



fun with NUMBERS



Multiplication, using ① halves, ② doubles, ③ elimination and ④ addition ...

- General Rules: ① begin with the number you're going to multiply and reduce it by half until you arrive at "1"; ② any result ending in ".5" (e.g., $15 \div 2 = 7.5 \rightarrow 7.0$) is rounded down; ③ each number in the "multiplying number" column are doubled; ④ each row, in the first column, beginning with an even number, would be eliminated; and ⑤ the final column of doubled numbers that were not eliminated are added together for the final result.

we begin by reducing the "multiplying number" into a series of halves, rounding any decimals down ...

Step 1:

Halves

321
160.~~x~~
80
40
20
10
5
2.~~x~~
1

321 × 12

Doubles

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next ... we need to double the numbers, in the "Doubles" column, to deal with them next ...

Step 2:

Halves

321
160.~~x~~
80
40
20
10
5
2.~~x~~
1

321 × 12

Doubles

12
24
48
96
192
384
768
1,536
3,072

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here, we need to eliminate each row that contains an even number under the "Halves" column ...

Step 3:

Halves	321 × 12	Doubles
321		12
160 x		24
80		48
40		96
20		192
10		384
5		768
2 x		1,536
1		3,072

finally ... we need to add the numbers in the "Doubles" column to arrive at the final result ...

Step 4:

Halves	321 × 12	Doubles
321		12
160 x		
80		
40		
20		
10		
5		768
2 x		
1		3,072
		3,852
		(12 + 768 + 3,072)