

YEAR 7 MATHS KNOWLEDGE ORGANISER

Topic/Skill	Definition/Tips	Example
1. Expression	A mathematical statement written using symbols, numbers or letters ,	$3x + 2$ or $5y^2$
2. Equation	A statement showing that two expressions are equal	$2y - 17 = 15$
3. Identity	An equation that is true for all values of the variables An identity uses the symbol: \equiv	$2x \equiv x+x$
4. Formula	Shows the relationship between two or more variables	Area of a rectangle = length x width or $A = L \times W$
5. Simplifying Expressions	Collect 'like terms' . Be careful with negatives. x^2 and x are not like terms.	$2x + 3y + 4x - 5y + 3 = 6x - 2y + 3$ $3x + 4 - x^2 + 2x - 1 = 5x - x^2 + 3$
6. x times x	The answer is x^2 not $2x$.	Squaring is multiplying by itself, not by 2.
7. $p \times p \times p$	The answer is p^3 not $3p$	If $p=2$, then $p^3=2 \times 2 \times 2=8$, not $2 \times 3=6$
8. $p + p + p$	The answer is $3p$ not p^3	If $p=2$, then $2+2+2=6$, not $2^3 = 8$
9. Expand	To expand a bracket, multiply each term in the bracket by the expression outside the bracket.	$3(m + 7) = 3m + 21$
10. Factorise	The reverse of expanding . Factorising is writing an expression as a product of terms by 'taking out' a common factor .	$6x - 15 = 3(2x - 5)$, where 3 is the common factor.

The 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 $16 \div 4 = 4$)

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



Types of quadrilateral



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) \div 2

Area of a parallelogram
= base x height
(Height = perpendicular height)

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 ($5^2 = 5 \times 5$) 49 ($7^2 = 7 \times 7$)
cube numbers	the result when a number has been multiplied by itself 3 times	8 ($2^3 = 2 \times 2 \times 2$) 27 ($3^3 = 3 \times 3 \times 3$)

Angles

full turn	360°
half turn	180°
right angle	90°
acute angle	$< 90^\circ$
obtuse angle	$> 90^\circ$
reflex angle	$> 180^\circ$
angles on a straight line	180°
angles inside a triangle	180°
angles inside a quadrilateral	360°

Fractions, decimals & percentages

$\frac{1}{100}$	0.01	1%	$\div 100$
$\frac{1}{20}$	0.05	5%	$\div 20$
$\frac{1}{10}$	0.1	10%	$\div 10$
$\frac{1}{5}$	0.2	20%	$\div 5$
$\frac{1}{4}$	0.25	25%	$\div 4$
$\frac{1}{2}$	0.5	50%	$\div 2$
$\frac{3}{4}$	0.75	75%	$\div 4, \times 3$
1	1	100%	$\div 1$

Bar Charts

Represents data as vertical blocks.
 x - **axis** shows the type of data
 y - **axis** shows the frequency for each type of data
 Each bar should be the **same width**
 There should be **gaps** between each bar
 Remember to **label** each axis.

