

Subject	Grade	Strand	Big Idea	
Math	8		Rationale, Course Description, Most Important Learner Outcomes, and Evaluation	View
Math	8	Number and Operations	Students will use expressions, equations, and inequalities to solve problems	View
Math	8	Numbers and Operations	Students will add, subtract, multiply and divide integers	View
Math	8	Number and Operations/Algebraic Relationships	Students will apply all operations on fractions and solve equations with fractions	View
Math	8	Number and Operations/Algebraic Relationships	Students will use prime factorization to determine greatest common factor and least common multiple. They will also use powers and exponents, scientific notation, and patterns to solve problems	View
Math	8	Number and Operations	Students will multiply rational numbers, find percent of a number and percent of increase and decrease, and use rates, ratios, and proportions to solve problems	View
Math	8	Number and Operations/Geometric and Spatial Relationships/Algebraic Relationships	Students will find square roots and rational and irrational number and place all on a number line, use Pythagorean theorem to solve problems, and solve and graph inequalities	View
Math	8	Geometric and Spatial Relationships	Students will explore various types of polygons, angle and side relationships, and area and perimeter	View
Math	8	Geometric and Spatial Relationships	Students will explore all types of transformations and rotational symmetry	View
Math	8	Measurement	Students will discuss reflex angles and conversion of measurements within systems.	View
Math	8	Measurement	Students will use surface area and volume of solids to solve problems and explore similarity in solids	View
Math	8	Measurement	Students will discover precision, accuracy, and the meaning of significant digits	View
Math	8	Algebraic Relationships	Students will explore linear equations and use slope-intercept form and distance and mid-point formulas to graph linear equations.	View
Math	8	Data and Probability	Students will use various types of graphs in problem solving activities and choose appropriate graphs for data display	View

Math	8	Data and Probability	Students will explore statistics and probability, measures of central tendency, stem and leaf plots, box and whisker plots, and interest	View
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8th Grade Pre-Algebra Math Curriculum Phelps County R-III

Rationale:

The primary purpose of the pre-algebra math course is to provide students with the skills necessary to enter algebra I and all other upper level mathematics courses. This class gives students a solid foundation in algebraic principles along with all other necessary eighth grade mathematics concepts.

Course Description:

The pre-algebra course is a combined class of seventh and eighth grade students. It allows students a chance to become familiar with algebraic concepts and how they apply to everyday life. All eighth grade Grade Level Expectations are taught in this course. These include the major categories of Numbers and Operations, Algebraic Relationships, Geometric and Spatial Relationships, Measurement, and Data and Probability. Each major category is broken down into smaller, more precise units, which are covered in daily lessons.

Most Important Learner Outcomes:

Students will be able to:

1. Use integers, fractions, expressions, equations, and inequalities to solve problems.
2. Find LCM and GCF using prime factorization.
3. Use powers and exponents, scientific notation, and patterns to solve problems.
4. Find the relationships between fractions, percents, rates, ratios and proportions.
5. Use perfect squares and square roots to solve problems involving Pythagorean theorem.
6. Identify various polygons and solve area and perimeter problems using those polygons.
7. Explore all types of formal transformations and rotational symmetry.
8. Explore reflex angles, convert measurements within systems, and circumference, surface area, and volume of various solids.
9. Discover the relationship between precision, accuracy and significant digits.
10. Use various formulas to create linear and non-linear graphs.

11. Explore types of graphs, choose appropriate graphs for data display, and use measures of central tendency and probability.

Evaluation:

Evaluation will be based on unit assessments, daily work, various performance events, teacher observation, quarterly Common Assessment testing, and yearly Missouri Assessment Program testing.

Phelps County R-3 School	Board Approved Date: Modification Date:
Subject: 8 th Grade Math	Class Name: Pre-Algebra
Unit: Number Sense and Operations/Algebraic Relationships—Expressions, equations, and inequalities	Duration: 8 days
Show-Me Standards Content: MA 1, 4 Show-Me Standards Process: 1.6, 3.1, 3.3, 3.4, 4.1	
Grade Level Expectations: NO 01.B.08, NO 02.B.08, NO 03.D.08, AR 02.A.08,	
Benchmarks: <ul style="list-style-type: none"> • Understand meanings of operations and how they relate to one another. • Represent and analyze mathematical situations and structures using algebraic symbols. • Use mathematical models to represent and understand quantitative relationships. 	Performance Indicators(Local Objective): <ol style="list-style-type: none"> 1. Apply properties of operations including order of operations to positive rational numbers. 2. Use variables to represent unknown quantities in equations and inequalities. 3. Model and solve problems using expressions, equations, or inequalities.
Activities and Assessments: <ol style="list-style-type: none"> 1. Students will complete assignments from the pre-algebra math book as well as assignments from other resources. 2. Students will take notes every day, complete problems in their notes, and work problems on the board. Teacher will complete sample problems on overhead projector and demonstrate use of websites on SMART Board. 3. Expression pair-up: Students will be given math symbols and words. They will practice in pairs writing expressions using words and numbers. 4. Working in pairs, students will translate word problems into equations. 5. Fun With Calendars—Students will use algebraic reasoning to solve a brain teaser involving a calendar. 6. Rags to Riches—Students play a game involving solving equations at http://www.quia.com/rr/4096.html 7. Thrillionaire Game—Students solve equations to earn points at http://www.syvum.com/cgi/online/tgamef.cgi/squizzes/algebra/equations2.tdf?0 8. Tonya’s Shoe Emporium/To the Market—Students will use word problems to write expressions and equations and solve problems. 9. Algebraic Equations—Students will write equation word problems that follow a pattern given in the assignment. 10. Math.com—Shows students steps for solving equations and inequalities and allows for practice at the end of each section. http://www.math.com/homeworkhelp/Algebra.html 	
Assessments: Unit Test, daily work, observation of students, in-class activities	

Resources:

Math textbook: *Mathematics Applications and Concepts Course 3*, Glencoe
Mathematics Applications and Concepts Course 3, Resource Masters

Study Island: www.studyisland.com

Materials: math symbols, words, calendar

Relevant Links:

<http://math.rice.edu/~lanius/Lessons/calen.html>

<http://www.quia.com/rr/4096.html>

<http://www.syvum.com/cgi/online/tgamef.cgi/squizzes/algebra/equations2.tdf?0>

Phelps County R-3 School	Board Approved Date: Modification Date:
Subject: 8 th Grade Math	Class Name: Math-8 th Grade
Unit: Number Sense and Operations--Integers	Duration: 7 days
Show-Me Standards Content: MA 1	
Show-Me Standards Process: 1.10, 3.5	
Grade Level Expectations: NO 03.C.08	
Benchmarks:	Performance Indicators(Local Objective):
<ul style="list-style-type: none"> • Compute fluently and make reasonable estimates 	<ol style="list-style-type: none"> 1. Apply all operations on rational numbers

Activities and Assessments:

1. Students will complete assignments from the pre-algebra math book as well as assignments from other resources.
2. Students will take notes every day, complete problems in their notes, and work problems on the board. Teacher will complete sample problems on overhead projector and demonstrate use of websites on SMART Board.
3. Equating Snap—Pair students up so that there are two students of equal skill level. Make this board game: $\square = \square x + \square$. One player deals three cards. Each player records the three in the boxes, trying to come up with the highest value of x. The first to do so scores 1 point.
4. Algebraic Addition—Students will use play money and IOUs to model integer addition and subtraction.
5. Beans in a Box—Lima beans that are spray painted red on one side to represent negative numbers and left white on the other to represent positive numbers are put in a clear plastic container with a line down the middle. Students shake to box, record the results and multiply the two sides.
6. Integer Addition/Subtraction War—Students draw two cards from a deck and either add the sum or subtract the difference of their cards using black cards for positive numbers, red cards for negative numbers. The winner takes the cards.
7. Integer Multiplication Snap—Students draw two cards from the top of the deck and turn them over. The first person to multiply the numbers and say the right answer collects both cards.
8. Circle 0, 21, 3, and 99—Puzzles involving adding positive real numbers to those sums.
http://nlvm.usu.edu/en/nav/category_g_3_t_1.html

Assessments: Unit Test, daily work, observation of students, in-class activities

Resources:

Math textbook: *Mathematics Applications and Concepts Course 3*, Glencoe
Mathematics Applications and Concepts Course 3, Resource Masters
 Study Island: www.studyisland.com

Materials:

Addition and Subtraction Quizmo
 two-color counters

Phelps County R-3 School	Board Approved Date: Modification Date:
Subject: 8 th Grade Math	Class Name: 7 th and 8 th Grade
Unit: Number Sense and Operations--Fractions	Duration: 11 days
Show-Me Standards Content: MA 1, 4, 5 Show-Me Standards Process: 1.6, 1.10, 3.1, 3.4, 3.6	
Grade Level Expectations: NO 01.D.08, NO 02.D.08, NO 01.C.08, AR 02.A08	
Benchmarks: <ul style="list-style-type: none"> • Understand numbers, ways of representing numbers, relationships among numbers and number systems • Understand meanings of operations and how they relate to one another • Represent and analyze mathematical situations and structures using algebraic symbols 	Performance Indicators(Local Objective): <ol style="list-style-type: none"> 1. recognize equivalent representations for the same number and generate them by <u>decomposing and composing numbers</u>, including scientific notation 2. use <u>factors</u> and <u>multiples</u> to describe relationships between and among numbers and justify characteristics of numbers 3. apply the relationship between squares and square roots and cubes and cube roots to solve a problem 4. use <u>symbolic algebra</u> to represent and solve problems that involve linear relationships, including <u>recursive</u> relationships
<p style="text-align: center;">Activities and Assessments:</p> <ol style="list-style-type: none"> 1. Students will complete assignments from the pre-algebra math book as well as assignments from other resources. 2. Students will take notes every day, complete problems in their notes, and work problems on the board. Teacher will complete sample problems on overhead projector and demonstrate use of websites on SMART Board. 3. Prime It!—Split students into groups of two to four. One player rolls both a decade and a ten-sided die. Record each of these numbers. Example $60+4=64$. Construct as many factor trees as possible and the correct prime factorization using exponential form. Each player records the number of trees they made. 4. Connor’s Equivalent Race—Split students into groups of four—two on each team. Each player deals out four cards and makes two proper fractions. Cards are placed between the players. They alternate drawing cards one at a time. They may use this card or discard it for another player to use. Players continue making equivalent fractions for a certain amount of time. The players with the most points are the winners. 5. Fraction Sandwiches—Students will solve fractional problems involving students and sandwiches by adding, subtracting, and finding equivalent fractions. 6. Fraction Frenzy—Students use the website http://www.learningplanet.com/sam/ff/index.asp to match equivalent fractions in a timed game. 7. Fractional Floor Plans—Students will design a floor plan for a two-story house. They will use a budget and write story problems using fractional measurements of the floor plan. 8. Beat Mr. MathJack—Students create cards with whole numbers on them and combine decks with three other students. They then deal two cards face up and determine the value. Any player who scores a whole number i.e. 12/12 automatically wins “mathjack” and gets two tokens. Mr. Mathjack asks each player if they want a card. They can discard or take cards until they want to stop. Mr. 	

Mathjack then turns over his hand. The object is to beat the value of Mr. Mathjack's cards. The player with the best hand wins.

Assessments: Unit Test, daily work, observation of students, in-class activities

Resources:

Math textbook: *Mathematics Applications and Concepts Course 3*, Glencoe

Mathematics Applications and Concepts Course 3, Resource Masters

Study Island: www.studyisland.com

Materials: deck of cards, ten-sided die, match sticks or straws, note cards

Relevant Links: <http://www.learningplanet.com/sam/ff/index.asp>

<http://www.teachers.net/lessons/posts/236.html>

Phelps County R-3 School	Board Approved Date: Modification Date:
Subject: 8 th Grade Math	Class Name: Pre-Algebra
Unit: Number Sense and Operations/Algebraic Relationships—Prime Factorization, Rational Numbers, Powers, Scientific Notation, Nth Term	Duration: 11 days
Show-Me Standards Content: MA 1, 4, 5 Show-Me Standards Process: 1.6, 1.10, 3.1, 3.4, 3.6	
Grade Level Expectations: NO 01.D.08, NO 02.D.08, NO 01.C.08, AR 02.A.08	
Benchmarks: <ul style="list-style-type: none"> • Understand numbers, ways of representing numbers, relationships among numbers and number systems. • Understand meanings of operations and how they relate to one another. • Represent and analyze mathematical situations and structures using algebraic symbols. 	Performance Indicators(Local Objective): <ol style="list-style-type: none"> 1. Recognize equivalent representations for the same number and generate them by composing and decomposing numbers including scientific notation. 2. Use factors and multiples to describe relationships between and among numbers and justify characteristics of numbers. 3. Apply relationship between square roots and cubes and cube roots to solve problems. 4. Use symbolic algebra to represent and solve problems that involve linear relationships, including recursive relationships.
<p style="text-align: center;">Activities and Assessments:</p> <ol style="list-style-type: none"> 1. Students will complete assignments from the pre-algebra math book as well as assignments from other resources. 2. Students will take notes every day, complete problems in their notes, and work problems on the board. Teacher will complete sample problems on overhead projector and demonstrate use of websites on SMART Board. 3. Scientific Notation—students use the website http://janus.astro.umd.edu/astro/scinote to practice converting numbers between standard and scientific notation. 4. Scientific Cards Line-up—Students are given cards with numbers in scientific notation and must line up without speaking in order. 5. A Thousand Lockers—Students use patterns to figure out the number of lockers closed in a school with 1000 lockers. Students create a diagram and a table to show this. 6. Traffic Jam—Students use patterns to get numbers, cars, and people to trade places following certain criteria. 7. Matchsticks—Students use nth term to determine a pattern of straws or matchsticks. Students will create a table showing the pattern. 8. Milk Crates—Students use nth term to determine the number of crates and milk bottles. Students will use drawings and create a table to show the patterns. 9. Prime It!—Students roll two die and combine the numbers. They then create as many factor trees as possible for each number. Students compare results and receive points for the number of trees they correctly developed. 10. Connor’s Equivalent Race—Students draw four cards and make two fractions. Students draw a card 	

and either use it in their fraction sentence or discard it for the other player to use. Students continue to draw and create as many equivalent fractions as possible. They play for a set period of time. Students with the most fractions at the end win.

11. Peg Puzzle—A game of patterns where students move pegs on the left to the right.

http://nlvm.usu.edu/en/nav/category_g_3_t_2.html. This game can also be played using students as the pegs and one student as the mover.

12. Factor Tree—A practice site for students to factor numbers using tree diagrams.

http://nlvm.usu.edu/en/nav/category_g_3_t_2.html

Assessments: Unit Test, daily work, observation of students, in-class activities

Resources:

Math textbook: *Mathematics Applications and Concepts Course 3*, Glencoe

Mathematics Applications and Concepts Course 3, Resource Masters

Study Island: www.studyisland.com

Curran, Joanne and Felling, Jane, Radical Math Volume X, Box Cars and One-Eyed Jacks, 2001

Relevant Links:

<http://janus.astro.umd.edu/astro/scinote>

<http://regentsprep.org/Regents/math/scinot/Tscicards.htm>

<http://mathforum.org/alejandre/frisbie/student.locker.html>

<http://mathforum.org/workshops/sum96/traffic.jam.html>

<http://mathcentral.uregina.ca/QQ/database/QQ.09.04/alex1.html>

<http://www.mathsonline.co.uk/nonmembers/resource/plans/matches.html>

<http://www.mathsonline.co.uk/nonmembers/resource/plans/milk.html>

http://nlvm.usu.edu/en/nav/category_g_3_t_2.html

Missing:

Math	8	Number and Operations	Students will multiply rational numbers, find percent of a number and percent of increase and decrease, and use rates, ratios, and proportions to solve problems
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Phelps County R-3 School	Board Approved Date: Modification Date:
Subject: 8 th Grade Math	Class Name: Pre-Algebra
Unit: Number Sense and Operations—Square Roots, Rational/Irrational Numbers Algebraic Relationships—Inequalities Geometric/Spatial Relationships—Pythagorean Theorem	Duration: 14 days
Show-Me Standards Content: MA 2, 4, 5 Show-Me Standards Process: 1.6, 3.3, 3.4, 3.6	
Grade Level Expectations: NO 01.A.08, NO 02.D.08, GSR 01.A.08, GSR 02.A.08, AR 03.A.08	
Benchmarks: <ul style="list-style-type: none"> • Understand numbers, ways of representing numbers, relationships among numbers and number systems. • Understand meanings of operations and how they relate to one another. • Analyze characteristics and properties of two and three dimensional geometric shapes and develop mathematical arguments about geometric relationships. • Specify locations and describe spatial relationships using coordinate geometry and other representational systems. • Use mathematical models to represent and understand quantitative relationships. 	Performance Indicators(Local Objective): <ol style="list-style-type: none"> 1. Compare and order rationals and percents, including finding their approximate locations on a number line. 2. Apply the relationships between squares and square roots and cubes and cube roots to solve a problem. 3. Describe, classify and generalize relationships between and among types of two- and three-dimensional objects using Pythagorean Theorem. 4. Use coordinate geometry to analyze properties of right triangles. 5. Model and solve problems using inequalities.
Activities and Assessments: <ol style="list-style-type: none"> 1. Students will complete assignments from the pre-algebra math book as well as assignments from other resources. 2. Students will take notes every day, complete problems in their notes, and work problems on the board. Teacher will complete sample problems on overhead projector and demonstrate use of websites on SMART Board. 3. Equations and Inequalities—This site shows students steps to solving inequalities and then provides a practice section. http://www.math.com/school/subject2/lessons/S2U3L4GL.html 4. Baseball and the Pythagorean Theorem—Students use a baseball “diamond” to determine lengths between the bases using Pythagorean Theorem. 5. Super Star Traveler—Students create a 7 x 7 grid and a five pointed star. Players roll two dice and find the sum. They are to then find the square root of that number to the nearest whole. They are allowed to remove up to five cards from a row to get the answer to their sum. If no move is available, they must fill in one point of their star. The first team to fill in their star is the loser. 6. Simply Radical—Students each roll a 20-sided die. At the same time, they multiply the two numbers and find the square root in simplified form. The first person to verbalize the answer out loud earns a point. 7. Pythagorean Theorem Puzzle—Students solve two puzzles that illustrate proof of the Theorem. http://nlvm.usu.edu/en/nav/category_g_3_t_3.html 	

Assessments: Unit Test, daily work, observation of students, in-class activities

Resources:

Math textbook: *Mathematics Applications and Concepts Course 3*, Glencoe
Mathematics Applications and Concepts Course 3, Resource Masters

Study Island: www.studyisland.com

Materials: computer, deck of cards, dice, 20-sided die

Relevant Links:

<http://www.math.com/school/subject2/lessons/S2U3L4GL.html>

<http://www.geom.uiuc.edu/~demo5337/Group3/bball.html>

http://nlvm.usu.edu/en/nav/category_g_3_t_3.html

Phelps County R-3 School	Board Approved Date: Modification Date:
Subject: 8 th Grade Math	Class Name: Pre-Algebra
Unit: Geometric/Spatial Relationships—Symmetry, Quadrilaterals	Duration: 12 days
Show-Me Standards Content: MA 2 Show-Me Standards Process: 1.6, 3.6	
Grade Level Expectations: GSR 01.A.08, GSR 01.B.08, GSR 02.A.08	
Benchmarks: <ul style="list-style-type: none"> • Analyze characteristics and properties of two and three dimensional geometric shapes and develop mathematical arguments about geometric relationships. • Specify locations and describe spatial relationships using coordinate geometry and other representational systems. 	Performance Indicators(Local Objective): <ol style="list-style-type: none"> 1. Describe, generalize, and classify relationships between and among two- and three-dimensional shapes. 2. Apply relationships among corresponding sides and corresponding areas of similar polygons to solve problems. 3. Use coordinate geometry to analyze properties of right triangles and quadrilaterals.
<p style="text-align: center;">Activities and Assessments:</p> <ol style="list-style-type: none"> 1. Students will complete assignments from the pre-algebra math book as well as assignments from other resources. 2. Students will take notes every day, complete problems in their notes, and work problems on the board. Teacher will complete sample problems on overhead projector and demonstrate use of websites on SMART Board. 3. Design a Fun House—Students use computer and graph paper to design a house using area and perimeter. 4. Shape Surveyor—Students solve area and perimeter problems to uncover ancient ruins. http://www.funbrain.com/poly/index.html 5. Perfectly Symmetrical—Students reflect dots across x and y axis to create symmetrical designs in this timed game. http://www.mathplayground.com/Perfectly_Symmetrical.html <p>Assessments: Unit Test, daily work, observation of students, in-class activities</p>	
<p style="text-align: center;">Resources:</p> <p>Math textbook: <i>Mathematics Applications and Concepts Course 3</i>, Glencoe <i>Mathematics Applications and Concepts Course 3, Resource Masters</i> Study Island: www.studyisland.com</p> <p>Materials: computer, graph paper</p> <p>Relevant Links:</p> <p>http://its.guilford.k12.nc.us/webquests/areaperim/areaperim.htm http://www.funbrain.com/poly/index.html http://www.mathplayground.com/Perfectly_Symmetrical.html</p>	

Phelps County R-3 School	Board Approved Date: Modification Date:
Subject: 8 th Grade Math	Class Name: Pre-Algebra
Unit: Geometry—Rotations, Reflections, Translations, Dilations, Symmetry	Duration: 14 days
Show-Me Standards Content: MA 2 Show-Me Standards Process: 1.6, 3.6	
Grade Level Expectations: GSR 03.A.08, GSR 03.B.08, GSR 03.C.08	
Benchmarks: <ul style="list-style-type: none"> • Apply transformations and use symmetry to analyze mathematical situations. 	Performance Indicators(Local Objective): <ol style="list-style-type: none"> 1. Reposition shapes under formal transformations, such as reflection, rotation, and translation. 2. Describe the relationship between the scale factor and the area of the image using a dilation. 3. Identify the number of rotational symmetries of a regular polygon.
<p style="text-align: center;">Activities and Assessments:</p> <ol style="list-style-type: none"> 1. Students will complete assignments from the pre-algebra math book as well as assignments from other resources. 2. Students will take notes every day, complete problems in their notes, and work problems on the board. Teacher will complete sample problems on overhead projector and demonstrate use of websites on SMART Board. 3. Four Types of Symmetry in the Plane—Students will see examples of each type of transformation and answer problems at the end of the unit. 4. Border Symmetry—Students will create bulletin board borders using different types of symmetry. 5. Interactive Transformations—Students will use this site to observe a reflection, understand, explore, and construct their own reflections using interactive geometry. 6. Tantalizing Tessellations—provides several lesson ideas for creating tessellations based on each type of transformation. 7. Transformations and Tangrams—an interactive site that allows students to manipulate tangram shapes into reflections, translations, and rotations. 8. NLVM Virtual Manipulatives—Provides practice for manipulating reflections, rotations, and translations. http://nlvm.usu.edu/en/nav/category_g_3_t_3.html 9. Reflect on These Words—Allows students to see and decode phrases reflected vertically or horizontally. 10. Mirror Images I and II—Students find vertical and horizontal lines of symmetry in pictures and recreate images to make them symmetrical. 11. Rotating Gears—Students use different sets of gears to determine the way of rotation. 12. Scale Drawings—Students draw various objects according to scale using centimeter grid paper. 13. Reflect on This—Students draw reflections of various images. 14. Symmetrical Images—Students draw lines of symmetry on shapes and determine if a shape has line or rotational symmetry. 15. It's Your Turn—Students practice drawing rotations of an image around a center point. <p>Assessments: Unit Test, daily work, observation of students, in-class activities</p>	

Resources:

Math textbook: *Mathematics Applications and Concepts Course 3*, Glencoe
Mathematics Applications and Concepts Course 3, Resource Masters
Study Island: www.studyisland.com

Materials: Computer, grid paper, drawing paper

Relevant Links:

http://nlvm.usu.edu/en/nav/category_g_3_t_3.html

<http://mathforum.org/sum95/suzanne/symsusan.html>

<http://www.math.okstate.edu/~wolfe/border/groupa.html>

<http://www.mathsnet.net/transform/refindex.html>

<http://mathcentral.uregina.ca/RR/database/RR.09.06/archamb1.html>

http://www.hbschool.com/elab/act_6_9.html

<http://www.mathisfun.com/geometry/reflection.html>

Phelps County R-3 School	Board Approved Date: Modification Date:
Subject: 8 th Grade Math	Class Name: Pre-Algebra
Unit: Measurement—Reflex Angles, Conversions	Duration: 8 days
Show-Me Standards Content: MA 2 Show-Me Standards Process: 1.4, 1.6, 1.10, 3.2	
Grade Level Expectations: M 01.B.08, M 02.B.08, M 02.E.08	
Benchmarks: <ul style="list-style-type: none"> • Understand measurable attributes of objects and the units, systems, and processes of measurement. • Apply appropriate techniques, tools, and formulas to determine measurements. 	Performance Indicators(Local Objective): <ol style="list-style-type: none"> 1. Identify the equivalent volume measures within a system of measurement. 2. Use tools to determine the measure of reflex angles to the nearest degree. 3. Convert square or cubic units to equivalent square or cubic units within the same system of measurement.
<p style="text-align: center;">Activities and Assessments:</p> <ol style="list-style-type: none"> 1. Students will complete assignments from the pre-algebra math book as well as assignments from other resources. 2. Students will take notes every day, complete problems in their notes, and work problems on the board. Teacher will complete sample problems on overhead projector and demonstrate use of websites on SMART Board. 3. Online Conversion—A site to help students see conversions between square and cubic units. http://www.onlineconversion.com 4. Converting Units—Students practice converting customary and metric units. http://www.aaamath.com/ 5. Converting Units—A site that teaches students a simple system for converting units. http://nlvm.usu.edu/en/nav/category_g_3_t_4.html <p>Assessments: Unit Test, daily work, observation of students, in-class activities</p>	
<p style="text-align: center;">Resources:</p> <p>Math textbook: <i>Mathematics Applications and Concepts Course 3</i>, Glencoe <i>Mathematics Applications and Concepts Course 3, Resource Masters</i> Study Island: www.studyisland.com</p> <p>Materials: Computer</p> <p>Relevant Links: http://www.onlineconversion.com http://www.aaamath.com/ http://nlvm.usu.edu/en/nav/category_g_3_t_4.html</p>	

Phelps County R-3 School	Board Approved Date: Modification Date:
Subject: 8 th Grade Math	Class Name: Pre-Algebra
Unit: Measurement—Circumference, Surface Area, Volume	Duration: 10 days
Show-Me Standards Content: MA 2 Show-Me Standards Process: 3.1, 3.3, 3.4, 4.1	
Grade Level Expectations: M 02.C.08, GSR 04.A.08, GSR 04.B.08	
Benchmarks: <ul style="list-style-type: none"> • Apply appropriate techniques, tools, and formulas to determine measurements. 	Performance Indicators(Local Objective): <ol style="list-style-type: none"> 1. Describe how to solve problems involving surface area and volume of prisms and cylinders. 2. Create isometric drawings from a given mat plan 3. Draw or use visual models to represent and solve problems.
<p style="text-align: center;">Activities and Assessments:</p> <ol style="list-style-type: none"> 1. Students will complete assignments from the pre-algebra math book as well as assignments from other resources. 2. Students will take notes every day, complete problems in their notes, and work problems on the board. Teacher will complete sample problems on overhead projector and demonstrate use of websites on SMART Board. 3. Classroom Makeover—Students will measure their classroom, then use formulas to determine the cost for paint, border, and carpet. 4. Circle Ratios—Students change the size of the diameter of a circle to see that the ratio of diameter to circumference is always 3.14. 5. Cube Nets—Students click on different nets to see which ones will form cubes. 6. Isometric Drawing Tool—Students may use this site to create isometric drawings. 7. Building a Box—Students will create nets that can be folded into cubes. This can be used in conjunction with the Cube Nets. 8. Using Cubes and Isometric Drawings—Create isometric drawings using the Isometric Drawing Tool. Contains four lessons that range from using the drawing tool to mat plans to surface area and volume. <p>Assessments: Unit Test, daily work, observation of students, in-class activities</p>	

Resources:

Math textbook: *Mathematics Applications and Concepts Course 3*, Glencoe
Mathematics Applications and Concepts Course 3, Resource Masters

Study Island: www.studyisland.com

Materials: graph paper, construction paper, computer

Relevant Links:

http://www.successlink.org/gti/gti_lesson.asp?lid=5268

<http://illuminations.nctm.org/ActivityDetail.aspx?ID=87>

<http://illuminations.nctm.org/ActivityDetail.aspx?ID=84>

<http://illuminations.nctm.org/ActivityDetail.aspx?ID=125>

<http://illuminations.nctm.org/LessonDetail.aspx?id=L570>

<http://illuminations.nctm.org/LessonDetail.aspx?U166>

Phelps County R-3 School	Board Approved Date: Modification Date:
Subject: 8 th Grade Math	Class Name: Pre-Algebra
Unit: Measurement—Precision, Accuracy, and Significant Digits	Duration: 5 days
Show-Me Standards Content: MA 2 Show-Me Standards Process: 1.7, 3.8	
Grade Level Expectations: M 02.D.08	
Benchmarks: <ul style="list-style-type: none"> Apply appropriate techniques, tools, and formulas to determine measurements. 	Performance Indicators(Local Objective): <ol style="list-style-type: none"> Analyze precision and accuracy in measurement situations and determine number of significant digits.
<p style="text-align: center;">Activities and Assessments:</p> <ol style="list-style-type: none"> Students will complete assignments from the pre-algebra math book as well as assignments from other resources. Students will take notes every day, complete problems in their notes, and work problems on the board. Teacher will complete sample problems on overhead projector and demonstrate use of websites on SMART Board. Significant Digit Practice—Students can use these sites to drill and practice finding number of significant digits: http://science.widener.edu/svb/tutorial/sigfigures.html, http://chemsite.lsrhs.net/measurement/images/Calculating%20With%20Sig%20Dig.swf Measurement and Significant Digits—Students can read the rules for determining significant digits and practice using the practice problems. Students will measure the dimensions of their room to the nearest millimeter and find the area. They will then determine the significant digits of this answer. They may repeat with several different objects or rooms. <p>Assessments: Unit Test, daily work, observation of students, in-class activities</p>	
<p style="text-align: center;">Resources:</p> <p>Math textbook: <i>Mathematics Applications and Concepts Course 3</i>, Glencoe <i>Mathematics Applications and Concepts Course 3, Resource Masters</i> Study Island: www.studyisland.com</p> <p>Materials: meter sticks, computers</p> <p>Relevant Links: http://science.widener.edu/svb/tutorial/sigfigures.html http://chemsite.lsrhs.net/measurement/images/Calculating%20With%20Sig%20Dig.swf http://www.hazelwood.k12.mo.us/~grichert/sciweb/phys8.htm http://www.andrews.edu/~calkins/math/webtexts/numb09hw.htm</p>	

Phelps County R-3 School	Board Approved Date: Modification Date:
Subject: 8 th Grade Math	Class Name: Pre-Algebra
Unit: Algebraic Relationships—linear equations, slope	Duration: 9 days
Show-Me Standards Content: MA 2, 4 Show-Me Standards Process: 1.6, 3.1, 3.6, 4.1	
Grade Level Expectations: AR 01.B.08, AR 01.C.08, AR 01.D.08, AR 02.A.08, AR 02.B.08, AR 03.A.08, AR 04.A.08	
Benchmarks: <ul style="list-style-type: none"> • Understand patterns, relationships, and functions. • Represent and analyze mathematical situations and structures using algebraic symbols. • Use mathematical models to represent and understand quantitative relationships. • Analyze change in various contexts. 	Performance Indicators(Local Objective): <ol style="list-style-type: none"> 1. Generalize patterns represented graphically or numerically using words or symbolic rules, including recursive notation. 2. Compare and contrast various forms of representations of patterns. 3. Compare properties of linear functions between or among tables, graphs, and equations. 4. Use symbolic algebra to represent and solve problems that involve linear relationships, including recursive relationships. 5. Generate equivalent forms of linear equations.
<p style="text-align: center;">Activities and Assessments:</p> <ol style="list-style-type: none"> 1. Students will complete assignments from the pre-algebra math book as well as assignments from other resources. 2. Students will take notes every day, complete problems in their notes, and work problems on the board. Teacher will complete sample problems on overhead projector and demonstrate use of websites on SMART Board. 3. Printing Books—Students will use linear functions, x- and y-intercepts, and slope to solve real-life problems involving textbook purchasing for a school district. 4. Walk the Plank—Students will use a “plank” and scales to determine slope, equation, and x-intercept of a linear function. 5. 	
<p>Assessments: Unit Test, daily work, observation of students, in-class activities</p>	

Resources:

Math textbook: *Mathematics Applications and Concepts Course 3*, Glencoe
Mathematics Applications and Concepts Course 3, Resource Masters

Study Island: www.studyisland.com

Materials: board, scale

Relevant Links:

<http://illuminations.nctm.org/LessonDetail.aspx?id=L271>

<http://illuminations.nctm.org/LessonDetail.aspx?id=L682>

Phelps County R-3 School	Board Approved Date: Modification Date:
Subject: 8 th Grade Math	Class Name: Pre-Algebra
Unit: Data and Probability—Types of Graphs	Duration: 13 days
Show-Me Standards Content: MA 3 Show-Me Standards Process: 1.2, 3.5	
Grade Level Expectations: DP 01.A.08, DP 03.A.08	
Benchmarks: <ul style="list-style-type: none"> • 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 	Performance Indicators(Local Objective): <ol style="list-style-type: none"> 1. Formulate questions, design studies and collect data about a characteristic. 2. Make conjectures about possible relationships between two characteristics of a sample on the basis of scatter plots of the data and approximate lines of fit.
Activities and Assessments: <ol style="list-style-type: none"> 1. Students will complete assignments from the pre-algebra math book as well as assignments from other resources. 2. Students will take notes every day, complete problems in their notes, and work problems on the board. Teacher will complete sample problems on overhead projector and demonstrate use of websites on SMART Board. 3. Lifeline—Students will make a timeline of their life, including at least 15 events that span from birth to present. 4. Conduct a survey—Students will build a questionnaire for a survey and get a sample of 20 answers. They will tally their results and build a bar graph to display the results. 5. Keep Your Eyes on the Ball—Group students into groups of three. Each group chooses two different balls. Tape a meter stick vertically on the wall. Students drop each ball from heights varying from 30-100 cm. They record each rebound height. Students will construct scatter plots to demonstrate the rebound height for each ball. 6. Where’s the Fat—Distribute graph paper to students. Label the horizontal axis with protein, the vertical axis with fat. Using Nutrition Data Fact Sheet A and B, plot the fat and protein content of the various sandwiches. Conclude which sandwiches are lowest in calories and highest in protein. 7. Delicious, Nutritious Ice Cream Bars—Distribute Ice Cream Bar Fact Sheet and discuss. Distribute Scatter Plot of Ice Cream Bar Ratings and analyze. 8. Barbie Bungee—Hand out to each group of students a Barbie Doll, 15-20 rubber bands, a large piece of paper, some tape, and a measuring stick. Rubber bands must all be the same size and thickness. Starting at 400 cm, connect Barbie to two rubber bands and drop her. Record how close she comes to the ground. Continue adding bands, two at a time, until Barbie gets as close to the floor as possible without hitting the floor. Record on a table. Create a graph to show line of best fit. 9. History of Populations, Name Your Tune, and What’s the Weather—Students use various graphs to answer questions <p>Assessments: Unit Test, daily work, observation of students, in-class activities</p>	

Resources:

Math textbook: *Mathematics Applications and Concepts Course 3*, Glencoe
Mathematics Applications and Concepts Course 3, Resource Masters

Study Island: www.studyisland.com

Materials:

Relevant Links:

<http://illuminations.nctm.org>

Phelps County R-3 School	Board Approved Date: Modification Date:
Subject: 8 th Grade Math	Class Name: Pre-Algebra
Unit: Data and Probability—Measures of Central Tendency, Probability	Duration: 9 days
Show-Me Standards Content: MA 3 Show-Me Standards Process: 3.4, 3.5	
Grade Level Expectations: DP 02.A.08, DP 04.A.08	
Benchmarks: <ul style="list-style-type: none"> • Select and use appropriate statistical methods to analyze data • Understand and apply basic concepts of probability 	Performance Indicators(Local Objective): <ol style="list-style-type: none"> 1. find, use and interpret <u>measures of center</u>, <u>outliers</u> and spread, including range and <u>interquartile range</u> 2. Make conjectures based on theoretical probability about the results of experiments.
<p style="text-align: center;">Activities and Assessments:</p> <ol style="list-style-type: none"> 1. Students will complete assignments from the pre-algebra math book as well as assignments from other resources. 2. Students will take notes every day, complete problems in their notes, and work problems on the board. Teacher will complete sample problems on overhead projector and demonstrate use of websites on SMART Board. 3. It's a Snap—Split students into pairs. One student will be the timekeeper, one the snapper. For 30 seconds, one students snaps his/her fingers while the other counts. The students rests 5 seconds, then snaps again. Record each team's results on a transparency. Display data in a line plot, stem and leaf plot, and back-to-back stem and leaf plot. 4. Your Drive Me to Distraction—Hand out Computing Capers I and give students one minute to complete. Hand out Computing Capers II and give them one minute to complete, but read numbers, sing, talk, etc. while they are completing this. Let them check answers for each sheet. Record the data on a stem and leaf plot and back-to-back stem and leaf plot. 5. Flick the Nick—Divide students into groups of 4-6. Each group will flick a nickel 12 times and record each distance. The number of times a student gets to flick depends on the number in the group. For example in a group of four, each student would flick 3 times. Create a line plot for each team. Identify lower and upper extreme and range. Find the median and mark. Find the upper and lower quartile. Construct a box plot above the line. 6. Interest Rates—Distribute Interest in a Box and have students complete. Record class results on Box Plot Form as a line plot. Divide class into ten groups and give each group one of the line plots. They will find the median and each quartile, constructing a box plot above each line. 7. Frisbee Toss—Students toss a Frisbee several times and graph the results. 8. Mean, Median, Mode-Oh my!—Students will measure the heights of students in their group, graph them, find measures of central tendency, and present their findings on a poster or Power Point. 9. Card Probability—Students use a deck of cards to determine theoretical and experimental probability. 10. Adjustable Spinner—A good site to use to determine probability of an event. http://illuminations.nctm.org/ActivityDetail.aspx?ID=79 11. Box Plotter—A good site for creating box plots using information from a set of problems. http://illuminations.nctm.org/ActivityDetail.aspx?ID=77 12. Sticks and Stones—Students will play a version of the Native American game. They will use 	

probability to estimate the number of turns they will need to win a game.

Assessments: Unit Test, daily work, observation of students, in-class activities

Resources:

Math textbook: *Mathematics Applications and Concepts Course 3*, Glencoe

Mathematics Applications and Concepts Course 3, Resource Masters

Study Island: www.studyisland.com

Materials: Frisbee, meter sticks, digital camera, deck of cards, stones, popsicle sticks, feathers or arrowheads (for game markers)

Relevant Links: <http://www.successlink.org>

<http://illuminations.nctm.org>