

# Sixth Grade

Common Core State  
Standards

## Mathematics

### Mathematical Practices

1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning

### Domains

- Ratio and Proportional Relationships
- The Number System
- Expressions and Equations
- Geometry
- Statistics and Probability

### Ratios and Proportional Relationships

Sixth grade students understand ratio concepts and use ratio thinking to solve problems. Ratios arise in situations in which two (or more) quantities are related. You will draw deeply on what you have learned about measurement in earlier grades to compare rates and develop proportional reasoning skills

Some examples include...

- “The ratio of wings to beaks in the bird house at the zoo was 2:1 because for every 2 wings there was 1 beak”
- “For every vote Candidate A received candidate C received nearly three votes.”

### The Number System

Sixth grade students extend and apply their previous understanding of multiplication and division to divide fractions by fractions; compute fluently with multi-digit numbers, find common factors and multiples and extend their understanding of whole numbers, simple fractions and decimals to the system of rational numbers (integers, both positive and negative; absolute values, and graph numbers in all four quadrants of a coordinate plane

For Example...

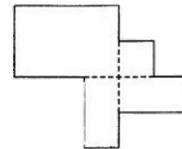
- Solving a problem like “One serving of rice is  $\frac{2}{3}$  of a cup. I ate 1 cup of rice. How many servings of rice did I eat?”

### Geometry

Sixth grade students apply what they have learned about area, surface area, and volume to solve real world problems.

Some examples include...

Breaking down special quadrilaterals or polygons into rectangle, triangles or other shapes and use what is known about their area, surface area, and/or volume to solve real-world and mathematical problems.



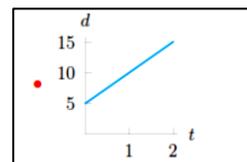
### Expressions and Equations

Sixth grade students begin to use the understanding of the properties of operations (addition, subtraction, multiplication, and division) with whole numbers, fractions, and decimals) to work with algebraic expressions and equations involving variables in more complex ways.

You will also reason about and solve one variable equations and inequalities and represent and analyze relationships between variables.

Some examples include...

- Analyzing the relationship between variables, using graphs and tables and relating these to an equation such as  $D=5t$



# Sixth Grade

(cont.)

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Mathematics

- Writing the calculations such as “subtract  $y$  from 5” as  $5 - y$
- Writing an algebraic expression that summarizes a calculation that could be carried out repeatedly with different numbers

$p$ =price  $c$ =change from \$10.00

take expression  $10 - p$  and extend it to a equation such as  $C = 10 - p$

Price of Book (\$)	5.00	6.49	7.15
Change from \$10	10-5.00	10-6.49	10-7.15

## Statistics and Probability

Sixth grade students use what they have learned about data and measurement in the earlier grades to formalize their understanding of the use of data and statistics and begin to communicate this understanding with sophisticated data displays and descriptions.

Some examples include...

- Formulating questions that can be answered with data.
- Design and use a plan to collect relevant data analyzing the data with appropriate methods.

## Mathematical Practices

When working a math problem students should...

1. Ask: “What is the best way to solve the problems?”, “Does this make sense?”, and “Can I solve the problem in a different way?”
2. Represent: real world problems using numbers and variables and create coherent representations of the problem at hand, and make sense of problems - considering the units involved, and attending to the meaning of the quantities.
3. Evaluate and explain thinking (either verbally or in writing) as well as the thinking of others using mathematical words and ideas. Support their explanations, asking questions like “How did you get that?”, “Why is that true?” and “Does that always work?”
4. Show different ways to solve a problem. Make and describe connections between different representations of the same problem. Check their answer to see if it makes sense. Look at models and choose which models are most useful to solve problems.
5. Consider available tools, including estimation and technology, to solve a problem and decide which are most helpful.
6. Solve problems accurately and efficiently and use mathematical vocabulary to explain their thinking
7. Discover patterns and rules that help them understand the problem and use what they know about numerical operations. Use equations with variables and understand geometric properties. Use drawings, diagrams, models, tables, lists or graphs and rules to explain their thinking.
8. Use reasoning to understand how algorithms work and make generalizations about mathematical patterns as they solve problems.



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