Supporting the development of Maths skills at home

1 × 1 = 1	2 × 1 = 2	3 × 1 = 3	4 × 1 = 4	5 × 1 = 5
1 × 2 = 2	2 × 2 = 4	3 × 2 = 6	4 × 2 = 8	5 × 2 = 10
1 × 3 = 3	2 × 3 = 6	3 × 3 = 9	4 × 3 = 12	5 × 3 = 15
1 × 4 = 4	2 × 4 = 8	3 × 4 = 12	4 × 4 = 16	5 × 4 = 20
1 × 5 = 5	2 × 5 = 10	3 × 5 = 15	4 × 5 = 20	5 × 5 = 25
1 × 6 = 6	2 × 6 = 12	3 × 6 = 18	4 × 6 = 24	5 × 6 = 30
1 × 7 = 7	2 × 7 = 14	3 × 7 = 21	4 × 7 = 28	5 × 7 = 35
1 × 8 = 8	2 × 8 = 16	3 × 8 = 24	4 × 8 = 32	5 × 8 = 40
1 × 9 = 9	2 × 9 = 18	3 × 9 = 27	4 × 9 = 36	5 × 9 = 45

6 × 1 = 6	7 × 1 = 7	8 × 1 = 8	9 × 1 = 9	10 × 1 = 10
6 × 2 = 12	7 × 2 = 14	8 × 2 = 16	9 × 2 = 18	10 × 2 = 20
6 × 3 = 18	7 × 3 = 21	8 × 3 = 24	9 × 3 = 27	10 × 3 = 30
6 × 4 = 24	7 × 4 = 28	8 × 4 = 32	9 × 4 = 36	10 × 4 = 40
6 × 5 = 30	7 × 5 = 35	8 × 5 = 40	9 × 5 = 45	10 × 5 = 50
6 × 6 = 36	7 × 6 = 42	8 × 6 = 48	9 × 6 = 54	10 × 6 = 60
6 × 7 = 42	7 × 7 = 49	8 × 7 = 56	9 × 7 = 63	10 × 7 = 70
6 × 8 = 48	7 × 8 = 56	8 × 8 = 64	9 × 8 = 72	10 × 8 = 80
6 × 9 = 54	7 × 9 = 63	8 × 9 = 72	9 × 9 = 81	10 × 9 = 90

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Why is being numerate so important?

- Being numerate allows us to function in everyday life- from dealing with bills, being able to calculate our shopping, to working out our wages, to even telling the time.
- Decisions in life are also based on numerical information, to make the best choices we need to be numerate.
- Maths skills are essential in every career and employers want staff with good skills. As technology continues to evolve, it is more important than ever that we all have the numeracy skills to be able to keep up.
- Children who have developed these skills and are confident with maths are more likely to: stay in education longer, be in work as adults and earn more throughout their lives

Top tips for helping your child's development in Maths.

- Be positive about Maths. Don't say things like "I can't do Maths" as your child might start to think like that themselves.
- Point out the Maths in everyday life. include your child in activities involving Maths such as using money, cooking and travelling.
- Praise your child for effort rather than talent - this shows them that by working hard they can always improve.
- If you struggle with Maths yourself - visit https://www.nnchallenge.org.uk/ and complete the free training to help improve your everyday Maths skills.
- Have fun with Maths – make it something which is fun – times table bingo, creative shape making, changing recipes.

Ways you can use Maths at home

The Family Maths Toolkit has some excellent ways you can help develop your child's numeracy skills, these are listed below:

At home

- Talk about numbers in sport. How many points does your team need to avoid relegation? How many goals/tries/points/runs has your team scored this season?
- Cooking. Measure ingredients and set the timer together. Talk about fractions in cooking, for example ask them how many quarter cups make a cup.
- Talk about the shape and size of objects. Use the internet to find interesting facts like tallest and shortest people, or biggest and smallest buildings etc.
- Talk about time. For example get them to work out what time you need to leave the house to get to school on time.
- Solve maths problems at home. For example 'we have 3 pizzas cut into quarters, if we eat 10 quarters, how many will be left?'

Money

- At the shops. When buying a couple of items, ask them to work out how much they will cost together. As a challenge for older children, ask them to estimate what the weekly shop will come to.
- Work out offers in supermarkets together. Ask them to work out the best deals.
- Ask your child to check your change

Out and about

- Directions. When travelling somewhere familiar, ask your child to give you directions and timings, then test their directions out.
- Sport. Sports are the perfect chance to think about speed, scores, time and angles. Get competitive; try out different angles to score from, ask them how many star jumps can they do in a minute.
- Explore the local area. Ask them to guess how many people live in your town, how far is the nearest airport is etc. Look for patterns in nature
- Estimation. For example ask them to think about how they can estimate how many bricks were used to build a local landmark.
- Journeys. Ask them questions like how many miles or kilometres have we travelled, how many are left and what time should we get to our destination *(note imperial measurements such as miles are not taught but are still used in every day life)*

Year 7 Term 1 learning

In the first term we focus on really developing and mastering the pupils core mathematical skills. The topics we will cover include:

- Addition and subtraction of large numbers
- Multiplying and division facts up to 12 x 12
- Understanding place value
- Multiplying decimals
- Dividing decimals
- Getting used to using a scientific calculator
- Prime number knowledge
- Square and cube numbers
- Calculating with negative numbers
- Factors and multiples of a given number
- Round to the nearest 10/100/1000
- Rounding to any given number of decimal places
- Perimeter of 2D shapes
- Area of rectangles, squares, triangles, trapeziums
- Volume of 3D shapes.

Times Table Rockstars

We know lots of our pupils have enjoyed using this at primary school so all pupils will be given a TTRS login at the start of the year to continue practicing their multiplication facts.

Helping with Maths homework at home.

Homework is important in the development of retention of topics but can unfortunately cause unnecessary stress for parents and carers who are not confident in their mathematical ability, below are some top tips for helping your child with their homework.

- If you don't know something, that's OK. Try and work out the problem together or ask your child's teacher for some help
- Set aside some homework time Start a homework routine, find a quiet place for your child to work and take away any distractions if possible.
- Rephrase questions using things that your child is interested in. Pupils often relate to money well so if possible rephrase the problem as a money problem.
- If they're doing well, praise them for effort. This helps children learn that their abilities can develop as long as they work hard.

- When they get stuck, ask them to explain what they've done so far and what they're finding hard. Try and help them work out where they've gone wrong.
- If the homework is too hard speak to their teacher for some guidance.

Useful websites – includes videos, worksheets, exam questions and answers for all concepts

https://corbettmaths.com/contents/

Maths Genie - Free Online GCSE and A Level Maths Revision

Other useful websites and further ideas:

Maths lessons for Key Stage 3 students - Oak National Academy (thenational.academy)

https://www.nationalnumeracy.org.uk/

https://www.familymathstoolkit.org.uk/

https://nrich.maths.org/teacher-secondary

https://www.moneyadviceservice.org.uk/en/corporate/you-your-kids-and-money

https://www.numeracyninjas.org/

https://www.bbc.co.uk/bitesize/subjects/zqhs34j

https://www.topmarks.co.uk/maths-games/11-14-years/number

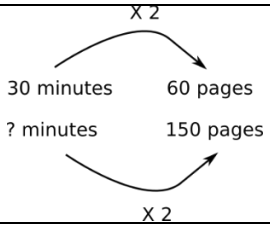
Key words, definitions and examples

On the pages that follow, you will find key words, definitions and examples of key concepts that will support you in helping support your child in their learning. For more information and support on other topics please feel free to email the Head of Maths jclarke@lynghallschool.co.uk or the Deputy Head of Maths gglancy@lynghallschool.co.uk

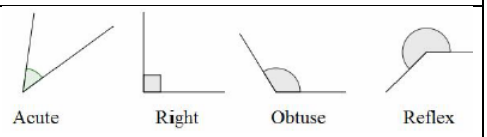
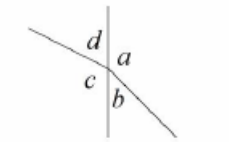
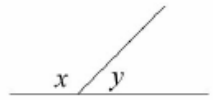
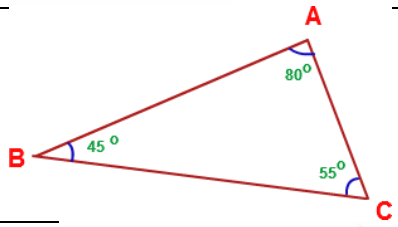
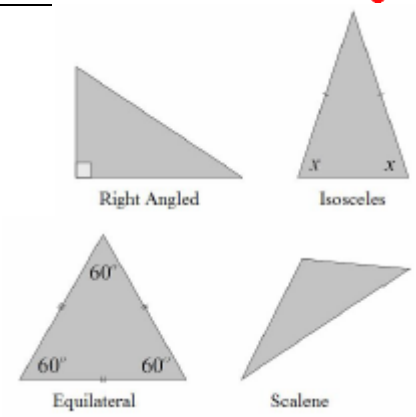
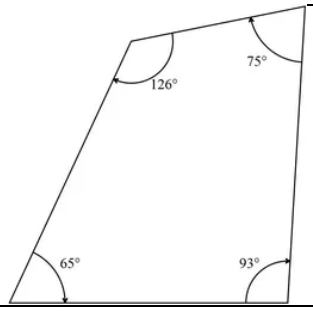
Key word	Definition/Tips	Example
Numerical operations		
Integer	A **whole number** that can be positive, negative or zero.	$-3, 0, 92$
Addition	To find the **total**, or **sum**, of two or more numbers. 'add', 'plus', 'sum'	$3 + 2 + 7 = 12$
Subtraction	To find the **difference** between two numbers. To find out how many are left when some are taken away. 'minus', 'take away', 'subtract'	$10 - 3 = 7$
Multiplication	Can be thought of as **repeated addition**. 'multiply', 'times', 'product'	$3 \times 6 = 6 + 6 + 6 = 18$
Division	Splitting into equal parts or groups. The process of calculating the **number of times one number is contained within another one**. 'divide', 'share'	$20 \div 4 = 5$ $\frac{20}{4} = 5$
BIDMAS	An acronym for the **order** you should do calculations in. BIDMAS stands for **'Brackets, Indices, Division, Multiplication, Addition and Subtraction'**. Indices are also known as 'powers' or 'orders'.	$6 + 3 \times 5 = 21, not\ 45$ $5^2 = 25$, where the 2 is the index/power.
<u>Factors, multiples and primes</u>		
Multiple	The result of multiplying a number by an integer. The **times tables** of a number.	The first five multiples of 7 are: $7, 14, 21, 28, 35$
Factor	A number that **divides exactly** into another number without a remainder. It is useful to write factors in pairs	The factors of 18 are: $1, 2, 3, 6, 9, 18$ The factor pairs of 18 are: $1, 18$ $2, 9$ $3, 6$
Lowest Common Multiple (LCM)	The **smallest** number that is in the **times tables** of each of the numbers given.	The LCM of 3, 4 and 5 is 60 because it is the smallest number in the 3, 4 and 5 times tables.

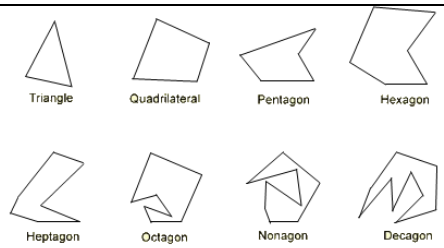
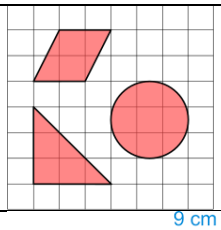
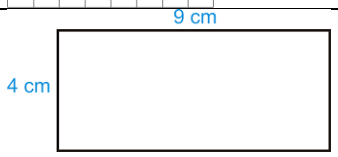
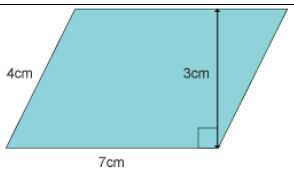
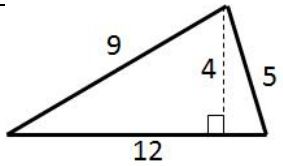
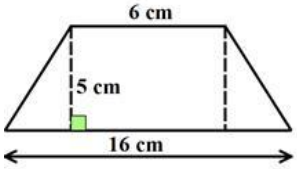
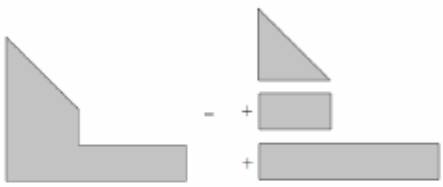
Highest Common Factor (HCF)	The **biggest** number that **divides exactly** into two or more numbers.	The HCF of 6 and 9 is 3 because it is the biggest number that divides into 6 and 9 exactly.
Prime Number	A number with **exactly two factors**. A number that can only be divided by itself and one. The number **1 is not prime**, as it only has one factor, not two.	The first ten prime numbers are: $2, 3, 5, 7, 11, 13, 17, 19, 23, 29$
<u>Fractions</u>		
Fraction	A mathematical expression representing the **division** of one integer by another. Fractions are written as **two numbers separated by a horizontal line**.	$\frac{2}{7}$ is a 'proper' fraction. $\frac{9}{4}$ is an 'improper' or 'top-heavy' fraction.
Numerator	The **top** number of a fraction.	In the fraction $\frac{3}{5}$, 3 is the numerator.
Denominator	The **bottom** number of a fraction.	In the fraction $\frac{3}{5}$, 5 is the denominator.
Mixed Number	A number formed of both an **integer part** and a **fraction part**.	$3\frac{2}{5}$ is an example of a mixed number.
Simplifying Fractions	**Divide the numerator and denominator by the highest common factor**.	$\frac{20}{45} = \frac{4}{9}$
Equivalent Fractions	Fractions which represent the **same value**.	$\frac{2}{5} = \frac{4}{10} = \frac{20}{50} = \frac{60}{150}\ etc.$
Comparing Fractions	To compare fractions, they each need to be rewritten so that they have a **common denominator**. **Ascending** means **smallest to biggest**. **Descending** means **biggest to smallest**.	Put in to ascending order : $\frac{3}{4}, \frac{2}{3}, \frac{5}{6}, \frac{1}{2}$. Equivalent: $\frac{9}{12}, \frac{8}{12}, \frac{10}{12}, \frac{6}{12}$ Correct order: $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{5}{6}$
Fraction of an Amount	**Divide** by the **bottom**, **times** by the **top**	Find $\frac{2}{5}$ of £60 $60 \div 5 = 12$ $12 \times 2 = 24$
Adding or Subtracting Fractions	Find the **LCM of the denominators** to find a common denominator. Use equivalent fractions to change each fraction to the **common denominator**. Then just **add or subtract the numerators** and keep the **denominator the same**.	$\frac{2}{3} + \frac{4}{5}$ Multiples of 3: 3, 6, 9, 12, **15**.. Multiples of 5: 5, 10, **15**.. LCM of 3 and 5 = 15 $\frac{2}{3} = \frac{10}{15}$

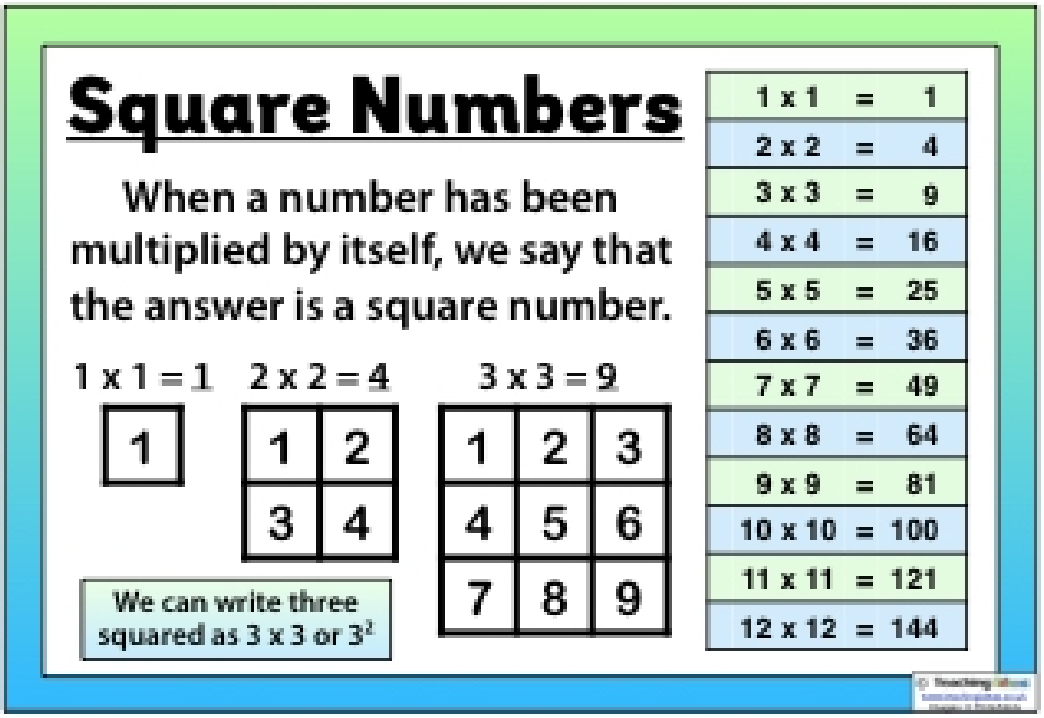
		$\frac{4}{5}=\frac{12}{15}$ $\frac{10}{15}+\frac{12}{15}=\frac{22}{15}=1\frac{7}{15}$
Multiplying Fractions	**Multiply** the **numerators** together and **multiply** the **denominators** together.	$\frac{3}{8}\times\frac{2}{9}=\frac{6}{72}=\frac{1}{12}$
Dividing Fractions	**'Keep it, Flip it, Change it – KFC'** Keep the first fraction the same Flip the second fraction upside down Change the divide to a multiply Multiply by the reciprocal of the second fraction.	$\frac{3}{4}\div\frac{5}{6}=\frac{3}{4}\times\frac{6}{5}=\frac{18}{20}=\frac{9}{10}$
<u>Percentages</u>		
Percentage	**Number of parts per 100.**	31% means $\frac{31}{100}$
Finding 10%	To find **10%**, **divide by 10**	10% of £36 = 36÷10=£3.60
Finding 1%	To find **1%**, **divide by 100**	1% of £8 = 8÷100 = £0.08
Increase or Decrease by a Percentage	Non-calculator: **Find the percentage** and **add** or **subtract** it from the **original** amount. Calculator: Find the **percentage multiplier** and multiply.	<u>Increase 500 by 20% (Non Calc):</u> 10% of 500 = 50 so 20% of 500 = 100 500 + 100 = 600 <u>Decrease 800 by 17% (Calc):</u> 100%-17%=83% 83% ÷ 100 = 0.83 0.83 x 800 = 664
<u>Averages</u>		
Mean	**Add** up the values and **divide** by how many values there are.	The mean of 3, 4, 7, 6, 0, 4, 6 is $\frac{3+4+7+6+0+4+6}{7}=5$
Median Value	The **middle** value. Put the data in order and find the middle one. If there are **two middle values**, find the number half way between them by **adding them together and dividing by 2**.	Find the median of: 4, 5, 2, 3, 6, 7, 6 Ordered: 2, 3, 4, **5**, 6, 6, 7 Median = 5
Mode /Modal Value	**Most** frequent/common.	Find the mode: 4, 5, 2, 3, 6, 4, 7, 8, 4 Mode = 4

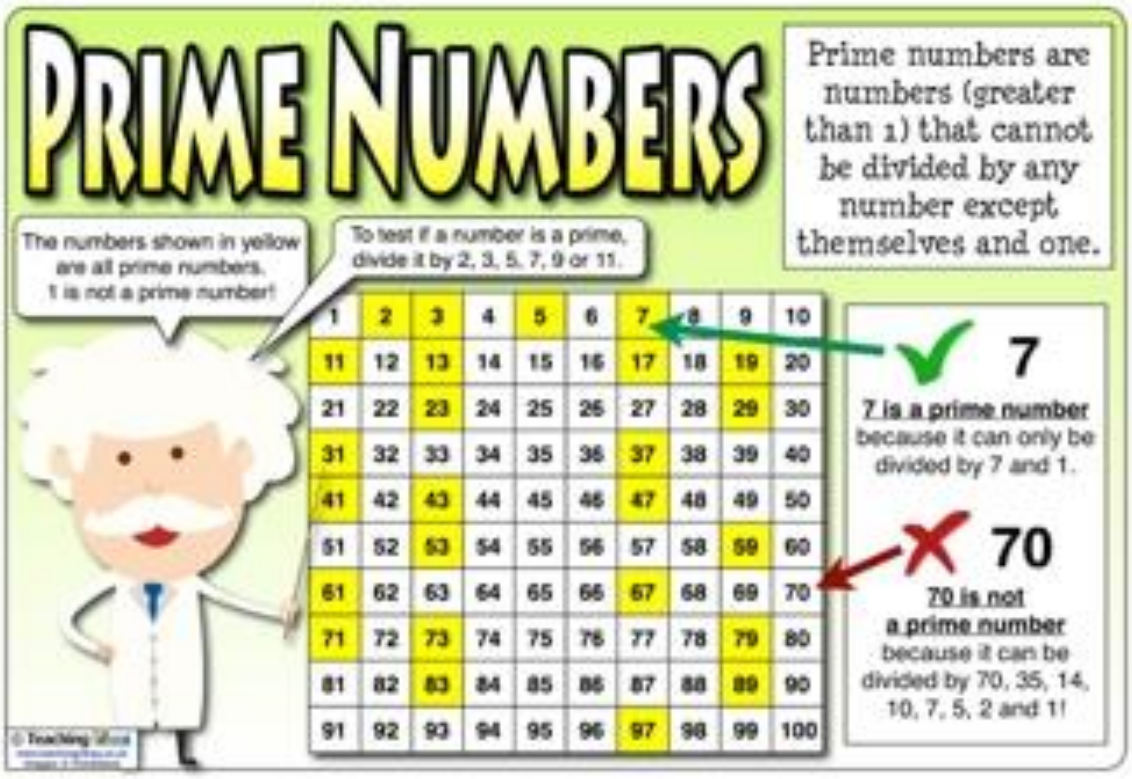
	Can have more than one mode (called bi-modal or multi-modal) or no mode (if all values appear once)	
Range	**Highest value subtract the Smallest value** Range is a 'measure of spread'. The smaller the range the more consistent the data.	Find the range: 3, 31, 26, 102, 37, 97. Range = 102-3 = 99
Ratio and proportion		
Ratio	Ratio compares the size of **one part** to **another part**. Written using the ':' symbol.	3 : 1 
Proportion	Proportion compares the size of **one part** to the size of the **whole**. Usually written as a fraction.	In a class with 13 boys and 9 girls, the proportion of boys is $\frac{13}{22}$ and the proportion of girls is $\frac{9}{22}$
Simplifying Ratios	**Divide** all parts of the ratio by a **common factor**.	5 : 10 = 1 : 2 (divide both by 5) 14 : 21 = 2 : 3 (divide both by 7)
Sharing in a Ratio	1. **Add** the total parts of the ratio. 2. **Divide** the amount to be shared by this value to find the value of one part. 3. **Multiply** this value by each part of the ratio. Use only if you **know the total**.	Share £60 in the ratio 3 : 2 : 1. 3 + 2 + 1 = 6 60 ÷ 6 = 10 3 x 10 = 30, 2 x 10 = 20, 1 x 10 = 10 £30 : £20 : £10
Proportional Reasoning	Comparing two things using **multiplicative reasoning** and applying this to a new situation. Identify one multiplicative link and use this to find missing quantities.	
Unitary Method	Finding the **value of a single unit** and then finding the necessary value by **multiplying** the single unit value.	3 cakes require 450g of sugar to make. Find how much sugar is needed to make 5 cakes. 3 cakes = 450g So 1 cake = 150g (÷ by 3) So 5 cakes = 750 g (x by 5)
Best Buys	Find the **unit cost** by **dividing** the **price by the quantity**. The **lowest** number is the best value.	8 cakes for £1.28 → 16p each (÷by 8) 13 cakes for £2.05 → 15.8p each (÷by 13) Pack of 13 cakes is best value.

Angles and shape

1. Types of Angles	**Acute angles** are less than 90°. **Right angles** are exactly 90°. **Obtuse angles** are greater than 90° but less than 180°. **Reflex angles** are greater than 180° but less than 360°.	
3. Angles at a Point	**Angles around a point add up to 360°.**	 $a+b+c+d=360^o$
4. Angles on a Straight Line	**Angles around a point on a straight line add up to 180°.**	 $x+y=180^o$
9. Angles in a Triangle	**Angles in a triangle add up to 180°.**	
10. Types of Triangles	**Right Angle** Triangles have a **90°** angle in. **Isosceles** Triangles have **2 equal sides** and **2 equal base angles**. **Equilateral** Triangles have **3 equal sides** and **3 equal angles (60°)**. **Scalene** Triangles have **different sides** and **different angles**. **Base angles in an isosceles triangle are equal.**	
11. Angles in a Quadrilateral	**Angles in a quadrilateral add up to 360°.**	

14. Names of Polygons	**3**-sided = **Triangle** **4**-sided = **Quadrilateral** **5**-sided = **Pentagon** **6**-sided = **Hexagon** **7**-sided = **Heptagon**/Septagon **8**-sided = **Octagon** **9**-sided = **Nonagon** **10**-sided = **Decagon**	
<u>Area and perimeter</u>		
Perimeter	The **total distance** around the **outside** of a shape. Units include: mm, cm, m etc.	**8 cm** **5 cm** $P = 8 + 5 + 8 + 5 = 26cm$
Area	The amount of **space inside** a shape. Units include: mm^2, cm^2, m^2	
Area of a Rectangle	**Length x Width**	 $A = 36cm^2$
Area of a Parallelogram	**Base x Perpendicular Height** Not the slant height.	 $A = 21cm^2$
Area of a Triangle	**Base x Height ÷ 2**	 $A = 24cm^2$
Area of a Trapezium	$\frac{(a+b)}{2} \times h$ "Half the sum of the parallel side, times the height between them. That is how you calculate the area of a trapezium"	 $A = 55cm^2$
Compound Shape	A shape made up of a **combination of other known shapes** put together.	


Square Numbers
When a number has been multiplied by itself, we say that the answer is a square number.
1 x 1 = 1
2 x 2 = 4
3 x 3 = 9
We can write three squared as 3 x 3 or 3²
1 x 1 = 1
2 x 2 = 4
3 x 3 = 9
4 x 4 = 16
5 x 5 = 25
6 x 6 = 36
7 x 7 = 49
8 x 8 = 64
9 x 9 = 81
10 x 10 = 100
11 x 11 = 121
12 x 12 = 144


PRIME NUMBERS
Prime numbers are numbers (greater than 1) that cannot be divided by any number except themselves and one.
The numbers shown in yellow are all prime numbers. 1 is not a prime number!
To test if a number is a prime, divide it by 2, 3, 5, 7, 9 or 11.
7
7 is a prime number because it can only be divided by 7 and 1.
70
70 is not a prime number because it can be divided by 70, 35, 14, 10, 7, 5, 2 and 1!