

## Wilson Area School District Planned Course Guide

**Title of planned course:** Pre-Algebra

**Subject Area:** Mathematics

**Grade Level:** 8

**Course Description:** *Prerequisites: Complete 7<sup>th</sup> grade math.*

The course is the study of Variables, Expressions, and Integers, Solving Equations, Factors, Fractions, and Exponents, Rational Numbers and Equations, Linear Functions, Volume, and Transformations.

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 (8-11 class periods)

**September:** Variables, Expressions, and Integers (cont.)  
Solving Equations (11-14 class periods)

**October:** Multi-step Equations (12-15 class periods)  
Factors, Fractions, and Exponents (12-15 class periods)

**November:** Factors, Fractions, and Exponents (cont.)  
Linear Functions (31-40 class periods)

**December:** Linear Functions (cont.)

**January:** Linear Functions (cont.)  
Systems of Equations (10-14 class periods)

**February:** Systems of Equations (cont.)  
Geometry (16-19 class periods)

**March:** Geometry (cont.)  
Transformations (9-12 class periods)  
Probability (7-9 class periods)

**April:** Probability (cont.)  
Inequalities (10-15 class periods)

**May:** Inequalities (cont.)  
Applications/ Prior Topics (10-15 class periods)

**June:** Applications/ Prior Topics (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:** 8-11 class periods

**Anchor(s) or adopted anchor:** M08.B-E.1.1.2, M08.A-N.1.1, CC.2.1.8.E.4, A1.1.1.1.1

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

- Evaluate and write variable expressions
- Use powers to describe repeated multiplication
- Represent numbers using exponential and square root forms
- Identify and plot points in a coordinate plane and use them to graph functions

**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 flash cards to memorize required square roots and cube roots

**Extensions:**

- Work with more challenging patterns and problems

**Remediation:**

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

**Instructional Methods:**

- Higher order thinking questions
- Individual, pair, and small group practice
- Warm ups
- Teacher directed examples
- Demonstration of how to use flashcards

**Materials & Resources:**

- Warm Ups
- Textbook
- Projector
- Teacher directed notes
- Handouts (worksheets)
- Activity supplies – flash cards
- Calculators

**Assessments:**

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

## Curriculum Scope & Sequence

**Planned Course:** Pre-Algebra

**Unit 2:** Solving Equations

**Time frame:** 11-14 class periods

**Anchor(s) or adopted anchor:** M08.B-E.3.1.2

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

- Use properties of addition and multiplication
- Use the distributive property with algebraic expressions
- Simplify variable expressions
- Solve one step equations with variables
- Solve equations involving 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
- Work in centers to review properties

**Extensions:**

- Use less technology to assist in operations with numbers

**Remediation:**

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

**Instructional Methods:**

- Teacher directed examples
- Higher order thinking questions
- Individual, pair, and whole group practice
- Calculator instruction
- Warm ups
- Whiteboard activity

**Materials & Resources:**

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

**Assessments:**

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

## Curriculum Scope & Sequence

**Planned Course:** Pre-Algebra

**Unit 3:** Multi-Step Equations

**Time frame:** 12-15class periods

**Anchor(s) or adopted anchor:** M08.B-E.3.1.1, M08.B-E.3.1.2

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

- Solve two-step equations
- Use distributive property and combining like terms
- Solve equations with like terms and parentheses
- Solve equations with variables on both sides

**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 in centers to practice solving
- Choose between projects (headline story, word problems, or mobile)

**Extensions:**

- Solve more difficult problems
- Design real world application problems
- Peer tutoring

**Remediation:**

- Additional exercises
- Chunk problems into parts to help organize students
- Chapter review exercises which revisits concepts and vocabulary
- Teacher/peer tutoring

**Instructional Methods:**

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



**Materials & Resources:**

- Warm Ups
- Textbook
- Projector
- Teacher directed notes
- Handouts (worksheets)
- Calculators
- Project supplies – paper, string, scissors, hole punch, chromebooks

**Assessments:**

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

## Curriculum Scope & Sequence

**Planned Course:** Pre-Algebra

**Unit 4:** Factors, Fractions, and Exponents

**Time frame:** 12-15 class periods

**Anchor(s) or adopted anchor:** M08.B-E.1.1.1, M08.B-E.1.1.3, M08.B-E.1.1.4

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

- Simplify exponential expressions
- Multiply and divide powers
- Work with numbers 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
- Student exploration of negative and zero exponents

**Extensions:**

- Demonstrate multi-step operations on numbers in scientific notation with no calculator

**Remediation:**

- Use more technology to assist in representing data and calculating
- Chapter review exercises which revisits concepts and vocabulary
- Teacher/peer tutoring

**Instructional Methods:**

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

**Materials & Resources:**

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

**Assessments:**

- Warm Ups
- Teacher observation of student work
- Homework assignments
- Test/quizzes

## Curriculum Scope & Sequence

**Planned Course:** Pre-Algebra

**Unit 5:** Linear Functions

**Time frame:** 31-40 class periods

**Anchor(s) or adopted anchor:** M08.B-E.2.1, M08.B-F.1.1, M08.B-F.2.1, A1.1.2.1

**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
- Use x- and y-intercepts to graph linear equations
- Solve for y in a linear equation
- Find and interpret slopes of lines equations in slope-intercept form.
- Write linear equations.
- Write equations of parallel and perpendicular lines.
- Use function notation to describe 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
- Participate in a physical activity to help with concepts of slope and line of best fit
- Whiteboard activities to practice skills

**Extensions:**

- Work with problems that have fractional and decimal values
- Consider what happens when two linear equations come together

**Remediation:**

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

**Instructional Methods:**

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

**Materials & Resources:**

- Warm Ups
- Textbook
- Projector
- Teacher directed notes
- Handouts (worksheets)
- Calculators
- Activity supplies – tape, rope

**Assessments:**

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

## Curriculum Scope & Sequence

**Planned Course:** Pre-Algebra

**Unit 7:** Systems of Equations

**Time frame:** 10-14 class periods

**Anchor(s) or adopted anchor:** M08.B-E.3.1.3-5, A1.1.2.2

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

- Connect solving equations with solving systems of equations
- Identify solutions of systems of linear equations in two variables
- Solve systems of linear equations in two variables by graphing
- Solve a system of linear equations using the substitution method

**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 conceptstems by elimination

**Remediation:**

- Use of technology to assist in graphing solutions
- Chapter review exercises which revisits concepts and vocabulary
- Teacher/peer tutoring

**Instructional Methods:**

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

**Materials & Resources:**

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

**Assessments:**

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

## Curriculum Scope & Sequence

**Planned Course:** Pre-Algebra

**Unit 8:** Geometry

**Time frame:** 16-19 class periods

**Anchor(s) or adopted anchor:** M08.C-G.3.1, M08.C-G.2.1, A1.1.1.1.2

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

- Determine area and circumference of circles
- Find volume of spheres
- Find volume of cylinders
- Find volume of cones
- Use Pythagorean Theorem
- Apply all topics to applications

**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
- Relate different formulas to each other
- Read non-fiction on the history of the Pythagorean Theorem

**Extensions:**

- Work with more complex multi-step problems

**Remediation:**

- Use visual aids
- Chapter review exercises which revisits concepts and vocabulary
- Teacher/peer tutoring

**Instructional Methods:**

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

**Materials & Resources:**

- Warm Ups
- Textbook
- Projector
- Teacher directed notes
- Handouts (worksheets)

**Assessments:**

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



## Curriculum Scope & Sequence

**Planned Course:** Pre-Algebra

**Unit 9:** Transformations

**Time frame:** 9-12 class periods

**Anchor(s) or adopted anchor:** M08.C-G.1.1

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

- Translate points and figures
- Reflect points and figures
- Rotate points and figures
- Dilate points and figures

**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:**

- Look for patterns to develop shortcuts to transformations

**Remediation:**

- Chapter review exercises which revisits concepts and vocabulary
- Teacher/peer tutoring
- Visual and technological aids

**Instructional Methods:**

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

**Materials & Resources:**

- Warm Ups
- Textbook
- Projector
- Teacher directed notes
- Handouts (worksheets)

**Assessments:**

- Warm Ups
- Teacher observation of student work
- Homework assignments
- Test/quizzes

## Curriculum Scope & Sequence

**Planned Course:** Pre-Algebra

**Unit 10:** Probability

**Time frame:** 7-9 class periods

**Anchor(s) or adopted anchor:** M08.D-S.1.1, M08.D-S.1.2

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

- Write lines of best fit to match scatterplots
- Use two-way tables to find information

**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
- Connect lines of best fit to linear equations
- Complete project to connect line of best fit to scatterplots

**Extensions:**

- Extend knowledge into deeper applications.

**Remediation:**

- Teacher/peer tutoring

**Instructional Methods:**

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

**Materials & Resources:**

- Warm Ups
- Textbook
- Projector
- Teacher directed notes
- Handouts (worksheets)
- Calculators
- Activity supplies – tape measurers

**Assessments:**

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

## Curriculum Scope & Sequence

**Planned Course:** Pre-Algebra

**Unit 11:** Inequalities

**Time frame:** 9-12 class periods

**Anchor(s) or adopted anchor:**A1.1.3.1

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

- Graph inequalities
- Solve one-step inequalities by using addition and subtraction
- Solve one-step inequalities by using multiplication and division
- Solve inequalities with more than one operation
- Solve inequalities with variables on both sides
- Solve and graph compound inequalities

**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
- Whiteboard activities
- Complete centers to relate inequalities to real world situations

**Extensions:**

- Make connections between solving equations and solving inequalities
- Work with more difficult problems

**Remediation:**

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

**Instructional Methods:**

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

**Materials & Resources:**

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

**Assessments:**

- Warm Ups
- Teacher observation of student work
- Homework assignments
- Test/quizzes

## Curriculum Scope & Sequence

**Planned Course:** Pre-Algebra

**Unit 12:** Applications/Prior Topics

**Time frame:** 10-15 class periods

**Anchor(s) or adopted anchor:** CC.2.2.HS.D.9, CC.2.2.7.B.3, A1.1.1.4.1, A1.1.1.5.1, A1.1.2.1, A1.2.1.1, A1.2.1.2

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

- Demonstrate proficiency on objectives throughout the year in order to prepare for Keystone testing in 9<sup>th</sup> grade

**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 a presentation on prior learned topics
- Present information to the class

**Extensions:**

- Students can use creativity to enhance presentations

**Remediation:**

- Teacher/peer tutoring
- Group work to help struggling students

**Instructional Methods:**

- Higher order thinking activities
- Individual, pair, and small group practice
- Student and Teacher directed examples

**Materials & Resources:**

- Textbook
- Student and Teacher directed notes
- Handouts (worksheets) – Student designed
- Calculators

**Assessments:**

- Teacher observation and evaluation of student work
- Homework assignments
- Test/quizzes