

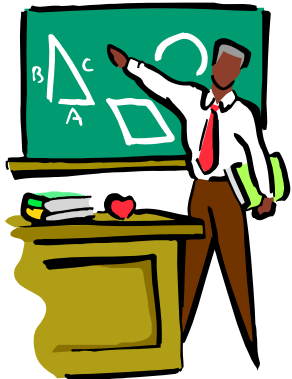
Structure and Logic

Algorithms and Algorithmic Thinking:

- Students analyze algorithms for multiplying and dividing fractions and decimals using properties of the real number system;
- Use their knowledge of parallelograms and triangles to create and defend algorithms for calculating the area of compound figures.

Logic, Reasoning, Problem Solving and Proof:

- Students use a variety of problem-solving strategies and analyze them for efficiency and appropriateness for contextual situations;
- Communicate their thinking using multiple representations;
- Synthesize and organize information from multiple sources to make inferences, draw conclusions, and justify their reasoning;
- Begin to solve simple logic problems using conditional statements.



Living and Working in a Mathematical World—Career Connections

We live in a mathematical world. Whether we are buying a car, choosing an apartment, or filing a tax return, we rely on our understanding of mathematics.

The level of mathematical thinking and problem solving needed in the workplace has increased dramatically. Those who understand and can do mathematics will have opportunities that others do not. Mathematical competence opens doors to productive futures. Here are a few examples of people at work and how they use mathematics in their everyday lives:

Bill Whitmire, House Builder



Bill likes pounding nails, sawing wood and trying to figure out the best way to solve a problem. That's what building is: a lot of mathematical thinking to go along with the physical work. Bill uses mathematics to figure out how much cement, lumber, nails, roofing and insulation he will need. He uses mathematics to read blueprints and figure out where to pour the foundation and put the doors. He uses geometry to figure the angles of the building, slope of the land and incline of the stairs. Building strong houses comes from building strong mathematics skills!

PBS MATHLINE: Career Connections

To explore profiles of people who tell about their careers and how they use mathematics in their everyday lives, go to:

www.pbs.org/teachersource/mathline/career

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Osborn School District
An Osborn Education

*Parents' Guide to
Grade Level
Learning Targets
for Mathematics*

Grade 6

Osborn School District ***Grade 6 Targets***

Mathematics

Number and Operations

Number Sense:

- Students broaden their knowledge of fractions, decimals, percents, and ratios, and the relationships between each;
- Compare and order integers, fractions, decimals, and percents;
- Explore the inverse relationships between perfect squares and cubes, and their roots;
- Explore absolute value.

Numerical Operations:

- Students Multiply and divide fractions and decimals;
- Extend their computation of decimals to include division of whole numbers and decimals by a decimal;
- Expand their understanding of the real number system by modeling the concepts of addition and subtraction of integers;
- Simplify numerical expressions using order of operations that now include exponents;
- Continue to apply properties of the real number system to evaluate expressions.

Estimation:

- Students continue to develop estimation strategies to predict and verify solutions;
- Use estimation to determine the reasonableness of solutions and continue to use benchmarks for the comparison of rational numbers.

Data Analysis and Probability

Data Analysis (Statistics):

- Students apply their understanding of fractions, decimals, and percents as they construct, analyze, and describe data;

- Use data displays and summary statistics to analyze the distribution of data and compare two data sets.

Probability:

- Students begin to make and test conjectures about theoretical probability by:
 - ◇ predicting outcomes of experiments,
 - ◇ performing experiments,
 - ◇ comparing experimental outcomes to a prediction, and
 - ◇ replicating experiments for the comparison of results.
- Determine possible outcomes using a variety of systematic approaches.

Systematic Listing and Counting:

- Students explore three attribute counting problems using Venn diagrams;
- Learn to create and analyze tree diagrams where data repeats;
- Expand their prior learning of the multiplication principle of counting.

Vertex-Edge Graphs:

- Students learn about Hamilton paths and circuits in comparison to prior learning of Euler paths and circuits in 5th grade;
- Learn to solve real-world problems related to Hamilton paths and circuits.

Patterns, Algebra and Functions

Patterns: Students expand prior knowledge about sequences involving whole numbers, fractions, and decimals to include sequences that use the four basic operations.

Functions and Relationships: Students examine the relationship between two sets of numbers represented by a chart, graph, table, written language, or an expression.

Algebraic Representations:

- Students write and use algebraic expressions and equations containing fractions and decimals to represent and solve contextual problems.
- Extend this skill to create and solve two-step

equations containing positive rational coefficients;

- Use mathematical terminology and symbols to translate between written and verbal mathematical expressions and equations that have the four basic operations.

Analysis of Change: Students extend prior learning about patterns of change to predict missing values on line graphs or scatter plots.

Geometry and Measurement

Geometric Properties:

- Students include circles in their exploration of two-dimensional figures;
- Investigate the relationship between the radius, diameter and circumference of a circle to define π ;
- Investigate and solve problems with angle relationships by applying the properties of supplementary, complementary, and vertical angles.

Transformation of Shapes:

- Perform transformations in all four quadrants of the coordinate plane;
- Differentiate between vertical and horizontal lines of reflection to reflect polygons in all four quadrants.

Coordinate Geometry:

- Students graph ordered pairs to all four quadrants;
- Justify the location of a missing coordinate in a figure.

Measurement:

- Students determine the appropriate unit of measure, tool, and necessary precision to solve problems and convert within systems of measurement to solve problems;
- Use scale drawings to estimate the measure of an object;
- Apply formulas to solve problems and explore the relationship between volume and area.