Grade 5	Grade 6	Grade 7
Standard 1 - Number Sense *Students compute with whole numbers*, decimals, and fractions and understand the relationship among decimals, fractions, and percents. They understand the relative magnitudes of numbers. They understand Prime* and composite* numbers.*	***Standard 1 – Number Sense*** *Students compare and order positive and negative integers*, decimals, fractions, and mixed numbers. They find multiples* and factors*.*	***Standard 1 - Number Sense*** *Students understand and use scientific notation* and square roots. They convert between fractions and decimals.*
5.1.1 Convert between numbers in words and numbers in figures, for numbers up to millions and decimals to thousandths. Example: Write the number 198,536 in words. 5.1.2 Round whole numbers and decimals to any place value. Example: Is 7,683,559 closer to 7,600,000 or 7,700,000? Explain your answer. 5.1.3 Arrange in numerical order and compare whole numbers or decimals to two decimal places by using the symbols for less than (<), equals (=), and greater than (>). Example: Write from smallest to largest: 0.5, 0.26, 0.08. 5.1.4 Interpret percents as a part of a hundred. Find decimal and percent equivalents for common fractions and explain why they represent the same value. Example: Shade a 100-square grid to show 30%. What fraction is this?	6.1.1 Understand and apply the basic concept of negative numbers (e.g., on a number line, in counting, in temperature, in "owing"). Example: The temperature this morning was -6° and now it is 3°. How much has the temperature risen? Explain your answer. 6.1.2 Interpret the absolute value of a number are the distance from zero on a number line, and find the absolute value of real numbers. Example: Use a number line to explain the absolute values of -3 and of 7. 6.1.3 Compare and represent on a number line positive and negative integers, fractions, decimals (to hundredths), and mixed numbers. Example: Find the positions on a number line of 3.56, -2.5, $1\frac{5}{6}$, and -4. 6.1.4 Convert between any two representations of numbers (fractions, decimals, and percents) without the use of a calculator. Example: Write $\frac{5}{8}$ as a decimal and	7.1.1 Read, write, compare and solve problems using whole numbers in scientific notation. Example: Write 300,000 in scientific notation. 7.1.2 Compare and order rational* and common irrational* numbers and place them on a number line. Example: Place in order: -2, $\frac{5}{8}$, -2.45, 0.9, π, -1 ¾. 7.1.3 Identify rational and common irrational numbers from a list. Example: Name all the irrational numbers in the list: =2, $\frac{5}{8}$, -2.45, 0.9, π, -1 ¾. 7.1.4 Understand and compute whole number power of whole numbers. Example: $3^5 = 3 \times 3 \times 3 \times 3 \times 3 = ?$

5.1.5 Explain different interpretations of fractions: as parts of a whole, parts of a set, and division of whole numbers by whole numbers. Example: What fraction of a pizza will each person get when 3 pizzas are divided equally among 5 people? 5.1.6 Describe and identify prime and composite numbers. Example: Which of the following numbers are prime: 3, 7, 12, 17, 18? Justify your choices. 5.1.7 Identify on a number line the relative position of simple positive fractions, positive mixed numbers, and positive decimals. Example: Find the positions on a number line of 1¼ and 1.4. *whole numbers: 0, 1, 2, 3, etc. *prime number: number that can be evenly divided only by 1 and itself (e.g., 2, 3, 5, 7, 11) *composite number: not a prime number (e.g., 4, 6, 8, 9, 10)	as a percent. 6.1.5 Recognize decimal equivalents for commonly used fractions without the use of a calculator. Example: Know that $\frac{1}{3}$ = 0.333 …, ½ = 0.5, $\frac{2}{5}$ = 0.4, etc. 6.1.6 Use models to represent ratios. Example: Divide 27 pencils to represent the ratio 4:5. 6.1.7 Find the least common multiple* and the greatest common factor* of whole numbers. Use them to solve problems with fractions (e.g., to find a common denominator to add two fractions or to find the reduced form for a fraction). Example: Find the smallest number that both 12 and 18 divide into. How does this help you add the fractions $\frac{5}{12}$ and $\frac{7}{18}$? *positive and negative integers: …, -3, -2, -1, 0, 1, 2, 3, … *multiples: e.g., multiples of 7 are 7, 14, 21, 28, etc. *factors: e.g., factors of 12 are 1, 2, 3, 4, 6, 12 *least common multiple: e.g., least common multiple of 4 and 6 is 12 *greatest common factor: e.g., greatest common factor of 18 and 42 is 6	7.1.5 Find the prime factorization* of whole numbers and write the results using exponents. Example: 24 = 2 x 2 x 2 x 3 = 2^3 X 3. 7.1.6 Understand and apply the concept of square root. Example: Explain how you can find the length of the hypotenuse of a right triangle with legs that measure 5 cm and 12 cm. 7.1.7 Convert terminating decimals* into reduced fractions. Example: Write 0.95 as a fraction. *scientific notation: a shorthand way of writing numbers using power of ten (e.g., 300,000 = 3 x 10^5) *rational number: any number that can be written as a ratio of two integers* (e.g., ½, $\frac{5}{8}$, $\frac{23}{9}$) *integers: …, -3, -2, -1, 0, 1, 2, 3 … *irrational number: any number that cannot be written as a ratio of two integers (e.g., π, $\sqrt{3}$, 7π) *prime factors: e.g., prime factors of 12 are 2 and 3, the two prime numbers that divide 12 *terminating decimals: decimals that do not continue indefinitely (e.g., 0.362, 34.1857)

Standard 2 – Computation *Students solve problems involving multiplication and division of whole numbers and solve problems involving addition, subtraction, and simple multiplication and division of fractions and decimals.*	***Standard 2 – Computation*** *Students solve problems involving addition, subtraction, multiplication, and division of integers. They solve problems involving fractions, decimals, ratios, proportions, and percentages.*	***Standard 2 – Computation*** *Students solve problems involving integers*, fractions, decimals, ratios, and percentages.*
5.2.1 Solve problems involving multiplication and division of any whole numbers. Example: 2,867 x 34 = ? Explain your answer. 5.2.2 Add and subtract fractions (including mixed numbers) with different denominators. Example: $3\frac{4}{5} - 2\frac{2}{3} = ?$ 5.2.3 Use models to show an understanding of multiplication and division of fractions. Example: Draw a rectangle 5 squares long and 3 squares wide. Shade $\frac{4}{5}$ of the rectangle, starting from the left. Shade $\frac{2}{3}$ of the rectangle, starting from the top. Look at the fraction of the squares that you have double-shaded and use that to show how to multiply $\frac{4}{5}$ by $\frac{2}{3}$.	6.2.1 Add and subtract positive and negative integers. Example: 17 ÷ -4 = ?, -8 - 5 = ? 6.2.2 Multiply and divide positive and negative integers. Example: Continue the pattern: 3 x 2 = ?, 2 x 2 = ?, 1 x 2 = ?, 0 x 2 = ?, -1 x 2 = ?, -2 x 2 = ?, etc. 6.2.3 Multiply and divide decimals. Example: 3.265 x 0.96 = ?, 56.79 ÷ 2.4 = ?	7.2.1 Solve addition, subtraction, multiplication, and division problem that use integers, fractions, decimals, and combinations of the four operations. Example: the temperature one day is 5°. It then falls by 3° each day for 4 days and, after that, rises by 2° each day for 3 days. What is the temperature on the last day? Explain your method. 7.2.2 Calculate the percentage increase and decrease of a quantity. Example: The population of a country was 36 million in 1990 and it rose to 41.4 million during the 1990s. What was the percentage increase in the population? 7.2.3 Solve problems that involve discounts, markups, and commissions. Example: A merchant buys CDs for $11 wholesale and marks up the price by 35%. What is the retail price?

5.2.4 Multiply and divide fractions to solve problems. Example: You have 3½ pizzas left from a party. How many people can have ¼ of a pizza each? 5.2.5 Add and subtract decimals and verify the reasonableness of the results. Example: Compute 39.46 – 20.89 and check the answer by estimating. 5.2.6 Use estimation to decide whether answers are reasonable in addition, subtraction, multiplication, and division problems. Example: Your friend says that 2,867 x 34 = 20,069. Without solving, explain why you think the answer is wrong. 5.2.7 Use mental arithmetic to add or subtract simple decimals. Example: Add 0.006 to .027 without using pencil and paper.	6.2.4 Explain how to multiply and divide positive fractions and perform the calculations. Example: Explain why $\frac{5}{8} \div \frac{15}{16} = \frac{5}{8} \times \frac{16}{15} = \frac{2}{3}$. 6.2.5 Solve problems involving addition, subtraction, multiplication, and division of positive fractions and explain why a particular operation was used for a given situation. Example: you want to place a towel bar 9 ¾ inches long in the center of a door 27 ½ inches wide. How far from each edge should you place the bar? Explain your method. 6.2.6 Interpret and use ratios to show the relative sizes of two quantities. Use the notations: a/b, a to b, a:b. Example: A car moving at a constant speed travels 130 miles in 2 hours. Write the ratio of distance to time and use it to find how far the car will travel in 5 hours. 6.2.7 Understand proportions and use them to solve problems. Example: Sam made 8 out of 24 free throws. Use a proportion to show how many free throws Sam would probably make out of 60 attempts.	7.2.4 Use estimation to decide whether answers are reasonable in problems involving fractions and decimals. Example: Your friend says that $3\frac{3}{8} \times 2\frac{2}{9} = 10$. Without solving, explain why you think the answer is wrong. 7.2.5 Use mental arithmetic to compute with simple fractions, decimals, and powers. Example: Find 3^4 without using pencil and paper. *integers: …, -3, -2, -1, 0, 1, 2, 3, …

	6.2.8 Calculate given percentages of quantities and solve problems involving discounts at sales, interest earned, and tips. Example: In a sale, everything is reduced by 20%. Find the sale price of a shirt whose pre-sale price was $30. 6.2.9 Use estimation to decide whether answers are reasonable to decimal problems. Example: your friends says that 56.79 ÷ 2.4 = 2.36625. Without solving, explain why you the answer is wrong. 6.2.10 Use mental arithmetic to add or subtract simple fractions and decimals. Example: Subtract $\frac{1}{6}$ from ½ without using pencil and paper.	

Standard 3 – Algebra and Functions *Students use variables in simple expressions, compute the value of an expression for specific values of the variable, and plot and interpret the results. They use two-dimensional coordinate grids to represent points and graph lines.*	***Standard 3 – Algebra and Functions*** *Students write verbal expressions and sentences as algebraic expressions and equations. They evaluate algebraic expressions, solve simple linear equations, and graph and interpret their results. They investigate geometric relationships and describe them algebraically.*	***Standard 3 – Algebra and Functions*** *Students express quantitative relationships using algebraic terminology, expressions, equations, inequalities, and graphs.*
5.3.1 Use a variable to represent an unknown number. Example: When a certain number is multiplied by 3 and then 5 is added, the result is 29. Let x stand for the unknown number and write an equation for the relationship.	6.3.1 Write and solve one-step linear equations and inequalities in one variable and check the answers. Example: The area of a rectangle is 143 cm² and the length is 11 cm. Write an equation to find the width of the rectangle and use it to solve the problem. Describe how you will check to be sure that your answer is correct.	7.3.1 Use variables and appropriate operations to write an expression, a formula, an equation, or an inequality that represents a verbal description. Example: Write in symbols the inequality: 5 less than twice the number is greater than 42.
5.3.2 Write simple algebraic expressions in one or two variables and evaluate them by substitution. Example: Find the value of $5x + 2$ when $x = 3$.	6.3.2 Write and use formulas with up to three variables to solve problems. Example: You have P dollars in a bank that gives r% simple interest per year. Write a formula for the amount of interest you will receive in one year. Use the formula to find the amount of interest on $80 at 6% per year.	7.3.2 Write and solve two-step linear equations and inequalities in one variable and check the answers. Example: Solve the equation $4x – 7 = 12$ and check your answer in the original equation.
5.3.3 Use the distributive property* in numerical equations and expressions. Example: Rewrite 3(16-11) by removing the parentheses.	6.3.3 Interpret and evaluate mathematical expressions that use grouping symbols such as parentheses. Example: Find the values of 10 – (7 – 3) and of (10 – 7) – 3.	7.3.3 Use correct algebraic terminology such as variable, equation, term, coefficient*, inequality, expression, and constant. Example: Name the variable, terms, and coefficient in the equation: $7x + 4 = 67$.

5.3.4 Identify and graph ordered pairs of positive numbers. Example: Plot the points (3, 1), (6, 2), and (9, 3). What do you notice?	6.3.4 Use parentheses to indicate which operation to perform first when writing expressions containing more than two terms and different operations. Example: Write in symbols: add 19 and 34 and double the result.	7.3.4 Evaluate numerical expressions and simplify algebraic expressions by applying the correct order of operations and the properties of rational numbers* (e.g., identify, inverse, commutative*, associative*, distributive*). Justify each step in the process. Example: Simplify $3(4x + 5x – 1) + 2(x+3)$ by removing the parentheses and rearranging. Explain each step you take.
5.3.5 Find ordered pairs (positive numbers only) that fit a linear equation, graph the ordered pairs, and draw the line they determine. Example: For $x = 1, 2, 3$, and 4, find points that fit the equation $y = 2x + 1$. Plot those points on graph paper and join them with a straight line.	6.3.5 Use variables in expressions describing geometric quantities. Example: Let l, w, and P be the length, width, and perimeter of a rectangle. Write a formula for the perimeter in terms of the length and width.	7.3.5 Solve an equation or formula with two variables for a particular variable. Example: Solve the formula $C = 2\pi r$ for r.
5.3.6 Understand that the length of a horizontal line segment on a coordinate plane equals the difference between the x-coordinates and that the length of a vertical line segment on a coordinate plane equals the difference between the y-coordinates. Example: Find the distance between the points (2, 5) and (7, 5) and the distance between the points (2, 1) and (2, 5).	6.3.6 Apply the correct order of operations and the properties of real numbers (e.g., identity, inverse, commutative*, associative*, and distributive* properties) to evaluate numerical expressions. Justify each step in the process. Example: Simplify $3(4 - 1) + 2$. Explain your method.	7.3.6 Define slope as vertical change per unit of horizontal change and recognize that a straight line has constant slope or rate of change. Example: Examine a table of values and make a conjecture about whether the table represents a linear function.
5.3.7 Use information taken from a graph or equation to answer questions about a problem situation. Example: The speed (v feet per second) of a car t seconds after it starts is given by the formula $v = 12t$. Find the car's speed after 5 seconds.	6.3.7 Identify and graph ordered pairs in the four quadrants of the coordinate plane. Example: Plot the points (3, -1), (-6, 2) and (9, -3). What do you notice?	7.3.7 Find the slope of a lien from its graph. Example: Draw the graph of $y = 2x = 1$. Choose two points on the graph and divide the change in y-value by the change in x-value. Repeat this for other pairs of points on the graph. What do you notice?

*distributive property: e.g., 3 x (5 ÷ 2) = 3 x 5 * 3 x 2	6.3.8 Solve the problems involving linear functions with integer* values. Write the equation and graph the resulting ordered pairs of integers on a grid. Example: A plant is 3 cm high the first time you measure it (on Day 0). Each day after that the plant grows by 2 cm. Write and equation connecting the height and the number of the day and draw its graph. 6.3.9 Investigate how a change in one variable relates to a change in a second variable. Example: In the last example, what do you notice about the shape of the graph? *commutative: the order when adding or multiplying numbers makes no difference (e.g., 5 + 3 = 3 + 5), but note that this is not true for subtraction or division *associative: the grouping when adding or multiplying numbers make s no difference (e.g., in 5 + 3 + 2, adding 5 and 3 and then adding 2 is the same as 5 added to 3 + 2), but note that this is not true fro subtraction and division *distributive: e.g., 3(5 + 2) = 3 X 5 + 3 x 2 *integers: …, -3, -2, -1, 0, 1, 2, 3 …	7.3.8 Draw the graph of a line given the slope and one point on the line, or two points on the line. Example: Draw the graph of the equation with slope of 3 and passing through the point with coordinates (0, -2). 7.3.9 Identify functions as linear or nonlinear and examine their characteristics in tables, graphs, and equations. Example: A plant is growing taller according to the formula $H = 2d + 3$, where H is the height after d days. Draw the graph of this function and explain what the point where it meets the vertical axis represents. Is this graph linear or nonlinear? 7.3.10 Identify and describe situations with constant or varying rates of change and know that a constant rate of change describes a linear function. Example: In the last example, how will the graph be different if the plant's speed of growth changes? *coefficient: e.g., 7 is the coefficient in 7*x* *rational number: any number that can be written as a ratio of two integers* (e.g., $\frac{1}{2}$, $\frac{5}{6}$, $\frac{23}{9}$) *integers: …, -3, -2, -1, 0, 1, 2, 3, …

		*commutative property: the order when adding or multiplying numbers make no difference (e.g., 5 + 3 = 3 + 5), but note that this is not true for subtraction and division *associative: the grouping when adding or multiplying numbers makes no difference (e.g., in 5 + 3 +2, adding 5 and 3 and then adding 2 is the same as 5 added to 3 + 2), but note that this is not true for subtraction or division *distributive: e.g., $3(5 + 2) = 3(5) + 3(2)$

Standard 4 – Geometry *Students identify, describe, and classify the properties of plane and solid geometric shapes and the relationships between them.*	***Standard 4 – Geometry*** *Students identify, describe, and classify the properties of plane and solid geometric shapes and the relationships between them.*	***Standard 4 – Geometry*** *Students deepen their understanding of plane and solid geometric shapes by constructing shapes that meet given conditions and by identifying attributes of shapes.*
5.4.1 Measure, identify, and draw angles, perpendicular and parallel lines, rectangles, triangles, and circles by using appropriate tools (e.g., ruler, compass, protractor, appropriate technology, media tools). Example: Draw a rectangle with sides 5 in and 3 in.	6.4.1 Identify and draw vertical*, adjacent*, complementary, and supplementary* angles and describe these angle relationships. Example: Draw two parallel lines with another line across them. Identify all pairs of supplementary angles.	7.4.1 Understand coordinate graphs and use them to plot simple shapes, find lengths and areas related to the shapes and find images under translations (slides), rotations (turns), and reflections (flips). Example: Draw the triangle with vertices (0,0), (3,0), and (0,4). Find the lengths of the sides and the area of the triangle. Translate (slide) the triangle 2 units to the right. What are the coordinates of the triangle?
5.4.2 Identify, describe, draw, and classify triangles as equilateral*, isosceles*, scalene*, right*, acute*, obtuse*, and equiangular*. Example: Draw an isosceles right triangle.	6.4.2 Use the properties of complementary, supplementary, and vertical angles to solve problems involving an unknown angle. Justify solutions. Example: Find the size of the supplement to an angle that measures 122˚. Explain how you obtain your answer.	7.4.2 Understand that transformations such as slides, turns, and flips preserve the length of segments, and that figures resulting from slides, turns, and flips are congruent* to the original figures. Example: In the last example, find the lengths of the sides and the area of the new triangle.
5.4.3 Identify congruent* triangles and justify your decisions by referring to sides and angles. Example: In a collection of triangles, pick out those that are the same shape and size and explain your answers.	6.4.3 Draw quadrilaterals* and triangles from given information about them. Example: Draw a quadrilateral with equal sides but no right angles.	7.4.3 Know and understand the Pythagorean Theorem and use it to find the length of the missing side of a right triangle and the lengths of other line segments. Use direct measurement to test conjectures about triangles. Example: Use the length and width of

5.4.4 Identify, describe, draw, and classify polygons*, such as pentagons and hexagons. Example: In a collection of polygons, pick out those with the same number of sides. 5.4.5 Identify and draw the radius and diameter of a circle and understand the relationship between the radius and diameter. Example: On a circle, draw a radius and a diameter and describe the differences and similarities between the two. 5.4.6 Identify shapes that have reflectional and rotational symmetry*. Example: What kinds of symmetries have the letters M, N, and O? 5.4.7 Understand that 90˚, 180˚, 270˚, and 360˚ are associated with ¼, ½, ¾, and full turns, respectively. Example: Face the front of the room. Turn through four right angles. Which way are you now facing? 5.4.8 Construct prisms* and pyramids using appropriate materials. Example: Make a square-based pyramid from construction paper.	6.4.4 Understand that the sum of the interior angles of any triangle is 180˚ and that the sum of the interior angles of any quadrilateral is 360˚. Use this information to solve problems. Example: find the size of the third angle of a triangle with the angles of 73˚ and 49˚. 6.4.5 Identify and draw two-dimensional shapes that are similar*. Example: Draw a rectangle similar to a given rectangle, but twice the size. 6.4.6 Draw the translation (slide) and reflection (flip) of shapes. Example: Draw a square and then slide it 3 inches horizontally across your page. Draw the new square in a different color. 6.4.7 Visualize and draw two-dimensional views of three-dimensional objects made from rectangular solids. Example: Draw a picture of an arrangement of rectangular blocks from the top, front, and right-hand side. *vertical angle: angles 1 and 3, or 2 and 4 *adjacent angles: angles 1 and 2 or 2 and 3, etc. *complementary angles: two angles whose sum is 90˚ *supplementary angles: two angles who sum is 180˚ (angels 1 and 2)	your classroom to calculate the distance across the room diagonally. Check by measuring. 7.4.4 Construct two-dimensional patterns (nets) for three-dimensional objects, such as right prisms*, pyramids, cylinders, and cones. Example: Draw a rectangle and two circles that will fit together to make a cylinder. *congruent: same shape and size *right prism: a three dimensional shape with two congruent ends that are polygons and all other sides are rectangles

5.4.9 Given a picture of a three-dimensional object, build the object with blocks. Example: Given a picture of a house made of cubes and rectangular prisms, build the house. *equilateral triangle: all sides are congruent *isosceles triangle: at least two sides are congruent *scalene triangle: no sides are equal *right triangle: one angle measures 90 degrees *acute triangle: all angles are less than 90 degrees *obtuse triangle: one angle is more than 90 degrees *equiangular triangle: all angles are of equal measure *congruent: two figures that are the same shape and size *polygon: two-dimensional shape with straight sides (e.g., triangle, rectangle, pentagon) *reflectional and rotational symmetry: letter M has reflectional symmetry in a line down the middle; letter N has rotational symmetry around its center *prism: solid shape with fixed cross-section (right prism is a solid shape with two parallel faces that are polygons and other faces that are rectangles)	*quadrilateral: a two-dimensional figure with four sides *similar: figures that have the same shape but may not have the same size	

Standard 5 – Measurement *Students understand and compute the areas and volumes of simple objects, as well as measuring weight, temperature, time, and money.*	***Standard 5 – Measurement*** *Students deepen their understanding of the measurement of plane and solid shapes and use this understanding to solve problems. They calculate with temperature and money, and choose appropriate units of measure in other areas.*	***Standard 5 – Measurement*** *Students compare units of measure and use similarity* to solve problems. They compute the perimeter, area, and volume of common geometric objects and use the results to find measures of less regular objects.*
5.5.1 Understand and apply the formulas for the area of a triangle, parallelogram, and trapezoid. Example: Find the area of a triangle with base 4 m and height 5 m. 5.5.2 Solve problems involving perimeters and areas of rectangles, triangles, parallelograms, and trapezoids, using appropriate units. Example: A trapezoidal garden bed has parallel sides of lengths 14 m and 11 m and its width is 6 m. Find its area and the length of fencing needed to enclose it. Be sure to use correct units. 5.5.3 Use formulas for the areas of rectangles and triangles to find the area of complex shapes by dividing them into basic shapes. Example: A square room of length 17 feet has a tiled fireplace area that is 6 feet long and 4 feet wide. You want to carpet the floor of the room, except the fireplace area. Find the area to be carpeted.	6.5.1 Select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles. Example: A triangular sheet of metal is about 1 foot across. Describe the units and tools you would use to measure its weight, its angles, and the length of its sides. 6.5.2 Understand and use larger units for measuring length by comparing miles to yards and kilometers to meters. Example: How many meters are in a kilometer? 6.5.3 Understand and use larger units for measuring area by comparing acres and square miles to square yards and square kilometers to square meters. Example: How many square meters are in a square kilometer?	7.5.1 Compare lengths, areas, volumes, weights, capacities, times, and temperatures within measurement systems. Example: The area of the school field is 3 acres. How many square yards is that? Explain your method. 7.5.2 Use experimentation and modeling to visualize similarity problems. Solve problems using similarity. Example: At a certain time, the shadow of your school building is 36 feet long. At the same time, the shadow of a yardstick held vertically is 4 feet long. How high is the school building? 7.5.3 Read and create drawings made to scale, construct scale models, and solve problems related to scale. Example: On a plan of your school, your classroom is 5 cm long and 3 cm wide. The actual classroom is 10 m long. How wide is it? Explain your answer.

5.5.4 Find the surface area and volume of rectangular solids using appropriate units. Example: Find the volume of a shoe box with length 30 cm, width 15 cm, and height 10 cm. 5.5.5 Understand and use the smaller and larger units for measuring weight (ounce, gram, and ton) and their relationship to pounds and kilograms. Example: How many ounces are in a pound? 5.5.6 Compare temperatures in Celsius and Fahrenheit, knowing that the freezing point of water is 0˚C and 32˚F and that the boiling point is 100˚C and 212˚F. Example: What is the Fahrenheit equivalent of 50˚C? Explain your answer. 5.5.7 Add and subtract with money in decimal notation. Example: You buy articles that cost $3.45, $6.99, and $7.95. How much change will you receive from $20?	6.5.4 Understand the concept of the constant π as the ratio of the circumference to the diameter of a circle. Develop and use the formulas for the circumference and area of a circle. Example: Measure the diameter and circumference of several circular objects. (Use string to find the circumference.) With a calculator, divide each circumference by its diameter. What do you notice about the results? 6.5.5 Know common estimates of π (3.14, $\frac{22}{7}$) and use these values to estimate and calculate the circumference and the area of circles. Compare with actual measurements. Example: Find the area of a circle of radius 15 cm. 6.5.6 Understand the concept of significant figures and round answers to an appropriate number of significant figures. Example: You measure the diameter of a circle as 2.47 m and use the approximation 3.14 for π to calculate the circumference. Is it reasonable to give 7.7558 m as your answer? Why or why not? 6.5.7 Construct a cube and rectangular box from two-dimensional patterns and use these patterns to compute the surface area of these objects.	7.5.4 Use formulas for finding the perimeter and area of basic two-dimensional shapes and the surface area and volume of basic three-dimensional shapes, including rectangles, parallelograms*, trapezoids*, triangles, circles, right prisms*, and cylinders. Example: Find the surface area of a cylindrical can 15 cm high and with a diameter of 8 cm. 7.5.5 Estimate and compute the area of more complex irregular two-dimensional shapes by dividing them into more basic shapes. Example: A room to be carpeted is a rectangle 5 m by 4 m. A semicircular fireplace of diameter 1.5 m takes up some of the floor space. Find the area to be carpeted. 7.5.6 Use objects and geometry modeling tools to compute the surface area of the faces and the volume of a three-dimensional object built from rectangular solids. Example: Build a model of an apartment building with blocks. Find its volume and total surface area. *similarity: figures that have the same shape but may not have the same size *parallelogram: a four-sided figure with both pairs of opposite sides parallel *trapezoid: a four-sided figure with one pair of opposite sides parallel

	Example: Find the total surface area of a shoe box with length 30 cm, width 15 cm, and height 10 cm. 6.5.8 Use strategies to find the surface area and volume of right prisms* and cylinders using appropriate units. Example: Find the volume of a cylindrical can 15 cm high and with a diameter of 8 cm. 6.5.9 Use a formula to convert temperatures between Celsius and Fahrenheit. Example: What is the Celsius equivalent of 100˚F? Explain your method. 6.5.10 Add, subtract, multiply, and divide with money in decimal notation. Example: Share $7.25 among five people. *right prism: a three-dimensional shape with two congruent ends that are polygons and all other faces are rectangles	*right prism: a three-dimensional shape with two congruent ends that are polygons and all other sides are rectangles.

Standard 6 – Data Analysis and Probability	***Standard 6 – Data Analysis and Probability***	***Standard 6 – Data Analysis and Probability***
Students collect, display, analyze, compare, and interpret data sets. They use the results of probability experiments to predict future events.	*Students compute and analyze statistical measures for data sets. They determine theoretical and experimental probabilities and use them to make predictions about events.*	*Students collect, organize, and represent data sets and identify relationships among variables within a data set. They determine probabilities and use them to make predictions about events.*
5.6.1 Explain which types of displays are appropriate for various sets of data. Example: Conduct a survey to find the favorite movies of the students in your class. Decide whether to use a bar, line, or picture graph to display the data. Explain your answer. 5.6.2 Find the mean*, median*, mode*, and range* of a set of data and describe what each does, and does not, tell about the data set. Example: Find the mean, median, and mode of a set of test results and describe how well each represents the data. 5.6.3 Understand that probability can take any value between 0 and 1, events that are not going to occur have probability 0, events certain to occur have probability 1, and more likely events have a high probability than less likely events. Example: What is the probability of rolling a 7 with a number cube?	6.6.1 Organize and display single-variable data in appropriate graphs and stem-and-leaf plots*, and explain which types of graphs are appropriate for various data sets. Make frequency tables for numerical data, grouping the data in different ways to investigate how different groupings describe the data. Understand and find relative and cumulative frequency for a data set. Use histograms of the data and of the relative frequency distribution, and a broken line graph for cumulative frequency, to interpret the data. Example: A bag contains pens in three colors. Nine students each draw a pen from the bag without looking, then record the results in the frequency table shown. Complete the column showing relative frequency. 6.6.2 Compare the mean*, median*, and mode* for a set of data and explain which measure is most appropriate in a given context. 6.6.3 Show all possible outcomes for compound events in an organized way and find the theoretical probability of each outcome. Example: A box contains four cards	7.6.1 Analyze, interpret, and display data in appropriate bar, line, and circle graphs and stem-and-leaf plots*, and justify the choice of display. Example: You survey the students in your school to find which of three designs for a magazine cover they prefer. To display the results, which would be more appropriate: a bar chart or a circle graph? Explain your answer. 7.6.2 Make predictions from statistical data. Example: Record the temperature and weather conditions (sunny, cloudy, or rainy) at 1 p.m. each day for two weeks. In the third week, use your results to predict the temperature from the weather conditions. 7.6.3 Describe how additional data, particularly outliers, added to a data set may affect the mean*, median*, and mode*. Example: You measure the heights of the students in your grade on a day when the basketball team is playing an away game. Later you measure the players on the team and include them in your data. What kind of effect will including the team have on the mean,

5.6.4 Express outcomes of experimental probability situations verbally and numerically (e.g., 3 out of 4, ¾). Example: What is the probability of rolling an odd number with a number cube? *mean: the average obtained by adding the values of and dividing by the number of values *median: the value that divides a set of data written in order of size into two equal parts *mode: the most common value in a set of data *range: the difference between the largest and smallest number	with the numbers 1 through 4 written on them. Show a list of all the possible outcomes if you draw two cards from the box without looking. What is the theoretical probability that you will draw the numbers one and two? Explain your answer. 6.6.4 Use data to estimate the probability of future events. Example: Teams A and B have played each other 3 times this season and Team A has won twice. When they play again, what is the probability of Team B winning? How accurate do you think this estimate is? 6.6.5 Understand and represent probabilities as ratios, measures of relative frequency, decimals between 00 and 1, and percentages between 0 and 100 and verify that the probabilities computed are reasonable. Example: the weather forecast says that the chance of rain today is 30%. Should you carry an umbrella? Explain your answer. *stem-and-leaf plot: see diagram in the first example *mean: the average obtained by adding the values and dividing by the number of values *median: the value that divides a set of data (written in order of size) into two equal parts *mode: the most common value in a set of data	median, and mode? Explain your answer. 7.6.4 Analyze data displays, including ways that they can be misleading. Analyze ways in which the wording of questions can influence survey results. Example: On a bar graph of a company's sales, it appears that sales have more than doubled since last year. Then you notice that the vertical axis starts at $5 million and can see that sales have in fact increased from $5.5 million to $6.2 million. 7.6.5 Know that if P is the probability of an event occurring, then $1 - P$ is the probability of that event not occurring. Example: The weather forecast says that the probability of rain today is 0.3. What is the probability that it won't rain? 7.6.6 Understand that the probability of either one or the other of two disjoint events* occurring is the sum of the two individual probabilities. Example: Find the probability of rolling 9 with two number cubes. Also find the probability of rolling 10. What is the probability of rolling 9 or 10? 7.6.7 Find the number of possible arrangements of several objects using a tree diagram.

		Example: A state's license plates contain 6 digits and one letter. How many different plates can be made if the letter must always be in the third position and the first digit cannot be zero? *stem-and-leaf plot: e.g., this one shows 62, 63, 67, 71, 75, 75, 76, etc. *mean: the average obtained by adding the values and dividing by the number of values *median: the value that divides a set of data written in order of size into two equal parts *mode: the most common value *disjoint events: events that cannot happen at the same time

Standard 7 – Problem Solving	*Standard 7 – Problem Solving*	*Standard 7 – Problem Solving*
Students make decisions about how to approach problems and communicate their ideas.	**Students make decisions about how to approach problems and communicate their ideas.**	**Students make decisions about how to approach problems and communicate their ideas.**
5.7.1 Analyze problems by identifying relationships, telling relevant from irrelevant information, sequencing and prioritizing information, and observing patterns. Example: Solve the problem: "When you flip a coin 3 times, you can get 3 heads, 3 tails, 2 heads, and 1 tail, or 1 head and 2 tails. Find the probability of each of these combinations." Notice that the case of 3 heads and the case of 3 tails are similar. Notice that the case of 2 heads and 1 tail and the case of 1 head and 2 tails are similar. 5.7.2 Decide when and how to break a problem into simpler parts. Example: In the first example, decide to look at the case of 3 heads and the case of 2 heads and 1 tail.	6.7.1 Analyze problems by identifying relationships, telling relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns. Example: Solve the problem: "Develop a method for finding all the prime numbers up to 100." Notice that any numbers that 4, 6, 8, … divide into also divide exactly by 2, and so you do not need to test 4, 6, 8, … 6.7.2 Make and justify mathematical conjectures based on a general description of a mathematical question or problem. Example: In the first example, decide that you need to test only the prime numbers as divisors, and explain it in the same way as for 4, 6, 8, …. 6.7.3 Decide when and how to break a problem into simpler parts. Example: In the first example, decide to find first those numbers not divisible by 2.	7.7.1 Analyze problems by identifying relationships, telling relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns. 7.7.2 Make and justify mathematical conjectures based on a general description of a mathematical question or problem. Example: In the first example, notice that three dots make and equilateral triangle for the number 3 and six dots make the next equilateral triangle. 7.7.3 Decide when and how to divide a problem into simpler parts. Example: In the first example, decide to make a diagram for the fourth and fifth triangular numbers.

Students use strategies, skills, and concepts in finding and communicating solutions to problems.	**Students use strategies, skills, and concepts in finding and communicating solutions to problems.**	**Students use strategies, skills, and concepts in finding and communicating solutions to problems.**
5.7.3 Apply strategies and results from simpler problems to solve more complex problems. Example: In the first example, begin with the situation where you flip the coin twice.	6.7.4 Apply strategies and results from simpler problems to solve more complex problems. Example: In the first example, begin by finding all the prime numbers up to 10.	7.7.4 Apply strategies and results from simpler problems to solve more complex problems. Example: In the first example, list the differences between any two triangular numbers.
5.7.4 Express solutions clearly and logically by using the appropriate mathematical terms and notation. Support solutions with evidence in both verbal and symbolic work. Example: In the first example, make a table or tree diagram to show another student what is happening.	6.7.5 Express solutions clearly and logically by using the appropriate mathematical terms and notation. Support solutions with evidence in both verbal and symbolic work. Example: In the first example, use a hundreds chart to cross off all multiples of 2 (except 2), then all multiples of 3 (except 3), then all multiples of 5 (except 5), etc. Explain why you are doing this.	7.7.5 Make and test conjectures by using inductive reasoning. Example: In the first example, predict the difference between the fifth and sixth numbers and use this to predict the sixth triangular number. Make a diagram to test your conjecture. 7.7.6 Express solutions clearly and logically by using the appropriate mathematical terms and notation. Support solutions with evidence in both verbal and symbolic work. Example: In the first example, use words, numbers, and tables to summarize your work with triangular numbers.
5.7.5 Recognize the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy. Example: You are buying a piece of plastic to cover the floor of your bedroom before you paint the room. How accurate should you be: to the nearest inch, foot, or yard? Explain your answer.	6.7.6 Recognize the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy. Example: Calculate the perimeter of a rectangular field that needs to be fenced. How accurate should you be: to the nearest kilometer, meter, centimeter, or millimeter? Explain your answer.	7.7.7 Recognize the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy. Example: Calculate the amount of aluminum needed to make a can with diameter 10 cm that is 15 cm high and 1 mm thick. Take π as 3.14 and give

5.7.6 Know and apply appropriate methods for estimating results of rational-number computations. Example: Will 7 x 18 be smaller or larger than 100? Explain your answer. 5.7.7 Make precise calculations and check the validity of the results in the context of the problem. Example: A recipe calls for $\frac{3}{8}$ of a cup of sugar. You plan to double the recipe for a party and you have only one cup of sugar in the house. Decide whether you have enough sugar and explain how you know.	6.7.7 Select and apply appropriate methods for estimating results of rational-number computations. Example: Measure the length and height of the walls of a room to find the total area. Estimate an answer by imagining meter squares covering the walls. 6.7.8 Use graphing to estimate solutions and check the estimates with analytic approaches. Example: use a graphing calculator to estimate the coordinates of the point where the straight line $y = 8x - 3$ crosses the x-axis. Confirm your answer by checking it in the equation. 6.7.9 Make precise calculations and check the validity of the results in the context of the problem. Example: In the first example, check whether some of the numbers not crossed out are in fact primes.	your answer to appropriate accuracy. 7.7.8 Select and apply appropriate methods for estimating results of rational-number computations. Example: Measure the dimensions of a swimming pool to find its volume. Estimate an answer by working with an average depth. 7.7.9 Use graphing to estimate solutions and check the estimates with analytic approaches. Example: Use a graphing calculator to find the crossing point of the straight lines $y = 2x + 3$ and $x + y = 10$. Confirm your answer by checking it in the equations. 7.7.10 Make precise calculations and check the validity of the results in the context of the problem. Example: In the first example, check that your later results fit with your earlier ones. If they do not, repeat the calculations to make sure.
Students determine when a solution is complete and reasonable and move beyond a particular problem by generalizing to other situations. 5.7.8 Decide whether a solution is reasonable in the context of the original situation. Example: In the first example about flipping a coin, check that your probabilities add to 1.	**Students determine when a solution is complete and reasonable and move beyond a particular problem by generalizing to other situations.** 6.7.10 Decide whether a solution is reasonable in the context of the original situation. Example: In the first example, decide whether your method was a good one – did it find all the prime numbers	**Students determine when a solution is complete and reasonable and move beyond a particular problem by generalizing to other situations.** 7.7.11 Decide whether a solution is reasonable in the context of the original situation. Example: In the first example, calculate the 10^{th} triangular number and draw the triangle of dots that goes

5.7.9 Note the method of finding the solution and show a conceptual understanding of the method by solving similar problems. Example: Find the probability of each of the combinations when you flip a coin 4 times.	efficiently? 6.7.11 Note the method of finding the solution and show a conceptual understanding of the method by solving similar problems Example: Use a hundreds chart to find all the numbers that are multiples of both 2 and 3.	with it. 7.7.12 Note the method of finding the solution and show a conceptual understanding of the method by solving similar problems. Example: Use your method from the first example to investigate pentagonal numbers.