Course Overview

Middle School | 8 | Math - *Last Updated on October 28, 2024*

DESCRIPTION

K-12 Content Area | Mission & Philosophy Statement

- With confidence and perseverance, young people can tackle complex and novel mathematical challenges, becoming skilled problem solvers who take ownership over their learning process.
- Young people possess the ability to reason mathematically, make conjectures, solve problems and build understanding through effective dialogue and collaboration.
- Learners exhibit critical inquiry through the deliberate asking of questions and the integration of conceptual understanding, reasoning abilities, and procedural fluency.
- Strategically selecting materials, technology, and other resources support mathematical learning and aid in achieving mathematical goals.

The PA Core 8 curriculum is a comprehensive framework designed to equip students with a deep understanding and proficiency in mathematics, segmented into four critical focus areas: numbers and operations, algebraic concepts, geometry and measurement, and data and probability.

In the area of numbers and operations, students distinguish between rational and irrational numbers using their properties. Students learn how to estimate irrational numbers by comparing them to rational numbers. In the area of algebraic concepts, students apply concepts of integer exponents to generate equivalent expressions, as well as evaluate square roots and cube roots to represent solutions to equations. Within this area, students examine linear equations by analyzing and describing relationships between two variables using slope. Students make connections between slope, lines and linear equations, as well as analyze, model and solve linear equations. It is within this area where students master solving linear equations as well as systems of linear equations. Significant time is spent having students translate scenarios into the language of algebra, predict future outcomes, create and compare different representations of linear patterns, and evaluate values of one variable given a value for another. Students are exposed to functions, as they learn to define, interpret and compare functions displayed algebraically, graphically, numerically in tables, or by verbal descriptions. With regard to the area of geometry, students use various tools to understand and apply geometric transformations to geometric figures on the coordinate plane. In addition, students will apply the Pythagorean Theorem and its converse to solve mathematical problems in two and three dimensions. Finally, in the area of measurement, data and probability, students construct and evaluate different representations of bivariate data. Students also compare and contrast data while learning to organize and display sets of data using different displays.

STANDARDS

Pennsylvania Common Core - Grade 8 - Mathematics

CC.2.1.8.E.1 | CC.2.1.8.E.4 | CC.2.2.8.B.1 | CC.2.2.8.B.2 | CC.2.2.8.B.3 | CC.2.2.8.C.1

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CC.2.2.8.C.2 | CC.2.3.8.A.1 | CC.2.3.8.A.2 | CC.2.3.8.A.3 | CC.2.4.8.B.1 | CC.2.4.8.B.2

COURSE OBJECTIVES

Specific objectives for this course are aligned to the Pennsylvania Core Standards for Mathematics and the Common Core State Standards for Mathematics as outlined in the Scope and Sequence for Grade 8 Mathematics

ASSESSMENT TYPES

- Benchmark Assessments
- Diagnostic Assessments
- Formative Assessments
- Summative Assessments

SUGGESTED METHODS OF INSTRUCTION

Below is a list of suggested strategies for high-quality instruction in Mathematics:

- Instructional components outlined in the Framework for Teaching by Charlotte Danielson
- Collaborative Learning
- Differentiation
- Direct and Guided Instruction
- Hands-on Learning
- Independent Practice
- Math Language Development Routines
- Problem-solving and Critical Thinking Tasks
- Real-World Applications
- Sense-Making Routines
- Use of Technology
- Visual Representations

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RESOURCES

District Approved Program Resources	District Approved Supplemental Resources	District Approved Technology Resources
McGraw Hill Reveal Math. (2025). • Teacher Edition Course 3: Volume 1 (Print & Digital) • Teacher Edition Course 3: Volume 2 (Print & Digital) • Student Edition Course 3: Volume 1 (Print & Digital) • Student Edition Course 3: Volume 2 (Print & Digital)	McGraw Hill, ALEKS (2025) IXL Math (2025)	

Unit 1: Math Is

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STANDARDS

National Common Core - Grade K-12 - Mathematics

CCSS.Math.Practice.MP3 CCSS.Math.Practice.MP1 CCSS.Math.Practice.MP4

CCSS.Math.Practice.MP5 CCSS.Math.Practice.MP6 CCSS.Math.Practice.MP8

Pennsylvania - Eligible Content - Grade 7 - Mathematics

M07.C-G.1.1.1 M07.C-G.2.2.2 M07.C-G.2.2 M07.A-N.1.1 M07.A-N.1.1.1 M07.B-E.1.1.1

M07.B-E.1.1 M07.A-R.1.1 M07.A-R.1.1.1 M07.D-S.3.1.1 M07.A-R.1.1.2 M07.A-R.1.1.6

M07.D-S.3.1

Pennsylvania Common Core - Grade 7 - Mathematics

CC.2.1.7.D.1 CC.2.1.7.E.1 CC.2.2.7.B.1 CC.2.4.7.B.3 CC.2.2.7.B.3

DESIRED RESULTS

Meaning	
Big Ideas & Understandings	**Essential Questions & Instructional Questions**
Students will... • build their math identities. • discuss approaches for making sense of a problem and determining strategies for solving it. • consider different ways to use mathematics to represent real-world situations. • refine their skills in constructing arguments to support their thinking. • consider strategies for uncovering patterns and for using patterns to solve problems. • recognize important aspects of mathematical problem solving, including perseverance.	**Students will...** • build upon their problem-solving skills as they consider alternative strategies for solving the problem presented. • model real-world situations with a range of representations. • construct arguments to critique the reasoning of classmates. • use appropriate units in their calculations. • make generalizations after noticing repeated calculations with operations.

Learning Objectives	
Knowledge	**Skills highlights**
Students will ... • see themselves as doers of math. • understand the habits of mind that are part of the problem-solving process. • understand classroom norms that are integral to a productive math learning environment.	**Students will be skilled at...** • using the habits of mind that are part of the problem-solving process. • constructing arguments to support their mathematical thinking. • using precise language when constructing arguments. • applying the habits of mind that are part of the problem-solving process as they solve problems. • seeing themselves as doers of math to solve problems efficiently. • using the language of mathematics when engaging in mathematical discourse. **Students will use math language to build skills in...**

Learning Objectives	
	• defining, revising, and refining their ideas verbally and in writing. • making conjectures by reflecting on learning and current understanding through writing words, phrases, or sentences. • critiquing and clarifying students' written ideas and arguments as well as those of others in a collaborative and supportive manner. • creating, writing or sharing verbally unique questions related to a situation or scenario. • comparing and connecting different possible approaches to solving problems. • discussing which tools and strategies, including words, symbols, diagrams, physical models, and technology students know can help them solve a problem and defend their ideas.

ASSESSMENT EVIDENCE

- Math Attitude Survey (Unit 1 only)
- Lesson quizzes
- Exit tickets
- Math probes
- Unit assessment

Unit 1: Math Is

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RESOURCES

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McGraw Hill Reveal Math (2025) - teacher edition Course 3: Volume 1 - teacher edition Course 3: Volume 2 - Student edition Course 3: Volume 1 print and digital -Student edition Course 3: Volume 2 print and digital	McGraw Hill ALEKS (2025) IXL Math (2025)	