

## Algebra I Mental Math, Estimation, and Fact to Know Strategies

**MM = Mental Math Strategy**

**ES = Estimation Strategy**

**FK = Fact to Know Strategy**

1. [MM] **Front End Strategy**. Perform the operation from left to right. [A,S,M,D]  
*Examples:*  $378 + 120 = 498$ .  $369 \div 9 = 41$ .  $48,320 \div 8 = 6,040$ .
2. [MM] **Compatible Numbers Strategy**. [A,S,M]  
*Examples:*  $25 + 8 + 6 + 12 + 25 = (25 + 25) + (8 + 12) + 6 = 50 + 20 + 6 = 76$ .  $2 \times 8 \times 5 \times 7 = (2 \times 5) \times (8 \times 7) = 10 \times 56 = 560$ .
3. [MM] **Compensation**. [A,M]  
*Examples:*  $18 \times 5 = 20 \times 5 - \text{"compensation"} = 20 \times 5 - 2 \times 5 = 100 - 10 = 90$ .  $65 + 38 = 65 + 40 - \text{"compensation"} = 105 - 2 = 103$ .
4. [MM] **Equal Additions Technique for Subtracting**. [S]  
*Example:*  $74 - 28 = 76 - 30 = 46$ .
5. [FK] **Double any number up to 50**  
*Examples:*  $28 \times 2 = 56$ .  $2 \times 47 = 94$ .
6. [ES] **Front-End Estimation with Adjustment**. [A,S,M,D]  
*Examples:*  $3185 \times 203 \approx 3000 \times 200 \approx 600000 + \text{"adjustm't"} \approx 640000$ . (When adjusting addition, consider the numbers you *did not use*, only adjust *up*, and always adjust the right-most place you used (which may be the *only* place you used!)).  $859 + 221 + 112 + 523 \approx 800 + 200 + 100 + 500 + \text{"adjustm't"} = 1600 + \text{"numbers not used do justify an increase of 100"} = 1600 + 100 \approx 1700$ .
7. [ES] **Clustering Technique for Addition**. [A]  
*Example:*  $712 + 699 + 694 \approx 700 \times 3 \approx 2100$ .
8. [MM] **10% of a Number** [M]  
*Example:* 10% of 12 = 1.2; 10% of 23,400 = 2,340.
9. [MM] **Adding with 5's in the Units Place**. [A]  
*Examples:*  $35 + 35 = 70$ .  $45 + 25 = 70$ .
10. [MM] **Cancel Zeros, Drop Some of the Zeros, Divide, Then "Put Them Back On."** [D]  
*Examples:*  $30000 \div 50 = 30 \div 5$  with two zeros = 600;  $4800 \div 60 = 80$ .
11. [MM] **Multiply by 4 by doubling twice** [M]  
*Examples:*  $18 \times 4 = 18 \times 2 \times 2 = 36 \times 2 = 72$ ;  $35 \times 4 = 70 \times 2 = 140$ .
12. [MM] **Divide by 4 by dividing by 2 twice** [D]  
*Examples:*  $68 \div 4 = 68 \div 2 \div 2 = 34 \div 2 = 17$ .
13. [MM] **To Multiply or Divide by 4, Use 2 Twice**. [M,D]  
*Examples:*  $4 \times 35 = 140$ .  $500 \div 4 = 125$ .  $84 \div 4 = 21$ .
14. [MM] **Think Multiplication Method of Dividing**. [D]  
*Example:*  $350 \div 7 = 50$  ( $7 \times \underline{\quad} = 350$ );  $486 \div 243 = 2$  ( $243 \times \underline{\quad} = 486$ ).
15. [FK] **Halve any even number  $\leq 100$** .  
*Examples:*  $68 \div 2 = 34$ . Half of 74 is 37.