

**NORTH MAC MIDDLE SCHOOL
CURRICULUM GUIDE**

Teacher: Miss Bilbruck

Grade Level: 8th Grade

Course: Pre-Algebra

Course Aims: To prepare students for Algebra I.

Course Description: This course is designed for students who need the basic skills required for Algebra I. Topics covered will include sets of numbers, order of operations with real numbers, algebraic expressions, properties of equality, solving equations and inequalities, and graphing. A review of fractions, decimals, integers, percents and proportions will also be covered. Basic geometry concepts will be introduced as well.

Textbook: Title: Prentice-Hall: Pre-Algebra

ISBN: 978-0-13-365945-0

Authors: Charles, McNemar, Ramirez

Publisher: Pearson Education, Inc.

Publication Date: 2009

Assessment: There will be a minimum of three assignments scored for each of the weeks in a quarter. Points will be obtained from assignments, quizzes, chapter test, projects, journal folders, and bell work. The points will be distributed amongst the range of percents for the categories provided below.

Example:

- Tests & Projects 50%
- Quizzes & Homework 30%
- Class Work 20%

1st Quarter: Pre-Algebra

<u>Lesson</u>	<u>Content</u>	<u>Assessment</u>	<u>Common Core Standard</u>	<u>Essential Questions</u>
Chapter 1: Algebraic Expressions and Integers				
1-1	Variables & Expressions	Quarterly Exams, Chapter Tests, Quizzes, Book Assignments, Worksheets, Projects, Journal Folders, & Bell Work	Reviews: 6.EE.1 6.EE.2.c 6.EE.6	Can the student identify variables, numerical expressions, and variable expressions? Can the student write expressions for word phrases?
1-2	Order of Operations		Reviews: 6.EE.2 6.EE.2.b	Can the student use the order of operations and grouping symbols?
1-3	Writing & Evaluating Expressions		Reviews: 6.EE.2 6.EE.2.a 6.EE.2.b 6.EE.6	Can the student evaluate and then solve variable expressions?
1-4	Integers & Absolute Value		Reviews: 6.NS.5 6.NS.6 6.NS.6.a 6.NS.6.c 6.NS.7 6.NS.7.c	Can the student represent, graph, and order integers? Can the student find opposite and absolute values?
1-5 1-6	Adding Integers Subtracting Integers		Reviews: 7.NS.1 7.NS.1.a 7.NS.1.b 7.NS.1.c 7.NS.1.d	Can the student use models and rules to add and subtract integers?
1-9	Multiplying & Dividing Integers		Reviews: 7.NS.2 7.NS.2.a 7.NS.2.b 7.NS.3	Can the student multiply integers using repeated addition, patterns, and rules? Can the student divide integers using rules?
1-10	Coordinate Plane		Reviews: 6.NS.6	Can the student name coordinates and quadrants in the coordinate plane?

			6.NS.6.b 6.NS.6.c 6.NS.8	Can the student graph points in the coordinate plane?
Chapter 2: Solving One-Step Equations and Inequalities				
2-1 2-2	Properties of Numbers Distributive Property	Quarterly Exams, Chapter Tests, Quizzes, Book Assignments, Worksheets, Projects, Journal Folders, & Bell Work	Reviews: 6.EE.2 6.EE.2.b	Can the student identify properties of addition and multiplication? Can the student use the properties to solve problems? Can the student use the distributive property with numerical and algebraic expressions?
2-3	Simplifying Variable Expressions		Reviews: 6.EE.2 6.EE.2.b	Can the student identify parts of a variable expression? Can the student simplify expressions?
2-4	Variables and Equations		Reviews: 6.EE.2 6.EE.2.b	Can the student classify types of equations? Can the student check equations using substitution?
2-5	Solving Equations by Adding or Subtracting		8.EE.7 8.EE.7.a	Can the student solve one-step equations using subtraction and addition?
2-6	Solving Equations by Multiplying or Dividing		8.EE.7 8.EE.7.a	Can the student solve one-step equations using division and multiplication?
2-8	Inequalities and Their Graphs		Reviews: 6.EE.5 6.EE.6 6.EE.8	Can the student solve and graph inequalities?
2-9	Solving One-Step Inequalities by Adding or Subtracting		Reviews: 6.EE.5 6.EE.6	Can the student solve one-step inequalities using subtraction and addition?

2-10	Solving One-Step Inequalities by Multiplying or Dividing		Reviews: 6.EE.5 6.EE.6	Can the student solve one-step inequalities using division or multiplication?
2nd Quarter: Pre-Algebra				
<u>Lesson</u>	<u>Content</u>	<u>Assessment</u>	<u>Common Core Standard</u>	<u>Essential Questions</u>
Chapter 3: Decimals and Fractions				
3-1 3-2	Rounding and Estimating Estimating Decimal Products and Quotients	Quarterly Exams, Chapter Tests, Quizzes, Book Assignments, Worksheets, Projects, Journal Folders, & Bell Work	Reviews: 5.NF.2 Reviews: 6.NS.3	Can the student round decimals? Can the student estimate sums and differences? Can the student estimate products and quotients?
3-3	Mean, Median, and Mode		Reviews: 6.SP.3 6.SP.5 6.SP.5.c	Can the student find the mean, median, mode, and range of a set of data? Can the student choose the best measure of central tendency?
3-4	Using Formulas		Reviews: 6.EE.2.c	Can the student substitute into formulas? Can the student use the formula for the perimeter of a rectangle?
3-5	Solving Equations by Adding or Subtracting Decimals		8.EE.7	Can the student solve one-step decimal equations involving addition and subtraction?
3-6	Solve Equations by Dividing or Multiplying Decimals		8.EE.7 8.EE.7.b	Can the student solve one-step decimal equations involving multiplication and division?
Chapter 4: Factors, Fractions, and Exponents				
4-1	Divisibility and Factors	Quarterly Exams, Chapter Tests, Quizzes, Book Assignments, Worksheets, Projects, Journal Folders,	Reviews: 4.OA.1	Can the student use divisibility tests? Can the student find factors?
4-2	Exponents		Reviews: 6.EE.1	Can the student use exponents?

		& Bell Work	6.EE.2 6.EE.2.c	Can the student use the order of operations with exponents?
4-3	Prime Factorization and Greatest Common Factor		Reviews: 6.EE.5 6.EE.6	Can the student find the prime factorization of a number? Can the student find the greatest common factor (GCF) of two or more numbers?
4-4	Simplifying Fractions		Reviews: 4.NF.1	Can the student find equivalent fractions? Can the student write fractions in simplest form?
4-6	Rational Numbers		8.NS.1	Can the student identify and graph rational numbers? Can the student evaluate fractions containing variables?
4-7	Exponents and Multiplication		8.EE.1	Can the student multiply powers with the same base? Can the student find a power of a power?
4-8	Exponents and Division		8.EE.1	Can the student divide expressions? Can the student simplify expressions with integer exponents?
4-9	Scientific Notation		8.EE.3 8.EE.4	Can the student write and evaluate numbers in scientific notation? Can the student calculate with scientific notation?
Chapter 5 & Lesson 6-5: Operations with Fractions (Mini Unit)				
5-2	Fractions and Decimals	Quarterly Exams, Chapter Tests, Quizzes, Book Assignments, Worksheets, Projects, Journal Folders, & Bell Work	Reviews: 7.NS.2.d 7.EE.3	Can the student write fractions as decimals? Can the student write terminating and repeating decimals as fractions?
6-5	Fractions, Decimals, and Percents		Reviews: 7.EE.3	Can the student write percents as fractions and decimals? Can the student order rational numbers?
4-4	Simplifying Fractions		Reviews: 4.NF.1	Can the student find equivalent fractions? Can the student write fractions in the simplest form?

5-3	Adding and Subtracting Fractions		Reviews: 5.NF.1	Can the student add and subtract fractions? Can the student add and subtract mixed numbers?
5-4	Multiplying and Dividing Fractions		Reviews: 5.NF.4.a 6.NS.1	Can the student multiply and divide fractions?
5-7	Solving Equations by Adding or Subtracting Fractions		8.EE.7	Can the student solve equations by subtracting and adding fractions?
5-8	Solving Equations by Multiplying Fractions		8.EE.7 8.EE.7.b	Can the student solve equations by multiplying fractions? Can the student solve equations by multiplying mixed numbers?

3rd Quarter: Pre-Algebra

<u>Lesson</u>	<u>Content</u>	<u>Assessment</u>	<u>Common Core Standard</u>	<u>Essential Questions</u>
Chapter 6: Ratios, Proportions, and Percents (Mini Unit)				
6-1	Ratios and Unit Rates	Quarterly Exams, Chapter Tests, Quizzes, Book Assignments, Worksheets, Projects, Journal Folders, & Bell Work	Reviews: 7.RP.1	Can the student write and simplify ratios? Can the student find rates and unit rates?
6-2	Proportions		Reviews: 7.RP.2 7.RP.2.a 7.RP.2.b	Can the student solve proportions? Can the student use proportions to solve problems?
6-3	Similar Figures and Scale Drawings		Reviews: 7.RP.1 7.RP.2 7.G.1	Can the student solve problems that involve similar figures? Can the student solve problems that involve scale drawings?
6-6	Proportions and Percents		Reviews: 7.EE.3	Can the student find a part of a whole and a percent? Can the student find a whole amount?
6-7	Percents and Equations		Reviews: 7.EE.3	Can the student write and solve percent equations? Can the student use equations in solving percent problems?

Chapter 9: Spatial Thinking

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9-1	Introduction to Geometry: Points, Lines, and Planes	Quarterly Exams, Chapter Tests, Quizzes, Book Assignments, Worksheets, Projects, Journal Folders, & Bell Work	Reviews: 4.G.1	Can the student name basic geometric figures? Can the student recognize intersecting lines, parallel lines, and skew lines?
9-2	Angle Relationships and Parallel Lines		8.G.5	Can the student identify adjacent and vertical angles?
9-3	Classifying Polygons		8.G.5	Can the student classify triangles and quadrilaterals?
9-5	Congruence		8.G.2	Can the student identify corresponding parts of congruent triangles? Can the student determine whether triangles are congruent?
9-8	Translations		8.G.1 8.G.1.a 8.G.1.b 8.G.1.c 8.G.2 8.G.3	Can the student graph translations? Can the student describe translations?
9-9	Symmetry and Reflections		8.G.1 8.G.1.a 8.G.1.b 8.G.1.c 8.G.2 8.G.3	Can the student identify a line of symmetry? Can the student graph a reflection of a geometric figure?
9-10	Rotations		8.G.1 8.G.1.a 8.G.1.b 8.G.1.c 8.G.2 8.G.3	Can the student graph rotations? Can the student identify rotational symmetry?
CC-9	Transformations and Congruency		8.G.1 8.G.1.a 8.G.1.b 8.G.1.c 8.G.2	Can the student analyze the image of a figure that has been translated and reflected to determine if the image is congruent to the original figure? Can the student identify a sequence of reflections, rotations, and translations that take a figure to its

				congruent image?
CC-10	Transformations and Similarity		8.G.4 8.G.5	Can the student find whether the shapes are similar through a sequence of rotations, reflections, translations, and dilations?
Chapter 10: Area & Volume (Mini Unit)				
10-1	Area: Parallelograms	Quarterly Exams, Chapter Tests, Quizzes, Book Assignments, Worksheets, Projects, Journal Folders, & Bell Work	Reviews: 7.G.6	Can the student find areas of rectangles and parallelograms?
10-2	Area: Triangles & Trapezoids		Reviews: 7.G.6	Can the student find areas of triangles and trapezoids?
10-3	Area: Circles		Reviews: 7.G.4	Can the student find areas of circles and irregular figures that include parts of circles?
10-5 10-6	Surface Area: Prisms and Cylinders Surface Area: Pyramids, Cones, and Spheres		Reviews: 6.G.4	Can the student find surface areas of prisms and cylinders? Can the student find surface areas of pyramids, cones and spheres?
10-7	Volume: Prisms and Cylinders		8.G.9	Can the student find volume of prisms and cylinders?
10-9	Volume: Pyramids, Cones, and Spheres		8.G.9	Can the student find volume of pyramids, cones, and spheres?
Chapter 11: Right Triangles in Algebra				
11-1	Square Roots and Irrational Numbers	Quarterly Exams, Chapter Tests, Quizzes, Book Assignments, Worksheets, Projects, Journal Folders, & Bell Work	8.NS.2 8.EE.2	Can the student find square roots of numbers? Can the student classify real numbers?
CC-11	Cube Roots		8.EE.2	Can the student find the cube root of each side of the equation to solve?
11-2	The Pythagorean Theorem		8.EE.2 8.G.6 8.G.7	Can the student use the Pythagorean Theorem? Can the student identify right triangles?
CC-12	Pythagorean Proofs		8.G.6	Can the student use the Converse of the Pythagorean Theorem to verify the triangle is a right triangle?
CC-13	Using the Pythagorean Theorem with Three-Dimensional Figures		8.G.7	Can the student find the unknown dimensions in three-dimensional shapes containing right triangles?
11-3	Distance and Midpoint Formulas		8.G.8	Can the student find the distance between two points using the Distance Formula? Can the student find the mid-point of a segment using the Midpoint Formula?

11-4	Problem Solving: Write a Proportion		8.EE.5 8.EE.6 8.F.4	Can the student write a proportion from similar triangles?
11-5	Special Right Triangles		8.G.7	Can the student use the relationships in 45° - 45° - 90° triangles? Can the student use the relationships in 30° - 60° - 90° triangles?

4th Quarter: Pre-Algebra

<u>Lesson</u>	<u>Content</u>	<u>Assessment</u>	<u>Common Core Standard</u>	<u>Essential Questions</u>
Chapter 7: Solving Equations and Inequalities				
7-1	Solving Two-Step Equations	Quarterly Exams, Chapter Tests, Quizzes, Book Assignments, Worksheets, Projects, Journal Folders, & Bell Work	8.EE.7	Can the student solve two-step equations? Can the student use two-step equations to solve problems?
7-2	Solving Multi-Step Equations		8.EE.7 8.EE.7.a 8.EE.7.b	Can the student combine like terms to simplify an expression? Can the student use the Distributive Property to simplify an equation?
CC-1	Types of Solutions of Linear Equations		8.EE.7.a	Can the student identify the type of solution to the linear equation?
7-3	Multi-Step Equations with Fractions and Decimals		8.EE.7 8.EE.7.b	Can the student solve multi-step equations with fractions? Can the student solve multi-step equations with decimals?
7-4	Problem Solving: Write an Equation		8.EE.7 8.EE.7.b	Can the student write an equation to solve the problem?
7-5	Solving Equations with Variables on Both Sides		8.EE.7 8.EE.7.b	Can the student use and solve equations with variables on both sides?
Chapter 8: Linear Functions and Graphing				
8-1	Square Roots and Irrational Number Systems	Quarterly Exams, Chapter Tests, Quizzes, Book Assignments, Worksheets,	8.F.1 8.F.2	Can the student determine whether a relation is a function? Can the student graph relations and functions?

8-2	Equations with Two Variables	Projects, Journal Folders, & Bell Work	8.F.4	Can the student find solutions of equations with two variables?
8-3	Slope and y-intercept		8.EE.6 8.F.3 8.F.4	Can the student find the slope of a line? Can the student use slope-intercept form in graphing a linear equation?
CC-2	Comparing Functions		8.F.2	Can the student compare functions even if the functions are represented differently?
CC-3	Describing Functions		8.F.5	Can the student describe the relationship by looking at the shape and direction of different parts of the graph?
8-4	Writing Rules for Linear Functions		8.F.1	Can the student write a function rule for a word relationship? Can the student write a function rule by analyzing a table or graph?
CC-5	Graphing Proportional Relationships		8.EE.5	Can the student graph proportional relationships to explore the relationship between the slope of a line on a graph and unit rate?
CC-14	Relative Frequency		8.SP.4	Can the student create two-way tables, where rows represent the values of one variable and columns represent the values of the other? Can the student identify patterns of association?
CC-6	Exploring Bivariate Data		8.SP.1	Can the student construct scatter plots to display and interpret bivariate data, looking at patterns of association between the two quantities in the given situation? Can the student describe patterns that exist with the data such as clustering, outliers, and any nonlinear patterns?
8-5	Scatter Plots		8.SP.1	Can the student interpret and draw scatter plots? Can the student use scatter plots to find trends?
CC-7	Modeling Data with Lines		8.SP.2	Can the student draw a line that fits the data?

			8.SP.3	Can the student evaluate how the line fits the data?
8-6	Problem Solving: Solve by Graphing		8.SP.1	Can the student solve problems by graphing?
8-7	Solving Systems of Linear Equations		8.EE.8 8.EE.8.a 8.EE.8.b 8.EE.8.c	Can the student solve systems of linear equations by graphing? Can the student use systems of linear equations to solve problems?
CC-8	Solving Systems of Equations		8.EE.8 8.EE.8.a 8.EE.8.b 8.EE.8.c	Can the student use graphing, substitution, elimination, or inspection to solve systems of equations?
Problem Solving Strategies (If Time Permits)				
1-8	Look For a Pattern	Quarterly Exams, Chapter Tests, Quizzes, Book Assignments, Worksheets, Projects, Journal Folders, & Bell Work	Mathematical Practices	Can the student find number patterns?
1-7	Inductive Reasoning		Mathematical Practices	Can the student write rules for patterns? Can the student make predictions and test conjectures?
2-7	Guess, Check, Revise		Mathematical Practices	Can the student solve a problem using the Guess, Check, Revise strategy?
3-8	Act it Out		Mathematical Practices	Can the student solve complex problems by first solving simpler cases?
4-5	Solve a Simpler Problem		Mathematical Practices	Can the student solve complex problems by first solving simpler cases?
5-6	Problem Solving: Work Backward		Mathematical Practices	Can the student solve problems by working backward?
6-10	Problem Solving: Make a Table		Mathematical Practices	Can the student solve problems by making a table?
9-4	Problem Solving: Draw a Diagram		Mathematical Practices	Can the student draw a diagram to solve a problem?
10-8	Problem Solving: Make a Model		Mathematical Practices	Can the student solve problems by making a model?
12-3	Using Graphs to Persuade		Mathematical Practices	Can the student recognize the use of breaks in the scales of graphs? Can the student recognize the use of different scales?

13-8	Problem Solving: Use Multiple Strategies		8.EE.7	Can the student solve problems by combining strategies?
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