**Approved Supplemental Mathematics Reference Sheet—Grade 4**

***ONLY*** for use by students on the MCAS Mathematics test who have this accommodation listed in their IEP or 504 plan

**Note**: Students may NOT use a reference sheet on which the tables have already been completed prior to the beginning of the test administration, and test administrators MUST check to confirm that they are providing students with blank sheets.

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| **General Problem-Solving Process** | **Order of Operations** |
| 1. Read/reread the problem for understanding.
2. Identify what the question is asking.
3. Make a plan to solve the problem. (*Choose at least one strategy.*)
	* Draw a picture.
	* Create a table, chart, or list.
	* Look for a pattern.
	* Work backwards.
	* Write a number sentence or an equation.
4. Solve the problem.
5. Reread the problem to see if your solution makes sense.
 | **PEMDAS*** **P**arentheses (brackets, etc.)
* **E**xponents
* **M**ultiplication or **D**ivision (left to right)
* **A**ddition or **S**ubtraction (left to right)
 |
| **GEMA**1. **G**rouping
2. **E**xponents
3. **M**ultiplicative operations (multiplication or division – left to right)
4. **A**dditive operations (addition or subtraction – left to right)
 |
| **Hundreds Charts** |
| Hundreds chart  | Hundreds chart |
| **Geometric Measurement** | **Divisibility Rules** |
| *P* = perimeter; *A* = area; $l=length; w=width$Perimeter of Rectangle: *P* = $l$+ $l $+ *w* + *w*Area of Rectangle: $A=l×w$

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|  $l$ |  |
| *A* | $$w$$ |

Area Model:  |

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| 2 | If the last digit is even |
| 3 | If the sum of the digits can be divided by 3 |
| 5 | If the last digit is 0 or 5 |
| 6 | If the number is divisible by both 2 and 3 |
| 9 | If the sum of the digits can be divided by 9 |
| 10 | If the last digit is 0 |

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| **Symbols** | **Conversions** |
| * > is greater than
* $<$ is less than
* $=$ is equal to
 | 1 pound = 16 ounces 1 day = 24 hours 1 yard = 3 feet 1 hour = 60 minutes 1 foot = 12 inches 1 minute = 60 seconds1 kilometer (km) = 1000 meters (m)1 meter (m) = 100 centimeters (cm)1 meter (m) = 1000 millimeters (mm)1 kilogram (kg) = 1000 grams (g)1 liter (L) = 1000 milliliters (mL) |
| **Place Value** |
| Whole number and decimal place values |
| **Number Line** |
| Number Line |

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| **Multiplication Table (NOTE: DO NOT COMPLETE THIS TABLE FOR THE STUDENT.)** |
| Multiplication table |

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| **Fraction Bars**  |
| Fraction Bars    |