

## Basic Multiplication Fact Categories

Category & Strategy	Examples	Extensions to Larger Numbers
<b>Categories Based on the Zero and Identity Properties of Multiplication</b>		
<b>Zero facts (<math>\times 0</math>)</b> $n \times 0 = 0$ The product of any number and 0 is 0.	$7 \times 0 = 0$ $0 \times 4 = 0$	$387 \times 0 = 0$ $0 \times 26 = 0$
<b>Ones facts (<math>\times 1</math>)</b> $n \times 1 = n$ The product of any number and 1 is that number.	$6 \times 1 = 6$ $1 \times 2 = 2$	$391 \times 1 = 391$ $1 \times 295 = 295$
<b>Doubles &amp; Related Facts</b>		
<b>Doubles facts (<math>\times 2</math>)</b> To multiply by 2, double the other number. This isn't a strategy so much as a category of facts that tend to come easily for many students.	$7 \times 2 = 14$ $2 \times 3 = 6$	$2 \times 125 = 150$ $14 \times 2 = 28$
<b>Doubles Plus One Set facts (<math>\times 3</math>)</b> $3 \times n = (2 + 1) \times n = 2 \times n + 1 \times n = 2 \times n + n$ To multiply by 3, double the number then add that number one time.	$3 \times 4 = (2 \times 4) + 4 = 12$ $3 \times 7 = (2 \times 7) + 7 = 21$	$3 \times 304 = (2 \times 304) + 304 = 912$ $3 \times 13 = (2 \times 13) + 13 = 39$
<b>Double-Doubles facts (<math>\times 4</math>)</b> $4 \times n = (2 \times 2) \times n = 2 \times (2 \times n)$ To multiply any number by 4, double it, and then double the result.	$4 \times 7 = 2 \times (2 \times 7) = 2 \times 14 = 28$ $4 \times 6 = 2 \times (2 \times 6) = 2 \times 12 = 24$	$4 \times 49 = 2 \times (2 \times 49) = 2 \times 98 = 196$ $4 \times 301 = 2 \times (2 \times 301) = 2 \times 602 = 1204$
<b>Double-Double-Doubles facts (<math>\times 8</math>)</b> $8 \times n = 2 \times 2 \times 2 \times n = ((2 \times n) \times 2) \times 2$ To multiply any number by 8, double it, double the result, and then double that result one last time.	$8 \times 5 = ((2 \times 5) \times 2) \times 2 = ((10 \times 2) \times 2) = 20 \times 2 = 40$ $8 \times 9 = ((2 \times 9) \times 2) \times 2 = (18 \times 2) \times 2 = 36 \times 2 = 72$	$8 \times 15 = ((2 \times 15) \times 2) \times 2 = (30 \times 2) \times 2 = 60 \times 2 = 120$ $8 \times 27 = ((2 \times 27) \times 2) \times 2 = (54 \times 2) \times 2 = 108 \times 2 = 216$
<b>Tens &amp; Related Facts</b>		
<b>Tens facts (<math>\times 10</math>)</b> This category of facts comes easily to most students because of our base ten place value system.	$10 \times 5 = 50$ $8 \times 10 = 80$	$247 \times 10 = 2,470$ $10 \times 28 = 280$
<b>Half-Tens facts (<math>\times 5</math>)</b> $5 \times n = 10 \times \frac{1}{2} \times n = (10 \times n) \times \frac{1}{2} = (10 \times n) \div 2$ or $5 \times n = 10 \times \frac{1}{2} \times n = 10 \times (n \times \frac{1}{2}) = 10 \times (n \div 2)$ To multiply any number by 5, multiply the number by 10 and then divide the result in half. Or, divide the number in half and then multiply by 10.	$5 \times 7 = (10 \times 7) \div 2 = 70 \div 2 = 35$ or $5 \times 7 = 10 \times (7 \div 2) = 10 \times 3.5 = 35$ $5 \times 8 = (10 \times 8) \div 2 = 80 \div 2 = 40$ or $5 \times 8 = 10 \times (8 \div 2) = 10 \times 4 = 40$	$5 \times 28 = (10 \times 28) \div 2 = 280 \div 2 = 140$ or $5 \times 28 = 10 \times (28 \div 2) = 10 \times 14 = 140$ $5 \times 620 = (10 \times 620) \div 2 = 6200 \div 2 = 3,100$ or $5 \times 620 = 10 \times (620 \div 2) = 10 \times 310 = 3,100$
<b>Half-Tens Plus One Set facts (<math>\times 6</math>)</b> $6 \times n = (5 + 1) \times n = 5 \times n + 1 \times n = 10 \div 2 \times n + 1 \times n = (10 \times n) \div 2 + n$ To multiply any number by 6, carry out the procedure for multiplying the number by 5 and then add the number to the result.	$6 \times 7 = ((10 \times 7) \div 2) + 7 = (70 \div 2) + 7 = 35 + 7 = 42$ $6 \times 9 = ((10 \times 9) \div 2) + 9 = (90 \div 2) + 9 = 45 + 9 = 54$	$6 \times 72 = ((10 \times 72) \div 2) + 72 = (720 \div 2) + 72 = 360 + 72 = 432$ $6 \times 114 = ((10 \times 114) \div 2) + 114 = (1140 \div 2) + 114 = 570 + 114 = 684$
<b>Tens Minus One Set facts (<math>\times 9</math>)</b> $9 \times n = (10 - 1) \times n = 10 \times n - 1 \times n = 10 \times n - n$ To multiply any number by 9, multiply it first by 10 and then subtract the number from the result.	$9 \times 7 = 10 \times 7 - 7 = 70 - 7 = 63$ $9 \times 9 = 10 \times 9 - 9 = 90 - 9 = 81$	$9 \times 121 = 10 \times 121 - 121 = 1,210 - 121 = 1,089$ $9 \times 47 = 10 \times 47 - 47 = 470 - 47 = 423$