Math 7

Course Syllabus

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Course Description:

7th Grade Mathematics **2 semesters** **Grade 7**

This course is designed to prepare students for a Pre-Algebra Math curriculum. Problem solving will continue to be emphasized, however, with a stronger emphasis on proportional reasoning. The students will gain an understanding of the properties of real numbers, solve linear equations and inequalities, and use data analysis techniques to make inferences and predictions.

Recommended Textbook Options:

McDougal-Littel: MathThematics

Required:
- Student Edition
- Teacher Edition OR worked out solutions manual

Recommended:
- Practice workbook and TE

Glencoe: Mathematics – Applications and Concepts

Required:
- Student Edition
- Teacher Edition OR worked out solutions manual

Recommended:
- Practice workbook and TE

Harcourt Holt: Middle School Math

Required:
- Student Edition
- Teacher Edition

Recommended:
- Practice workbook and TE

Recommended Supplemental Materials or Software:

ALEKS subscription or Apangea

Supplies or Equipment:

Scientific Calculator

Standards Based Portfolio

A Portfolio containing graded examples of student work from the selected curriculum will be required as per school policy, and should be shared with the assigned Contact Teacher once per semester.

Pacing Guide

The topics and standards for this course have been divided between the two semesters.

Semester 1(Fall)	**Semester 2 (Spring)**
Integers	Graphing
Equations	Equations and Inequalities
Factors and Fractions	Perimeter, Circumference and Area
Rational Numbers	Data, Statistics and Probability
Ratios, Proportion, and Percent	Multistep Problem Solving

In order to fulfill this pacing requirement, the recommended texts have been broken down by chapter. Covering the chapters in the order listed will insure that all topics on the final exam will be covered during the appropriate semester.

Glencoe – Mathematics – Applications and Concepts

Semester 1(Fall)	**Semester 2 (Spring)**
Module 1	Module 5
Module 2	Module 6
Module 3	Module 7
Module 4	Module 8

Harcourt Holt – Middle School Math

Semester 1(Fall)	**Semester 2 (Spring)**
Chapter 1	Chapter 7
Chapter 2	Chapter 8
Chapter 3	Chapter 9
Chapter 4	Chapter 10
Chapter 5	Chapter 11
Chapter 6	Chapter 12

McDougal Littell – Maththematics

Semester 1(Fall)	**Semester 2 (Spring)**
Chapter 1	Chapter 5
Chapter 2	Chapter 6
Chapter 3	Chapter 9
Chapter 4	Chapter 10
Chapter 7	Chapter 11
Chapter 8	Chapter 12

I-DEA Student Honor Code:

With any form of valid proof of dishonesty with regard to student work or testing, the instructor may elect from a range of actions. Academic dishonesty could lead to a zero grade for the assignment or even failure for the entire course following consultation between the instructor, Secondary Supervisor, and Director.

All students must adhere to the **Honor Code:**

"On my honor, I will maintain the highest possible standards of honesty, integrity and personal responsibility. This means I will not lie, cheat or steal, and as a member of this academic community, I am committed to creating an environment of respect and mutual trust."

Standards

Standard 1: Number and Operation

Students in Grade 7 read, write, compare, order, and place on a number line: rational numbers, including integers, fractions, and decimals, and absolute values. Students solve problems requiring the conversion between simple decimals, fractions, and percents. Students add, subtract, multiply, and divide whole numbers, fractions, and decimals and students evaluate numerical expressions using the order of operations with whole numbers and decimals. Students explain when estimation is appropriate and describe the usefulness of an estimate as opposed to an exact answer.

Goal 1.1: Understand and use numbers.

- 7.M.1.1.1 Compare magnitudes and relative magnitudes of rational numbers, including integers, fractions, and decimals. (327.01.a , 327.01.c)
- 7.M.1.1.2 Solve problems requiring the conversion between simple decimals, fractions, ratios, and percents. (327.01.b)
- 7.M.1.1.3 Locate the position of rational numbers on a number line. (327.01.e)
- 7.M.1.1.4 Rewrite multiple factors using exponents. (327.02.c)
- 7.M.1.1.5 Apply the number theory concepts of primes, composites, and prime factorization and find the Least Common Multiple (LCM) and the Greatest Common Factor (GCF). (327.01.d)
- 7.M.1.1.6 Recognize pertinent information for problem solving. (328.01.b)
- 7.M.1.1.7 Describe the use of integers in real-world situations.
- 7.M.1.1.8 Use appropriate vocabulary.

Goal 1.2: Perform computations accurately.

- 7.M.1.2.1 Recall the common equivalent fractions, decimals, and percents of halves, fourths, and tenths.
- 7.M.1.2.2 Add, subtract, multiply, and divide whole numbers, fractions and decimals; and add, multiply, and divide integers. (327.02.a, 327.02.d)
- 7.M.1.2.3 Evaluate whole numbers in exponential form.
- 7.M.1.2.4 Evaluate numerical expressions using the order of operations with whole numbers and decimals. (327.02.b)
- 7.M.1.2.5 Select and use an appropriate method of computation from mental math, paper and pencil, calculator, or a combination of the three. (327.02.e)
- 7.M.1.2.6 Use a variety of strategies including common mathematical formulas to compute problems drawn from real life situations. (328.01.a)
- 7.M.1.2.7 Use appropriate vocabulary and notations. (327.02.f)

Goal 1.3: Estimate and judge reasonableness of results.

- 7.M.1.3.1 Estimate to predict computation results. (327.03.a)
- 7.M.1.3.2 Explain when estimation is appropriate and describe the usefulness of an estimate as opposed to an exact answer. (327.03.b)
- 7.M.1.3.3 Identify whether a given estimate is an overestimate or underestimate. (327.03.c)
- 7.M.1.3.4 Use a four-function calculator to solve complex grade-level problems.
- 7.M.1.3.5 Formulate conjectures and discuss why they must be or seem to be true. (328.02.c)
- 7.M.1.3.6 Use appropriate vocabulary and notations. (327.03.d)

Standard 2: Concepts and Principles of Measurement
Students in Grade 7 select and use appropriate units and tools to make formal measurements in both systems. Students apply given formulas for perimeter, circumference, or area of triangles, circles, and quadrilaterals. Students solve problems involving perimeter and area of rectangles and squares. Students compare units and explain their relationship to one another and to real world applications.

Goal 2.1: Understand and use U.S. customary and metric measurements.

- 7.M.2.1.1 Select and use appropriate units and tools to make formal measurements in both systems. (329.01.a)
- 7.M.2.1.2 Apply estimation of measurement to real-world and content problems using standard measuring devices. (329.01.b)
- 7.M.2.1.3 Explain the differences between perimeter, area, and volume (capacity) and their measures within both systems. (329.01.c)
- 7.M.2.1.4 Given the formulas, find the perimeter, circumference, or area of triangles, circles, and quadrilaterals. (331.01.e)
- 7.M.2.1.5 Convert units of measurement within each system. (329.01.e)
- 7.M.2.1.6 Solve problems involving perimeter and area of rectangles and triangles. (329.01.d)
- 7.M.2.1.7 Use appropriate vocabulary and notations. (329.01.f)

Goal 2.2: Apply the concepts of rates, ratios, and proportions.

- 7.M.2.2.1 Explain rates and their relationship to ratios, and use proportions to solve problems represented with a diagram. (329.02.a, 329.03.a)
- 7.M.2.2.2 Reduce rates to unit rates.

Goal 2.3: Apply dimensional analysis.

- 7.M.2.3.1 Identify properly constructed dimensional analysis conversions. (329.04.a)

Goal 2.4: Apply appropriate techniques and tools to determine measurements.

- No objectives at this grade level.

Standard 3: Concepts and Language of Algebra and Functions
Students in Grade 7 use variables in simple expressions and equations and students use symbols “<,” “>,”“=,” “?,” “=,” and “=” to express relationships. Students use the order of operations in evaluating simple algebraic expressions and students solve one-step equations. Students extend patterns involving rational numbers and describe the rule that generates the pattern.

Goal 3.1: Use algebraic symbolism as a tool to represent mathematical relationships.

- 7.M.3.1.1 Use variables in simple expressions and equations. (330.01.a)
- 7.M.3.1.2 Translate simple word statements into algebraic expressions and equations. (330.01.b)
- 7.M.3.1.3 Use symbols “<,” “>,”“=,” “?,” “?,” and “?” to express relationships. (330.01.c)

Goal 3.2: Evaluate algebraic expressions.

- 7.M.3.2.1 Evaluate simple numeric and algebraic expressions using commutative, associative, identity, zero, inverse, distributive, and substitution properties. (330.02.a)

- 7.M.3.2.2 Use the order of operations in evaluating simple algebraic expressions. (330.02.b)

Goal 3.3: Solve algebraic equations and inequalities.

- 7.M.3.3.1 Solve one-step equations. (330.03.a)

Goal 3.4: Understand the concept of functions.

- 7.M.3.4.1 Extend patterns involving rational numbers and describe the rule that generates the pattern. (333.01.a)
- 7.M.3.4.2 Explain how a change in one quantity impacts a change in another quantity. (333.01.b)
- 7.M.3.4.3 Use appropriate vocabulary and notations. (333.01.c)

Goal 3.5: Represent equations, inequalities and functions in a variety of formats.

- 7.M.3.5.1 Represent a simple set of data in a table, as a graph, and as a mathematical relationship. (333.02.a)

Goal 3.6: Apply functions to a variety of problems.

- 7.M.3.6.1 Use patterns and linear functions to represent and solve simple problems. (333.03.a)

Standard 4: Concepts and Principles of Geometry
Students in Grade 7 describe and classify relationships among types of one-, two-, and three-dimensional geometric figures using their defining properties. Students draw and measure various angles and shapes using appropriate tools and students identify congruence, similarities, and line symmetry of shapes. Students identify and plot points on a coordinate plane.

Goal 4.1: Apply concepts of size, shape, and spatial relationships.

- 7.M.4.1.1 Classify relationships among types of one- and two-, dimensional geometric figures, using their defining properties. (331.01.a)
- 7.M.4.1.2 Draw and measure various angles and shapes using appropriate tools. (331.01.b)
- 7.M.4.1.3 Apply fundamental concepts, properties, and relationships among points, lines, rays, planes, and angles. (331.01.c)
- 7.M.4.1.4 Explain and model the effects of reflections, translations, and rotations on various shapes. (331.01.g)
- 7.M.4.1.5 Identify congruence, similarities, and line symmetry of shapes. (331.01.d)
- 7.M.4.1.6 Describe the concept of surface area and volume (capacity). (331.01.f)
- 7.M.4.1.7 Use appropriate vocabulary and symbols. (331.01.h)

Goal 4.2: Apply the geometry of right triangles.

- No objectives at this grade level.

Goal 4.3: Apply graphing in two dimensions.

- 7.M.4.3.1 Identify and plot points on a coordinate plane.

Goal 4.4: Represent and graph linear relationships.

- No objectives at this grade level.

Goal 4.5: Use reasoning skills.

- No objectives at this grade level.

Standard 5: Data Analysis, Probability, and Statistics
Students in the Grade 7 read and interpret tables, charts, and graphs, including frequency tables, scatter plots, line graphs, line plots, bar graphs, histograms, circle graphs, and stem-and-leaf plots. Students collect, organize and display data with appropriate notation in tables, charts and graphs, including scatter plots, line graphs, line plots, bar graphs, and stem-and-leaf plots. Students determine the measures of central tendency – mean, median and mode – with sets of data and students predict, perform, and record results of simple probability experiments.

Goal 5.1: Understand data analysis.

- 7.M.5.1.1 Read and interpret tables, charts, and graphs, including frequency tables, scatter plots, broken line graphs, line plots, bar graphs, histograms, circle graphs, and stem-and-leaf plots. (332.01.a)
- 7.M.5.1.2 Explain conclusions drawn from tables, charts, and graphs. (332.01.b)
- 7.M.5.1.3 Use appropriate vocabulary and notations. (332.01.c)

Goal 5.2: Collect, organize, and display data.

- 7.M.5.2.1 Collect, organize, and display data with appropriate notation in tables, charts and graphs, including scatter plots, broken line graphs, line plots, bar graphs, and stem-and-leaf plots. (332.02.a)

Goal 5.3: Apply simple statistical measurements.

- 7.M.5.3.1 Determine the measures of central tendency – mean, median and mode – with sets of data. (332.03.a)
- 7.M.5.3.2 Discuss distribution of data, including range, frequency, gaps, and clusters. (332.03.b)

Goal 5.4: Understand basic concepts of probability.

- 7.M.5.4.1 Predict, perform, and record results of simple probability experiments. (332.04.a)
- 7.M.5.4.2 Recognize equally likely outcomes. (332.04.c)
- 7.M.5.4.3 Explain that probability ranges from impossible to certain (0% to 100%).
- 7.M.5.4.4 Use the language of probability. (332.04.b)

Goal 5.5: Make predictions or decisions based on data.

- 7.M.5.5.1 Make predictions based on simple theoretical probabilities. (332.05.a)
- 7.M.5.5.2 Use appropriate vocabulary and notations. (332.05.b)