

# Mathematics

The goal of the Montgomery County Public Schools pre-K–12 mathematics program is for all students to achieve mathematical proficiency through mastery of mathematical skills, concepts, and processes. The end result is the ability to think and reason mathematically and use mathematics to solve problems in authentic contexts.

The mathematics curriculum at each grade level is organized into units of instruction. The following statements provide an overview of what students should know and be able to do by the end of each unit in Math 5. Throughout all units, students will apply concepts and skills to solve problems, communicate and reason mathematically, and make mathematical connections.

## Unit 1

- Identify and apply prime and composite numbers less than 100 and rules of divisibility.
- Determine and apply the greatest common factor and least common multiple of numbers.
- Recognize and represent functional relationships using graphs, tables, and rules.
- Compare and order integers on a number line.

## Unit 2

- Identify, describe, compare, and classify 2- and 3-dimensional figures using relevant properties.
- Measure angles and identify their parts.
- Describe relationships among the radius, diameter, center, and circumference of a circle.
- Draw geometric figures using tools and technology.

## Unit 3

- Compute with whole numbers.
- Translate among fractions, decimals, and percents.
- Compare and order decimals to the thousandths place.
- Solve problems with fractions, decimals, and percents using a variety of strategies.

## Unit 4

- Organize data using a variety of graphic displays.
- Analyze and interpret graphs, including stem and leaf plots.\*
- Compute and compare the mean, median, mode, and range of data sets.

## Unit 5

- Select appropriate measurement attributes, tools, and units to solve problems.
- Estimate and determine the perimeter and area of a closed figure.
- Develop and use formulas to determine the volume of a rectangular prism.
- Identify transformations in tessellations.

## Unit 6

- Write and evaluate simple algebraic expressions.
- Use mathematical properties to solve problems.
- Describe the probability of an event using a fraction or a ratio.
- Make predictions based on probability experiments.

\*A stem and leaf plot is a method of organizing data for the purpose of comparison.

## Curriculum Resources for Parents

Parents should first consult the recommended resources listed under "How Parents Can Access Curriculum Resources," page ii.

Sites recommended by the

National Council of Teachers of Mathematics:

**National Council of Teachers of Mathematics Illustrations**, [www.illustrations.nctm.org](http://www.illustrations.nctm.org). From the NCTM website. A comprehensive organization of math investigations, lessons, tools, and resources. Call 703-620-9840.

**Math Archives**, "Topics in Mathematics," [www.archives.math.ohio.edu/topic/](http://www.archives.math.ohio.edu/topic/). Dozens of basic and advanced math topics with links to related sites and lessons. Contact SunSite, University of Tennessee, Mathematics Dept., Knoxville, TN 37996.

**Education Place**, "Brain Teasers," [www.eduplace.com/math/brain/](http://www.eduplace.com/math/brain/). Provided by Houghton Mifflin Company this site contains a weekly word problem and solution for Grades 3-4, 5-6, and 7-8.

**Figure This**, [www.figurethis.org/](http://www.figurethis.org/). National Council of Teachers of Mathematics. Funded by the U.S. Department of Education and the National Science Foundation. Go to "Math Index." The site provides puzzle-type applications in a variety of algebra, geometry, measurement, number, and statistics/probability subtopics, and includes answers. Each item features a note on where the math can be applied in the real world. Contact NCTM, 1906 Association Drive, Reston, VA 20191-1502. Call 703-620-9840.

**Math Forum @ Drexel**, [www.mathforum.org](http://www.mathforum.org). Drexel University. A large site with a useful arithmetic/early mathematics link of activities and problems related to basic operations and other basic mathematical topics. Provides a vast selection of resources. Contact the Math Forum, 3210 Cherry Street, Philadelphia, PA 19104. Call 800-756-7823.

**Helping Your Child Learn Math**, Produced by USDE, 1999, [www.ed.gov/pubs/parents/Math/](http://www.ed.gov/pubs/parents/Math/). Provides math applications to real-life situations. This second edition of Helping Your Child Learn Math is for parents of children in kindergarten through fifth grade. It has been revised to include a variety of activities that will help children learn and apply mathematical concepts such as geometry, algebra, measurement, statistics, and probability in a useful and fun way. All of the activities in this book relate math to everyday life and complement many of the math lessons that children are learning in school. Call 800-USA-LEARN.

### OTHER MATH SITES:

**www.multiplication.com**, [www.multiplication.com/parents.htm](http://www.multiplication.com/parents.htm). The parents page provides multiple strategies for teaching the times tables. Also includes games, flashcards, worksheets, other activities, and other resources. The site employs two instructional strategies—traditional and interactive/innovative techniques with pictures, rhymes, and stories.

**AAA Math**, [www.aaamath.com](http://www.aaamath.com). This site contains hundreds of pages of basic math skills, which are sorted by math topics and grade levels K-8. It includes explanations of topics, practice, games, problems, and interactive practice activities. A traditional, yet fun, approach. Contact AAA Math, Box 16498, Albuquerque, NM 87191.

# Reading/Language Arts

The Montgomery County Public Schools elementary reading/language arts program reflects the integrated nature of a balanced literacy program. The elementary reading program provides instruction in the five components of reading—Phonemic Awareness (in kindergarten and Grade 1 only), Phonics, Vocabulary, Fluency, and Comprehension—and engagement in independent reading. Both reading purposes—Reading for Literary Experience and Reading to Be Informed—receive equal instructional attention. The elementary language arts program encompasses writing instruction, which includes teaching the writing process and traits of effective writing (Ideas, Organization, Word Choice, Voice, Sentence Fluency, and Conventions.) The three writing purposes—Writing to Express Personal Ideas, Writing to Inform, and Writing to Persuade—receive instructional attention. The processes of listening and speaking are integrated into all of the components of a comprehensive, balanced literacy program.

## Reading

### Vocabulary

- Uses knowledge of word parts, root words, relationships between and among words (synonyms, analogies), and multiple meanings to determine meaning and pronunciation.
- Acquires and expands vocabulary through reading a wide variety of material.

### Fluency

- Reads grade-level text accurately with expression.

### Comprehension

- Reads grade-level text for different purposes: literary experience (e.g., stories, plays, poems) and to be informed (e.g., articles and directions).
- Applies reading strategies used before, during, and after reading text.

#### BEFORE-READING STRATEGIES

- Determines a purpose for reading.
- Previews text and formulates questions.
- Uses background knowledge and previews text to make predictions and ask questions.

#### DURING-READING STRATEGIES

- Makes connections to the text.
- Uses sensory images to understand text.
- Confirms or alters predictions.
- Uses strategies to fix what does not make sense.
- Rereads to confirm or alter understanding.
- Determines the importance of information in text.
- Answers or refines questions.
- Makes inferences (i.e., draws conclusions, identifies cause/effect relationships).
- Uses characteristics of fiction and informational text to aid comprehension.
- Identifies the organization of text to gain meaning.

#### AFTER-READING STRATEGIES

- Responds to reading through discussion.
- Rereads to clarify or extend meaning.
- Identifies author's message.
- Summarizes text.
- Evaluates information read.
- Explains how tone is reflected in the author's style.
- Analyzes the various techniques used by the author to influence the reader.
- Responds to comprehension questions in writing.
- Selects and independently reads at least 25 grade-level-appropriate books.

## Writing

- Uses the writing process (prewriting, first draft, revising, editing/proofreading, publishing).
- Writes independently for a variety of purposes (for personal expression, to inform, to persuade) and for an extended period of time.
- Determines purpose and audience and maintains focus for writing.
- Revises writing by using criteria or checklists.
- Edits writing using standard English language conventions correctly (complex sentence structure, varied punctuation, usage) to clearly communicate message.
- Selects appropriate structures and features of language for purpose, audience, and content.
- Shows evidence of traits of effective writing.
- Uses resources effectively to spell words.
- Develops multi-paragraph composition using a clear organizing structure.
- Connects descriptions in ways that make a topic clear and interesting to the reader.
- Uses strong beginnings to engage the reader.
- Develops a research question based on a selected topic and uses multiple resources to locate information.

## **LISTENING AND SPEAKING SKILLS AND STRATEGIES ARE LEARNED AND APPLIED DURING READING AND WRITING INSTRUCTION.**

- Gathers and conveys information from listening.
- Determines a speaker's point of view by tone of voice and body language.
- Plans and delivers effective oral presentations using visual aids and technology.
- Uses criteria for peer review of oral presentations.
- Speaks in a variety of situations, using an appropriate organizational pattern.

## **TEXT CHARACTERISTICS**

- Book and print features
- Sentence complexity
- Content
- Themes
- Ideas
- Language and literary features
- Text structure

By examining how the book supports the developing reader and the challenges that are present, appropriate books can be matched to students for small-group instruction to help them progress as readers. Text characteristics provide a guide to help teachers select the best text to use for instructional purposes. Grade-level-appropriate books are designated by the following list of criteria.

## **Grade 5 text characteristics**

- Small print and reduced word spacing.
- Different text organizations.
- Variety and complexity of text structures, such as problem-solution and chronological order.
- Text requires readers to retain and recall information for an extended period of time.
- Complex ideas and more sophisticated language, including figurative language.
- Longer descriptive narratives.
- Density of text increases.
- Meaning at a literal and figurative level.
- More sophisticated themes and abstract and complex topics.
- New genre introduced—science fiction and memoir.
- Informational text with complex organizational patterns and text features.

Adapted from *Leveled Books for Readers: Grades 3–6*. Fountas and Pinnell.

## **Curriculum Resources for Parents**

*Parents should first consult the recommended resources listed under "How Parents Can Access Curriculum Resources," page ii.*

### **Reading/Language Arts**

**National Council of Teachers of English**, [www.ncte.org/search?q=parents](http://www.ncte.org/search?q=parents). Designed specifically to help parents help their children. Assorted topics. Contact NCTE, 1111 Kenyon Road, Urbana, IL 61801-1096. Call 217-328-3870 or 877-369-6283.

**International Reading Association**, [www.reading.org/InformationforParents.aspx](http://www.reading.org/InformationforParents.aspx). Go to a variety of topics—also in Spanish. Contact IRA, 444 North Capitol Street, NW, #630, Washington, D.C. 20001. Call 202-624-8800.

### **Helping Your Child Publication Series**

[ed.gov/parents/academic/help/hyc.html](http://ed.gov/parents/academic/help/hyc.html)

Designed to provide parents with lessons and activities to help their school aged and preschool children master reading, understand the value of homework and develop skills.

### **Other Reading/Language Arts Sites:**

**Guide to Grammar and Writing**, Capital Community College, Hartford, Conn. <http://grammar.cc.commnet.edu/grammar>. This site contains an extensive collection of grammar, mechanics, language, usage, and writing topics, easily accessed by multiple indexes. This very comprehensive site addresses rules, examples, exercises, and quizzes. Call 806-906-5000.

**Read, Write, Now! Activities for Reading and Writing Fun**, [www.udel.edu/ETL/RWN/Activities.html](http://www.udel.edu/ETL/RWN/Activities.html). Produced by the U.S. Department of Education in collaboration with the International Reading Association and Reading is Fundamental. This site includes reading activities and reading lists for children through Grade 6. Listed as a resource in MCPS website Weblinks/"Internet Resources: Great for Homework." Call 800-860-9228 or 800-872-5327.

NOTE: Please be aware that Internet sites occasionally discontinue and addresses often change.