**Curriculum**

**5th Grade Mathematics**

**Course Overview**

In the fifth grade, students continue to build on their **mathematics** foundation,

including place value, addition, subtraction, multiplication and division of whole

numbers, decimals and fractions, percent, ratio, estimation, measurement,

geometry and graphing. Problem solving is emphasized. NB: The Saxon Math and McDougal Littell programs serve to resource the math objectives outlined in the Core Knowledge Sequence™. Where possible, mathematics skills are reinforced and applied in other subject areas, particularly science. The math program is accelerated, meaning that fifth grade uses sixth grade programs. The students are placement tested and grouped with some students receiving a faster paced program, and others given time to practice and consolidate their skills in a more spiral fashion.

**Department Standards**

Students will be able to comprehend mathematical concepts.

Students will be able to apply mathematical procedures accurately, efficiently, and appropriately.

Students will be able to formulate, represent, and solve mathematical problems.

Students will develop the capacity for logical mathematical thought and communication.

**Benchmarks**:

Fifth grade students will be able to:

recognize number values and patterns;

demonstrate an understanding of the relationship between ratio and percent;

demonstrate an understanding of fractions and decimals;

recognize units of measurement and their relationships;

recognize geometric shapes and relationships;

demonstrate understanding of probability and statistics;

recognize introductory concepts and processes of pre‐algebra; and

demonstrate adeptness in computation.

**Performance Indicators**

**(BENCHMARK 1)**

• Read and write numbers (in digits and words) up to the billions.

• Recognize place value up to billions.

• Order and compare numbers to 999,999,999 using the signs <, >, and =.

• Write numbers in expanded form.

• Locate positive and negative integers on a number line.

• Compare integers using the symbols <, >, and =.

• Know that the sum of an integer and its opposite is 0.

• Add and subtract positive and negative integers.

• Using a number line, locate positive and negative whole numbers.

• Round to the nearest ten, hundred, thousand, and hundred thousand.

• Review perfect squares and square roots to 144; recognize the square

root sign

• Using the terms *squared* and *cubed* and *to the nth power*, read and

evaluate numerical expressions with exponents.

• Identify the powers of ten up to 10 to the 6th

• Identify a set and the members of a set, as indicated by brackets.

• Identify numbers under 100 as prime or composite.

• Identify prime factors of numbers to 100 and write using exponential

notation for multiple primes.

• Determine the greatest common factor (GCF) of given numbers.

• Determine the least common multiple (LCM) of given numbers.

**(BENCHMARK 2)**

• Determine and express simple ratios.

• Use ratio to create a simple scale drawing.

• Ratio and rate: solve problems on speed as a ratio, using the formula

D=RxT or S=D/T.

• Recognize the percent sign and understand percent as “per hundred.”

• Express equivalences between fractions, decimals, and percents, and

know common equivalences: 1/10=10%, 1/4= 25%, 1/2=50%, and 3/4=75%.

• Find the given percent of a number.

**(BENCHMARK 3)**

• Determine the least common denominator (LCD) of fractions with unlike

denominators.

• Recognize equivalent fractions (for example, 1/2=3/6).

• Put fractions in lowest terms.

• Compare fractions with like and unlike denominators, using the signs <, >,

and =.

• Identify the reciprocal of a given fraction; know that the product of a

given number and its reciprocal =1.

• Add and subtract fractions and mixed numbers with like and unlike

denominators.

• Multiply and divide fractions and mixed numbers.

• Round fractions and mixed numbers to the nearest whole number.

• Write fractions as decimals (e.g., 1/4=0.25; 17/25=0.68; 1/3=0.3333… or

0.33, rounded to the nearest hundred.

• Read, write, and order decimals to the nearest ten‐thousandth.

• Write decimals in expanded form.

• Read and write decimals on a number line.

• Round decimals (and decimal quotients) to the nearest tenth, hundredth,

or thousandth.

• Estimate decimal sums, differences, and products by rounding.

• Add and subtract decimals through ten‐thousandths.

• Multiply decimals by 10, 100, 1000, or by another decimal.

• Divide decimals by whole numbers or decimals.

**(BENCHMARK 4)**

• For addition, know the names of and understand the commutative and

associative properties.

• For multiplication, know the names of and understand the commutative

and associative properties.

• Multiply two factors of up to four digits each.

• Write number in expanded form using multiplication.

• Estimate a product.

• Use mental computation strategies for multiplication using the

distributive property.

• Solve word problems involving multiplication.

• Understand multiplication and division as inverse operations.

• Know what it means for one number to be “divisible” by another number.

• Know that 0 cannot be a divisor, and that any number divided by 1=that

number.

• Estimate a quotient.

• Know how to move the decimal point when dividing by 10, 100, or 1000.

• Divide dividends of up to four digits by one‐, two‐, or three‐digit divisors.

• Solve division problems with remainders, and round a repeating decimal

quotient.

• Check division using multiplication (and adding any remainder).

• Solve word problems with multiple steps.

• Solve problems with more than one operation.

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**(BENCHMARK 5)**

• Convert to common units in problems involving addition and subtraction

of different units.

• Solve problems involving elapsed time; regroup when multiplying and

dividing amounts of time.

**(BENCHMARK 6)**

• Identify and draw points, segments, rays and lines.

• Identify and draw lines: horizontal, vertical, perpendicular, parallel, and

intersecting.

• Measure the degrees in angles, and know the measurements for right,

acute, obtuse, and straight angles.

• Identify and construct equilateral, right, and isosceles triangles.

• Know what it means for triangles to be congruent.

• Identify polygons: triangle, quadrilateral, pentagon, hexagon, octagon,

parallelogram, trapezoid, rhombus, rectangle, and square.

• Know that regular polygons have sides of equal length and angles of equal

measure.

• Identify and draw diagonals of polygons.

• In circles, identify and arc, chord, radius (radii), and diameter; know that

radius=1/2 diameter.

• Using a compass, draw circles with given diameters or radii.

• Find the circumference of a circle using the formulas C=πd or C=2πr, and

using 3.14 as the value of pi.

• Review the formula for the area of a rectangle and solve problems

involving finding area in a variety of both metric and customary square

units.

• Find the area of triangles, using the formula A=1/2(bh).

• Find the area of a parallelogram using the formula A=bh.

• Find the area of an irregular figure (such as a trapezoid) by dividing it

into regular figures and applying known processes of finding those areas.

• Find the surface area of a rectangular prism.

• Compute the volume of rectangular prisms in cubic units, using the

formula V=lwh.

**(BENCHMARK 7)**

• Understand probability as a measure of the likelihood that an event will

happen; using simple models, express probability of a given event as a

fraction, percent, or decimal between 0 and 1.

• Collect and organize data in graphic form (bar, line, or circle graphs).

• Solve problems requiring interpretation and application of graphically

displayed data.

• Find the average (mean) of a given set of numbers.

• Plot points on a coordinate plane, using ordered pairs of positive and

negative whole numbers.

• Graph simple functions.

**(BENCHMARK 8)**

• Recognize variables and solve basic equations using variables.

• Write and solve equations for word problems.

Find the value of an expression given the replacement values for the variables,

for example: What is 7‐c if c=3.5?

**Assessments**

* Class discussion and practice
* Homework
* Quizzes
* Chapter test

**Core Topics**

1. Numbers and Number Sense

2. Ratio and Percent

 a. Ratio

 b. Percent

3. Fractions and Decimals

 a. Fractions

 b. Decimals

4. Computation

 a. Addition

 b. Subtraction

 c. Multiplication

 d. Division

 e. Solving Problems and Equations

5. Measurement

6. Geometry

7. Probability and Statistics

8. Pre‐Algebra

**Specific Content**

Whole Number Operations

Estimation

Powers and Exponents

Order of Operations

Variables and Expressions

Mental Math

Measuring Length

Perimeter and Area

Scale Drawings

Frequency Tables and Line Plots

Coordinate, Line, Circle, and Bar Graphs

Mean, Median, and Mode

Decimals and Place Value

Measuring Metric Lengths

Rounding, Estimating, and Ordering Decimals

Adding and Subtracting Decimals

Multiplying Decimals and Whole Numbers

The Distributive Property

Multiplying and Dividing by Powers of Ten

Mass and Capacity

Changing Metric Units

Adding and Subtracting Fractions with Common Denominator

Adding and Subtracting Fractions with Different Denominators

Adding and Subtracting Mixed Numbers and Improper Fractions

Subtracting Mixed Numbers by Renaming

Multiplying Fractions

Multiplying Mixed Numbers

Dividing Fractions

Dividing Mixed Numbers

Estimating Fractions

Converting a Decimal to a Fraction

Converting a Fraction to a Decimal

Measurement System Overview

Metric System Basics

Converting and Understanding Metric Length

Converting and Understanding Customary Length

Adding and Subtracting Customary Length

Converting and Understanding Metric Volume

Converting and Understanding Customary Volume

Adding and Subtracting Customary Length

Converting and Understanding Metric Mass

Converting and Understanding Customary Weight

Adding and Subtracting Customary Weight

Converting between the Customary and Metric Units

Bar Charts

Line Charts

Frequency Tables and Line Plots

Mean, Median and Mode

Stem and Leaf Plots

Box and Whisker Plots

Interpreting Circle Charts

Ratios

Rates

Solving Proportions

Proportions and Scale Drawings

Understanding Percents

Converting Percents, Decimals and Fractions

Finding Percent of a Number

Geometry Basics: Points, Segments, Lines and Rays

Angles and Angle Measurement

Classifying Angles

Classifying Triangles

Classifying Quadrilaterals

Polygons

Similar and Congruent Figures

Line Symmetry

Area of a Parallelogram

Area of a Triangle

Circumference and Area of a Circle

Area of a Composite Figure

Solid Figures

Rectangular Prism

Comparing Integers

Adding Integers

Subtracting Integers

Multiplying Integers

Dividing Integers

Expressions and Equation

Solving Addition Equations

Solving Subtraction Equations

Solving Multiplication Equations

Solving Division Equations

Finding Outcomes

Probability of Independent Events

Misleading Statistics

Stem‐and‐Leaf Plots

Box‐and‐Whisker Plots

Choosing an Appropriate Data Display

**Resources**

*Saxon Math 7/6*

McDougal Littell *Middle School Math* (for advanced students)

Practice and Enrichment Workbooks

Classroom Posters

*Saxon Math* Manipulative Kit