Grade 3	Grade 4	Grade 5  Fluently multiply multi-digit whole numbers using the standard algorithm.	
Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g.,	Fluently multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on		
knowing that $8x5=40$ , one knows $40 \div 5=8$ ) or properties of operations. By the end of	place value and the properties of operations. Illustrate and explain the calculation by using	Strategies Used	
Grade 3, know from memory all products	equations, rectangular arrays, and/or area		
of two one-digit numbers.	models. *Grade 4 expectations in this domain are limited to	a) Multiplying by 10:	
Strategies Used	whole numbers less than or equal to 1,000,000	Counting by 10s. e.g., 10x3= 10+10+10=30 or 10, 20, 30	
*Multiplying by 1 and 2 have already	Strategies Used		
been introduced in grade 2.	<u>Gratogroo Good</u>	b) Multiplying by 5:	
been introduced in grade 2.	a) Multiplying by 10:	Counting by 5s. e.g., 5x4=5+5+5+5=20 or 5, 10, 15, 20	
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Counting by 10s.	e.g., 10x3= 10+10+10=30 or 10, 20, 30	c) Multiplying by 0:	
e.g., 10x3= 10+10+10=30 or 10, 20, 30		If either factor is 0 the product is always 0	
	b) Multiplying by 5:	e.g., 0x7=0	
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Counting by 5s.	e.g., 5x4-5+5+5+5-20 of 5, 10, 15, 20	d) Multiplying by 3:	
e.g., 5x4=5+5+5+5=20 or 5, 10, 15, 20	c) Multiplying by 0:	Multiply by 2 and add 1 more group.	
c) Multiplying by 0:	If either factor is 0 the product is always 0.	e.g., 3x4= (2x4) + (1x4)=12	
If either factor is 0 the product is always	e.g., 0x7=0	e) Multiplying by 4:	
0.		Double a double.	
e.g., 0x7=0	d) Multiplying by 3:	e.g., 4x6=(2x6)+(2x6)=12+12=24	
	Multiply by 2 and add 1 more group.		
d) Multiplying by 3:	e.g., 3x4= (2x4) + (1x4)=12	f) Multiplying by 6:	
Multiply by 2 and add 1 more group.	e) Multiplying by 4:	Double a multiple of 3.	
e.g., 3x4= (2x4) + (1x4)=12	Double a double.	e.g., 6x5=(3x5)+(3x5)=15+15=30	
e) Multiplying by 4:	e.g., 4x6=(2x6)+(2x6)=12+12=24	g) Multiplying by 9:	
Double a double.		The product of x 9 is 1 group less than the	
e.g., 4x6=(2x6)+(2x6)=12+12=24	f) Multiplying by 6:	product of the same x10 fact.	
	Double a multiple of 3.	e.g., 9x7= (10x7)-(1x7)= 70-7=63	
f) Multiplying by 6:	e.g., 6x5=(3x5)+(3x5)=15+15=30		
Double a multiple of 3.	a) Multiplying by 0:	h) Multiplying by 8:	
e.g., 6x5=(3x5)+(3x5)=15+15=30	g) Multiplying by 9:	Products that are double that of multiplying	

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## g) Multiplying by 9:

The product of x 9 is 1 group less than the product of the same x10 fact. e.g., 9x7= (10x7)-(1x7)= 70-7=63

#### h) Multiplying by 8:

Products that are double that of multiplying by 4. e.g., 8x3= (4x3)+(4x3)=12+12=24

### i) Multiplying by 7:

Break apart 7 (distributive property) to find that it is the sum of 5 times the factor and 2 times the factor or use commutative property students already know all of the x7 facts except 7x7. e.g., 7x7=(5x7)+(2x7)=35+14=49

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