

EIGHTH GRADE

COMMON CORE

MATH

AND

ENGLISH LANGUAGE ARTS

OVERVIEW

FOR PARENTS

Mathematics | Standards for Mathematical Practice for All Grades

The Standards for Mathematical Practice describe behaviors that all students will develop in the Common Core Standards. These practices rest on important “processes and proficiencies” including problem solving, reasoning and proof, communication, representation, and making connections. These practices will allow students to understand and apply mathematics with confidence.

- Make sense of problems and persevere in solving them.
 - Find meaning in problems
 - Analyze, predict and plan solution pathways
 - Verify answers
 - Ask themselves the question: “Does this make sense?”

- Reason abstractly and quantitatively.
 - Make sense of quantities and their relationships in problems
 - Create coherent representations of problems

- Construct viable arguments and critique the reasoning of others.
 - Understand and use information to construct arguments
 - Make and explore the truth of conjectures
 - Justify conclusions and respond to arguments of others

- Model with mathematics.
 - Apply mathematics to problems in everyday life
 - Identify quantities in a practical situation
 - Interpret results in the context of the situation and reflect on whether the results make sense

- Use appropriate tools strategically.
 - Consider the available tools when solving problems

- Are familiar with tools appropriate for their grade or course (pencil and paper, concrete models, ruler, protractor, calculator, spreadsheet, computer programs, digital content located on a website, and other technological tools)

- Be precise.
 - Communicate precisely to others
 - Use clear definitions, state the meaning of symbols and are careful about specifying units of measure and labeling axes
 - Calculate accurately and efficiently

- Look for and make use of structure.
 - Discern patterns and structures
 - Can step back for an overview and shift perspective
 - See complicated things as single objects or as being composed of several objects

- Look for and identify ways to create shortcuts when doing problems.
 - When calculations are repeated, look for general methods, patterns and shortcuts
 - Be able to evaluate whether an answer makes sense

Grade 8 Overview | Mathematics

Eighth grade students deepen their understanding of rational and irrational numbers. Algebraically, students compute with radicals and exponents, solve linear equations and define, solve, compare, and graph functions. In geometry, seventh grade students understand and use the Pythagorean Theorem and solve problems involving volumes of cylinders, cones, and spheres.

- Understand rational and irrational numbers

Identify each number as rational or irrational:

$\sqrt{18}$	irrational, because 18 is not a perfect square
$\sqrt{64}$	rational, because 64 is a perfect square
$-\sqrt{47}$	irrational, because 47 is not a perfect square
135.6	rational, because it is a terminating decimal
0.2525...	rational, because it is a repeating decimal
0.120120012...	irrational, because it neither terminates nor repeats
π	irrational, because it cannot be represented as a/b , where a and b are integers

- Work with radicals and integer exponents
 - For example, estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9 , and determine that the world population is more than 20 times larger.
- Understand the connection between proportional relationships, lines, and linear equations and be able to graph them
- Understand that the unit rate of a proportional relationship is the slope of the graph
- Use similar triangles to explain slope and understand $y = mx + b$
- Analyze and solve linear equations with one variable and pairs of simultaneous linear equations
- Define, solve, and compare functions
- Understand that a function is a rule and the ordered pairs are input and output
- Build and use functions to model relationships
- Understand congruence and similarity
- Understand, use, and apply the Pythagorean Theorem
- Investigate patterns of sets of data
- Construct and interpret scatter plots
- Solve problems involving volumes of cylinders, cones, and spheres
- Construct and interpret scatter plots

Common Core Algebra 1

Relationships Between Quantities and Reasoning with Equations

- Reason quantitatively and use units to solve problems.
- Interpret the structure of expressions.
- Create equations that describe numbers or relationships.
- Understand solving equations as a process of reasoning and explain the reasoning.
- Solve equations and inequalities in one variable.

Linear and Exponential Relationships

- Extend the properties of exponents to rational exponents.
- Solve systems of equations.
- Represent and solve equations and inequalities graphically.
- Understand the concept of a function and use function notation.
- Interpret functions that arise in applications in terms of a context.
- Analyze functions using different representations.
- Build a function that models a relationship between two quantities.
- Build new functions from existing functions.
- Construct and compare linear, quadratic, and exponential models and solve problems.
- Interpret expressions for functions in terms of the situation they model.

Descriptive Statistics

- Summarize, represent, and interpret data on a single count or measurement variable.
- Summarize, represent, and interpret data on two categorical and quantitative variables.
- Interpret linear models.

Expressions and Equations

- Interpret the structure of expressions.
- Write expressions in equivalent forms to solve problems.
- Perform arithmetic operations on polynomials.
- Create equations that describe numbers or relationships.
- Solve equations and inequalities in one variable.
- Solve systems of equations.

Quadratic Functions and Modeling

- Use properties of rational and irrational numbers.
- Interpret functions that arise in applications in terms of a context.
- Analyze functions using different representations.
- Build a function that models a relationship between two quantities.
- Build new functions from existing functions.
- Construct and compare linear, quadratic, and exponential models and solve problems.

Grade 8 Overview | English Language Arts

Eighth grade students interact a great deal with literature and informational text. They use evidence from selections to analyze characters' points of view and how the author uses dialogue. Students cite textual evidence to support their analysis of text and identify how the structure contributes to the meaning and style of each text. In writing, students show relationships among experiences and events.

Reading

- Use evidence when drawing conclusions from the reading
- Determine a theme and its relationship to the characters, setting, and plot
- Analyze how dialogue affects the outcome of a text
- Identify how the structure contributes to the meaning and style of each text
- Analyze how the points of view of the characters and the reader create effects such as suspense or humor
- Determine an author's response to conflicting viewpoints
- Evaluate an author's premises or hypotheses by corroborating or challenging conclusions with other sources of information
- Read and understand grade-level literary and nonfiction texts

Writing

- Write arguments to support claims with clear reasons and relevant evidence
- Write informative texts that examine a topic and convey ideas
- Write narratives that show the relationships among experiences and events
- Conduct research projects and demonstrate an understanding of the subject under investigation
- Use technology to produce and publish writing and present relationships between information and ideas

Speaking and Listening

- Participate in discussions, one-on-one and with a group
- Identify when irrelevant evidence is used in a speaker's claim
- Plan and present a narrative
- Use eye contact, appropriate volume, and clear pronunciation when presenting

Language

- Use correct grammar and language
- Use correct capitalization, punctuation, and spelling
- Use a variety of methods to determine the meaning of unknown words
- Interpret figures of speech
 - Verbal irony
 - Puns