



Year 6 Four Operations

MATHS KNOWLEDGE ORGANISER



ESSENTIAL VOCABULARY

Factor	we use factor to mean a number that can be multiplied or divided to produce a given number
Multiple	a multiple is the product of any quantity and an integer
Common factor	is a whole number which is a factor of two or more numbers.
Common multiple	is an integer (a whole number) that two or more numbers can multiply into without a remainder
prime number	A number that only has one and itself as factors
Square numbers	Square number result from a number being multiplied by itself
Cube numbers	Cube numbers result from a number being multiplied by itself twice
estimate	estimation means having a rough calculation of the value, number, quantity, or extent of something
Inverse operation	Inverse operations are opposite operations. They are the operation that reverses the effect of another operation
short division	Short division is a formal written method of dividing numbers. It's often used when dividing numbers with up to four digits by a one-digit number.
Long multiplication	Long Multiplication is a special method for multiplying larger numbers.
Sum	the whole number or amount when two or more numbers or amounts have been added together.
Composite	When a number can be divided up exactly it is a Composite Number
dividend	a dividend is the amount that you want to divide up.
divisor	Divisor can also mean a number that divides an integer exactly (no remainder).

Add and Subtract Whole Numbers

Column Method

	4	5	8	6	4
+	2	3	4	9	7
	6	9	3	6	1
		1	1	1	

Starting with the ones, add each column in turn. Regroup tens, hundreds, thousands, ten thousands as required.

	3	5	7 ¹³	4 ¹	2
-		3	4	7	6
	3	2	2	6	6

Starting with the ones, subtract each column in turn. Exchange tens, hundreds, thousands and/or ten thousands as required.

Multiply up to 4-digit by 2-digit

1	3	2	
	1	5	4
×		2	6
	9	2	4
3	0	8	0
4	0	0	4
1	1		

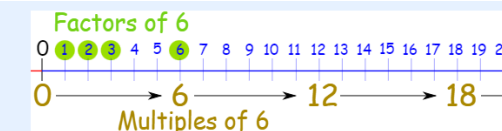
Start with the ones.

$$154 \times 6 = 924$$

$$154 \times 20 = 3080$$

$$3080 + 924 = 4004$$

Factor, multiples



Factors:

- $1 \times 6 = 6$, so **1** and **6** are factors of 6
- $2 \times 3 = 6$, so **2** and **3** are factors of 6

Multiples:

- $0 \times 6 = 0$, so **0** is a multiple of 6
- $1 \times 6 = 6$, so **6** is a multiple of 6
- $2 \times 6 = 12$, so **12** is a multiple of 6
- and so on

LINKS TO PREVIOUS LEARNING

perform mental calculations, including with mixed operations and large numbers

identify common factors, common multiples and prime numbers
perform mental calculations, including with mixed operations and large numbers

Stem sentences

To cube a number, we need to multiply the number by _____ and then by _____ again.

To multiply by a 2-digit number, we need to first multiply by the _____ and then find the _____.

The factor pairs of _____ are _____.

_____ is a common multiple of _____ and _____.



Short Division

Start from the left.

		4	4	0	5	$5 \div 12 = 0 \text{ r}5$
12	5	⁵ 2	⁴ 8	⁶ 0		$52 \div 12 = 4 \text{ r}4$
						$48 \div 12 = 4$
						$6 \div 12 = 0 \text{ r}6$

Long Division

		1	2	0	r	3
14	1	6	8	3		
	1	4	0	0		
		2	8	3		
		2	8	0		
				3		

Common Factors

Factors of 48

1	2	3	4	6	8	12	16	24	48
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Factors of 30

1	2	3	5	6	10	15	30
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Common factors: 1, 2, 3, 6

Primes

A prime number has only 1 and itself as factors: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43

A composite number has factors other than 1 and itself.

Mental Calculations and Estimation

Order of calculations:

$$50 \times 34 \times 2 = 50 \times 2 \times 34 = 100 \times 34 = 3400$$

Money: $\text{£}8.99 + \text{£}3.49 = \text{£}12.48$

Use $\text{£}9 + \text{£}3.50 = \text{£}12.50$ and subtract 2p

Estimate on a number line



Subdivide line to estimate: 17

Common Multiples

Multiples of 3

3	...	18	21	24	...	39	42
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Multiples of 7

7	14	21	28	35	42
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Common multiples: 21, 42...

Squares and Cubes

Square numbers result from a number being multiplied by itself (e.g. $5 \times 5 = 25$):

1, 4, 9, 16, 25, 36, 49, 64, 81, 100

Cube numbers result from a number being multiplied by itself twice ($2 \times 2 \times 2 = 8$):

1, 8, 27, 64, 125

Reason from Known Facts

$90 \div 10 = 9$ so $90 \div 20 = 4.5$ and $90 \div 5 = 18$

$16 \times 9 = 144$ so $1.6 \times 9 = 14.4$

$4352 \div 17 = 256$
so $256 \times 18 = 4352 + 256 = 4608$

$3786 + 2850 = 6636$
so $4786 + 2850 = 7636$
and $2786 + 3850 = 6636$
and $8636 - 3786 = 4850$