

Seventh Grade Math

Shannon O'Malley
somalley@seattlegirlsschool.org

Goals:

Seventh graders take the first half of our Algebra I course at SGS. The 7th grade math program is designed to build strong computational and analytical skills while supporting students to become flexible problem solvers who can move between different representations (graphical, numerical, analytical, and geometric models) with fluency. Throughout the course, students are asked to explain and communicate their thinking as they grow in their understanding of important algebra concepts such as variable, equation, proportionality, linearity, and slope. Students will gain confidence with data interpretation and will become skilled at modeling real world situations with algebra. These ideas will be applied further in 8th grade, when students tackle the second half of Algebra I.

Core questions:

What are variables, expressions, and equations? How can they be used to solve real-world problems? How can I use proportional reasoning to think critically about the world? What kinds of patterns can I find in equations, numerical tables, and graphs, and how do they relate to each other?

Important ways of working:

The course is organized around the big ideas of algebra and is intended to promote understanding of these important topics. Students can expect to work on problems both individually and in groups. Small group work is often the dominant structure when students are exploring ideas that are new or complex. Individual work, on the other hand, is used to further computational fluency and foster personal accountability for learning. Students are also expected to participate in and contribute to class discussions. Algebra tiles are used throughout much of the course in order to support sense-making, help students visualize ideas, and make abstract concepts more concrete.

Keys to student success:

Participate: Students will learn the most if they are willing to take intellectual risks by sharing ideas, listening to others' ideas, and engaging actively (whether working in a group, with a partner, or individually).

Explain your thinking: Students will be pushed to justify their ideas and extend their conceptual understanding.

Ask questions: Successful students recognize when they are stuck and ask targeted questions to help them get "un-stuck."

Be persistent: In higher-level math, as in life, time and commitment are necessary to solve the most important problems. Success is more often attained through willingness to persevere and work hard to find a solution than through the ability to get an answer quickly and with minimal effort.

Seventh grade math overview:

Unit	Time Frame	Skills & Concepts Emphasized
Integers, Order of Operations, and Graphs	September—October	✓ Graphing ✓ Evaluating expressions ✓ Integer arithmetic
Equivalent Expressions	October—November	✓ Variables & expressions ✓ Combining like terms ✓ Factoring and distributing
Solving Equations	November—December	✓ Solving linear equations ✓ Checking solutions
Lines and Slope	January—February	✓ Linear situations in equations, graphs, & number tables ✓ Slope
Proportional Reasoning	March-April	✓ Proportionality ✓ Methods & applications: scaling, sampling, percents.
Intercepts and Intersections	May	✓ More w/ slope & rate of change ✓ Intro to systems of equations

Homework is an integral part of the course and is assigned weekly on Tuesdays. Homework assignments are non-traditional in the sense that they are not intended as practice of concepts recently covered in class. Primary goals of homework are to support mental math skills, allow a range of challenge levels, value persistence, and encourage students to build a math community outside of the classroom. To earn full credit, students must attempt each problem before the due date and must arrive in class ready to discuss with their team and make corrections. It is not expected that students will be able to solve all problems successfully on their own, but they are expected to try each one, talk with other people if possible, and come in with questions!

FUN Folders will be used to practice current or recent concepts from class. Students will be given 10 minutes at the beginning of most classes to complete this work and they are welcome to bring them home. Students will receive new FUN folder material about every two weeks.

Some ways to support your student with algebra:

Encourage perseverance. Many algebra problems cannot be solved in a few minutes. This can be a big shift from elementary and pre-algebra level math classes.

Help them make a list of questions to bring to class. Encourage them to verbalize their reasoning.

Foster a growth mindset. Value the word “yet.” (As in, “I don’t understand this... yet.”)

Contact me. Please don’t hesitate to email me about any issues that may come up!