

Wilson Area School District Planned Course Guide

Title of planned course: Pre-Algebra

Subject Area: Mathematics

Grade Level: 7

Course Description: *Prerequisites: Complete 6th grade math;*

The course is the study of Variables, Expressions, and Integers, Solving Equations and Inequalities, Exponents, Rational Numbers and Equations, Ratio, Proportion, and Probability, Percents, Linear Functions, Measurement, Area, Volume, Data Analysis and Probability, Angle Relationships, and Geometric Figures.

Applications of real-world problems will be included. Course requirements include: tests, quizzes, projects, presentations, notebook, daily homework, and usage of calculators. It is highly recommended that each student have a calculator.

Time/Credit for this Course: 1.0

Curriculum Writing Committee: Kathleen Zane, Julia Morrissey

Wilson Area School District Curriculum Map

August: Variables, Expressions, and Integers (13 – 19 days)

September: Variables, Expressions, and Integers (cont.)
Solving Equations (17 – 23 days)

October: Solving Equations (cont.)
Multi-Step Equations and Inequalities (15 – 21 days)

November: Multi-Step Equations and Inequalities (cont.)
Ratio, Proportion, and Probability (20 – 26 days)

December: Ratio, Proportion, and Probability (cont.)

January: Percents (12 – 18 days)
Measurement and Volume (14 – 20 days)

February: Measurement and Volume (cont.)
Angle Relationships (10 – 16 days)

March: Angle Relationships (cont.)
Data Analysis and Probability (5 days)

April: Data Analysis and Probability (5 - 10 days)

May: Factors, Fractions, and Exponents (9 – 15 days)
Linear Functions (14 – 20 days)

June: Linear Functions (cont.)

Wilson Area School District Planned Course Materials

Course Title: Pre-Algebra

Textbook: Pre-Algebra
Larson/Houghton Mifflin © 2012

Supplemental Books: Pre-Algebra
Holt/Rinehart/Winston © 2008

Teacher Resources:

- Textbooks
- Worksheets
- Internet
- Teacher created worksheets
- Additional worksheets and cooperative learning books

Curriculum Scope & Sequence

Planned Course: Pre-Algebra

Unit 1: Variables, Expressions, and Integers

Time frame: 13-19 class periods

Anchor(s) or adopted anchor: M07.A-N.1.1; M07.B-E.2.3

Essential content/objectives: At end of the unit, students will be able to:

- Use variables to represent unknown quantities
- Evaluate and write variable expressions
- Apply the algebraic order of operations to rational numbers
- Apply properties of operations to add and subtract rational numbers
- Represent addition and subtraction on a horizontal or vertical number line
- Apply properties of operations to multiply and divide rational numbers, including real-world contexts; demonstrate that the decimal form of a rational number terminates or eventually repeats

Core Activities: Students will complete/participate in the following:

- Define key terms relating to Pre-Algebra
- Complete examples of problems in class
- Participate in individual, pair, and small group practice of concepts
- Complete hands-on activity to discover knowledge

Extensions:

- Work with the calculator to be able to enter fractions, exponents, and convert from fractions to decimals and decimals to fractions
- Online problem solving
- Workbook Enrichment

Remediation:

- Additional exercises
- Less complex numbers to work with to build prior knowledge
- Chapter review exercises which revisits concepts and vocabulary
- Teacher/peer tutoring
- Online Practice

Instructional Methods:

- Projected notes
- Higher order thinking questions
- Individual, pair, and small group practice
- Warm ups
- Teacher directed examples
- Mimio presentations

Materials & Resources:

- Warm Ups
- Textbook
- Mimio Lessons
- Projector
- Notes/examples
- Handouts (worksheets)
- Activity supplies
- Calculators
- Individual white boards

Assessments:

- Warm Ups
- Pretests
- Student pair-share and group discussion
- Teacher observation of student work
- Homework assignments
- Test/quizzes
- Questioning techniques

Curriculum Scope & Sequence

Planned Course: Pre-Algebra

Unit 2: Solving Equations

Time frame: 17-23 class periods

Anchor(s) or adopted anchor: M07.B-E.1.1, M07.B-E.2.1, M07.B-E.2.2.1, M07.B-E.2.3

Essential content/objectives: At end of the unit, students will be able to:

- State and apply the Commutative, Associative, and Distributive Properties
- Use the Distributive Property to write equivalent expressions
- Simplify expressions with variables
- Solve equations with variables using addition and subtraction
- Solve equations with variables using multiplication and division
- Write equations that represent real-world situations
- Solve equations with variables and decimals

Core Activities: Students will complete/participate in the following:

- Define key terms relating to Pre-Algebra
- Complete examples of problems in class
- Participate in individual, pair, and small group practice of concepts
- Use visual aids to assist in learning

Extensions:

- Use less technology to assist in operations with numbers
- Workbook Enrichment

Remediation:

- Additional exercises
- Use more technology to assist in operations with numbers
- Chapter review exercises which revisits concepts and vocabulary
- Teacher/peer tutoring
- Online practice

Instructional Methods:

- Teacher directed examples
- Projected notes
- Higher order thinking questions
- Individual, pair, and whole group practice
- Calculator instruction
- Mimio presentations
- Warm ups

Materials & Resources:

- Warm Ups
- Textbook
- Projector
- Notes
- Handouts (worksheets)
- Calculators
- Individual white boards

Assessments:

- Warm Ups
- Teacher observation of student work
- Student pair-share and group discussion
- Homework assignments
- Test/quizzes
- Questioning techniques

Curriculum Scope & Sequence

Planned Course: Pre-Algebra

Unit 3: Multi-Step Equations and Inequalities

Time frame: 15-21 class periods

Anchor(s) or adopted anchor: M07.B-E.2.1, M07.B-E.2.2, M07.B-E.2.3

Essential content/objectives: At end of the unit, students will be able to:

- Solve two-step equations
- Solve equations using the distributive property
- Solve equations with variables on both sides
- Write and solve multistep equations
- Solve real-world problems by using multistep equations
- State and use symbols of inequality
- Write inequalities to represent real-world situations
- Solve inequalities using addition or subtraction
- Solve inequalities using multiplication or division
- Solve multi-step inequalities
- Write multi-step inequalities to represent real-world situations

Core Activities: Students will complete/participate in the following:

- Define key terms relating to Pre-Algebra
- Complete examples of problems in class
- Participate in individual, pair, and small group practice of concepts
- Create visual representation in the form of a mobile on balanced equations

Extensions:

- Solve more difficult problems
- Design problems to solve real-world problems of their own design
- Workbook Enrichment

Remediation:

- Additional exercises
- Give more instructions on what methods to use instead of having all types mixed together.
- Chapter review exercises which revisits concepts and vocabulary
- Teacher/peer tutoring
- Online Practice

Instructional Methods:

- Projected notes
- Higher order thinking questions
- Individual, pair, and small group practice
- Teacher directed examples
- Group project
- Mimio presentations
- Warm ups

Materials & Resources:

- Warm Ups
- Textbook
- Projector
- Teacher directed notes
- Handouts (worksheets)
- Calculators
- Individual white boards
- Project supplies

Assessments:

- Warm Ups
- Teacher observation of student work
- Student pair-share and group discussion
- Homework assignments
- Test/quizzes
- Project
- Higher order questioning

Curriculum Scope & Sequence

Planned Course: Pre-Algebra

Unit 4: Ratio, Proportion, and Probability

Time frame: 20 - 26 class periods

Anchor(s) or adopted anchor: M07.A-R.1.1, M07.B-E.2.1, M07.B-E.2.3, M07.D-S.3.1, M07.D-S.3.2

Essential content/objectives: At end of the unit, students will be able to:

- Find ratios and unit rates
- Determine whether two quantities are proportional
- Write and solve proportions
- Use proportions to solve problems
- Identify similar and congruent figures
- Find unknown side lengths of similar figures
- Use proportions with scale drawings
- Find probabilities
- Use the multiplication principal to find probabilities

Core Activities: Students will complete/participate in the following:

- Define key terms relating to Pre-Algebra
- Complete examples of problems in class
- Participate in individual, pair, and small group practice of concepts
- Create and solve problems on proportion

Extensions:

- Perform experiments and calculate the probability
- Create and solve more challenging problems involving proportion
- Workbook enrichment

Remediation:

- Additional exercises
- Chapter review exercises which revisits concepts and vocabulary
- Teacher/peer tutoring
- Online practice

Instructional Methods:

- Projected notes
- Teacher directed examples
- Higher order thinking questions
- Individual, pair, and small group practice
- Warm ups
- Mimio Presentations

Materials & Resources:

- Warm Ups
- Textbook
- Mimio lessons
- Projector
- Teacher directed notes
- Handouts (worksheets)
- Calculators
- Individual white boards

Assessments:

- Warm Ups
- Teacher observation of student work
- Student pair-share and group discussion
- Homework assignments
- Test/quizzes
- Questioning techniques

Curriculum Scope & Sequence

Planned Course: Pre-Algebra

Unit 5: Percents

Time frame: 12 – 18 class periods

Anchor(s) or adopted anchor: M07.A-R.1.1.6; M07.B-E.2.1; M07.B-E.2.2; M07.B-E.2.3

Essential content/objectives: At end of the unit, students will be able to:

- Convert between fractions, decimals, and percents
- Use a fraction to find the percent of a number
- Use decimals to solve percent problems
- Use equations to solve percent problems
- Find a percent of change in a quantity
- Find markups, discounts, sales tax, and tips
- Calculate interest earned and account balances

Core Activities: Students will complete/participate in the following:

- Define key terms relating to Pre-Algebra
- Complete examples of problems in class
- Participate in individual, pair, and small group practice of concepts
- Create and solve real-life percent problems
- Complete Cellular Phone project

Extensions:

- Work with problems that have fractional values
- Workbook enrichment

Remediation:

- Additional exercises
- Break problems into smaller sections
- Give more instructions on what process to use for particular problems
- Chapter review exercises which revisits concepts and vocabulary
- Teacher/peer tutoring
- Online practice

Instructional Methods:

- Projected notes
- Warm ups
- Higher order thinking questions
- Teacher directed examples
- Individual, pair, and small group practice
- Mimio Presentations

Materials & Resources:

- Warm Ups
- Textbook
- Mimio Lessons
- Projector
- Teacher directed notes
- Handouts (worksheets)
- Individual white boards
- Calculators
- Sale flyers, catalogues, bank interest percentage rates
- Project supplies

Assessments:

- Warm Ups
- Teacher observation of student work
- Student pair-share and group discussion
- Homework assignments
- Test/quizzes
- Questioning techniques
- Project

Curriculum Scope & Sequence

Planned Course: Pre-Algebra

Unit 6: Measurement, Area, and Volume

Time frame: 14 – 20 class periods

Anchor(s) or adopted anchor: M07.B-E.2.1, M07.B-E.2.2, M07.C-G.1.1, M07.C-G.2.2, M07.B-E.2.3

Essential content/objectives: At end of the unit, students will be able to:

- Classify triangles by sides and angles
- Solve problems involving triangles
- Use and apply the triangle inequality theorem
- Find circumference and area of circles
- Find the surface area of prisms and cylinders
- Describe two-dimensional figures that result from slicing three-dimensional solids
- Find the volume of prisms and cylinders

Core Activities: Students will complete/participate in the following:

- Define key terms relating to Pre-Algebra
- Complete examples of problems in class
- Participate in individual, pair, and small group practice of concepts
- Work with partners to solve mixed real-world problems
- Work with a group to determine the more efficient package

Extensions:

- Write and solve your own problems that model real-world situations
- Work with more difficult numbers, fractions, and decimals
- Workbook enrichment

Remediation:

- Give specific instructions for each type of problem and which formula to use
- Chapter review exercises which revisits concepts and vocabulary
- Teacher/peer tutoring
- Online practice

Instructional Methods:

- Projected notes
- Warm ups
- Higher order thinking questions
- Teacher directed examples
- Individual, pair, and small group practice
- Mimio Presentations

Materials & Resources:

- Warm Ups
- Textbook
- Projector
- Teacher directed notes
- Handouts (worksheets)
- Calculators
- Individual white boards
- Activity supplies

Assessments:

- Warm Ups
- Teacher observation of student work
- Student pair-share and group discussion
- Homework assignments
- Test/quizzes
- Questioning techniques
- Project observation

Curriculum Scope & Sequence

Planned Course: Pre-Algebra

Unit 7: Angle Relationships

Time frame: 10-16 class periods

Anchor(s) or adopted anchor: M07.C-G.2.1, M07.B-E.2.3

Essential content/objectives: At end of the unit, students will be able to:

- State and identify special pairs of angles
- Identify angles when a transversal intersects lines
- Find the measure of missing angles using special angle pairs

Core Activities: Students will complete/participate in the following:

- Define key terms relating to Pre-Algebra
- Complete examples of problems in class
- Participate in individual, pair, and small group practice of concepts

Extensions:

- Workbook Enrichment
- Work with more difficult angle measures including decimals and fractions
- Identify real-life examples and find missing angle measures

Remediation:

- Break problems into smaller sections
- Create flashcards to study concepts and vocabulary
- Chapter review exercises which revisits concepts and vocabulary
- Teacher/peer tutoring
- Online practice

Instructional Methods:

- Projected notes
- Teacher directed examples
- Warm ups
- Individual, pair, and whole group practice
- Higher ordering questioning

Materials & Resources:

- Warm Ups
- Textbook
- Mimio lessons
- Projector
- Teacher directed notes
- Handouts (worksheets)
- Calculators
- Individual white boards

Assessments:

- Warm Ups
- Teacher observation of student work
- Student pair-share and group discussion
- Homework assignments
- Test/quizzes
- Questioning techniques

Curriculum Scope & Sequence

Planned Course: Pre-Algebra

Unit 8: Data Analysis and Probability

Time frame: 5 – 10 class periods

Anchor(s) or adopted anchor: M07.D-S.1.1; M07.D-S.2.1; M07.D-S.3.1; M07.D-S.3.2, M07.B-E.2.3

Essential content/objectives: At end of the unit, students will be able to:

- Identify populations and sampling methods
- Make conclusions about populations using surveys
- Compare two numerical data distributions using measures of center and variability
- Find probabilities of independent events

Core Activities: Students will complete/participate in the following:

- Define key terms relating to Pre-Algebra
- Complete examples of problems in class
- Participate in individual, pair, and small group practice of concepts
- Data Collection group Project to understand the sampling methods

Extensions:

- Workbook enrichment
- Find probabilities of dependent events
- Collect and display data in an appropriate graph

Remediation:

- Chapter review exercises which revisits concepts and vocabulary
- Teacher/peer tutoring
- Online practice

Instructional Methods:

- Projected notes
- Warm ups
- Teacher directed examples
- Higher order thinking questions
- Individual, pair, and small group practice
- Group project

Materials & Resources:

- Warm Ups
- Textbook
- Projector
- Mimio Presentations
- Teacher directed notes
- Handouts (worksheets)
- Calculators
- Individual white boards

Assessments:

- Warm Ups
- Teacher observation of student work
- Homework assignments
- Test/quizzes
- Questioning techniques
- Project Observation

Curriculum Scope & Sequence

Planned Course: Pre-Algebra

Unit 9: Factors, Fractions, and Exponents

Time frame: 9-15 class periods

Anchor(s) or adopted anchor: M08.B-E.1.1.3; M08.B-E.1.1.4, M07.B-E.2.3

Essential content/objectives: At end of the unit, students will be able to:

- Define exponents and powers
- Find products of powers
- Simplify products of monomials
- Find the power of a power
- Find the power of a product
- Simplify quotients of powers
- Simplify powers of fractions
- Understand the concepts of negative and zero exponents
- Simplify expressions containing negative and zero exponents
- Write numbers using scientific notation
- Perform operations with numbers written in scientific notation

Core Activities: Students will complete/participate in the following:

- Define key terms relating to Pre-Algebra
- Complete examples of problems in class
- Participate in individual, pair, and small group practice of concepts
- Compare linear and exponential models to discover importance

Extensions:

- Work with problems involving more variables and fractions within fractions
- Workbook enrichment

Remediation:

- Break types of problems into sections according to what type they are
- Chapter review exercises which revisits concepts and vocabulary
- Teacher/peer tutoring
- Online practice

Instructional Methods:

- Projected notes
- Warm ups
- Higher order thinking questions
- Individual, pair, and small group practice
- Teacher directed examples

Materials & Resources:

- Warm Ups
- Textbook
- Projector
- Teacher directed notes
- Handouts (worksheets)
- Calculators
- Individual white boards

Assessments:

- Warm Ups
- Student pair-share and group discussion
- Teacher observation of student work
- Homework assignments
- Test/quizzes
- Questioning techniques

Curriculum Scope & Sequence

Planned Course: Pre-Algebra

Unit 10: Linear Functions

Time frame: 14-20 class periods

Anchor(s) or adopted anchor: M08.B-E.2.1.1, M08.B-F.1.1.1, M08.B-F.1.1.2, M08.B-F.1.1.3, M07.B-E.2.3

Essential content/objectives: At end of the unit, students will be able to:

- Use graphs to represent relations and functions
- Find solutions of equations in two variables
- Understand that functions can be linear or nonlinear
- Use x and y intercepts to graph linear equations
- Find and interpret slopes of lines

Core Activities: Students will complete/participate in the following:

- Define key terms relating to Pre-Algebra
- Complete examples of problems in class
- Participate in individual, pair, and small group practice of concepts
- Complete hands-on activity to discover knowledge

Extensions:

- Workbook enrichment
- Represent situations in an equation and calculate slope

Remediation:

- Additional exercises
- Chapter review exercises which revisits concepts and vocabulary
- Teacher/peer tutoring
- Online Practice

Instructional Methods:

- Projected notes
- Warm ups
- Mimio Presentations
- Teacher directed examples
- Higher order thinking questions
- Individual, pair, and small group practice

Materials & Resources:

- Warm Ups
- Textbook
- Projector
- Teacher directed notes
- Handouts (worksheets)
- Calculators
- Individual white boards

Assessments:

- Warm Ups
- Student pair-share and group discussion
- Teacher observation of student work
- Homework assignments
- Test/quizzes
- Questioning techniques