Parent Guide to the Standards
7th Grade
Mathematics

This guide provides a summary of what your child will learn by the end of seventh grade in mathematics in the state of Kansas. This guide will also give some examples of seventh grade mathematics so you can assist your child. To view the standards in their entirety, please go to: http://community.ksde.org/Default.aspx?tabid=5276

The 2017 Kansas Mathematics Standards are divided into two sections. The first section is the same for every grade level from prekindergarten to 12th grade and is described below. The Standards for Mathematical Practice address *how* mathematics should be taught and *how* the students should engage in the mathematics. The second section outlines the content at each grade level.

Standards for Mathematical Practice — 7th

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.

Your child will be taught skills that encourage critical thinking and problem solving. Some examples include:

- Students in the 7th grade solve problems involving ratios and rates and discuss how they solved the problems.
- Students construct arguments using verbal or written explanations accompanied by expressions, equations, inequalities, models, graphs, tables, and other data displays.
- Students solve real-world problems through the application of algebraic and geometric concepts.
- Students continue to refine their mathematical communication skills by using clear and precise language in their discussions with others and in their own reasoning.
- Students create, explain, evaluate, and modify probability models to describe simple and compound events.

Content Standards for Mathematics — 7th

The specific skills and content your child will be taught come from the content standards. The domains are listed with some examples of the mathematics at the seventh grade level.

Ratios and Proportional Relationships:

- Understand ratio, unit rate, and unit rate notation and language.
- Use proportional relationships to solve multistep ratio and percent problems.

The Number System:

- Add, subtract, multiply, and divide rational numbers.
- Apply order of operations to rational numbers to solve real-world problems.

Expressions and Equations:

- Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
- Use variables to represent quantities in a real-world or mathematical problem and construct simple equations and inequalities to solve problems.

Geometry:

- Solve problems involving scale drawings of geometric figures.
- Know the formulas for the area and circumference of a circle and use them to solve problems.
- Solve problems involving area, volume and surface area of two- and three-dimensional objects.

Statistics and Probability:

- Use data from a random sample to draw inferences about a population.
- Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.

Samples of Math Applications — 7th

Seventh grade students are expected to write equations from context and identify the coefficient as the unit rate.

Example: The price of apples at the store can be determined by the equation $P = 1.19n$, where P is the price and n is the number of pounds of apples. What is the unit rate?

Solution: The constant of proportionality is the coefficient of x (or the independent variable). The constant of proportionality is 1.19.

Career Application

Business professionals often use unit rates to calculate units produced per day, profit per quarter, average acquisition cost per customer, average cost per unit, and average selling cost. This information can help potential investors determine whether or not they should invest their money in a company.

The following is a link to a video clip from an episode of ABC's hit show *Shark Tank* in which unit rates are clearly used by the sharks to help them decide whether or not to invest in the company that makes the Tree T-Pee.

https://www.youtube.com/watch?v=GH0ZZfjjAmM

Why Must I Learn Math?

Here is a Math Guide!
http://www.mathguide.com/issues/whymath.html#6

Multistep Ratio & Percent Problems

The use of proportional relationships is also extended to solve percent problems involving tax, markups and markdowns simple interest ($I = prt, I = interest, p = principle, r = rate, and\ t = time$), gratuities and commissions, fees, percent increase and decrease, and percent error.

***Example**:* Games Unlimited buys video games for $10. The store increases the price 300%? What is the price of the video game?

Solution: Using proportional reasoning, if $10 is 100% then what amount would be 300%? Since 300% is 3 times 100%, $30 would be $10 times 3. Thirty dollars represents the amount of increase from $10 so the new price of the video game would be $40.

***Example**:* Gas prices are projected to increase 124% by April 2015. A gallon of gas currently costs $4.17. What is the projected cost of a gallon of gas for April 2015?

Solution: A student might say: "The original cost of a gallon of gas is $4.17. An increase of 100% means that the cost will double. I will also need to add another 24% to figure out the final projected cost of a gallon of gas. Since 25% of $4.17 is about $1.04, the projected cost of a gallon of gas should be around $9.40."

$$\$4.17 + \$4.17 + (0.24 \cdot 4.17) = 2.24 \times 4.17$$

100%	100%	24%
$4.17	$4.17	?

Why Study Math?

Ask Dr. Math!
http://mathforum.org/dr.math/faq/faq.why.math.html

Career Application

Builders and contractors must understand ratios so that buildings meet local codes and regulations. These ratios might include number of pounds of weight per beam; thickness to height ratios; occupancy to area; and height to length of ramps. Contractors must also be able to understand ratios so they can provide accurate cost estimates to potential customers.

Sampling Data

Students collect and use multiple samples of data to make generalizations about a population.

Example: Below is the data collected from two random samples of 100 students regarding student's course preference at school. Make at least two inferences based on the results.

Student Sample	P.E.	Math	English	Total
#1	74	12	14	100
#2	77	12	11	100

Solution: Most students prefer P.E.; More students prefer P.E. than Math and English combined.

Real-Life Applications

Using data, Facebook knows which new friends to suggest for you, cell phones can predict words you are typing after only a few letters are typed or even from the previous word(s) typed, and Netflix predicts which movies you would most likely enjoy based on your viewing habits.

Area

7th grade students will apply properties of operations and work with rational numbers (integers and positive/negative fractions and decimals) to write equivalent expressions.

Example: What is the length and width of the rectangle below? Express the area as a sum and as a product.

$3a$	$6b$

Solution: The GCF is 3, which will be the width because it is common to both expressions. The length of the first rectangle must be a and the length of the second rectangle must be $2b$, which makes the total length $a + 2b$. The area can be expressed as a sum $3a + 6b$ and as a product $3(a + 2b)$.

3	$3a$	$6b$
	$a + 2b$	

Math Careers http://www.careercornerstone.org/math/math.htm

Helpful Websites:

- ✓ Kansas Math Standards – http://community.ksde.org/Default.aspx?tabid=5276
- ✓ Parent Roadmaps from the Council of Great City Schools – https://www.cgcs.org/cms/lib/DC00001581/Centricity/Domain/36/ParentGuide_Math_7.pdf
- ✓ PTA's Parent Guides to Student Success – https://www.pta.org/docs/default-source/uploadedfiles/7th-grade-june20