



Westborough Public Schools

Grade 3 Mathematics

In the spirit of the Common Core State Standards for Mathematics, all Grade 3 students will be given an opportunity to participate in rigorous lessons each day. These lessons will support the development of conceptual understanding, procedural fluency, and application/problem solving.

Conceptual understanding: The standards call for conceptual understanding of key concepts, such as multiplication, division, and fractions. Teachers teach more than just “answer getting.” They support the students’ ability to access concepts from a number of perspectives so that students are able to see math as more than just procedures requiring memorization. Students display their conceptual understanding by applying their knowledge to new situations as well as by speaking and writing about their understanding of the math concepts being presented.

Procedural skill and fluency: The standards call for speed and accuracy with simple calculations. Teachers structure class time and/or homework time for students to practice core functions such as decomposing numbers, composing numbers, addition, subtraction, multiplication, division, and learning one digit multiplication facts so that students are able to understand and manipulate more complex concepts in the future.

Application/Problem Solving: The standards call for students to use their math knowledge flexibly through application and problem solving. Teachers provide opportunities for students to apply math in context and in “real world” situations.

The Common Core State Standards for Mathematics (CCSSM) consist of two parts: The **Content Standards** and the **Standards for Mathematical Practice**. While the CCSSM content standards describe what mathematics students should be able to understand and do, the mathematical practices describe how students should engage with these mathematical concepts and skills. The Westborough Public Schools math curriculum is designed to promote a deep understanding of mathematics and to develop mathematically proficient students who can think, reason, model, and solve problems

COMMON CORE CONTENT STANDARDS

Grade 3 instructional time will focus on four critical areas:

1) Developing understanding of multiplication and division and strategies for multiplication and division within 100.

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) Developing understanding of fractions, especially unit fractions (fractions with numerator 1).

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, $\frac{1}{2}$ of the paint in a small bucket could be less paint than $\frac{1}{3}$ of the paint in a larger bucket, but $\frac{1}{3}$ of a ribbon is longer than $\frac{1}{5}$ 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) Developing understanding of the structure of rectangular arrays and of area.

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) Describing and analyzing two-dimensional shapes.

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.

STANDARDS FOR MATHEMATICAL PRACTICE

The Common Core State Standards for Mathematical Practice are practices FOR which are expected to be integrated into every math lesson for all students. Below are a few examples of how these practices may be integrated into tasks that 3rd grade students complete.

1) Make sense of problems and persevere in solving them. In third grade, mathematically proficient students know that doing mathematics involves solving problems and discussing how they solved them. Students explain to themselves the meaning of a problem and look for ways to solve it. Third grade students may use concrete objects or pictures to help them conceptualize and solve problems. They may check their thinking by asking themselves, “Does this make sense?” Students listen to other students’ strategies and are able to make connections between various methods for a given problem.

2) Reason abstractly and quantitatively. Mathematically proficient third grade students should recognize that a number represents a specific quantity. They connect the quantity to written symbols and create a logical representation of the problem at hand, considering both the appropriate units involved and the meaning of quantities.

3) Construct viable arguments and critique the reasoning of others. In third grade, mathematically proficient students may construct arguments using concrete referents, such as objects, pictures, and drawings. They refine their mathematical communication skills as they participate in mathematical discussions that the teacher facilitates by asking questions such as “How did you get that?” and “Why is that true?” They explain their thinking to others and respond to others’ thinking.

4) Model with mathematics. Mathematically proficient students experiment with representing problem situations in multiple ways including numbers, words (mathematical language), drawing pictures, using objects, acting out, making a chart, list, or graph, creating equations, etc. Students require extensive opportunities to generate various mathematical representations and to solve both equations and story problems, and explain connections between representations as well as between representations and equations. Students should be able to use all of these representations as needed. They should evaluate their results in the context of the situation and reflect on whether the results make sense.

5) Use appropriate tools strategically. Mathematically proficient third grade students consider the available tools (including estimation) when solving a mathematical problem and decide when certain tools might be helpful. For instance, they may use graph paper to find all the possible rectangles that have a given perimeter. They compile the possibilities into an organized list or a table, and determine whether they have all the possible rectangles.

6) Attend to precision. Mathematically proficient third grade students develop their mathematical communication skills, they try to use clear and precise language in their discussions with others and in their own reasoning. They are careful about specifying units of measure and state the meaning of the symbols they choose. For instance, when figuring out the area of a rectangle they record their answers in square units.

7) Look for and make use of structure. In third grade mathematically proficient students look closely to discover a pattern or structure in the problems they are working with. For instance, students use properties of operations as strategies to multiply and divide (commutative and distributive properties).

8) Look for and express regularity in repeated reasoning. Mathematically proficient students in third grade should notice repetitive actions in computation and look for more shortcut methods. For example, students may use the distributive property as a strategy for using products they know to solve products that they don't know. For example, if students are asked to find the product of 7×8 , they might decompose 7 into 5 and 2 and then multiply 5×8 and 2×8 to arrive at $40 + 16$ or 56. In addition, third graders continually evaluate their work by asking themselves, "Does this make sense?"