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## MEAP Mathematics Standard Setting Performance Level Descriptors (PLDs)

There are four Performance Levels on MEAP in mathematics:

- (1) Exceeded Michigan Standards
- (2) Met Michigan Standards
- (3) Basic
- (4) Apprentice

The mathematics Standard Setting PLDs define in detail what students at each grade and performance level should know and be able to do in relation to the Michigan Mathematics Grade Level Content Expectations (GLCEs).

In September 2005, groups of Michigan educators were brought together to develop these PLDs, taking into account both the curriculum framework and the mathematics assessments themselves. In January 2006, the PLDs were used by Michigan educators, parents, and community members to determine recommended cut scores between the performance levels. The recommended cut scores were formally adopted by the Michigan State Board of Education in January 2006.

In this document, only the first three levels are defined explicitly. The fourth level (*apprentice*) is defined as not meeting the requirements for the *basic* level.

The PLDs are presented in two ways:

1. Within grade level across performance levels—this presentation shows how performance progresses from one performance level to the next within each grade.
2. Within performance level across grades—this presentation shows how student performance progresses from one grade to another within each performance level.

You may note that in mathematics, the PLDs are presented in alignment across grades 3 and 4, 5 and 6, and 7 and 8 rather than across grades 3-8 as in reading and writing. This is because the set of knowledge and skills expected of students in mathematics changes significantly over grades, making it impossible for a grade 3-8 progression to fit on a reasonably small number of pages.

The Mathematics MEAP given in the Fall in grades 3-8 measures the mathematics knowledge and skills expected at the end of grades 2-7.

**MEAP Mathematics Grade 3 Performance Level Descriptors (Across Performance Levels)  
(Addresses Grade 2 Knowledge and Skills)**

<b>Basic (Level 3)</b>	<b>Met (Level 2)</b>	<b>Exceeded (Level 1)</b>
Read and write whole numbers at least up to 100.	Read, write, and compare whole numbers up to 1,000.	Read, write, and compare whole numbers up to 1,000 in contextual and non-contextual problems.
Solve basic problems with some accuracy using addition and subtraction with two-digit numbers.  Solve some basic multiplication and sharing problems up to 5x5.	Solve basic problems using addition and subtraction with two- and three-digit numbers.  Solve basic multiplication and sharing problems up to 5x5.	Solve complex problems using addition and subtraction with two- and three-digit numbers.  Solve basic multiplication and sharing problems up to 5x5 and apply to non-routine real world problems.
Recognize with some accuracy common fractions and decimals including money.	Recognize and name common fractions and decimals including money.	Recognize, name, and compare common fractions and decimals including money.
Tell time and use various measurement tools in standard problems, including measuring perimeter and area with some accuracy.	Tell time and use various measurement tools in standard problems, including measuring perimeter and area.	Accurately tell time and use various measurement tools in complex problems including measuring perimeter and area.
Identify common two- and three- dimensional objects with some accuracy.	Identify and manipulate common two- and three-dimensional objects.	Identify, manipulate, describe, and compare common two- and three- dimensional objects.
Read pictographs with scale up to at least two with some accuracy.	Read and construct pictographs with a scale up to three.	Read, construct, and interpret pictographs with a scale up to three.
Locate and name coordinates on a simple map or grid with some accuracy.	Locate and name coordinates on a simple map or grid.	Locate and name coordinates on a complex map or grid.

**MEAP Mathematics Grade 4 Performance Level Descriptors (Across Performance Levels)  
(Addresses Grade 3 Knowledge and Skills)**

<b>Basic (Level 3)</b>	<b>Met (Level 2)</b>	<b>Exceeded (Level 1)</b>
Read, write, and compare whole numbers up to 1,000.	Read, write, and compare whole numbers up to 10,000.	Read, write, and compare whole numbers up to 10,000 in non-contextual problems.
Solve and estimate basic problems with some accuracy using addition and subtraction with two-digit numbers with regrouping and up to four-digit numbers without regrouping.  Solve and apply some basic multiplication and division problems up to $10 \times 10$ .	Fluently solve and estimate basic problems using addition and subtraction with two-digit numbers with regrouping and up to four-digit numbers without regrouping.  Solve and apply basic multiplication and division problems up to $10 \times 10$ .	Fluently solve and estimate complex problems using addition and subtraction with two-digit numbers with regrouping and up to four-digit numbers without regrouping.  Solve and apply basic multiplication and division problems up to $10 \times 10$ in non-routine real world problems.
Recognize, name, and solve some problems involving common fractions and decimals including money with limited accuracy.	Recognize, name, and solve problems involving common fractions and decimals including money.	Accurately recognize, name, and solve complex problems involving common fractions and decimals including money.
Calculate, apply, and use common units of measure in length, weight, time, and temperature in standard problems with some accuracy.	Calculate, apply, and use common units of measure in length, weight, time, and temperature in contextual situations.	Calculate, apply, and use common units of measure in length, weight, time, and temperature in contextual & non-contextual situations.
Identify, describe, compare, manipulate, and construct common two- and three-dimensional objects with limited accuracy.  Identify some properties of lines.	Identify, describe, compare, manipulate, and construct common two- and three-dimensional objects.  Identify properties of lines.	Manipulate, construct, and recognize properties of common two- and three-dimensional objects.  Identify properties of lines and apply them to problems.
Read, interpret, and solve problems involving bar graphs with limited accuracy.	Read, interpret, and solve problems involving bar graphs.	Read, interpret, and solve complex problems involving bar graphs.

**MEAP Mathematics Grade 5 Performance Level Descriptors (Across Performance Levels)  
(Addresses Grade 4 Knowledge and Skills)**

<b>Basic (Level 3)</b>	<b>Met (Level 2)</b>	<b>Exceeded (Level 1)</b>
Perform basic operations (e.g., addition and subtraction) with whole numbers; perform some basic operations with simple decimals and fractions.	Perform basic (e.g., addition, subtraction) and complex (e.g., multiplication, and division) operations with whole numbers; perform basic operations with simple decimals and fractions.	Perform basic and complex operations with whole numbers and with simple decimals and fractions.
Show partial understanding of relationships between place-value and decimals, that decimals and fractions are parts of a whole, and that simple fractions and decimals are interchangeable.	Show sufficient understanding of relationships between place-value and decimals, that decimals and fractions are parts of a whole, and that simple fractions and decimals are interchangeable. Apply to basic, routine real-world problems.	Show substantial understanding of relationships between place-value and decimals, that decimals and fractions are parts of a whole, and that fractions and decimals are interchangeable. Apply concepts to complex, non-routine real-world problems.
Identify some of the fundamental characteristics and properties (e.g., symmetry) of two-dimensional and three-dimensional geometric shapes.	Identify the fundamental characteristics and properties (e.g., symmetry) of two-dimensional and three-dimensional geometric shapes; recognize basic transformations of geometric shapes.	Identify and apply the fundamental characteristics and properties (e.g., symmetry) of two-dimensional and three-dimensional geometric shapes; recognize complex transformations of geometric shapes.
Demonstrate partial understanding in reading, constructing, and interpreting simple tables and bar graphs.	Demonstrate understanding in reading, constructing, and interpreting simple and complex tables and bar graphs.	Read, construct, and interpret simple and complex tables and bar graphs; able to draw conclusions and/or make predictions from data.
Demonstrate partial knowledge (e.g., formulas) of concepts such as perimeter and area of squares and rectangles; inappropriately use measurement tools in solving problems.	Demonstrate appropriate application of basic measurement concepts (e.g., use of measurement tools such as rulers and thermometers, simple conversions) as applied to temperature, perimeter and area of squares and rectangles in solving routine problems.	Demonstrate appropriate application of measurement concepts (e.g., use of measurement tools, simple conversions) as applied to temperature, perimeter and area of squares and rectangles in solving multi-step, non-routine problems.
Partially solve real-world problems in each of the mathematics content strands; written solutions are minimal, unorganized, and presented without supporting information or explanations.	Solve real-world problems including the application of appropriate operations, measurement, or estimation in each of the mathematics content strands; written solutions are organized and presented with both supporting information and explanations of how they were achieved.	Solve real-world problems including the application of appropriate operations, measurement, or estimation in each of the mathematics content strands; written solutions go beyond the obvious and are organized and presented with both supporting information and thorough explanations of how they were achieved.

**MEAP Mathematics Grade 6 Performance Level Descriptors (Across Performance Levels)  
(Addresses Grade 5 Knowledge and Skills)**

<b>Basic (Level 3)</b>	<b>Met (Level 2)</b>	<b>Exceeded (Level 1)</b>
Perform basic and some complex operations with whole numbers, decimals, and fractions in some applied situations (e.g., equivalent fractions, problems involving money).	Perform basic and complex operations with whole numbers, decimals, and fractions in applied situations (e.g., equivalent fractions, problems involving money, division of fractions of whole numbers).	Perform basic and complex operations with whole numbers, decimals, and fractions in complex, non-routine applied situations (e.g., equivalent fractions, problems involving money, division of fractions of whole numbers).
Show partial understanding of percents, ratios, and prime factorization. Perform simple, routine operations on whole numbers using powers-of-ten; express some simple fractions and simple decimals as percents and vice versa.	Show sufficient understanding of percents, ratios, and prime factorization. Perform complex, routine operations on whole numbers using powers-of-ten; express fractions and decimals as percents and vice versa.	Show substantial understanding of percents, ratios, and prime factorization. Perform complex, non-routine operations on whole numbers and decimals using powers-of-ten; express fractions and decimals as percents and vice versa.
Identify, measure, and classify some angles (e.g., obtuse, acute, right, vertical, and straight); can use some properties of geometric shapes (e.g., sum of interior angles) to solve simple problems.	Identify, measure, and classify angles (e.g., obtuse, acute, right, vertical, and straight); can use properties of geometric shapes (e.g., sum of interior angles) to solve routine problems.	Identify, measure, and classify angles (e.g., obtuse, acute, right, vertical, and straight); use properties of geometric shapes (e.g., sum of interior angles) to solve complex, non-routine multi-step problems.
Demonstrate partial understanding in reading, constructing, and interpreting simple line graphs; find and interpret the concept of mode to solve simple problems.	Demonstrate understanding in reading, constructing, and interpreting simple and complex line graphs; find and interpret the concepts of mean and mode to solve multi-step problems.	Demonstrate understanding in reading, constructing, and interpreting simple and complex line graphs; find, interpret, and apply the concepts of mean and mode to solve complex multi-step problems.
Demonstrate partial knowledge of some basic measurement concepts (e.g., use of measurement tools such as protractors, simple conversions) relating to volume of rectangular prisms, perimeter and area of triangles and parallelograms.	Demonstrate sufficient knowledge of basic measurement concepts (e.g., use of measurement tools such as protractors, simple and complex conversions) relating to volume of rectangular prisms, perimeter and area of triangles and parallelograms in solving routine problems.	Demonstrate substantial knowledge of basic measurement concepts (e.g., use of measurement tools such as protractors, simple and complex conversions) relating to volume of rectangular prisms, perimeter and area of triangles and parallelograms in solving complex, non-routine multi-step problems.
Partially solve problems in each of the mathematics content strands; written solutions are minimal, unorganized, and presented without supporting information or explanations.	Solve problems including the application of appropriate operations, measurement, or estimation in each of the mathematics content strands; written solutions are organized and presented with both supporting information and explanations of how they were achieved.	Solve problems including the application of appropriate operations, measurement, or estimation in each of the mathematics content strands; written solutions go beyond the obvious and are organized and presented with both supporting information and thorough explanations of how they were achieved.

**MEAP Mathematics Grade 7 Performance Level Descriptors (Across Performance Levels)  
(Addresses Grade 6 Knowledge and Skills)**

<b>Basic (Level 3)</b>	<b>Met (Level 2)</b>	<b>Exceeded (Level 1)</b>
<p>Operate on rational numbers with limited understanding.</p> <p>Apply a specified operation in a contrived situation.</p> <p>Develop an understanding of rational number relationships.</p>	<p>Operate fluently on rational numbers, including addition, subtraction, multiplication, and division and can estimate all four.</p> <p>Determine and apply the appropriate operations for a given situation containing rational numbers.</p> <p>Understand the relationships among fractions, decimals, percents, and ratios.</p>	<p>Formulate algorithms, apply operations in more complex situations.</p>
<p>Represent a situation with a one-operation expression, such as <math>2X</math> or <math>X + 2</math></p> <p>Recognize linear patterns in tables and graphs.</p> <p>Solve one-operation equations in the form of <math>aX = c</math> or <math>a + X = c</math>.</p>	<p>Represent a situation with algebraic expressions.</p> <p>Represent linear functions in tables, graphs, and equations.</p> <p>Solve equations in the form of <math>aX + b = c</math>.</p>	<p>Recognize and write equivalent expressions.</p> <p>Make connections among graphs, tables, and equations.</p> <p>Find linear/nonlinear rules that are represented in a table.</p>
<p>Calculate volume and surface area with minimal understanding and accuracy.</p>	<p>Understand and use methods to calculate volume and surface area of cubes and rectangular prisms.</p>	<p>Derive the formulas for surface area and volume.</p>
<p>Recognize basic transformations and relate them to congruence.</p> <p>Recognize some angle relationships.</p>	<p>Apply basic transformations to congruence relationships.</p> <p>Demonstrate an understanding of angle relationships (complementary, supplementary, interior, exterior, vertical).</p>	<p>Apply compositions of transformations.</p> <p>Informally prove angle relationships.</p>
<p>Recognize a situation as either impossible, unlikely, likely, or certain.</p> <p>Express simple probabilities as fractions.</p>	<p>Compute simple probabilities and express as a decimal, fraction, or percent.</p>	<p>Design a simulation to determine the relative frequencies of outcomes.</p>

**MEAP Mathematics Grade 8 Performance Level Descriptors (Across Performance Levels)  
(Addresses Grade 7 Knowledge and Skills)**

<b>Basic (Level 3)</b>	<b>Met (Level 2)</b>	<b>Exceeded (Level 1)</b>
<p>Operate on rational numbers with limited understanding.</p> <p>Inconsistent use of order of operations.</p> <p>Solve contrived proportion problems.</p> <p>Compute square root of perfect squared numbers.</p>	<p>Operate fluently on negative rational numbers, including addition, subtraction, multiplication, and division and can estimate all four.</p> <p>Understand and apply order of operations.</p> <p>Calculate rates of change.</p> <p>Solve proportion problems.</p> <p>Compute and estimate square roots.</p>	<p>Formulate algorithms, apply operations in more complex situations.</p> <p>Convert ratio quantities between different systems of units.</p> <p>Given a proportional situation, formulate multiple strategies to solve.</p> <p>Compute and estimate cube roots.</p>
<p>Make connections between graphs and tables of a linear relationship, including directly proportional relationships.</p> <p>Solve contrived problems involving linear and directly proportional relationships.</p>	<p>Make connections between graphs, tables, and equations of a linear relationship, including directly proportional relationships.</p> <p>Solve applied problems involving linear and directly proportional relationships.</p> <p>Apply basic properties of real numbers.</p> <p>Simplify algebraic expressions using addition and subtraction.</p>	<p>Apply basic properties of real numbers using algebraic expressions.</p> <p>Simplify algebraic expressions (including the distributive property) and justify reasoning.</p>
<p>Given two similar figures, can find missing sides.</p> <p>Identify similar shapes and their scale factors.</p>	<p>Solve problems involving similar figures and scale drawings.</p> <p>Understand relationships between similar figures, including angle, sides, area and scale factor.</p> <p>Informally show that two triangles are similar using AAA and SSS.</p>	<p>Use similarity properties to justify arguments (including AAA, SSS, SAS).</p> <p>Informally show that two triangles are similar using SAS.</p>
<p>Represent data using stem and leaf plots and box-and-whisker plots.</p> <p>Calculate mean, median, quartile and interquartile range with definitions given.</p>	<p>Interpret data using circle graphs, stem and leaf plots, histograms and box-and-whisker plots.</p> <p>Represent data using histograms, stem-and-leaf plots, and box-and-whisker plots.</p> <p>Calculate relative and cumulative frequencies.</p> <p>Calculate mean, median, quartiles and interquartile range.</p>	<p>Given data, select appropriate representations. Represent data using circle graph.</p> <p>Interpret relative and cumulative frequencies.</p> <p>Compare and contrast the use of mean and median.</p>

**MEAP Mathematics “Met Standards” Performance Level Descriptors  
(Across Grades 3 and 4, Addressing Grades 2 and 3 Knowledge and Skills)**

<b>Grade: 3</b>	<b>Grade: 4</b>
Read, write, and compare whole numbers up to 1,000.	Read, write, and compare whole numbers up to 10,000.
Solve basic problems using addition and subtraction with two and three digit numbers.	Fluently solve and estimate basic problems using addition and subtraction with two-digit numbers with regrouping and up to four-digit numbers without regrouping.
Solve basic multiplication and sharing problems up to 5x5.	Solve and apply basic multiplication and division problems up to 10x10.
Recognize and name common fractions and decimals including money.	Recognize, name, and solve problems involving common fractions and decimals including money.
Tell time and use various measurement tools in standard problems, including measuring perimeter and area.	Calculate, apply, and use common units of measure in length, weight, time, and temperature in contextual situations.
Identify and manipulate common two- and three-dimensional objects.	Identify, describe, compare, manipulate, and construct common two- and three-dimensional objects.  Identify properties of lines.
Read and construct pictographs with a scale up to three.	Read, interpret, and solve problems involving bar graphs.
Locate and name coordinates on a simple map or grid.	

**MEAP Mathematics “Met Standards” Performance Level Descriptors  
(Across Grades 5 and 6, Addressing Grades 4 and 5 Knowledge and Skills)**

<b>Grade: 5</b>	<b>Grade: 6</b>
Perform basic (e.g., addition, subtraction) and complex (e.g., multiplication, and division) operations with whole numbers; perform basic operations with simple decimals and fractions.	Perform basic and complex operations with whole numbers, decimals, and fractions in applied situations (e.g., equivalent fractions, problems involving money, division of fractions of whole numbers).
Show sufficient understanding of relationships between place-value and decimals, that decimals and fractions are parts of a whole, and that simple fractions and decimals are interchangeable. Apply to basic, routine real-world problems.	Show sufficient understanding of percents, ratios, and prime factorization. Perform complex, routine operations on whole numbers using powers-of-ten; express fractions and decimals as percents and vice versa.
Identify the fundamental characteristics and properties (e.g., symmetry) of two-dimensional and three-dimensional geometric shapes; recognize basic transformations of geometric shapes.	Identify, measure, and classify angles (e.g., obtuse, acute, right, vertical, and straight ); use properties of geometric shapes (e.g., sum of interior angles) to solve routine problems.
Demonstrate understanding in reading, constructing, and interpreting simple and complex tables and bar graphs.	Demonstrate understanding in reading, constructing, and interpreting simple and complex line graphs; find and interpret the concepts of mean and mode to solve multi-step problems.
Demonstrate appropriate application of basic measurement concepts (e.g., use of measurement tools such as rulers and thermometers, simple conversions) as applied temperature, perimeter and area of squares and rectangles in solving routine problems.	Demonstrate appropriate application of basic measurement concepts (e.g., use of measurement tools such as protractors, simple and complex conversions) as applied to volume of rectangular prisms, perimeter and area of triangles and parallelograms in solving routine problems.
Solve problems including the application of appropriate operations, measurement, or estimation in each of the mathematics content strands; written solutions are organized and presented with both supporting information and explanations of how they were achieved.	Solve problems including the application of appropriate operations, measurement, or estimation in each of the mathematics content strands; written solutions are organized and presented with both supporting information and explanations of how they were achieved.

**MEAP Mathematics “Met Standards” Performance Level Descriptors  
(Across Grades 7 and 8, Addressing Grades 6 and 7 Knowledge and Skills)**

<b>Grade: 7</b>	<b>Grade: 8</b>
<p>Operate fluently on positive rational numbers, including addition, subtraction, multiplication, and division and can estimate all four.</p> <p>Determine and apply the appropriate operations for a given situation containing rational numbers.</p> <p>Understand the relationships among fractions, decimals, percents, and ratios.</p>	<p>Operate fluently on negative rational numbers, including addition, subtraction, multiplication, and division and can estimate all four.</p> <p>Understand and apply order of operations.</p> <p>Solve simple proportion problems and proportion equations in the form of <math>\frac{a}{b} = \frac{c}{d}</math></p> <p>Compute and estimate square roots.</p> <p>Calculate rates of change.</p>
<p>Represent linear functions in tables, graphs, and equations.</p> <p>Solve equations in the form of <math>aX + b = c</math>.</p> <p>Represent a situation with algebraic expressions.</p>	<p>Make connections between graphs, tables, and equations of a linear relationship, including directly proportional relationships.</p> <p>Solve applied problems involving linear and directly proportional relationships.</p> <p>Simplify algebraic expressions using addition and subtraction.</p> <p>Apply basic properties of real numbers.</p>
<p>Understand and use methods to calculate volume and surface area of cubes and rectangular prisms.</p>	
<p>Apply basic transformations to congruence relationships.</p> <p>Demonstrate an understanding of angle relationships (complementary, supplementary, interior, exterior, vertical).</p>	<p>Solve problems involving similar figures and scale drawings.</p> <p>Understand relationships between similar figures, including angle, sides, area, and scale factor.</p> <p>Informally show that two triangles are similar using AAA and SSS.</p>
<p>Compute simple probabilities and express as a decimal, fraction, or percent.</p>	<p>Interpret data using circle graphs, stem and leaf plots, histograms, and box-and-whisker plots.</p> <p>Represent data using histograms, stem-and-leaf plots, and box-and-whisker plots.</p> <p>Calculate relative and cumulative frequencies.</p> <p>Calculate mean, median, quartiles, interquartile range.</p>

**MEAP Mathematics “Exceeded Standards” Performance Level Descriptors  
(Across Grades 3 and 4, Addressing Grades 2 and 3 Knowledge and Skills)**

<b>Grade: 3</b>	<b>Grade: 4</b>
Read, write, and compare whole numbers up to 1,000 in contextual and non-contextual problems.	Read, write, and compare whole numbers up to 10,000 in contextual and non-contextual problems.
Solve complex problems using addition and subtraction with two and three digit numbers.	Fluently solve and estimate complex problems using addition and subtraction with two-digit numbers with regrouping and up to four-digit numbers without regrouping.
Solve basic multiplication and sharing problems up to 5x5 and apply to non-routine real world problems.	Solve and apply basic multiplication and division problems up to 10x10 in non-routine real world problems.
Recognize, name, and compare common fractions and decimals including money.	Accurately recognize, name, and solve complex problems involving common fractions and decimals including money.
Accurately tell time and use various measurement tools in complex problems including measuring perimeter and area.	Calculate, apply, and use common units of measure in length, weight, time, and temperature in contextual & non-contextual situations.
Identify, manipulate, describe, and compare common two- and three-dimensional objects.	Manipulate, construct, and recognize properties of common two-dimensional and three-dimensional objects.  Identify properties of lines and apply them to problems.
Read, construct, and interpret a pictograph with a scale up to three.	Read, interpret, and solve complex problems involving bar graphs.
Accurately locate and name coordinates on a complex map or grid.	

**MEAP Mathematics “Exceeded Standards” Performance Level Descriptors  
(Across Grades 5 and 6, Addressing Grades 4 and 5 Knowledge and Skills)**

<b>Grade: 5</b>	<b>Grade: 6</b>
Perform basic and complex operations with whole numbers and with simple decimals and fractions.	Perform basic and complex operations with whole numbers, decimals, and fractions in complex, non-routine applied situations (e.g., equivalent fractions, problems involving money, division of fractions of whole numbers).
Show substantial understanding of relationships between place-value and decimals, that decimals and fractions are parts of a whole, and that fractions and decimals are interchangeable. Apply to complex, non-routine real-world problems.	Show substantial understand of percents, ratios, and prime factorization. Perform complex, non-routine operations on whole numbers and decimals using powers-of-ten; express fractions and decimals as percents and vice versa.
Identify and apply the fundamental characteristics and properties (e.g., symmetry) of two-dimensional and three-dimensional geometric shapes; recognize complex transformations of geometric shapes.	Identify, measure, and classify angles (e.g., obtuse, acute, right, vertical, and straight ); use properties of geometric shapes (e.g., sum of interior angles) to solve routine problems.
Demonstrate understanding in reading, constructing, and interpreting simple and complex tables and bar graphs; able to draw conclusions and/or make predictions from data.	Demonstrate understanding in reading, constructing, and interpreting simple and complex line graphs; find, interpret, and apply the concepts of mean and mode to solve complex multi-step problems.
Demonstrate appropriate application of measurement concepts (e.g., use of measurement tools, simple conversions) as applied to temperature, perimeter and area of squares and rectangles in solving multi-step, non-routine problems.	Demonstrate substantial knowledge of basic measurement concepts (e.g., use of measurement tools such as protractors, simple and complex conversions) as applied to volume of rectangular prisms, perimeter and area of triangles and parallelograms in solving complex, non-routine, multi-step problems.
Solve problems including the application of appropriate operations, measurement, or estimation in each of the mathematics content strands; written solutions go beyond the obvious and are organized and presented with both supporting information and thorough explanations of how they were achieved.	Solve problems including the application of appropriate operations, measurement, or estimation in each of the mathematics content strands; written solutions go beyond the obvious and are organized and presented with both supporting information and thorough explanations of how they were achieved.

**MEAP Mathematics “Exceeded Standards” Performance Level Descriptors  
(Across Grades 7 and 8, Addressing Grades 6 and 7 Knowledge and Skills)**

<b>Grade: 7</b>	<b>Grade: 8</b>
<p>Formulate algorithms.</p> <p>Apply operations in more complex situations.</p>	<p>Formulate algorithms.</p> <p>Apply operations in more complex situations.</p> <p>Convert ratio quantities between different systems of units.</p> <p>Given a proportional situation, formulate multiple strategies to solve.</p> <p>Compute and estimate cube roots.</p>
<p>Recognize and write equivalent expressions.</p> <p>Make connections among graphs, tables and equations.</p> <p>Find linear/nonlinear rules that are represented in a table.</p>	<p>Apply basic properties of real numbers using algebraic expressions.</p> <p>Simplify algebraic expressions (including the distributive property) and justify reasoning.</p>
<p>Derive the formulas for surface area and volume.</p>	
<p>Apply compositions of transformations.</p> <p>Informally prove angle relationships.</p>	<p>Informally show that two triangles are similar using SAS.</p> <p>Use similarity properties to justify arguments (including AAA, SSS, SAS).</p>
<p>Design a simulation to determine the relative frequencies of outcomes.</p>	<p>Interpret relative and cumulative frequencies.</p> <p>Given data, select appropriate representations.</p> <p>Represent data using circle graph.</p> <p>Compare and contrast the use of mean and median.</p>

**MEAP Mathematics “Basic” Performance Level Descriptors  
(Across Grades 3 and 4, Addressing Grades 2 and 3 Knowledge and Skills)**

<b>Grade: 3</b>	<b>Grade: 4</b>
Read and write whole numbers at least up to 100.	Read, write, and compare whole numbers up to 1,000.
Solve basic problems with some accuracy using addition and subtraction with two digit numbers.	Solve and estimate basic problems with some accuracy using addition and subtraction with two-digit numbers with regrouping and up to four-digit numbers without regrouping.
Solve some basic multiplication and sharing problems up to $5 \times 5$ .	Solve and apply some basic multiplication and division problems up to $10 \times 10$ .
Limited recognition of common fractions and decimals including money.	Recognize, name, and solve some problems involving common fractions and decimals including money with limited accuracy.
Tell time and use various measurement tools in standard problems, including measuring perimeter and area with some accuracy.	Calculate, apply, and use common units of measure in length, weight, time, and temperature in standard problems with some accuracy.
Identify common two- and three-dimensional objects with some accuracy.	Identify, describe, compare, manipulate, and construct common two- and three-dimensional objects with limited accuracy.  Identify some properties of lines.
Read a pictograph with a scale up to at least two with some accuracy.	Read, interpret, and solve problems involving bar graphs with limited accuracy.
Locate and name coordinates on a simple map or grid with some accuracy.	

**MEAP Mathematics “Basic” Performance Level Descriptors  
(Across Grades 5 and 6, Addressing Grades 4 and 5 Knowledge and Skills)**

<b>Grade: 5</b>	<b>Grade: 6</b>
Perform basic operations (e.g., addition and subtraction) with whole numbers; perform some basic operations with simple decimals and fractions.	Perform basic (e.g. addition and subtraction) and some complex (e.g. multiplication and division) operations with whole numbers, decimals, and fractions in some applied situations (e.g., equivalent fractions, problems involving money).
Show partial understanding of relationships between place-value and decimals, that decimals and fractions are parts of a whole, and that simple fractions and decimals are interchangeable.	Show partial understanding of percents, ratios, and prime factorization. Perform simple, routine operations on whole numbers using powers-of-ten; express some simple fractions and simple decimals as percents and vice versa.
Identify some of the fundamental characteristics and properties (e.g., symmetry) of two-dimensional and three-dimensional geometric shapes.	Identify, measure, and classify some angles (e.g., obtuse, acute, right, vertical, and straight); use some properties of geometric shapes (e.g., sum of interior angles) to solve simple problems.
Demonstrate partial understanding in reading, constructing, and interpreting simple tables and bar graphs.	Demonstrate partial understanding in reading, constructing, and interpreting simple line graphs; find and interpret the concept of mode to solve simple problems.
Demonstrate partial knowledge (e.g., formulas) of perimeter and area of squares and rectangles; inappropriately use measurement tools to solve problems.	Demonstrate partial knowledge of some basic measurement concepts (e.g., use of measurement tools such as protractors, simple conversions) relating to volume of rectangular prisms, perimeter and area of triangles and parallelograms.
Partially solve problems in each of the mathematics content strands; written solutions are minimal, unorganized, and presented without supporting information or explanations.	Partially solve problems in each of the mathematics content strands; written solutions are minimal, unorganized, and presented without supporting information or explanations.

**MEAP Mathematics “Basic” Performance Level Descriptors  
(Across Grades 7 and 8, Addressing Grades 6 and 7 Knowledge and Skills)**

<b>Grade: 7</b>	<b>Grade: 8</b>
<p>Operate on rational numbers with limited understanding.</p> <p>Apply a specified operation in a contrived situation.</p> <p>Develop an understanding of rational number relationships.</p>	<p>Operate on rational numbers with limited understanding.</p> <p>Inconsistent use of order of operations.</p> <p>Solve contrived proportion problems.</p> <p>Compute square root of perfect squared numbers.</p>
<p>Represent a situation with a one-operation expression, such as <math>2X</math> or <math>X + 2</math>.</p> <p>Recognize linear patterns in tables and graphs.</p> <p>Solve one-operation equations in the form of <math>aX = c</math> or <math>a + X = c</math>.</p>	<p>Make connections between graphs and tables of a linear relationship, including directly proportional relationships.</p> <p>Solve contrived problems involving linear and directly proportional relationships.</p>
<p>Calculate volume and surface area with minimal understanding and accuracy.</p>	
<p>Recognize basic transformations and relate them to congruence.</p> <p>Recognize some angle relationships.</p>	<p>Identify similar shapes and their scale factors.</p> <p>Given two similar figures, find missing sides.</p>
<p>Recognize a situation as either impossible, unlikely, likely or certain.</p> <p>Express simple probabilities as fractions.</p>	<p>Represent data using stem and leaf plots and box-and whisker plots.</p> <p>Calculate mean, median, quartile and interquartile range with definitions given.</p>