Oregon Mathematics Achievement Level Descriptors – Grade 3

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
General Policy Definitions (Apply to all grades and all subjects)	**Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate mastery of the grade-level knowledge and skills required for proficiency.**	**Students demonstrate mastery of grade-level knowledge and skills exceeding the requirement for proficiency.**
Mathematics Policy Definitions (Apply to all grades)	**Students demonstrate limited mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.**	**Students demonstrate mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain their steps.**	**Students demonstrate mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.**	**Students demonstrate mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.**
Mathematics Achievement Level Descriptors **Number and Operations** Develop an understanding of fractions	• Inconsistently represent common fractions (e.g., halves, thirds, fourths, tenths) as equal parts of a whole or parts of a set. • Inconsistently identify which fractional part is larger when wholes are the same size. • Inconsistently use fractions with common denominators to represent numbers that are equal to, less than, or greater than one. • Inconsistently compare or order fractions while using models. • Inconsistently identify equivalent fractions using given concrete models or the number line. • Inconsistently add common fractions with like denominators.	• Represent common fractions (e.g., halves, thirds, fourths, tenths) as equal parts of a whole or parts of a set. • Identify which fractional part is larger when wholes are the same size. • Use fractions with common denominators to represent numbers that are equal to, less than, or greater than one. • Solve problems that involve comparing or ordering fractions by using models, benchmarks (0, 1/2, 1), or common numerators or denominators. • Identify equivalent fractions given models or the number line. • Add common fractions with like denominators using models or manipulatives.	• Represent common fractions (e.g., halves, thirds, fourths, tenths) as equal parts of a whole, parts of a set, or points or distances on a number line. • Recognize and demonstrate that sizes of fractional parts are relative to the size of the whole. • Uses fraction to represent numbers that are equal to, less than, or greater than one. • Solve problems that involve comparing and ordering fractions by using models, benchmarks (0, 1/2, 1), or common numerators or denominators. • Identify equivalent fractions using models, including the number line. • Add common fractions with like denominators.	• Represent common fractions (e.g., halves, thirds, fourths, tenths) as equal parts of a whole, parts of a set, or points or distances on a number line and can justify their reasoning. • Recognize and demonstrate that sizes of fractional parts are relative to the size of the whole and can explain their thinking. • Uses fraction to represent numbers that are equal to, less than, or greater than one in more than one way. • Solve problems that involve comparing and ordering fractions by using a variety of methods (e.g., models, benchmarks (0, 1/2, 1), or common numerators or denominators. • Identify and creates equivalent fractions using models, including the number line. • Add common fractions with like denominators and explains their thinking.

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Oregon Mathematics Achievement Level Descriptors – Grade 3

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General Policy Definitions (Apply to all grades and all subjects)	Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate mastery of the grade-level knowledge and skills required for proficiency.	Students demonstrate mastery of grade-level knowledge and skills exceeding the requirement for proficiency.
Mathematics Policy Definitions (Apply to all grades)	Students demonstrate limited mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.	Students demonstrate mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain their steps.	Students demonstrate mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.	Students demonstrate mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.
Mathematics Achievement Level Descriptors **Number and Operations, Algebra, and Data Analysis** **Develop understanding of multiplication and division**	• Inconsistently represent the concept of multiplication as repeated addition. • Inconsistently represent the concept of division as repeated subtraction or forming equal groups. • Inconsistently attempt to use models of multiplication (e.g., equal-sized groups, arrays, area models, equal "jumps" on number lines and hundreds charts) or division (e.g., repeated subtraction, partitioning, and sharing) to solve problems. • Inconsistently use a strategy based on the number properties (e.g., place value, commutative, associative, distributive, identity, and zero) to determine multiplication or division involving basic facts. • Inconsistently use the inverse relationship between multiplication and division (e.g., 5 x 6 = 30, 30 ÷ 6 = 5) or the relationship between multiples and factors with concrete models. • Inconsistently represent number patterns using rules that involve multiplication or addition (e.g., {3, 6, 9, 12,... },{1, 2, 4, 8, ...}) • Inconsistently interpret frequency tables, bar graphs, picture graphs, or line plots involving addition, subtraction, multiplication, or division.	• Represent the concept of multiplication as repeated addition in a routine situation. • Represent the concept of division as repeated subtraction or forming equal groups. • Apply models of multiplication (e.g., equal-sized groups, arrays, area models, equal "jumps" on number lines and hundreds charts) or division (e.g., repeated subtraction, partitioning, and sharing) to solve problems. • Apply some strategy based on the number properties (e.g., place value, commutative, associative, distributive, identity, and zero) to determine multiplication or division involving basic facts. • Often use the inverse relationship between multiplication and division (e.g., 5 x 6 = 30, 30 ÷ 6 = 5) or the relationship between multiples and factors. • Represent or extend number patterns using rules that involve multiplication or addition (e.g., {3, 6, 9, 12,... },{1, 2, 4, 8, ...}) • Analyze frequency tables, bar graphs, picture graphs, or line plots and use them to solve problems involving addition, subtraction, multiplication, or division.	• Represent and apply the concept of multiplication as repeated addition. • Represent and apply the concept of division as repeated subtraction and forming equal groups. • Apply models of multiplication (e.g., equal-sized groups, arrays, area models, equal "jumps" on number lines and hundreds charts) and division (e.g., repeated subtraction, partitioning, and sharing) to solve problems. • Apply increasingly sophisticated strategy based on the number properties (e.g., place value, commutative, associative, distributive, identity, and zero) to solve multiplication and division involving basic facts. • Apply the inverse relationship between multiplication and division (e.g., 5 x 6 = 30, 30 ÷ 6 = 5) and the relationship between multiples and factors in routine situations. • Represent, analyze and extend number patterns using rules that involve multiplication and/or addition (e.g., {3, 6, 9, 12,... }, {1, 2, 4, 8, ...}) • Analyze frequency tables, bar graphs, picture graphs, and line plots; and use them to solve problems involving addition, subtraction, multiplication, and division.	• Represent and apply the concept of multiplication as repeated addition in a variety of situations and justifies their thinking. • Represent and apply the concept of division as repeated subtraction and forming equal groups in a variety of situations and justifies their thinking. • Apply models of multiplication (e.g., equal-sized groups, arrays, area models, equal "jumps" on number lines and hundreds charts) and division (e.g., repeated subtraction, partitioning, and sharing) to solve non-routine problems and justify their thinking. • Apply increasingly sophisticated strategy based on the number properties (e.g., place value, commutative, associative, distributive, identity, and zero) to solve complex multiplication and division problems involving basic facts. • Apply the inverse relationship between multiplication and division (e.g., 5 x 6 = 30, 30 ÷ 6 = 5) and the relationship between multiples and factors in non-routine situations. • Represent, analyze and extend number patterns using rules that involve multiplication and/or addition (e.g., {3, 6, 9, 12, ... }, {1, 2, 4, 8,...}) to the nth term. • Analyze frequency tables, bar graphs, picture graphs, and line plots; and use them to solve complex problems involving addition, subtraction, multiplication, and division.

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Oregon Mathematics Achievement Level Descriptors – Grade 3

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Mathematics Policy Definitions (Apply to all grades)	**Students demonstrate limited mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.**	**Students demonstrate mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain their steps.**	**Students demonstrate mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.**	**Students demonstrate mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.**
Mathematics Achievement Level Descriptors **Geometry and Measurement** Analyze 2-dimensional shapes, including perimeter	• Inconsistently identify right angles in two-dimensional shapes or determine if angles are greater than or less than a right angle (obtuse and acute). • Inconsistently identify, describe, or informally classify triangles by their sides and angles. • Inconsistently identify, describe, compare, or classify quadrilaterals (square, rectangle, parallelogram, rhombus, and trapezoid) by their sides and angles. • Inconsistently identify or describe pentagons, hexagons, and octagons by the number of sides or angles. • Inconsistently decompose, combine, or transform polygons to make other polygons. • Build or draw two-dimensional shapes to inconsistently understand attributes and properties of two-dimensional space. • Inconsistently determine an appropriate unit or tool to find the perimeter of polygons. • Use attribute or property of two-dimensional shapes to inconsistently identify parallel and perpendicular lines, congruence, symmetry, and perimeter.	• Identify right angles in two-dimensional shapes or determine if angles are greater than or less than a right angle (obtuse and acute). • Identify, describe, compare, or informally classify triangles by their sides and angles. • Often identify, describe, compare, and/or classify quadrilaterals (square, rectangle, parallelogram, rhombus, and trapezoid) by their sides and angles • Identify, describe, or compare pentagons, hexagons, and octagons by the number of sides or angles. • Decompose, combine, or transform polygons to make other polygons. • Build or draw two-dimensional shapes to understand attributes and properties of two-dimensional space. • Often determine an appropriate unit or tool to find the perimeter of polygons. • Uses attribute or property of two-dimensional shapes to consistently identify parallel and perpendicular lines, congruence, symmetry, and perimeter.	• Identify right angles in two-dimensional shapes and determine if angles are greater than or less than a right angle (obtuse and acute). • Identify, describe, compare, analyze, and informally classify triangles by their sides and angles. • Consistently identify, describe, compare, analyze, and classify quadrilaterals (square, rectangle, parallelogram, rhombus, and trapezoid) by their sides and angles. • Identify, describe, and compare pentagons, hexagons, and octagons by the number of sides or angles. • Investigate and describe the results of decomposing, combining, and transforming polygons to make other polygons. • Build, draw, and analyze two-dimensional shapes to understand attributes and properties of two-dimensional space. • Determine an appropriate unit, tool, or strategy to find the perimeter of polygons. • Use attribute and property of two-dimensional shapes to solve problems including applications involving parallel and perpendicular lines, congruence, symmetry, and perimeter.	• Identify right angles in non-routine two-dimensional shapes and determine if angles are greater than or less than a right angle (obtuse and acute). • Identify, describe, compare, analyze, and informally classify triangles by their sides and angles and explains their thinking. • Identify, describe compare, analyze, and classify quadrilaterals (square, rectangle, parallelogram, rhombus, and trapezoid) by their sides and angles and explains their thinking. • Identify, describe, and compare pentagons, hexagons, and octagons by the number of sides or angles and explains their thinking. • Investigate, describe, and predict the results of decomposing, combining, and transforming polygons to make other polygons. • Build, draw, and analyze two-dimensional shapes to understand attributes and properties of two-dimensional space and justifies their thinking. • Determine an appropriate unit, tool, and strategy to find the perimeter of polygons and justifies their thinking. • Use attribute and property of two-dimensional shapes to solve non-routine problems including applications involving parallel and perpendicular lines, congruence, symmetry, and perimeter.

7/27/2010 Draft

*** Please note:** Names for the proposed levels are currently under consideration.

Oregon Mathematics Achievement Level Descriptors – Grade 4

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
General Policy Definitions (Apply to all grades and all subjects)	**Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate mastery of the grade-level knowledge and skills required for proficiency.**	**Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.**
Mathematics Policy Definitions (Apply to all grades)	**Students demonstrate limited mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.**	**Students demonstrate mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain their steps.**	**Students demonstrate mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.**	**Students demonstrate mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.**
Mathematics Achievement Level Descriptors **Number and Operations** Develop an understanding of Decimals	• Inconsistently read, write, or represent decimal numbers (to the hundredths). • Use models to represent fractions and decimals and inconsistently connects equivalent fractions and decimals. • Inconsistently determine decimal equivalents for common fractions. • Inconsistently compare fractions or decimals. • Inconsistently estimate decimal or fractional amounts in routine situations. • Inconsistently represent money amounts to $10.00 in dollars and cents.	• Read, write, or represent decimal numbers (to the hundredths). • Use models to connect equivalent fractions and decimals. • Determine decimal equivalents or approximation for some common fractions. • Compare and order fractions or compares and orders decimals. • Estimate decimal or fractional amounts in routine situations. • Represent money amounts to $10.00 in dollars and cents.	• Read, write, and represent decimal numbers (to the hundredths). • Use models to connect and compare equivalent fractions and decimals. • Determine decimal equivalent and/or approximation for common fractions. • Compare and order fractions and decimals. • Estimate decimal or fractional amounts in routine and non-routine situations. • Represent money amounts to $10.00 in dollars and cents and applies to situations involving purchasing ability and making change.	• Read, write, and represent decimal numbers (to the hundredths) in a context. • Use models to connect and compare equivalent fractions and decimals including mixed numbers or improper fractions. • Determine decimal equivalents or approximation for common fractions and can explain the relationship between them. • Compare and order a fractions and decimals, including improper fractions and mixed numbers. • Estimate decimal or fractional amounts and justifies solutions. • Represent money amounts to $10.00 in dollars and cents and applies to situations involving purchasing ability and making change with the fewest bills and coins.

*** Please note:** Names for the proposed levels are currently under consideration.

Oregon Mathematics Achievement Level Descriptors – Grade 4

The achievement level descriptors are cumulative.

General Policy Definitions (Apply to all grades and all subjects)	Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate mastery of the grade-level knowledge and skills required for proficiency.	Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.
Mathematics Policy Definitions (Apply to all grades)	Students demonstrate limited mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.	Students demonstrate mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain their steps.	Students demonstrate mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.	Students demonstrate mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.
Mathematics Achievement Level Descriptors **Number and Operations and Algebra** Fluency with multiplication of whole numbers	• Inconsistently compute multiplication facts to 10 times 10. • Demonstrate inconsistent understanding of application of models for multiplication (e.g., equal-sized groups, arrays, area models, equal intervals on the number line). • Inconsistently use a given estimation strategy for multiplication (e.g., use benchmarks, overestimate, underestimate, round) when computing with whole numbers. • Inconsistently use accurate methods to multiply multi-digit whole numbers. • Inconsistently multiply multi-digit whole numbers.	• Apply with fluency multiplication facts to 10 times 10. • Demonstrate partial understanding of application of models for multiplication (e.g., equal-sized groups, arrays, area models, equal intervals on the number line), place value, or properties of operations (commutative, associative, and distributive). • Use a given estimation strategy for multiplication (e.g., use benchmarks, overestimate, underestimate, round) when computing with whole numbers. • Use accurate or generalizable methods to multiply multi-digit whole numbers. • Use given procedures for multiplying multi-digit whole numbers.	• Apply with fluency multiplication facts to 10 times 10 and related division facts. • Demonstrate understanding of application of models for multiplication (e.g., equal-sized groups, arrays, area models, equal intervals on the number line), place value, and properties of operations (commutative, associative, and distributive). • Select and use appropriate estimation strategies for multiplication (e.g., use benchmarks, overestimate, underestimate, round) to calculate mentally based on the problem situation when computing with whole numbers. • Develop and use accurate, efficient, and generalizable methods to multiply multi-digit whole numbers. • Develop fluency with efficient procedures for multiplying multi-digit whole numbers.	• Apply with fluency multiplication facts to 10 times 10 and related division facts in complex situations. • Demonstrate understanding of application of models for multiplication (e.g., equal-sized groups, arrays, area models, equal intervals on the number line), place value, and properties of operations (commutative, associative, and distributive) in complex situations. • Select and use appropriate estimation strategies for multiplication (e.g., use benchmarks, overestimate, underestimate, round) to calculate mentally based on the problem situation when computing with whole numbers and explains why a strategy was chosen. • Develop and use accurate, efficient, and generalizable methods to multiply 3-digit by 3-digit whole numbers or larger. • Develop fluency with efficient procedures for multiplying multi-digit whole numbers and justifies why the procedures work on the basis of place value and number properties.

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Oregon Mathematics Achievement Level Descriptors – Grade 4

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General Policy Definitions (Apply to all grades and all subjects)	Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate mastery of the grade-level knowledge and skills required for proficiency.	Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.
Mathematics Policy Definitions (Apply to all grades)	Students demonstrate limited mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.	Students demonstrate mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain their steps.	Students demonstrate mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.	Students demonstrate mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.
Mathematics Achievement Level Descriptors **Measurement** Area	•Inconsistently recognize area as an attribute of two- dimensional regions or inconsistently recognizes a square that is one unit on a side as the standard unit for measuring area. •Inconsistently identify a standard unit for measuring area. •Use different-sized units of area to cover a shape with gaps and/or overlaps. •Begin to see the area model of multiplication or begin to observe area measure as multiplication. •Inconsistently find the area of common shapes that can be subdivided into rectangles. •Inconsistently find perimeters or areas of rectangles or squares. • Inconsistently calculate perimeters and areas of given rectangles.	•Recognize area as an attribute of two-dimensional regions or recognize a square that is one unit on a side as the standard unit for measuring area. •Partially determine area by finding the total number of same-sized units of area that cover a shape without gaps or overlaps. •Sometime determine the appropriate units, strategies, or tools to solve problems that involve estimating or measuring area. •Connect area measure to the area model used to represent multiplication. •Find the areas of common shapes that can be subdivided into rectangles. •Solve problems involving perimeters or areas of rectangles and squares. •Calculate perimeter and area of given rectangles and identifies rectangles with equal perimeters or equal areas.	•Recognize area as an attribute of two-dimensional regions and recognize a square that is one unit on a side as the standard unit for measuring area. •Determine area by finding the total number of same-sized units of area that cover a shape without gaps or overlaps. •Determine the appropriate units, strategies, and tools to solving problems that involve estimating and/or measuring area. •Connect area measure to the area model used to represent multiplication and uses this to express the formula for area of a rectangle. •Find the area of complex shapes that can be subdivided into rectangles. •Solve problems involving perimeters and areas of rectangles and squares. •Recognize that rectangles with the same area can have different perimeters and that rectangles with the same perimeter can have different areas.	•Recognize area as an attribute of two-dimensional regions and recognize a square that is one unit on a side as the standard unit for measuring area in complex situations. •Determine area by finding the total number of same-sized units of area that cover an irregular shape without gaps or overlaps. •Determine and justify appropriate units, strategies, and tools to solve problems that involve estimating and/or measuring area. •Connect area measure to the area model used to represent multiplication and explains how this justifies the formula for area of a rectangle. •Determine the areas of complex shapes that can be subdivided into rectangles and can explain their thinking. •Solve problems involving perimeters and areas of rectangles and squares and justifies their thinking. •Recognize, generalize, and justify that rectangles with the same area can have different perimeters and that rectangles with the same perimeter can have different areas.

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Oregon Mathematics Achievement Level Descriptors – Grade 5

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
General Policy Definitions (Apply to all grades and all subjects)	**Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate mastery of the grade-level knowledge and skills required for proficiency.**	**Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.**
Mathematics Policy Definitions (Apply to all grades)	**Students demonstrate limited mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.**	**Students demonstrate mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain their steps.**	**Students demonstrate mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.**	**Students demonstrate mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.**
Mathematics Achievement Level Descriptors **Number and Operations and Data Analysis** Fluency with addition and subtraction of fractions and decimals	• Inconsistently use a given fraction model to represent addition or subtraction with unlike denominators that are multiples of each other. • Use a given decimal model to add or subtract decimals (to the tenths). • Inconsistently use appropriate strategies to estimate decimal sums and differences. • Beginning to develop an efficient procedure for adding and subtracting decimals or adding and subtracting fractions. • Solve simple problems involving the addition or subtraction of fractions or decimals. • Inconsistently uses ordered pairs on coordinate graphs to specify locations. • Inconsistently construct double bar graphs, line, or circle graphs to solve problems involving fractions or decimals.	• Use a given fraction model to represent addition or subtraction with unlike denominators. • Use a given decimal model, place value, or number properties to add and subtract decimals (to the thousandths). • Use appropriate strategies to estimate fraction or decimal sums and/or differences. • Develop an efficient procedure for adding and subtracting fractions or decimals. • Solve simple problems involving the addition and subtraction of fractions or decimals. • Often uses ordered pairs on coordinate graphs to specify locations. • Construct double bar, line, or circle graphs to solve problems involving fractions or decimals.	• Use fraction models to represent the addition and subtraction of fractions with unlike denominators. • Use decimal models, place value, and number properties to add and subtract decimals (to the thousandths). • Select and use appropriate strategies to estimate fraction and decimal sums and differences. • Develop fluency with efficient procedures for adding and subtracting fractions and decimals. • Solve problems involving the addition and subtraction of fractions and decimals. • Uses ordered pairs on coordinate graphs to specify locations and describe paths. • Construct and analyze double bar, line, and circle graphs to solve problems involving fractions and decimals.	• Construct multiple fraction models to represent addition and subtraction of fractions with unlike denominators. • Use decimal models, place value, and number properties to add and subtract decimals (to the thousandths) and can explain their reasoning. • Select and use appropriate strategies to estimate a mixture of fraction and decimal sums and differences. • Develop fluency with efficient procedures for adding and subtracting fractions and decimals and justify why the procedures work. • Solve non-routine problems involving the addition and subtraction of fractions and decimals. • Use ordered pairs on coordinate graphs to specify locations and describe paths in context. • Construct and analyze double bar, line, and circle graphs to solve problems involving fractions and decimals, in context.

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Oregon Mathematics Achievement Level Descriptors – Grade 5

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Mathematics Policy Definitions (Apply to all grades)	**Students demonstrate limited mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.**	**Students demonstrate mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain their steps.**	**Students demonstrate mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.**	**Students demonstrate mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.**
Mathematics Achievement Level Descriptors **Number and Operations and Algebra** Fluency with division of whole numbers	• Inconsistently apply understanding of one model for division or the relationship of division to multiplication to solve problems. • Inconsistently apply properties of operations to solve problems involving division. • Inconsistently use a given estimation strategy for division to calculate mentally when computing with whole numbers. • Inconsistently use accurate, efficient, or generalizable methods to find quotients for multi-digit division problems. • Beginning to develop fluency with efficient procedures for dividing whole numbers. • Inconsistently determine an appropriate form of the quotient in a problem situation.	• Apply understanding of models for division **or** the relationship of division to multiplication to solve problems. • Apply properties of operations to solve problems involving division. • Use a given estimation strategy for division to calculate mentally when computing with whole numbers. • Use a given accurate, efficient, or generalizable method to find quotients for multi-digit division problems. • Apply efficient procedures for dividing whole numbers. • Determine an appropriate form of the quotient **and/or** interpret the remainder in a problem situation.	• Apply understanding of models for division **and** the relationship of division to multiplication to solve problems. • Apply concepts of place value and the properties of operations to solve problems involving division. • Select and use appropriate estimation strategies for division to calculate mentally based on the problem situation when computing with whole numbers. • Develop and use accurate, efficient, and generalizable methods to find quotients for multi-digit division problems. • Develop fluency with efficient procedures for dividing whole numbers. • Determine the most appropriate form of the quotient **and** interpret the remainder in a problem situation.	• Apply understanding of models for division and the relationship of division to multiplication to solve non-routine problems. • Apply and justify concepts of place value and the properties of operations to solve problems involving division. • Select and use appropriate estimation strategies for division to calculate mentally based on the problem situation when computing with whole numbers and can justify why a strategy was chosen. • Develop, justify, and use accurate, efficient, and generalizable methods to find quotients for multi-digit division problems. • Develop fluency with efficient procedures for dividing whole numbers and justify why the procedures work on the basis of place value and number properties. • Determine the most appropriate form of the quotient and interpret the remainder in a complex problem situation.

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Oregon Mathematics Achievement Level Descriptors – Grade 5

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Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
General Policy Definitions (Apply to all grades and all subjects)	Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate mastery of the grade-level knowledge and skills required for proficiency.	Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.
Mathematics Policy Definitions (Apply to all grades)	Students demonstrate limited mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.	Students demonstrate mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain their steps.	Students demonstrate mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.	Students demonstrate mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.
Mathematics Achievement Level Descriptors **Geometry, Measurement, and Algebra** Analyze three-dimensional shapes, including volume and surface area	• Inconsistently identify or classify triangles by their angles or sides. • Inconsistently apply given formulas for the areas of triangles and parallelograms. • Inconsistently describe three-dimensional shapes by the number of edges, faces and/or vertices. • Inconsistently recognize volume as an attribute of three-dimensional space. • Inconsistently determine volume by finding the total number unit cubes that fill a three-dimensional shape without gaps or overlaps. • Inconsistently recognize a cube that is one unit on an edge as the standard unit for measuring volume. • Inconsistently determine the appropriate units, strategies, or tools for solving problems that involve measuring volume. • Inconsistently decompose three-dimensional shapes and finds volumes of rectangular prisms. • Inconsistently, identify or measures necessary attributes of shapes to use area, surface area, or volume formulas to solve problems, when given the dimensions and formula.	• Identify and classify triangles by their angles or sides. • Apply given formulas for the areas of triangles and parallelograms. • Often describes three-dimensional shapes by the number of edges, faces, and/or vertices. • Recognize volume as an attribute of three-dimensional space for common figures (e.g. prism, pyramid, cone, cylinder, sphere). • Determine volume by finding the total number of unit cubes that fill a three-dimensional shape without gaps or overlaps. • Often recognize a cube that is one unit on an edge as the standard unit for measuring volume. • Determine the appropriate units, strategies, or tools for solving problems that involve estimating or measuring volume. • Decompose three-dimensional shapes and finds volumes of rectangular prisms. • Identify and measure necessary attributes of shapes to use area, surface area, or volume formulas to solve problems, when given the dimensions and formula.	• Identify and classify triangles by their angles and sides. • Find relationships among the formulas for the areas of triangles and parallelograms. • Describe three-dimensional shapes by the number of edges, faces, and/or vertices as well as types of faces. • Recognize volume as an attribute of three-dimensional space. • Determine volume by finding the total number of same-sized units of volume that fill a three-dimensional shape without gaps or overlaps. • Recognize a cube that is one unit on an edge as the standard unit for measuring volume. • Determine the appropriate units, strategies, and tools for solving problems that involve estimating or measuring volume. • Decompose three-dimensional shapes and finds surface areas and volumes of triangular and rectangular prisms. • Identify and measure necessary attributes of shapes to use area, surface area, and volume formulas to solve problems, when given all dimensions.	• Identify and classify triangles by their angles and sides in context. • Find and justify relationships among the formulas for the areas of triangles and parallelograms. • Describe three-dimensional shapes by the number of edges, faces, and/or vertices as well as types of faces, from multiple perspectives. • Recognize volume as an attribute of three-dimensional space in context. • Determine volume by finding the total number of same-sized units of volume that fill a three-dimensional shape without gaps or overlaps or makes a shape with given volume. • Recognize a cube that is one unit on an edge as the standard unit for measuring volume and can apply it. • Determine the appropriate units, strategies, and tools for solving complex problems that involve estimating or measuring volume and can explain why it was chosen. • Decompose three-dimensional shapes and finds surface areas and volumes of triangular and rectangular prisms, in context. • Identify and measure necessary attributes of shapes to use area, surface area, and volume formulas to solve problems, when there are missing parts of the dimensions.

7/27/2010 Draft

*** Please note:** Names for the proposed levels are currently under consideration.

Oregon Mathematics Achievement Level Descriptors – Grade 6

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
Policy Definitions (Apply to all grades and all subjects)	**Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate mastery of the grade-level knowledge and skills required for proficiency.**	**Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.**
Math Descriptors (Apply to all grades)	**Students demonstrate limited mastery of mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.**	**Students demonstrate partial mastery of mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain some of their steps.**	**Students demonstrate mastery of mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.**	**Students demonstrate mastery of mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.**
Mathematics Achievement Level Descriptors **Number** Fluency with multiplication and division of fractions and decimals	•Inconsistently use appropriate strategies to estimate fraction and decimal products and quotients. •Inconsistently use given strategies for solving problems with multiplication and division of fractions and decimals. •Inconsistently apply given efficient procedures for multiplying and dividing fractions or decimals. • Inconsistently apply the inverse relationship between multiplication and division of fractions. •Inconsistently apply the properties of operations to simplify calculations. •Inconsistently use the relationship between common decimals and fractions to solve problems.	•Use given appropriate strategies to estimate fraction and decimal products and quotients. •Use given strategies for solving problems with multiplication and division of fractions and decimals. •Use given efficient procedures for multiplying and dividing fractions or decimals. •Often apply the inverse relationship between multiplication and division of fractions. •Apply the properties of operations, including simplifying calculations with fractions or simplifying calculations with decimals. •Often use the relationship between common decimals and fractions to solve problems, including measurement.	•Select and use appropriate strategies to estimate fraction and decimal products and quotients. •Use and analyze strategies for solving problems with multiplication and division of fractions and decimals. •Use efficient procedures for multiplying and dividing fractions and decimals. •Apply the inverse relationship between multiplication and division of fractions. •Apply the properties of operations, including simplifying calculations with fractions and simplifying calculations with decimals. •Use the relationship between common decimals and fractions to solve problems, including measurement.	•Select and use appropriate strategies to estimate fraction and decimal products and quotients in context. •Use, analyze, and justify a variety of strategies for solving problems with multiplication and division of fractions and decimals. •Use efficient procedures for multiplying and dividing fractions and decimals and justifies why they work. •Apply the inverse relationship between multiplication and division of fractions and justifies why it works. •Apply the properties of operations, including simplifying calculations involving a combination of fractions and decimals. •Apply the relationship between common decimals and fractions to solve non-routine problems.

* **Please note:** Names for the proposed levels are currently under consideration.

Oregon Mathematics Achievement Level Descriptors – Grade 6

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
Policy Definitions (Apply to all grades and all subjects)	Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate mastery of the grade-level knowledge and skills required for proficiency.	Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.
Math Descriptors (Apply to all grades)	Students demonstrate limited mastery of mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.	Students demonstrate partial mastery of mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain some of their steps.	Students demonstrate mastery of mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.	Students demonstrate mastery of mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.
Mathematics Achievement Level Descriptors **Number and Probability** Rate, ratio and probability	• Beginning to develop and apply the meaning of ratio, rate, or percent to solve problems. • Inconsistently determine decimal equivalents for common fractions, including approximations. • Starting to understand the meaning of probability or inconsistently represents probabilities as ratios, decimals, or percents. • Inconsistently determine simple experimental or theoretical probabilities. • Beginning to develop the concept of pi as the ratio of the circumference of a circle to its diameter.	• Apply the meaning of ratio, rate, or percent to solve problems. • Determine decimal or percent equivalents for common fractions, including approximations. • Understand the meaning of probability and sometimes is able to represent probabilities as ratios, decimals, or percents. • Determine simple experimental or theoretical probabilities. • Partially develop the concept of pi as the ratio of the circumference of a circle to its diameter.	• Develop, analyze, and apply the meaning of ratio, rate, and percent to solve problems. • Determine decimal and percent equivalents for common fractions, including approximations. • Understand the meaning of probability and represents probabilities as ratios, decimals, and percents. • Determine simple probabilities, both experimental and theoretical. • Develop the concept of pi as the ratio of the circumference of a circle to its diameter.	• Develop, analyze, and apply the meaning of ratio, rate, and percent to solve non-routine problems. • Determine and justify equivalent decimals, percents and common fractions, including approximations. • Use the meaning of probability and represents probabilities as ratios, decimals, and percents to solve non-routine problems. • Determine simple probabilities with outcomes not equally likely. • Apply the concept of pi as the ratio of the circumference of a circle to its diameter to solve problems.

Oregon Mathematics Achievement Level Descriptors – Grade 6

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
Policy Definitions (Apply to all grades and all subjects)	Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate mastery of the grade-level knowledge and skills required for proficiency.	Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.
Math Descriptors (Apply to all grades)	Students demonstrate limited mastery of mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.	Students demonstrate partial mastery of mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain some of their steps.	Students demonstrate mastery of mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.	Students demonstrate mastery of mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.
Mathematics Achievement Level Descriptors **Algebra** Writing and using mathematical expressions and equations	• Inconsistently use the order of operations to simplify expressions. • Developing an understanding of the meaning or use of variables. • Inconsistently evaluate or use expressions and formulas to solve problems. • Inconsistently identify equivalent expressions. • Inconsistently represent or determine relationships and patterns using tables, graphs, words or, when possible, symbols. • Developing the concept that the solutions of an equation are the values of the variables that make the equation true. • Inconsistently solve one-step equations by using number sense and/or properties of operations.	• Use the order of operations to simplify expressions that may include exponents or grouping symbols. • Developing an understanding of the meaning and use of variables. • Evaluate and use expressions and formulas to solve problems. • Often able to identify and represent equivalent expressions. • Represent, analyze, or determine relationships and patterns using tables, graphs, words or, when possible, symbols. • Often recognize that the solutions of an equation are the values of the variables that make the equation true. • Solve simple one-step equations by using number sense, properties of operations, or the idea of maintaining equality on both sides of an equation.	• Use the order of operations to simplify expressions that may include exponents and grouping symbols. • Understand the meanings and uses of variables. • Write, evaluate, and use expressions and formulas to solve problems. • Identify and represent equivalent expressions (e.g., different ways to see a pattern). • Represent, analyze, and determine relationships and patterns using tables, graphs, words and, when possible, symbols. • Recognize that the solutions of an equation are the values of the variables that make the equation true. • Solve one-step equations by using number sense, properties of operations, and the idea of maintaining equality on both sides of an equation.	• Use the order of operations to simplify expressions that include both exponents and grouping symbols and explains the reasoning. • Understand the meanings and use of variables to solve non-routine problems. • Write, evaluate, and use expressions and formulas to solve more complex problems. • Identify and represent complex equivalent expressions. • Extend patterns to the n^{th} term using tables, graphs, words and when possible, symbols. • Apply the knowledge that solutions of a complex equation are the values of the variables that make the equation true. • Solve one-step equations involving fractions and/or decimals.

* **Please note:** Names for the proposed levels are currently under consideration.

Oregon Mathematics Achievement Level Descriptors – Grade 7

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
Policy Definitions (Apply to all grades and all subjects)	Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate mastery of the grade-level knowledge and skills required for proficiency.	Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.
Math Descriptors (Apply to all grades)	Students demonstrate limited mastery of mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.	Students demonstrate partial mastery of mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain some of their steps.	Students demonstrate mastery of mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.	Students demonstrate mastery of mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.
Mathematics Achievement Level Descriptors **Number and Algebra** Rational numbers and linear equations	• Inconsistently apply given models (including everyday contexts), strategies, or procedures to compute with integers. • Inconsistently estimate or solve problems involving negative rational numbers. • Inconsistently applies properties of rational numbers and algebra to write and solve linear equations in one variable.	• Applies given models (including everyday contexts), strategies, or procedures to compute with integers. • Estimates or solves problems involving negative rational numbers. • Applies properties of rational numbers and algebra to write and solve linear equations in one variable.	• Develops, analyzes, and applies models (including everyday contexts), strategies, and procedures to compute with integers, with an emphasis on negative integers. • Extends knowledge of integers and positive rational numbers to estimate and solve problems involving negative rational numbers. • Applies properties of rational numbers and algebra to write and solve linear equations in one variable and can explain steps.	• Computes with integers and applies efficient strategies to analyze models (including new and complex situations). • Integrates knowledge of rational numbers to estimate and fluently solve problems, and can justify strategies. • Applies properties of rational numbers and algebra to write and solve complex linear equations in one variable and can justify steps clearly.

* **Please note:** Names for the proposed levels are currently under consideration.

Oregon Mathematics Achievement Level Descriptors – Grade 7

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
Policy Definitions (Apply to all grades and all subjects)	Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate mastery of the grade-level knowledge and skills required for proficiency.	Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.
Math Descriptors (Apply to all grades)	Students demonstrate limited mastery of mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.	Students demonstrate partial mastery of mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain some of their steps.	Students demonstrate mastery of mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.	Students demonstrate mastery of mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.
Mathematics Achievement Level Descriptors **Number, Algebra and Geometry** Proportionality and similarity	• Inconsistently identify or represents proportional relationships with coordinate graphs, tables or equations.	• Identify and represent proportional relationships with coordinate graphs, tables or equations.	• Identify and represent proportional relationships (including inverse proportionality) with coordinate graphs, tables, and equations. Identifies unit rate as the slope of the related line.	• Integrate knowledge of and explain proportional relationships (Including inverse proportionality) with coordinate graphs, tables and equations. Interprets unit rate as the slope of the related line.
	• Inconsistently solve problems involving ratio, proportion, percent, simple probability, scale factors, similarity or congruence.	• Solve problems involving ratio, proportion, percent, simple probability, scale factors, similarity, or congruence.	• Apply ratio and proportionality to solve problems involving ratio, proportion, percent, simple probability, scale factors, similarity and congruence.	• Apply proportionality strategy and integrate knowledge of ratios to solve complex problems including percent, probability, scale factors, similarity and congruence and justifies thinking.
	• Inconsistently convert among different units of measurement, given conversion factors, to solve problems.	• Convert among different units of measurement, given conversion factors, to solve problems.	• Convert among different units of measurement to solve problems including rates.	• Convert among different units to solve multi-step problems including rates and can support results.
	• Inconsistently recognize how changes in one measure (e.g., length, area, volume) affects another.	• Recognize how changes in one measure (e.g., length, area, volume) affects another.	• Apply scale factor to analyze how the change in one measure (e.g., length, area, volume) affects another.	• Integrate knowledge of measurement (length, area, volume) and scale factor to analyze and generalize how the change in one measure affects others.

* **Please note:** Names for the proposed levels are currently under consideration.

Oregon Mathematics Achievement Level Descriptors – Grade 7

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
Policy Definitions (Apply to all grades and all subjects)	Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate mastery of the grade-level knowledge and skills required for proficiency.	Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.
Math Descriptors (Apply to all grades)	Students demonstrate limited mastery of mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.	Students demonstrate partial mastery of mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain some of their steps.	Students demonstrate mastery of mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.	Students demonstrate mastery of mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.
Mathematics Achievement Level Descriptors **Measurement and Geometry** Develop and use formulas for surface area and volume	• Inconsistently use a given model to explain the reasonableness of formulas for the circumference or area of circles; surface area of pyramids or cylinders or volume of pyramids, cylinders, or cones. • Inconsistently use a given estimate of π to estimate or calculate the circumference or area of circles. • Inconsistently apply given formulas for the areas of different polygons when determining surface area. • Inconsistently solve problems involving surface areas of pyramids or cylinders or volumes of pyramids, cylinders, or cones. Inconsistently estimate or compute area or volume of irregular shapes.	• Use a given model to explain the reasonableness of formulas for the circumference or area of circles; surface area of pyramids or cylinders or volume of pyramids, cylinders, or cones. • Use a given estimate of π to estimate or calculate the circumference and area of circles. • Apply given formulas for the areas of different polygons when determining surface area. • Solve problems involving surface areas of pyramids or cylinders or volumes of pyramids, cylinders, or cones. Estimate or compute area or volume of irregular shapes.	• Use models to explain the reasonableness of formulas for the circumference and area of circles; surface area of pyramids and cylinders; and the volume of pyramids, cylinders, and cones. • Select and use estimates of π to estimate or calculate the circumference and area of circles. • Apply relationships among formulas for the areas of different polygons when determining surface area. • Solve problems involving surface areas of pyramids and cylinders and volumes of pyramids, cylinders, and cones. Estimate and compute area and volume of complex or irregular shapes by dividing them into basic shapes.	• Use models to explain and justify the reasonableness of formulas for the circumference and area of circles; surface area of pyramids and cylinders; and the volume of pyramids, cylinders, and cones. • Select and uses estimates of π to estimate or calculate the circumference and area of circles and can justify the appropriateness of the estimate. • Apply and justify strategies utilizing relationships among formulas for the areas of different polygons when determining surface area. • Apply strategies to solve complex problems involving surface areas of pyramids and cylinders and volumes of pyramids. Estimate and compute area and volume of complex or irregular shapes and analyzes their strategies and solutions.

*** Please note:** Names for the proposed levels are currently under consideration.

Oregon Mathematics Achievement Level Descriptors – Grade 8

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
Policy Definitions (Apply to all grades and all subjects)	Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate mastery of the grade-level knowledge and skills required for proficiency.	Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.
Math Descriptors (Apply to all grades)	Students demonstrate limited mastery of mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.	Students demonstrate partial mastery of mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain some of their steps.	Students demonstrate mastery of mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.	Students demonstrate mastery of mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.
Mathematics Achievement Level Descriptors **Algebra** Linear functions and equations	• Inconsistently, translate among simple contextual, verbal, tabular, graphical, or algebraic representations of linear functions. • Inconsistently find the slope of a line given routine representations. • Inconsistently identify or determine the x or y intercept of linear relationships. • Inconsistently use linear equations to solve routine problems in one variable. • Inconsistently use informal strategies to solve systems of linear equations in two variables with integer coefficients.	• Translate among routine contextual, verbal, tabular, graphical, or algebraic representations of linear functions • Find the slope of a line given routine representations. • Identify or determine the x and y intercept of linear relationships. • Use linear equations to solve routine problems and uses them to make predictions. • Use informal strategies to solve systems of linear equations in two variables.	• Translate among contextual, verbal, tabular, graphical, and algebraic representations of linear functions. • Determine slope of a line and identify the slope as a constant rate of change from multiple representations. • Identify and interpret the intercepts of linear relationships in different representations, and recognize a proportional relationship (y = kx). • Select and use linear functions and equations to represent and analyze problems to make predictions and inferences. • Use informal strategies to solve problems involving systems of linear equations in two variables and relate the system to a pair of lines that are intersecting, parallel, or the same line.	• Translate among non-routine contextual, verbal, tabular, graphical and algebraic representations of linear functions. • Interpret the slope of a line as a constant rate of change from multiple representations and justify their thinking. • Identify and interpret continuity and discreteness of linear relationships in different representations, and recognize a proportional relationship (y = kx). • Select and use linear functions and equations to represent and analyze complex problems to make predictions and inferences. • Use informal strategies to solve problems involving systems of linear equations in two variables and relate the system to a pair of lines that are intersecting, parallel, or the same line and can explain their strategies.

7/27/2010 Draft

* **Please note:** Names for the proposed levels are currently under consideration.

Oregon Mathematics Achievement Level Descriptors – Grade 8

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
Policy Definitions (Apply to all grades and all subjects)	Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate mastery of the grade-level knowledge and skills required for proficiency.	Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.
Math Descriptors (Apply to all grades)	Students demonstrate limited mastery of mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.	Students demonstrate partial mastery of mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain some of their steps.	Students demonstrate mastery of mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.	Students demonstrate mastery of mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.
Mathematics Achievement Level Descriptors **Data Analysis And Algebra** Analyze and summarize data	• Inconsistently organize and create simple data displays (e.g., histograms, box-and-whisker plots, and scatter plots) to answer questions. • Inconsistently use measures of center and spread to compare two data sets. • Inconsistently interpret and analyze displays of data or descriptive statistics. • Inconsistently use sample data to make predictions regarding a population and to estimate the likelihood of future events • Inconsistently identify claims based on data or evaluates the reasonableness of a given claim.	• Organize and create data displays (e.g., histograms, box-and-whisker plots and scatter plots) to pose or answer questions. • Use measures of center and spread to summarize or compare two data sets. • Interpret and analyze displays of data or descriptive statistics. • Use sample data to make predictions regarding a population or estimate the likelihood of future events. • Identify claims based on data or evaluate the reasonableness of a given claim.	• Select, organize, and create data displays (e.g., histograms, box-and-whisker plots, and scatter plots) to pose and answer questions and explains the choice of display. • Use measures of center and spread to summarize and compare data sets. • Interpret and analyze displays of data and descriptive statistics. • Use sample data to make predictions about a population in order to estimate the likelihood of future events. Evaluate the reasonableness of the predictions. • Identify claims based on statistical data and evaluate the reasonableness of those claims.	• Select, organize and create data displays (e.g., histograms, box-and-whisker plots, and scatter plots) to pose and answer questions and justify the reasonableness of choice of display. • Use measures of center and spread to summarize and compare complex data sets in a variety of formats. • Interpret and analyze displays of complex data and descriptive statistics. • Use complex sample data to make predictions about a population In order to estimate likelihood of future events. Evaluate the reasonableness of the predictions by justifying the strategy used. • Identify claims based on statistical data and evaluates the reasonableness of those claims with multiple examples.

7/27/2010 Draft

* **Please note:** Names for the proposed levels are currently under consideration.

Oregon Mathematics Achievement Level Descriptors – Grade 8

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
Policy Definitions (Apply to all grades and all subjects)	Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate mastery of the grade-level knowledge and skills required for proficiency.	Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.
Math Descriptors (Apply to all grades)	Students demonstrate limited mastery of mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.	Students demonstrate partial mastery of mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain some of their steps.	Students demonstrate mastery of mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.	Students demonstrate mastery of mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.
Mathematics Achievement Level Descriptors **Geometry and Measurement** Angles and the Pythagorean Theorem	• Inconsistently use properties of parallel lines, transversals, and angles to find missing sides and angles or to solve problems including similarity and congruence. • Inconsistently use models to show a triangle has an interior angle sum of 180^0 or that a quadrilateral has an interior angle sum of 360^0 to solve for a missing angle when the angles are given as real numbers.. • Inconsistently use the Pythagorean Theorem to find the hypotenuse of a right triangle or to find distances between two points on a coordinate plane. • Inconsistently use perfect squares to estimate square roots.	• Use properties of parallel lines, transversals, and angles to find missing sides and angles or to solve problems including similarity and congruence. • Use models to show a triangle has an interior angle sum of 180^0 and that a quadrilateral has an interior angle sum of 360^0 to solve for a missing angle when the angles are given as real numbers. • Use the Pythagorean Theorem to find a missing side in a right triangle or to find distance between points on a coordinate plane. • Use perfect squares to estimate square roots.	• Select and use properties of parallel lines, transversals, and angles to find missing sides and angles expressed in algebraic terms and to solve problems including similarity and congruence. • Use models to show a triangle has an interior angle sum of 180^0 and that a quadrilateral has an interior angle sum of 360^0 to solve for a missing angle(s) when the angles involve variable expressions and/or real numbers. • Select and use the Pythagorean Theorem to find a missing side in a right triangle and to find distance between points on a coordinate plane. • Estimate square roots using referents and models.	• Use properties of parallel lines, transversals, and angles to find missing sides and angles expressed in algebraic terms often requiring multiple steps and to solve problems including similarity and congruence. • Use models to show and justify a triangle has an interior angle sum of 180^0 and that a quadrilateral has an interior angle sum of 360^0 to solve for a missing angle(s) when solving for the angles requires a multi-step equation. • Apply the Pythagorean Theorem to find a missing side in a right triangle in a multi-triangle setting which requires several applications of the theorem. Extend knowledge of the theorem to find distances in three–dimensional settings • Estimate square roots using referents and models and justifies the strategy used.

7/27/2010 Draft

*** Please note:** Names for the proposed levels are currently under consideration.

Mathematics Oregon Achievement Level Descriptors – High School

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
General Policy Definitions (Apply to all grades and all subjects)	Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate mastery of the grade-level knowledge and skills required for proficiency.	Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.
Mathematics Policy Definitions (Apply to all grades)	Students demonstrate limited mastery of mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.	Students demonstrate partial mastery of mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain some of their steps.	Students demonstrate mastery of mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.	Students demonstrate mastery of mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.
Mathematics Achievement Level Descriptors **High School Algebra**	•Sometime perform computations with real numbers accurately. Inconsistently order or locate real numbers on a number line. •Inconsistently simplify expressions involving real numbers and/or algebraic symbols. •Inconsistently solve linear equations given the equation. Identify slope from a graph. Solve systems of linear equations using tables and graphs. • Inconsistently identify and graphs linear, quadratic, and exponential functions using tables, graphs, and equations. Can sometimes find the domain and range given the graph. •Inconsistently solve quadratic functions or understand the meaning of the solutions.	•Perform computations with real numbers accurately. Order or locate real numbers on a number line. •Evaluate and simplify expressions involving real numbers and/or algebraic symbols. This excludes factoring and complex expressions. •Solve problems involving linear equations using tables, graphs, and symbols. Determine slope. Often solve linear inequalities and graphs the solution. •Identify and graphs linear, quadratic, and exponential functions using tables, graphs, and equations. Identify the domain and range from a graph. •Solve routine quadratic functions using one method and can explain why the method works. Identify the axis of symmetry graphically.	•Apply efficient strategies for performing computations with real numbers. Order and locate real numbers on a number line. •Consistently evaluate, create, and determine equivalent expressions involving real numbers and /or algebraic symbols. •Represent linear relationships and solve problems involving systems of linear equations using tables, graphs, and symbols. Solve linear inequalities and graphs the solution. Able to work with function notation. •Distinguish between, manipulate, graphs, and apply linear, quadratic, and exponential functions in routine and non-routine situations using tables, graphs, and equations. Identify the domain and range from a table, a graph or an equation. •Solve quadratic functions graphically and algebraically and is able to explain the relationship between the two strategies. Determine the vertex and axis of symmetry graphically and algebraically.	•Fluently apply efficient strategies for performing computations with real numbers. Able to justify the result using mathematical properties. •Consistently evaluate, create, justify, and determine equivalent expressions involving real numbers and/or algebraic symbols. •Represent, solve, interpret the meaning of, and converts among representations of linear equations and inequalities. Solve problems involving systems of linear inequalities using tables, graphs, and symbols. •Distinguish between, manipulate, graphs, and apply linear, quadratic, and exponential functions, including making inferences or predictions, using tables, graphs, and equations. Identify the domain and range from a table, a graph, an equation, or within a context. •Solve quadratic functions graphically and algebraically and can communicate why a method was chosen and its relationship to the solution.

***Please note:** Names for the proposed levels are currently under consideration.

Mathematics Oregon Achievement Level Descriptors – High School

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
General Policy Definitions (Apply to all grades and all subjects)	Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate mastery of the grade-level knowledge and skills required for proficiency.	Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.
Mathematics Policy Definitions (Apply to all grades)	Students demonstrate limited mastery of mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.	Students demonstrate partial mastery of mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain some of their steps.	Students demonstrate mastery of mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.	Students demonstrate mastery of mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.
Mathematics Achievement Level Descriptors **High School Geometry**	•Inconsistently apply properties of two and three dimensional figures. •Inconsistently determine area, surface area, and/or volume given dimensions. Inconsistently solve for missing dimensions. •Inconsistently use some theorems or solve problems related to congruent and similar figures in two and three dimensions. •Inconsistently justify properties or solve problems using coordinate geometry when the two dimensional figures have numeric coordinates. •Inconsistently identify and perform single transformations of geometric figures on a coordinate plane.	•Identify and compare properties of two and three dimensional figures. •Determine area, surface area, and/or volume given dimensions. Often solve for missing dimensions. •Use some theorems and solve problems related to congruent and similar figures in two and three dimensions. •Use coordinate geometry to justify properties and solve problems involving two dimensional figures with numeric coordinates. •Identify and perform single transformations of geometric figures on a coordinate plane.	•Understand and apply properties of geometric figures and relationships between figures in two and three dimensions. •Determine area, surface area, and/or volume whether or not all dimensions are given. Solve related context-based problems. •Consistently integrate the use of theorems and/or algebraic equations to solve problems related to congruent and similar figures in two and three dimensions, including right triangle trigonometry. •Use coordinate geometry to justify properties, explain conjectures, and solve problems involving two dimensional figures with numeric coordinates. •Identify and perform single and composite transformations (2) of geometric figures on a coordinate plane.	•Understand and apply properties of geometric figures and analyzes relationships between figures in two and three dimensions. •Determine area, surface area, and/or volume for non-routine figures. Solve for missing dimensions that require multiple equations. •Consistently and efficiently integrate the use of theorems and/or algebraic equations to solve and justify relationships between congruent and similar figures in two and three dimensions. •Use coordinate geometry to justify properties, explain conjectures, and solve problems involving two dimensional figures with numeric and symbolic coordinates. •Fluently identify and perform single and composite transformations (more than 2) of geometric figures on a coordinate plane.

***Please note:** Names for the proposed levels are currently under consideration.

Mathematics Oregon Achievement Level Descriptors – High School

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
General Policy Definitions (Apply to all grades and all subjects)	Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.	Students demonstrate mastery of the grade-level knowledge and skills required for proficiency.	Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.
Mathematics Policy Definitions (Apply to all grades)	Students demonstrate limited mastery of mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.	Students demonstrate partial mastery of mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain some of their steps.	Students demonstrate mastery of mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.	Students demonstrate mastery of mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.
Mathematics Achievement Level Descriptors **High School Statistics and Probability**	•Inconsistently analyze survey methods and evaluates data-based reports. •Inconsistently compare and draw conclusions about independent data sets and data in graphical displays, including central tendencies and range. •Inconsistently compute and interpret simple theoretical and experimental probabilities. Sometimes determine the sample space of a probability experiment.	•Analyze the strengths and limitations of survey methods and evaluate data-based reports looking at the way the data was analyzed and displayed. •Compare and draw conclusions about independent data sets and data in graphical displays, including central tendencies, range, and line of best fit, when appropriate. •Compute and interpret simple theoretical and experimental probabilities. Often determine the sample space of a probability experiment.	•Determine and analyze survey methods and evaluate data-based reports. •Compare, analyze, draw conclusions about, and interpret independent data sets and data in graphical displays, including central tendencies, range, and line of best fit, when appropriate. •Compute, analyze, and interpret theoretical and experimental probabllities. Determine the sample space of a probability experiment.	•Determine and analyze survey methods and evaluate data-based reports and is able to communicate appropriate suggestions for improvement. •Compare, analyze, draw conclusions about, and interpret independent data sets and data in graphical displays, including central tendencies, range, and line of best fit, when appropriate, and are able to explain how a change in the data set would alter the display and central tendencies. •Compute, analyze, and interpret theoretical and experimental probabilities with complex sample spaces.

***Please note:** Names for the proposed levels are currently under consideration.

Oregon Department of Education
Mathematics Achievement Standards Verification Workshop
Agenda for Monday, August 9, 2010

12:30 PM **Participant Registration (Basement B)**
Sign in, get name tag with table designation and complete temporary employee forms including ID for I-9.

1:00 PM **Opening Session and Bookmark Overview (Basement A)**
- Welcome to the Standards Verification with overview of OAKS and cut scores.
- Explain why this process is necessary and why the process differs from that of 2006.

2:00 PM **Definitions, Meeting Rules and Norming Activity**
- Scavenger hunt activity.
- Confirm definitions of Key Terms (PISA, NAEP, content standards, achievement descriptors, Ordered Item Booklets, achievement standards, cut scores).
- Trust Building—conduct a "think aloud" using definitions.

2:45 PM **BREAK**

3:00 PM **Target Student Description Writing (Basement A)**
- Visualize and connect to students in the achievement levels, think of your Target Students to confirm whether the current cut score is at the correct level.

3:15 PM **Ordered Item Booklet (OIB) Overview with Mock Exercise**
- Review a mock-up non secure Ordered Item Booklet and practice placing bookmarks.

4:00 PM **ADJOURN**
- Participants sign out.
- Table Leader debriefing.
- ODE Group Leader and Math Consultant debriefing.

Oregon Department of Education
Mathematics Achievement Standards Verification Workshop
Tuesday, August 10, 2010

8:00 AM **SIGN-IN AND NETWORKING**

8:30 AM **RECAP OF DAY ONE (Basement A)**

9:00 AM **Silent Reading – Review of Policy Level Descriptors (Basement A)**
Review top two rows of Achievement Level Descriptor Handout (this will help with identification of the target student for each achievement level)

9:10 AM **Target Student Modeling (Basement A)**
Math consultants will model the group discussion of how to identify the target student, using 7th grade as an example

9:20 AM **Target Student Description Writing (Basement A)**
Continuation of Monday's exercise. In grade-level groups, continue writing target student descriptions for "nearly meets," "meets," and "exceeds", using Policy Level Descriptors and Achievement Level Descriptors as a guide

9:45 AM **Review Ordered Item Booklets (OIB) (Breakout Rooms)**
- Group leader introduces this task by instructing participants to find the Item Map and OIB in their secure materials packet. Review each column in individual item map (15 min).
- Participants individually review items in OIB and make notes (60 min).
- ODE Group Leader reviews how bookmarks are placed and what they mean (15 min).
- Training evaluation (15 min).

11:30 AM **SECURE MATERIALS COLLECTION AND BREAK**

11:45 AM **Round One Bookmark Placement (Breakout Rooms)**
ODE Group Leader facilitates participants to place their round one bookmarks—this is an individual activity.

12:30 PM **SECURE MATERIALS COLLECTION AND LUNCH**

1:00 PM **Round One Bookmark Placement Cont'd (Breakout Rooms)**
ODE Group Leader facilitates participants to place their round one bookmarks—this is an individual activity.

2:00 PM **Process and Policy Implications (Basement A)**
Discuss the implications of including NAEP and PISA items calibrated to Oregon's scale.

2:30 PM **Presentation of Round 1 Bookmark Placement (Basement A)**
Share results from all grade levels and review table leader responsibilities.

2:45 PM **Discussion of Round One Bookmark Placement (Breakout Rooms)**
- ODE Group Leader announces average bookmark placement for each level.
- Table leader leads discussion of participants in explaining their rationales behind the lowest and highest ratings.

3:15 PM **SECURE MATERIALS COLLECTION AND BREAK**

3:30 PM **Round Two Bookmark Placement (Breakout Rooms)**
ODE Group Leader directs participants to place their round two bookmarks—this is a small group table activity. Group Leader completes Round 2 Data Sheet.

5:00 PM **SECURE MATERIALS COLLECTION AND ADJOURN**
- Participants sign out.
- ODE Group Leader and Math Consultant debriefing.

Oregon Department of Education
Mathematics Achievement Standards Verification Workshop
Wednesday, August 11, 2010

7:45 AM **SIGN-IN AND NETWORKING**

8:00 AM **Welcome and Overview of Day (Basement A)**
Impact Data from Round Two Bookmark Placement and Q/A

8:30 AM **Discussion of Round Two Bookmark Placement (Breakout Rooms)**
- Table Leader co-lead discussion of all grade-level group participants in explaining rationales behind the lowest and highest ratings.
- Intent is to reach a Group Consensus cut score.

Round Three Bookmark Placement (Breakout Rooms)
- ODE Group Leader directs participants to place their round three individual bookmarks and reach Group Consensus—this is a larger group activity.
- Participants turn in individual Data Sheets to the ODE Group Leader.
- Grade Level Group turn in Group Consensus Data Sheet to the ODE Group Leader.
- **SECURE MATERIALS COLLECTION**

9:45 AM **BREAK**

10:00 AM **Achievement Level Descriptor Input and Discussion (Breakout Rooms)**
As a group, begin:
Examine the Achievement Level Descriptor document formatted for editing.
Discuss the importance of Achievement Level Descriptors
Discuss the need for individual editing and group consensus editing
Examine items in the OIB then edit the Achievement Level Descriptors based on edits already made to grades.
Move all personal participant belongings to Basement A.

11:00 AM **Presentation of Smoothed Recommendations/Impact Data (Basement A)**
- All participants are included.
- Presentation: Overview of data smoothing and cross grade articulation.
- Table Leaders facilitate discussions of smoothed data.
- ODE Group Leaders facilitate sharing of cut scores and associated impact data, including recommendations regarding cross-grade articulation.
- Round 4: Grade Level Groups confirm Group Consensus cut scores based on large group feedback from smoothing.
- **SECURE MATERIALS COLLECTION**

12:00 PM **WORKING LUNCH – Baked Potato Bar Served in Basement C**

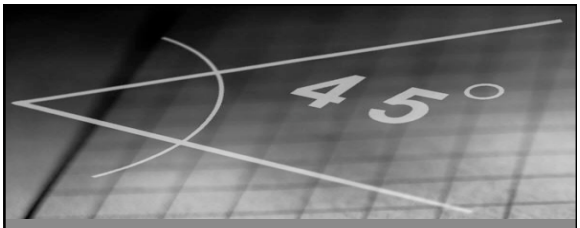
12:30 PM **Achievement Level Descriptor Input and Discussion (Basement A)**
As a group, continue and conclude:
Examine items in the OIB then edit the Achievement Level Descriptors based on edits already made to grades.
Consensus edits for each grade (3, 4, 5, 6, 7, 8, High School)

2:30 PM **BREAK**

2:45 PM **Evaluations (Basement A)**

3:00 PM **Closing Comments (Basement A)**

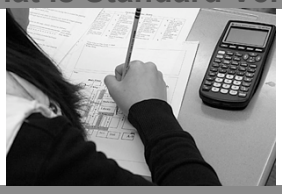
3:30 PM **ADJOURN**
- Participants sign out.
- ODE leader and Math Consultants debriefing.



2010 Oregon Mathematics Achievement Standard Verification

Opening Session

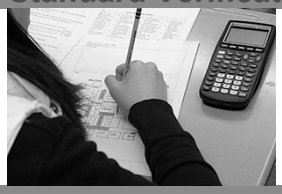
What is Standard Verification?



- Process to determine levels of achievement
- Answer question "How good is good enough?"
- Use expert judgment to reach consensus
- Why standard verification?

2

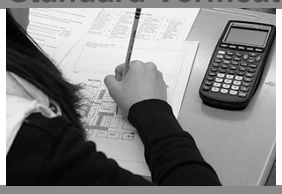
Why Standard Verification Now?



- Revised Mathematics Standards
- U.S. Department of Education Peer Review
- Common Core adopted December 2011

3

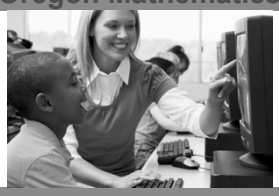
Why Standard Verification Now?



- Essential Skills/ Diploma requirement for 2014 Graduates
- Algebra 1 or higher requirement for 2014 Graduates
- Reporting moved to Grade 11

4

Oregon Mathematics Standards



How much does a student need to know to be classified in a given achievement level for OAKS?

5

Content Standards

Content standards define what all students must know and be able to do

- Oregon adopted content standards for Mathematics in 2007 and 2009
- OAKS 2010-11 will assess the new standards

9/16/10 6

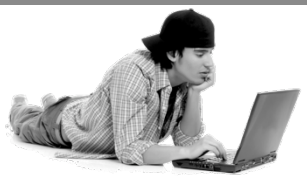
Achievement Standards

Achievement standards describe what students *should be able to do* in each achievement level.

– You will actively discuss your expectations of the "target student" in each achievement level

7

Achievement Levels



- Specify knowledge, skills, and abilities
- Define *Exceeds, Meets, Nearly Meets,* and *Does Not Yet Meet*
- Derived from the content standards
- Communicate to parents, students, educators and public

8

Grade 4 Draft Achievement Level Descriptors

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
Mathematics Policy Definitions (Apply to all grades)	Students demonstrate limited mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.	Students demonstrate mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain their steps.	Students demonstrate mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.	Students demonstrate mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.
Mathematics Achievement Level Descriptors Number and Operations and Algebra Fluency with multiplication of whole numbers	• Inconsistently compute multiplication facts to 10 times 10. • Demonstrate inconsistent understanding of application of models for multiplication (e.g., equal-sized groups, arrays, area models, equal intervals on the number line). • **Inconsistently use a given estimation strategy for multiplication (e.g., use benchmarks, overestimate, underestimate, round) when computing with whole numbers.** • Inconsistently use accurate methods to multiply multi-digit whole numbers. • Inconsistently multiply multi-digit whole numbers.	• Apply with fluency multiplication facts to 10 times 10. • Demonstrate partial understanding of application of models for multiplication (e.g., equal-sized groups, arrays, area models, equal intervals on the number line), place value, or properties of operations (commutative, associative, and distributive). • **Use a given estimation strategy for multiplication (e.g., use benchmarks, overestimate, underestimate, round) when computing with whole numbers.** • Use accurate or generalizable methods to multiply multi-digit whole numbers. • Use given procedures for multiplying multi-digit whole numbers.	• Apply with fluency multiplication facts to 10 times 10 and related division facts. • Demonstrate understanding of application of models for multiplication (e.g., equal-sized groups, arrays, area models, equal intervals on the number line), place value, and properties of operations (commutative, associative, and distributive). • **Select and use appropriate estimation strategies for multiplication (e.g., use benchmarks, overestimate, underestimate, round) to calculate mentally based on the problem situation when computing with whole numbers.** • Develop and use accurate, efficient, and generalizable methods to multiply multi-digit whole numbers. • Develop fluency with efficient procedures for multiplying multi-digit whole numbers.	• Apply with fluency multiplication facts to 10 times 10 and related division facts in complex situations. • Demonstrate understanding of application of models for multiplication (e.g., equal-sized groups, arrays, area models, equal intervals on the number line), place value, and properties of operations (commutative, associative, and distributive) in complex situations. • **Select and use appropriate estimation strategies for multiplication (e.g., use benchmarks, overestimate, underestimate, round) to calculate mentally based on the problem situation when computing with whole numbers and explains why a strategy was chosen.** • Develop and use accurate, efficient, and generalizable methods to multiply 3-digit by 3-digit whole numbers or larger. • Develop fluency with efficient procedures for multiplying multi-digit whole numbers and justifies why the procedures work on the basis of place value and number properties.

9/16/10 4.2.3 9

Grade 4 Content Standard

4.2.3 : Select and use appropriate estimation strategies for multiplication (e.g., use benchmarks, overestimate, underestimate, round) to calculate mentally based on the problem situation when computing with whole numbers.

9/16/10 10

Item aligns to Nearly Meets Achievement Level

Round 469 to the nearest 100.

Ⓐ 400

Ⓑ 470

Ⓒ 500

Ⓓ 550

9/16/10 11

Item aligns to Meets Achievement Level

Mrs. Gomez bought 4 items at the grocery store. The items ranged in price from $2 to $9. What is a reasonable estimate of how much she spent for all the items?

Ⓐ Over $35

Ⓑ About $23

Ⓒ Less than $14

Ⓓ About $10

9/16/10 12

Verifying the Cut Scores

- You will set three cut scores on the test scale
- Decisions will be based on Oregon content standards.
- One cut score for
  - *Nearly Meets*
  - *Meets*
  - *Exceeds*

9/16/10 13

Roles for Standard Verification

- Group Leaders
- Table Leaders
- Participants
- Math Consultants

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Role for Group Leaders

Grade level Facilitator
- Keep group on task
- Watch the time
- Facilitate discussion

Materials collection
- Keep materials secure
- Monitor submitted comments/questions

15

Other Roles

Table Leaders
- Appointed
- Lead discussion at the table
- Standard setters

Participants
- Standard setters
- Recorder

Math Consultants
- Answer content-related questions

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Workshop Overview

Round 1
Study test items on your own
Place bookmark without discussion

Round 2
Discuss ratings in table group
Place bookmark

Round 3
Discuss ratings in grade-level group
Place final bookmark

Achievement Level Description Review

Ordered Item Booklets

- One item per page
- Easiest item first, hardest item last
- Items ascend by difficulty

18

Ordered Item Booklets

Includes External References:

- NAEP Basic, Mean, and Proficient (Grades 4, 8, and HS)
- PISA Averages (HS)
- OUS Freshman receiving a C or higher in non-remedial math

19

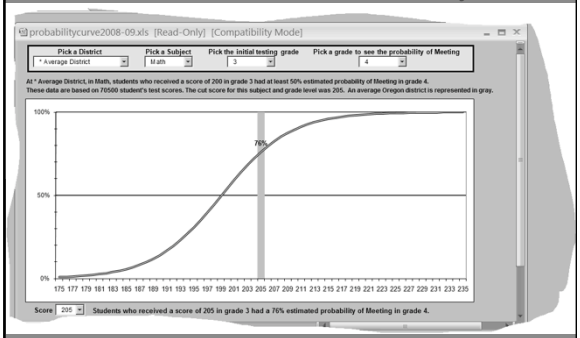
Ordered Item Booklets

Includes Current and Projected Cut Scores:

- Current Nearly Meets, Meets, and Exceeds cut scores (2006 standards)
- Projected Nearly Meets, Meets, and Exceeds cut scores

20

Growth Model Probability Curves



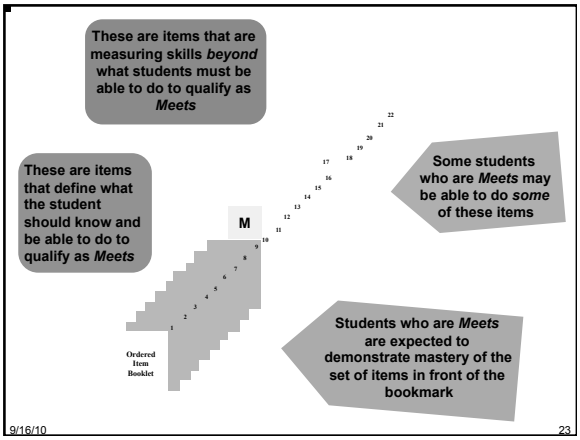
- http://www.ode.state.or.us/wma/policy/accountability/growth/probabilitycurve2008-09.xls

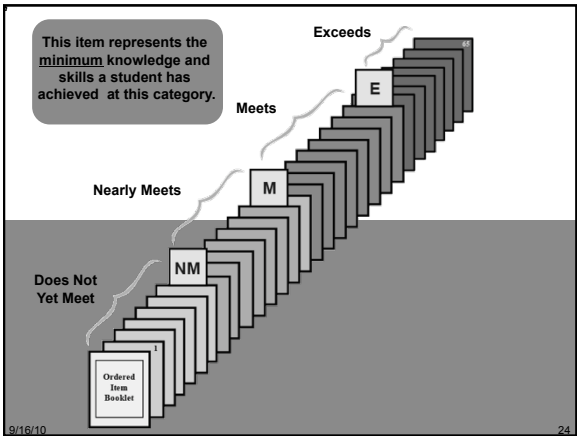
21

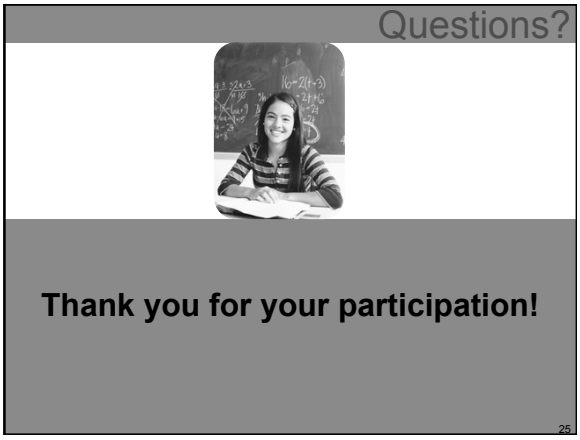
Bookmark Placement

Items *before* the Bookmark reflect content that all students at this level should know and be able to do.

22






Questions?
Thank you for your participation!
25

Good Morning!

Recap of Day One

Learnings from Table Leaders et al.

- How is a bookmark set?
- What is a target student?
- More time is needed to process this information as a table group
- Questions

More Time

- We will extend today's and tomorrow's work until 5:00
- Review bookmark placement and target student
- Table discussion about bookmark placement and target student

Review

How are the OIB pages ordered?

- From **easiest** in the beginning to **hardest** at the back of the book.
- The difficulty is based on **psychometric analysis** of the results of many thousands of students.
- Trust the order of the booklet, **these items are arranged based on the responses of many thousands of Oregon students**.

Review

Bookmark Placement

- Just like a binder with tabs, we place the bookmark in front of a group of items to distinguish sets of items from each other based on the achievement level descriptors.
- Place the bookmark immediately in front of the first item marking an achievement level.

Review

Bookmark Placement

- Students who are at the achievement level of Meets are expected to demonstrate mastery of the set of item in front of this Bookmark (about 67% of the time).
- Items in front of this bookmark define the minimum that students should generally know and be able to do at the achievement level of MEETS.

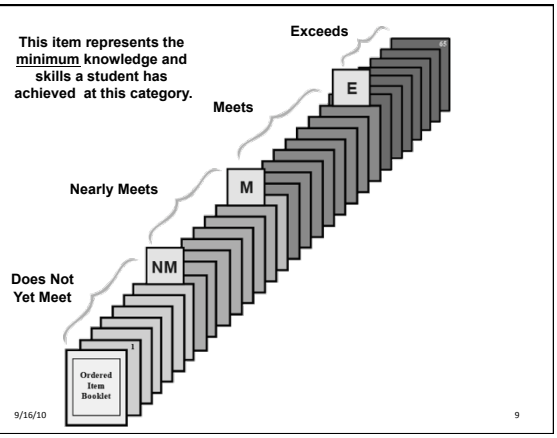
Example

Placing a bookmark

- I look at pages 1, 2, 3, 4, 5 – all easy test items for 4th graders
- I look at pages 6 and 7 these are a little harder
- I look at page 8 … it is tougher
- I look at page 9 … and say, this is rigorous … A students who could generally answer this item correctly has achieved the knowledge consistent with the achievement level descriptor.
- I place my bookmark between pages 8 and 9
- Students meeting this level would generally (67%) of the time get the items before this point correct. Test items after this point are more difficult … they will be less likely to answer subsequent items correctly.

The Bookmark Marks a Minimum Threshold

- Students who are at the achievement level of Meets are expected to demonstrate mastery of the set of items in front of this Bookmark (about 67% of the time).
- Items in front of this Bookmark define the minimum that students should generally know and be able to do at the achievement level of Meets.



Exercise in Sample OIB

Bookmark Placement

1. Nearly Meets Level begins on page 4 (Place your **Nearly Meet**s Bookmark and fill in Round 1 Response at bottom of the Bookmark)
2. Meets Target Student will generally get the items on pages 1 – 8 correct (Place your **Meets** Bookmark and fill in Round 1 Response at bottom of the Bookmark) –less than 67% on page 8.
3. Exceeds Level should be the same as the Massachusetts Meets Reference Point

Exercise in Sample OIB (Answers)

Bookmark Placement

1. Nearly Meets Level begins on page 4 (Place your Nearly Meets Bookmark and fill in Round 1 Response at bottom of the Bookmark) Between 3 and 4 (Enter 4)
2. Meets Target Student will generally get four of the items on pages 1 – 7 correct (Place your Meets Bookmark and fill in Round 1 Response at bottom of the Bookmark) Between 7 and 8 (Enter 8)
3. Exceeds Level should be the same as the Massachusetts Meets Reference Point Between 11 and 12 (Enter 12)

Errata

- Red Practice OIB – Put an X through page five
- Misprint on slides ___ should be OIB, not OID

Appendix D: Panel Composition

Question #1. What is your occupation?

Grades	N	K-12 educator	Community college educator	University educator	Parent	Community member	Business member	Other
All	42	78.57%	7.14%	4.76%	2.38%	0.00%	4.76%	2.38%
3	11	81.82%	0.00%	0.00%	9.09%	0.00%	0.00%	9.09%
5	11	90.91%	0.00%	9.09%	0.00%	0.00%	0.00%	0.00%
8	10	70.00%	10.00%	0.00%	0.00%	0.00%	20.00%	0.00%
10	10	70.00%	20.00%	10.00%	0.00%	0.00%	0.00%	0.00%

Question #2. How many years in your current profession?

Grades	N	1-5	6-10	11-15	16-20	21+
All	42	4.76%	19.05%	7.14%	11.90%	57.14%
3	11	0.00%	18.18%	0.00%	18.18%	63.64%
5	11	18.18%	18.18%	9.09%	0.00%	54.55%
8	10	0.00%	10.00%	0.00%	20.00%	70.00%
10	10	0.00%	30.00%	20.00%	10.00%	40.00%

Question #3. What is your primary role at this workshop?

Grades	N	K-12 educator	Community college educator	University educator	Parent	Community member	Business member	Other
All	41	82.93%	7.32%	2.44%	2.44%	0.00%	4.88%	0.00%
3	10	90.00%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%
5	11	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
8	10	70.00%	10.00%	0.00%	0.00%	0.00%	20.00%	0.00%
10	10	70.00%	20.00%	10.00%	0.00%	0.00%	0.00%	0.00%

Question #4. Have you ever participated in a bookmarking prior to this event?

Grades	N	Yes	No
All	42	33.33%	66.67%
3	11	45.45%	54.55%
5	11	45.45%	54.55%
8	10	10.00%	90.00%
10	10	30.00%	70.00%

Appendix D: Panel Composition

Question #5. Have you ever taught Special Education?

Grades	N	Yes	No
All	42	16.67%	83.33%
3	11	18.18%	81.82%
5	11	18.18%	81.82%
8	10	10.00%	90.00%
10	10	20.00%	80.00%

Question #6. Have you taught ESL/ELD?

Grades	N	Yes	No
All	42	19.05%	80.95%
3	11	27.27%	72.73%
5	11	18.18%	81.82%
8	10	30.00%	70.00%
10	10	0.00%	100.00%

Question #7. Have you taught Vocational Education?

Grades	N	Yes	No
All	42	7.14%	92.86%
3	11	0.00%	100.00%
5	11	18.18%	81.82%
8	10	10.00%	90.00%
10	10	0.00%	100.00%

Question #8. Have you taught Alternative Education?

Grades	N	Yes	No
All	41	12.20%	87.80%
3	11	18.18%	81.82%
5	11	9.09%	90.91%
8	9	22.22%	77.78%
10	10	0.00%	100.00%

Question #9. Have you taught Adult Education?

Grades	N	Yes	No
All	42	45.24%	54.76%
3	11	45.45%	54.55%
5	11	45.45%	54.55%
8	10	50.00%	50.00%
10	10	40.00%	60.00%

Appendix D: Panel Composition

Question #10. Which grade did you work on during this bookmarking event?

Grades	N	Grade 3	Grade 5	Grade 8	Grade 10	Not disclosed
All	43	25.58%	25.58%	23.26%	23.26%	2.33%

Question #11. What is your educational level? (optional)

Grades	N	HSD or GED	Bachelor's	Master's	Doctorate
All	42	0.00%	16.67%	73.81%	9.52%
3	11	0.00%	27.27%	72.73%	0.00%
5	11	0.00%	0.00%	81.82%	18.18%
8	10	0.00%	10.00%	80.00%	10.00%
10	10	0.00%	30.00%	60.00%	10.00%

Question #12. What is your gender? (optional)

Grades	N	Male	Female
All	42	28.57%	71.43%
3	11	27.27%	72.73%
5	11	27.27%	72.73%
8	10	10.00%	90.00%
10	10	50.00%	50.00%

Question #13. What is your race? (optional)

Grades	N	Asian/ Pacific Islander	Black/ African American	American Indian	White	Other
All	40	5.00%	0.00%	0.00%	90.00%	5.00%
3	10	10.00%	0.00%	0.00%	90.00%	0.00%
5	10	0.00%	0.00%	0.00%	100.00%	0.00%
8	10	0.00%	0.00%	0.00%	100.00%	0.00%
10	10	10.00%	0.00%	0.00%	70.00%	20.00%

Question #14. Are you of Hispanic origin? (optional)

Grades	N	Yes	No
All	40	5.00%	95.00%
3	10	0.00%	100.00%
5	10	0.00%	100.00%
8	10	0.00%	100.00%
10	10	20.00%	80.00%

Math Standards Verification

Meeting Rules
and Norms at Your Table Group

"A river without banks is a pond."
(Ken Blanchard)

Meeting Rules

- No electronic device turned on during the sessions (This includes laptops, cameras, cellular phones, PDA)
- DO NOT replicate or send secure test items electronically
- DO NOT make or keep copies of any materials
- DO NOT disclose confidential testing materials for any actual or potential test items to anyone outside ODE
- DO return any and all of the materials entrusted to you by ODE or its contractors in their entirety after your work has been completed

Importance of norming your table group:

- Table group members as co-workers
- Table group Communication
- Table group members interaction
- Table group organization and function
- Table group problem solving, resolution and decision making

Objectives :

At the end of this exercise:

- Each Table group will have a set of guidelines to define the team's functioning.
- Each Table group will recognize the role of the table leader
- Each Table group will have chosen a recorder

Examples of Norms:

- Each person has the right to ask questions
- If something is said: no repeats
- Each person is limited to three minutes for comments

Appendix E: Norming and Rules Presentation

Some questions to consider when developing Norms:

Decision Making
- How will we make decisions?
- Are we an advisory or a decision-making body?
- Will we reach decisions by consensus?
- How will we deal with conflicts?

Participation
- How will we encourage everyone's participation?

Expectations
- What do we expect from members?
- Are there requirements for participation?

Listening
- How will we encourage listening?
- How will we discourage interrupting?

Time
- How much time do we allow for comments?
- How do we ensure everyone has an equal amount of time to talk?

ODE - Math Standards Setting - August 2010

Team Roles:

Table Leader (Facilitator)
To facilitate, is to help something (usually a process) move along. The word derives from "facile" which is French for "easy". To facilitate, then, is literally to make something easier.
Facilitate does not mean "solving a problem" or "doing it for someone". It means doing something that makes a process run a little better. When a situation is too difficult, a facilitator is there to help.

Time keeper
Each session is timed and promptness is crucial to ensure work effectiveness and reach the goals set for Math Standard setting.

Recorder
The recorder is responsible for keeping a record of team meetings and maintaining a record of the team's work.

Reporter is working to maintain good communication among team members. The reporter also summarizes and shares out in a brief statement the work accomplished by the team.

ODE - Math Standards Setting - August 2010

How to Norm:

1. Get in your Team (group table members
2. Designate a recorder (scribe)
3. Using the chart pad: write down the norms you know or feel are necessary for working with others. (these can be positive or negative – for example: "Everyone can drink water or No repeating similar ideas")
4. Post the norms on the wall
5. With a pen choose your absolute three-four norms (vote)
6. As a group decide the top four norms
7. Write a clean version of your norms on a chart pad and post them on the wall by your table
8. Remember you can refer to these at all times. After working with the norms for a few hours, it is acceptable to revisit some of the norms using the same process.

ODE - Math Standards Setting - August 2010

QUESTIONS?

ODE - Math Standards Setting - August 2010

Appendix F: Norms by Grade Level Group

Benchmark Group	Table Team	Norms
3-4	A & B	• Agree to disagree in order to find consensus • Everyone participates/shares • Timing based on participation and overall time given for task • Questions- respect each other's needs and be sure to operate with same definitions/clarification • Follow a protocol for sharing 1 item each and then another round if needed. Start each round with different people • Everyone has opportunity to respond/comment • 2 minutes for comments/responses • No side conversations with others are speaking • Honor each other's opinions and background • Consensus- strive for 1-2-3 process to resolve conflict
5-6	A	• Everyone has opportunity to be heard without interruption (on topic) • 2 minutes time agreement (max then Q, turn take) • 4/5 = consensus • > = 3/5 table lead decide on option • NO side conversations
5-6	B	• All members give input • Time limit may be imposed • Show respect and courtesy • Decision making process: All members rate their response: 1. Understand and agree 2. Understand/can live with 3. Don't understand/support but open 4. Don't support
7-8	A & B	• No interrupting (2 minutes talk) • Focus on the purpose • Respect each other's opinions and thoughts • Gain consensus
High school	A & B	• Respect the opinions and needs of others • Actively contribute • Be task and goal oriented • All conversations happen within the group; no sidebar conversations • Each person is limited to 2 minutes to express ideas • Each person has the opportunity to contribute on each round before anyone contributes twice • Decision reached via vote: 4 – 1 to ratify any decision

Transcribed from posters developed by grade level groups. Some edits have been made for clarity.

Mathematics Achievement Standards Verification Workshop

Training Evaluation

Key:

SD=Strongly Disagree
D=Disagree
N=Neutral
A=Agree
SA=Strongly Agree

Please indicate your agreement with the following statements about the training.	SD	D	N	A	SA
1. The training made the standards verification task clear to me.	☐	☐	☐	☐	☐
2. The training materials were helpful.	☐	☐	☐	☐	☐
3. The training clearly identified the goals for the standards verification procedure.	☐	☐	☐	☐	☐
4. I am confident I understand my role in the standards verification process.	☐	☐	☐	☐	☐
5. I understand how the mathematics assessment is used.	☐	☐	☐	☐	☐
6. I understand the impact our standards verification task may have on how the mathematics assessment is used.	☐	☐	☐	☐	☐
7. Time was used efficiently in this training.	☐	☐	☐	☐	☐
8. I am confident that I will know how to place my bookmarks.	☐	☐	☐	☐	☐
9. Overall, I feel well trained and prepared to complete the standards verification task.	☐	☐	☐	☐	☐

Please add your comments in the space below.

Appendix G: Workshop Participant Training Evaluation

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Agree + Strongly Agree
The training made the standards verification task clear to me.	0	7.1%	21.4%	66.7%	2.4%	69%
The training materials were helpful.	0	0	9.5%	76.2%	11.9%	88.1%
The training clearly identified the goals for the standards verification procedure.	0	7.14%	11.9%	61.9%	16.7%	78.6%
I am confident I understand my role in the standards verification process.	0	0	7.1%	73.8%	19%	92.9%
I understand how the mathematics assessment is used.	0	4.8%	2.4%	54.8%	35.6%	90.5%
I understand the impact our standards verification task may have on how the mathematics assessment is used.	0	4.8%	11.9%	50%	31%	81%
Time was used efficiently in this training.	7.1%	28.6%	31%	26.2%	4.8%	31%
I am confident that I will know how to place my bookmarks.	0	4.8%	28.6%	45.2%	19%	64.3%
Overall, I feel well trained and prepared to complete the standards verification task.	0	4.8%	21.4%	61.9%	9.5%	71.4%

Note: N = 42

Appendix G: Mathematics Consultants Pre-Training Evaluation

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Agree + Strongly Agree
The training made the standards verification task clear to me.	0%	0%	0%	100%	0%	100%
The training materials were helpful.	0%	0%	0%	33.3%	66.7%	100%
The training clearly identified the goals for the standards verification procedure.	0%	0%	0%	83.3%	16.7%	100%
I am confident I understand my role in the standards verification process.	0%	0%	0%	83.3%	16.7%	100%
I understand how the mathematics assessment is used.	0%	0%	0%	0%	100%	100%
I understand the impact our standards verification task may have on how the mathematics assessment is used.	0%	0%	0%	0%	100%	100%
Time was used efficiently in this training.	0%	0%	0%	33.3%	66.7%	100%
I am confident that I will know how to place my bookmarks.	0%	0%	0%	100%	0%	100%
Overall, I feel well trained and prepared to complete the standards verification task.	0%	0%	0%	50%	50%	100%

Note: N =6

Administered 12:00 pm, August 6, 2010

ORDERED ITEM BOOKLETS

MATH ACHIEVEMENT STANDARDS VERIFICATION

ODE - August 9-11, 2010

What is an Ordered Item Booklet (OIB)?

The Ordered Item Booklet is constructed using items from the test. The items are ordered in terms of difficulty where the easiest item appears first and the hardest item appears last; this ordering is determined by student performance on the test. The Item Map gives detailed information about each item in the Ordered Item Booklet and gives standard setting participants a place to record their thoughts about the items.

Getting a feel for it

•Get a feel for it: Look through the example of the OIB provided

•Share with one of your table group members one thing you notice about the OIB (2 min)

•Large group remarks

Working with the OID

What do we do with the OID?

- We use the OIB to separate each Achievement level: Does not Meet, Nearly Meets, Meets and Exceeds
- For each session you are provided an OIB in which you work directly by placing your bookmarks

Who is my audience?

- Oregon students
- When you are placing the Meets bookmark for example, you are separating the highest "nearly Meets" ability from the lowest "Meets" ability

How does it work?

Bookmarking

- You literally place a bookmark in the booklet to separate the content students should have mastered from the content they are not expected to master.
- Choose the *Meets* bookmark: Start on page one of the OIB and look at the content until you see an item you feel is beyond what a student should have mastered to *Meet* standard. Use the Item map to guide your decision

What is the Item Map?

•The item map is a matrix that provides you with information about the item in the OIB

Questions?

Example:

Question: Is there a right and wrong place for the bookmark?
Answer: Judgment is an integral part of bookmarking, therefore there is no right or wrong

GRADE

4

MATHEMATICS

Achievement Standards Verification

Ordered Item Booklet

August 9, 2010

SAMPLE

This book is being used by

Name: _____

RED

Appendix H: Ordered Item Booklet Training

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Developed by the Office of Assessment and Information Services

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SAMPLE

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1

M0001820

Carl has 2 quarters and 2 dimes,
How much money does he have?

A. $0.12

B. $0.30

C. $0.50

D. $0.70

2

M0005090

3 quarters, 1 dime, and 3 pennies equals:

A. $0.07

B. $0.75

C. $0.88

D. $3.13

3

M0002660

What digit is in the thousands place in 48,130?

A. 1

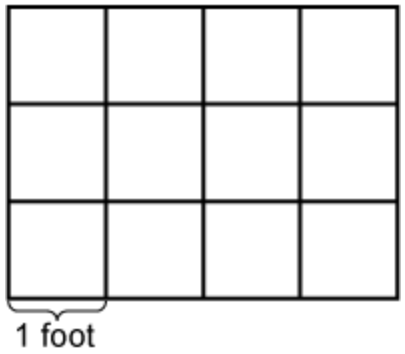
B. 3

C. 4

D. 8

4

M0242560



How many square feet is Kay's garden?

A. 14 square feet

B. 12 square feet

C. 10 square feet

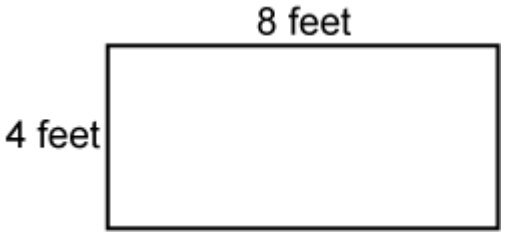
D. 4 square feet

Current Oregon Standard
Nearly Meets

5

M0107160

What is the perimeter of this figure?



A. 12 feet

B. 20 feet

C. 24 feet

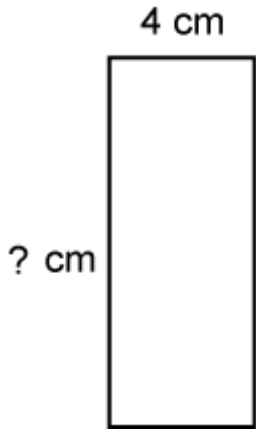
D. 32 feet

Current Oregon Standard
Meets

External Reference Point
Idaho Meets (via NAEP)

6

M0406770



Jack is measuring around a rectangular table. The perimeter of the rectangle is 28 cm.
How long is the side of the rectangle?

A. 4 cm

B. 7 cm

C. 10 cm

D. 11 cm

7

M9200381

Suppose a duck can swim about 500 feet per minute.
How long would it take the duck to swim 2,000 feet?

A. 40 seconds

B. 4 minutes

C. 40 minutes

D. 10,000 seconds (about 3 hours)

Projected Oregon Standard
Meets

8

M0254790

When measuring the length of an exterior wall for a grocery store, which of these units would you most likely use?

A. Millimeters (mm)

B. Centimeters (cm)

C. Meters (m)

D. Kilometers (km)

9

M9700600

Mrs. Gomez bought 4 items at the grocery store. The items ranged in price from $2 to $9. What is a reasonable estimate of how much she spent for all the items?

A. Over $35

B. About $23

C. Less than $14

D. About $10

Current Oregon Standard
Exceeds

10

M0102850

Which digit is in the hundredths place in the number below?

946.507

A. 9 B. 4 C. 0 D. 7

11

M0246640

Pat is building a fence around his garden. The garden is a rectangle 14 feet by 6 feet.
How many feet of fencing does he need?

A. 20 feet B. 28 feet C. 40 feet D. 84 feet

External Reference Point
Massachusetts Meets (via NAEP)

12

M9800640

The sides of 2 squares measure 34 centimeters and 51 centimeters.
What is the DIFFERENCE in the perimeters of the two squares?

A. 1445 centimeters

B. 68 centimeters

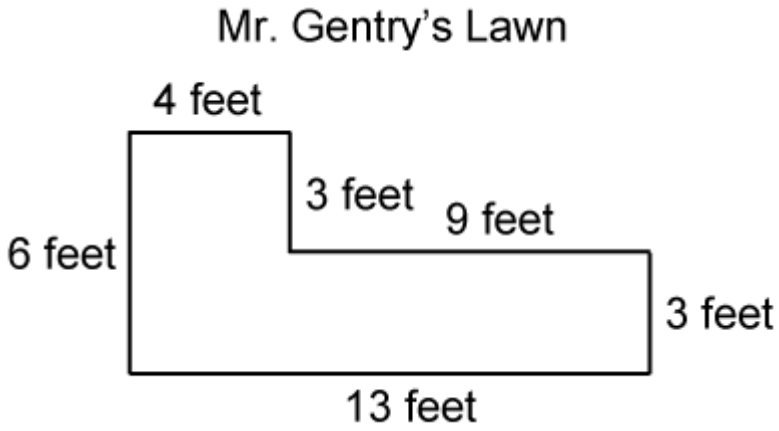
C. 34 centimeters

D. 17 centimeters

External Reference Point
NAEP: Grade 4 US Advanced

13

M0404930



Ken had a weekly lawn-mowing job working for Mr. Gentry. Each Saturday, Ken mowed the lawn. How much area did he mow each week?

A. 38 square feet

B. 51 square feet

C. 78 square feet

D. 117 square feet

back of booklet

GRADE

4

SAMPLE

SECURE and CONFIDENTIAL MATERIALS

Oregon Department of Education
Attention: Dr. Kathleen Vanderwall
503-947-5721
255 Capitol Street SE
Salem, OR 97310

RED

Exceeds

- Students who are at the achievment level of **Exceeds** are expected to demonstrate mastery of the set of items in **front** of this Bookmark.
- The items in **front** of this Bookmark define the minimum that students should know and be able to do at the achievment level of **Exceeds**.

Round 1
- Study test items.
- Place bookmark **without** discussion.

Your initials _____ pg # _____

Round 2
- Discuss placement in **table group**.
- Place bookmark.

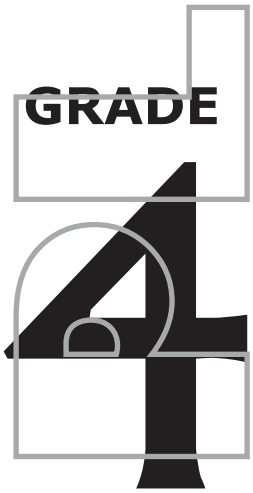
Your initials _____ pg # _____

Round 3
- Discuss placement in **grade level group**.
- Place FINAL bookmark.

Your initials _____ pg # _____

Meets

- Students who are at the achievment level of **Meets** are expected to demonstrate mastery of the set of items in **front** of this Bookmark.
- The items in **front** of this Bookmark define the minimum that students should know and be able to do at the achievment level of **Meets**.



Round 1
- Study test items.
- Place bookmark **without** discussion.

Your initials _____ pg # _____

Round 2
- Discuss placement in **table group**.
- Place bookmark.

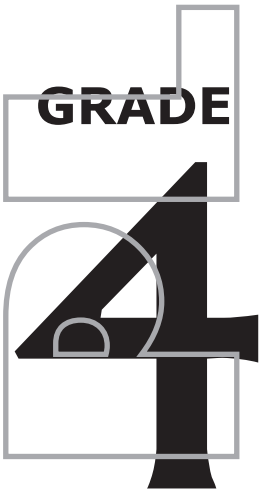
Your initials _____ pg # _____

Round 3
- Discuss placement in **grade level group**.
- Place FINAL bookmark.

Your initials _____ pg # _____

Nearly Meets

- Students who are at the achievment level of **Nearly Meets** are expected to demonstrate mastery of the set of items in **front** of this Bookmark.
- The items in **front** of this Bookmark define the minimum that students should know and be able to do at the achievment level of **Nearly Meets**.



Round 1
- Study test items.
- Place bookmark **without** discussion.

Your initials _____ pg # _____

Round 2
- Discuss placement in **table group**.
- Place bookmark.

Your initials _____ pg # _____

Round 3
- Discuss placement in **grade level group**.
- Place FINAL bookmark.

Your initials _____ pg # _____

Appendix I: Ordered Item Map

Name:_____
Table No. _____

Oregon Standard Verification 2010
Grade 4 Practice Mathematics Item Map

Order of Difficulty (Page #)	Reference	Oregon Item ID	Key	2009 Content Standard	Participant Notes [Why is this item more difficult than the preceding items? (e.g., 3-5 items)]
1		M0001820	D	4.1.6 : Represent money amounts to $10.00 in dollars and cents, and apply to situations involving purchasing ability and making change.	
2		M0005090	C	4.1.6 : Represent money amounts to $10.00 in dollars and cents, and apply to situations involving purchasing ability and making change.	
3		M0002660	D	4.2.2 : Apply understanding of models for multiplication (e.g., equal-sized groups, arrays, area models, equal intervals on the number line), place value, and properties of operations (commutative, associative, and distributive).	
4	Oregon Nearly Meets	M0242560	B	4.3.2 : Determine area by finding the total number of same-sized units of area that cover a shape without gaps or overlaps.	
5	Oregon Meets, Idaho Meets (via NAEP)	M0107160	C	4.3.7 : Solve problems involving perimeters and areas of rectangles and squares.	
6		M0406770	C	4.3.7 : Solve problems involving perimeters and areas of rectangles and squares.	

Appendix I: Ordered Item Map

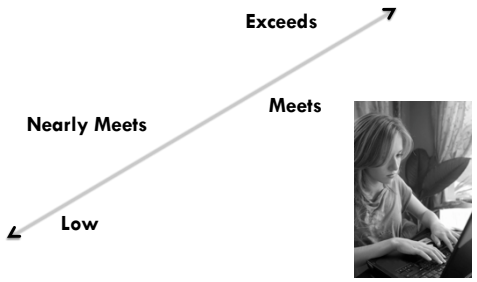
Order of Difficulty (Page #)	Reference	Oregon Item ID	Key	2009 Content Standard	Participant Notes [Why is this item more difficult than the preceding items? (e.g., 3-5 items)]
7	Projected Oregon Meets	M9200381	B	4.2.3 : Select and use appropriate estimation strategies for multiplication (e.g., use benchmarks, overestimate, underestimate, round) to calculate mentally based on the problem situation when computing with whole numbers.	
8		M0254790	C	4.3.4 : Determine the appropriate units, strategies, and tools to solving problems that involve estimating or measuring area.	
9	Oregon Exceeds	M9700600	B	4.2.3 : Select and use appropriate estimation strategies for multiplication (e.g., use benchmarks, overestimate, underestimate, round) to calculate mentally based on the problem situation when computing with whole numbers.	
10		M0102850	C	4.1.4 : Compare and order fractions and decimals.	
11	Massachuesetts Meets (via NAEP)	M0246640	C	4.3.7 : Solve problems involving perimeters and areas of rectangles and squares.	
12	NAEP: Grade 4 US Advanced	M9800640	B	4.3.7 : Solve problems involving perimeters and areas of rectangles and squares.	
13		M0404930	B	4.3.6 : Find the areas of complex shapes that can be subdivided into rectangles.	

MATHEMATICS STANDARD SETTING

Thinking about Target Students

Many Levels of Student Progress

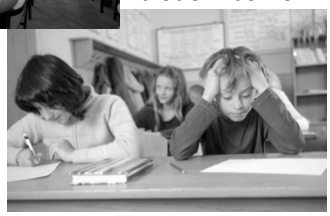
Only 4 Levels of Achievement



Begin with the student who "Meets"

What problems can this target student solve?

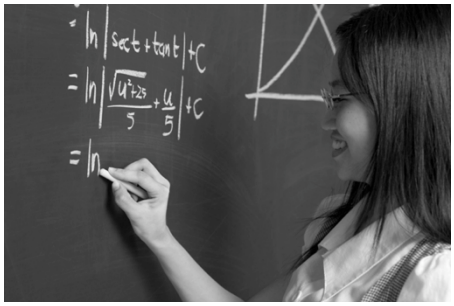
What problems stump this student?



The Target Student

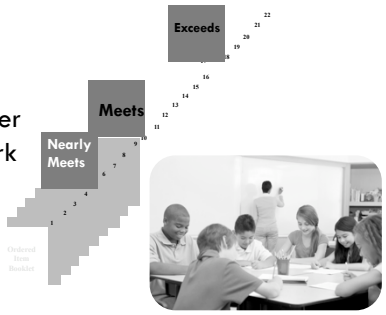
JUST BARELY

meets the achievement level.



The Target Student can solve problems in front of the bookmark . . .

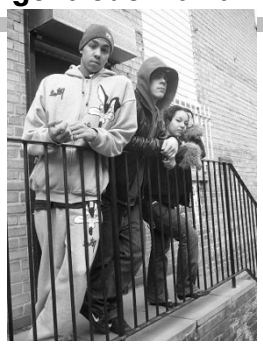
AND
the first few problems after the book mark



Think about recent classes of students.

Picture your target student.

Write down your target student's name.



As your group discusses the target student,

share characteristics of your student.

Target Student Descriptions

Each grade level group writes 3 –

- **Meets**
- **Nearly Meets**
- **Exceeds**

Place your bookmark between the hardest question a target student could answer . . .

. . . and the easiest question that student would likely answer incorrectly.

Oregon Mathematics Standard Setting 2010-11 and beyond

Target Student Description Writing
Instructions for Grade Level Leaders

In previous Oregon Standard Setting events, participants created descriptors of the target students using the appropriate Oregon standards, the previously developed achievement-level descriptors, and the expectations the participants have of students in the achievement levels.

These definitions served as a basis for establishing a common understanding of the type of student that should be considered when setting each cut score on the test. Participants were encouraged to take notes during the target student discussion and were referred to the target student descriptors throughout the standard setting.

Description Writing

1. Ask panelists to think about what a student who **just barely** meets the requirements for **"Meets the Standard"** knows and is able to do and **what differentiates** that student from the highest performing student in the level just below.

2. Starting with the "Meets the Standard" level, have panelists work together to write a common definition of what a student at the entry point for each level should know and be able to do; that is, define the "**target student**." These may be bullet points or phrases and clauses; the description does not need to be a polished paragraph.

3. Once panelists reach consensus on the description of the **"Meets" target student**, move on to the **"Nearly Meets" student**. Again, focus the group on what the student who **just barely fits** in the category can do and how that is **different** from the student who does not quite make it into this category.

4. Finally, have the panelists describe the **target student** who **just squeaks into** the **"Exceeds"** category. This is not the highest performing student; it is the student who is just enough beyond "Meets the Standard" to be considered as "Exceeds."

Tips

- Ask panelists to think of a specific student (instead of a group) whose ability characterizes **the borderline between performance categories** (target student). This allows panelists to focus on one student with whom they are familiar. (Research by Impara and Plake suggests that teachers are not very accurate in estimating the performance of a group of students.)

- When panelists go through the **Ordered Item Booklet**, have them think of the **target student** and respond with a **"yes"** or **"no"** to the question **"Can the target student answer this item correctly?"** (In previous studies, most participants experienced difficulty in attempting to conceive of a group of target students. Most of them were ultimately unable to do so and made use of alternative cognitive strategies. Thinking of the target student as an individual helps teachers focus and respond to the yes/no question.)

Appendix K: Target Student Descriptions

Group	Nearly Meets	Meets	Exceeds
3-4	• Basic skill know • Diff choosing strategies • Inconsistent performance • Can explain but not justify answers • Lacks confidence • Doesn't check work	• Diff. with multiple step problems • Comfortably meets/barely meets? • Relies on limited strategies within comfort • Solves most problems acc./eff. • Understand/apply basic skills and models • Not fully dependent on adults • Relies on memory/difficult with real life application • Able to problem solve (simple vs complex) • Use established Models/strategies • Good number sense/conceptual understanding math • Notices errors within context • Computation = strong	• Can develop new strategies to solve unknown situations • Confident/successful • Flexible with strategies • Reflects on reasonableness of answer • Checks work/uses inverse opperations • Connections between multiple strategies within work • Chooses and justifies most efficient strategies
5-6	• Uses limited (one) strategy • Not solid with fraction-decimal-percents relationships • Still developing number sense "reasonableness" not solid • Over reliance on calculator • Base facts still developing fluency • Don't understand contextual words. (in applied situations) • Ratio-rate-multiplication relationships still developing • May not approach prob. w/o support • Regular error with order of operations • Not yet able to self-correct (check reasonable) • Need more time to develop conceptually	• Guess and check often, uses 1-2 other strategies too • Inconsistently double-check work • More reliance/competence with std procedures, algorithms • Uses calculator for basic calculations (but may not know if answer reasonable) • Solve straight forward problems & situations that are "familiar"	• Comfortable with material conceptualized (not yet internalized) • Understand basic vocabulary (not expand) • Comfortable decimals and fractions Equiv. and use interchangeably (not always dec-frac) • Apply rules – simple story probs • Know basic facts (multipl. & div) and • Understand order of oper. • Confident – willing to take risks • Know multiple strategies (beyond guess/ck) • Solid underst. Of ratio/rat/% • Repeat some method when dbl ck work emerging algeb. Connect alg as representing real world (not yet – generalization) patterning • Reasoning out answers • Comfortable using calculator (estimation strategy) • Comfortable finding formulas/using form. • Contextual words – operational • Comfortable using manipulatives Multi-step/analysis

Appendix K: Target Student Descriptions

7-8	• Successfully completes one step or one procedure problems • Successfully finds mean, mode or struggles with variability • Do the mechanics but can't draw the conclusions	• Know how to use the "tools" (ie. Calculator, formulas, ruler, graph paper) while understanding content, appropriate vocabulary) • Use complex problem solving strategies • Able to solve most multi-step problems • Able to make conclusions	• Background knowledge to figure out what they may not have learned in class • Can explain through "the what and why" in solving a problem • See an alternative approach • Make comparisons successfully • Look for ways to apply and extend
High school	• Has some knowledge gaps • May need prompting • May have difficulty with multi-step problems • Consistently follows familiar procedures	• Can get most one-step solutions • Works independently most of the time • Solves multi-step problems • Engaged in the learning process • Confidence to work through problems • Can work problem more than one way • Proficient with basic algebra • Has developed test-taking strategies	• Apply knowledge to new areas • They ask/answer probing questions • Metacognitive • Can solve complex problems • Makes connections and extensions • Uses inductive/deductive reasoning

Mathematics Achievement Standard Verification
August 9 – 11, 2010

Grade Group: _____

Table Group: _____

Panelist Name: _____

Round 1 Bookmark:

Nearly Meets: Page _____

Meets: Page _____

Exceeds: Page _____

Mathematics

Round 1 Bookmark Placements and Impact Data

ID	Performance	03	04	05	06	07	08	10
1	Does Not Yet Meet		18.14%		29.97%		27.92%	29.85%
2	Nearly Meets		35.56%		23.34%		19.00%	20.95%
3	Meets		26.99%		28.97%		24.72%	37.76%
4	Exceeds		19.31%		17.72%		28.35%	11.43%
5	Meets & Above		46.30%		46.69%		53.08%	49.20%

Median OIB page numbers

Table A

Nearly Meets		22		19		27	19
Meets		30		39		38	29
Exceeds		48		49		46	43

Table B

Nearly Meets	19		32		26	16
Meets	33		38		33	28
Exceeds	49		48		46	48

Both Tables

Nearly Meets	21		31		26	19
Meets	33		38		34	28
Exceeds	49		48		46	44

Mathematics

Round 1 Bookmark Placements and Impact Data

ID	Performance	03	04	05	06	07	08	10
1	Does Not Yet Meet		18.1%		30.0%		27.9%	29.9%
2	Nearly Meets		35.6%		23.3%		19.0%	20.9%
3	Meets		27.0%		29.0%		24.7%	37.8%
4	Exceeds		19.3%		17.7%		28.4%	11.4%
5	Meets & Above		46.3%		46.7%		53.1%	49.2%

OIB page numbers

Table A

	Average	High	Low	Median
Nearly Meets	22	28	16	22
Meets	30	33	26	30
Exceeds	48	50	45	48

Table B

	Average	High	Low	Median
Nearly Meets	20	21	18	19
Meets	35	44	33	33
Exceeds	50	59	45	49

Grade 04

	Average	High	Low	Median
Nearly Meets	21	28	16	21
Meets	32	44	26	33
Exceeds	49	59	45	49

Grade 04 only

Mathematics

Round 1 Bookmark Placements and Impact Data

ID	Performance	03	04	05	06	07	08	10
1	Does Not Yet Meet		18.1%		30.0%		27.9%	29.9%
2	Nearly Meets		35.6%		23.3%		19.0%	20.9%
3	Meets		27.0%		29.0%		24.7%	37.8%
4	Exceeds		19.3%		17.7%		28.4%	11.4%
5	Meets & Above		46.3%		46.7%		53.1%	49.2%

OIB page numbers

Table A

	Average	High	Low	Median
Nearly Meets	25	36	15	19
Meets	37	47	30	39
Exceeds	49	55	43	48

Table B

	Average	High	Low	Median
Nearly Meets	30	35	21	32
Meets	38	41	36	38
Exceeds	49	51	48	48

Grade 06

	Average	High	Low	Median
Nearly Meets	27	36	15	31
Meets	38	47	30	38
Exceeds	49	55	43	48

Grade 06 only

Mathematics

Round 1 Bookmark Placements and Impact Data

ID	Performance	03	04	05	06	07	08	10
1	Does Not Yet Meet		18.1%		30.0%		27.9%	29.9%
2	Nearly Meets		35.6%		23.3%		19.0%	20.9%
3	Meets		27.0%		29.0%		24.7%	37.8%
4	Exceeds		19.3%		17.7%		28.4%	11.4%
5	Meets & Above		46.3%		46.7%		53.1%	49.2%

OIB page numbers

Table A

	Average	High	Low	Median
Nearly Meets	23	30	13	27
Meets	36	42	32	38
Exceeds	49	59	46	46

Table B

	Average	High	Low	Median
Nearly Meets	27	30	24	26
Meets	34	38	32	33
Exceeds	48	55	46	46

Grade 08

	Average	High	Low	Median
Nearly Meets	25	30	13	26
Meets	35	42	32	34
Exceeds	49	59	46	46

Grade 08 only

Mathematics

Round 1 Bookmark Placements and Impact Data

ID	Performance	03	04	05	06	07	08	10
1	Does Not Yet Meet		18.1%		30.0%		27.9%	29.9%
2	Nearly Meets		35.6%		23.3%		19.0%	20.9%
3	Meets		27.0%		29.0%		24.7%	37.8%
4	Exceeds		19.3%		17.7%		28.4%	11.4%
5	Meets & Above		46.3%		46.7%		53.1%	49.2%

OIB page numbers

Table A

	Average	High	Low	Median
Nearly Meets	17	24	1	19
Meets	28	30	24	29
Exceeds	47	66	41	43

Table B

	Average	High	Low	Median
Nearly Meets	19	33	8	16
Meets	30	40	25	28
Exceeds	49	58	41	48

Grade 10

	Average	High	Low	Median
Nearly Meets	18	33	1	19
Meets	29	40	24	28
Exceeds	48	66	41	44

Grade 10 only

Individual Bookmarkings (Round 1)

Grade Group	Table	NM	M	E
3-4	A	16	26	45
		23	26	49
		18	30	47
		21	30	50
		25	33	47
		28	33	49
	B	18	33	49
		19	33	49
		21	33	45
		19	34	49
		21	44	59
5-6	A	15	30	48
		18	30	43
		19	39	49
		36	41	48
		35	47	55
	B	21	36	51
		32	36	48
		30	38	48
		32	38	50
		35	41	48
7-8	A	13	32	46
		14	32	46
		27	38	46
		30	38	59
		30	42	48
	B	24	32	46
		26	33	46
		26	33	48
		29	35	55
		30	38	46
HS	A	1	24	66
		19	25	41
		19	29	43
		22	30	44
		24	30	43
	B	8	25	48
		16	28	58
		16	28	41
		24	28	41
		33	40	58

Mathematics Achievement Standard Verification
August 9 – 11, 2010

Grade Group: _____

Table Group: _____

Panelist Name: _____

Round 2 Bookmark:

Nearly Meets: Page _____

Meets: Page _____

Exceeds: Page _____

Mathematics

Round 2 Bookmark Placements and Impact Data

ID	Performance	03	04	05	06	07	08	10
1	Does Not Yet Meet		18.14%		29.97%		37.80%	29.85%
2	Nearly Meets		35.56%		23.34%		13.44%	27.25%
3	Meets		26.99%		33.23%		28.33%	36.91%
4	Exceeds		19.31%		13.46%		20.42%	5.98%
5	Meets & Above		46.30%		46.69%		48.75%	42.90%

Median OIB page numbers

Table A

Nearly Meets		21		21		30	19
Meets		32		41		38	29
Exceeds		49		48		55	45

Table B

Nearly Meets		21		30		28	19
Meets		33		38		35	28
Exceeds		49		50		46	51

Both Tables

Nearly Meets		21		30		29	19
Meets		33		38		36	29
Exceeds		49		50		50	48

Mathematics

Round 2 Bookmark Placements and Impact Data

ID	Performance	03	04	05	06	07	08	10
1	Does Not Yet Meet		18.1%		30.0%		37.8%	29.9%
2	Nearly Meets		35.6%		23.3%		13.4%	27.3%
3	Meets		27.0%		33.2%		28.3%	36.9%
4	Exceeds		19.3%		13.5%		20.4%	6.0%
5	Meets & Above		46.3%		46.7%		48.8%	42.9%

OIB page numbers

Table A

	Average	High	Low	Median
Nearly Meets	22	26	19	21
Meets	32	33	30	32
Exceeds	49	49	49	49

Table B

	Average	High	Low	Median
Nearly Meets	20	21	19	21
Meets	33	33	33	33
Exceeds	48	49	44	49

Grade 04

	Average	High	Low	Median
Nearly Meets	21	26	19	21
Meets	32	33	30	33
Exceeds	49	49	44	49

Grade 04 only

Mathematics

Round 2 Bookmark Placements and Impact Data

ID	Performance	03	04	05	06	07	08	10
1	Does Not Yet Meet		18.1%		30.0%		37.8%	29.9%
2	Nearly Meets		35.6%		23.3%		13.4%	27.3%
3	Meets		27.0%		33.2%		28.3%	36.9%
4	Exceeds		19.3%		13.5%		20.4%	6.0%
5	Meets & Above		46.3%		46.7%		48.8%	42.9%

OIB page numbers

Table A

	Average	High	Low	Median
Nearly Meets	25	36	18	21
Meets	40	42	36	41
Exceeds	48	49	45	48

Table B

	Average	High	Low	Median
Nearly Meets	30	32	25	30
Meets	38	38	38	38
Exceeds	50	50	50	50

Grade 06

	Average	High	Low	Median
Nearly Meets	27	36	18	30
Meets	39	42	36	38
Exceeds	49	50	45	50

Grade 06 only

Mathematics

Round 2 Bookmark Placements and Impact Data

ID	Performance	03	04	05	06	07	08	10
1	Does Not Yet Meet		18.1%		30.0%		37.8%	29.9%
2	Nearly Meets		35.6%		23.3%		13.4%	27.3%
3	Meets		27.0%		33.2%		28.3%	36.9%
4	Exceeds		19.3%		13.5%		20.4%	6.0%
5	Meets & Above		46.3%		46.7%		48.8%	42.9%

OIB page numbers

Table A

	Average	High	Low	Median
Nearly Meets	30	32	27	30
Meets	38	38	38	38
Exceeds	55	55	53	55

Table B

	Average	High	Low	Median
Nearly Meets	28	29	26	28
Meets	34	35	33	35
Exceeds	47	48	46	46

Grade 08

	Average	High	Low	Median
Nearly Meets	29	32	26	29
Meets	36	38	33	36
Exceeds	51	55	46	50

Grade 08 only

Mathematics

Round 2 Bookmark Placements and Impact Data

ID	Performance	03	04	05	06	07	08	10
1	Does Not Yet Meet		18.1%		30.0%		37.8%	29.9%
2	Nearly Meets		35.6%		23.3%		13.4%	27.3%
3	Meets		27.0%		33.2%		28.3%	36.9%
4	Exceeds		19.3%		13.5%		20.4%	6.0%
5	Meets & Above		46.3%		46.7%		48.8%	42.9%

OIB page numbers

Table A

	Average	High	Low	Median
Nearly Meets	21	24	19	19
Meets	29	30	28	29
Exceeds	49	66	43	45

Table B

	Average	High	Low	Median
Nearly Meets	19	24	15	19
Meets	30	38	28	28
Exceeds	50	53	46	51

Grade 10

	Average	High	Low	Median
Nearly Meets	20	24	15	19
Meets	30	38	28	29
Exceeds	50	66	43	48

Grade 10 only

Individual Bookmarkings (Round 2)

Grade Group	Table	NM	M	E
3-4	A	21	30	49
		25	31	49
		26	32	49
		19	33	49
		21	33	49
		21	33	49
	B	19	33	44
		19	33	49
		21	33	49
		21	33	49
		21	33	49
5-6	A	18	36	48
		30	39	45
		21	41	48
		36	41	49
		19	42	48
	B	25	38	50
		30	38	50
		30	38	50
		32	38	50
		32	38	50
7-8	A	27	38	53
		30	38	55
		30	38	55
		30	38	55
		32	38	55
	B	26	33	46
		27	34	46
		28	35	48
		29	35	46
		29	35	48
HS	A	22	28	44
		19	29	45
		19	29	43
		19	30	66
		24	30	48
	B	15	28	48
		19	28	51
		20	28	51
		19	29	46
		24	38	53

Mathematics Achievement Standard Verification
August 9 – 11, 2010

Grade Group: _____

Table Group: _____

Panelist Name: _____

Round 3 Bookmark:

Nearly Meets: Page _____

Meets: Page _____

Exceeds: Page _____

Mathematics Achievement Standard Verification
August 9 – 11, 2010

Grade Group: _____

Group Consensus Bookmark:

Nearly Meets: Page _____

Meets: Page _____

Exceeds: Page _____

Mathematics

Round 3 Bookmark Placements and Impact Data

ID	Performance	03	04	05	06	07	08	10
1	Does Not Yet Meet	20.4%	20.4%	25.4%	30.0%	29.2%	37.8%	29.9%
2	Nearly Meets	32.5%	33.3%	29.1%	23.3%	19.2%	9.1%	20.9%
3	Meets	28.8%	27.0%	27.5%	29.0%	33.7%	36.7%	46.1%
4	Exceeds	18.3%	19.3%	18.0%	17.7%	17.9%	16.4%	3.1%
5	Meets & Above	47.1%	46.3%	45.5%	46.7%	51.6%	53.1%	49.2%

Median OIB page numbers

Table A

Nearly Meets		23		30		29	19
Meets		33		38		35	28
Exceeds		49		48		55	53

Table B

Nearly Meets		21		30		29	19
Meets		33		38		35	28
Exceeds		49		49		48	53

Both Tables

Nearly Meets	21	23	31	30	23	29	19
Meets	34	33	39	38	27	35	28
Exceeds	45	49	50	48	43	52	53

Mathematics

Round 3 Bookmark Placements and Impact Data

ID	Performance	03	04	05	06	07	08	10
1	Does Not Yet Meet		20.4%		30.0%		37.8%	29.9%
2	Nearly Meets		33.3%		23.3%		9.1%	20.9%
3	Meets		27.0%		29.0%		36.7%	46.1%
4	Exceeds		19.3%		17.7%		16.4%	3.1%
5	Meets & Above	47.1%	46.3%	45.5%	46.7%	51.6%	53.1%	49.2%

OIB page numbers

Table A

	Average	High	Low	Median
Nearly Meets	23	25	21	23
Meets	33	33	33	33
Exceeds	49	49	49	49

Table B

	Average	High	Low	Median
Nearly Meets	22	23	21	21
Meets	33	33	33	33
Exceeds	49	49	49	49

Grade 04

	Average	High	Low	Median
Nearly Meets	22	25	21	23
Meets	33	33	33	33
Exceeds	49	49	49	49

Group Consensus Bookmark

Median
23
33
49

Grade 04 only

Mathematics

Round 3 Bookmark Placements and Impact Data

ID	Performance	03	04	05	06	07	08	10
1	Does Not Yet Meet		20.4%		30.0%		37.8%	29.9%
2	Nearly Meets		33.3%		23.3%		9.1%	20.9%
3	Meets		27.0%		29.0%		36.7%	46.1%
4	Exceeds		19.3%		17.7%		16.4%	3.1%
5	Meets & Above	47.1%	46.3%	45.5%	46.7%	51.6%	53.1%	49.2%

OIB page numbers

Table A

	Average	High	Low	Median
Nearly Meets	26	30	19	30
Meets	38	39	38	38
Exceeds	49	50	48	48

Table B

	Average	High	Low	Median
Nearly Meets	30	30	29	30
Meets	38	38	38	38
Exceeds	49	50	48	49

Grade 06

	Average	High	Low	Median
Nearly Meets	28	30	19	30
Meets	38	39	38	38
Exceeds	49	50	48	48

Group Consensus Bookmark

Median
30
38
49

Grade 06 only

Mathematics

Round 3 Bookmark Placements and Impact Data

ID	Performance	03	04	05	06	07	08	10
1	Does Not Yet Meet		20.4%		30.0%		37.8%	29.9%
2	Nearly Meets		33.3%		23.3%		9.1%	20.9%
3	Meets		27.0%		29.0%		36.7%	46.1%
4	Exceeds		19.3%		17.7%		16.4%	3.1%
5	Meets & Above	47.1%	46.3%	45.5%	46.7%	51.6%	53.1%	49.2%

OIB page numbers

Table A

	Average	High	Low	Median
Nearly Meets	29	30	29	29
Meets	35	35	35	35
Exceeds	53	55	46	55

Table B

	Average	High	Low	Median
Nearly Meets	29	29	28	29
Meets	35	35	35	35
Exceeds	50	55	48	48

Grade 08

	Average	High	Low	Median
Nearly Meets	29	30	28	29
Meets	35	35	35	35
Exceeds	52	55	46	52

Group Consensus Bookmark

Median
29
35
51

Grade 08 only

Mathematics

Round 3 Bookmark Placements and Impact Data

ID	Performance	03	04	05	06	07	08	10
1	Does Not Yet Meet		20.4%		30.0%		37.8%	29.9%
2	Nearly Meets		33.3%		23.3%		9.1%	20.9%
3	Meets		27.0%		29.0%		36.7%	46.1%
4	Exceeds		19.3%		17.7%		16.4%	3.1%
5	Meets & Above	47.1%	46.3%	45.5%	46.7%	51.6%	53.1%	49.2%

OIB page numbers

Table A

	Average	High	Low	Median
Nearly Meets	19	19	19	19
Meets	28	29	28	28
Exceeds	52	53	46	53

Table B

	Average	High	Low	Median
Nearly Meets	19	21	19	19
Meets	28	30	28	28
Exceeds	53	53	53	53

Grade 10

	Average	High	Low	Median
Nearly Meets	19	21	19	19
Meets	28	30	28	28
Exceeds	52	53	46	53

Group Consensus Bookmark

Median
19
28
53

Grade 10 only

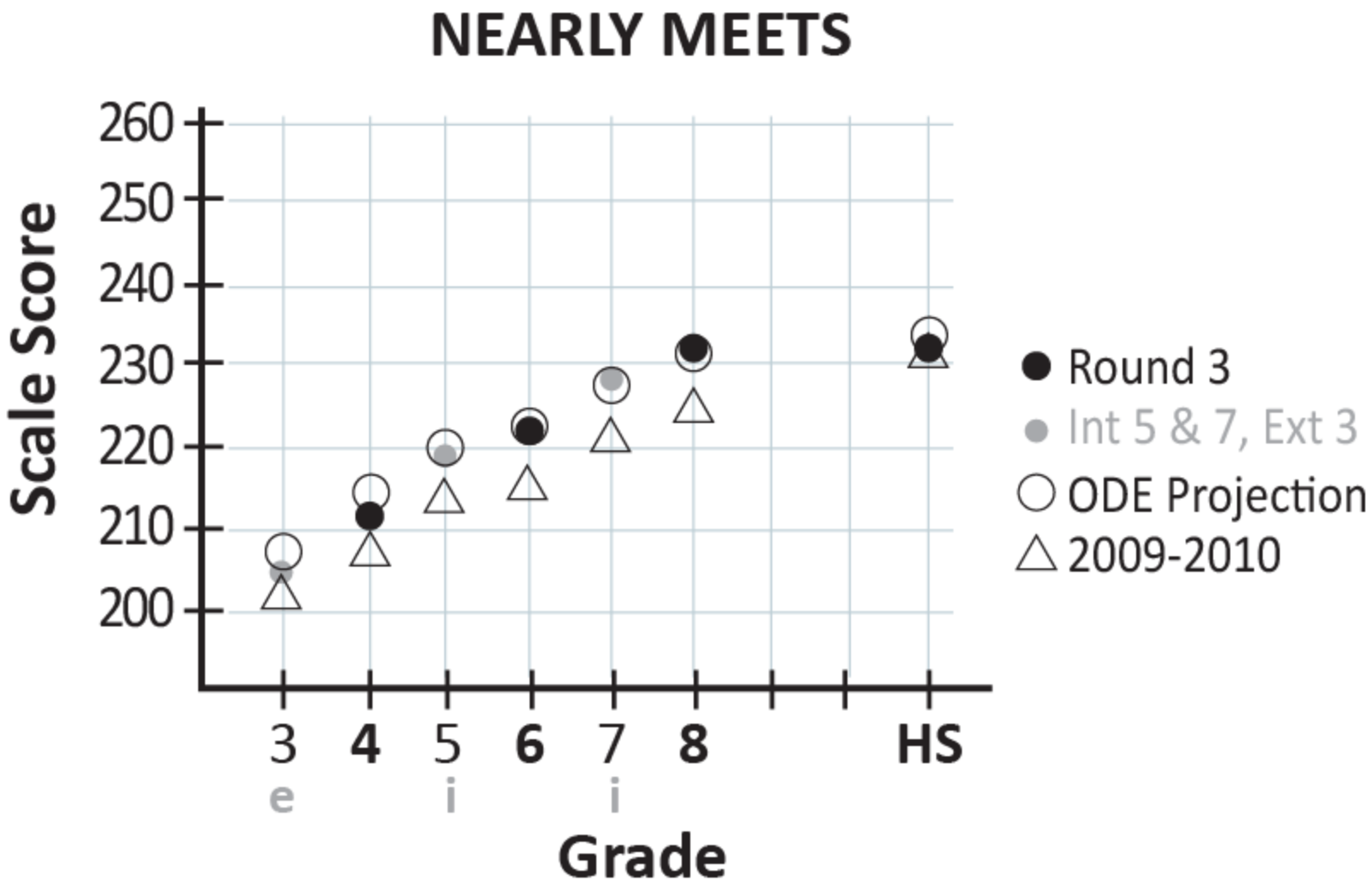
Individual Bookmarkings (Round 3)

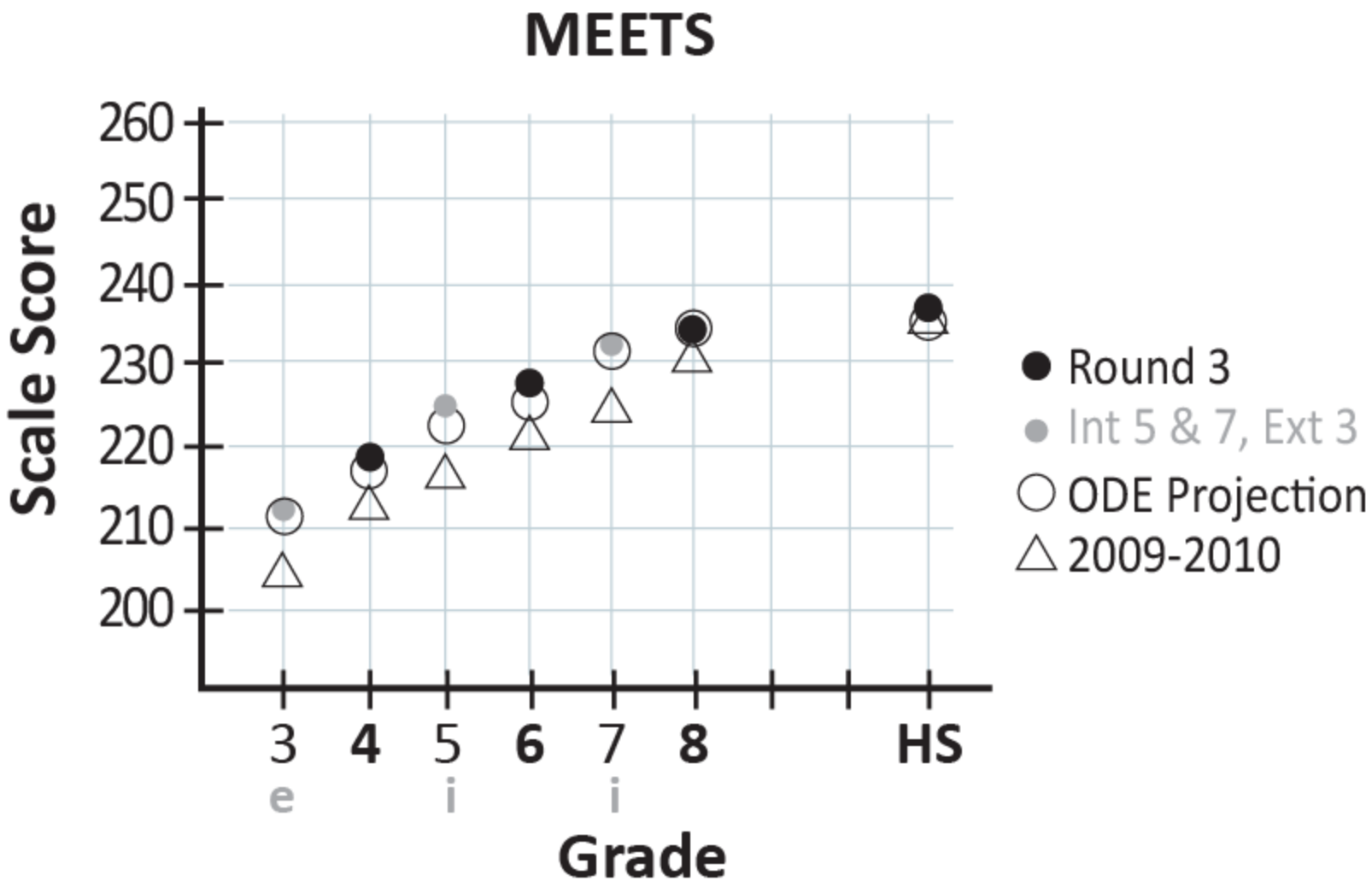
Grade Group	Table	NM	M	E
3-4	A	21	33	49
		23	33	49
		23	33	49
		23	33	49
		23	33	49
		25	33	49
	B	21	33	49
		21	33	49
		21	33	49
		23	33	49
		23	33	49
5-6	A	19	38	48
		30	38	48
		30	38	49
		30	38	50
		19	39	48
	B	29	38	48
		30	38	48
		30	38	50
		30	38	49
		30	38	50
7-8	A	29	35	53
		29	35	46
		29	35	55
		29	35	55
		30	35	55
	B	28	35	48
		29	35	52
		29	35	48
		29	35	48
		29	35	55
HS	A	19	28	53
		19	28	53
		19	28	46
		19	29	53
		19	29	53
	B	19	28	53
		19	28	53
		19	28	53
		19	28	53
		21	30	53

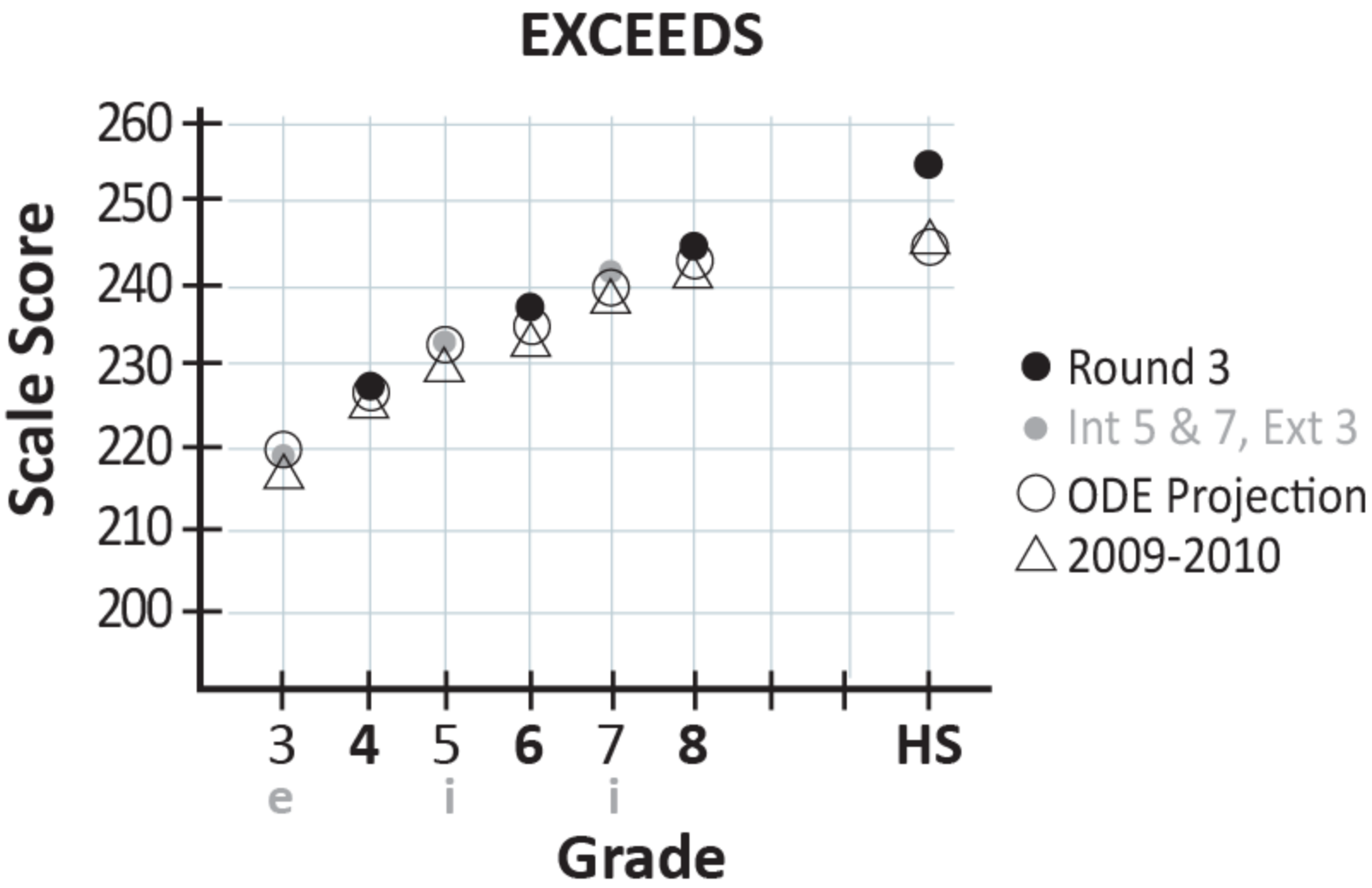
Mathematics Achievement Standards Verification

Smoothing Recommendation and Impact Data

August 11, 2010


NEARLY MEETS
Scale Score
260
250
240
230
220
210
200
3
4
5
6
7
8
HS
e
i
i
Grade
Round 3
Int 5 & 7, Ext 3
ODE Projection
2009-2010


MEETS
Scale Score
260
250
240
230
220
210
200
3
e
4
5
i
6
7
i
8
HS
Grade
Round 3
Int 5 & 7, Ext 3
ODE Projection
2009-2010


EXCEEDS
Scale Score
260
250
240
230
220
210
200
3
4
5
6
7
8
HS
e
i
i
Grade
Round 3
Int 5 & 7, Ext 3
ODE Projection
2009-2010

Mathematics Achievement Standard Verification
August 9 – 11, 2010

Grade Group: _____

Grade: _____

Group Consensus Confirmation:

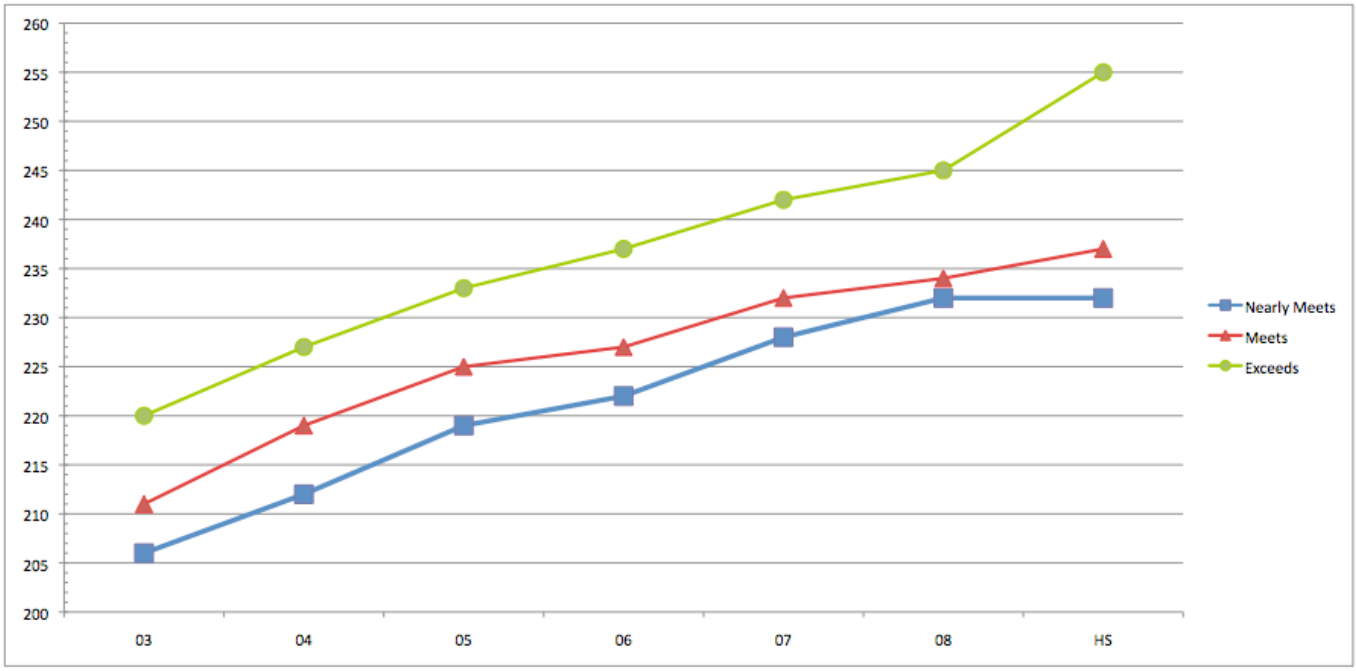
Nearly Meets: Page _____

Meets: Page _____

Exceeds: Page _____

Appendix P: Round Four

Round Four Cut Scores



ID	Perf	03	04	05	06	07	08	HS
2	Nearly Meets	206	212	219	222	228	232	232
3	Meets	211	219	225	227	232	234	237
4	Exceeds	220	227	233	237	242	245	255

Appendix Q: Individual Bookmarks by Round

Table Q1 Individual Bookmarks, Round One

Grade	Participant	Table	Nearly Meets Bookmark	Difference from the Mean	Meets Bookmark	Difference from the Mean	Exceeds Bookmark	Difference from the Mean
04	3	A	25	4.2	33	0.7	47	-1.9
04	4	A	18	-2.2	30	-2.3	47	-1.9
04	6	A	23	2.2	26	-6.3	49	0.1
04	7	A	21	0.2	30	-2.3	50	1.1
04	9	A	16	-4.8	26	-6.3	45	-3.9
04	11	A	28	7.2	33	0.7	49	0.1
04	1	B	19	-1.8	33	0.7	49	0.1
04	2	B	19	-1.8	34	1.7	49	0.1
04	5	B	18	-2.8	33	0.7	49	0.1
04	8	B	21	0.2	44	11.7	59	10.1
04	10	B	21	0.2	33	0.7	45	-3.9
06	12	A	19	-8.3	39	1.4	49	0.2
06	14	A	36	8.7	41	3.4	48	-0.8
06	16	A	18	-9.3	30	-7.6	43	-5.8
06	18	A	35	7.7	47	9.4	55	6.2
06	21	A	15	-12.3	30	-7.6	48	-0.8
06	13	B	35	7.7	41	3.4	48	-0.8
06	15	B	32	4.7	36	-1.6	48	-0.8
06	17	B	21	-6.3	36	-1.6	51	2.2
06	19	B	30	2.7	38	0.4	48	-0.8
06	20	B	32	4.7	38	0.4	50	1.2
08	22	A	13	-11.9	32	-3.3	46	-2.6
08	24	A	27	2.1	38	2.7	46	-2.6
08	26	A	30	5.1	38	2.7	59	10.4
08	28	A	30	5.1	42	6.7	48	-0.6
08	29	A	14	-10.9	32	-3.3	46	-2.6
08	23	B	29	4.1	35	-0.3	55	6.4
08	25	B	26	1.1	33	-2.3	46	-2.6
08	27	B	30	5.1	38	2.7	46	-2.6
08	30	B	26	1.1	33	-2.3	48	-0.6
08	31	B	24	-0.9	32	-3.3	46	-2.6
HS	32	A	1	-17.2	24	-4.7	66	17.7
HS	34	A	19	0.8	25	-3.7	41	-7.3
HS	35	A	19	0.8	29	0.3	43	-5.3
HS	38	A	22	3.8	30	1.3	44	-4.3
HS	39	A	24	5.8	30	1.3	43	-5.3
HS	33	B	8	-10.2	25	-3.7	48	-0.3
HS	36	B	33	14.8	40	11.3	58	9.7
HS	37	B	16	-2.2	28	-0.7	41	-7.3
HS	40	B	24	5.8	28	-0.7	41	-7.3
HS	41	B	16	-2.2	28	-0.7	58	9.7

Appendix Q: Individual Bookmarks by Round

Table Q2 Individual Bookmarks, Round Two

Grade	Participant	Table	Nearly Meets Bookmark	Difference from the Mean	Meets Bookmark	Difference from the Mean	Exceeds Bookmark	Difference from the Mean
04	1	B	21	-0.3	33	0.5	49	0.5
04	2	B	19	-2.3	33	0.5	49	0.5
04	3	A	21	-0.3	33	0.5	49	0.5
04	4	A	19	-2.3	33	0.5	49	0.5
04	5	B	21	-0.3	33	0.5	49	0.5
04	6	A	26	4.7	32	-0.5	49	0.5
04	7	A	21	-0.3	33	0.5	49	0.5
04	8	B	19	-2.3	33	0.5	44	-4.6
04	9	A	21	-0.3	30	-2.5	49	0.5
04	10	B	21	-0.3	33	0.5	49	0.5
04	11	A	25	3.7	31	-1.5	49	0.5
06	12	A	21	-6.3	41	2.1	48	-0.8
06	13	B	30	2.7	38	-0.9	50	1.2
06	14	A	36	8.7	41	2.1	49	0.2
06	15	B	32	4.7	38	-0.9	50	1.2
06	16	A	18	-9.3	36	-2.9	48	-0.8
06	17	B	30	2.7	38	-0.9	50	1.2
06	18	A	30	2.7	39	0.1	45	-3.8
06	19	B	25	-2.3	38	-0.9	50	1.2
06	20	B	32	4.7	38	-0.9	50	1.2
06	21	A	19	-8.3	42	3.1	48	-0.8
08	22	A	27	-1.8	38	1.8	53	2.3
08	23	B	29	0.2	35	-1.2	48	-2.7
08	24	A	30	1.2	38	1.8	55	4.3
08	25	B	26	-2.8	33	-3.2	46	-4.7
08	26	A	30	1.2	38	1.8	55	4.3
08	27	B	29	0.2	35	-1.2	46	-4.7
08	28	A	30	1.2	38	1.8	55	4.3
08	29	A	32	3.2	38	1.8	55	4.3
08	30	B	28	-0.8	35	-1.2	48	-2.7
08	31	B	27	-1.8	34	-2.2	46	-4.7
HS	32	A	19	-1.0	30	0.3	66	16.5
HS	33	B	15	-5.0	28	-1.7	48	-1.5
HS	34	A	19	-1.0	29	-0.7	43	-6.5
HS	35	A	19	-1.0	29	-0.7	45	-4.5
HS	36	B	24	4.0	38	8.3	53	3.5
HS	37	B	19	-1.0	29	-0.7	46	-3.5
HS	38	A	22	2.0	28	-1.7	44	-5.5
HS	39	A	24	4.0	30	0.3	48	-1.5
HS	40	B	19	-1.0	28	-1.7	51	1.5
HS	41	B	20	0.0	28	-1.7	51	1.5

Appendix Q: Individual Bookmarks by Round

Table Q3 Individual Bookmarks, Round Three

Grade	Participant	Table	Nearly Meets Bookmark	Difference from the Mean	Meets Bookmark	Difference from the Mean	Exceeds Bookmark	Difference from the Mean
04	1	B	21	-1.5	33	0.0	49	0.0
04	2	B	23	0.5	33	0.0	49	0.0
04	3	A	23	0.5	33	0.0	49	0.0
04	4	A	23	0.5	33	0.0	49	0.0
04	5	B	23	0.5	33	0.0	49	0.0
04	6	A	23	0.5	33	0.0	49	0.0
04	7	A	23	0.5	33	0.0	49	0.0
04	8	B	21	-1.5	33	0.0	49	0.0
04	9	A	21	-1.5	33	0.0	49	0.0
04	10	B	21	-1.5	33	0.0	49	0.0
04	11	A	25	2.5	33	0.0	49	0.0
06	12	A	30	2.3	38	-0.1	48	-0.8
06	13	B	30	2.3	38	-0.1	49	0.2
06	14	A	30	2.3	38	-0.1	50	1.2
06	15	B	30	2.3	38	-0.1	48	-0.8
06	16	A	19	-8.7	38	-0.1	48	-0.8
06	17	B	30	2.3	38	-0.1	50	1.2
06	18	A	30	2.3	38	-0.1	49	0.2
06	19	B	29	1.3	38	-0.1	48	-0.8
06	20	B	30	2.3	38	-0.1	50	1.2
06	21	A	19	-8.7	39	0.9	48	-0.8
08	22	A	29	0.0	35	0.0	53	1.5
08	23	B	29	0.0	35	0.0	55	3.5
08	24	A	30	1.0	35	0.0	55	3.5
08	25	B	29	0.0	35	0.0	48	-3.5
08	26	A	29	0.0	35	0.0	55	3.5
08	27	B	29	0.0	35	0.0	52	0.5
08	28	A	29	0.0	35	0.0	55	3.5
08	29	A	29	0.0	35	0.0	46	-5.5
08	30	B	28	-1.0	35	0.0	48	-3.5
08	31	B	29	0.0	35	0.0	48	-3.5
HS	32	A	19	-0.2	28	-0.4	53	0.7
HS	33	B	19	-0.2	28	-0.4	53	0.7
HS	34	A	19	-0.2	28	-0.4	46	-6.3
HS	35	A	19	-0.2	29	0.6	53	0.7
HS	36	B	21	1.8	30	1.6	53	0.7
HS	37	B	19	-0.2	28	-0.4	53	0.7
HS	38	A	19	-0.2	28	-0.4	53	0.7
HS	39	A	19	-0.2	29	0.6	53	0.7
HS	40	B	19	-0.2	28	-0.4	53	0.7
HS	41	B	19	-0.2	28	-0.4	53	0.7

Oregon Mathematics Achievement Level Descriptors – Grade 3

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
General Policy Definitions (Apply to all grades and all subjects)	**Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate mastery of grade-level knowledge and skills exceeding the requirement for proficiency.**
Mathematics Policy Definitions (Apply to all grades)	**Students demonstrate limited mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.**	**Students demonstrate mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain their steps.**	**Students demonstrate mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.**	**Students demonstrate mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.**
Mathematics Achievement Level Descriptors **3.1** **Number and Operations**: Develop an understanding of fractions and fraction equivalence.	• Inconsistently represent common fractions (e.g., halves, thirds, fourths, tenths) as equal parts of a whole or parts of a set. • Inconsistently identify which fractional part is larger when wholes are the same size. • Inconsistently use fractions with common denominators to represent numbers that are equal to, less than, or greater than one. • Inconsistently compare or order fractions while using models. • Inconsistently identify equivalent fractions using given concrete models or the number line. • Inconsistently add common fractions with like denominators.	• Represent common fractions (e.g., halves, thirds, fourths, tenths) as equal parts of a whole or parts of a set. • Identify the fractional part of a given whole or which fractional part is larger when wholes are the same size. • Use fractions with common denominators to represent numbers that are equal to, less than, or greater than one. • Solve problems that involve comparing **or** ordering fractions by using models, benchmarks (0, 1/2, 1), or common numerators or denominators. • Identify equivalent fractions given models or the number line. • Add common fractions with like denominators using models or manipulatives.	• Represent common fractions (e.g., halves, thirds, fourths, tenths) as equal parts of a whole, parts of a set, or points or distances on a number line. • Recognize and demonstrate that sizes of fractional parts are relative to the size of the whole. • Use fractions to represent numbers that are equal to, less than, or greater than one. • Solve problems that involve comparing and ordering fractions by using models, benchmarks (0, 1/2, 1), or common numerators or denominators. • Identify equivalent fractions using models, including the number line. • Add common fractions with like denominators.	• Represent common fractions (e.g., halves, thirds, fourths, tenths) as equal parts of a whole, parts of a set, or points or distances on a number line and can justify their reasoning. • Recognize and demonstrate that sizes of fractional parts are relative to the size of the whole and can explain their thinking. • Use fractions to represent numbers that are equal to, less than, or greater than one in more than one way. • Solve problems that involve comparing and ordering fractions by using a variety of methods (e.g., models, benchmarks (0, 1/2, 1), or common numerators or denominators.) • Identify and create equivalent fractions using models, including the number line. • Add common fractions with like denominators and explain their thinking.

* **Please note:** Names for the proposed levels are currently under consideration.

Oregon Mathematics Achievement Level Descriptors – Grade 3

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
General Policy Definitions (Apply to all grades and all subjects)	**Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate mastery of grade-level knowledge and skills exceeding the requirement for proficiency.**
Mathematics Policy Definitions (Apply to all grades)	**Students demonstrate limited mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.**	**Students demonstrate mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain their steps.**	**Students demonstrate mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.**	**Students demonstrate mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.**
Mathematics Achievement Level Descriptors **3.2** **Number and Operations, Algebra, and Data Analysis**: Develop understandings of multiplication and division, and strategies for basic multiplication facts and related division facts.	• Inconsistently represent the concept of multiplication as repeated addition. • Inconsistently represent the concept of division as repeated subtraction or forming equal groups. • Inconsistently attempt to use models of multiplication (e.g., equal-sized groups, arrays, area models, equal "jumps" on number lines and hundreds charts) or division (e.g., repeated subtraction, partitioning, and sharing) to solve problems. • Inconsistently use a strategy based on the number properties (e.g., place value, commutative, associative, distributive, identity, and zero) to determine multiplication or division involving basic facts. • Inconsistently use the inverse relationship between multiplication and division (e.g., 5 x 6 = 30, 30 ÷ 6 = 5) or the relationship between multiples and factors with concrete models. • Inconsistently represent number patterns using rules that involve multiplication or addition (e.g., {3, 6, 9, 12,… },{1, 2, 4, 8, …}) • Inconsistently interpret frequency tables, bar graphs, picture graphs, or line plots involving addition, subtraction, multiplication, or division.	• Represent the concept of multiplication as repeated addition in a routine situation. • Represent the concept of division as repeated subtraction or forming equal groups. • Apply models of multiplication (e.g., equal-sized groups, arrays, area models, equal "jumps" on number lines and hundreds charts) or division (e.g., repeated subtraction, partitioning, and sharing) to solve problems. • Apply a strategy based on the number properties (e.g., place value, commutative, associative, distributive, identity, and zero) to determine multiplication or division involving basic facts. • Often use the inverse relationship between multiplication and division (e.g., 5 x 6 = 30, 30 ÷ 6 = 5) or the relationship between multiples and factors. • Represent or extend number patterns using rules that involve multiplication **or** addition (e.g., {3, 6, 9, 12,… },{1, 2, 4, 8, …}) • Analyze frequency tables, bar graphs, picture graphs, or line plots and use them to solve problems involving addition, subtraction, multiplication, or division.	• Represent and apply the concept of multiplication as repeated addition. • Represent and apply the concept of division as repeated subtraction and forming equal groups. • Apply models of multiplication (e.g., equal-sized groups, arrays, area models, equal "jumps" on number lines and hundreds charts) and division (e.g., repeated subtraction, partitioning, and sharing) to solve problems. • Apply increasingly sophisticated strategies based on the number properties (e.g., place value, commutative, associative, distributive, identity, and zero) to solve multiplication and division problems involving basic facts. • Apply the inverse relationship between multiplication and division (e.g., 5 x 6 = 30, 30 ÷ 6 = 5) and the relationship between multiples and factors in routine situations. • Represent, analyze and extend number patterns using rules that involve multiplication and/or addition (e.g., {3, 6, 9, 12,… }, {1, 2, 4, 8, …}) • Analyze frequency tables, bar graphs, picture graphs, and line plots; and use them to solve problems involving addition, subtraction, multiplication, and division.	• Represent and apply the concept of multiplication as repeated addition in a variety of situations and justify their thinking. • Represent and apply the concept of division as repeated subtraction and forming equal groups in a variety of situations and justify their thinking. • Apply models of multiplication (e.g., equal-sized groups, arrays, area models, equal "jumps" on number lines and hundreds charts) and division (e.g., repeated subtraction, partitioning, and sharing) to solve non-routine problems and justify their thinking. • Apply increasingly sophisticated strategies based on the number properties (e.g., place value, commutative, associative, distributive, identity, and zero) to solve complex multiplication and division problems involving basic facts. • Apply the inverse relationship between multiplication and division (e.g., 5 x 6 = 30, 30 ÷ 6 = 5) and the relationship between multiples and factors in non-routine situations. • Represent, analyze and extend number patterns using rules (expressions) that involve multiplication and/or addition (e.g., {3, 6, 9, 12, … }, {1, 2, 4, 8,…}) to the nth term. • Analyze frequency tables, bar graphs, picture graphs, and line plots; and use them to solve complex problems involving addition, subtraction, multiplication, and division.

* **Please note:** Names for the proposed levels are currently under consideration.

Oregon Mathematics Achievement Level Descriptors – Grade 3

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
General Policy Definitions (Apply to all grades and all subjects)	**Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate mastery of grade-level knowledge and skills exceeding the requirement for proficiency.**
Mathematics Policy Definitions (Apply to all grades)	**Students demonstrate limited mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.**	**Students demonstrate mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain their steps.**	**Students demonstrate mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.**	**Students demonstrate mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.**
Mathematics Achievement Level Descriptors **3.3 <u>Geometry</u> and <u>Measurement</u>**: Describe and analyze properties of two-dimensional shapes, including perimeters.	• Inconsistently identify right angles in two-dimensional shapes or determine if angles are greater than or less than a right angle (obtuse and acute). • Inconsistently identify, describe, or informally classify triangles by their sides **or** angles. • Inconsistently identify, describe, compare, or classify quadrilaterals (square, rectangle, parallelogram, rhombus, and trapezoid) by their sides **or** angles. • Inconsistently identify or describe pentagons, hexagons, and octagons by the number of sides or angles. • Inconsistently decompose, combine, or transform polygons to make other polygons. • Build or draw two-dimensional shapes to inconsistently understand attributes and properties of two-dimensional space. • Inconsistently determine an appropriate unit or tool to find the perimeter of polygons. • Use some attributes **or** properties of two-dimensional shapes to inconsistently identify parallel **or** perpendicular lines, congruence, symmetry, and perimeter.	• Identify right angles in two-dimensional shapes or determine if angles are greater than or less than a right angle (obtuse and acute). • Identify, describe, compare, or informally classify triangles by their sides **and** angles. • Often identify, describe, compare, and/or classify quadrilaterals (square, rectangle, parallelogram, rhombus, and trapezoid) by their sides **and** angles • Identify, describe, or compare pentagons, hexagons, and octagons by the number of sides or angles. • Decompose, combine, or transform polygons to make other polygons. • Build or draw two-dimensional shapes to understand attributes and properties of two-dimensional space. • Often determine an appropriate unit or tool to find the perimeter of polygons. • Use some attributes **or** properties of two-dimensional shapes to consistently identify parallel **and** perpendicular lines, congruence, symmetry, and perimeter.	• Identify right angles in two-dimensional shapes and determine if angles are greater than or less than a right angle (obtuse and acute). • Identify, describe, compare, analyze, and informally classify triangles by their sides and angles. • Consistently identify, describe, compare, analyze, and classify quadrilaterals (square, rectangle, parallelogram, rhombus, and trapezoid) by their sides and angles. • Identify, describe, and compare pentagons, hexagons, and octagons by the number of sides or angles. • Investigate and describe the results of decomposing, combining, and transforming polygons to make other polygons. • Build, draw, and analyze two-dimensional shapes to understand attributes and properties of two-dimensional space. • Determine an appropriate unit, tool, or strategy to find the perimeter of polygons. • Use attributes and properties of two-dimensional shapes to solve problems including applications involving parallel **and** perpendicular lines, congruence, symmetry, and perimeter.	• Identify right angles in non-routine two-dimensional shapes and determine if angles are greater than or less than a right angle (obtuse and acute). • Identify, describe, compare, analyze, and informally classify triangles by their sides and angles and explain their thinking. • Identify, describe compare, analyze, and classify quadrilaterals (square, rectangle, parallelogram, rhombus, and trapezoid) by their sides and angles and explain their thinking. • Identify, describe, and compare pentagons, hexagons, and octagons by the number of sides or angles and explain their thinking. • Investigate, describe, and predict the results of decomposing, combining, and transforming polygons to make other polygons. • Build, draw, and analyze two-dimensional shapes to understand attributes and properties of two-dimensional space and justify their thinking. • Determine an appropriate unit, tool, and strategy to find the perimeter of polygons and justify their thinking. • Use attributes and properties of two-dimensional shapes to solve non-routine problems including applications involving parallel **and** perpendicular lines, congruence, symmetry, and perimeter.

* **Please note:** Names for the proposed levels are currently under consideration.

Oregon Mathematics Achievement Level Descriptors – Grade 4

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
General Policy Definitions (Apply to all grades and all subjects)	**Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.**
Mathematics Policy Definitions (Apply to all grades)	**Students demonstrate limited mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.**	**Students demonstrate mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain their steps.**	**Students demonstrate mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.**	**Students demonstrate mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.**
Mathematics Achievement Level Descriptors **4.1** **Number and Operations**: Develop an understanding of decimals, including the connections between fractions and decimals.	• Inconsistently read, write, or represent decimal numbers (to the hundredths). • Use models to represent fractions and decimals and inconsistently connect equivalent fractions and decimals. • Inconsistently determine decimal equivalents for common fractions. • Inconsistently compare fractions or decimals. • Inconsistently estimate decimal or fractional amounts in routine situations. • Inconsistently represent money amounts to $10.00 in dollars and cents.	• Read, write, or represent decimal numbers (to the hundredths). • Use models to connect equivalent fractions and decimals. • Determine decimal equivalents or approximation for some common fractions. • Compare and order fractions or compare and order decimals. • Estimate decimal or fractional amounts in routine situations. • Represent money amounts to $10.00 in dollars and cents.	• Read, write, and represent decimal numbers (to the hundredths). • Use models to connect and compare equivalent fractions and decimals. • Determine decimal equivalent and/or approximation for common fractions. • Compare and order fractions and decimals. • Estimate decimal or fractional amounts in routine and non-routine situations. • Represent money amounts to $10.00 in dollars and cents and apply to situations involving purchasing ability and making change.	• Read, write, and represent decimal numbers (to the hundredths) in a context. • Use models to connect and compare equivalent fractions and decimals including mixed numbers or improper fractions. • Determine decimal equivalents or approximation for common fractions and can explain the relationship between them. • Compare and order fractions and decimals, including improper fractions and mixed numbers. • Estimate decimal or fractional amounts and justify solutions. • Represent money amounts to $10.00 in dollars and cents and apply to situations involving purchasing ability and making change with the fewest bills and coins.

* **Please note:** Names for the proposed levels are currently under consideration.

Oregon Mathematics Achievement Level Descriptors – Grade 4

The achievement level descriptors are cumulative.

General Policy Definitions (Apply to all grades and all subjects)	**Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.**
Mathematics Policy Definitions (Apply to all grades)	**Students demonstrate limited mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.**	**Students demonstrate mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain their steps.**	**Students demonstrate mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.**	**Students demonstrate mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.**
Mathematics Achievement Level Descriptors **4.2 <u>Number and Operations</u> and <u>Algebra</u>:** Develop fluency with multiplication facts and related division facts, and with multi-digit whole number multiplication.	• Inconsistently compute multiplication facts to 10 times 10. • Demonstrate inconsistent understanding of application of models for multiplication (e.g., equal-sized groups, arrays, area models, equal intervals on the number line). • Inconsistently use a given estimation strategy for multiplication (e.g., use benchmarks, overestimate, underestimate, round) when computing with whole numbers. • Inconsistently use accurate methods to multiply multi-digit whole numbers. • Inconsistently multiply multi-digit whole numbers.	• Apply with fluency multiplication facts to 10 times 10. • Demonstrate partial understanding of application of models for multiplication (e.g., equal-sized groups, arrays, area models, equal intervals on the number line), place value, or properties of operations (commutative, associative, and distributive). • Use a given or familiar estimation strategy for multiplication (e.g., use benchmarks, overestimate, underestimate, round) when computing with whole numbers. • Use accurate or generalizable methods to multiply multi-digit whole numbers. • Use given or familiar procedures for multiplying multi-digit whole numbers.	• Apply with fluency multiplication facts to 10 times 10 and related division facts. • Demonstrate understanding of application of models for multiplication (e.g., equal-sized groups, arrays, area models, equal intervals on the number line), place value, and properties of operations (commutative, associative, and distributive). • Select and use appropriate estimation strategies for multiplication (e.g., use benchmarks, overestimate, underestimate, round) to calculate mentally based on the problem situation when computing with whole numbers. • Develop and use accurate, efficient, and generalizable methods to multiply multi-digit whole numbers. • Develop fluency with efficient procedures for multiplying multi-digit whole numbers.	• Apply with fluency multiplication facts to 10 times 10 and related division facts in complex situations. • Demonstrate understanding of application of models for multiplication (e.g., equal-sized groups, arrays, area models, equal intervals on the number line), place value, and properties of operations (commutative, associative, and distributive) in complex situations. • Select and use appropriate estimation strategies for multiplication (e.g., use benchmarks, overestimate, underestimate, round) to calculate mentally based on the problem situation when computing with whole numbers and explain why a strategy was chosen. • Develop and use accurate, efficient, and generalizable methods to multiply 3-digit by 3-digit whole numbers or larger. • Develop fluency with efficient procedures for multiplying multi-digit whole numbers and justify why the procedures work on the basis of place value and number properties.

* **Please note:** Names for the proposed levels are currently under consideration.

Oregon Mathematics Achievement Level Descriptors – Grade 4

The achievement level descriptors are cumulative.

General Policy Definitions (Apply to all grades and all subjects)	**Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.**
Mathematics Policy Definitions (Apply to all grades)	**Students demonstrate limited mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.**	**Students demonstrate mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain their steps.**	**Students demonstrate mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.**	**Students demonstrate mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.**
Mathematics Achievement Level Descriptors **4.3 <u>Measurement</u>:** Develop an understanding of area and determine the areas of two-dimensional shapes.	• Inconsistently recognize area as an attribute of two- dimensional regions or inconsistently recognize a square that is one unit on a side as the standard unit for measuring area. • Inconsistently identify a standard unit for measuring area. • Use different-sized units of area to cover a shape with gaps and/or overlaps. • Begin to see the area model of multiplication or begin to observe area measure as multiplication. • Inconsistently find the area of common shapes that can be subdivided into rectangles. • Inconsistently find perimeters or areas of rectangles or squares. • Inconsistently calculate perimeters and areas of given rectangles.	• Recognize area as an attribute of two-dimensional regions or recognize a square that is one unit on a side as the standard unit for measuring area. • Partially determine area by finding the total number of same-sized units of area that cover a shape without gaps or overlaps. • Sometimes determine the appropriate units, strategies, or tools to solve problems that involve estimating or measuring area. • Connect area measure to the area model used to represent multiplication. • Find the areas of common shapes that can be subdivided into rectangles. • Solve problems involving perimeters or areas of rectangles and squares. • Calculate perimeter and area of given rectangles and identifies rectangles with equal perimeters or equal areas.	• Recognize area as an attribute of two-dimensional regions and recognize a square that is one unit on a side as the standard unit for measuring area. • Determine area by finding the total number of same-sized units of area that cover a shape without gaps or overlaps. • Determine the appropriate units, strategies, and tools to solve problems that involve estimating and/or measuring area. • Connect area measure to the area model used to represent multiplication and use this to express the formula for area of a rectangle. • Find the area of complex shapes that can be subdivided into rectangles. • Solve problems involving perimeters and areas of rectangles and squares. • Recognize that rectangles with the same area can have different perimeters and that rectangles with the same perimeter can have different areas.	• Recognize area as an attribute of two-dimensional regions and recognize a square that is one unit on a side as the standard unit for measuring area in complex situations. • Determine area by finding the total number of same-sized units of area that cover an irregular shape without gaps or overlaps. • Determine and justify appropriate units, strategies, and tools to solve problems that involve estimating and/or measuring area. • Connect area measure to the area model used to represent multiplication and explains how this justifies the formula for area of a rectangle. • Determine the areas of complex shapes that can be subdivided into rectangles and can explain their thinking. • Solve problems involving perimeters and areas of rectangles and squares and justify their thinking. • Recognize, generalize, and justify that rectangles with the same area can have different perimeters and that rectangles with the same perimeter can have different areas.

* **Please note:** Names for the proposed levels are currently under consideration.

Oregon Mathematics Achievement Level Descriptors – Grade 5

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
General Policy Definitions (Apply to all grades and all subjects)	**Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.**
Mathematics Policy Definitions (Apply to all grades)	**Students demonstrate limited mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.**	**Students demonstrate mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain their steps.**	**Students demonstrate mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.**	**Students demonstrate mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.**
Mathematics Achievement Level Descriptors **5.1** **<u>Number and Operations</u> and <u>Data Analysis</u>**: Develop an understanding of and fluency with addition and subtraction of fractions and decimals.	• Begin to use a given fraction model to represent addition or subtraction with unlike denominators that are multiples of each other. • Use a given decimal model to add or subtract decimals (to the tenths). • Inconsistently use appropriate strategies to estimate decimal sums and differences. • Begin to use an efficient procedure for adding and subtracting decimals or adding and subtracting fractions. • Solve simple problems involving the addition **or** subtraction of fractions **or** decimals. • Inconsistently use ordered pairs on coordinate graphs to specify locations. • Inconsistently construct double bar graphs, line, or circle graphs to solve problems involving fractions or decimals.	• Use a given fraction model to represent addition or subtraction with unlike denominators. • Use a given decimal model, place value, **or** number properties to add and subtract decimals (to the thousandths). • Use appropriate strategies to estimate fraction **or** decimal sums **and/or** differences. • Use an efficient procedure for adding and subtracting fractions **or** decimals. • Solve simple problems involving the addition **and** subtraction of fractions **or** decimals. • Use ordered pairs on coordinate graphs to specify locations. • Construct double bar, line, **or** circle graphs to solve problems involving fractions **or** decimals.	• Use fraction models to represent the addition and subtraction of fractions with unlike denominators. • Use decimal models, place value, **and** number properties to add and subtract decimals (to the thousandths). • Select and use appropriate strategies to estimate fraction **and** decimal sums **and** differences. • Use efficient procedures for adding and subtracting fractions **and** decimals. • Solve problems involving the addition **and** subtraction of fractions **and** decimals. • Use ordered pairs on coordinate graphs to specify locations and describe paths. • Construct and analyze double bar, line, **and** circle graphs to solve problems involving fractions **and** decimals.	• Construct multiple fraction models to represent addition and subtraction of fractions with unlike denominators. • Use decimal models, place value, and number properties to add and subtract decimals (to the thousandths) and explain their reasoning. • Select and use appropriate strategies to estimate a mixture of fraction and decimal sums and differences. • Use efficient procedures for adding and subtracting fractions and decimals and justify why the procedures work. • Solve non-routine problems involving the addition and subtraction of fractions and decimals. • Use ordered pairs on coordinate graphs to specify locations and describe paths in context. • Construct and analyze double bar, line, and circle graphs to solve problems involving fractions and decimals, in context.

* **Please note:** Names for the proposed levels are currently under consideration.

Oregon Mathematics Achievement Level Descriptors – Grade 5

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
General Policy Definitions (Apply to all grades and all subjects)	**Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.**
Mathematics Policy Definitions (Apply to all grades)	**Students demonstrate limited mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.**	**Students demonstrate mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain their steps.**	**Students demonstrate mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.**	**Students demonstrate mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.**
Mathematics Achievement Level Descriptors **5.2** **Number and Operations and Algebra**: Develop an understanding of and fluency with division of whole numbers.	• Inconsistently apply understanding of one model for division or the relationship of division to multiplication to solve problems. • Inconsistently apply properties of operations to solve problems involving division. • Inconsistently use a given estimation strategy for division to calculate mentally when computing with whole numbers. • Inconsistently use a given accurate, efficient, or generalizable methods to find quotients for multi-digit division problems. • Begin to develop fluency with efficient procedures for dividing whole numbers. • Inconsistently determine an appropriate form of the quotient in a problem situation.	• Apply understanding of models for division **or** the relationship of division to multiplication to solve problems. • Apply properties of operations to solve problems involving division. • Use a given estimation strategy for division to calculate mentally when computing with whole numbers. • Use a given accurate, efficient, or generalizable method to find quotients for multi-digit division problems. • Apply efficient procedures for dividing whole numbers. • Determine an appropriate form of the quotient **and/or** interpret the remainder in a problem situation.	• Apply understanding of models for division **and** the relationship of division to multiplication to solve problems. • Apply concepts of place value and the properties of operations to solve problems involving division. • Select and use appropriate estimation strategies for division to calculate mentally based on the problem situation when computing with whole numbers. • Develop and use accurate, efficient, and generalizable methods to find quotients for multi-digit division problems. • Develop fluency with efficient procedures for dividing whole numbers. • Determine the most appropriate form of the quotient **and** interpret the remainder in a problem situation.	• Apply understanding of models for division and the relationship of division to multiplication to solve non-routine problems. • Apply and justify concepts of place value and the properties of operations to solve problems involving division. • Select and use appropriate estimation strategies for division to calculate mentally based on the problem situation when computing with whole numbers and can justify why a strategy was chosen. • Develop, justify, and use accurate, efficient, and generalizable methods to find quotients for multi-digit division problems. • Develop fluency with efficient procedures for dividing whole numbers and justify why the procedures work on the basis of place value and number properties. • Determine the most appropriate form of the quotient and interpret the remainder in a complex problem situation.

* **Please note:** Names for the proposed levels are currently under consideration.

Oregon Mathematics Achievement Level Descriptors – Grade 5

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
General Policy Definitions (Apply to all grades and all subjects)	**Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.**
Mathematics Policy Definitions (Apply to all grades)	**Students demonstrate limited mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.**	**Students demonstrate mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain their steps.**	**Students demonstrate mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.**	**Students demonstrate mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.**
Mathematics Achievement Level Descriptors **5.3 Geometry, Algebra, and Measurement**: Analyze 3-D shapes, including volume and surface area	• Inconsistently identify **or** classify triangles by their angles **or** sides. • Inconsistently apply given formulas for the areas of triangles and parallelograms. • Inconsistently describe three-dimensional shapes by the number of edges, faces and/or vertices. • Inconsistently recognize volume as an attribute of three-dimensional space. • Inconsistently determine volume by finding the total number unit cubes that fill a three-dimensional shape without gaps or overlaps. • Inconsistently recognize a cube that is one unit on an edge as the standard unit for measuring volume. • Inconsistently determine the appropriate units, strategies, or tools for solving problems that involve measuring volume. • Inconsistently decompose three-dimensional shapes and find volumes of rectangular prisms. • Inconsistently, identify or measures necessary attributes of shapes to use area, surface area, or volume formulas to solve problems, when given the dimensions and formula.	• Identify and classify triangles by their angles or sides. • Apply given formulas for the areas of triangles and parallelograms. • Often describe three-dimensional shapes by the number of edges, faces, and/or vertices. • Recognize volume as an attribute of three-dimensional space for common figures (e.g. prism, pyramid, cone, cylinder, sphere). • Determine volume by finding the total number of unit cubes that fill a three-dimensional shape without gaps or overlaps. • Often recognize a cube that is one unit on an edge as the standard unit for measuring volume. • Determine the appropriate units, strategies, or tools for solving problems that involve estimating or measuring volume. • Decompose three-dimensional shapes and find volumes of rectangular prisms. • Identify and measure necessary attributes of shapes to use area, surface area, or volume formulas to solve problems, when given the dimensions and formula.	• Identify and classify triangles by their angles and sides. • Find relationships among the formulas for the areas of triangles and parallelograms. • Describe three-dimensional shapes by the number of edges, faces, and/or vertices as well as types of faces. • Recognize volume as an attribute of three-dimensional space. • Determine volume by finding the total number of same-sized units of volume that fill a three-dimensional shape without gaps or overlaps. • Recognize a cube that is one unit on an edge as the standard unit for measuring volume. • Determine the appropriate units, strategies, and tools for solving problems that involve estimating or measuring volume. • Decompose three-dimensional shapes and find surface areas and volumes of triangular and rectangular prisms. • Identify and measure necessary attributes of shapes to use area, surface area, and volume formulas to solve problems, when given all dimensions.	• Identify and classify triangles by their angles and sides in context. • Find and justify relationships among the formulas for the areas of triangles and parallelograms. • Describe three-dimensional shapes by the number of edges, faces, and/or vertices as well as types of faces, from multiple perspectives. • Recognize volume as an attribute of three-dimensional space in context. • Determine volume by finding the total number of same-sized units of volume that fill a three-dimensional shape without gaps or overlaps or makes a shape with given volume. • Recognize a cube that is one unit on an edge as the standard unit for measuring volume and can apply it. • Determine the appropriate units, strategies, and tools for solving complex problems that involve estimating or measuring volume and can explain why it was chosen. • Decompose three-dimensional shapes and find surface areas and volumes of triangular and rectangular prisms, in context. • Identify and measure necessary attributes of shapes to use area, surface area, and volume formulas to solve problems, when there are missing parts of the dimensions.

* **Please note:** Names for the proposed levels are currently under consideration.

Oregon Mathematics Achievement Level Descriptors – Grade 6

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
Policy Definitions (Apply to all grades and all subjects)	**Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.**
Math Descriptors (Apply to all grades)	**Students demonstrate limited mastery of mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.**	**Students demonstrate partial mastery of mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain some of their steps.**	**Students demonstrate mastery of mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.**	**Students demonstrate mastery of mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.**
Mathematics Achievement Level Descriptors **6.1 <u>Number and Operations</u>:** Develop an understanding of and fluency with multiplication and division of fractions and decimals.	• Inconsistently use given appropriate strategies to estimate fraction and decimal products and quotients. • Inconsistently use given strategies for solving problems with multiplication and division of fractions and decimals. • Inconsistently apply given efficient procedures for multiplying and dividing fractions **or** decimals. • Inconsistently apply the inverse relationship between multiplication and division of fractions. • Inconsistently apply the properties of operations to simplify calculations. • Inconsistently use the relationship between common decimals and fractions to solve problems.	• Use given appropriate strategies to estimate fraction and decimal products and quotients. • Use given strategies for solving problems with multiplication and division of fractions and decimals. • Use given efficient procedures for multiplying and dividing fractions **or** decimals. • Often apply the inverse relationship between multiplication and division of fractions. • Apply the properties of operations, including simplifying calculations with fractions **or** simplifying calculations with decimals. • Often use the relationship between common decimals and fractions to solve problems, including measurement.	• Select and use appropriate strategies to estimate fraction and decimal products and quotients. • Use and analyze strategies for solving problems with multiplication and division of fractions and decimals. • Use efficient procedures for multiplying and dividing fractions **and** decimals. • Apply the inverse relationship between multiplication and division of fractions. • Apply the properties of operations, including simplifying calculations with fractions **and** simplifying calculations with decimals. • Use the relationship between common decimals and fractions to solve problems, including measurement.	• Select and use appropriate strategies to estimate fraction and decimal products and quotients in non-routine contexts. • Use, analyze, and justify a variety of strategies for solving problems with multiplication and division of fractions and decimals. • Use efficient procedures for multiplying and dividing fractions **and** decimals and justify why they work. • Apply the inverse relationship between multiplication and division of fractions and justify why it works. • Apply the properties of operations, including simplifying calculations involving a combination of fractions and decimals. • Apply the relationship between common decimals and fractions to solve non-routine problems, including measurement.

* **Please note:** Names for the proposed levels are currently under consideration.

Oregon Mathematics Achievement Level Descriptors – Grade 6

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
Policy Definitions (Apply to all grades and all subjects)	**Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.**
Math Descriptors (Apply to all grades)	**Students demonstrate limited mastery of mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.**	**Students demonstrate partial mastery of mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain some of their steps.**	**Students demonstrate mastery of mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.**	**Students demonstrate mastery of mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.**
Mathematics Achievement Level Descriptors **6.2 <u>Number and Operations</u> and <u>Probability</u>**: Connect ratio, rate, and percent to multiplication and division.	• Begin to apply the meaning of ratio, rate, or percent to solve problems. • Inconsistently determine decimal **or** percent equivalents for common fractions, including approximations. • Begin to understand the meaning of probability and inconsistently represents probabilities as ratios, decimals, **or** percents. • Inconsistently determine simple experimental **or** theoretical probabilities. • Begin to understand the concept of pi as the ratio of the circumference of a circle to its diameter.	• Apply the meaning of ratio, rate, or percent to solve problems. • Determine decimal **or** percent equivalents for common fractions, including approximations. • Understand the meaning of probability and represent probabilities as ratios, decimals, **or** percents. • Determine simple experimental **or** theoretical probabilities. • Partially understand the concept of pi as the ratio of the circumference of a circle to its diameter.	• Analyze, and apply the meaning of ratio, rate, and percent to solve problems. • Determine decimal **and** percent equivalents for common fractions, including approximations. • Understand the meaning of probability and represent probabilities as ratios, decimals, **and** percents. • Determine simple probabilities, both experimental **and** theoretical. • Understand the concept of pi as the ratio of the circumference of a circle to its diameter.	• Analyze, and apply the meaning of ratio, rate, and percent to solve non-routine problems. • Determine and justify equivalent decimals, percents **and** common fractions, including approximations. • Use the meaning of probability and represent probabilities as ratios, decimals, **and** percents to solve non-routine problems. • Determine simple probabilities, both experimental **and** theoretical, with outcomes not equally likely. • Apply the concept of pi as the ratio of the circumference of a circle to its diameter to solve problems.

* **Please note:** Names for the proposed levels are currently under consideration.

Oregon Mathematics Achievement Level Descriptors – Grade 6

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
Policy Definitions **(Apply to all grades and all subjects)**	**Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.**
Math Descriptors **(Apply to all grades)**	**Students demonstrate limited mastery of mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.**	**Students demonstrate partial mastery of mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain some of their steps.**	**Students demonstrate mastery of mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.**	**Students demonstrate mastery of mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.**
Mathematics Achievement Level Descriptors **6.3** **Algebra**: Write, interpret, and use mathematical expressions and equations.	• Inconsistently use the order of operations to simplify expressions. • Begin to understand the meanings **or** uses of variables. • Inconsistently evaluate **or** use expressions and formulas to solve problems. • Inconsistently identify equivalent expressions. • Inconsistently represent **or** determine relationships and patterns using tables, graphs, words **or**, when possible, symbols. • Begin to understand that the solutions of an equation are the values of the variables that make the equation true. • Inconsistently solve one-step equations by using number sense **and/or** properties of operations.	• Use the order of operations to simplify expressions that may include exponents **or** grouping symbols. • Begin to understand the meanings **and** uses of variables. • Evaluate **and** use expressions and formulas to solve problems. • Often able to identify **and** represent equivalent expressions. • Represent, analyze, **or** determine relationships and patterns using tables, graphs, words **or**, when possible, symbols. • Often recognize that the solutions of an equation are the values of the variables that make the equation true. • Solve simple one-step equations by using number sense, properties of operations, **or** the idea of maintaining equality on both sides of an equation.	• Use the order of operations to simplify expressions that may include exponents **and** grouping symbols. • Understand the meanings **and** uses of variables. • Write, evaluate, **and** use expressions and formulas to solve problems. • Identify **and** represent equivalent expressions (e.g., different ways to see a pattern). • Represent, analyze, **and** determine relationships and patterns using tables, graphs, words **and**, when possible, symbols. • Recognize that the solutions of an equation are the values of the variables that make the equation true. • Solve one-step equations by using number sense, properties of operations, **and** the idea of maintaining equality on both sides of an equation.	• Use the order of operations to simplify expressions that include both exponents and grouping symbols and explain the reasoning. • Understand the meanings and uses of variables to solve non-routine problems. • Write, evaluate, **and** use expressions and formulas to solve more complex problems. • Identify **and** represent complex equivalent expressions. • Generalize patterns to the n^{th} term using tables, graphs, words **and** when possible, symbols. • Apply the knowledge that solutions of a complex equation are the values of the variables that make the equation true. • Solve one-step equations involving fractions **and/or** decimals.

* **Please note:** Names for the proposed levels are currently under consideration.

Oregon Mathematics Achievement Level Descriptors – Grade 7

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
Policy Definitions (Apply to all grades and all subjects)	**Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.**
Math Descriptors (Apply to all grades)	**Students demonstrate limited mastery of mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.**	**Students demonstrate partial mastery of mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain some of their steps.**	**Students demonstrate mastery of mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.**	**Students demonstrate mastery of mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.**
Mathematics Achievement Level Descriptors **7.1** **<u>Number and Operations</u> and <u>Algebra</u>**: Develop an understanding of operations on all rational numbers and solving linear equations.	• Inconsistently apply given models (including everyday contexts), strategies, **or** procedures to compute with integers. • Inconsistently estimate solutions **or** solve problems involving positive and negative rational numbers. • Inconsistently apply properties of rational numbers and algebra to write and solve linear equations in one variable.	• Apply given models (including everyday contexts), strategies, **or** procedures to compute with integers. • Estimate solutions **or** solve problems involving positive and negative rational numbers. • Apply properties of rational numbers and algebra to write and solve linear equations in one variable.	• Develop, analyze, and apply models (including everyday contexts), strategies, **and** procedures to compute with integers, with an emphasis on negative integers. • Extend knowledge of both positive and negative rational numbers to estimate solutions **and** solve problems. • Apply properties of rational numbers and algebra to write and solve linear equations in one variable and explain steps.	• Compute with integers and applies efficient strategies to analyze models (including new and complex situations). • Integrate knowledge of both positive and negative rational numbers to estimate solutions and fluently solve problems, and justify strategies. • Apply properties of rational numbers and algebra to write and solve complex linear equations in one variable and justify steps clearly.

* **Please note:** Names for the proposed levels are currently under consideration.

Oregon Mathematics Achievement Level Descriptors – Grade 7

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
Policy Definitions (Apply to all grades and all subjects)	**Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.**
Math Descriptors (Apply to all grades)	**Students demonstrate limited mastery of mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.**	**Students demonstrate partial mastery of mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain some of their steps.**	**Students demonstrate mastery of mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.**	**Students demonstrate mastery of mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.**
Mathematics Achievement Level Descriptors **7.2 <u>Number and Operations</u>, <u>Algebra</u> and <u>Geometry</u>**: Develop an understanding of and apply proportionality, including similarity**.**	• Inconsistently identify **or** represent proportional relationships with coordinate graphs, tables **or** equations. • Inconsistently solve problems involving ratio, proportion, percent, simple probability, scale factors, similarity **or** congruence. • Inconsistently convert among different units of measurement, given conversion factors, to solve problems. • Inconsistently recognize how a change in one measure (e.g., length, area, volume) affects another.	• Identify **and** represent proportional relationships with coordinate graphs, tables **or** equations. • Solve problems involving ratio, proportion, percent, simple probability, scale factors, similarity, **or** congruence. • Convert among different units of measurement, given conversion factors, to solve problems. • Recognize how a change in one measure (e.g., length, area, volume) affects another.	• Identify and represent proportional relationships (including inverse proportionality) with coordinate graphs, tables, and equations. Identify unit rate as the slope of the related line. • Apply ratio and proportionality to solve problems involving ratio, proportion, percent, simple probability, scale factors, similarity **and** congruence. • Convert among different units of measurement to solve rate problems and explain process. • Apply scale factor to analyze how a change in one measure (e.g., length, area, volume) affects another.	• Integrate knowledge of and explain proportional relationships (Including inverse proportionality) with coordinate graphs, tables and equations. Interpret unit rate as the slope of the related line. • Apply proportionality and integrate knowledge of ratios to solve complex problems including percent, probability, scale factors, similarity **and** congruence and justify thinking. • Convert among different units to solve multi-step problems, including rates, and justify results. • Integrate knowledge of measurement (length, area, volume) and scale factor to analyze and generalize how a change in one measure affects others.

* **Please note:** Names for the proposed levels are currently under consideration.

Oregon Mathematics Achievement Level Descriptors – Grade 7

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
Policy Definitions (Apply to all grades and all subjects)	**Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.**
Math Descriptors (Apply to all grades)	**Students demonstrate limited mastery of mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.**	**Students demonstrate partial mastery of mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain some of their steps.**	**Students demonstrate mastery of mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.**	**Students demonstrate mastery of mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.**
Mathematics Achievement Level Descriptors **7.3 <u>Measurement</u> and <u>Geometry</u>**: Develop an understanding of and use formulas to determine surface area and volume.	• Inconsistently use a given model to explain the formulas for the circumference **or** area of circles, surface area of pyramids **or** cylinders, **or** volume of pyramids, cylinders, **or** cones. • Inconsistently use a given estimate of π to estimate or calculate the circumference **or** area of circles. • Inconsistently apply given formulas for the areas of different polygons when determining surface area. • Inconsistently solve problems involving surface areas of pyramids **or** cylinders **or** volumes of pyramids, cylinders, **or** cones. Inconsistently estimate **or** compute area **or** volume of irregular shapes.	• Select and use a given model to explain formulas for the circumference **or** area of circles; surface area of pyramids **or** cylinders **or** volume of pyramids, cylinders, **or** cones. • Use a given estimate of π to estimate or calculate the circumference **and** area of circles. • Apply given formulas for the areas of different polygons when determining surface area. • Solve problems involving surface areas of pyramids **or** cylinders **or** volumes of pyramids, cylinders, **or** cones. Estimate **or** compute area or volume of irregular shapes.	• Use models to explain the formulas for the circumference **and** area of circles; surface area of pyramids **and** cylinders; **and** the volume of pyramids, cylinders, **and** cones. • Select and use estimates of π to estimate or calculate the circumference **and** area of circles. • Apply relationships among formulas for the areas of different polygons when determining surface area. • Solve problems involving surface areas of pyramids **and** cylinders **and** volumes of pyramids, cylinders, **and** cones. Estimate **and** compute area and volume of complex or irregular shapes by dividing them into basic shapes.	• Use models to explain and justify the formulas for the circumference **and** area of circles; surface area of pyramids **and** cylinders; **and** the volume of pyramids, cylinders, **and** cones. • Select and use estimates of π to estimate or calculate the circumference **and** area of circles and justify the appropriateness of the estimate. • Apply and justify strategies utilizing relationships among formulas for the areas of different polygons when determining surface area. • Apply strategies to solve complex problems involving surface areas of pyramids **and** cylinders **and** volumes of pyramids. Estimate **and** compute area **and** volume of complex or irregular shapes and analyze strategies and solutions.

* **Please note:** Names for the proposed levels are currently under consideration.

Oregon Mathematics Achievement Level Descriptors – Grade 8

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
Policy Definitions (Apply to all grades and all subjects)	**Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.**
Math Descriptors (Apply to all grades)	**Students demonstrate limited mastery of mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.**	**Students demonstrate partial mastery of mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain some of their steps.**	**Students demonstrate mastery of mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.**	**Students demonstrate mastery of mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.**
Mathematics Achievement Level Descriptors **8.1** **Algebra**: Analyze and represent linear functions, and solve linear equations and systems of linear equations.	• Inconsistently, translate among simple contextual, verbal, tabular, graphical, **or** algebraic representations of linear functions. • Inconsistently find the slope of a line given routine representations. • Inconsistently identify **or** determine the x **or** y intercept of linear relationships. • Inconsistently use linear equations to solve routine problems in one variable. • Inconsistently use informal strategies (e.g., graphs or tables) to solve systems of linear equations in two variables with integer coefficients.	• Translate among routine contextual, verbal, tabular, graphical, **or** algebraic representations of linear functions. • Find the slope of a line given routine representations. • Identify **or** determine the x **and** y intercept of linear relationships. • Use linear equations to solve routine problems and use them to make predictions. • Use informal strategies (e.g., graphs or tables) to solve systems of linear equations in two variables.	• Translate among contextual, verbal, tabular, graphical, **and** algebraic representations of linear functions. • Determine slope of a line and identify the slope as a constant rate of change from multiple representations. • Identify **and** interpret the intercepts of linear relationships in different representations, **and** recognize a proportional relationship (y = kx). • Select and use linear functions and equations to represent and analyze problems to make predictions and inferences. • Use informal strategies (e.g., graphs or tables) to solve problems involving systems of linear equations in two variables; relate the system to a pair of lines that are intersecting, parallel, or the same line.	• Translate among non-routine contextual, verbal, tabular, graphical **and** algebraic representations of linear functions. • Interpret the slope of a line as a constant rate of change from multiple representations and justify reasoning. • Identify **and** interpret continuity and discreteness of linear relationships in different representations, **and** recognize a proportional relationship (y = kx). • Select and use linear functions and equations to represent and analyze complex problems to make predictions and inferences. • Use informal strategies (e.g., graphs or tables) to solve problems involving systems of linear equations in two variables; relate the system to a pair of lines that are intersecting, parallel, or the same line; and explain strategies.
Proposed	**Does Not Yet Meet***	**Nearly Meets***	**Meets***	**Exceeds***

* **Please note:** Names for the proposed levels are currently under consideration.

Oregon Mathematics Achievement Level Descriptors – Grade 8

The achievement level descriptors are cumulative.

Levels				
Policy Definitions (Apply to all grades and all subjects)	**Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.**
Math Descriptors (Apply to all grades)	**Students demonstrate limited mastery of mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.**	**Students demonstrate partial mastery of mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain some of their steps.**	**Students demonstrate mastery of mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.**	**Students demonstrate mastery of mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.**
Mathematics Achievement Level Descriptors **8.2** **Data Analysis and Algebra**: Analyze and summarize data sets.	• Inconsistently organize and create simple data displays (e.g., histograms, box-and-whisker plots, line plots, and scatter plots) to answer questions. • Inconsistently use measures of center and spread to compare two data sets. • Inconsistently interpret and analyze displays of data **or** descriptive statistics. • Inconsistently use sample data to make predictions regarding a population and to estimate the likelihood of future events • Inconsistently identify claims based on data or evaluate the reasonableness of a given claim.	• Organize and create data displays (e.g., histograms, box-and-whisker plots, line plots, and scatter plots) to pose **or** answer questions. • Use measures of center and spread to summarize **or** compare **two** data sets. • Interpret and analyze displays of data **or** descriptive statistics. • Use sample data to make predictions regarding a population or estimate the likelihood of future events. • Identify claims based on data **or** evaluate the reasonableness of a given claim.	• Select, organize, and create data displays (e.g., histograms, box-and-whisker plots, line plots, and scatter plots) to pose **and** answer questions, and explain the choice of display. • Use measures of center and spread to summarize **and** compare data sets. • Interpret and analyze displays of data **and** descriptive statistics. • Use sample data to make predictions about a population in order to estimate the likelihood of future events. Evaluate the reasonableness of the predictions. • Identify claims based on statistical data **and** evaluate the reasonableness of those claims.	• Select, organize and create data displays (e.g., histograms, box-and-whisker plots, line plots, and scatter plots) to pose **and** answer questions, and justify the reasonableness of choice of display. • Use measures of center and spread to summarize and compare complex data sets in a variety of formats. • Interpret and analyze displays of complex data **and** descriptive statistics. • Use complex sample data to make predictions about a population In order to estimate likelihood of future events. Evaluate the reasonableness of the predictions by justifying the strategy used. • Identify claims based on statistical data and evaluate the reasonableness of those claims with multiple examples.
Proposed Levels	**Does Not Yet Meet***	**Nearly Meets***	**Meets***	**Exceeds***
Policy	**Students do not demonstrate mastery**	**Students demonstrate partial**	**Students demonstrate mastery of**	**Students demonstrate a deep**

* **Please note:** Names for the proposed levels are currently under consideration.

Oregon Mathematics Achievement Level Descriptors – Grade 8

The achievement level descriptors are cumulative.

Policy Definitions (Apply to all grades and all subjects)	**Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.**
Math Descriptors (Apply to all grades)	**Students demonstrate limited mastery of mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.**	**Students demonstrate partial mastery of mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain some of their steps.**	**Students demonstrate mastery of mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.**	**Students demonstrate mastery of mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.**
Mathematics Achievement Level Descriptors **8.3 Geometry and Measurement**: Analyze two- and three-dimensional spaces and figures by using distance and angle.	• Inconsistently use properties of parallel lines, transversals, and angles to find missing sides and angles **or** to solve problems including similarity and congruence. • Inconsistently use models to show a triangle has an interior angle sum of 180^0**, or** that a quadrilateral has an interior angle sum of 360^0, **or** to solve for a missing angle when the angles are given as real numbers. • Inconsistently use the Pythagorean Theorem to find the hypotenuse of a right triangle **or** to find the distance between two points on a coordinate plane. • Inconsistently use perfect squares to estimate square roots.	• Use properties of parallel lines, transversals, and angles to find missing sides and angles **or** to solve problems including similarity and congruence. • Use models to show a triangle has an interior angle sum of 180^0**, and** that a quadrilateral has an interior angle sum of 360^0, **and** to solve for a missing angle when the angles are given as real numbers. • Use the Pythagorean Theorem to find a missing side in a right triangle **or** to find the distance between points on a coordinate plane. • Use perfect squares to estimate square roots.	• Select and use properties of parallel lines, transversals, and angles to find missing sides and angles expressed in algebraic terms **and** to solve problems including similarity and congruence. • Use models to show a triangle has an interior angle sum of 180^0, **and** that a quadrilateral has an interior angle sum of 360^0, **and** to solve for a missing angle(s) when the angles involve variable expressions and/or real numbers. • Select and use the Pythagorean Theorem to find a missing side in a right triangle **and** to find the distance between points on a coordinate plane. • Estimate square roots using referents and models. (e.g., perfect squares, number lines, or coordinate	• Use properties of parallel lines, transversals, and angles to find missing sides and angles expressed in algebraic terms often requiring multiple steps **and** to solve problems including similarity and congruence. • Use models to show and justify a triangle has an interior angle sum of 180^0, **and** that a quadrilateral has an interior angle sum of 360^0, **and** to solve for a missing angle(s) where a multi-step equation could be applied. • Apply the Pythagorean Theorem to find a missing side in a right triangle in a multi-triangle setting which requires several applications of the theorem. Extend knowledge of the theorem to find distances in three–dimensional settings • Estimate square roots using referents and models, and justify the strategy used.

* **Please note:** Names for the proposed levels are currently under consideration.

Mathematics Oregon Achievement Level Descriptors – High School

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
General Policy Definitions (Apply to all grades and all subjects)	**Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.**
Mathematics Policy Definitions (Apply to all grades)	**Students demonstrate limited mastery of mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.**	**Students demonstrate partial mastery of mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain some of their steps.**	**Students demonstrate mastery of mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.**	**Students demonstrate mastery of mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.**
Mathematics Achievement Level Descriptors **High School Algebra**	• Sometimes perform computations with real numbers accurately. Inconsistently order or locate real numbers on a number line. • Inconsistently simplify expressions involving real numbers and/or algebraic symbols. • Inconsistently solve linear equations given the equation. Identify slope from a graph. Identify solutions of systems of linear equations using given tables or graphs. • Inconsistently identify and graph linear, quadratic, and exponential functions using tables, graphs, and equations. Sometimes find the domain and range given the graph. • Inconsistently solve quadratic equations **or** understand the meaning of the solutions.	• Perform computations with real numbers accurately. Order **or** locate real numbers on a number line. • Evaluate and simplify basic expressions involving real numbers and/or algebraic symbols. (This excludes factoring beyond numeric GCF.) • Solve problems involving linear equations using tables, graphs, **or** symbols. Determine slope. Sometimes solve linear inequalities and graph the solution. • Identify and graph linear, quadratic, and exponential functions using tables, graphs, and equations. Identify the domain and range from a graph. • Solve routine quadratic equations. Identify the axis of symmetry graphically.	• Apply efficient strategies for performing computations with real numbers. Order **and** locate real numbers on a number line. • Consistently evaluate, create, and determine equivalent expressions involving real numbers and /or algebraic symbols. • Represent linear relationships and solve problems involving systems of linear equations using tables, graphs, **and** symbols. Solve linear inequalities and systems of linear inequalities and graph the solution sets. Work with function notation. • Distinguish between, manipulate, and apply linear, quadratic, and exponential functions in routine and non-routine situations using tables, graphs, and equations. Identify the domain and range from a table, graph, or equation. • Solve quadratic equations graphically and algebraically and explain the relationship between the two strategies. Determine the vertex and axis of symmetry graphically and algebraically.	• Fluently apply efficient strategies for performing computations with real numbers. Justify the result using mathematical properties. • Consistently evaluate, create, justify, and determine equivalent expressions involving real numbers and/or algebraic symbols. • Represent, solve, interpret the meaning of, and convert among representations of linear equations and inequalities, including systems of linear inequalities. • Distinguish between, manipulate, and apply linear, quadratic, and exponential functions. Identify the domain and range from a table, graph, equation, or a context. Make inferences or predictions, using tables, graphs, and equations. • Solve quadratic equations graphically and algebraically and communicate why a method was chosen and its relationship to the solution.

***Please note:** Names for the proposed levels are currently under consideration.

8/17/2010 Draft for Review

Mathematics Oregon Achievement Level Descriptors – High School

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
General Policy Definitions (Apply to all grades and all subjects)	**Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.**
Mathematics Policy Definitions (Apply to all grades)	**Students demonstrate limited mastery of mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.**	**Students demonstrate partial mastery of mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain some of their steps.**	**Students demonstrate mastery of mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.**	**Students demonstrate mastery of mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.**
Mathematics Achievement Level Descriptors **High School Geometry**	• Inconsistently apply properties of two and three dimensional figures. • Inconsistently determine area, surface area, and/or volume given dimensions. Inconsistently solve for missing dimensions. • Inconsistently use theorems **or** solve problems related to congruent and similar figures in two and three dimensions. • Inconsistently solve problems using coordinate geometry when the two-dimensional figures have numeric coordinates. • Inconsistently identify and perform single transformations of geometric figures on a coordinate plane.	• Identify and compare properties of two and three dimensional figures. • Determine area, surface area, and/or volume given dimensions. Often solve for missing dimensions. • Use some theorems **and** solve problems related to congruent and similar figures in two- and three-dimensions. • Use coordinate geometry to solve problems involving two-dimensional figures with numeric coordinates. • Identify and perform single transformations of geometric figures on a coordinate plane.	• Understand and apply properties of geometric figures and relationships between figures in two and three dimensions. • Determine area, surface area, and/or volume. Sole for missing dimensions. Solve related context-based problems. • Consistently integrate the use of theorems and/or algebraic equations to solve problems related to congruent and similar figures in two and three dimensions, including right triangle trigonometry. • Use coordinate geometry to justify properties, explain conjectures, and solve problems involving two-dimensional figures with numeric coordinates. • Identify and perform single and composite transformations (2) of geometric figures on a coordinate plane.	• Understand and apply properties of geometric figures and analyze relationships between figures in two and three dimensions. • Determine area, surface area, and/or volume for non-routine figures. Solve for missing dimensions using multiple equations. • Consistently and efficiently integrate the use of theorems and/or algebraic equations to solve and justify relationships between congruent and similar figures in two and three dimensions. • Use coordinate geometry to justify properties, explain conjectures, and solve problems involving two-dimensional figures with numeric and symbolic coordinates. • Fluently identify and perform single and composite transformations (more than 2) of geometric figures on a coordinate plane.

***Please note:** Names for the proposed levels are currently under consideration.

Mathematics Oregon Achievement Level Descriptors – High School

The achievement level descriptors are cumulative.

Proposed Levels	Does Not Yet Meet*	Nearly Meets*	Meets*	Exceeds*
General Policy Definitions (Apply to all grades and all subjects)	**Students do not demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate partial mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate mastery of grade-level knowledge and skills required for proficiency.**	**Students demonstrate a deep knowledge of concepts and procedures beyond the proficient level.**
Mathematics Policy Definitions (Apply to all grades)	**Students demonstrate limited mastery of mathematical knowledge and skills through the direct application of a concept or procedure in simplified and familiar situations with occasional success.**	**Students demonstrate partial mastery of mathematical knowledge and skills through the direct application of concepts and procedures in familiar situations with regular success. They are able to explain some of their steps.**	**Students demonstrate mastery of mathematical knowledge and skills through selecting from an assortment of strategies and integrating concepts and procedures in a variety of situations with consistent success. They are able to explain steps and procedures.**	**Students demonstrate mastery of mathematical knowledge and skills through the use of multiple reasoning strategies and apply them in new and complex situations with consistent success. They are able to analyze their strategies and solutions.**
Mathematics Achievement Level Descriptors **High School Statistics**	• Inconsistently identify survey methods and evaluate data-based reports. • Inconsistently compare and draw conclusions about independent data sets and data in graphical displays, including central tendencies and range. • Inconsistently compute and interpret simple theoretical and experimental probabilities. Sometimes determine the sample space of a probability experiment.	• Identify the strengths and limitations of survey methods and evaluate data-based reports using given data displays and analyses. • Compare and draw conclusions about independent data sets and data in graphical displays, including central tendencies, range, and line of best fit. • Compute and interpret simple theoretical and experimental probabilities. Often determine the sample space of a probability experiment.	• Determine and analyze survey methods and evaluate data-based reports. • Compare, analyze, draw conclusions about, and interpret independent data sets and data in graphical displays, including central tendencies, range, and line of best fit. • Compute, analyze, and interpret theoretical and experimental probabilities. Determine the sample space of a probability experiment.	• Determine and analyze survey methods and evaluate data-based reports and communicate appropriate suggestions for improvement. • Compare, analyze, draw conclusions about, and interpret independent data sets and data in graphical displays, including central tendencies, range, and line of best fit. Explain how a change in the data set alters the display and central tendencies. • Compute, analyze, and interpret theoretical and experimental probabilities with complex sample spaces.

***Please note:** Names for the proposed levels are currently under consideration.

Appendix S: Workshop Participant Interview Protocol

Formal Interviews

1. What is your primary role at this workshop?
2. How much previous experience with standards verification do you have?
3. How did the training prepare you for the task?
4. How comfortable did you feel with the standards verification process?
5. How confident are you with the process and/or outcomes of this workshop?
6. Did you feel that your opinions were considered and valued by your group?
7. Is there anything that you would change about this process?
8. Do you have any other feedback about the training or the workshop?

Informal Interviews

1. How did you go from individual bookmarks to group consensus?
2. How was working with your group?
3. Do you have other feedback?

Mathematics Achievement Standards Verification Workshop
Workshop Evaluation

Key:

SD=Strongly Disagree
D=Disagree
N=Neutral
A=Agree
SA=Strongly Agree

Please indicate your agreement with the following statements about this bookmarking event.	SD	D	N	A	SA
1. The Bookmark Procedure was well described.	☐	☐	☐	☐	☐
2. Reviewing the test items helped me place my bookmarks.	☐	☐	☐	☐	☐
3. The ordering of the items in the Ordered Item Booklet aligned with my perception of the relative difficulty of the items.	☐	☐	☐	☐	☐
4. During Round One, I placed my bookmarks without consulting other participants.	☐	☐	☐	☐	☐
5. I had enough time to consider my Round One bookmarks.	☐	☐	☐	☐	☐
6. My group had enough time to consider our Round Two bookmarks.	☐	☐	☐	☐	☐
7. Overall, I think my table's discussions were open and honest.	☐	☐	☐	☐	☐
8. Overall, I believe that my opinions were considered and valued by my group.	☐	☐	☐	☐	☐
9. I learned how to do the bookmark placement as I went along, so my later ones may not be comparable to my earlier ones.	☐	☐	☐	☐	☐
10. I understood how to place my bookmarks.	☐	☐	☐	☐	☐
11. Overall, I am satisfied with my group's final bookmarks.	☐	☐	☐	☐	☐
12. I feel this procedure was fair.	☐	☐	☐	☐	☐
13. This experience will help me target instruction for the students in my classroom. (Leave blank if you are not a teacher.)	☐	☐	☐	☐	☐
14. The bookmarking event was well organized.	☐	☐	☐	☐	☐
15. Participating in the bookmarking process increased my understanding of the test.	☐	☐	☐	☐	☐

Mathematics Achievement Standards Verification Workshop

Key:

SD=Strongly Disagree
D=Disagree
N=Neutral
A=Agree
SA=Strongly Agree

Please indicate your agreement with the following statements about the cut scores.	SD	D	N	A	SA
16. I am confident that the Bookmark Procedure used produced valid cut scores.	☐	☐	☐	☐	☐
17. I would be able to defend the Nearly Meets cut score against criticism that it is too high.	☐	☐	☐	☐	☐
18. I would be able to defend the Nearly Meets cut score against criticism that it is too low.	☐	☐	☐	☐	☐
19. I would be able to defend the Meets cut score against criticism that it is too high.	☐	☐	☐	☐	☐
20. I would be able to defend the Meets cut score against criticism that it is too low.	☐	☐	☐	☐	☐
21. I would be able to defend the Exceeds cut score against criticism that it is too high.	☐	☐	☐	☐	☐
22. I would be able to defend the Exceeds cut score against criticism that it is too low.	☐	☐	☐	☐	☐

Please add your comments in the space below.

Mathematics Achievement Standards Verification Workshop

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Key:

NI=Not Important
SI = Somewhat Important
I=Important
VI=Very Important
NA=Not Applicable

Please indicate the importance of the following factors in your bookmark placement.	NI	SI	I	VI	NA
23. The Achievement Level Descriptions (ALDs) of Does Not Yet Meet, Nearly Meets, Meets, Exceeds.	☐	☐	☐	☐	☐
24. Your perceptions of the difficulty of the items in the Ordered Item Booklet.	☐	☐	☐	☐	☐
25. Your perceptions of the quality of the sample student responses.	☐	☐	☐	☐	☐
26. Your own classroom experience.	☐	☐	☐	☐	☐
27. Visualizing a Target Student.	☐	☐	☐	☐	☐
28. The impact data.					
29. The PISA, NAEP & OUS calibration data.	☐	☐	☐	☐	☐
30. The presentation of impact data.	☐	☐	☐	☐	☐
31. Your initial classification of student performance in Round One.	☐	☐	☐	☐	☐
32. Panel discussions.	☐	☐	☐	☐	☐
33. The initial classifications of other panelists.	☐	☐	☐	☐	☐

Please add your comments in the space below.

Mathematics Achievement Standards Verification Workshop

Please answer the following background questions.

1. What is your occupation?
- ☐ K-12 educator
- ☐ Community college educator
- ☐ University educator
- ☐ Parent
- ☐ Community member
- ☐ Business member
- ☐ Other

2. How many years in your current profession?
- ☐ 1-5
- ☐ 6-10
- ☐ 11-15
- ☐ 16-20
- ☐ 21+

3. What is your primary role at this workshop?
- ☐ K-12 educator
- ☐ Community college educator
- ☐ University educator
- ☐ Parent
- ☐ Community member
- ☐ Business member

4. Have you participated in bookmarking prior to this event?
- ☐ Yes
- ☐ No

5. Have you taught Special Education?
- ☐ Yes
- ☐ No

6. Have you taught ESL/ELD?
- ☐ Yes
- ☐ No

7. Have you taught Vocational Education?
- ☐ Yes
- ☐ No

8. Have you taught Alternative Education?
- ☐ Yes
- ☐ No

9. Have you taught Adult Education?
- ☐ Yes
- ☐ No

10. Which grade did you work on during this bookmarking event?
- ☐ Grade 3
- ☐ Grade 5
- ☐ Grade 8
- ☐ Grade 10

11. What is your education level? (optional)
- ☐ HSD or GED
- ☐ Bachelor's
- ☐ Master's
- ☐ Doctorate

12. What is your gender? (optional)
- ☐ Male
- ☐ Female

13. What is your race? (optional)
- ☐ Asian/ Pacific Islander
- ☐ Black/ African American
- ☐ American Indian
- ☐ White
- ☐ Other

14. Are you of Hispanic origin? (optional)
- ☐ Yes
- ☐ No

Appendix T: Workshop Evaluation Form and Response Data

Please indicate your agreement with the following statements about this bookmarking event.

Question #1. The Bookmark Procedure was well described.

Grades	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Agree + Strongly Agree
All	43	0.00%	2.32%	16.29%	67.44%	13.95%	81.40%
3	11	0.00%	0.00%	0.00%	81.82%	18.18%	100.00%
5	11	0.00%	9.09%	36.36%	54.55%	0.00%	54.55%
8	10	0.00%	0.00%	20.00%	60.00%	20.00%	80.00%
10	10	0.00%	0.00%	10.00%	80.00%	10.00%	90.00%

Question #2. Reviewing the test items helped me place my bookmarks.

Grades	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Agree + Strongly Agree
All	43	2.32%	0.00%	0.00%	25.58%	72.09%	97.67%
3	11	9.09%	0.00%	0.00%	9.09%	81.82%	90.91%
5	11	0.00%	0.00%	0.00%	45.45%	54.55%	100.00%
8	10	0.00%	0.00%	0.00%	40.00%	60.00%	100.00%
10	10	0.00%	0.00%	0.00%	10.00%	90.00%	100.00%

Question #3. The ordering of the items in the Ordered Item Booklet aligned with my perception of the relative difficulty of the items.

Grades	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Agree + Strongly Agree
All	42	2.38%	19.05%	33.33%	42.86%	2.38%	45.24%
3	11	9.09%	0.00%	9.09%	72.73%	9.09%	81.82%
5	11	0.00%	27.27%	36.36%	36.36%	0.00%	36.36%
8	10	0.00%	20.00%	40.00%	40.00%	0.00%	40.00%
10	10	0.00%	30.00%	40.00%	30.00%	0.00%	30.00%

Question #4. During Round One, I placed my bookmarks without consulting other participants.

Grades	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Agree + Strongly Agree
All	42	2.33%	0.00%	0.00%	16.28%	81.40%	97.67%
3	11	9.09%	0.00%	0.00%	9.09%	81.82%	90.91%
5	11	0.00%	0.00%	0.00%	45.45%	54.55%	100.00%
8	10	0.00%	0.00%	0.00%	10.00%	90.00%	100.00%
10	10	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%

Appendix T: Workshop Evaluation Form and Response Data

Question #5. I had enough time to consider my Round One bookmarks.

Grades	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Agree + Strongly Agree
All	42	2.36%	0.00%	2.33%	34.88%	60.47%	95.35%
3	11	9.09%	0.00%	0.00%	18.18%	72.73%	90.91%
5	11	0.00%	0.00%	0.00%	63.64%	36.36%	100.00%
8	10	0.00%	0.00%	10.00%	40.00%	50.00%	90.00%
10	10	0.00%	0.00%	0.00%	20.00%	80.00%	100.00%

Question #6. My group had enough time to consider our Round Two bookmarks.

Grades	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Agree + Strongly Agree
All	42	0.00%	0.00%	4.65%	41.86%	53.49%	95.35%
3	11	0.00%	0.00%	9.09%	72.73%	18.18%	90.91%
5	11	0.00%	0.00%	0.00%	40.00%	60.00%	100.00%
8	10	0.00%	0.00%	10.00%	20.00%	70.00%	90.00%
10	10	0.00%	0.00%	0.00%	27.27%	72.73%	100.00%

Question #7. Overall, I think my table's discussions were open and honest.

Grades	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Agree + Strongly Agree
All	42	0.00%	0.00%	0.00%	23.26%	76.44%	100.00%
3	11	0.00%	0.00%	0.00%	9.09%	90.91%	100.00%
5	11	0.00%	0.00%	0.00%	45.45%	54.55%	100.00%
8	10	0.00%	0.00%	0.00%	30.00%	70.00%	100.00%
10	10	0.00%	0.00%	0.00%	10.00%	90.00%	100.00%

Question #8. Overall, I believe that my opinions were considered and valued by my group.

Grades	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Agree + Strongly Agree
All	42	0.00%	0.00%	0.00%	25.58%	74.42%	100.00%
3	11	0.00%	0.00%	0.00%	18.18%	81.82%	100.00%
5	11	0.00%	0.00%	0.00%	45.45%	54.55%	100.00%
8	10	0.00%	0.00%	0.00%	30.00%	70.00%	100.00%
10	10	0.00%	0.00%	0.00%	10.00%	90.00%	100.00%

Appendix T: Workshop Evaluation Form and Response Data

Question #9. I learned how to do the bookmark placement as I went along, so my later ones may not be comparable to my earlier ones.

Grades	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Agree + Strongly Agree
All	42	6.98%	41.86%	16.28%	27.91%	6.98%	34.88%
3	11	9.09%	36.36%	27.27%	18.18%	9.09%	27.27%
5	11	0.00%	45.45%	0.00%	45.45%	9.09%	54.55%
8	10	0.00%	40.00%	30.00%	20.00%	10.00%	30.00%
10	10	20.00%	30.00%	0.00%	40.00%	10.00%	50.00%

Question #10. I understood how to place my bookmarks.

Grades	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Agree + Strongly Agree
All	42	0.00%	0.00%	4.65%	51.16%	44.19%	95.35%
3	11	0.00%	0.00%	0.00%	36.36%	63.64%	100.00%
5	11	0.00%	0.00%	18.18%	81.82%	0.00%	81.82%
8	10	0.00%	0.00%	0.00%	40.00%	60.00%	100.00%
10	10	0.00%	0.00%	0.00%	50.00%	50.00%	100.00%

Question #11. Overall, I am satisfied with my group's final bookmarks.

Grades	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Agree + Strongly Agree
All	42	0.00%	0.00%	2.38%	52.38%	45.24%	97.62%
3	11	0.00%	0.00%	0.00%	40.00%	60.00%	100.00%
5	11	0.00%	0.00%	0.00%	90.91%	9.09%	100.00%
8	10	0.00%	0.00%	10.00%	10.00%	80.00%	90.00%
10	10	0.00%	0.00%	0.00%	70.00%	30.00%	100.00%

Question #12. I feel this procedure was fair.

Grades	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Agree + Strongly Agree
All	42	0.00%	0.00%	0.00%	58.14%	41.86%	100.00%
3	11	0.00%	0.00%	0.00%	36.36%	63.64%	100.00%
5	11	0.00%	0.00%	0.00%	100.00%	0.00%	100.00%
8	10	0.00%	0.00%	0.00%	40.00%	60.00%	100.00%
10	10	0.00%	0.00%	0.00%	60.00%	40.00%	100.00%

Appendix T: Workshop Evaluation Form and Response Data

Question #13. This experience will help me target instruction for the students in my classroom. (Leave blank if you are not a teacher.)

Grades	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Agree + Strongly Agree
All	27	0.00%	3.70%	14.81%	40.74%	40.74%	81.48%
3	6	0.00%	0.00%	16.67%	16.67%	66.67%	83.33%
5	7	0.00%	14.29%	0.00%	57.14%	28.57%	85.71%
8	8	0.00%	0.00%	25.00%	37.50%	37.50%	75.00%
10	8	0.00%	0.00%	12.50%	62.50%	25.00%	87.50%

Question #14. The bookmarking event was well organized.

Grades	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Agree + Strongly Agree
All	42	2.33%	4.65%	27.91%	46.51%	18.60%	65.12%
3	11	0.00%	9.09%	18.18%	54.55%	18.18%	72.73%
5	11	0.00%	9.09%	54.55%	36.36%	0.00%	36.36%
8	10	0.00%	0.00%	40.00%	20.00%	40.00%	60.00%
10	10	0.00%	0.00%	0.00%	90.00%	10.00%	100.00%

Question #15. Participating in the bookmarking process increased my understanding of the test.

Grades	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Agree + Strongly Agree
All	42	0.00%	4.65%	6.98%	37.21%	51.16%	88.37%
3	11	0.00%	0.00%	0.00%	36.36%	63.64%	100.00%
5	11	0.00%	9.09%	9.09%	45.45%	36.36%	81.82%
8	10	0.00%	10.00%	0.00%	40.00%	50.00%	90.00%
10	10	0.00%	0.00%	20.00%	30.00%	50.00%	80.00%

Please indicate your agreement with the following statements about the cut scores.

Question #16. I am confident that the Bookmark Procedure used produced valid cut scores.

Grades	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Agree + Strongly Agree
All	42	0.00%	0.00%	16.28%	69.77%	13.95%	83.72%
3	11	0.00%	0.00%	9.09%	81.82%	9.09%	90.91%
5	11	0.00%	0.00%	27.27%	72.73%	0.00%	72.73%
8	10	0.00%	0.00%	10.00%	70.00%	20.00%	90.00%
10	10	0.00%	0.00%	20.00%	50.00%	30.00%	80.00%

Appendix T: Workshop Evaluation Form and Response Data

Question #17. I would be able to defend the Nearly Meets cut score against criticism that it is too high.

Grades	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Agree + Strongly Agree
All	42	0.00%	0.00%	9.30%	69.77%	20.93%	90.70%
3	11	0.00%	0.00%	18.18%	72.73%	9.09%	81.82%
5	11	0.00%	0.00%	9.09%	90.91%	0.00%	90.91%
8	10	0.00%	0.00%	0.00%	80.00%	20.00%	100.00%
10	10	0.00%	0.00%	10.00%	40.00%	50.00%	90.00%

Question #18. I would be able to defend the Nearly Meets cut score against criticism that it is too low.

Grades	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Agree + Strongly Agree
All	42	0.00%	0.00%	11.63%	65.12%	23.26%	88.37%
3	11	0.00%	0.00%	9.09%	63.64%	27.27%	90.91%
5	11	0.00%	0.00%	9.09%	90.91%	0.00%	90.91%
8	10	0.00%	0.00%	0.00%	60.00%	40.00%	100.00%
10	10	0.00%	0.00%	30.00%	40.00%	30.00%	70.00%

Question #19. I would be able to defend the Meets cut score against criticism that it is too high.

Grades	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Agree + Strongly Agree
All	42	0.00%	2.33%	4.65%	69.77%	23.26%	93.02%
3	11	0.00%	0.00%	9.09%	72.73%	18.18%	90.91%
5	11	0.00%	9.09%	9.09%	81.82%	0.00%	81.82%
8	10	0.00%	0.00%	0.00%	60.00%	40.00%	100.00%
10	10	0.00%	0.00%	0.00%	60.00%	40.00%	100.00%

Question #20. I would be able to defend the Meets cut score against criticism that it is too low.

Grades	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Agree + Strongly Agree
All	42	0.00%	0.00%	6.98%	65.12%	27.91%	93.02%
3	11	0.00%	0.00%	9.09%	54.55%	36.36%	90.91%
5	11	0.00%	0.00%	18.18%	81.82%	0.00%	81.82%
8	10	0.00%	0.00%	0.00%	60.00%	40.00%	100.00%
10	10	0.00%	0.00%	10.00%	50.00%	40.00%	90.00%

Appendix T: Workshop Evaluation Form and Response Data

Question #21. I would be able to defend the Exceeds cut score against criticism that it is too high.

Grades	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Agree + Strongly Agree
All	42	0.00%	2.33%	6.98%	72.09%	18.60%	90.70%
3	11	0.00%	0.00%	9.09%	81.82%	9.09%	90.91%
5	11	0.00%	0.00%	9.09%	81.82%	9.09%	90.91%
8	10	0.00%	0.00%	0.00%	60.00%	40.00%	100.00%
10	10	0.00%	10.00%	10.00%	70.00%	10.00%	80.00%

Question #22. I would be able to defend the Exceeds cut score against criticism that it is too low.

Grades	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Agree + Strongly Agree
All	42	0.00%	2.33%	6.98%	60.47%	30.23%	90.70%
3	11	0.00%	0.00%	9.09%	72.73%	18.18%	90.91%
5	11	0.00%	0.00%	18.18%	72.73%	9.09%	81.82%
8	10	0.00%	0.00%	0.00%	60.00%	40.00%	100.00%
10	10	0.00%	10.00%	0.00%	50.00%	40.00%	90.00%

Please indicate the importance of the following factors in your bookmark placement.

Question #23. The Achievement Level Descriptions (ALDs) of Does Not Yet Meet, Nearly Meets, Meets, Exceeds.

Grades	N	Not Important	Somewhat Important	Important	Very Important	Not Applicable	Important + Very Important
All	42	0.00%	4.65%	30.23%	65.12%	0.00%	95.35%
3	11	0.00%	0.00%	27.27%	72.73%	0.00%	100.00%
5	11	0.00%	9.09%	54.55%	36.36%	0.00%	90.91%
8	10	0.00%	10.00%	0.00%	90.00%	0.00%	90.00%
10	10	0.00%	0.00%	40.00%	60.00%	0.00%	100.00%

Question #24. Your perceptions of the difficulty of the items in the Ordered Item Booklet.

Grades	N	Not Important	Somewhat Important	Important	Very Important	Not Applicable	Important + Very Important
All	42	0.00%	2.33%	32.56%	65.12%	0.00%	97.67%
3	11	0.00%	0.00%	18.18%	81.82%	0.00%	100.00%
5	11	0.00%	9.09%	9.09%	81.82%	0.00%	90.91%
8	10	0.00%	0.00%	40.00%	60.00%	0.00%	100.00%
10	10	0.00%	0.00%	70.00%	30.00%	0.00%	100.00%

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Question #25. Your perceptions of the quality of the sample student responses.

Grades	N	Not Important	Somewhat Important	Important	Very Important	Not Applicable	Important + Very Important
All	42	9.52%	23.81%	23.81%	28.57%	14.29%	52.38%
3	11	10.00%	10.00%	30.00%	30.00%	20.00%	60.00%
5	11	18.18%	36.36%	9.09%	36.36%	0.00%	45.45%
8	10	0.00%	20.00%	20.00%	30.00%	30.00%	50.00%
10	10	10.00%	30.00%	30.00%	20.00%	10.00%	50.00%

Question #26. Your own classroom experience.

Grades	N	Not Important	Somewhat Important	Important	Very Important	Not Applicable	Important + Very Important
All	42	2.38%	4.76%	23.81%	61.90%	7.14%	85.71%
3	11	10.00%	0.00%	10.00%	70.00%	10.00%	80.00%
5	11	0.00%	18.18%	18.18%	54.55%	9.09%	72.73%
8	10	0.00%	0.00%	40.00%	50.00%	10.00%	90.00%
10	10	0.00%	0.00%	30.00%	70.00%	0.00%	100.00%

Question #27. Visualizing a Target Student.

Grades	N	Not Important	Somewhat Important	Important	Very Important	Not Applicable	Important + Very Important
All	42	2.33%	6.98%	30.23%	58.14%	2.33%	88.37%
3	11	0.00%	0.00%	18.18%	72.73%	9.09%	90.91%
5	11	9.09%	18.18%	27.27%	45.45%	0.00%	72.73%
8	10	0.00%	10.00%	30.00%	60.00%	0.00%	90.00%
10	10	0.00%	0.00%	50.00%	50.00%	0.00%	100.00%

Question #28. The impact data.

Grades	N	Not Important	Somewhat Important	Important	Very Important	Not Applicable	Important + Very Important
All	25	8.00%	16.00%	32.00%	44.00%	0.00%	76.00%
3	5	0.00%	0.00%	80.00%	20.00%	0.00%	100.00%
5	7	14.29%	28.57%	28.57%	28.57%	0.00%	57.14%
8	6	0.00%	0.00%	33.33%	66.67%	0.00%	100.00%
10	7	14.29%	28.57%	0.00%	57.14%	0.00%	57.14%

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Question #29. The PISA, NAEP & OUS calibration data.

Grades	N	Not Important	Somewhat Important	Important	Very Important	Not Applicable	Important + Very Important
All	42	2.38%	19.05%	40.48%	38.10%	0.00%	78.57%
3	11	0.00%	18.18%	63.64%	18.18%	0.00%	81.82%
5	11	9.09%	27.27%	18.18%	45.45%	0.00%	63.64%
8	10	0.00%	0.00%	40.00%	60.00%	0.00%	100.00%
10	9	0.00%	33.33%	44.44%	22.22%	0.00%	66.67%

Question #30. The presentation of impact data.

Grades	N	Not Important	Somewhat Important	Important	Very Important	Not Applicable	Important + Very Important
All	42	4.65%	11.63%	39.53%	41.86%	2.33%	81.40%
3	11	0.00%	0.00%	72.73%	27.27%	0.00%	100.00%
5	11	9.09%	18.18%	18.18%	54.55%	0.00%	72.73%
8	10	0.00%	0.00%	30.00%	60.00%	10.00%	90.00%
10	9	10.00%	30.00%	30.00%	30.00%	0.00%	60.00%

Question #31. Your initial classification of student performance in Round One.

Grades	N	Not Important	Somewhat Important	Important	Very Important	Not Applicable	Important + Very Important
All	42	2.33%	13.95%	48.84%	32.56%	2.33%	81.40%
3	11	0.00%	18.18%	45.45%	27.27%	9.09%	72.73%
5	11	0.00%	27.27%	45.45%	27.27%	0.00%	72.73%
8	10	0.00%	10.00%	50.00%	40.00%	0.00%	90.00%
10	9	10.00%	0.00%	60.00%	30.00%	0.00%	90.00%

Question #32. Panel discussions.

Grades	N	Not Important	Somewhat Important	Important	Very Important	Not Applicable	Important + Very Important
All	42	0.00%	2.33%	9.30%	86.05%	2.33%	95.35%
3	11	0.00%	0.00%	0.00%	90.91%	9.09%	90.91%
5	11	0.00%	9.09%	18.18%	72.73%	0.00%	90.91%
8	10	0.00%	0.00%	20.00%	80.00%	0.00%	100.00%
10	9	0.00%	0.00%	0.00%	100.00%	0.00%	100.00%

Appendix T: Workshop Evaluation Form and Response Data

Question #33. The initial classifications of other panelists.

Grades	N	Not Important	Somewhat Important	Important	Very Important	Not Applicable	Important + Very Important
All	42	0.00%	19.05%	38.10%	40.48%	2.38%	78.57%
3	11	0.00%	0.00%	36.36%	63.64%	0.00%	100.00%
5	11	0.00%	27.27%	36.36%	36.36%	0.00%	72.73%
8	10	0.00%	11.11%	44.44%	33.33%	11.11%	77.78%
10	9	0.00%	40.00%	40.00%	20.00%	0.00%	60.00%