Mathematical Proficiency and Common Core State Standards Mathematical Practices

The goal of the Montgomery County Public Schools Pre-K—12 mathematics program is for all students to achieve mathematical proficiency by developing both conceptual understanding and procedural fluency. The end result is the ability to think and reason mathematically and use mathematics to solve problems in authentic contexts.

—Elementary Integrated Curriculum Pre-K—12 Mathematics Curriculum Framework (Original Approval: July 2001)

What is mathematical proficiency?

STRANDS OF MATHEMATICAL PROFICIENCY

Applying

Being able to formulate problems mathematically and to devise strategies for solving them using concepts and procedures appropriately

Computing

Carrying out mathematical procedures, such as adding, subtracting, multiplying, and dividing numbers flexibly, accurately, efficiently, and appropriately

Reasoning

Using logic to explain and justify a solution to a problem or to extend from something known to something not yet known

Understanding

Comprehending mathematical concepts, operations, and relations—knowing what mathematical symbols, diagrams, and procedures mean

Engaging

Seeing mathematics as sensible, useful, and doable—if you work at it—and being willing to do the work

What do mathematically proficient students do?

COMMON CORE STATE STANDARDS MATHEMATICAL PRACTICES

Practices ***Mathematically proficient students:***	**Examples** ***Mathematically proficient students:***
Make sense of problems and persevere in solving them	Plan a solution pathway rather than simply jumping into a solution attempt
Reason abstractly and quantitatively	Attend to the meaning of quantities, not just how to compute them
Construct viable arguments and critique the reasoning of others	Justify their conclusions, communicate them to others, and respond to the arguments of others
Model with mathematics	Apply the mathematics they know to solve problems arising in everyday life
Use appropriate tools strategically	Consider the available tools when solving a mathematical problem, and make sound decisions about when each of these tools might be helpful
Attend to precision	Calculate accurately and efficiently; give carefully formulated explanations
Look for and make use of structure	Notice, for example, that 3 and 7 more is the same amount as 7 and 3 more or sort a collection of shapes according to how many sides the shapes have
Look for and express regularity in repeated reasoning	Look both for general methods and for shortcuts; evaluate the reasonableness of their intermediate results