

Mathematics

The goal of math instruction in Sumter County School District Two is to improve student achievement. The mathematics program is based on National (www.nctm.org) and 2007 SC state standards (www.myschools.com). It provides a well- balanced mathematical curriculum for all students. With such a program, students will learn to value mathematics and become proficient in basic skills. Students will acquire number power, as they develop numerical literacy and confidence in using mathematics to become proficient problem solvers.

The emphasis of mathematics instruction in elementary mathematics has shifted from teaching arithmetic to teaching students mathematics through rigorous standards. The importance of arithmetic has not diminished over time, but instead the criteria for evaluating a child's proficiency and the methods of teaching arithmetic has shifted and broadened. Student learning and computational skills are imbedded in the new mathematics standards. It is important that students learn the basic facts of arithmetic to demonstrate competence and confidence in using these facts because they are the foundation to higher levels of mathematics. For this reason, there are certain aspects of arithmetic that must be mastered because of the spiraling and building nature of mathematics.

Listed below are arithmetic concepts that should be mastered by grade level.

1st Grade - Students should recall basic addition and subtraction facts.

2nd Grade – Students should add and subtract two digit numbers with regrouping.

3rd Grade - Students should recall the basic multiplication facts (tables 1 – 12).

4th Grade - Students should be able to multiply whole numbers fluently, as well as compare and write equivalent fractions and decimals.

5th Grade - Students should divide whole number fluently as well as add and subtract fractions and decimals.

6th Grade – Students should understand percents and integers as well as add and subtract fractions.

7th Grade – Students should be able to perform the four basic operations with integers and fluently multiply and divide fractions and decimals.

8th Grade - Students should fluently add, subtract, multiply and divide integers, understand irrational numbers and approximate square and cube roots.

Highlights of New Learning

Elementary Grades

Middle Grades

Instructional Maps

Elementary Math Instructional Map

Middle School Math Instructional Map

High School Math Instructional Map

Highlights of New Learning for Elementary Mathematics

Kindergarten

- Comparing sets of objects,
- Recognizing the effect of addition and subtraction,
- Representing place value within specified ranges,
- Classifying based on attributes,
- Identifying two- and three-dimensional shapes,
- Representing basic two-dimensional shapes,
- Using positional and directional words to describe location and movement,
- Telling time to the hour and using a calendar,
- Making nonstandard measurements and identifying measuring devices, and
- Organizing data in graphic displays and interpreting data.

1st Grade

Special emphasis

- Representing quantities in word form,
- ## recalling basic addition and subtraction facts,
- generating strategies to add and subtract without regrouping,
- understanding how patterns relate to addition and subtraction,
- translating patterns into rules,
- classifying two-dimensional shapes as polygons or nonpolygons,
- identifying line symmetry,
- determining the value of a collection of coins,
- generating and using common referents for whole-inch measurements,
- telling time to the half hour and recognizing past and future dates on a calendar,
- using thermometers to measure temperature, and
- using survey questions to generate data and making predictions based on data.

2nd Grade

Special emphasis

- estimating items in a set,
- Understanding equal groupings as repeated addition and sharing equally as repeated subtraction.
- ## Generating strategies to add and subtract two-digit numerals with regrouping.
- Generating strategies to round numbers to the nearest ten.
- Analyzing patterns in skip counting,
- Identifying multiple lines of symmetry,
- Predicting results of combining and subdividing two-dimensional shapes,
- Making change,
- Using appropriate tools and units to measure,
- Telling time to the nearest five-minute interval and quarter hour,
- Matching *a.m.* and *p.m.* to familiar situations,
- Creating survey questions to collect data, and
- Inferring trends and making predictions based on data sets.

3rd Grade

Special emphasis

- Symbolically comparing number quantities;
- Applying an algorithm to add and subtract whole numbers fluently;
- Applying the concept of fractions;
- ## Recalling basic multiplication and division facts;
- Generating strategies to multiply one single-digit whole-number factor and one double-digit whole-number factor;
- Using symbols to represent an unknown quantity in a simple addition, subtraction, or multiplication equation;
- Understanding the attributes of circles;
- Classifying polygons;
- Classifying lines, line segments, and angles;
- Predicting the results of one transformation;
- Generating strategies to determine perimeters of polygons;
- Telling time to the nearest minute;
- Applying a procedure to find the range of a data set;
- Comparing the benefits of multiple representations of a given data set; and
- Understanding when the probability of an event is 0 or 1.

4th Grade

Special emphasis

- ## Applying an algorithm to multiply whole numbers fluently;
- ## Generating strategies to divide whole numbers by single-digit divisors;
- Applying strategies and procedures to find equivalent forms of fractions and comparing fractions and decimals;
- Generating strategies to add and subtract decimals through hundredths;
- Translating among letters, symbols, and words to represent quantities in a simple mathematical expression or equation;
- Applying procedures to find the value of an unknown in a simple whole-number equation;
- Analyzing quadrilaterals;
- Predicting results of multiple transformations;
- Finding points in the first quadrant of a coordinate grid;
- Generating strategies to determine area of rectangles and triangles;
- Using equivalencies to convert units of measure within the U.S. Customary System;
- Applying strategies and procedures to determine elapsed time within a 12-hour period;
- Interpreting data in graphic displays with increments greater or equal to one; and
Analyzing possible outcomes for a simple event.

5th Grade

Special emphasis

- ## Applying an algorithm to divide whole numbers fluently,
- Understanding the concept of prime and composite numbers,
- ## Generating strategies to add and subtract fractions,
- Applying an algorithm to add and subtract decimals through thousandths,
- Classifying shapes as congruent,
- Translating between two-dimensional representations and three-dimensional objects,
- Predicting results of combined multiple transformations,
- Analyzing shapes for line and/or rotational symmetry,
- Using a protractor to measure angles,
- Using equivalencies to convert units of measure within the metric system,
- Applying formulas to determine perimeter and area,
- Applying strategies and formulas to determine volume,
- Applying procedures to determine elapsed time within a 24-hour period,
- Applying procedures to calculate the measures of central tendency, and
- Concluding why the sum of the probabilities of the outcomes of an experiment must equal 1.

Highlights of New Learning for Middle School Mathematics

6th Grade

Special Emphasis

- ## Understanding the concepts of percentages and integers,
- Comparing rational numbers and percentages,
- ## Applying an algorithm to add and subtract fractions,
- ## Generating strategies to multiply and divide fractions and decimals,
- Understanding the concepts of exponents and powers of ten,
- Applying order of operations,
- Using inverse operations to solve one-step equations,
- Representing location of points in all four quadrants,
- Constructing two-dimensional shapes with rotational symmetry,
- Classifying shapes as similar,
- Identifying pairs of angles that are complementary or supplementary,
- Applying strategies and formulas to approximate circumference and area of a circle,
- Applying strategies and procedures to estimate and determine perimeters and areas of irregular shapes,
- Using proportions to determine unit rates,
- Using a scale to determine distance, and
- Applying procedures to calculate the probability of complementary events.

7th Grade

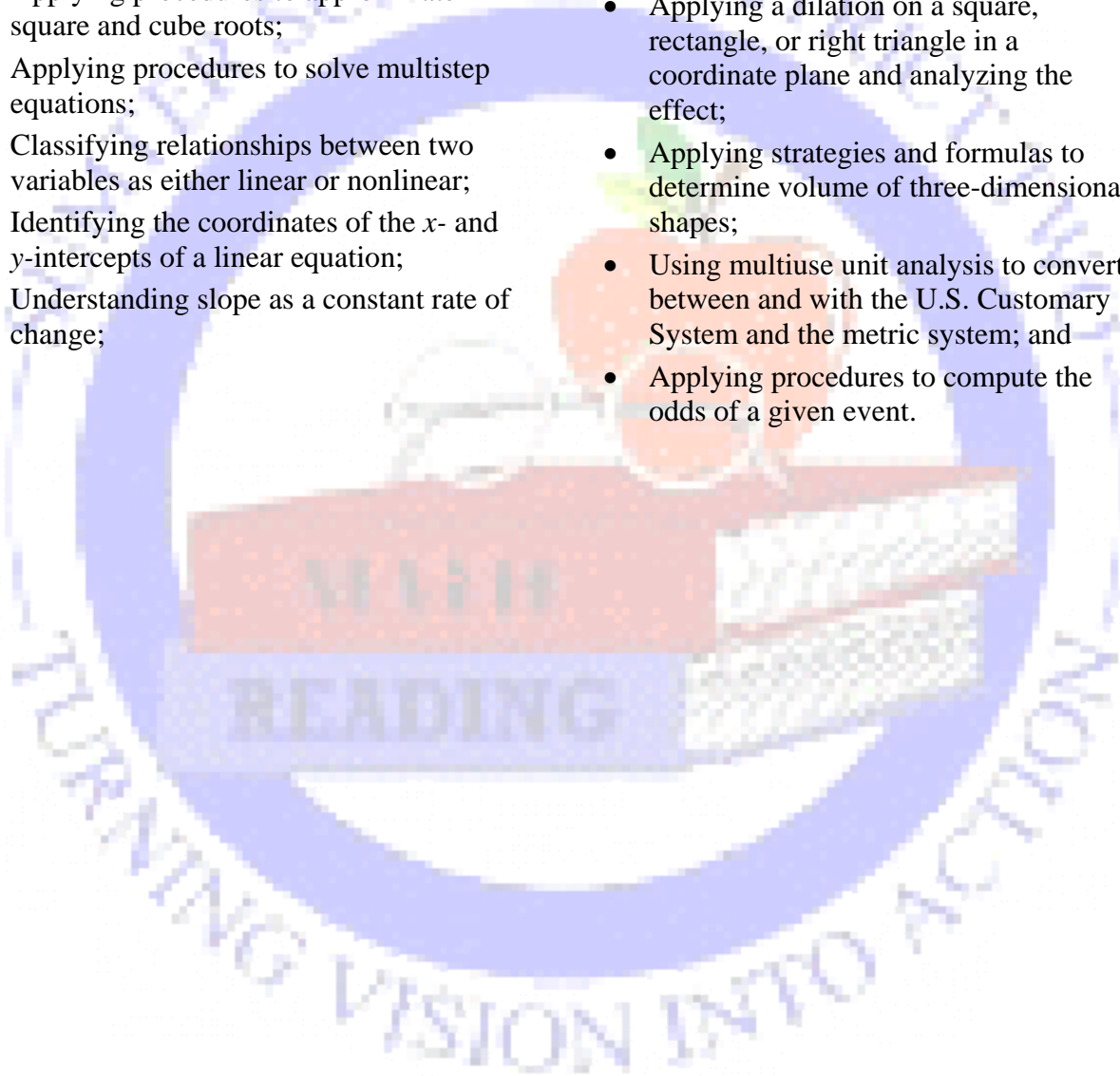
Special Emphasis

- ## Understanding fractional percentages and percentages greater than 100;
- Understanding the concept of square roots and the inverse relationship between squaring and finding square roots of perfect squares;
- Understanding the meaning of absolute value;
- ## Generating strategies to add, subtract, multiply, and divide integers;
- ## Applying an algorithm to multiply and divide fractions and decimals;
- Using inverse operations to solve two-step equations and inequalities;
- Classifying and explaining proportional relationships;
- Translating between two- and three-dimensional representations of compound figures;
- Creating tessellations with transformations and explaining the angle-measure relationships among shapes that tessellate;
- Applying strategies and formulas to determine the surface area and volume of three-dimensional shapes;
- Using one-step unit analysis to convert between and within U.S. Customary System and the metric system; and
- Applying procedures to calculate the interquartile range and the probability of mutually exclusive events.

8th Grade

SPECIAL EMPHASIS

- ## Applying an algorithm to add, subtract, multiply, and divide integers;
- ## Understanding the concept of irrational numbers;
- Applying procedures to approximate square and cube roots;
- Applying procedures to solve multistep equations;
- Classifying relationships between two variables as either linear or nonlinear;
- Identifying the coordinates of the x - and y -intercepts of a linear equation;
- Understanding slope as a constant rate of change;
- Applying the Pythagorean theorem;
- Using ordered pairs, equations, intercepts, and intersections to locate points and lines in a coordinate plane;
- Applying a dilation on a square, rectangle, or right triangle in a coordinate plane and analyzing the effect;
- Applying strategies and formulas to determine volume of three-dimensional shapes;
- Using multiuse unit analysis to convert between and with the U.S. Customary System and the metric system; and
- Applying procedures to compute the odds of a given event.



Sumter School District Two Elementary Mathematics Instructional Model

Four Components

- *Calendar Math*
- *Problem of the Day*
- *Direct Instruction*
- *Perfect Practice*

Justification

- It is a framework for instruction with specified objectives that maximizes learning.
- It provides deliberate “chunking” of time to more effectively deliver and assess instruction and learning in mathematics.

Every Day Calendar Math

Time: 5 – 10 minutes

Purpose

- To provide daily exposure, review and practice of standard concepts
- To provide a set of constant elements that are linked to mathematical concepts
- To provide planned opportunities for all to communicate their mathematical thinking using models.

Problem of the Day

Time: 5 – 10 minutes

Purpose

- To provide direct instruction and practice in problem solving strategies to enable students to become competent and confident problem solvers.

Small Group Learning Opportunity

- Students practice the “Voice of Problem Solving”
- Students take ownership of their learning

Direct Instruction

Time: 25 – 35 minutes

Purpose

- To provide instruction in grade specific standards in all strands of the Standards.

Recommended Materials

- District adopted textbook
- Marilyn Burns materials, Navigation Series by NCTM
- Math Handbook Series, Buckle Down, PACT Coach

Best Practices

- Hands-On Instruction
- Time for Exploration, and Reflection
- Models connected to Mathematical Concepts

Perfect Practice

Time: 5 minutes

Purpose

- To provide daily review and practice of concepts
- To increase fluency
- To insure automaticity

This mathematical model is very important because each part of it targets specific objectives to maximize the teaching and learning of mathematics.

Increased student achievement on all performance evaluations is our goal.

Sumter School District Two Middle School Mathematics Instructional Model

Four Components

- *Calendar Math*
- *Problem of the Day*
- *Direct Instruction*
- *Perfect Practice*

Justification

- It is a framework for instruction with specified objectives that maximizes learning.
- It provides deliberate “chunking” of time to more effectively deliver and assess instruction and learning in mathematics.

Every Day Calendar Math

Time: 5 – 10 minutes

Purpose

- To provide daily exposure, review and practice of standard concepts
- To provide a set of constant elements that are linked to mathematical concepts
- To provide planned opportunities for all to communicate their mathematical thinking using models.

Problem of the Day

Time: 5 – 10 minutes

Purpose

- To provide direct instruction and practice in problem solving strategies to enable students to become competent and confident problem solvers.

Small Group Learning Opportunity

- Students practice the “Voice of Problem Solving”
- Students take ownership of their learning

Direct Instruction

Time: 25 – 35 minutes

Purpose

- To provide instruction in grade specific standards in all strands of the Standards.

Recommended Materials

- District adopted textbook
- Marilyn Burns materials, Navigation Series by NCTM
- Math Handbook Series, Buckle Down, Math Coach

Best Practices

- Hands-On Instruction
- Time for Exploration, and Reflection
- Models connected to Mathematical Concepts

Perfect Practice

Time: 5 minutes

Purpose

- To provide daily review and practice of concepts
- To increase fluency
- To insure automaticity

This mathematical model is very important because each part of it targets specific objectives to maximize the teaching and learning of mathematics.

Increased student achievement on all performance evaluations is our goal.

Sumter School District Two High School Mathematics Instructional Model

Four Components

- *Daily Warmup*
- *Problem of the Day*
- *Direct Instruction*
- *Perfect Practice*

Justification

- It is a framework for instruction with specified objectives that maximizes learning.
- It provides deliberate “chunking” of time to more effectively deliver and assess instruction and learning in mathematics.

Daily Warmup

Time: 5 – 10 minutes

Purpose

- To provide daily exposure, review and practice of standard concepts
- To provide a set of constant elements that are linked to mathematical concepts
- To provide planned opportunities for all to communicate their mathematical thinking using models.

Problem of the Day

Time: 5 – 10 minutes

Purpose

- To provide direct instruction and practice in problem solving strategies to enable students to become competent and confident problem solvers.

Small Group Learning Opportunity

- Students practice the “Voice of Problem Solving”
- Students take ownership of their learning

Direct Instruction

Time: 15 – 25 minutes modeling

15 – 35 minutes guided practice

Purpose

- To provide instruction in grade specific standards in all strands of the Standards.

Recommended Materials

- District adopted textbook with supplementary materials
- Algebra Rescue
- Coach Study Guide for ACT/SAT , Skills Coach Algebra and Geometry
- South Carolina HSAP Coach, South Carolina Video –Streaming

Best Practices

- Hands-On Instruction (including TI-83+ calculators, Geometer’s Sketchpad, Algebra Tiles, Hands-on Equations, etc.)
- Technology Infusion
- Models connected to Mathematical Concepts
- Time for Exploration and Reflection

Perfect Practice

Time: 10 minutes

Purpose

- To provide daily review and practice of concepts
- To increase fluency
- To insure automaticity

This mathematical model is very important because each part of it targets specific objectives to maximize the teaching and learning of mathematics.

Increased student achievement on the High School Assessment Program (HSAP) and the End of Course Examination Program is our goal.

