

MATHEMATICS

Optional tools for teachers. There are no Oregon academic content standards prior to grade 3.

Common Curriculum Goals

Oregon Grade-Level Foundations

Kindergarten

Calculations and Estimations

Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

NUMBERS

Read, write, order, and identify whole numbers less than 10.

Use words such as before and after to describe relative position in a sequence of whole numbers on a number line up to 10 (e.g., 5 is before 6).

Recognize whole numbers less than 10 in random order.

Use objects or pictures to decompose whole numbers.

Explore and differentiate coins: penny, nickel, dime, and quarter.

Count forward by one beginning with any number less than 30.

Compute fluently and make reasonable estimates.

COMPUTATION AND ESTIMATION

Add and subtract pairs of numbers using less than 10 concrete objects.

Mentally find one more or one less than a single-digit number.

Judge whether sets of objects have less than, more than or the same number as a reference set.

Statistics and Probability

Select and use appropriate statistical methods to analyze data.

COLLECT AND DISPLAY DATA

Identify “how many more or less” and how many all together from pictographs and bar graphs.

#1B Shape of Things

MATHEMATICS

Optional tools for teachers. There are no Oregon academic content standards prior to grade 3.

Common Curriculum Goals

Oregon Grade-Level Foundations

Kindergarten

Algebraic Relationships

Understand patterns, relations, and functions.

PATTERNS AND FUNCTIONS

Sort, classify, and order objects by size, color, shape, or other properties.

#1A&B The Shape of Things

Identifies objects that do not belong to a particular group.

#1A&B The Shape of Things

Copy and extend patterns using concrete models.

#1A&B The Shape of Things

Represent and analyze mathematical situations and structures using algebraic symbols.

ALGEBRAIC RELATIONSHIPS

Compare two or more sets of 10 or fewer objects and identify which set is equal to, more than, or less than the other.

Measurement

Understand measurable attributes of objects and the units, systems, and processes of measurement.

UNITS AND TOOLS

Sort and classify objects to show different attributes that can be measured in different ways (e.g., length, weight, size).

Apply appropriate techniques, tools, and formulas to determine measurements.

DIRECT AND INDIRECT MEASUREMENT

Understand concepts related to time of day: morning, afternoon, evening, day, night.

Compare the time of occurrence of two events using the terms before or after.

MATHEMATICS

Optional tools for teachers. There are no Oregon academic content standards prior to grade 3.

Common Curriculum Goals

Oregon Grade-Level Foundations

Kindergarten

Geometry

Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.

PROPERTIES AND RELATIONSHIPS

Identify basic shapes (e.g., square, circle, triangle, rectangle, and oval).

#1A&B The Shape of Things

Match objects to outlines of their shapes.

#1A&B The Shape of Things

Classify and sort geometric shapes by attributes (e.g., number of sides, shape, size).

#1A&B The Shape of Things

Use visualization, spatial reasoning, and geometric modeling to solve problems.

MODELING

Create shapes with manipulatives (e.g., pattern blocks or tiles).

Mathematical Problem Solving

There are currently no kindergarten grade-level foundations for Mathematical Problem Solving.

MATHEMATICS

Optional tools for teachers. There are no Oregon academic content standards prior to grade 3.

Common Curriculum Goals

Oregon Grade-Level Foundations

Grade 1

Calculations and Estimations

Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

NUMBERS

Read, write, order, and identify whole numbers less than 100.

Order 1st through 10th in numeric or word form.

Count and group objects in ones and tens.

Use objects or pictures to decompose whole numbers to 10 (e.g., $5 = 4 + 1$, $5 = 2 + 3$).

Identify, order, and compare coins by making equivalent amounts up to 25 cents.

Demonstrate counting skills of skip counting by 5 and 10 to 100.

Compute fluently and make reasonable estimates.

COMPUTATION AND ESTIMATION

Add and subtract with concrete objects.

Apply with fluency sums to nine and related subtraction facts.

Find sums and differences less than 100.

Make change for amounts to 25 cents.

Mentally add 10 to a single-digit number.

Estimate number of objects and check reasonableness of answers by counting up to 20 objects.

MATHEMATICS

Optional tools for teachers. There are no Oregon academic content standards prior to grade 3.

Common Curriculum Goals

Oregon Grade-Level Foundations

Grade 1

Understand meanings of operations and how they relate to one another.

OPERATIONS AND PROPERTIES

Represent situations using models of addition and subtraction (e.g., putting together or adding on, taking away, finding the difference, comparing).

Statistics and Probability

Select and use appropriate statistical methods to analyze data.

STATISTICS

Identify “how many more or less” and “how many all together” from pictographs and bar graphs.

Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

COLLECT AND DISPLAY DATA

Pose questions and gather data about themselves and their surroundings.

Sort and classify objects according to their attributes and organize data about the objects into categories.

Represent data using concrete objects and pictographs.

Develop and evaluate inferences and predictions that are based on data.

DATA ANALYSIS AND PREDICTIONS

Answer simple questions related to data displayed in pictographs, including which result occurred the most or least often.

MATHEMATICS

Optional tools for teachers. There are no Oregon academic content standards prior to grade 3.

Common Curriculum Goals

Oregon Grade-Level Foundations

Grade 1

Algebraic Relationships

Understand patterns, relations, and functions.

PATTERNS AND FUNCTIONS

Sort and classify objects using one or more attributes by observing relationships.

Identify an element that does not belong in a simple pattern.

Supply a missing element in or extend number patterns involving addition or subtraction by a single-digit number.

Extend and generate patterns involving three elements sharing a common attribute (e.g., color, number, shape, letter) using concrete models or objects.

Represent and analyze mathematical situations and structures using algebraic symbols.

ALGEBRAIC RELATIONSHIPS

Understand the meaning of equals and use the = symbol.

Construct and solve simple number sentences involving sums to 9 and related subtraction facts using concrete objects, pictures, or symbols.

Measurement

Understand measurable attributes of objects and the units, systems, and processes of measurement.

UNITS AND TOOLS

Compare and order objects according to measurable attributes (e.g., long or short, light or heavy).

Apply appropriate techniques, tools, and formulas to determine measurements.

DIRECT AND INDIRECT MEASUREMENT

Identify and name days of the week and months of the year and interpret calendar information (e.g., tomorrow, yesterday, how many Tuesdays are in November).

Tell time to the nearest hour using analog and digital clocks.

MATHEMATICS

Optional tools for teachers. There are no Oregon academic content standards prior to grade 3.

Common Curriculum Goals

Oregon Grade-Level Foundations

Grade 1

Geometry

Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Use visualization, spatial reasoning, and geometric modeling to solve problems.

Specify locations and describe spatial relationships using coordinate geometry and other representational systems.

Mathematical Problem Solving

PROPERTIES AND RELATIONSHIPS

Identify, describe, and classify triangles, rectangles, squares, circles, and ovals.

#1 The Shape of Things

Recognize and identify attributes of two-dimensional geometric shapes in the environment (e.g., make a triangle and square from pieces of straw and compare how many pieces of straw are used to make each shape).

MODELING

Model triangles, rectangles, squares, circles, and ovals.

Create repeating geometric shapes using manipulatives (e.g., two triangles can make a square).

COORDINATE GEOMETRY

Arrange and describe objects in space by relative position and direction (e.g., near, far, below, above, up, down, behind, in front of, next to, left or right of).

There are currently no grade 1 grade-level foundations for Mathematical Problem Solving.

MATHEMATICS

Optional tools for teachers. There are no Oregon academic content standards prior to grade 3.

Common Curriculum
Goals

Oregon Grade-Level Foundations

Grade 2

Calculations and Estimations

Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

NUMBERS

Read, write, order, model, and compare whole numbers less than 100.

Read number words less than one hundred and write the corresponding numeric value.

Identify and model the whole number of ones, tens, and hundreds in numbers less than 100.

Compose and decompose whole numbers less than one hundred by place value (e.g., $426=4\text{-}100\text{'s}$, $2\text{-}10\text{'s}$, $6\text{-}1\text{'s}$).

Order, model, and identify wholes, halves, and fourths using concrete models and visual representations.

Understand a fraction represents subdivisions of a whole into equal parts.

Locate whole numbers on a number line.

Order and compare coins by making equivalent amounts up to \$1.00.

Demonstrate the counting skills of skip counting by 2 to 100 and by 100 to 1000.

Determine whether a set of objects has an odd or even number of elements.

MATHEMATICS

Optional tools for teachers. There are no Oregon academic content standards prior to grade 3.

Common Curriculum Goals

Oregon Grade-Level Foundations

Grade 2

Compute fluently and make reasonable estimates.

COMPUTATION AND ESTIMATION

Develop and evaluate strategies for adding and subtracting whole numbers.

Apply with fluency sums to 18 and related subtraction facts.

Add and subtract pairs of any two-digit numbers.

Find the sum of three or more two-digit numbers.

Make change for amounts to \$1.00.

Mentally add or subtract multiples of 10 to and from a number.

Identify the most efficient operation (add, subtract, multiply, or divide) for solving a problem.

Estimate number of objects and check reasonableness of answers by counting up to 100 objects.

Round one- or two-digit whole numbers to the nearest 10 to estimate sums and differences.

Understand meanings of operations and how they relate to one another.

OPERATIONS AND PROPERTIES

Understand various meanings of addition and subtraction of whole numbers and the relationship between the operations.

Use the commutative $(4+2)=(2+4)$ and associative $(4+3)+7=4+(3+7)$ properties of addition to simplify calculations.

Describe the effects of adding or subtracting by a whole number.

Demonstrate the zero property for addition and subtraction.

MATHEMATICS

Optional tools for teachers. There are no Oregon academic content standards prior to grade 3.

Common Curriculum Goals

Oregon Grade-Level Foundations

Grade 2

Statistics and Probability

Select and use appropriate statistical methods to analyze data.

STATISTICS

Identify "most and least" from data sets that contain more than 10 items (e.g., from a bar graph that shows "how many pockets in our clothing" identify by number "the most pockets" and "the least pockets").

Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

COLLECT AND DISPLAY DATA

Ask and answer simple questions related to tallies, charts, and bar graphs.

Record results of probability experiments using tallies or by completing charts.

Represent and interpret data using tally charts and pictographs.

Develop and evaluate inferences and predictions that are based on data.

DATA ANALYSIS AND PREDICTIONS

Develop inferences about the likelihood of the occurrence of an event based on data collected from activities which have outcomes that depend on chance (e.g., tossing a two colored counter, using a spinner).

MATHEMATICS

Optional tools for teachers. There are no Oregon academic content standards prior to grade 3.

Common Curriculum
Goals

Oregon Grade-Level Foundations

Grade 2

Algebraic Relationships

Understand patterns, relations, and functions.

PATTERNS AND FUNCTIONS

Sort and classify objects using one or more attributes by observing relationships and making generalizations.

Identify, describe, extend, and reproduce a pattern and use it to make predictions and analyze how repeating and growing patterns are generated.

Supply a missing element in or extend number patterns involving addition or subtraction.

Use a hundreds chart to generate the patterns in rows, skip counting, decades, columns, and generate arrangements of two-dimensional figures.

Represent and analyze mathematical situations and structures using algebraic symbols.

ALGEBRAIC RELATIONSHIPS

Describe quantitative relationships using the terms “greater than,” “less than,” and “equal to” and the associated symbols $>$, $<$, $=$.

Construct and solve simple number sentences involving sums to 18 and related subtraction facts using concrete objects, pictures, or symbols.

Common Curriculum Goals

Oregon Grade-Level Foundations

Grade 2

Measurement

Understand measurable attributes of objects and the units, systems, and processes of measurement.

Apply appropriate techniques, tools, and formulas to determine measurements.

UNITS AND TOOLS

Select an appropriate tool and standard unit to measure length, weight, and capacity (volume) of objects larger than the unit tools (e.g., rulers, measuring cups, balances).

Understand that using different measurement units will result in different numerical measurements for the same object.

Understand the measurement process (choosing a measurement unit, comparing that unit to the object, and reporting the number of units).

DIRECT AND INDIRECT MEASUREMENT

Demonstrate an understanding of time and use of time relationships (e.g., how many minutes in an hour, days in a week, months in a year).

Tell time to the nearest half hour using analog and digital clocks.

Measure length using multiple copies of units of the same size (such as paper clips) laid end to end.

Estimate length in standard and nonstandard units (e.g., finger lengths, pencil lengths).

Determine the capacity (volume) of an object by counting and filling (e.g., how many small containers fit in a larger container, how many scoops of beans in a can).

Estimate capacity (volume) of objects in standard units (e.g., cups in a bowl, cubes in a box).

Determine the weight of an object using a balance scale.

Estimate weight of objects.

Find the area of a two-dimensional figure by covering the figure with unit figures (e.g., how many small squares cover a larger shape).

Common Curriculum Goals

Oregon Grade-Level Foundations

Grade 2

Geometry

Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Use visualization, spatial reasoning, and geometric modeling to solve problems.

Specify locations and describe spatial relationships using coordinate geometry and other representational systems.

Apply transformations and use symmetry to analyze mathematical situations.

PROPERTIES AND RELATIONSHIPS

Identify, describe, compare, and classify two-dimensional shapes using appropriate vocabulary (e.g., rhombus, trapezoid, parallelogram), including the faces of three-dimensional objects (e.g., face, base).

Identify attributes of two-dimensional shapes: sides and angles.

MODELING

Model and sketch triangles, rectangles, squares, circles, ovals, parallelograms, rhombi, and trapezoids.

Create new shapes using combinations of known shapes (e.g., two congruent right triangles to form a rectangle).

Recognize two-dimensional geometric shapes in the environment, including the faces of three-dimensional objects (e.g., rectangles on a cereal box), and from different perspectives (e.g., use your mind's eye to imagine what shapes would be formed if you cut a square diagonally).

COORDINATE GEOMETRY

Describe, name, and interpret relative positions in space and apply ideas about relative position to maps.

Describe, name, and interpret direction and distance in navigating space and apply ideas about direction and distance to maps and routes.

TRANSFORMATIONS AND SYMMETRY

Identify symmetry, patterns, and shapes in everyday surroundings.

Create designs with line and rotational symmetry.

Illustrate reflections (flips), rotations (turns) and translations (slides) using concrete or pictorial models (e.g., paper folding, cut outs, and pattern blocks).

MATHEMATICS

Optional tools for teachers. There are no Oregon academic content standards prior to grade 3.

Common Curriculum Goals

Oregon Grade-Level Foundations

Grade 2

Mathematical Problem Solving

Select, apply, and translate among mathematical representations to solve problems.

Apply and adapt a variety of appropriate strategies to solve problems.

Monitor and reflect on the process of mathematical problem solving.

Communicate mathematical thinking coherently and clearly; use the language of mathematics to express mathematical ideas precisely.

Accurately solve problems that arise in mathematics and other contexts.

These standards are assessed using the Mathematics Problem Solving Scoring Guide in grades 3 - CIM

CONCEPTUAL UNDERSTANDING

Interpret the concepts of a problem-solving task and translate them into mathematics.

PROCESSES AND STRATEGIES

Choose strategies that can work and then carry out the strategies chosen.

VERIFICATION

Produce identifiable evidence of a second look at the concepts/strategies/calculations to defend a solution.

COMMUNICATION

Use pictures, symbols, and/or vocabulary to convey the path to the identified solution.

ACCURACY

Accurately solve problems using mathematics.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum
Goals

Oregon Grade-Level Standards

Grade 3

Calculations and Estimations

Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

NUMBERS

Read, write, order, model, and compare whole numbers less than one thousand.

Identify the place value and actual value of digits in a whole number less than one thousand.

Compose and decompose whole numbers less than one thousand by place value.

*Order, model, compare, and identify commonly used fractions (halves, thirds, fourths, eighths, tenths) using **concrete models and visual representations.***

Develop understanding of fractions as parts of unit wholes, as parts of a collection, as locations on number lines, and as divisions of whole numbers.

Locate whole numbers and common fractions on a number line.

Order and compare dollars and coins by making equivalent amounts up to \$10.00.

Demonstrate the counting skills of skip counting as they relate to multiplication facts.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

Grade 3

Compute fluently and make reasonable estimates.

COMPUTATION AND ESTIMATION

Develop and evaluate strategies for multiplying whole numbers.

Add and subtract pairs of up to four digit numbers.

Develop and acquire efficient strategies for determining multiplication and division facts 0-9.

Multiply a two-digit number by a one-digit number.

Make change for amounts up to \$10.00.

Mentally add or subtract multiples of 10, 100, or 1000 to or from a number.

Identify the operation (add, subtract, multiply, or divide) for solving a problem.

Develop and use strategies (overestimate, underestimate, range of estimates) to make reasonable estimates.

Recognize which place value will be the most helpful in estimating an answer.

Understand meanings of operations and how they relate to one another.

OPERATIONS AND PROPERTIES

Represent situations using models of multiplication and division (e.g., repeat addition, equal groups of objects, arrays, repeated subtraction, equal grouping, sharing equally).

Use the commutative and associative properties of multiplication to simplify calculations.

Describe the effects of multiplying or dividing by a whole number.

Demonstrate the zero property for multiplication and identity property for multiplication and division.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

Grade 3

Statistics and Probability

Select and use appropriate statistical methods to analyze data.

STATISTICS

Determine the mode and range of a set of data.

Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

COLLECT AND DISPLAY DATA

Ask and answer simple questions that can be answered by collecting, organizing, and displaying data.

Represent and interpret data using tally charts, pictographs, and bar graphs, including identifying the mode and range.

[#36 Pollution Search](#)

Develop and evaluate inferences and predictions that are based on data.

DATA ANALYSIS AND PREDICTIONS

Draw conclusions and make predictions and inferences from tally charts, pictographs, or bar graphs. [#16B Pass the Plants, Please](#)

Algebraic Relationships

Understand patterns, relations, and functions.

PATTERNS AND FUNCTIONS

Describe, extend, and make generalizations about numeric and geometric patterns (e.g., increasing the number of sides of two-dimensional geometric figures in sequence; consecutive odd numbers).

Supply a missing element in or determine a rule that extends number patterns involving addition and multiplication by a single-digit number.

*Generate a pattern or sequence from a **verbal**, written, and pictorial description.*

Represent and analyze mathematical situations and structures using algebraic symbols.

ALGEBRAIC RELATIONSHIPS

Use letters, boxes, or other symbols to stand for a missing number in simple expressions or equations.

Identify and apply a relationship between two quantities (e.g., If four people can be seated at one table, how many tables are needed to seat 24 people?).

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

Grade 3

Measurement

Understand measurable attributes of objects and the units, systems, and processes of measurement.

Apply appropriate techniques, tools, and formulas to determine measurements.

UNITS AND TOOLS

Select the most appropriate tool and metric unit to measure length, time, weight, and volume.

Compare units of measure between customary and metric systems (e.g., inches > centimeters, liters < gallons).

Understand and explain the need for using standard units.

DIRECT AND INDIRECT MEASUREMENT

Determine elapsed time for given activities using representations of analog and digital clocks.

Tell time to the nearest minute using an analog clock.

Describe temperature changes and concepts as they occur in daily situations.

Determine measurements of length to the nearest centimeter and nearest meter.

Estimate the length of objects in meters and centimeters.

Determine measurements of volume to the nearest milliliter or liter of measuring cups, beakers, or graduated cylinders.

Estimate volume of objects in milliliters and liters.

Determine measurements of weight to the nearest gram and kilograms.

Estimate weight of objects in grams and kilograms.

Find areas of rectangular arrays.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

Grade 3

Geometry

Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Use visualization, spatial reasoning, and geometric modeling to solve problems.

Specify locations and describe spatial relationships using coordinate geometry and other representational systems.

Apply transformations and use symmetry to analyze mathematical situations.

PROPERTIES AND RELATIONSHIPS

*Identify, **describe**, compare, and classify common three-dimensional geometric objects: cubes, prisms, spheres, pyramids, cones, and cylinders.*

Compare and classify solid geometric shapes (e.g., triangular, pyramid, cube, rectangular prism) according to the number and shapes of faces, edges, and vertices.

Recognize and identify attributes of three-dimensional geometric shapes (faces, edges, vertices), including attributes of shapes in the environment.

MODELING

Model three-dimensional shapes including cubes, rectangular prisms, spheres, pyramids, cones, and cylinders.

Put shapes together and take them apart to form other shapes.

Recognize three-dimensional geometric shapes (e.g., cube, cone, cylinder, pyramid, and sphere) in the environment and from different perspectives.

COORDINATE GEOMETRY

Describe paths for moving from one location to another on a grid.

TRANSFORMATIONS AND SYMMETRY

Identify line and rotational symmetry.

*Predict **and describe** the results of performing reflections, rotations and translations of triangles.*

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

Grade 3

Mathematical Problem Solving

These standards are assessed using the Mathematics Problem Solving Scoring Guide in grades 3 - CIM.

Select, apply, and translate among mathematical representations to solve problems.

CONCEPTUAL UNDERSTANDING

Interpret the concepts of a problem-solving task and translate them into mathematics.

Apply and adapt a variety of appropriate strategies to solve problems.

PROCESSES AND STRATEGIES

Choose strategies that can work and then carry out the strategies chosen.

Monitor and reflect on the process of mathematical problem solving.

VERIFICATION

Produce identifiable evidence of a second look at the concepts/strategies/calculations to defend a solution.

Communicate mathematical thinking coherently and clearly; use the language of mathematics to express mathematical ideas precisely.

COMMUNICATION

Use pictures, symbols, and/or vocabulary to convey the path to the identified solution.

Accurately solve problems that arise in mathematics and other contexts.

ACCURACY

Accurately solve problems using mathematics.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum
Goals

Oregon Grade-Level Standards

Grade 4

Calculations and Estimations

Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

#66 Germinating Giants

NUMBERS

Read, write, order, model, and compare whole numbers to one million, common fractions, and decimals to hundredths.

Identify the place value and actual value of digits in a number to one million.

Locate common fractions and decimals on a number line.

Model, recognize, and generate equivalent forms of decimals to hundredths.

Determine factors of whole numbers to 100 using models such as arrays.

Compute fluently and make reasonable estimates.

66 Germinating Giants

#76 How Big is Your Tree?

COMPUTATION AND ESTIMATION

Develop and evaluate strategies for multiplying and dividing whole numbers and adding and subtracting fractions with like denominators.

Apply with fluency efficient strategies for determining multiplication and division facts 0-9.

Multiply a three-digit number by a one-digit number.

Divide a three-digit number by a one-digit number with or without remainders.

Determine the meaning of whole number remainders in a problem situation.

Add and subtract commonly used fractions with like denominators (halves, thirds, fourths, eighths, tenths) and decimals to hundredths.

Add and subtract decimals to hundredths, including money amounts.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum
Goals

Oregon Grade-Level Standards

Grade 4

Mentally multiply or divide multiples of 10 (e.g., 40×70 or $2700/30$).

Identify the most efficient operation (add, subtract, multiply, or divide) for solving a problem.

Select and use an appropriate estimation strategy (overestimate, underestimate, range of estimates) based on the problem situation when computing with whole numbers or money amounts.

Use place value concepts such as rounding to nearest 10, 100, and 1000 to estimate and check reasonableness of answers.

Understand meanings of operations and how they relate to one another.

OPERATIONS AND PROPERTIES

Demonstrate the meaning of fractions as part of a unit whole or as parts of a collection or set.

*Use inverse operations (addition and subtraction, multiplication and division) to solve problems **and check solutions** involving calculations with whole numbers.*

Apply the commutative, associative, and identity properties of addition and multiplication and the distributive property to simplify calculations with whole numbers.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum
Goals

Oregon Grade-Level Standards

Grade 4

Statistics and Probability

Select and use appropriate statistical methods to analyze data.

#41 How Plants Grow

STATISTICS

Determine the median for a set of data and understand what each statistic does and does not indicate about the data.

Understand and apply basic concepts of probability.

PROBABILITY

Determine probability of a single event.

Understand that the probability of an event can be represented by a number from 0 (impossible) to 1 (certain).

Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

#16B Pass the Plants, Please
#38 Every Drop Counts

COLLECT AND DISPLAY DATA

Conduct experiments and simulations to determine experimental probability of different outcomes.

Represent and interpret data collected from probability experiments and simulations using tallies, charts, pictograms, and bar graphs, including determining probabilities of single events.

Develop and evaluate inferences and predictions that are based on data.

DATA ANALYSIS AND PREDICTIONS

Predict the degree of likelihood of a single event occurring using words such as certain, impossible, most often, least often, likely, and unlikely.

Predict the likelihood of an outcome prior to an experiment and compare predicted probability with the actual results.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum
Goals

Oregon Grade-Level Standards

Grade 4

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum
Goals

Oregon Grade-Level Standards

Grade 4

Algebraic Relationships

Understand patterns, relations, and functions.

PATTERNS AND FUNCTIONS

Describe, extend and make generalizations about patterns and sequences and supply missing elements in chart or table format.

Supply a missing element in or determine a rule that extends number patterns involving addition or subtraction of decimals.

Represent and analyze mathematical situations and structures using algebraic symbols.

ALGEBRAIC RELATIONSHIPS

Select operational and relational symbols to make a number sentence true (e.g., $4 _ 3 = 12$, $5 + 17 _ 25$).

Represent and solve open sentences or problems involving numeric equations or inequalities (e.g., $3 + ? = 4$; $2 + 1 > ?$; $4 < 2 + ?$).

Translate between different representations (words, numeric, pictorial) of a simple quantitative relationship (e.g., match a table of values to its rule).

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

Grade 4

Measurement

Understand measurable attributes of objects and the units, systems, and processes of measurement.

#67 How Big is Your Tree?

Apply appropriate techniques, tools, and formulas to determine measurements.

#67 How Big is Your Tree?

UNITS AND TOOLS

Select the most appropriate tool and U.S. customary unit to measure length, perimeter, weight, and volume.

Carry out simple unit conversions within the U.S. customary system (e.g., inches to feet, ounces to pounds).

DIRECT AND INDIRECT MEASUREMENT

Determine elapsed time requiring unit conversions (e.g., weeks to months, minutes to hours).

*Read temperature measurements of thermometers with Fahrenheit and Celsius units and **recognize reasonable ranges of temperatures for different events (e.g., cold or hot day).***

Determine measurements of length and perimeter to the nearest inch and nearest foot.

Estimate the length of objects in inches, feet, and yards.

Determine measurements of volume to the nearest 1/4 cup, quart, or gallon of measuring cups, beakers, or graduated cylinders.

Estimate the volume of objects in cups, quarts, and gallons.

Determine measurements of weight to the nearest ounce and pound.

Estimate the weight of objects in ounces and pounds.

Relate the area of a rectangle and its dimensions to area models for multiplication and division.

Determine perimeter and area of rectangles given lengths of sides.

Estimate and measure the area of a rectangular surface using unit squares.

*Use referents for U.S. customary measurements to make estimates of length, weight, and volume **and evaluate the reasonableness of the estimate (e.g., length of one floor tile and estimate length of classroom).***

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

Grade 4

Geometry

Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Use visualization, spatial reasoning, and geometric modeling to solve problems.

#67 How Big is Your Tree?

Specify locations and describe spatial relationships using coordinate geometry and other representational systems.

Apply transformations and use symmetry to analyze mathematical situations.

PROPERTIES AND RELATIONSHIPS

*Identify, **describe**, compare, and classify quadrilaterals by their sides and angles.*

Identify right, acute, and obtuse angles in isolation and in geometric figures.

Use properties of quadrilaterals to determine the lengths of their sides and perimeters.

Develop, understand, and apply the property that the sum of the angle measures in a quadrilateral is 360 degrees.

Identify congruent quadrilaterals using concrete methods.

Draw conclusions about the measures of corresponding sides and angles of two congruent quadrilaterals.

MODELING

Model, sketch, draw, and label points, lines, line segments, angles, rays, quadrilaterals, and parallel, perpendicular, and intersecting lines.

Build three-dimensional objects and sketch two-dimensional representations of the object.

COORDINATE GEOMETRY

Locate coordinates of points on graph paper, maps, globes, and other charts.

Determine the shortest path of horizontal and vertical movement between two locations on a grid.

TRANSFORMATIONS AND SYMMETRY

*Predict **and describe** the results of performing reflections, rotations and translations of quadrilaterals.*

*Identify **and describe** a motion or series of motions that will show two quadrilaterals are congruent.*

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

Grade 4

Mathematical Problem Solving

These standards are assessed using the Mathematics Problem Solving Scoring Guide in grades 3 - CIM.

#67 How Big is Your Tree?

Select, apply, and translate among mathematical representations to solve problems.

CONCEPTUAL UNDERSTANDING

Interpret the concepts of a problem-solving task and translate them into mathematics.

Apply and adapt a variety of appropriate strategies to solve problems.

PROCESSES AND STRATEGIES

Choose strategies that can work and then carry out the strategies chosen.

Monitor and reflect on the process of mathematical problem solving.

VERIFICATION

Produce identifiable evidence of a second look at the concepts/strategies/calculations to defend a solution.

Communicate mathematical thinking coherently and clearly; use the language of mathematics to express mathematical ideas precisely.

COMMUNICATION

Use pictures, symbols, and/or vocabulary to convey the path to the identified solution.

Accurately solve problems that arise in mathematics and other contexts.

ACCURACY

Accurately solve problems using mathematics.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

Grade 5

Calculations and Estimations

Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

#67 How Big is Your Tree?

#66 Germinating Giants

Compute fluently and make reasonable estimates.

#66 Germinating Giants

#67 How Big is Your Tree?

NUMBERS

Order, model, and compare common fractions, decimals, and percentages.

Locate decimals and percentages on a number line.

Model, recognize, and generate equivalent forms of commonly used fractions, decimals, and percents.

Identify classes of numbers (e.g., primes, composites, even, odd, multiples) in a 1-to-100 number chart and describe numeric patterns related to them.

Recognize characteristics of odd, even, prime, and composite numbers.

COMPUTATION AND ESTIMATION

Develop and evaluate strategies for computing with decimals and fractions.

Divide by two-digit numbers.

Determine the meaning of a remainder expressed as a whole number, fraction, or decimal in a problem situation involving division.

Add and subtract fractions and mixed numbers with common fractions found on a ruler (2, 4, 8, 16).

Add, subtract, multiply, and divide decimals, including money amounts.

Model percentages on a hundreds grid to determine equivalent decimals and percentages.

Determine the order of operations for multiple-step calculations involving addition, subtraction, multiplication, and division.

Select and use an appropriate estimation strategy (overestimate, underestimate, range of estimates) based on the problem situation when computing with decimals.

Use referent numbers and rounding to estimate the magnitude of calculations with decimals.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

Grade 5

Understand meanings of operations and how they relate to one another.

OPERATIONS AND PROPERTIES

*Use inverse operations (addition and subtraction, multiplication and division) to solve problems **and check solutions** involving calculations with decimals.*

Apply the commutative, associative, and identity properties of addition and multiplication and the distributive property to simplify calculations with decimals.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

Grade 5

Statistics and Probability

Select and use appropriate statistical methods to analyze data.

#41 How Plants Grow

Understand and apply basic concepts of probability.

Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

#38 Every Drop Counts

STATISTICS

Compare two related sets of data using measures of center (mean, median and mode) and spread (range).

PROBABILITY

Connect simple fractional probabilities to events (e.g., heads is 1 out of 2; rolling a 5 on a six-sided number cube is 1/6).

COLLECT AND DISPLAY DATA

Design investigations to address a question and recognize how data collection methods affect the nature of a set of data.

#37 Reduce, Reuse, Recycle

Understand basic concepts of sampling (e.g., larger samples yield better results, the need for representative samples).

#37 Reduce, Reuse, Recycle

Represent and interpret data using tables, circle graphs, bar graphs, and line graphs or plots (first quadrant).

#16 Pass the Plants, Please

#37 Reduce, Reuse, Recycle

Compare different representations of the same data and evaluate how well each representation shows important aspects of the data (e.g., circle and bar graphs, histograms with different widths).

#37 Reduce, Reuse, Recycle

Evaluate the appropriateness of representations of categorical and numeric data (e.g., categorical: types of lunch food; and numerical: heights of students in a class).

#37 Reduce, Reuse, Recycle

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

Grade 5

Develop and evaluate inferences and predictions that are based on data.

#38 Every Drop Counts

DATA ANALYSIS AND PREDICTIONS

Analyze data from tables and bar graphs using mean, median, mode, and range, and draw conclusions.

#37 Reduce, Reuse, Recycle

Algebraic Relationships

Understand patterns, relations, and functions.

#85 In the Driver's Seat

PATTERNS AND FUNCTIONS

Represent and analyze patterns and functions using words, tables, graphs or simple algebraic expressions.

Supply a missing element in or determine a rule that extends number patterns involving multiplication or division.

Represent and analyze mathematical situations and structures using algebraic symbols.

ALGEBRAIC RELATIONSHIPS

Use letters, boxes, or other symbols to stand for an unknown quantity in expressions or equations.

Represent the idea of a variable as an unknown quantity using a letter or symbol.

Represent and evaluate algebraic expressions involving a single variable (e.g., $4s$, $.05n$).

*Identify **and represent** whole number data on a coordinate graph (first quadrant).*

Use mathematical models to represent and understand quantitative relationships.

MODELING

*Identify or **describe** a situation which may be modeled by a given graph.*

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

Grade 5

Analyze change in various contexts.

CHANGE

Identify and describe situations with constant or varying rates of change and compare them.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

Grade 5

Measurement

Understand measurable attributes of objects and the units, systems, and processes of measurement.

#67 How Big is Your Tree?

Apply appropriate techniques, tools, and formulas to determine measurements.

#67 How Big is Your Tree?

UNITS AND TOOLS

Using estimation, convert from a measurement expressed using one unit within a system to one using a comparable unit within the other system (e.g., inches to centimeters).

Understand that measurements are approximations and understand how differences in units and tools affect precision.

DIRECT AND INDIRECT MEASUREMENT

Know common referents for Fahrenheit and Celsius temperatures (e.g., freezing point, boiling point).

Determine measurements of length and perimeter to the nearest tenth centimeter (millimeter) and nearest tenth meter.

Estimate the measure of acute, right, and obtuse angles in degrees using referent angles of 45 and 90 degrees and determine the measurement of angles between 0 and 180 degrees to the nearest degree.

Develop and use formulas for determining the perimeter and area of rectangles, and related triangles and parallelograms.

Develop strategies to measure the perimeter of simple polygons and everyday objects.

Analyze the effects on area and perimeter by combining two simple geometric figures (e.g., two right triangles and a rectangle).

Compare and contrast the formulas for area of rectangles, related triangles, and parallelograms.

Estimate and measure volume of a rectangular solid using unit cubes.

Use referents for metric measurements to make estimates of length, weight, and volume and evaluate the reasonableness of the estimate (e.g., height of teacher estimated in height of student lengths).

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

Grade 5

Geometry

Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Use visualization, spatial reasoning, and geometric modeling to solve problems.

#67 How Big is Your Tree?

Specify locations and describe spatial relationships using coordinate geometry and other representational systems.

Apply transformations and use symmetry to analyze mathematical situations.

PROPERTIES AND RELATIONSHIPS

*Identify, **describe**, compare and classify triangles by their sides and angles.*

Use properties of triangles to determine the lengths of their sides and perimeters.

Develop, understand, and apply the property that the sum of the angle measures in a triangle is 180 degrees.

Draw conclusions about the measures of corresponding sides and angles of two congruent and similar triangles.

MODELING

Accurately draw and label triangles, angles, and line segments using measurement tools.

Identify and build three-dimensional objects from two-dimensional representations.

COORDINATE GEOMETRY

Make and use coordinate systems to specify location and describe paths.

Find the distance between points along the horizontal and vertical lines of a coordinate system.

TRANSFORMATIONS AND SYMMETRY

Identify and describe line and rotational symmetry in two-dimensional shapes and designs.

Identify and describe a motion or series of motions that will show two triangles are congruent.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

Grade 5

Mathematical Problem Solving

These standards are assessed using the Mathematics Problem Solving Scoring Guide in grades 3 - CIM.

#67 *How Big is Your Tree?*

#85 *In the Driver's Seat*

Select, apply, and translate among mathematical representations to solve problems.

CONCEPTUAL UNDERSTANDING

Interpret the concepts of a problem-solving task and translate them into mathematics.

Apply and adapt a variety of appropriate strategies to solve problems.

PROCESSES AND STRATEGIES

Choose strategies that can work and then carry out the strategies chosen.

Monitor and reflect on the process of mathematical problem solving.

VERIFICATION

Produce identifiable evidence of a second look at the concepts/strategies/calculations to defend a solution.

Communicate mathematical thinking coherently and clearly; use the language of mathematics to express mathematical ideas precisely.

COMMUNICATION

Use pictures, symbols, and/or vocabulary to convey the path to the identified solution.

Accurately solve problems that arise in mathematics and other contexts.

ACCURACY

Accurately solve problems using mathematics.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum
Goals

Oregon Grade-Level Standards

Grade 6

Calculations and Estimations

Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

#66 *Germinating Giants*

NUMBERS

Order, model, and compare positive rational numbers (fractions, decimals, and percentages).

Apply factors and multiples to express fractions in lowest terms and identify fraction equivalents.

Understand rates and ratios as comparisons of two quantities by division.

Differentiate between rates and ratios and express both as fractions.

Solve problems by calculating rates and ratios.

Locate positive rational numbers (fractions, decimals, and percentages) on a number line.

Apply equivalent forms of fractions and decimals to solve problems.

Determine equivalent forms of fractions, mixed numbers, and improper fractions.

Model square numbers and recognize their characteristics.

Identify prime and composite numbers less than 100.

Solve problems using concepts related to factoring and determining divisibility (e.g., 2, 3, 5, 9, and 10).

Compute fluently and make reasonable estimates.

#66 *Germinating Giants*

#67 *How Big is Your Tree?*

COMPUTATION AND ESTIMATION

Develop and analyze algorithms for computing with fractions and mixed numbers.

Add and subtract fractions with like and unlike denominators.

Understand linear, area, and discrete models to multiply and divide fractions.

Solve problems involving common percentages.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum
Goals

Oregon Grade-Level Standards

Grade 6

Convert mentally among common decimals, fractions, and percentages.

Apply grouping symbols to simplify calculations and evaluate expressions.

Develop *and use strategies to estimate the results of positive rational number computations* **and judge the reasonableness of results.**

Use referent numbers in estimating answers to adding and subtracting fractions and mixed numbers (e.g., $2\frac{1}{4} + \frac{3}{8} < 3$, since both $\frac{1}{4}$ and $\frac{3}{8}$ are less than $\frac{1}{2}$).

Understand meanings of operations and how they relate to one another.

OPERATIONS AND PROPERTIES

Use the inverse operations of addition and subtraction to solve problems **and check solutions** *involving adding and subtracting fractions and mixed numbers.*

Apply the associative, commutative, and distributive properties to simplify computations with positive rational numbers.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

Grade 6

Statistics and Probability

Select and use appropriate statistical methods to analyze data.

#41 How Plants Grow

Understand and apply basic concepts of probability.

Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

#38 Every Drop Counts

Develop and evaluate inferences and predictions that are based on data.

STATISTICS

Find, use, and interpret measures of center and spread.

PROBABILITY

Determine experimental probability of an event from a set of data.

Express probability using fractions, ratios, decimals, and percents.

Understand that probability cannot determine an individual outcome, but can be used to predict the frequency of an outcome.

Determine the number of possible combinations of two or more classes of objects (e.g., shirts, pants, and shoes).

COLLECT AND DISPLAY DATA

Design experiments and simulations to determine experimental probability of different outcomes.

Understand that experimental probability approaches theoretical probability as the number of trials increases.

Recognize and understand the connections among concepts of independent outcomes, picking at random, and fairness.

Represent and interpret the outcome of a probability experiment using a frequency distribution, including determining experimental probabilities.

DATA ANALYSIS AND PREDICTIONS

Make predictions for succeeding trials of a probability experiment given the outcome of preceding repeated trials.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum
Goals

Oregon Grade-Level Standards

Grade 6

#16B Pass the Plants, Please

#38 Every Drop Counts

Predict the outcome of a probability experiment by computing and using theoretical probability.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

Grade 6

Algebraic Relationships

Understand patterns, relations, and functions.

#85 In the Driver's Seat

Represent and analyze mathematical situations and structures using algebraic symbols.

Use mathematical models to represent and understand quantitative relationships.

Analyze change in various contexts.

PATTERNS AND FUNCTIONS

Represent, analyze, and determine rules for finding patterns involving positive rational numbers with tables, graphs, words, and when possible, symbolic rules.

ALGEBRAIC RELATIONSHIPS

Develop an understanding of different uses of variables (e.g., as a placeholder for a specific unknown, as representative of a range of values).

Represent and evaluate algebraic expressions involving two variables (e.g., $bh / 2$, $2w + 2L$).

Describe and interpret relationships using information from tables and graphs including coordinate graphs (first quadrant).

Graph linear equations on a coordinate grid by making a table using whole number coordinates.

MODELING

Model and solve contextualized problems using various representations such as graphs, tables, and equations.

Recognize and represent direct variation using tables and graphs.

Identify and sketch a graph that models a given situation.

CHANGE

Investigate how a change in one variable relates to a change in a second variable.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

Grade 6

Measurement

Understand measurable attributes of objects and the units, systems, and processes of measurement.

#67 How Big is Your Tree?

Apply appropriate techniques, tools, and formulas to determine measurements.

#67 How Big is Your Tree?

UNITS AND TOOLS

Select the most appropriate unit to measure area and perimeter.

Carry out unit conversions in the U.S. customary system as a result of calculations involving measurements of length, perimeter, volume, and weight (e.g., $6\frac{1}{2}'' + 10\frac{1}{4}'' = 16\frac{3}{4}''$ or $1\text{ ft. }4\frac{3}{4}''$).

Convert from a measurement expressed in one unit within a system to another using a different unit within the same system to measure perimeter and area.

DIRECT AND INDIRECT MEASUREMENT

Determine measurements of length and perimeter to the nearest eighth inch (for length less than one foot) and nearest inch (for lengths greater than one foot).

Estimate the measures of angles greater than 180 degrees.

Develop and use formulas for finding perimeter and area of polygons.

Calculate the area and circumference of a circle using pi as well as common approximations of pi (e.g., 3.14, $22/7$).

Develop strategies for determining approximate perimeter and area of irregular shapes.

Determine the area of a complex figure representative of a problem situation composed of a combination of two or more geometric figures (e.g., attach a triangle to a parallelogram).

Recognize that two-dimensional shapes having the same perimeter may have different areas and that shapes having the same area may have different perimeters.

Analyze how changes in area of a figure affect the dimensions of the figure.

Use referents to make estimates of area and evaluate the reasonableness of the estimate (e.g., estimate area classroom by measuring area of one floor tile).

Calculate rates (e.g., miles per hour, simple interest, people per

MATHEMATICS

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Common Curriculum Goals

Oregon Grade-Level Standards

Grade 6

square mile) to solve problems.

Geometry

Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Use visualization, spatial reasoning, and geometric modeling to solve problems.

#67 How Big is Your Tree?

Specify locations and describe spatial relationships using coordinate geometry and other representational systems.

Apply transformations and use symmetry to analyze mathematical situations.

PROPERTIES AND RELATIONSHIPS

Identify, describe, compare and classify polygons by their sides and angles.

Identify and represent the radius, center, diameter, chord, and circumference of a circle.

Identify combinations of angles that are complementary or supplementary and determine their measures.

Use properties of polygons to determine the lengths of sides and perimeters.

Develop, understand, and apply the property of the sum of the measures of the interior angles in a polygon as well as the sum of the exterior angles.

Find and use congruent polygons which will cover a surface without overlapping (tessellation).

MODELING

Model, sketch, draw, and label polygons, circles (including the center, radius, and diameter), complementary angles, supplementary angles, vertical angles, and adjacent angles.

Identify and describe the intersection of two or more geometric figures in the plane (e.g., the intersection of a circle and a line).

COORDINATE GEOMETRY

Plot polygons on coordinate graphs (first quadrant).

Determine lengths and areas of simple polygons from coordinate graphs.

TRANSFORMATIONS AND SYMMETRY

Build or sketch a shape that has a given number of lines of symmetry, or rotational symmetries e.g., sketch a simple polygon with a given number of lines of symmetry).

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum
Goals

Oregon Grade-Level Standards

Grade 6

Common Curriculum
Goals

Oregon Grade-Level Standards

Grade 6

Mathematical Problem Solving

These standards are assessed using the Mathematics Problem Solving Scoring Guide in grades 3 - CIM.

#67 How Big is Your Tree?

#85 In the Driver's Seat

Select, apply, and translate among mathematical representations to solve problems.

CONCEPTUAL UNDERSTANDING

Interpret the concepts of a problem-solving task and translate them into mathematics.

Apply and adapt a variety of appropriate strategies to solve problems.

PROCESSES AND STRATEGIES

Choose strategies that can work and then carry out the strategies chosen.

Monitor and reflect on the process of mathematical problem solving.

VERIFICATION

Produce identifiable evidence of a second look at the concepts/strategies/calculations to defend a solution.

Communicate mathematical thinking coherently and clearly; use the language of mathematics to express mathematical ideas precisely.

COMMUNICATION

Use pictures, symbols, and/or vocabulary to convey the path to the identified solution.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum
Goals

Oregon Grade-Level Standards

Grade 6

Accurately solve problems that arise in mathematics and other contexts.

ACCURACY

Accurately solve problems using mathematics.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

Grade 7

Calculations and Estimations

Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

#50 400-Acre Wood

Compute fluently and make reasonable estimates.

#50 400-Acre Wood

#67 How Big is Your Tree?

NUMBERS

Model and compare rational numbers with an emphasis on integers.

Express numbers greater than one in scientific and standard notation.

Use rates, ratios, and percents to solve problems.

Locate rational numbers (with an emphasis on integers) on a number line.

Interpret, model, and use percents greater than 100 and less than 1 to solve problems.

Determine the prime factorization of a number less than 1000 and express the prime factorization using exponents when applicable.

Use factors (including greatest common factor of two or more numbers), multiples (including least common multiple of two or more numbers), prime factorization, and relatively prime numbers to solve problems.

COMPUTATION AND ESTIMATION

Develop and analyze algorithms and compute with integers.

Multiply and divide fractions and mixed numbers.

Compute with squares and cubes, with an emphasis on finding area, surface area, and volume.

Solve problems involving percentages (including percent increase and decrease, interest rates, tax, discount, tips, and part/whole relationships).

Apply order of operations including exponents, to simplify calculations and evaluate expressions.

Develop and use strategies to estimate the results of integer computations **and judge the reasonableness of results.**

Use referent numbers in estimating answers to calculations with fractions and percents (e.g., $12 \times \frac{3}{8} < 6$, since $\frac{3}{8} < \frac{1}{2}$ and $\frac{1}{2}$ of 12 is 6).

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

Grade 7

Understand meanings of operations and how they relate to one another.

OPERATIONS AND PROPERTIES

Demonstrate the meaning of whole number exponents as repeated multiplication.

*Use inverse operations (addition and subtraction, multiplication and division) to solve problems **and check solutions** involving calculations with integers*

Apply the associative, commutative, and distributive properties to simplify computations with rational numbers (with an emphasis on integers).

Describe the effects of multiplying or dividing a number by a number between 0 and 1.

Apply the property of additive inverses to determine solutions of equations.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

Grade 7

Statistics and Probability

Select and use appropriate statistical methods to analyze data.

#41 How Plants Grow

Understand and apply basic concepts of probability.

Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

#37 Reduce, Reuse, Recycle

STATISTICS

Find, use, and interpret measures of center and spread, including mean and interquartile range for given or derived data.

PROBABILITY

Compute experimental probabilities from a set of data and theoretical probabilities for single and simple compound events, using various methods (e.g., organized lists, tree diagrams, area models).

Determine probabilities of simple independent and dependent events.

Compare experimental probability of an event with the theoretical probability and explain any difference.

Determine all possible outcomes of a particular event or all possible arrangements of objects in a given set by applying various methods including tree diagrams and systematic lists.

COLLECT AND DISPLAY DATA

Formulate questions and design experiments or surveys to collect relevant data.

#37 Reduce, Reuse, Recycle

Identify situations in which it makes sense to sample and identify methods for selecting a sample (e.g., convenience sampling, responses to survey, random sampling) that are representative of a population.

#37 Reduce, Reuse, Recycle

Distinguish between random and biased samples and identify possible sources of bias in sampling.

Represent and interpret data using frequency distribution tables, box-and whisker-plots, stem-and-leaf plots, and single- and multiple-line graphs.

#37 Reduce, Reuse, Recycle

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum
Goals

Oregon Grade-Level Standards

Grade 7

Determine the graphical representation of a set of data that best shows key characteristics of the data.

#37 Reduce, Reuse, Recycle

Recognize distortions of graphic displays of sets of data and evaluate appropriateness of alternative displays.

Common Curriculum
Goals

Oregon Grade-Level Standards

Grade 7

Develop and evaluate inferences and predictions that are based on data.

#37 Reduce, Reuse, Recycle

#38 Every Drop Counts

DATA ANALYSIS AND PREDICTIONS

Analyze data from frequency distribution tables, box-and-whisker-plots, and stem-and-leaf plots using measures of center and spread and draw conclusions.

Predict and evaluate how adding data to a set of data affects measures of center.

Use observations about differences between two or more samples to make conjectures about the populations from which the samples were taken.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum
Goals

Oregon Grade-Level Standards

Grade 7

Algebraic Relationships

Understand patterns, relations, and functions.

PATTERNS AND FUNCTIONS

Represent, analyze, and determine rules for finding patterns involving integers with tables, graphs, words, and when possible, symbolic rules.

Represent and analyze mathematical situations and structures using algebraic symbols.

ALGEBRAIC RELATIONSHIPS

*Algebraically represent situations and solve problems involving linear equations and **inequalities**.*

Evaluate algebraic expressions and formulas by substituting integers.

Interpret algebraic relationships represented by two-column tables, number lines and coordinate graphs (four quadrants).

Graph linear equations on a coordinate grid by making a table using integer coordinates.

Use mathematical models to represent and understand quantitative relationships.

MODELING

Model situations, make predictions and inferences, and solve problems using linear equations.

Recognize and represent direct variation using tables, graphs, and equations.

Identify and sketch a graph that models a given situation.

Analyze change in various contexts.

CHANGE

Identify and describe how a change in one variable relates to a change in a second variable.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

Grade 7

Measurement

Understand measurable attributes of objects and the units, systems, and processes of measurement.

#67 How Big is Your Tree?

Apply appropriate techniques, tools, and formulas to determine measurements.

#67 How Big is Your Tree?

UNITS AND TOOLS

Select the most appropriate unit to measure surface area and volume.

Convert from a measurement expressed in one unit within a system to another using a different unit within the same system to measure surface and volume.

DIRECT AND INDIRECT MEASUREMENT

Develop and use strategies and formulas for calculating surface area and volume of right prisms, pyramids, and cylinders.

Develop strategies for determining approximate volumes of irregular shapes.

Determine surface area and volume of three-dimensional block constructions, given a two-dimensional representation.

Compare and contrast the formulas for surface area and volume of prisms and pyramids.

Create examples of rectangular prisms having the same volume, but different surface areas.

Describe what happens to the surface area and volume of a solid when its shape is changed.

Use referents to make estimates of surface area and volume and evaluate the reasonableness of the estimate.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

Grade 7

Geometry

Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Use visualization, spatial reasoning, and geometric modeling to solve problems.

#67 How Big is Your Tree?

Specify locations and describe spatial relationships using coordinate geometry and other representational systems.

Apply transformations and use symmetry to analyze mathematical situations

PROPERTIES AND RELATIONSHIPS

Determine defining properties that characterize classes of quadrilaterals including side and angle measurements and their component parts (e.g., altitudes, medians, diagonals, bisectors).

Identify parallel and intersecting lines and pairs of angles formed (right, vertical, adjacent) by parallel lines cut by a transversal and determine their measure.

Use proportional reasoning, drawings, models, or technology to demonstrate congruence and similarity of polygons with an emphasis on quadrilaterals.

Determine the measures of missing sides and angles in congruent quadrilaterals and their component parts.

MODELING

Model, sketch, and label prisms, pyramids, cylinders, and quadrilaterals with specified side lengths or angle measures.

Use two-dimensional representation of three-dimensional objects, including nets, to solve problems involving surface area and volume.

COORDINATE GEOMETRY

Identify properties of quadrilaterals and their component parts on a coordinate graph.

TRANSFORMATIONS AND SYMMETRY

Determine the image of a point (with integer coordinates) on a graph under translations and reflections.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum
Goals

Oregon Grade-Level Standards

Grade 7

Mathematical Problem Solving

These standards are assessed using the Mathematics Problem Solving Scoring Guide in grades 3 - CIM.

#67 *How Big is Your Tree?*

#85 *In the Driver's Seat*

Select, apply, and translate among mathematical representations to solve problems.

CONCEPTUAL UNDERSTANDING

Interpret the concepts of a problem-solving task and translate them into mathematics.

Apply and adapt a variety of appropriate strategies to solve problems.

PROCESSES AND STRATEGIES

Choose strategies that can work and then carry out the strategies chosen.

Monitor and reflect on the process of mathematical problem solving.

VERIFICATION

Produce identifiable evidence of a second look at the concepts/strategies/calculations to defend a solution.

Communicate mathematical thinking coherently and clearly; use the language of mathematics to express mathematical ideas precisely.

COMMUNICATION

Use pictures, symbols, and/or vocabulary to convey the path to the identified solution.

Accurately solve problems that arise in mathematics and other contexts.

ACCURACY

Accurately solve problems using mathematics.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

Grade 8

Calculations and Estimations

Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

#50 400-Acre Wood

Compute fluently and make reasonable estimates.

#50 400-Acre Wood

#67 How Big is Your Tree?

Understand meanings of operations and how they relate to one another.

NUMBERS

Compare numbers greater than one expressed in scientific notation.

Apply proportions to solve problems.

Locate rational numbers on a number line.

Apply equivalent forms of rational numbers (including percents) to solve problems.

COMPUTATION AND ESTIMATION

Develop and analyze algorithms and compute with rational numbers.

Use order of operation rules, including exponents.

Develop and use strategies to estimate the results of rational number computations and judge the reasonableness of results.

Estimate square roots of whole numbers less than 100 and cube roots of whole numbers less than 1000 between two whole numbers.

OPERATIONS AND PROPERTIES

Demonstrate the meaning of square roots as lengths of the sides of squares and cube roots as lengths of edges of cubes.

Use the inverse operations of squares and square roots to solve problems and check solutions.

Apply the associative, commutative, and distributive properties to simplify computations with rational numbers.

Apply the property of multiplicative inverses to determine

MATHEMATICS

Adopted April 2002

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Common Curriculum Goals

Oregon Grade-Level Standards

Grade 8

solutions of linear equations and inequalities.

Statistics and Probability

Select and use appropriate statistical methods to analyze data.

#41 How Plants Grow

Understand and apply basic concepts of probability.

Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

Develop and evaluate inferences and predictions that are based on data.

STATISTICS

*Choose appropriate measures of central tendencies to describe given or **derived** data.*

*Estimate a line of best fit on a scatter plot **and informally explain the meaning of the line** and use the line to make predictions.*

PROBABILITY

Understand and use appropriate terminology to describe complementary and mutually exclusive events and determine their probabilities.

*Apply theoretical probability to determine if an event or game is fair or unfair **and pose** and evaluate modifications to change the fairness.*

COLLECT AND DISPLAY DATA

Collect and display data as lists, tables, and plots using appropriate technology (e.g., graphing calculators, computer software).

#35 Loving It Too Much

#37 Reduce, Reuse, Recycle

#38 Every Drop Counts

Represent bivariate data in a scatter plot and identify relationships in the plot.

DATA ANALYSIS AND PREDICTIONS

Estimate or predict the occurrence of future events using data.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum
Goals

Oregon Grade-Level Standards

Grade 8

Algebraic Relationships

Understand patterns, relations, and functions.

#85 In the Driver's Seat

Represent and analyze mathematical situations and structures using algebraic symbols.

PATTERNS AND FUNCTIONS

Represent, analyze and determine rules for finding patterns relating to linear functions, nonlinear functions, and arithmetic sequences with tables, graphs, and symbolic rules.

Identify functions as linear or nonlinear from tables, graphs, or equations **and contrast their properties**.

Interpret the meaning of the rate of change and y-intercept of a linear relationship in a problem setting.

ALGEBRAIC RELATIONSHIPS

Represent and solve equations of the form $ax+b = c$ or $k(ax + b) = c$.

Approximate solutions of systems of linear equations from a graph.

Recognize **and generate** equivalent symbolic forms for algebraic expressions with an emphasis on linear relationships.

Evaluate algebraic expressions and formulas, including expressions involving exponents and parentheses, by substituting rational numbers.

Translate between and interpret linear relationships represented by words, symbols, tables, and graphs.

Determine the slope and x- and y-intercepts given the graph of a linear equation.

Graph a linear equation given the slope and an initial value (y-intercept).

Recognize **and graph** the solutions of linear inequalities on a number line.

Graph simple quadratic equations ($y=kx^2$ or $y=kx^2+b$) by

MATHEMATICS

Adopted April 2002

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Common Curriculum Goals

Oregon Grade-Level Standards

Grade 8

Use mathematical models to represent and understand quantitative relationships.

generating a table of values for a given equation.

Identify and describe the effects of changing the slope or y-intercept on the graph of a linear relationship of the form $y=kx$ or $y=kx+b$.

MODELING

Model situations, make predictions and inferences, and solve problems using linear equations and inequalities.

*Recognize **and represent** direct variation using tables, graphs, and equations.*

Determine when data represented in a table or graph represents a linear or nonlinear relationship.

Analyze change in various contexts.

CHANGE

Understand that the rate of change in a linear function is constant and is equal to the slope of its graphed line.

Determine the slope of a line given two points on the line.

Analyze the nature of change in quantities in linear relationships represented by graphs, tables, or formulas.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

Grade 8

Measurement

Understand measurable attributes of objects and the units, systems, and processes of measurement.

#67 How Big is Your Tree?

UNITS AND TOOLS

Determine an appropriate scale for representing an object in a scale drawing.

Carry out unit conversions between the metric and U.S. customary systems of measurement given conversion ratios (e.g., 1 in = 2.54 cm).

Convert between units for large and small numbers in the metric system (e.g., mega- to kilo-).

Apply appropriate techniques, tools, and formulas to determine measurements.

#67 How Big is Your Tree?

DIRECT AND INDIRECT MEASUREMENT

Calculate and analyze changes in area and volume in relation to changes in linear measures of figures.

Analyze how changes in surface area and volume of a solid affect the dimensions of the solid.

Solve problems involving rates and derived measurements for such attributes as speed, velocity, and density.

Determine actual distances from scale drawings, blueprints, and maps and solve problems involving scale factors.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

Grade 8

Geometry

Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Use visualization, spatial reasoning, and geometric modeling to solve problems.

#67 How Big is Your Tree?

Specify locations and describe spatial relationships using coordinate geometry and other

PROPERTIES AND RELATIONSHIPS

Determine defining properties that characterize classes of triangles including side and angle measurements and their component parts (*e.g., angle bisectors, altitudes, medians*).

Use proportional reasoning, drawings, models or technology to demonstrate similarity and congruence of polygons with an emphasis on triangles.

Determine the measures of corresponding sides and angles of congruent and similar triangles and their component parts.

Use similar triangles to measure distances indirectly (e.g., flagpole and shadow).

Use the Pythagorean theorem to determine if triangles are right triangles and determine the lengths of missing sides in right triangles.

Investigate triangles and their component parts and draw conclusions about their properties.

Create and critique inductive and deductive arguments to verify the Pythagorean theorem.

Justify conclusions that two triangles are or are not congruent and are or are not similar.

MODELING

Draw to scale two-dimensional representations of rectangular prisms and triangles with specified side lengths or angle measures.

Construct and read drawings and models made to scale.

COORDINATE GEOMETRY

On a coordinate plane, determine the relative placement (e.g., intersecting, parallel, perpendicular) of two lines.

MATHEMATICS

Adopted April 2002

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Common Curriculum Goals

Oregon Grade-Level Standards

Grade 8

representational systems.

Determine the distance between two points on a coordinate graph using right triangles and the Pythagorean theorem.

Apply transformations and use symmetry to analyze mathematical situations.

TRANSFORMATIONS AND SYMMETRY

Classify transformations based on whether they produce congruent or similar non-congruent figures (e.g., compare pairs of shapes where the image has been transformed, identify the type of translation and use angles, diagonals, and lines of symmetry to determine congruence).

Identify and sketch the figure that is the result of a given rotation, translation, reflection, or dilation or a combination of two transformations.

Know properties of dilated images.

Determine the effects of a transformation on linear and area measurements of the original figure.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

Grade 8

Mathematical Problem Solving

#67 *How Big is Your Tree?*

#85 *In the Driver's Seat*

Select, apply, and translate among mathematical representations to solve problems.

Apply and adapt a variety of appropriate strategies to solve problems.

Monitor and reflect on the process of mathematical problem solving.

Communicate mathematical thinking coherently and clearly; use the language of mathematics to express mathematical ideas precisely.

Accurately solve problems that arise in mathematics and other contexts.

These standards are assessed using the Mathematics Problem Solving Scoring Guide in grades 3 - CIM.

CONCEPTUAL UNDERSTANDING

Interpret the concepts of a problem-solving task and translate them into mathematics.

PROCESSES AND STRATEGIES

Choose strategies that can work and then carry out the strategies chosen.

VERIFICATION

Produce identifiable evidence of a second look at the concepts/strategies/calculations to defend a solution.

COMMUNICATION

Use pictures, symbols, and/or vocabulary to convey the path to the identified solution.

ACCURACY

Accurately solve problems using mathematics.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum
Goals

Oregon Grade-Level Standards

CIM/CAM

Calculations and Estimations

Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

NUMBERS

Compare real numbers.

Order and compare numbers expressed in scientific notation to each other and to other forms of real numbers.

Recognize that the set of real numbers contains the set of irrational numbers and the set of rational numbers and know the difference between them.

Locate real numbers on a number line (including approximations of irrational numbers).

Apply equivalent forms of real numbers to solve problems.

Compute fluently and make reasonable estimates.

COMPUTATION AND ESTIMATION

Compute with real numbers, including absolute value and numbers expressed in scientific notation.

Compute with integer exponents and whole number roots.

Mentally multiply and divide by powers of 10 to estimate results of computations involving numbers expressed in scientific notation.

Develop and use strategies to estimate the results of real number computations, determine the amount of error, and judge the reasonableness of results.

Estimate the results of computations with integer powers and roots of real numbers.

MATHEMATICS

Adopted April 2002

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Common Curriculum Goals

Oregon Grade-Level Standards

CIM/CAM

Understand meanings of operations and how they relate to one another.

OPERATIONS AND PROPERTIES

Recognize that taking the n th root of a number corresponds to prime factorization.

*Use the inverse operations of n th power and n th root to solve problems **and check solutions.***

Apply the associative, commutative, and distributive properties to simplify computations with real numbers.

Use properties of numbers to demonstrate whether assertions are true or false.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

CIM/CAM

Statistics and Probability

Select and use appropriate statistical methods to analyze data.

STATISTICS

*Estimate from a graph or a set of data the mean and standard deviation of a normal distribution and **draw conclusions about the distribution of data using measures of center and spread** (e.g., analyze a variety of summary statistics and graphical displays).*

Analyze bivariate data and identify the type of function (e.g., linear, quadratic, exponential) that could be used to model the data.

Understand and apply basic concepts of probability.

PROBABILITY

Compute the probability of a compound event (e.g., toss a coin three times to find the probability of two heads).

Determine probabilities of dependent and independent events (e.g., use colored marbles with and without replacement).

Use conditional probability to solve problems (e.g., from a sample set for the roll of two tetrahedral die; given that a sum is even, what is the probability that the sum is 6?).

Determine all possible outcomes of a particular event or all possible arrangements of objects in a given set by applying counting strategies, combinations, and permutations.

Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

COLLECT AND DISPLAY DATA

*Determine appropriate designs for simulations (surveys, observational studies, and experiments) and modeling to study a problem **and construct empirical probability distributions to represent results.***

Use matrices, histograms, scatter plots, stem-and-leaf plots, and box-and whisker-plots to interpret data.

Identify examples of populations that are normally distributed.

MATHEMATICS

Adopted April 2002

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Common Curriculum Goals

Oregon Grade-Level Standards

CIM/CAM

Develop and evaluate inferences and predictions that are based on data.

DATA ANALYSIS AND PREDICTIONS

Make inferences and predictions from data in histograms, scatter plots, and parallel box plots.

Make predictions about populations based on reported sample statistics.

Understand that inferences about a population drawn from a sample involve uncertainty and that the role of statistics is to measure that uncertainty.

MATHEMATICS

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Common Curriculum
Goals

Oregon Grade-Level Standards

CIM/CAM

Algebraic Relationships

Understand patterns, relations, and functions.

Represent and analyze mathematical situations and structures using algebraic symbols.

PATTERNS AND FUNCTIONS

Represent and generalize sequences resulting from linear, quadratic, and exponential relationships using recursive or explicit formulas, tables of values, and graphs.

Produce a valid conjecture using inductive reasoning by generalizing from a pattern of observations.

Evaluate and make a table for two-variable formulas and match a graph or table of values to its formula.

Identify independent and dependent variables and determine the domain and range of a function in a problem situation.

ALGEBRAIC RELATIONSHIPS

Algebraically represent situations and solve problems involving quadratic and exponential equations, including exponential growth and decay.

Use graphs to solve non-linear equations, including quadratics.

Represent and solve systems of linear equations with two variables using simultaneous equations and by graphing.

*Recognize **and generate** equivalent forms for algebraic expressions, including combining like terms and expanding binomials.*

Evaluate algebraic expressions and formulas by substituting real numbers.

Translate between and interpret quadratic and exponential relationships represented by words, symbols, tables, and graphs.

Determine and interpret maxima or minima and zeros of quadratic functions, and linear functions where $y = \text{constant}$.

Graph linear inequalities in two variables.

Graph quadratic and exponential equations.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

CIM/CAM

Use mathematical models to represent and understand quantitative relationships.

Analyze how changing a parameter (i.e., k , b) in a quadratic or exponential function of the form $y=k^x+b$, $y=kx^2+b$, or $y=k(x+b)^2$ affects its graph.

MODELING

Model situations, make predictions and inferences, and solve problems using linear, quadratic, and exponential functions.

Determine when data represented in a table or graph represents a linear, quadratic, or exponential relationship.

Analyze change in various contexts.

CHANGE

Approximate and interpret rates of change in graphical and numeric data.

Analyze the nature of change of each variable in a non-linear relationship as suggested by a table of values, a graph, or a formula.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

CIM/CAM

Measurement

Understand measurable attributes of objects and the units, systems, and processes of measurement.

UNITS AND TOOLS

Determine the appropriate units, scales, and tools for problem situations involving measurement.

Solve problems involving unit conversions (e.g., mile per hour to feet per second) given the unit equivalencies.

Determine the precision of a given measuring tool (e.g., 1 degree for a standard protractor).

Apply appropriate techniques, tools, and formulas to determine measurements.

DIRECT AND INDIRECT MEASUREMENT

Develop and use strategies and formulas for calculating surface area and volume of cones and spheres.

Use formulas to solve problems involving finding missing dimensions given perimeter, area, surface area, and volume of polygons, circles, prisms, pyramids, cones, cylinders, and spheres.

Develop and understand, and use the formula for determining arc length (e.g., portion of a circle).

Determine perimeter and area of shapes of circles and polygons (annulus, etc.) in context.

Determine the surface area and volume of a complex figure composed of a combination of two or more geometric figures or a figure derived from a regular solid (e.g., hemisphere, frustum of a cone).

Compare and contrast the formulas for surface area and volume of cylinders and cones.

Determine a shape that has minimum or maximum perimeter, area, surface area, or volume under specified conditions.

Make and use scale drawings and models to solve problems.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum
Goals

Oregon Grade-Level Standards

CIM/CAM

Geometry

Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.

PROPERTIES AND RELATIONSHIPS

Determine defining properties that characterize classes of three-dimensional figures and their component parts.

Recognize and represent three-dimensional figures and their component parts.

Justify and use theorems involving the angles formed by parallel lines cut by a transversal.

Develop, understand, and apply properties of circles and of inscribed and circumscribed polygons.

Use measures of sides and of interior and exterior angles of polygons to classify figures and solve problems.

Prove congruence of two triangles or their corresponding component parts.

Determine the measures of corresponding angles, sides, and corresponding parts of congruent and similar figures.

Use angle, side length, and triangle inequality relationships to solve problems.

Use trigonometric functions, and angle and side relationships of special right triangles (30- 60-right triangles and isosceles right triangles) to solve for an unknown length and determine distances and solve problems.

Investigate relationships among chords, secants, tangents, inscribed angles, and inscribed and circumscribed polygons of circles.

Construct and judge the validity of a logical argument and give counterexamples to disprove a statement.

Justify and use theorems involving the properties of triangles, quadrilaterals, circles, and their component parts to verify congruence and similarity.

MATHEMATICS

Adopted April 2002

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Common Curriculum Goals

Oregon Grade-Level Standards

CIM/CAM

Use visualization, spatial reasoning, and geometric modeling to solve problems.

MODELING

Model, sketch, label and where appropriate construct cones and spheres, and basic elements of geometric figures (e.g., altitudes, midpoints, medians, angle bisectors, and perpendicular bisectors) using compass and straightedge or technology.

Describe how two or more objects are related in space (e.g., skew-lines, the possible ways three planes might intersect).

Make a model of a three-dimensional figure from a two-dimensional drawing and make a two-dimensional representation of a three-dimensional object through scale drawings, perspective drawings, blueprints, or computer simulations.

Recognize representations of three-dimensional objects from different perspectives and identify cross-sections of three-dimensional objects.

Specify locations and describe spatial relationships using coordinate geometry and other representational systems.

COORDINATE GEOMETRY

Determine the relative placement (e.g., intersecting, parallel, perpendicular) of two lines on a coordinate plane given the algebraic equations representing them.

Calculate slope, distance and midpoint between points with an emphasis on practical applications (use coordinate formulas).

MATHEMATICS

Adopted April 2002

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Common Curriculum Goals

Oregon Grade-Level Standards

CIM/CAM

Apply transformations and use symmetry to analyze mathematical situations.

TRANSFORMATIONS AND SYMMETRY

Use coordinate geometry to determine whether a figure is symmetrical with respect to a line or a point.

Determine whether a given pair of figures on a coordinate plane represents a translation, reflection, rotation, and/or dilation.

Determine the image of a figure on a coordinate graph under translations, reflections, and rotations.

Given a figure and its image on a coordinate graph, determine the translation vector or locate the axis of reflection.

*Determine the coordinates of **and draw** the dilation of a figure on a coordinate graph.*

Analyze the congruence, similarity, and line or rotational symmetry of figures using transformations.

MATHEMATICS

Adopted April 2002

Student accountability for grades 3, 5, 8 and CIM standards began in 2004-05. Student accountability for grades 4, 6, 7 begins 2005-06.

Common Curriculum Goals

Oregon Grade-Level Standards

CIM/CAM

Mathematical Problem Solving

These standards are assessed using the Mathematics Problem Solving Scoring Guide in grades 3 - CIM.

Select, apply, and translate among mathematical representations to solve problems.

CONCEPTUAL UNDERSTANDING

Interpret the concepts of a problem-solving task and translate them into mathematics.

Apply and adapt a variety of appropriate strategies to solve problems.

PROCESSES AND STRATEGIES

Choose strategies that can work and then carry out the strategies chosen.

Monitor and reflect on the process of mathematical problem solving.

VERIFICATION

Produce identifiable evidence of a second look at the concepts/strategies/calculations to defend a solution.

Communicate mathematical thinking coherently and clearly; use the language of mathematics to express mathematical ideas precisely.

COMMUNICATION

Use pictures, symbols, and/or vocabulary to convey the path to the identified solution.

Accurately solve problems that arise in mathematics and other contexts.

ACCURACY

Accurately solve problems using mathematics.