Mansfield Public Schools
Mathematics Curriculum

The Common Core State Standards in Mathematics (CCSSM) are a set of academic standards in mathematics that are grounded in evidence and designed to ensure that all students have the academic knowledge and skills they need in these core subjects to succeed after high school. The CCSS were developed in a state-led process under the leadership of governors and chief state school officers with participation from 48 states. The process included the involvement of state departments of education, districts, teachers, community leaders, experts in a wide array of fields, and professional educator organizations. These standards were adopted by the state of Connecticut in July, 2010.

Focus, coherence, and rigor are the major evidence-based design principles of the Common Core State Standards for Mathematics. These principles are meant to fuel greater achievement in a deep and rigorous curriculum, one in which students acquire conceptual understanding, procedural skill and fluency, and the ability to apply mathematics to solve problems. Thus, the instructional shifts in mathematics are as follows:

- **Focus:** fewer standards allow for focusing on the major work for each grade
- **Coherence:** the standards are designed around coherent progressions and conceptual connections
- **Rigor:** in major topics, pursue with equal intensity conceptual understanding, procedural skill and fluency, and applications of the mathematics in real-world scenarios

The Common Core State Standards for Mathematics have two key components:

- **Standards for Mathematical Practice** – these practices describe expertise and habits of mind that all math students should exhibit.
- **Standards for Mathematical Content** – conceptual understandings, procedural skills and fluencies, and applications in mathematics

The Content Standards at each grade level are grouped into domains (e.g. Geometry) and clusters within each domain.

Standards for Mathematical Practice

The eight mathematical practices are:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning

Grade 3

In Grade 3, instructional time should focus on four critical areas: (1) developing understanding of multiplication and division and strategies for multiplication and division within 100; (2) developing understanding of fractions, especially unit fractions (fractions with numerator 1); (3) developing understanding of the structure of rectangular arrays and of area; and (4) describing and analyzing two-dimensional shapes.

1. Students develop an understanding of the meanings of multiplication and division of whole numbers through activities and problems involving equal-sized groups, arrays, and area models; multiplication is finding an unknown product, and division is finding an unknown factor in these situations. For equal-sized group situations, division can require finding the unknown number of groups or the unknown group size. Students use properties of operations to calculate products of whole numbers, using increasingly sophisticated strategies based on these properties to solve multiplication and division problems involving single-digit factors. By comparing a variety of solution strategies, students learn the relationship between multiplication and division.
2. Students develop an understanding of fractions, beginning with unit fractions. Students view fractions in general as being built out of unit fractions, and they use fractions along with visual fraction models to represent parts of a whole. Students understand that the size of a fractional part is relative to the size of the whole. For example, 1/2 of the paint in a small bucket could be less paint than 1/3 of the paint in a larger bucket, but 1/3 of a ribbon is longer than 1/5 of the same ribbon because when the ribbon is divided into 3 equal parts, the parts are longer than when the ribbon is divided into 5 equal parts. Students are able to use fractions to represent numbers equal to, less than, and greater than one. They solve problems that involve comparing fractions by using visual fraction models and strategies based on noticing equal numerators or denominators.
3. Students recognize area as an attribute of two-dimensional regions. They measure the area of a shape by finding the total number of same-size units of area required to cover the shape without gaps or overlaps, a square with sides of unit length being the standard unit for measuring area. Students understand that rectangular arrays can be decomposed into identical rows or into identical columns. By decomposing rectangles into rectangular arrays of squares, students connect area to multiplication, and justify using multiplication to determine the area of a rectangle.
4. Students describe, analyze, and compare properties of two-dimensional shapes. They compare and classify shapes by their sides and angles, and connect these with definitions of shapes. Students also relate their fraction work to geometry by expressing the area of part of a shape as a unit fraction of the whole.

Key Fluencies

- Add/subtract within 1,000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction
- Multiply/divide within 100 using strategies and algorithms based on the relationship between multiplication and division properties of operations
- Know from memory all products of two one-digit numbers

Operations and Algebraic Thinking

- Represent and solve problems involving multiplication and division
- Understand properties of multiplication and the relationship between multiplication and division
- Multiply and divide within 100
- Solve problems involving the four operations, and identify and explain patterns in arithmetic

Number and Operations in Base Ten

- Use place value understanding and properties of operations to perform multi-digit arithmetic

Number and Operations – Fractions

- Develop understanding of fractions as numbers

Measurement and Data

- Solve problems involving measurement and estimation of intervals of time to nearest minute, liquid and volumes, and masses of objects
- Represent and interpret data
- Geometric measurement understand concepts of area an relate area to multiplication and to addition
- Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures

Geometry

- Reason with shapes and their attributes