

Seventh 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

Ratio and Proportional Relationships

Seventh grade students build on work from previous years to analyze proportional relationships and use them to solve real-world and mathematical problems.

Some examples could include...

- Four different stores are having a sale. The signs below show the discounts available at each of the four stores.

Two for the price of one	Buy one and get 25% off the second
Buy two and get 50% off the second one	Three for the price of two

a. Which of these four different offers gives the biggest percentage price reduction? Explain your reasoning clearly.

b. Which of these four different offers gives the smallest percentage price reduction? Explain your reasoning clearly.

- Microsoft Corp. wants to acquire 1.5 million shares of Apple Corp. that are worth \$374 per share and is willing to swap Microsoft Corp. shares at \$26 per share. How many shares (to the nearest share) do they need to offer to get an even swap?

The Number System

Seventh grade students extend and apply their previous understanding of addition, subtraction, multiplication and division to the system of rational numbers (whole numbers, fractions, decimals).

- Ocean water freezes at about $2\frac{1}{2}^{\circ}\text{C}$. Fresh water freezes at 0°C . Antifreeze, a liquid used to cool most car engines freezes at -64° . Imagine the temperature is at exactly the freezing point of ocean water. How many degrees must the temperature drop for the antifreeze to turn to ice?
- Three seventh grade classes at Sunview Middle School collected the most box tops for a school fundraiser, and so they won a \$600 prize to share among them. Mr. Aceves' class collected 3,760 box tops, Mrs. Baca's class collected 2,301 and Mr. Canyon's class collected 1,855. How should they divide the money so that each class gets the same fraction of the prize money as the fraction of the box tops they collected?

Expressions and Equations

Seventh grade students also can extend and apply their previous understanding of addition, subtraction, multiplication and division with the system of rational numbers to solve real-world and mathematical problems using numerical and algebraic expressions and equations.

Some examples could include...

- Simplify the expression $7-2(3-8x)$
- The perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?
- If the price of a ticket to a school concert is p dollars then the attendance is $1000 - 50p$. What range of prices ensures 600 people will attend?

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(cont.)

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Geometry

Seventh grade students will learn to draw, construct, and describe geometric figures and describe the relationships between them

You will also solve real-world and mathematical problems involving angle measure, area, surface area and volume.

For example...

- *Mariko has an 80 :1 scale drawing of the floor plan of her house. On the floor plan the dimensions of her rectangular living room are $1\frac{7}{8}$ inches by $2\frac{1}{2}$ inches. What is the area of her real living room in square feet?*

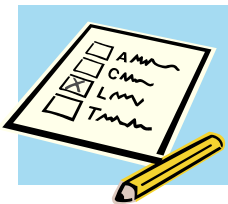
Statistics and Probability

Seventh grade students learn to design valid surveys and how to use those surveys to draw inferences and compare groups.

You will also work with probability, exploring how to develop, use, and evaluate mathematical models that predict the chance of events happening.

Some examples could include...

- *Estimate the mean word length in a book by randomly sampling words from the book.*



- *Predict the winner of school election based on a randomly sampled survey data. Gauge how far off the estimate or prediction might be.*

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. They 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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