

Lake Washington School District  
Teaching and Learning Framework

**Grades 7 - 12**

Mathematics

Algebra

Power Standards | August 2007

# Grades 7 - 12 | Mathematics

## Number Sense

### Power Standards

### Evidence of Learning

1. Understand and use scientific notation (1.1.1)

Explain the meaning of scientific notation using words, pictures, symbols, or numbers

Express and/or use equivalents among fractions, decimals, percents, integers, positive integer exponents, square roots, and/or numbers written in scientific notation.

Read and translate numbers represented in scientific notation from calculators and other technology, texts, tables, and charts.

Use scientific notation in a given situation.

2. Understand the concept and symbolic representation and relative values of rational numbers (1.1.2)

Explain the meaning of integers raised to whole number exponents and provide examples

Explain the meaning of square root of a whole number and provide examples

Order rational numbers including integers, whole number powers, and square roots, and explain why one rational number is greater than, equal to, or less than another

Recognize properties of the number systems: whole numbers, integers, and rational numbers and recognize how they are related to each other

3. Understand and use the distributive property and the properties of addition and multiplication on rational numbers (1.1.3)

Demonstrate the distributive property of multiplication over addition using an area model or picture

Use the distributive property to factor expressions

4. Understand and apply the concepts of ratio, percent and direct proportion (1.1.4)

Determine an unknown value for a dimension or a number of events or object using ratio, proportion and/or percents

Select and use the most advantageous representation for a given situation

Determine a ratio or percent for a given situation

5. Complete multi-step computations with combinations of rational numbers using order of operations and addition, subtraction, multiplication, division, powers, and square roots (1.1.6)

Use properties to reorder and rearrange expressions to compute more efficiently

## Measurement

### Power Standards

1. Understand and apply derived units of measurement (1.2.2)

### Evidence of Learning

Explain the concept of a rate

Explain how division of measurements produces a derived unit of measurement (e.g. miles traveled divided by hours traveled yields the derived unit [miles per hour])

Find a rate of change in a situation (e.g. increase per year in stamp cost) and label the results

Use unit analysis to find equivalent rates (e.g. miles per hour to feet per second)

Use rate to determine a measured outcome

2. Measurement and Units: Convert between units within or between measurement systems

## Probability and Statistics

### Power Standards

1. Analyze variations in data to determine the effect on the measures of central tendency (1.1.4)

### Evidence of Learning

Use and interpret the most appropriate measure of central tendency and the range to describe a given set of data (e.g. the model hourly wage earned by eighth graders is \$5.75 per hour and the range is \$5.00 to \$6.50, therefore there are very small differences in hourly wages for eighth graders)

2. Understand, apply and evaluate data techniques involving 2-variable data (1.4.3, 1.4.5)

Determine whether the methods of data collection used were appropriate for a given question or population.

Determine the equation for a reasonable line to describe a set of two-variable data.

Determine whether an equation for a line is appropriate for a given set of data and support the judgment with data.

3. Summarize data through graphs and numerical summaries

Use and interpret pie charts, bar graphs, histograms, box-and-whisker plots, stem and leaf, and line graphs.

Use numerical statistics to summarize data: mean, median, mode, range, percentiles, and IQR.

## Algebraic Sense

### Power Standards

### Evidence of Learning

*Although there are no Power Standards involving quadratic and exponential equations, students should be introduced to these functions*

1. Apply processes that use repeated addition (linear) or repeated multiplication (exponential) (1.5.1)

Translate among equivalent numerical, graphical, and algebraic forms of a linear function

Extend, represent, or create linear and non-linear patterns and sequences using tables and graphs

2. Analyze a pattern, table, graph or model involving repeated addition to write an equation or rule (1.5.2)

Find the equation of a line in a variety of ways (e.g. from a table, graph, slope-intercept, two points)

Represent linear situations involving integers and whole number powers of integers using expressions, equations, inequalities, graphs, and tables.

Identify or write an equation or rule to describe a pattern, sequence, and/or a linear function

Represent systems of equations and inequalities graphically

Write an expression, equation, or inequality with two variables representing a linear model of a real-world problem

3. Understand and apply a variety of strategies to simplify expressions and solve multi-step linear equations, one-step linear inequalities, and systems of linear equations (1.5.5, 1.5.6)

Rearrange formulas to solve for a particular variable (e.g. given  $A=5bh$ , solve for  $h$ )

Solve real-world situations involving linear relationships and verify that the solutions makes sense in relation to the problem

Find the solution to a system of linear equations using tables and graphs.

Interpret solutions of systems of equations

Solve multi-step equations involving fractions, decimals, and whole number powers of integers.