Maths Knowledge Organiser Year Six

Brook Primary School

Multiplication and division vocabulary

Term	Definition	Example
factor	a number that divides exactly into another number	factors of 12 = 1, 2, 3, 4, 6, 12
common factor	factors of two numbers that are the same	common factors of 8 and 12 = 1, 2, 4
prime number	a number with only 2 factors: 1 and itself	2, 3, 5, 7, 11, 13, 17, 19…
composite number	a number with more than two factors	12 (it has 6 factors)
prime factor	a factor that is prime	prime factors of 12 = 2, 3
multiple	a number in another number's times table	multiples of 9 = 9, 18, 27, 36…
common multiple	multiples of two numbers that are the same	common multiples of 4 and 6 = 12, 24…
square numbers	the result when a number has been multiplied by itself	25 (5^2 = 5x5) 49 (7^2 = 7x7)
cube numbers	the result when a number has been multiplied by itself 3 times	8 (2^3 = 2x2x2) 27 (3^3 = 3x3x3)

Place value

Twelve million six hundred and eight thousand one hundred and forty-five

TM (Tens of Millions)	M (Millions)	HTH (Hundreds of Thousands)	TTH (Tens of Thousands)	TH (Thousands)	H (Hundreds)	T (Tens)	O (Ones)
1	2	6	0	8	1	4	5

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 × 6 = 924
154 × 20 = 3080
3080 + 924 = 4004

Order of Operations

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

Short Division

Start from the left.

12 | 5 2 8 6 0 → 4 4 0 5

5 ÷ 12 = 0 r5
52 ÷ 12 = 4 r4
48 ÷ 12 = 4
6 ÷ 12 = 0 r6

Long Division

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

Algebra

Forming Expressions

An expression is a group of numbers, letters and operation symbols.

Add 14 to a	$a + 14$
Subtract 20 from b	$b - 20$
Multiply c by 4	$4c$
12 more than d	$d + 12$
Multiply e by 3 and subtract 5	$3e - 5$
Add 12 to f and then multiply by 2	$2(f + 12)$

Forming Equations

$a + 14 = 20$
$b - 20 = 15$
$4c = 28$
$d + 12 = 30$
$3e - 5 = 10$
$2(f + 12) = 44$

An equation is a number statement with an equal sign (=). Expressions on either side of the equal sign are of equal value.

Co-ordinates
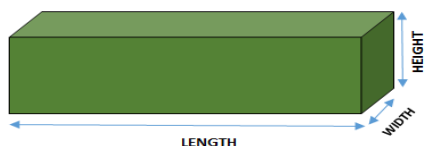
Read co-ordinates along the x axis (horizontal) first, then the y axis (vertical). E.g. (3,-4) = go right 3, down 4.

Mean
The mean is a type of average. To find the mean, add up all the numbers and divide by how many there are. E.g. the mean of 4, 5, 3, 4 is 4. (Because $4 + 5 + 3 + 4 = 16$, and $16 \div 4 = 4$)

Fractions, decimals & percentages

$1/100$	0.01	1%	÷ 100
$1/20$	0.05	5%	÷ 20
$1/10$	0.1	10%	÷ 10
$1/5$	0.2	20%	÷ 5
¼	0.25	25%	÷ 4
½	0.5	50%	÷ 2
¾	0.75	75%	÷ 4, x3
1	1	100%	÷ 1

Volume = the amount of space a 3D shape takes up,   usually measured in cm^3 or m^3

LENGTH, HEIGHT, WIDTH

Multiplying Proper Fractions
Multiplying Fractions by Fractions
$$\frac{1}{2} \times \frac{1}{3} = \frac{1 \times 1}{2 \times 3} = \frac{1}{6}$$

Multiplying Fractions by Whole Numbers
$$\frac{2}{5} \times 3 \qquad 3 = \frac{3}{1} \qquad \frac{2}{5} \times \frac{3}{1} = \frac{6}{5} = 1\frac{1}{5}$$
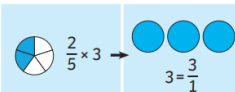
Dividing Fractions by Whole Numbers
$$\frac{2}{5} \div 2 = \frac{1}{5}$$

Multiplication and division are the inverse of one another so:

÷ 2 is the same as × $\frac{1}{2}$

$$\frac{2}{5} \times \frac{1}{2} = \frac{2}{10}$$

Negative Numbers

3 - 8 = -5

-6 + 11 = 5

-5   -3

+6   +5

A ratio says how much of one thing there is compared to another thing.

3 : 1

There are 3 blue squares to 1 yellow square

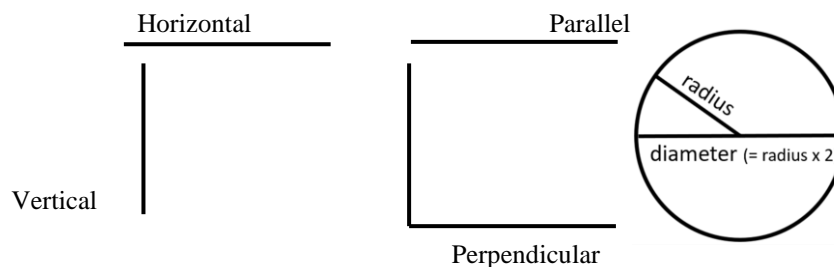Ratios can be shown in different ways:

Use the ":" to separate the values: 3 : 1

Or we can use the word "to":   3 to 1

Or write it like a fraction: 3/1

Shape vocabulary
perimeter = measure around the edge (**circumference** = perimeter of a circle)

Horizontal

Parallel

Vertical

Perpendicular

radius

diameter (= radius x 2)

2D shapes

Name	No. of sides
quadrilateral	4
pentagon	5
hexagon	6
heptagon	7
octagon	8
nonagon	9
decagon	10

polygon = shape with straight sides
regular = all sides/angles the same
irregular = sides/angles **not** same

Types of triangle

scalene   equilateral   isosceles

Types of quadrilateral

parallelogram   trapezium   rhombus

AREA
is the amount of space inside a 2D shape usually measured in cm^2 or m^2.
Area of a triangle
= (base x height) ÷ 2
Area of a parallelogram
= base x height
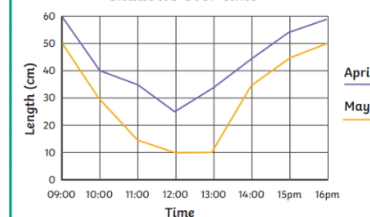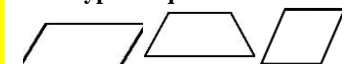*(Height = perpendicular height)*

Line Graph
Line graphs are used to show changes to a measurement over time.

Data shown in a line graph is continuous.
Sets of points are joined together to make the line.

A line graph to show the length of shadows over time

Length (cm): 60, 50, 40, 30, 20, 10, 0
Time: 09:00 10:00 11:00 12:00 13:00 14:00 15pm 16pm

April
May