

US GRADE 5 MATHEMATICS SCHEME OF WORK

1. Place Value with Decimals and Fractions

Estimated Lesson Time: 2-5 hours

Aim: Build upon their understanding of the place value system, particularly by extending the patterns to decimal numbers. Beyond that, keep working on reading, writing, comparing, and rounding numbers, including decimals and various kinds of fractions.

- Recap place value with whole numbers - Building numbers up to 1,000,000 by multiplying by 10; explain and explore patterns of zeros when multiplying or dividing by powers of 10; recognize that in a multi-digit number any digit represents 10 times the digit to its right and $\frac{1}{10}$ of the number to its left
- Understand decimal place values - Build decimal numbers to thousandths by repeatedly dividing by 10; explain and explore patterns in the position of the decimal point when multiplying or dividing decimals by powers of 10; recognize that in a multi-digit decimal, any digit still represents 10 times the digit to its right and $\frac{1}{10}$ of the number to its left
- Reading, writing, comparing and rounding numbers - Work on writing and reading numbers from thousandths to millions; compare sizes of whole numbers, decimals and fractions (vulgar and mixed, also converting between) within these limits (recapping $<$ $>$ and $=$ if necessary); rounding decimals to the nearest $\frac{1}{1000}$, $\frac{1}{100}$, $\frac{1}{10}$, whole, 10, 100, 10,000 etc.

2. Multiplication and Division of Whole Numbers

Estimated Lesson Time: 4-8 hours

Aim: Work on multi-digit multiplication and division in order to finalize fluency with multi-digit multiplication and extend division to two-digit divisors.



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- Multiplying by 10 and estimation - Review multiplying by powers of 10 and times tables, estimate multi-digit products by rounding to largest place value
- Multi-digit multiplication - Build through multiplying multi-digit numbers (two-digit, three-digit and four-digit numbers by one-digit, two-digit and three-digit numbers), learn to assess the reasonableness of the product (often through estimation or personal judgment)
- Dividing by 10 and estimation - Divide multiples of powers of 10 by multiples of 10 without remainders, estimate multi-digit quotients by rounding numbers to their largest place value and other compatible numbers
- Multi-digit division - Build through dividing multi-digit numbers (two-digit, three-digit and four-digit numbers by one-digit, two-digit and three-digit numbers) resulting in one or two-digit quotients and any remainders, using a range of suitable methods; learn to assess the reasonableness of the product (often through estimation or personal judgment)
- Word Problems - Express and solve word problems involving multi-digit multiplication and division

3. Shapes and Volume

Estimated Lesson Time: 2-4 hours

Aim: Explore the volume of three-dimensional shapes, as well as classify two-dimensional shapes.

- Volume of 3D shapes - Understand volume as an attribute of 3D shapes measured in cubic units; find the volume of rectangular prisms using $v = b \times h$ and $v = w \times h \times l$; see volume as additive and find the volume of composite solid figures
- Classification of 2D shapes - polygons v non-polygons; classifying types of quadrilaterals (parallelograms, trapezoids, rhombuses, rectangles, squares): trapezoids have 1 or 2 sets of parallel sides, parallelograms are trapezoids with 2 sets of parallel sides, rhombuses are parallelograms with 4 equal sides, rectangles are parallelograms with 4 right angles, squares are rectangles with equal sides or



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rhombuses with 4 right angles also any quadrilateral with 4 equal sides and 4 right angles; classify triangles based on sides and angles

4. Addition and Subtraction of Fractions/Decimals

Estimated Lesson Time: 4-8 hours

Aim: Extend students' knowledge of fractions and decimals to include addition and subtraction.

- Addition and subtraction of fractions - Recap structure of fractions and equivalent fractions (including cancelling); add and subtract fractions with like denominators; add and subtract fractions with unlike denominators (with answer less than 1); add and subtract fractions with unlike denominators (with answer greater than 1); add and subtract mixed numbers; add and subtract more than 2 fractions
- Addition and subtraction of decimals - Add and subtract decimals
- Word Problems - Multi-step word problems involving addition and subtraction of fractions and decimals

5. Multiplication and Division of Fractions

Estimated Lesson Time: 5-10 hours

Aim: Deepen students' understanding of fraction multiplication and begin to explore fraction division (and fractions as division).

- Fractions as division - Demonstrate fractions as division using area, dimensions or quantities; solve word problems involving division of whole numbers with answers in the form of fractions or mixed numbers.
- Multiplying fractions by whole numbers - Multiply unit fractions by whole numbers (referring back to fractions as decimals); Multiply non-unit fractions by whole numbers; solve real-life examples of multiplying fractions by whole numbers



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- Multiplying fractions - Demonstrate general method of multiplying fractions; show how to simplify fractions before and after multiplication; solve real-life examples of multiplying fractions by whole numbers
- Multiplying mixed numbers - Multiplying mixed numbers by whole numbers; multiply mixed numbers by simple fractions; multiply mixed numbers by mixed numbers (both by converting to vulgar fractions and decomposition); solve real-life examples of multiplying mixed numbers
- Dividing fractions - divide a unit fraction by a whole number; divide a whole number by a unit fraction; divide fractions by fractions using invert and multiply; solve real-life examples of dividing fractions

6. Multiplication and Division of Decimals

Estimated Lesson Time: 5-10 hours

Aim: Develop students' knowledge of multiplication and division with whole numbers and with fractions as well multiply and divide by decimals.

- Multiplying decimals - Multiply single digit whole numbers by simple decimals (1 d.p., less than 1); multiply multi-digit whole numbers by simple decimals; understand movement of decimal point; multiply whole numbers by complex decimals (2 or 3 d.p., less than and greater than 1); estimate multiplying decimals by rounding; multiply decimals by decimals;
- Dividing decimals - Divide a decimal by a single digit whole number (with and without decomposition); divide a decimal by a double digit whole number (with and without decomposition); divide a whole number and a decimal by $\frac{1}{10}$ or $\frac{1}{100}$; divide a whole number or a decimal by a decimal
- Word problems - Multi-step word problems involving multiplication and division of decimals; unit conversion word problems involving multiplication and division of decimals



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7. Patterns and the Coordinate Plane

Estimated Lesson Time: 2-5 hours

Aim: Introduce students to the coordinate plane and its representation of the location of objects in space, as well as patterns and real-world situations.

- Understanding the coordinate plane - Constructing a coordinate plane, identifying coordinates and plotting points; doing the same with non-unit coordinates and intervals; determining appropriate intervals and axis size for given points
- Drawing figures in the coordinate plane - plotting horizontal and vertical lines and investigating patterns in coordinates; drawing perpendicular and parallel lines on coordinate plane; drawing shape (symmetrical and non-symmetrical) on coordinate plane
- Real-life problems using the coordinate plane - plot points on coordinate plane given as values in a table or from a description of a situation and use these graphs to solve real-life problems

Estimated Total Time: 24-50 hours

