7th Grade Mathematics

Key Instructional Activities

In grade seven, students will further develop their understanding of rates and ratios, using tables, graphs, and equations to solve real-world problems involving proportional relationships. Students will also work on quickly and accurately solving multi-step problems involving positive and negative rational numbers—any number that can be made by dividing one integer by another, such as ½, 0.75, or 2. Additionally, students will expand their knowledge of geometry and apply the properties of operations to solve real world problems involving the measurement of multi-dimensional objects. Activities in these areas will include:

- Determining whether two quantities are in a proportional relationship and using knowledge of rates, ratios, proportions, and percentages to solve multi-step problems

- Identifying the unit rate of change (the constant rate at which the value of a variable changes) in tables, graphs, equations, and verbal descriptions

- Calculating the unit rates associated with ratios of fractions, including quantities measured in different units (for example, the ratio of ½ a mile for every ¼ of an hour means that you travel 2 miles in an hour)

- Solving problems using equations to find the value of one missing variable

- Applying the properties of operations to generate equivalent mathematical expressions

- Solving multi-step word problems by adding, subtracting, multiplying, and dividing positive and negative rational numbers in any form (including whole numbers, fractions, or decimals)

- Understanding that numbers cannot be divided by 0

- Converting rational numbers to decimals using long division

- Describing situations in which positive and negative quantities combine to make 0

- Finding the area of two-dimensional objects and the volume and surface area of three-dimensional objects

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What resources are available for students and parents?

https://hcbemath.weebly.com/

✓ Online Math Textbook
✓ Parent Portal
✓ Overview of Units and Pacing
✓ The Learn Button!

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View Online Learning Modules for This Unit

What is the Learn Button on the Weebly Site? *Link to Georgia Virtual School Modules for instructional videos, examples, and practice by unit.*

7th Math Course Overview

Unit 1: Operations with Rational Numbers
Expected Dates: Beginning of School Year to Mid-September

Students develop a unified understanding of numbers, recognizing fractions, decimals (that have a finite or a repeating decimal representation), and percents as different representations of rational numbers. Students extend addition, subtraction, multiplication, and division to all rational Numbers, maintaining the properties of operations and the relationships between addition and subtraction, and multiplication and division. By applying these properties, and by viewing negative numbers in terms of everyday contexts (e.g., amounts owed or temperatures below zero), students explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers. They use the arithmetic of rational numbers as they formulate expressions and equations in one variable and use these equations to solve problems**.**

Unit 2: 2A - Expressions and 2B – Equations
Expected Dates: Mid-September to Early November

Students build on their understanding of order of operations and use the properties of operations to rewrite equivalent numerical expressions that were developed in Grade 6. Students continue to use properties that were initially used with whole numbers and now develop the understanding that properties hold for integers, rational and real numbers. Opportunities build upon this experience of writing expressions using variables to represent situations and use the properties of operations to generate equivalent expressions. Moreover, students should use substitution to understand that expressions are equivalent. This is a continuation of work from 6th grade using properties of operations and combining like terms. Students are expected to show their steps in their work and explain their thinking using the correct terminology for the properties and operations. Students' understanding and application of writing and solving one-step equations from a problem situation to multi-step problem situations is built. This is also the context for students to practice using rational numbers including: integers, and positive and negative fractions and decimals. Finally an equation matching the order of operations is written. Multiple opportunities for students to work with multi-step problem situations that have multiple solutions and therefore can be represented by an inequality are provided. Students become aware that values can satisfy an inequality but not be appropriate for the situation, therefore limiting the solutions for that particular problem.

Unit 3: Ratios & Proportional Relationships
Expected Dates: Early November to December

Students extend their understanding of ratios and develop understanding of proportionality to solve single- and multi-step problems. Students use their understanding of ratios and proportionality to solve a wide variety of percent problems, including those involving discounts, interest, taxes, tips, and percent increase or decrease. Students solve problems about scale drawings by relating corresponding lengths between the objects or by using the fact that relationships of lengths within an object are preserved in similar objects. Students graph proportional relationships and understand the unit rate informally as a measure of the steepness of the related line, called the slope. They distinguish proportional relationships from other relationships

Unit 4: Geometry
Expected Dates: January to Mid-February

Students continue their work with area from Grade 6, solving problems involving the area and circumference of a circle and surface area of three-dimensional objects. Students will reason about relationships among two-dimensional figures using informal geometric constructions, and they gain familiarity with the relationships between angles formed by intersecting lines. Students work with three-dimensional figures, relating them to two-dimensional figures by examining cross-sections. They solve real-world and mathematical problems involving area, surface area, and volume of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes and right prisms.

Unit 5: Inferences
Expected Dates: Mid-February to Early March

Students build on their previous work with single data distributions to compare two data distributions and address questions about differences between populations. They begin informal work with random sampling to generate data sets and learn about the importance of representative samples for drawing inferences.

Unit 6: Probability
Expected Dates: Early March to May

In Grade 7, students will concentrate on understanding that good answers to statistical questions depend upon a good plan for collecting data relevant to the questions of interest. Because statistically sound data production is based on random sampling, a probabilistic concept, students must develop some knowledge of probability before launching into sampling. Their introduction to probability is based on seeing probabilities of chance events as long-run relative frequencies of their occurrence, and many opportunities to develop the connection between theoretical probability models and empirical/experimental probability approximations. This connection forms the basis of statistical inference.

Helpful Tips for Parents and Guardians

Believe that every child can be successful in math. It takes good teaching, coaching, encouragement and practice.

Partnering with your child's teacher

• Get to know your child's math teacher! Your child will thank you (someday) for being involved in his or her learning. Also – know about the online resources that are available!

• Don't be afraid to reach out to your child's teacher—you are an important part of your child's education. Ask to see a sample of your child's work or bring a sample with you.

• Talk with your child's teacher about difficulties he/she may be experiencing. When teachers and parents work together, children benefit.

• Ask the teacher questions like:

> • Where is my child excelling? How can I support this success?

> • What do you think is giving my child the most trouble? How can I help my child improve in this area?

> • What can I do to help my child with upcoming work?

Helping your child learn outside of school

• Talk about math in a positive way. A positive attitude about math is infectious. Encourage your child to stick with it whenever a problem seems difficult. This will help your child see that everyone can learn math.

• Encourage persistence. Some problems take time to solve. Praise your child when he or she makes an effort, and share in the excitement when he or she solves a problem or understands something for the first time

• Encourage your child to experiment with different approaches to mathematics. There is often more than one way to solve a math problem.

• Encourage your child to talk about and show a math problem in a way that makes sense

• When your child is solving math problems ask questions such as: Why did you...? What can you do next? Do you see any patterns? Does the answer make sense? How do you know? This helps to encourage thinking about mathematics.

• Connect math to everyday life and help your child understand how math influences them (i.e. shapes of traffic signs, walking distance to school, telling time).

• Play family math games together that add excitement such as checkers, junior monopoly, math bingo and uno.

• Computers + math = fun! There are great computer math games available on the internet that you can discover with your child.