

YR4 MULTIPLICATION AND DIVISION KNOWLEDGE ORGANISER

Key Concepts

- Recall multiplication and division facts for multiplication tables up to 12×12 .
- Multiply together three numbers.
- Multiply two-digit and three-digit numbers by a one-digit number using formal written layout.
- Divide two-digit and three-digit numbers by a one-digit number.

Key Vocabulary

- multiply/multiplication
- divide/division
- calculate/calculation
- mental calculation
- written method
- operation
- remainder
- factor/factor pairs
- efficient
- exchange
- commutative law



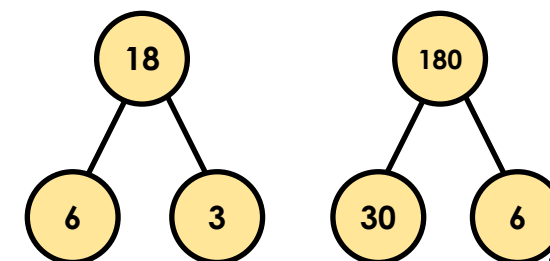
Multiplication Tables

$1 \times 6 = 6$	$2 \times 6 = 12$	$3 \times 6 = 18$	$4 \times 6 = 24$	$5 \times 6 = 30$	$6 \times 6 = 36$
$7 \times 6 = 42$	$8 \times 6 = 48$	$9 \times 6 = 54$	$10 \times 6 = 60$	$11 \times 6 = 66$	$12 \times 6 = 72$
$1 \times 7 = 7$	$2 \times 7 = 14$	$3 \times 7 = 21$	$4 \times 7 = 28$	$5 \times 7 = 35$	$6 \times 7 = 42$
$7 \times 7 = 49$	$8 \times 7 = 56$	$9 \times 7 = 63$	$10 \times 7 = 70$	$11 \times 7 = 77$	$12 \times 7 = 84$
$1 \times 9 = 9$	$2 \times 9 = 18$	$3 \times 9 = 27$	$4 \times 9 = 36$	$5 \times 9 = 45$	$6 \times 9 = 54$
$7 \times 9 = 63$	$8 \times 9 = 72$	$9 \times 9 = 81$	$10 \times 9 = 90$	$11 \times 9 = 99$	$12 \times 9 = 108$
$1 \times 11 = 11$	$2 \times 11 = 22$	$3 \times 11 = 33$	$4 \times 11 = 44$	$5 \times 11 = 55$	$6 \times 11 = 66$
$7 \times 11 = 77$	$8 \times 11 = 88$	$9 \times 11 = 99$	$10 \times 11 = 110$	$11 \times 11 = 121$	$12 \times 11 = 132$
$1 \times 12 = 12$	$2 \times 12 = 24$	$3 \times 12 = 36$	$4 \times 12 = 48$	$5 \times 12 = 60$	$6 \times 12 = 72$
$7 \times 12 = 84$	$8 \times 12 = 96$	$9 \times 12 = 108$	$10 \times 12 = 120$	$11 \times 12 = 132$	$12 \times 12 = 144$

Division Facts

$6 \div 6 = 1$	$12 \div 6 = 2$	$18 \div 6 = 3$	$24 \div 6 = 4$	$30 \div 6 = 5$	$36 \div 6 = 6$
$42 \div 6 = 7$	$48 \div 6 = 8$	$54 \div 6 = 9$	$60 \div 6 = 10$	$66 \div 6 = 11$	$72 \div 6 = 12$
$7 \div 7 = 1$	$14 \div 7 = 2$	$21 \div 7 = 3$	$28 \div 7 = 4$	$35 \div 7 = 5$	$42 \div 7 = 6$
$49 \div 7 = 7$	$56 \div 7 = 8$	$63 \div 7 = 9$	$70 \div 7 = 10$	$77 \div 7 = 11$	$84 \div 7 = 12$
$9 \div 9 = 1$	$18 \div 9 = 2$	$27 \div 9 = 3$	$36 \div 9 = 4$	$45 \div 9 = 5$	$54 \div 9 = 6$
$63 \div 9 = 7$	$72 \div 9 = 8$	$81 \div 9 = 9$	$90 \div 9 = 10$	$99 \div 9 = 11$	$108 \div 9 = 12$
$11 \div 11 = 1$	$22 \div 11 = 2$	$33 \div 11 = 3$	$44 \div 11 = 4$	$55 \div 11 = 5$	$66 \div 11 = 6$
$77 \div 11 = 7$	$88 \div 11 = 8$	$99 \div 11 = 9$	$110 \div 11 = 10$	$121 \div 11 = 11$	$132 \div 11 = 12$
$12 \div 12 = 1$	$24 \div 12 = 2$	$36 \div 12 = 3$	$48 \div 12 = 4$	$60 \div 12 = 5$	$72 \div 12 = 6$
$84 \div 12 = 7$	$96 \div 12 = 8$	$108 \div 12 = 9$	$120 \div 12 = 10$	$132 \div 12 = 11$	$144 \div 12 = 12$

Related Facts from Times Tables



$3 \times 6 = 18$	$6 \times 3 = 18$
$18 \div 3 = 6$	$18 \div 6 = 3$
$30 \times 6 = 180$	$60 \times 3 = 180$
$180 \div 30 = 6$	$180 \div 60 = 3$

Multiply Three Numbers

$$4 \times 3 \times 6 = 72$$



"I would solve this by multiplying 4 by 3, which is 12. Then, I multiply 12 by 6, which is 72."

"Because multiplication is commutative, you can multiply the numbers in any order and you will get the same answer."



$4 \times 3 \times 6 = 72$	$3 \times 6 \times 4 = 72$
$4 \times 6 \times 3 = 72$	$6 \times 4 \times 3 = 72$
$3 \times 4 \times 6 = 72$	$6 \times 3 \times 4 = 72$



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Multiplication - Formal Written Method

Pupils begin by using place value counters to understand written multiplication:

H	T	O
100	10 10	1 1 1
100	10 10	1 1 1
100	10 10	1 1 1

	1	2	4
x			3
	3	7	2
			1

Pupils transfer this understanding to a formal written method.

Multiply each digit from the 3 digit number by the 1 digit number, starting with the ones. $4 \times 3 = 12$. Twelve ones cannot go in the ones column so exchange ten ones for one ten and place it into the tens column. Keep the 2 ones in the ones column. Then, multiply the tens digit by 3. The extra ten must be added; there are now 7 tens altogether. Finally, multiply the hundreds digit by 3 and put the answer in the hundreds column - 3 hundreds. The answer is 372.

Division - Formal Written Method

Pupils begin by using place value counters to understand written division:

H	T	O
100	10 10	1 1 1 1 1 1

$$126 \div 6$$

Start with the hundreds column. As the 100 counter cannot be split into groups of 6, exchange it for 10 lots of 10 and put these counters into the tens column.

H	T	O
100 →	10 10 10 10 10 10 10 10 10	1 1 1 1 1 1

Then, put the 10s counters into as many equal groups of 6 as possible. We can now see that there are two groups of 6 tens. Next, put the ones counters into groups of 6. There is 1 group of 6 in total, making the answer 21.

Pupils transfer this understanding to a formal written method.

	0		
6	1	2	6

Start by looking at how many groups of 6 you can make with 1 hundred. You cannot make any complete groups of 6 so place a zero in the hundreds column. Then, exchange the 1 hundred for 10 tens so there are now 12 tens.

	0	2	
6	1	2	7

You can make two groups of 6 tens using 12 tens. Therefore, place 2 in the tens column.

	0	2	1
6	1	2	6

Finally, look at the ones digit. With 6 ones, you can make 1 group of 6 ones. This means that a 1 is placed in the ones column. The answer is 21.



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