

# Mathematics

## Program for Grades K - 12

In keeping with Maryland and national education goals, Harford County Public Schools personnel are committed to providing challenging mathematics programs that well-prepare students for the rigors of life-long learning. International studies, state mandates, citizens, mathematics specialists, and department chairs all provide information that helps define the HCPS mathematics program. Recent initiatives include:

- implementation of the *Common Core State Standards (CCSS)* and *Mathematical Practices*,
- expansion of enrichment and intervention opportunities for students,
- expansion of professional learning opportunities for teachers, and
- implementation of classroom practices that consistently challenge students to compute fluently, reason logically, and communicate thinking succinctly.



### Maryland College and Career Ready Standards

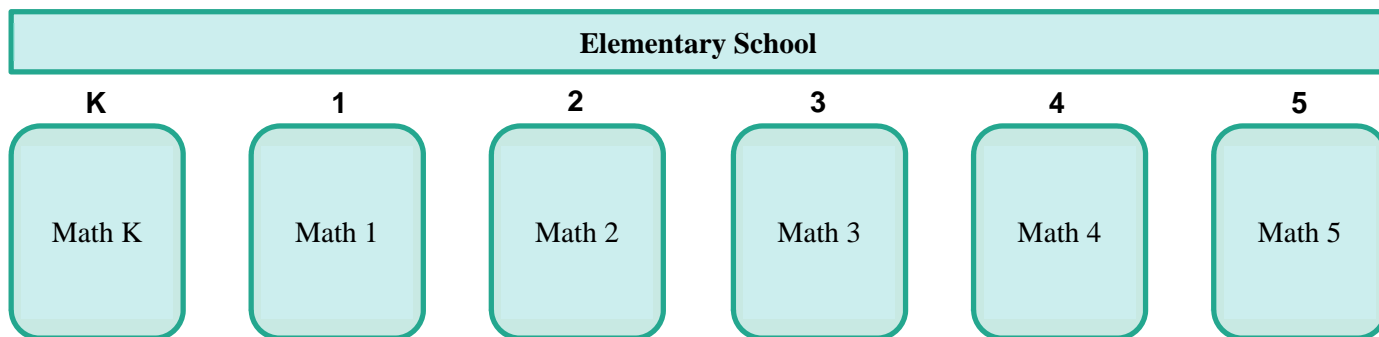
International studies indicate that mathematics knowledge of U.S. students consistently lags behind that of students in 20 other countries. To address this deficiency, the U. S. Department of Education reviewed the mathematics education practices in the 20 countries that outperform the United States and worked to develop new mathematics standards that describe what students should know and be able to do at each grade level, K-12. The resulting *Common Core State Standards (CCSS)* provide clear direction for the implementation of a focused, coherent, and rigorous curriculum that prepares students for college and careers. *CCSS Mathematical Practices* are integrated into all mathematics curricula from kindergarten through grade 12. Maryland has embraced and refined the CCSS to develop the Maryland College and Career Ready Standards.

### Mathematical Practices

Mathematically proficient students ...

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

More information about *CCSS* and the *Mathematical Practices* can be found at <http://www.corestandards.org>.



### Critical Mathematical Content

**Kindergarten** Count, compare, and classify objects; understand addition as putting together and subtraction as taking apart; identify geometric shapes

**Grade 1** Represent and solve addition and subtraction problems; add and subtract within 20; understand place value to 100; measure length and time; combine shapes

**Grade 2** Solve addition and subtraction word problems; fluently add and subtract within 20; work with equal groups to prepare for multiplication; understand place value to 1000; measure and estimate lengths; work with time and money; interpret data

**Grade 3** Solve multiplication and division problems, multiply and divide within 100, develop understanding of fractions (especially unit fractions), relate arrays, area and multiplication, analyze geometric figures

**Grade 4** Fluently multiply and divide multi-digit whole numbers; find equivalent fractions; add and subtract fractions with like denominators; multiply fractions by whole numbers; understand place value; classify geometric figures based on properties

**Grade 5** Fluently add and subtract fractions; develop understanding of multiplication and division of unit fractions and whole numbers; divide whole numbers with two-digit divisors; perform operations with decimals; determine volume



*Proficient students expect mathematics to make sense. They take an active stance in solving mathematical problems. When faced with a non-routine problem, they have the courage to plunge in and try something, and they have the procedural and conceptual tools to carry through. They are experimenters and inventors, and can adapt known strategies to new problems. They think strategically.*

*Common Core Standards Initiative  
2010*

Middle School			High School			
6	7	8	9	10	11	12
Math 6	Intro to Algebra Grade 7	Algebra I Grade 8	Geometry	Algebra II	Trig	Pre-Calculus or AP Statistics
Pre-Algebra	Algebra I Grade 7	Geometry	Algebra II	Trig/Pre-Calc	AP courses	AP courses
	Math 7	Intro to Algebra Grade 8	Algebra I	Geometry	Algebra II	Math Electives

This chart shows course options for middle and high school students. There may be varied formats for high school courses.

- Students who are successful in grade level content have an opportunity to complete an algebra course in middle school and Advanced Placement courses (AP Calculus, AP Statistics, or AP Computer Science) in high school.
- Students who demonstrate exceptional proficiency with both content and Mathematical Practices may be ready for advanced work in middle and high school. For example, Pre-Algebra for sixth graders will include the grade 6 and grade 7 outcomes in one year and Algebra I Grade 7 will combine the Introduction to Algebra and Algebra I into one course in grade 7.
- Students who need additional support with extended time to successfully complete grade level mathematics, will have an opportunity to enroll in Algebra II and courses beyond Algebra II.

### College and Career Readiness

The Harford County Public Schools mathematics curriculum is comprised of a set of well-articulated mathematics learning objectives that sequentially prepare students to successfully gain admission to college and engage in the challenges of higher education and the workplace. The U. S. Department of Education, the Maryland State Board of Regents for the University System of Maryland (USM), the Maryland State Board of Education, and the Harford County Public Schools have established high standards for college and career readiness. Beginning in 2015, students seeking admission to USM colleges and universities must have completed four credits in mathematics, including Algebra II and at least one credit in mathematics in each year that they are in high school. Students who complete Algebra I and/or Geometry by the end of grade 8 will earn non-mathematics elective high school credit.



## Parent Checklist for Supporting Mathematics Learning

- ☺ Have a positive attitude toward mathematics.
- ☺ Set high expectations.
- ☺ Discuss the mathematics being learned in class.
- ☺ Find opportunities to do mathematics every day.
- ☺ Be open to a variety of ways to solve a problem.
- ☺ Work on puzzles and other engaging mathematics problems.
- ☺ Discuss the mathematics found in sports statistics and other real-world applications of mathematics.
- ☺ Use computers and calculators, as well as pencil and paper, to solve problems.
- ☺ Discuss why (or why not) an answer to a mathematics problem is reasonable.
- ☺ Practice memorized facts.
- ☺ Monitor homework.
- ☺ Make mistakes a part of learning.
- ☺ Encourage enrollment in challenging courses.



### Which state and national mathematics tests will my child take during the 2016-17 school year?

Grades 3-8	PARCC
Algebra I	High School Assessment PARCC (Graduation Requirement)
Algebra II	PARCC
Grades 10-11	PSAT
Grades 10-12	SAT or ACT
AP courses	AP Calculus, AP Statistics, AP Computer Science

