul> <p>The student interprets real-world problems and models their solutions by</p> <ul style="list-style-type: none"><li>• solving real-world problems</li><li>• using properties of operations to generate equivalent expressions that involve addition and subtraction</li><li>• explaining inequalities and integers in the real world</li></ul>



## DLM Performance Level Descriptors–Math: Grade 7

### Year-End Model

<b>Emerging</b>	<p>A student who achieves at the <b>emerging</b> performance level typically attends to and seeks objects or people and looks for and makes use of mathematical structures (for example, patterns and attributes of shapes).</p> <p>The student attends to and seeks objects or people by</p> <ul style="list-style-type: none"><li>• paying attention and noticing new things in their environment</li><li>• recognizing measurable attributes of an object (for example, size, shape, and number of sides)</li><li>• identifying objects that are the same and objects that are different</li></ul> <p>The student looks for and makes use of mathematical structures by</p> <ul style="list-style-type: none"><li>• combining and partitioning, or dividing, objects into sets</li><li>• classifying objects</li><li>• arranging objects using a rule</li><li>• recognizing separate objects and objects in a set</li><li>• recognizing the concept of <i>whole</i> on a set model</li><li>• identifying patterns that occur in nature and real life (for example, sunrise and sunset)</li></ul>
<b>Approaching the Target</b>	<p>A student who achieves at the <b>approaching the target</b> performance level typically identifies repeated calculations, looks for and makes use of mathematical structures, and models with mathematics.</p> <p>The student identifies repeated calculations by</p> <ul style="list-style-type: none"><li>• modeling, solving, and explaining repeated addition (for example, <math>2 + 2 + 2</math> or <math>4 + 4 + 4</math>)</li><li>• modeling, solving, and explaining repeated subtraction (for example, <math>10 - 2 - 2 - 2</math>)</li></ul> <p>The student looks for and makes use of mathematical structures by</p> <ul style="list-style-type: none"><li>• matching identical two-dimensional and three-dimensional shapes</li></ul> <p>The student models with mathematics by</p> <ul style="list-style-type: none"><li>• recognizing increasing or decreasing patterns (for example, 1, 3, 5 . . . or 8, 6, 4 . . .)</li><li>• recognizing line plots, bar graphs, and picture graphs</li><li>• recognizing lines, line segments, points, and rays</li><li>• recognizing two-dimensional and three-dimensional shapes</li></ul>



<b>At Target</b>	<p>A student who achieves at the <b>at target</b> performance level typically calculates accurately, reasons abstractly, and explains reasoning.</p> <p>The student calculates accurately by</p> <ul style="list-style-type: none"><li>• adding and subtracting fractions with common denominators (for example, <math>2/5 + 1/5</math>)</li><li>• decomposing fractions (for example, <math>2/4 = 1/4 + 1/4</math>)</li><li>• demonstrating the concept of multiplication and division</li><li>• applying the properties of addition and multiplication to solve problems</li></ul> <p>The student reasons abstractly by</p> <ul style="list-style-type: none"><li>• explaining length and perimeter</li><li>• recognizing angles of different sizes (for example, acute, right, and obtuse)</li><li>• recognizing an arithmetic sequence</li><li>• recognizing the outcomes of an event</li><li>• recognizing tenths and one-tenth in decimal and fraction form (for example, .10 and <math>1/10</math>)</li></ul> <p>The student explains their reasoning by</p> <ul style="list-style-type: none"><li>• describing attributes of shapes (for example, size and number of sides)</li><li>• explaining length and perimeter</li><li>• classifying events as possible or impossible</li><li>• recognizing the outcomes of an event</li></ul>
<b>Advanced</b>	<p>A student who achieves at the <b>advanced</b> performance level typically calculates accurately, reasons abstractly, explains reasoning, interprets real-world problems, models solutions, and interprets data.</p> <p>The student calculates accurately by</p> <ul style="list-style-type: none"><li>• matching similar two-dimensional and three-dimensional shapes</li><li>• using coordinates on a grid to find the perimeter of polygons</li><li>• comparing angles to a right angle</li><li>• demonstrating the relationship between multiplication and division</li><li>• adding and subtracting fractions with denominators of 10 and 100 (for example, <math>4/10 + 60/100</math>)</li><li>• multiplying numbers 1–20 by numbers 1–5 and 10</li><li>• dividing numbers 1–20 by numbers 1–5 and 10</li><li>• representing fractions as decimals</li></ul> <p>The student reasons abstractly and explains reasoning by</p> <ul style="list-style-type: none"><li>• explaining decimals</li><li>• recognizing recursive rules for arithmetic sequences</li><li>• using symbols to compare two decimals with a hundredths place (for example, <math>0.01 &gt; 0.001</math>)</li></ul> <p>The student interprets real-world problems and models their solutions by</p> <ul style="list-style-type: none"><li>• recognizing equivalent expressions</li><li>• writing equivalent expressions for word problems</li></ul> <p>The student interprets data by</p> <ul style="list-style-type: none"><li>• assessing the variability of data sets</li><li>• comparing the shapes of two data sets</li><li>• drawing inferences based on the shape and spread of data</li></ul>



## DLM Performance Level Descriptors–Math: Grade 8

### Year-End Model

<b>Emerging</b>	<p>A student who achieves at the <b>emerging</b> performance level typically looks for and makes use of mathematical structures (for example, patterns and attributes of shapes).</p> <p>The student looks for and makes use of mathematical structures by</p> <ul style="list-style-type: none"><li>• combining and partitioning, or dividing, sets of objects</li><li>• forming pairs of objects and ordering objects</li><li>• recognizing a set of objects</li><li>• recognizing objects that are separate from a set</li><li>• classifying objects and ordering objects by attribute</li><li>• recognizing attribute values of shapes (for example, size and number of sides)</li><li>• identifying objects that are the same and objects that are different</li><li>• combining two parts or two sets to make a whole</li><li>• recognizing patterns occurring in nature (for example, sunrise and sunset)</li><li>• using sets of objects to demonstrate the concept of addition</li></ul>
<b>Approaching the Target</b>	<p>A student who achieves at the <b>approaching the target</b> performance level typically identifies repeated calculations, looks for and makes use of mathematical structures, reasons abstractly, and interprets data.</p> <p>The student identifies repeated calculations by</p> <ul style="list-style-type: none"><li>• solving, modeling, and explaining repeated addition problems (for example, <math>2 + 2 + 2</math> or <math>4 + 4 + 4</math>)</li><li>• modeling, solving, and explaining repeated subtraction problems (for example, <math>10 - 2 - 2 - 2 - 2</math>)</li></ul> <p>The student looks for and makes use of mathematical structures by</p> <ul style="list-style-type: none"><li>• recognizing tenths and one-tenth in decimal and fraction form (for example, .10 and <math>1/10</math>)</li><li>• matching two-dimensional and three-dimensional shapes</li><li>• recognizing angles of different degrees (for example, acute, obtuse, and right)</li></ul> <p>The student reasons abstractly by</p> <ul style="list-style-type: none"><li>• explaining transformations of geometric shapes</li><li>• recognizing increasing and decreasing patterns</li><li>• extending a pattern</li><li>• matching two-dimensional shapes</li></ul> <p>The student interprets data by</p> <ul style="list-style-type: none"><li>• explaining coordinate pairs</li><li>• recognizing bar graphs, picture graphs, line graphs, and charts</li><li>• using graphs or charts to answer questions</li></ul>



<b>At Target</b>	<p>A student who achieves at the <b>at target</b> performance level typically makes sense of problems and perseveres in solving them, calculates accurately, reasons abstractly, and interprets data.</p> <p>The student makes sense of problems and calculates accurately by</p> <ul style="list-style-type: none"><li>• recognizing exponents</li><li>• representing decimals with tenths and hundredths as fractions (for example, <math>0.40 = 4/10</math>)</li><li>• subtracting two fractions with the same denominator</li><li>• subtracting two decimals</li><li>• finding the unknown value in an equation</li><li>• solving multiplication problems</li><li>• representing fractions as decimals</li></ul> <p>The student reasons abstractly by</p> <ul style="list-style-type: none"><li>• explaining decimals</li><li>• comparing angles to a right angle</li><li>• recognizing figures that have had a transformation (for example, a translation, reflection, or rotation)</li><li>• recognizing congruent figures</li></ul> <p>The student interprets data by</p> <ul style="list-style-type: none"><li>• reading and representing data on graphs and charts</li><li>• recognizing covariation and the direction of covariation</li><li>• generating ordered pairs</li></ul>
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## Advanced

A student who achieves at the **advanced** performance level typically calculates accurately, attends to precision in calculations, reasons abstractly, explains reasoning, interprets real-world problems, models solutions, and interprets data.

The student calculates accurately and attends to precision by

- solving word problems involving addition, subtraction, or multiplication
- finding the function rule in graphs and tables
- using formulas to calculate area, perimeter, and volume
- representing a fraction as a decimal
- explaining the properties of exponents
- solving linear inequalities
- adding and subtracting fractions with unlike denominators of 10 and 100 (for example,  $4/10 + 60/100$ )

The student reasons abstractly and explains reasoning by

- recognizing the recursive rule
- relating similar figures to transformations
- describing a series of transformations on shapes
- recognizing the effects of transformations on lines and angles

The student interprets real-world problems and models their solutions by

- recognizing and extending geometric sequences
- explaining complementary angles
- using symbols to compare decimals with thousandths (for example,  $0.002 < 0.005$ )

The student interprets data by

- recognizing covariation and the direction of covariation
- making predictions using data on graphs and charts



## DLM Performance Level Descriptors–Math: Grade 9

### Year-End Model

<b>Emerging</b>	<p>A student who achieves at the <b>emerging</b> performance level typically looks for and makes use of mathematical structures (for example, patterns and attributes of shapes).</p> <p>The student looks for and makes use of mathematical structures by</p> <ul style="list-style-type: none"><li>• partitioning, or dividing, and combining objects or shapes</li><li>• recognizing attributes of shapes (for example, size and number of sides)</li><li>• recognizing sets and subsets of objects</li><li>• recognizing objects that are separate</li><li>• understanding opposites</li><li>• recognizing objects as the same or different</li></ul>
<b>Approaching the Target</b>	<p>A student who achieves at the <b>approaching the target</b> performance level typically calculates accurately and looks for and makes use of mathematical structures.</p> <p>The student calculates accurately by</p> <ul style="list-style-type: none"><li>• using repeated addition to solve problems (for example, <math>2 + 2 + 2</math> or <math>4 + 4 + 4</math>)</li><li>• using repeated subtraction to solve problems (for example, <math>10 - 2 - 2 - 2 - 2</math>)</li><li>• understanding place value (for example, that one ten equals ten ones)</li><li>• calculating the area and perimeter of shapes</li><li>• demonstrating an understanding of multiplication and division</li></ul> <p>The student looks for and makes use of mathematical structures by</p> <ul style="list-style-type: none"><li>• recognizing two-dimensional and three-dimensional shapes</li><li>• recognizing measureable attributes (for example, size, shape, and number of sides)</li><li>• identifying points, rays, and right angles</li></ul>



<b>At Target</b>	<p>A student who achieves at the <b>at target</b> performance level typically makes sense of problems and perseveres in solving them, calculates accurately, looks for and makes use of mathematical structures, and reasons abstractly.</p> <p>The student makes sense of problems, perseveres in solving them, and calculates accurately by</p> <ul style="list-style-type: none"><li>• solving multiplication and division word problems</li><li>• finding the unknown value in multiplication and division equations</li><li>• solving real-world problems with rational numbers</li><li>• solving word problems involving area and perimeter</li></ul> <p>The student looks for and makes use of mathematical structures by</p> <ul style="list-style-type: none"><li>• recognizing measurable attributes</li><li>• representing linear equations that contain one variable</li><li>• matching two-dimensional and three-dimensional shapes</li><li>• recognizing circles, perpendicular lines, and parallel lines</li></ul> <p>The student reasons abstractly by</p> <ul style="list-style-type: none"><li>• using geometric shape names to describe real-world objects</li><li>• describing a mathematical situation</li></ul>
<b>Advanced</b>	<p>A student who achieves at the <b>advanced</b> performance level typically calculates accurately, attends to precision in calculations, and looks for and makes use of mathematical structures.</p> <p>The student calculates accurately and attends to precision by</p> <ul style="list-style-type: none"><li>• applying the associative and commutative properties of addition and multiplication to solve problems</li><li>• multiplying without a calculator</li><li>• solving real-world problems</li><li>• solving multi-step word problems</li></ul> <p>The student looks for and makes use of mathematical structures by</p> <ul style="list-style-type: none"><li>• applying math vocabulary to solve problems</li><li>• identifying vertical, straight, and adjacent angles</li></ul>





## DLM Performance Level Descriptors–Math: Grade 10

### Year-End Model

<b>Emerging</b>	<p>A student who achieves at the <b>emerging</b> performance level typically looks for and makes use of mathematical structures (for example, patterns and attributes of shapes).</p> <p>The student looks for and makes use of mathematical structures by</p> <ul style="list-style-type: none"><li>• combining and partitioning, or dividing, objects into sets</li><li>• recognizing objects or shapes that are the same or different</li><li>• forming pairs of objects</li><li>• communicating the number of objects (up to ten) in a set without counting</li><li>• comparing objects in a set based on attributes (for example, size, shape, and number of sides)</li><li>• ordering objects using a rule</li><li>• recognizing attributes of objects (for example, shape, size, and number of sides)</li></ul>
<b>Approaching the Target</b>	<p>A student who achieves at the <b>approaching the target</b> performance level typically calculates accurately, looks for and makes use of mathematical structures, and interprets data.</p> <p>The student calculates accurately by</p> <ul style="list-style-type: none"><li>• rounding decimals to the tenths and hundredths places</li><li>• using different operations (for example, addition and subtraction) to solve problems</li><li>• writing equations using different operations (for example, addition and subtraction)</li></ul> <p>The student looks for and makes use of mathematical structures by</p> <ul style="list-style-type: none"><li>• classifying objects based on attributes (for example, size, shape, and number of sides)</li><li>• matching two-dimensional and three-dimensional shapes of the same size and different orientation</li></ul> <p>The student interprets data by</p> <ul style="list-style-type: none"><li>• identifying types of bar, picture, or line graphs</li><li>• reading and communicating data from bar and picture graphs</li></ul>



<b>At Target</b>	<p>A student who achieves at the <b>at target</b> performance level typically makes sense of problems and perseveres in solving them, calculates accurately, reasons abstractly, and interprets data.</p> <p>The student makes sense of problems, perseveres in solving them, and calculates accurately by</p> <ul style="list-style-type: none"><li>• solving linear equations that include one variable</li><li>• solving linear inequalities</li><li>• reporting numerical answers with a degree of precision</li><li>• representing and solving real-world problems</li><li>• solving problems using rational numbers</li></ul> <p>The student reasons abstractly by</p> <ul style="list-style-type: none"><li>• communicating if an event outcome is possible or impossible</li><li>• communicating whether an event is independent or dependent</li><li>• recognizing transformations of congruent figures</li></ul> <p>The student interprets data by</p> <ul style="list-style-type: none"><li>• calculating the mean of a data set</li><li>• using graphs to interpret concrete information</li><li>• communicating an understanding of bar graphs, picture graphs, line plots, and pie charts</li><li>• explaining the x-coordinate and y-coordinate</li><li>• interpreting a point within a line on a graph</li><li>• recognizing covariation within a data set</li></ul>
<b>Advanced</b>	<p>A student who achieves at the <b>advanced</b> performance level typically calculates accurately, makes use of mathematical structures, attends to precision in calculations, reasons abstractly, and interprets data.</p> <p>The student calculates accurately and attends to precision by</p> <ul style="list-style-type: none"><li>• solving multi-step word problems</li></ul> <p>The student looks for and makes use of mathematical structures by</p> <ul style="list-style-type: none"><li>• selecting and applying appropriate mathematical methods to solve problems</li><li>• understanding and recognizing congruent shapes</li></ul> <p>The student reasons abstractly by</p> <ul style="list-style-type: none"><li>• synthesizing information presented in word problems</li><li>• using transformations to describe compound events</li><li>• explaining compound events</li></ul> <p>The student interprets data by</p> <ul style="list-style-type: none"><li>• calculating the median and mode of a data set</li><li>• predicting information using a graph or chart</li><li>• analyzing and comparing data from different graphical representations</li></ul>



## DLM Performance Level Descriptors–Math: Grade 11

### Year-End Model

<b>Emerging</b>	<p>A student who achieves at the <b>emerging</b> performance level typically looks for and makes use of mathematical structures (for example, patterns and attributes of shapes).</p> <p>The student looks for and makes use of mathematical structures by</p> <ul style="list-style-type: none"><li>• forming pairs of objects</li><li>• combining and comparing object pairs</li><li>• classifying objects or shapes by attribute (for example, size, shape, and number of sides)</li><li>• combining two parts to make a whole</li><li>• communicating if an object is the same or different</li><li>• identifying objects that are the same and objects that are different</li><li>• matching two-dimensional and three-dimensional shapes</li><li>• ordering objects using a rule</li><li>• recognizing patterns in real life or nature (for example, sunrise and sunset)</li></ul>
<b>Approaching the Target</b>	<p>A student who achieves at the <b>approaching the target</b> performance level typically calculates accurately, looks for and makes use of mathematical structures, and interprets data.</p> <p>The student calculates accurately by</p> <ul style="list-style-type: none"><li>• solving and explaining repeated addition problems (for example, <math>2 + 2 + 2</math> or <math>4 + 4 + 4</math>)</li><li>• recognizing a sample space (all possible outcomes of an event)</li></ul> <p>The student looks for and makes use of mathematical structures by</p> <ul style="list-style-type: none"><li>• recognizing patterns and sequences of numbers or symbols</li><li>• matching two-dimensional and three-dimensional shapes</li></ul> <p>The student interprets data by</p> <ul style="list-style-type: none"><li>• identifying bar graphs, picture graphs, line plots, and pie charts</li><li>• using math vocabulary related to graphing to solve problems (for example, <i>variability</i>, <i>peak of data</i>, and <i>outlier</i>)</li><li>• explaining coordinate pairs</li><li>• explaining the <i>x</i>-coordinate and <i>y</i>-coordinate</li></ul>



<b>At Target</b>	<p>A student who achieves at the <b>at target</b> performance level typically makes sense of problems, perseveres in solving them, models with mathematics, reasons abstractly, and interprets data.</p> <p>The student makes sense of problems and perseveres in solving them by</p> <ul style="list-style-type: none"><li>• solving multiplication problems</li><li>• recognizing the recursive rule in an equation or an arithmetic sequence</li></ul> <p>The student models with mathematics by</p> <ul style="list-style-type: none"><li>• recognizing and extending geometric and arithmetic sequences</li><li>• recognizing and explaining similar and congruent figures</li></ul> <p>The student reasons abstractly by</p> <ul style="list-style-type: none"><li>• identifying the theoretical probability of an event</li><li>• identifying all possible outcomes of an event</li></ul> <p>The student interprets data by</p> <ul style="list-style-type: none"><li>• solving problems using graphs</li><li>• interpreting data and using it to make inferences</li><li>• understanding covariation</li><li>• finding the average rate of change (slope) of a linear function</li></ul>
<b>Advanced</b>	<p>A student who achieves at the <b>advanced</b> performance level typically calculates accurately, attends to precision in calculations, reasons abstractly, and interprets data.</p> <p>The student calculates accurately and attends to precision by</p> <ul style="list-style-type: none"><li>• simplifying expressions with exponents</li><li>• applying a sequencing rule</li><li>• finding a term in an arithmetic sequence</li><li>• extending geometric and arithmetic sequences</li><li>• finding perfect squares and cubes</li><li>• identifying the interval of increase or decrease in variables of a numerical relation</li></ul> <p>The student reasons abstractly by</p> <ul style="list-style-type: none"><li>• relating transformations to congruent and similar shapes</li><li>• applying theoretical probability to simple events</li></ul> <p>The student interprets data by</p> <ul style="list-style-type: none"><li>• comparing data sets to draw inferences</li><li>• solving real-world problems with graphs and tables</li><li>• analyzing graphs, tables, and data distributions</li><li>• predicting and extending information using graphs and tables</li></ul>