

PA CORE STANDARDS

Mathematics

Standards cannot be viewed or addressed in isolation, as each standard depends upon or may lead into multiple standards across grades; thus, it is imperative that educators are familiar with both the standards that come before and those that follow a particular grade level. These revised standards reflect instructional shifts that cannot occur without the integrated emphasis on content and practice.

Standards are overarching statements of what a proficient math student should know and be able to do. The Pennsylvania Assessment Anchors and Eligible Content closely align with the revised standards and are an invaluable source for greater detail.

Key Points in Mathematics

- The standards stress both procedural skills and conceptual understanding to ensure students are learning and applying the critical information they need to succeed at higher levels.
- K–5 standards, which provide students with a *solid foundation in whole numbers, addition, subtraction, multiplication, division, fractions, and decimals*, help young students build the foundation to successfully apply more demanding math concepts and procedures, and move into application. They also provide detailed guidance to teachers on how to navigate their way through topics such as *fractions, negative numbers, and geometry*, and do so by maintaining a continuous progression from grade to grade.
- Having built a strong foundation at K–5, students can do hands-on learning in geometry, algebra, and probability and statistics. Students who have mastered the content and skills through the seventh grade will be *well-prepared for algebra* in grade 8.
- High school standards emphasize *practicing applying mathematical ways of thinking to real world issues and challenges*.

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INTRODUCTION

The Pennsylvania Core Standards in Mathematics in grades PreK–5 lay a solid foundation in whole numbers, addition, subtraction, multiplication, division, fractions, and decimals. Taken together, these elements support a student’s ability to learn and apply more demanding math concepts and procedures. The middle school and high school standards call on students to practice applying mathematical ways of thinking to real world issues and challenges; they prepare students to think and reason mathematically. Additionally, they set a rigorous definition of college and career readiness by demanding that students develop a depth of understanding and ability to apply mathematics to novel situations, as college students and employees regularly do. Although the **standards are not a curriculum** or a prescribed series of activities, school entities will use them to develop a local school curriculum that will meet local students’ needs.

This document includes PA Core Standards for **Mathematical Content** and **Mathematical Practice**. The mathematics standards define what students should understand and be able to do. Mathematical Practice Standards describes the habits of mind required to reach a level of mathematical proficiency.

PA Core Standards <i>Mathematical Content and Mathematical Practice</i>		
Standards for Mathematical Content		Standards for Mathematical Practice
2.1 Numbers and Operations A) <i>Counting and Cardinality</i> B) <i>Numbers and Operations in Base Ten</i> C) <i>Numbers and Operations—Fractions</i> D) <i>Ratios and Proportional Relationships</i> E) <i>The Number System</i> F) <i>Number and Quantity</i>		<ul style="list-style-type: none">• <i>Make sense of problems and persevere in solving them.</i>• <i>Reason abstractly and quantitatively.</i>• <i>Construct viable arguments and critique the reasoning of others.</i>• <i>Model with mathematics.</i>• <i>Use appropriate tools strategically.</i>• <i>Attend to precision.</i>• <i>Look for and make use of structure.</i>• <i>Look for and make sense of regularity in repeated reasoning.</i>
2.2 Algebraic Concepts A) <i>Operations and Algebraic Thinking</i> B) <i>Expressions & Equations</i> C) <i>Functions</i> D) <i>Algebra</i>		
2.3 Geometry A) <i>Geometry</i>		
2.4 Measurement, Data, and Probability A) <i>Measurement and Data</i> B) <i>Statistics and Probability</i>		

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The PA Core Standards for Mathematics detail four standard areas: *Numbers and Operations*, *Algebraic Concepts*, *Geometry*, and *Measurement, Data, and Probability*. These standard areas are reflective of the reporting categories in the PA Core Assessment Anchors and Eligible Content. The intent of this document is to provide a useful tool for designing curriculum, instruction, and assessment. The grade level curriculum and instructional shifts in mathematics cannot occur without the integrated emphasis on content and practice. The chart below illustrates the four standard areas and the development and progression of the strands, with an understanding that all is framed around the Standards for Mathematical Practice.

Mathematical Standards: Development and Progression												
Standards for Mathematical Practice												
Make sense of problems and persevere in solving them. Construct viable arguments and critique the reasoning of others. Use appropriate tools strategically. Look for and make use of structure.						Reason abstractly and quantitatively. Model with mathematics. Attend to precision. Look for and express regularity in repeated reasoning.						
	PreK	K	1	2	3	4	5	6	7	8	HS	
2.1 Numbers and Operations	(A) Counting & Cardinality											
		(B) Numbers and Operations in Base Ten					(D) Ratios and Proportional Relationships			(F) Number and Quantity		
					(C) Numbers and Operations — Fractions			(E) The Number System				
2.2 Algebraic Concepts	(A) Operations and Algebraic Thinking						(B) Expressions and Equations			(D) Algebra		
										(C) Functions		
2.3 Geometry	(A) Geometry											
2.4 Measurement, Data, and Probability	(A) Measurement and Data							(B) Statistics and Probability				