

MATH: GRADE 5

DATA ANALYSIS, STATISTICS, AND PROBABILITY



Students will be able to...

- Describe and compare data sets using the concepts of median, mode, maximum and minimum, and range.
- Find medians and other fractional parts of data sets.
- Use data characteristics to identify data sets, to describe numerical and categorical variables, and to compare a sample to a larger population.
- Frame question about association between variables in a data set and construct representations and descriptions that help answer those questions.
- Formulate, test, define, and refine survey questions and uses background information in designing a survey.
- Construct and interpret a variety of data representations.
- Theorize and makes statements, conclusions, and recommendations based on organized data.
- Formulate questions, collect and organize data and make line plots and tables to examine and compare data sets.
- Know what a sample is, what some of the factors that make a sample reasonable are, and why a larger sample tends to reflect a populations better than a smaller one.
- Develop strategies for finding a representative sample.
- Students predict the probability of outcomes of simple experiments.
- Understand probability as how likely something is to occur.
- Understand that the probability of an event ranges from never to always.
- Can accurately describe the probability of an event using numbers or words.
- Recognize that repeating a probability experiment several times can yield a variety of results.
- Recognize that probability can be described using fractions, decimals, or percents.
- Plot the results of probability experiments on line plots and interpret the data represented.
- Can estimate probabilities based on results of actual trials.

Geometry

Students will be able to...

- Identify polygons based on their properties.
- Distinguish between polygons and non-polygons and between regular and non-regular polygons.
- Recognize and name polygons by the number of sides.
- Sort and classify triangles and quadrilaterals and use mathematical vocabulary to describe them.
- Graph points and identify coordinates of points on the Cartesian coordinate plane.
- Locate and plot points on a coordinate grid.
- Identify relationships among points, lines, and planes, turns and angles, e.g., intersecting, parallel, perpendicular.
- Understand parallel lines.
- Find and understand relationships among angles, line lengths, and areas of similar polygons.

- Determine if two shapes are congruent by measuring sides or a combination of sides and angles, as necessary; or by motions or series of motions, e.g., translations, rotations, and reflections.
- Find the size of turns and angles and the sums of turns and angles in regular and non-regular polygons.
- Identify 3-D shapes based on their properties, such as edges and faces.
- Understand the idea of volume and units of volume.
- Develop, use, describe, and justify methods of determining volume.

Measurement

Students will be able to...

- Apply the concepts of perimeter and area to the solution of problems.
- Find proportional relationships between polygons that are similar.
- Find and understand relationship among angles, line lengths, and areas of similar polygons.
- Identify, measure, describe, classify, and construct various angles, triangles, and quadrilaterals.
- Sort and classify triangles and quadrilaterals and use mathematical vocabulary to describe them.
- Solve problems involving units of measurement.
- Identify benchmarks for the measure of: length, weight, volume, and time.
- Order items by measures of weight and by measures of liquid amount.
- Measure weight with a balance scale and weights.
- Develop meaning for the concepts of volume and density; distinguishing between quantity and weight.
- Determine when precise measurement is required and when estimates are good enough.
- Use benchmarks to estimate measurements.
- Choose and accurately use appropriate tools for measuring: weight, volume, capacity and time.
- Recognize which measurement units are U.S. standard and which are metric.
- Find areas of triangles and parallelograms. Recognize that shapes with the same number of sides but different appearances can have the same area. Develop strategies to find the area of more complex shapes.
- Find volumes and surface areas of rectangular prisms.
- Understand the notion of volume and units of volume.
- Develop, use, describe, and justify methods of determining volume.
- Find the sum of the angles in simple polygons (up to eight sides) with and without measuring the angles.
- Distinguish and see relationships between turns and angles.
- Use known angles to find the measures of other angles.

Number Sense and Operations

Students will be able to...

- Demonstrate an understanding of place value.
- Can read, write and order large numbers.
- Can round larger numbers to the nearest multiple of 100 or 1000.
- Understand the magnitude of large quantities such as thousands, ten thousands, and hundred thousands and begins to develop a sense of the size of one million.

- Understand decimals as part of the base ten number system.
- Represent and compare very large and very small positive numbers in various forms.
- Demonstrate an understanding of fractions as ratio of whole numbers, as parts of unit wholes, and as parts of a collection, and as locations on a number line.
- Identify and determine common equivalent fractions, mixed numbers, decimals, and percents.
- Identify everyday situations that involve fractions, decimals, and percents.
- Identify and use equivalent fractions, decimals, and percents.
- Find and position integers, fractions, and decimals on the number line.
- Break fractions, decimals, and percents into familiar parts.
- Find decimals that are smaller than, larger than, or in between other decimals.
- Compare and order fractions, decimals, and percents.
- Understand percent as “out of 100”.
- Use percent to describe portions of groups.
- Use decimals to describe portions of groups.
- Compare and order fractions, decimals, and percents using landmarks and visual models.
- Identify, order, and label fractions between 0 and 1 on a number line.
- Apply number theory concepts---including prime and composite numbers---to the solution of problems.
- Understand number characteristics and their relationships, e.g., even, odd, multiples, factors, primes, and squares.
- Use factors of 100 and multiples of those factors to explore landmarks up to 100.
- Know the factor pairs of 100 and can relate them to the factor pairs of 1000 and 10,000.
- Select and use appropriate operations to solve problems involving addition, subtraction, multiplication, and division with whole numbers, fractions, decimals, and percents.
- Solve word problems involving fractions, decimals, and percents and expresses answers appropriately.
- Demonstrate an understanding of the inverse relationship of addition and subtraction, and use that understanding to simplifying computation and solve problems.
- Understand and explain the relationship among the four basic operations and uses those relationships to solve problems and model situations.
- Accurately and efficiently add, subtract, multiply, and divide whole numbers.
- Use mental and written strategies based on numerical reasoning to find sums, differences, products, and quotients.
- Use addition, subtraction, multiplication, and division notation accurately.
- Estimate results of computations with whole numbers, fractions, decimals, and percents. Describe reasonableness of estimates.
- Develop, record, explain, and compare strategies for estimating subtraction, multiplication, and division problems in more than one way.

Discussion, Presentation and Composition

Students will be able to...

- Use agreed upon rules to participate in large and small group discussions.
- Express ideas in an organized way.
- Explain their mathematical thinking in writing.
- Maintain a system for collecting, referring to, and sharing their work.