



FOUR OPERATIONS

KNOWLEDGE ORGANISER

Year 6



Overview

Addition

add more plus increase total sum altogether

Subtraction

subtract minus less take away decrease leave fewer difference

Multiplication

multiply lots of times groups of multiplied by array repeated product addition

Division

divide remainder share share equally groups of divided by repeated each subtraction

Four Operations we learn:

- Add and subtract integers
- Primes to 100
- Multiply up to a 4-digit number by a 2-digit number
- Short division
- Division using factors
- Estimation
- Long division
- Common factors
- Common multiples
- Squared & Cubed Numbers
- Order of Operations

Addition, subtraction, multiplication and division is useful learning because it is used in many areas of everyday life – e.g. shopping, cooking, or playing games. It also forms the basis for lots of other maths ideas.

Addition, Subtraction, Multiplication, Division Methods

Column Addition: Start with the ones – add each column in turn, regrouping where needed.

TTh	Th	H	T	O
3	4	3	9	6
+ 5	8	1	2	4
9	2	5	2	0

Short Multiplication

$$\begin{array}{r} 6425 \\ \times 7 \\ \hline 44975 \end{array}$$

-Move regrouped numbers to the next column. After the next multiplication, add the regrouped number.

Short Division

$$\begin{array}{r} 845r2 \\ 325 \overline{) 3253} \end{array}$$

Remember to record remainders after the letter 'r'.

Long Multiplication

$$\begin{array}{r} 21 \\ \times 3862 \\ \hline 15448 \\ 115860 \\ \hline 131308 \end{array}$$

-Remember to use the zero as a placeholder before multiplying the 10s.

Long Division

$$\begin{array}{r} 77R35 \\ 47 \overline{) 3654} \\ \underline{329} \\ 364 \\ \underline{329} \\ 35 \end{array}$$

Times Tables/ Order of Operations/ Squared & Cubed Numbers

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

Order of Operations

The order that we carry out a calculation is important. BODMAS helps us to remember the correct order.

B Brackets	$10 \times (4 + 2) / 10 \times 6 - 60$
O Order	$5 + 2^2 / 5 + 4 - 9$
D Division	$10 + 6 \div 2 / 10 + 3 - 13$
M Multiplication	$10 - 4 \times 2 / 10 - 8 - 2$
A Addition	$10 \times 4 + 7 / 40 + 7 - 47$
S Subtraction	$10 \div 2 - 3 / 5 - 3 - 2$

Squared Numbers

$$2^2$$

1	2
3	4

$$2 \times 2 = 4$$

...result from a number being multiplied by itself. Squared numbers include 1, 4, 9, 16, 25, 36, 49, 64, 81 and 100

Cubed Numbers



$$2 \times 2 \times 2 = 8$$

$$2^3 = 8$$

...result from a number being multiplied by itself twice.

Mental Calculations, Estimation and Reasoning: We should use these techniques alongside known number facts (e.g. knowledge of times tables) to work out more complex problems.

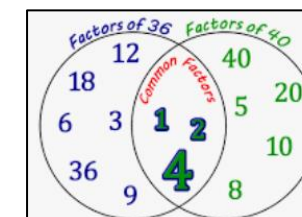
Common Factors, Prime Numbers and Common Multiples

Factors: A factor is a number that you multiply with another number to get a product. A **product** is the solution to a multiplication problem.

Factor Rainbow for 24

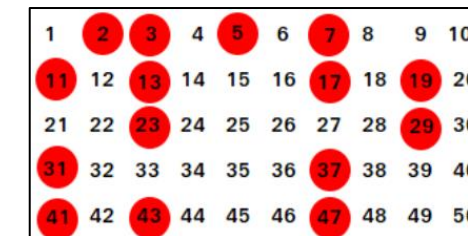


The factors of 24 are 1, 2, 3, 4, 6, 8, 12 and 24. These numbers can be multiplied with another to make 24.



Common factors are factors of 2 or more numbers. e.g. the common factors of 36 and 40 are 1, 2 and 4.

Prime Numbers: Prime numbers can only be divided by itself and 1. There are no other factors.



Common Multiples

Multiples of 6:

6	12	18	24	30	36
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Multiples of 8:

8	16	24	32	40
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24 is a common multiple of both 6 and 8.

Key Vocabulary

Addition Multiplication Division Subtraction Integer Estimate Squared Cubed Factor Prime Number Reasoning