YOUR School
8th Grade Mathematics Curriculum Overview

Introduction

In Grade 8, the focus of mathematics content will be on three critical areas:

1. **Investigating expressions and equations, using equations of lines to represent relationships, and solving linear equations and systems of linear equations**

   Students will use linear equations and systems of linear equations to represent, analyze, and solve a variety of problems.

   Students will interpret parts of equations (such as slope or intercepts), describing the meaning of each part as it relates to the equation's graph and the scenario that the equation is representing.

   Students will solve equations and systems of equations.

2. **Understanding functions and using functions to describe quantitative relationships**

   Students will understand that functions describe situations where one quantity determines another.

   Students will translate among different ways to represent functions.

3. **Analyzing two- and three-dimensional figures using distance, angle, similarity, congruence, and the Pythagorean Theorem**

   Students will solve problems involving distance, angles, translations, rotations, reflections, dilations, congruence, and similarity.

   Students will understand the Pythagorean Theorem and use it to solve problems.

   Students will find volume of 3-dimensional figures such as cones, cylinders, and spheres.

Quarterly Overview

While many of the mathematics topics are related and will be integrated throughout the school year, mathematics lesson topics will generally follow the schedule outlined below:

First Quarter

- Know that there are numbers that are not rational, and approximate them by rational numbers
- Work with radicals and integer exponents
- Understand the connections between proportional relationships, lines, and linear equations

Second Quarter

- Understand congruence and similarity using physical models, transparencies, or geometry software
- Define, evaluate, and compare functions
- Use functions to model relationships between quantities

Third Quarter

- Analyze and solve linear equations and pairs of simultaneous linear equations
- Understand and apply the Pythagorean Theorem

Fourth Quarter

- Solve real-world and mathematical problems involving volume of cylinders, cones and spheres
- Investigate patterns of association in statistical data

Eight Mathematical Practices

Mathematics class is about much more than just "getting the right answer." The goal is not to turn students into human computers. Rather, the goal is to help shape students (eventually) into fully-functioning adults who can think critically, communicate effectively, use resources wisely, and problem-solve creatively. The eight Mathematical Practices are "habits of mind" that help students form a deep understanding of mathematics concepts, but also extend far beyond the walls of the math classroom.

Therefore, in our math class, your student will have many opportunities to:

1. Be a good problem-solver, and not give up when something doesn't work perfectly the first time.
2. Think about problems in lots of different ways.
3. Communicate effectively to show and explain their thinking and learn from the way others think.
4. Understand how the concepts they learn relate to the world around them.
5. Use mathematical tools skillfully and wisely to help in the problem-solving process.
6. Pay attention to important details, but also keep the big picture in mind.
7. Analyze complicated problems and break them down into simpler parts.
8. Identify helpful patterns and find effective shortcuts to be more efficient in problem-solving.

Students who enjoy and are successful in mathematics are those who embrace being creative problem-solvers and who approach mathematics with a sense of curiosity and adventure.

How to Support Student Learning at Home

You can help your student by reinforcing mathematical concepts at home. Sometimes that might mean going through flash cards for a few minutes a day, but the best mathematical support happens by highlighting the math that is already around you.

Play card games, Monopoly, and Scrabble. Have your student be the scorekeeper or banker.	**Children should drink 5-8 cups of water per day. Track how much water you drink for a week (in terms of cups, pints, and quarts).**	**On birthdays, figure out how many months (or weeks, or days) old the person is.**
Estimate how many M&Ms (or similar) will fit into a cup. Then fill it up and count to find out.	**Estimate how long something is. Then measure to find out.**	**Estimate how long something will take. Then test it out to see.**
Give your student an allowance or pay them for chores. Talk about pay rates, saving money, and spending money.	**Talk about meanings of percentages when you see "% off" sales or check the weather or track progress in computer games, ebooks, etc.**	**Talk about what decimals mean in the context of money. What's the difference between 1 cent and 0.01 cent?**
Highlight fractions everywhere. "What fraction of the people here are wearing hats?"	**Make recipes together and measure ingredients creatively. "We need 1 ½ cups of flour, but only have a ¼ cup measuring cup. What can we do?"**	**Make recipes. Double or halve the recipe. Have your student be in charge of reading the recipe and giving directions.**
Craft or scrapbook together. Measure lengths in fractions of inches.	**Build a project that requires measuring and cutting boards or other material.**	**Plant a garden. Discuss number of plants, spacing of plants, height and width of plants. Track rainfall with a rain gauge.**

Be relaxed and positive in these interactions, and your student will learn to relax and think positively about mathematics. Don't put too much emphasis on speed or correct answers. Instead, ask questions about how they thought about the topic and share your thoughts. Try to think about things in different ways. (And don't be surprised if you start to enjoy doing math with them too!)