St. Peter School   **Quincy, Illinois**
Grade 8 Math
Diary map is based on the 2017-2018 school year. Information may change year to year. Months are guidelines and items may be done at different times of the year.

Month	Essential Questions	Content	Skills	Assessment	Resources	Technology

Common Core Standards for Mathematical Content			Common Core Standards for Mathematical Practice			

Common Core Standards for Mathematical Content

The Number System
8.NS.A   Know that there are numbers that are not rational and approximate them by rational numbers.

Expressions and Equations
8.EE.A   Work with radicals and integer exponents.
8.EE.B   Understand the connections between proportional relationships, lines, and linear equations.
8.EE.C   Analyze and solve linear equations and pairs of simultaneous linear equations.

Functions
8.F.A   Define, evaluate, and compare functions.
8.F.B   Use functions to model relationships between quantities.

Geometry
8.G.A   Understand congruence and similarity using physical models, transparencies, or geometry software.
8.G.B   Understand and apply the Pythagorean Theorem.
8.G.C   Solve real-world and mathematical problems involving volume of cylinders, cones and spheres.

Statistics and Probability
8.SP.A   Investigate patterns of association in bivariate data

Common Core Standards for Mathematical Practice
MP.1   Make sense of problems and persevere in solving them.
MP.2   Reason abstractly and quantitatively.
MP.3   Construct viable arguments and critique the reasoning of others.
MP.4   Model with mathematics.
MP.5   Use appropriate tools strategically.
MP.6   Attend to precision.
MP.7   Look for and make use of structure.
MP.8   Look for and express regularity in repeated reasoning.

*Practice standards are ongoing all year.

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Ongoing **Standards:** All	**ALEKS** How are math skills practiced and applied?	**ALEKS** -Grade level math topics and prerequisites	**ALEKS** -Apply math skills to solve problems that are individualized based on level of readiness	**ALEKS** -Mastery of individualized topics		**ALEKS** -ALEKS program -iPads
Aug.-Sept. **Standards:** 7.NS.2 8.SP.1 8.NS.A	**Variables, Expressions, and Integers** How are integers, equations, and inequalities applied in mathematics?	**Variables, Expressions, and Integers** -Expressions and Variables -Powers and Exponents -Comparing and ordering integers -Adding integers	**Variables, Expressions, and Integers** -Evaluate and write variable expressions -Use powers to describe repeated multiplication -Use order of operations to evaluate expressions	**Variables, Expressions, and Integers** -Worksheets (teacher created) -Quiz (teacher created) -Test (teacher created) -Flashcards	**Variables, Expressions, and Integers** Houghton Mifflin Harcourt *Larson Pre-Algebra* (2012) -textbook -Resources and Assessment book	**Variables, Expressions, and Integers** -Elmo -SMART Board -iPads -Online games and apps -Calculators -Websites

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		-Subtracting integers -Multiplying integers -Dividing integers	-Compare and order integers -Add, subtract, multiply, and divide integers -Apply all integer rules, exponent rules, and order of operations rules to solve expressions and real-world math problems			
	Solving Equations How are equations solved?	**Solving Equations** -Properties of operations -The Distributive Property -Simplifying variable expressions -Variables and Expressions -Solving equations using addition, subtraction, multiplication, and division -Decimal and fraction equations	**Solving Equations** -Use properties of addition and multiplication -Solve problems that involve perimeter and area using equation format -Use the Distributive Property -Simplify variable expressions -Solve equations with variables -Solve equations using addition and subtraction -Solve equations using multiplication and division -Solve equations using two steps -Solve equations that require integers rules, order of operation rules, distributive property -Solve equations involving decimals and	**Solving Equations** -Worksheets (teacher created) -Quiz (teacher created) -Test (teacher created)	**Solving Equations** Houghton Mifflin Harcourt *Larson Pre-Algebra* (2012) -textbook -Resources and Assessment book	**Solving Equations** -Elmo -SMART Board -iPads -Calculators -Websites

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			fractions			
Oct. **Standards:** 7.NS.2 8.SP.A 8.NS.A	**Multi-Step Equations and Inequalities** How are multi-step equations solved? How are inequalities solved? How are inequalities graphed?	**Multi-Step Equations and Inequalities** -Two-step equations -The Distributive Property -Equations having like terms and parenthesis -Equations with variables on both sides -Inequalities using addition and subtraction -Inequalities using multiplication and division -Multi-step inequalities	**Multi-Step Equations and Inequalities** -Solve two-step equations -Describe and practice like terms, coefficients, and constants -Solve equations using the Distributive Property -Solve equations with variables on both sides involving like terms, order of operations, Distributive Property -Solve inequalities using addition and subtraction -Solve inequalities using multiplication and division -Solve multi-step inequalities	**Multi-Step Equations and Inequalities** -Worksheets (teacher created) -Quiz (teacher created) -Test (teacher created)	**Multi-Step Equations and Inequalities** Houghton Mifflin Harcourt *Larson Pre-Algebra* (2012) -textbook -Resources and Assessment book	**Multi-Step Equations and Inequalities** -Elmo -SMART Board -iPads -Calculators -Websites
Nov.-Dec. **Standards:** 8.EE.A	**Factors, Fractions, And Exponents** Why is it beneficial to find the LCM and GCF of monomials using prime factorization? How are the rule of exponents applied? How are negative and zero exponents applied? How are monomials simplified using only positive exponents?	**Factors, Fractions, And Exponents** -Factors -Prime factorization -Prime numbers -Composite numbers -GCF of monomials -LCM of monomials -Equivalent fractions -Multiples -Exponents -Powers -Bases -Rules of exponents -Negative exponents -Zero exponents	**Factors, Fractions, And Exponents** -Write the prime factorization of a number -Find the GCF of two or more whole numbers -Simplify monomials -Decide if two numbers are relatively prime -Find the GCF of two monomials -Find the LCM and LCD of two or more numbers -Find equivalent fractions	**Factors, Fractions, And Exponents** -Worksheets (teacher created) -Quiz (teacher created) -Test (teacher created)	**Factors, Fractions, And Exponents** Houghton Mifflin Harcourt *Larson Pre-Algebra* (2012) -textbook -Resources and Assessment book -Rule card for the powers (teacher and student created)	**Factors, Fractions, And Exponents** -Elmo -SMART Board -iPads -Calculators -Websites

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	How is scientific notation used?	-Scientific notation	-Multiply and divide powers -Work with negative and zero exponents -Understand the rules of exponents -Write numbers using powers of ten -Write numbers using scientific notation			
Jan.-Feb. **Standards:** 8.G.A 8.G.B 8.G.C	**Angles, Triangles, and Polygons** How is a protractor used to find measurements? How are similar triangles used to find missing angle measures? How are interior and exterior angles solved? How are exterior and interior angle measures of polygons found? How are angles formed by parallel lines and transversals described? How is the relationship among the angles of triangles, regular polygons, and irregular polygons described?	**Angles, Triangles, and Polygons** -Acute angles -Obtuse angles -Straight angles -Right angles -Protractors -Arrowheads -Parallel lines -Transversal lines -Alternate interior angles -Alternate exterior angles -Lines -Rays -Line segments -Endpoints -Vertex -Supplementary -Complementary -Planes -Symmetry -Perpendicular lines -Intersecting lines -Skew lines	**Angles, Triangles, and Polygons** -Classify and measure all angles -Work with a protractor and arrowhead -Identify and solve for angles without the use of protractor -Use the skills from vocabulary of angles and lines to find the measures of all angles in a plane -Identify types of angles using the degrees on a plane -Find measures of angles formed by parallel and transversal lines -Measure and identify relationships among vertical, adjacent, supplementary, and complementary angles -Find interior and exterior angle measures of triangles	**Angles, Triangles, and Polygons** -Worksheets (teacher created) -Quiz (teacher created) -Test (teacher created) -Flashcards (student created)	**Angles, Triangles, and Polygons** Houghton Mifflin Harcourt *Larson Pre-Algebra* (2012) -textbook -Resources and Assessment book	**Angles, Triangles, and Polygons** -Elmo -SMART Board -iPads -Calculators -Websites -Online games and apps

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		-Vertical angles -Adjacent angles -Corresponding angles -Interior angles of a triangle -Exterior angles of a triangle -Convex -Concave -Classification of triangles -Equilateral triangles -Scalene triangles -Isosceles triangles -Quadrilaterals -Regular polygons -Degrees of regular and irregular polygons -Similar triangles	-Understand that the sum of the exterior angle measures of a polygon is 360 degrees -Find the sum of the interior and exterior angles measures of polygons -Demonstrate that the sum of the interior angle measures of a triangle is 180 degrees and apply this fact to find the unknown measures of angles and the sum of the angles of polygons -Use similar triangles to solve problems that include height and distance -Understand the concept of similar triangles -Use indirect measurement to find the missing measures			
March **Standards:** 8.G.A 8.G.B 8.G.C	**Measurement, Perimeter, and Area** How do you find the measures of two angles of a triangle when you know one? What characteristics are looked for when classifying a quadrilateral or a polygon?	**Measurement, Perimeter, and Area** -Missing measures of triangles -Identification of all polygons, quadrilaterals, and circles -Perimeter formulas of all regular and irregular polygons -Area formulas of all regular and irregular polygons	**Measurement, Perimeter, and Area** -Solve for the missing angle of a triangle -Classify the parts of quadrilaterals and polygons -Find the perimeter of all regular shapes using the correct formulas -Use the correct formulas for area and solve problems for	**Measurement, Perimeter, and Area** -Worksheets (teacher created) -Quiz (teacher created) -Test (teacher created) -Flashcards (student created)	**Measurement, Perimeter, and Area** Houghton Mifflin Harcourt *Larson Pre-Algebra* (2012) -textbook -Resources and Assessment book -Formula Flashcards (teacher created)	**Measurement, Perimeter, and Area** -Elmo -SMART Board -iPads -Calculators -Websites -Online games and apps

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	How are the perimeters of a regular and irregular polygons found using the correct formulas? How are the areas of squares, rectangles, parallelograms, triangles, trapezoids, and circles found using the correct formulas? What information is needed to find the area or the circumference of a circle? How is the missing height and base sub 1 or base sub 2 found of a trapezoid? How is the missing dimension of all regular and irregular polygons found? How are unknown angle measures found using algebra skills? How is the area of a shaded and unshaded region of polygon found?	-Area and circumference of circles -Parts of a circle -Missing dimensions of all regular and irregular polygons -Area of shaded and unshaded regions of polygons	regular and irregular polygons -Use the correct formula and steps to solve area and circumference of a circle -Understand the parts of a circle -Apply knowledge based on the formulas, to find missing dimensions of shapes given the correct area and circumference using algebra steps and work -Find the area of shaded and unshaded regions of a polygon			
April **Standards:**	**Geometry: Surface Area and Volume** How are solids identified	**Geometry: Surface Area and Volume** -Vertices	**Geometry: Surface Area and Volume** -Identify all parts of a	**Geometry: Surface Area and Volume** -Worksheets (teacher	**Geometry: Surface Area and Volume** Houghton Mifflin	**Geometry: Surface Area and Volume** -Elmo

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8.G.A 8.G.B 8.G.C	by shape, size, and their nets? How is the surface area of prisms, pyramids, cones, cylinders, and spheres found? How is the volume of prisms, pyramids, cones, cylinders, and spheres found? How is the volume of compound shapes found?	-Faces -Edges -Identification of all solids -Nets -Surface area: prisms, polygons, cones, cylinders, and spheres with different bases -Two and three-dimensional solids -Volume: prisms, polygons, cylinders, cones, and spheres with different bases -Volume of compound solids	solid -Identify all types of solids with different bases -Use the net of all prisms, cylinders, pyramids, cones, and spheres with different bases to find its surface area -Find the surface area of prisms, cylinders, pyramids, cones, and spheres using the correct formulas and bases -Describe two-dimensional figures that result from slicing three-dimensional solids -Find the volume of prisms, cylinders, pyramids, cones, and spheres using the correct formula and bases -Find the missing dimension of solids when the volume is given -Find the volume of compound shapes using multiple formulas	created) -Quiz (teacher created) -Test (teacher created) -Flashcards (student created)	Harcourt *Larson Pre-Algebra* (2012) -textbook -Resources and Assessment book -Formula Flashcards (teacher created)	-SMART Board -iPads -Calculators -Websites -Online games and apps
May **Standards:** 8.EE.A 8.EE.B 8.EE.C	**Graphing and Writing Linear Equations** How are linear equations recognized? How are linear equations graphed?	**Graphing and Writing Linear Equations** -Slope -Undefined and zero slope -Linear equations -Positive slope	**Graphing and Writing Linear Equations** -Graph linear equations -Make a table of values -Identify between horizontal and vertical graphed lines	**Graphing and Writing Linear Equations** -Worksheets (teacher created) -Quiz (teacher created) -Test (teacher created)	**Graphing and Writing Linear Equations** Big Ideas Learning LLC *Big Ideas Math* Course 3 (2014) -textbook -Resources and	**Graphing and Writing Linear Equations** -Elmo -SMART Board -iPads -Calculators -Websites

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	How is an equation known to be linear? How is the slope of a line used to describe the line? How is the slope of a line found using a table of values?	-Negative slope -Delta and the symbol -Table of values -Two-point formula -Horizontal and vertical slope lines	-Solve linear equations before graphing -Find the slope of a line using two points -Find the slope of lines from tables -Know the difference between a positive and negative slope of a line -Use the two-point formula to find the slope of a line -Define slope -Define what delta means in relation to slope -Find the slope of horizontal and vertical lines -Find the slope of a line through given points -Understand what a zero and undefined slope		Assessment book	