

Eighth Grade Mental Math, Estimation, and Fact to Know Strategies Strategies #16-30

MM = Mental Math Strategy

ES = Estimation Strategy

FK = Fact to Know Strategy

16. [ES] **Rounding** [A,S,M,D]
Example: $28,319 - 1,978 \approx 28,000 - 2,000 = 26,000$.
17. [ES] **Substitute Compatible Numbers** [A,S,M,D]
Example: $38 \times 391 \times 26 \approx 40 \times 25 \times 391 = 1000 \times 391 \approx 391,000$. (Note that this is *not rounding*. You may not substitute for all numbers. That is, some numbers may be used as is.)
18. [FK] **Double any number up to 50**
Examples: $28 \times 2 = 56$. $2 \times 47 = 94$.
19. [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!)). $859 + 221 + 112 + 523 \approx 800 + 200 + 100 + 500 + \text{"adjustm't"} = 1600 + \text{"numbers not used do justify an increase of 100"} = 1600 + 100 \approx 1700$. [MM] **Multiply by a Unit Fraction by Dividing.** [M]
Examples: $\left(\frac{1}{5}\right) 35 = 35 \div 5 = 7$.
20. [MM] **Cancel Zeros, Drop Some of the Zeros, Divide, Then "Put Them Back On."** [D]
Example: $30000 \div 50 = 30 \div 5$ with two zeros = 600.
21. [FK] **Part-Part-Whole on 100.** [A,S]
Example: $100 - 41 = 59$.
22. [FK] **Multiply or Divide 11 & 12.** [M,D]
Examples: $12 \times 7 = 84$. $6 \times 11 = 66$.
23. [MM] **Multiply by 4 by doubling twice** [M]
Examples: $35 \times 4 = 35 \times 2 \times 2 = 70 \times 2 = 140$. $17 \times 4 = 17 \times 2 \times 2 = 34 \times 2 = 68$.
24. [MM] **Divide by 4 by dividing by 2 twice** [D]
Examples: $84 \div 4 = 84 \div 2 \div 2 = 42 \div 2 = 21$; $464 \div 4 = 464 \div 2 \div 2 = 232 \div 2 = 116$.
25. [MM] **Use Doubling when 2 is a Factor.** [M]
Examples: $6 \times 35 = 3 \times (2 \times 35) = 3 \times 70 = 210$. $13 \times 8 = 13 \times 2 \times 2 \times 2 = 26 \times 2 \times 2 = 52 \times 2 = 104$.
26. [FK] **Halve any even number ≤ 100 .** [D]
Examples: $68 \div 2 = 34$. $38 \div 2 = 19$.
27. [MM] **Multiply by a Unit Fraction by Dividing.** [M]
Examples: $\left(\frac{1}{5}\right) 35 = 35 \div 5 = 7$.
28. [MM] **Multiplying Decimals by dropping the decimal and putting it back in later.** [M]
Examples: $.80 \times .3 = 24$. $.5 \times .3 = .15$.
29. [MM] **Solve Proportions using Factor of Change** [M,D]
Example: Solve $\frac{2}{9} = \frac{a}{36}$, $a = 8$.
30. [FK] **Know Basic Percent-Fraction-Decimal Equivalences-multiples of 25%.** (0%, 25%, 50%, 75%, 100%)
Example: $75\% = \frac{3}{4} = .75$.