# Mathematics Advanced 4
## Year-at-a-Glance

<table>
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<tr>
<th>Unit Number and Title</th>
<th>Standards</th>
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<th>Essential Questions</th>
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</table>
| **Unit 1:** Expressions, Equations & Volume | 3.OA.7, 4.OA.3*, 4.OA.4, 4.OA.5, 4.NBT.1, 4.NBT.2, 4.NBT.4, 4.NBT.5*, 4.NBT.6*, 5.OA.1*, 5.OA.2*, 5.NBT.6*, 5.NF.5, 5.MD.3*, 5.MD.4, 5.MD.5* | • Multiplication and division are inverse operations.  
• Using different models and strategies for multiplication and division can lead to efficient computation.  
• Understanding properties of operations promotes efficient computation.  
• Relational thinking can be used to interpret and relate expressions using symbols and tables.  
• Estimation serves as a tool for judging reasonableness of computations.  
• Algebraic expressions and equations can be used to symbolically represent real life situations.  
• Volume of rectangular prisms can be found by using a formula. | • How does understanding multiplication help you understand division?  
• Why is it important to use models and multiple strategies for solving multiplication and division problems?  
• What are flexible, effective, and efficient methods of computation?  
• Why is it important to estimate when computing?  
• What are the benefits or representing relationships in various ways?  
• What is the meaning of volume of a solid figure?  
• How can the volume of a right rectangular prism be found? | Use Grade 5 Bridges resources unless otherwise noted | 10/12/22 |

* indicates standards that are assessed through the Unit Post-Assessment.

Baltimore County Public Schools  
Office of Mathematics PreK-12  
July 2022
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| **Unit 2: Adding & Subtracting Fractions** | 3.NF.2, 4.NF.1, 4.NF.2, 4.NF.3, 4.NF.4, 5.NF.1*, 5.NF.2*, 5.NF.3*, 5.NF.4*, 5.NBT.7 | • A fraction can be expressed in numerous ways.  
• Representing a fraction or decimal in an alternate way might make it easier to compare with other fractions or decimals and to compute.  
• Computation with fractions is an extension of computation with whole numbers.  
• A fraction is relative to the size of the whole or unit. | • How can representing a fraction or a decimal in an alternate way help you compare and compute with efficiency?  
• How can models be used to compute fractions with like and unlike denominators?  
• How are models used to show how fractional parts are combined or separated?  
• Why do we need common denominators to add or subtract fractions?  
• How do I explain how changing the size of the whole affects the size or amount of a fraction? | **Unit 2 Screener (M1S2)**  
Checkpoints:  
• Fraction Addition & Subtraction (M2S6)  
• Working with Fractions (M3S3)  
Work Samples:  
• Fractions (M1S5) | **12/6/22** |

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| **Unit 3: Place Value & Decimals** | 4.NF.1, 4.NF.2, 4.NF.3, 4.NF.5, 4.NF.6, 4.NF.7, 5.NBT.1, 5.NBT.2*, 5.NBT.3*, 5.NBT.4*, 5.NBT.6*, 5.NBT.7*, 5.NF.1, 5.MD.1* | - Students use exponents to write powers of ten and apply this understanding to write multi-digit whole numbers in expanded form with exponents. Writing decimals in expanded form is an extension of writing whole numbers in expanded form.  
- Students apply their understanding of the structure of the base ten number system to use place value concepts to compare, order, round, and estimate decimal numbers.  
- Students calculate sums and differences of decimals by using models, properties of operations, and place value understanding.  
- Place value concepts for whole number operations can be applied to decimal operations.  
- Division procedures are based on the meanings of base-ten numerals and properties of operations.  
- The relationship between division and multiplication allows for multiple strategic approaches for solving a division problem. | - How does understanding the structure of the number system help you solve problems?  
- How does representing mathematical ideas using models help you to understand and communicate those ideas?  
- How are decimals related to fractions?  
- How does the base ten system apply to representing numbers using exponents?  
- How are exponents connected to multiplication?  
- How can multiplication be used to solve a division problem? | Unit 3 Screener (M1S1)  
Checkpoints:  
- Fractions & Decimals (Grade 4, Unit 3 M3S4)  
- Decimal Place Value 1 (M2S4)  
- Decimal Place Value 2 (M3S1)  
Work Samples:  
- Decimal Equivalencies (M2S3)  
Unit 3 Assessment (M4S4)  
- Administered through Schoology Performance Matters | 2/3/23 |

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| Unit 4: Multiplying & Dividing Whole Numbers & Decimals | 4.OA.4, 4.NBT.5, 5.OA.1, 5.OA.2*, 5.NBT.5*, 5.NBT.6*, 5.NBT.7*, 5.NF.4*, 5.MD.1, 5.MD.5 | - Multiplication and division are inverse operations.  
- Strategies used to multiply whole numbers and decimals numbers can also be used to divide whole numbers and decimal numbers.  
- The standard algorithm is a useful tool when multiplying whole numbers. | - How are multiplication and division inverse operations?  
- What strategies can be used to multiply and divide whole numbers and decimal numbers?  
- How is the standard algorithm related to ratio tables, area models, and partial products? | Unit 4 Screener (M1S1)  
Checkpoints:  
- Multiplication & Division (M2S4)  
- Multiplication Algorithm (M4S1)  
Work Sample:  
- Multiplication (M2S1)  
Unit 4 Assessment (M4S5)  
- Administered through Schoology Performance Matters | 3/8/23 |

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| Unit 5: Multiplying & Dividing Fractions | 5.NBT.6 5.NF.1 5.NF.4* 5.NF.5* 5.NF.6 5.NF.7* | • Understand and explain the effects of multiplication and division when using fractions.  
  • Multiplication does not always lend itself to producing a product bigger than either or both of the factors used.  
  • When a given number is multiplied by a fraction less than 1, the product is less than the given number.  
  • Division does not always produce a smaller quotient than the dividend and/or divisor.  
  • Quotients that are greater than the dividend when a whole number is divided by a fraction less than 1.  
  • The importance of knowing and understanding both interpretations of division, sharing and grouping, is required to make sense of division with fractions. | • How are multiplication and division similar and different when computing problems with fractions?  
  • Why does multiplication not always result in a product bigger than either or both of the factors used?  
  • Why is the product less than the given number when multiplying by a fraction less than 1?  
  • Why does division not always produce a smaller quotient than the dividend and/or divisor?  
  • Why is it important to know and understand the different interpretations of division, sharing and grouping?  
  • How does understanding the context of a division problem, as it pertains to sharing and grouping, effect the solution path and outcome of the mathematical problem? | Unit 5 Screener (M1S1)  
  Checkpoints:  
  • Whole Number Times a Fraction (M2S1)  
  • Fraction Times Fraction (M3S4)  
  Unit 5 Assessment (M4S6)  
  • Administered through Schoology Performance Matters | 4/17/23 |

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| **Unit 6:** Graphing, Geometry & Volume | 5.OA.1 5.NBT.6* 5.NF.4 5.NF.5 5.NF.6 5.MD.3 5.MD.4 5.MD.5* | • Volume can be calculated using the volume formula: length x width x height.  
• Area models can be an efficient strategy to solve multiplication problems.  
• Ratios can be used to determine dimensions of rectangular shapes.  
• Area of a rectangle with fractional side lengths can be found through tiling or by multiplying the side lengths. | • What is the meaning of volume of a solid figure?  
• How can the volume of a right rectangular prism be found?  
• What makes the area model an efficient strategy to solve multiplication problems?  
• How does the area model for multiplication relate to other efficient strategies for multiplication?  
• How can a ratio and proportion be used to calculate the dimensions of a rectangle and used to create scaled shapes? | Unit 6 Screener (M1S1)  
Checkpoints:  
• Multiplying Mixed Numbers & Fractions (M4S3)  
Unit 6 Assessment (M4S4)  
• Administered through Schoology Performance Matters | 5/11/23 |

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| Unit 7: Division & Decimals | 5.OA.1 5.NBT.1 5.NBT.2* 5.NBT.6* 5.NBT.7* 5.NF.3 5.NF.4 5.NF.7* | • Division of whole numbers and decimals can be calculated using equations, rectangular arrays, and/or area models.  
• Observe, describe, and explain patterns in the number of zeros in the products, as well as patterns in the placement of the decimal point when multiplying or dividing by powers of 10.  
• Multiplication can be used to solve division problems because they are inverse operations.  
• Understand and explain the effects of dividing whole numbers and decimals.  
• Division procedures are based on the meanings of base-ten numerals and properties of operations.  
• The relationship between division and multiplication allows for multiple strategic approaches for solving a division problem. | • What is the relationship of the division strategies taught throughout this unit?  
• How does the placement of the decimal point change when dividing by powers of 10?  
• How does using multiplication help when solving division problems?  
• What patterns do you notice in the quotient when dividing by decimal numbers and whole numbers? | Unit 7 Screener (M1S1)  
Checkpoints:  
• Division (M1S6)  
• Fraction Division (M2S4)  
• Powers of Ten (M4S1)  
Work Samples:  
• Division Problems (M2S2)  
Unit 7 Assessment (M4S4)  
• Administered through Schoology Performance Matters | 6/13/23 |

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