Math 7

Teachers: Mrs. Alayna Marziale, Mrs. Jana Brown Instutition: Lowville Academy
Academic Year: 2025-2026 Class Time: XYZ M/W/F, XYZ T/Th
Email: XYZ@XYZ.edu Website: www.marziale.tech/alayna

Introduction

My name is Mrs. Marziale and I am thrilled to be teaching Math 7 this year alongside my substitute, Mrs. Brown.

The purpose of this course is to provide students the opportunity to master foundational concepts in mathematics. Students who engage fully, regardless of their starting point, will develop by the end of the year a working ability to think critically, use mathematical reasoning, model complex situations quantitatively, and communicate solutions with precision.

The topics to be taught in this course are as follows. They are subject to change slightly.

1. Numbers and operations: Rational numbers, integers, complex fractions, ratios, unit conversions, repeated operations

2. Algebra: Multistep linear equations and inequalities, systems of equations with integer solutions, proportional reasoning, exponents and roots, polynomial manipulation

3. Geometry: Transformations, congruence and similarity, area/volume for complex solids, angle relationships, coordinate proofs

4. Statistics and probability: Two-way tables, probability of compound events, expected value, linear regression, measures of center and spread in context

5. Functions: Interpreting and graphing linear and simple nonlinear functions, recognizing sequences, function notation basics

Motivation

The number one confusion that students have when they are expected to learn math in school is captured by the question "when am I even going to use this in the real world?" Students deserve credit for the question because the responsibility of the teacher is in fact to help students understand not only *how* to do math but *why* they are doing it. Therefore, the choice of topics shown above is motivated by their broad applicability in modeling and solving real world problems. Below are some examples of problems that, by learning the topics chosen for this course, students will be equipped to solve:

1. A drone delivers packages. Its path can be described by $y = 3x + 5$. It then changes to $y = -2x + 20$. Find the intersection point of the paths and interpret the meaning in terms of distance and altitude that the drone traveled. (**Requires working knowledge of: algebra, functions, coordinate geometry, systems of equations**)

2. A water tank drains at a rate of 2.5 liters per minute. A second tank drains 40 liters in 16 minutes. After how many minutes will both tanks have drained the same amount, and what is that amount? (**Requires working knowledge of: numbers and operations, proportional reasoning, linear equations**)

3. A company uses a cube-shaped container for shipping. If the surface area is increased by 44%, find the percentage increase in volume. Express your reasoning algebraically and check for reasonableness. (**Requires working knowledge of: geometry, exponents and roots, algebraic manipulation**)

4. A game involves rolling a fair 6-sided die twice. Define the event E as "the sum of the two rolls is prime" and event F as "at least one roll is a 4." Compute $P(E \cap F)$, $P(E \cup F)$, and comment on the independence of E and F. (**Requires working knowledge of: statistics and probability, compound events, independence, fractions**)

5. You have 3 types of tickets to a concert: balcony \$45, floor \$65, VIP \$120. You sell a total of 50 tickets for \$3,200. Write and solve a system of equations if the number of VIP tickets sold is twice the number of balcony tickets. (**Requires working knowledge of: algebra, systems of equations, numbers and operations, linear modeling**)

6. A bacteria culture doubles every 2 hours. Starting with 500 bacteria, write a function to model population after t hours, then find population at 7 hours and the time when the population reaches $64,000$. (**Requires working knowledge of: functions, exponents, algebra, sequences, modeling**)

7. A cylindrical can of radius 4 cm and height 10 cm is melted and recast into a cube. Find the edge length of the cube. Then, calculate the percent change in surface area. (**Requires working knowledge of: geometry, volume and surface area, exponents and roots, algebraic manipulation**)

8. A survey categorizes 120 students by favorite sport (basketball, soccer, tennis) and gender. 40 students like basketball, 50 like soccer, and 30 like tennis; 60 are male. If 30 of the males like soccer, complete the two-way table, find the relative frequencies, and interpret if sport preference and gender are independent. (**Requires working knowledge of: statistics and probability, two-way tables, relative frequency, independence, ratio and proportion**)

More generally, even outside of math, this course offers the opportunity to cultivate critical thinking skills that will give you a more objective handle on the world. To be able to analyze problems, evaluate evidence, and reason logically are all important abilities to carry into the rest of your life. Whether making big decisions about money, interpreting information in the news, troubleshooting technical issues, or navigating complex situations in your personal or professional life, the habits of mind you can develop in this course will remain valuable for as long as you wield that big beautiful brain.

<u>*Course Structure*</u>

This section is meant to give you a sense for what the course will look like and what you will need in order to participate in it.

Rules

The two standards I use to judge student success are (A) excellence in work and (B) excellence in conduct. This motivates a basic set of rules.

1. Show respect to the the classroom environment and the people in it.

2. Focus during class time.

3. Hold yourself to academic integrity.[1]

4. Submit assignments on time or ask permission to submit late.

5. Put away all devices during class time unless granted permission.

6. Ask permission any time you wish to use AI to do work.

7. If granted any kind of permission, only operate within the limits specified by the teacher.

Zero tolerance is granted to rule violations. I will arbitrate fair and consistent penalties as I see fit.

Recommended Materials

1. Notebook of ruled paper

2. Notebook of graph paper

3. Pencils

4. Ruler

5. Calculator[2]

6. Access to the course website for notes and assignments

Grading

Tests	XYZ%
Quizzes	XYZ%
Homeworks	XYZ%
Projects	XYZ%
Participation[3]	XYZ%
Total	100%

---

[1] Only submit work that reflects your own understanding and effort. Give credit to all outsourced ideas or solutions. Never use unauthorized aids during tests or quizzes. Never plagiarize.

[2] A four-function or basic scientific calculator is permitted unless specifically stated. Phones are unacceptable. If you're uncertain that your calculator is OK, ask. Skills will be assessed with and without a calculator to ensure conceptual fluency.

[3] General adherence to section entitled "Rules."

Tentative Pace

This is the initial plan for the course's progression. It is subject to change. We will work around sanctioned holidays.

Weeks 1,2: 09/03 - 09/16: Syllabus, integers, rational numbers, order of operations, unit conversions

Weeks 3,4: 09/17 - 09/30: Ratios and proportional relationships; percent, scale, unit rate

Weeks 5,6: 10/01 - 10/14: Complex fractions, repeated operations, multi-step problems

Weeks 7,8: 10/15 - 10/28: Expressions, properties, and structure; combining like terms

Weeks 9,10: 10/29 - 11/11: Linear equations and inequalities; multistep solving

Weeks 11,12: 11/12 - 11/25: Two-variable equations, graphs, intercepts, rate of change

Weeks 13,14: 11/26 - 12/09: Systems of linear equations (tables, graphs, substitution)

Weeks 15,16: 12/10 - 12/23: Exponents and roots; integer exponents; square and cube roots

Weeks 17,18: 12/24 - 01/06: Intro functions; sequences as functions; function notation basics

Weeks 19,20: 01/07 - 01/20: Nonlinear previews (simple exponentials) and modeling contexts

Weeks 21,22: 01/21 - 02/03: Transformations in the plane; congruence and similarity

Weeks 23,24: 02/04 - 02/17: Angle relationships; triangles and polygons; coordinate proofs

Weeks 25,26: 02/18 - 03/03: Area/volume: composite figures; prisms, cylinders; nets

Weeks 27,28: 03/04 - 03/17: Surface area and volume applications; density and scaling

Weeks 29,30: 03/18 - 03/31: Probability of simple and compound events; simulations

Weeks 31,32: 04/01 - 04/14: Two-way tables; relative frequencies; independence

Weeks 33,34: 04/15 - 04/28: Measures of center and spread; comparing distributions

Weeks 35,36: 04/29 - 05/12: Intro linear regression: trend, residual idea, cautions

Weeks 37,38: 05/13 - 05/26: Integrated projects and cumulative review

Weeks 39,40: 05/27 - 06/09: Extension/acceleration, performance task, year-end review

Parent/Guardian Acknowledgment

My student has reviewed the Math 7 syllabus and agrees to follow the rules in it.

Student Name:............................... Signature:....................................
Parent/Guardian Name: .... Signature:....................................
Contact Phone or Email:.................. Date:...