



This booklet has been written to help you understand how mathematics is taught in school. It also gives practical ideas and suggestions for helping your child at home.

We know that parents are keen to help with their child's education but may find they do not understand what their child is doing as it is different to the way they were taught or find they confuse their children with their methods.

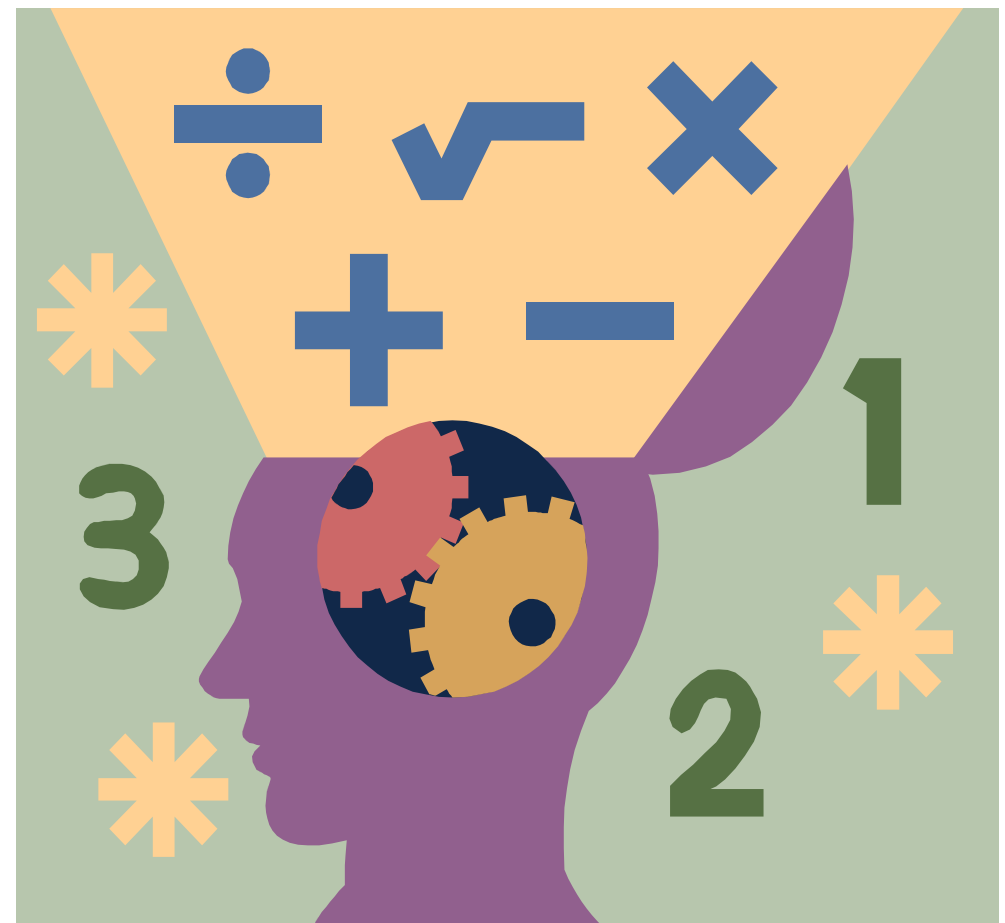
The days are gone when maths lessons are endless pages of calculations to be done in silence. Today it is a lot more about collaboration and investigation. Children are taught why the methods work, not just how to perform them. It is the difference between telling someone directions or giving them a map.

Many parents also feel less confident in mathematics as they feel they do not understand it. This feeling could rub off onto your child.

So use this guide to help you and your child gain in confidence and remember to make maths fun!

Reference materials include: Mathematical Vocabulary booklet (DfE), target setting booklet (DfE), Maths for Mums & Dads (Rob Eastaway & Mike Askew)

## SHUSTOKE C.E. PRIMARY SCHOOL



## Maths props to have in the house

Tape measure and ruler - get your child involved when completing DIY.

Bar of chocolate (with squares) - good for showing multiplication and fractions.

Magnet numbers - a great way for impromptu maths in the house.

Dartboard - darts teaches not only addition, subtraction and multiplication but also raises discussions of what is needed to finish the game.

Unusual dice - they don't have to be 6 sided.

Dominoes - another great game to show combinations of numbers

Guess who - this game shows how to group characters into categories and can be extended to shapes and numbers.

Thermometer - shows both positive and negative numbers to discuss.

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**Remember to make maths fun and relevant!**

## Some Do's and Don'ts

- Make maths silly, gruesome, scary or dangerous—get your child excited about maths questions e.g. I bet you don't know the answer?
- Recognise there's more than one way of doing calculations— children's methods may be long winded or confusing, but you should always let them try their own way of solving a problem. Notice one method does not solve all calculations e.g. you would use different methods to find  $3,786+4,999$  to  $3,786 + 4,568$ .
- Don't expect children to 'get it' after you've explained to once—it can take a long time for the penny to drop. It is perfectly normal for children not to recognise a concept learnt in a new context.
- Don't tell your child you are hopeless at maths—many adults claim to be hopeless at maths and this can give the message that maths is difficult, not enjoyable and ultimately not important to succeed in life. This just isn't true, as adults we deal with mathematics everyday and cope with it. Just because you don't understand or remember how to complete long division, doesn't mean you don't understand mathematics.
- Mathematics is a large, rich and imaginative subject that can inspire and be used in the everyday life and you can make this subject come to life!

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## Some Do's and Don'ts

- When a child gets a question wrong, it is tempting to tell them they are wrong and how to correct it. Why not ask them to explain their method and help them spot their mistake.
- Similarly if a child gets a question right, get them to explain how they reached their answer, perhaps pretending not to understand their reasoning.
- Play maths with your child — games are full of maths and are an ideal way to engage mathematical thinking. Consider questioning when playing e.g. Can you be the banker and change £500?
- Let your child win, or be 'better than you' - of course you know your child best, so will know the correct balance of winning and losing, but can compete against one another within a mathematical context e.g. I bet you can't get ready for bed in 5 minutes.
- Make maths a casual part of what you do while you're doing something else — instead of making maths formal find ways to sneak it in e.g. How many more plates do I need? Have we got enough for the bread and milk? Did you see the number 23 bus? I was wondering, is 23 a prime number?
- Make maths 'hands on'—remember the three C's of everyday maths: cash, clocks and cooking. All three **22** perfect opportunities to practise maths.

## Maths props to have in the house

A prominent clock - try using both an analogue and digital clock. Can you compare the two?

A wall calendar - not only good for noticing days and months, but also for finding patterns e.g. 7 times table

Board games with dice or spinner - why not make your own board game?

Pack of playing cards - not only can you learn about counting but also chance and probability.

Calculator - you can discover so many patterns with calculators, not just basic computation.

Measuring jug - discover both imperial and metric ways of measuring.

Scales - traditional balances can show counting as well as measuring.

Dried beans, pasta - useful for counting, dividing and finding the difference.

**Remember to make maths fun and relevant!**

# Maths Overview Year by Year

## Reception

Counting is important and the basis of arithmetic. Children in Reception will be learning to say the number names in order, forwards and backwards, and count collections of objects.

They will be encouraged to use the language more or less to add and subtract with numbers to 10.

e.g. 1 more than 6? The number 1 less than 7?

Children will engage in activities such as putting two groups of objects together to find the total. They remove some objects showing 'taking away.'

The beginnings of multiplication and division are developed through counting groups of the same size and sharing.

Making patterns, building models and sorting things around the classroom develop reasoning using everyday language to describe them.

They will compare things using language like bigger, greater, heavier and lighter.

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**Remember this is an overview, not an exhaustive list.**

# Vocabulary to know by the end of the year

## Instructions

listen  
join in  
say

think  
imagine  
remember

start from  
start with  
start at

look at  
point to  
show me

put, place  
fit

arrange  
rearrange  
change, change over  
split  
separate

carry on, continue  
repeat  
what comes next?

find  
choose  
collect

use  
make  
build

tell me  
describe  
pick out  
talk about  
explain  
show me

read  
write  
trace  
copy  
complete  
finish, end

fill in  
shade  
colour

tick, cross  
draw  
draw a line between  
join (up)  
ring  
cost  
count  
work out  
answer  
check

## General

same number/s  
different number/s  
missing number/s  
number facts

number line, number track  
number square  
number cards  
counters, cubes, blocks, rods  
die, dice  
dominoes  
pegs, peg board

same way, different way  
best way, another way  
in order, in a different order

not  
all, every, each

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## Vocabulary to know by the end of the year

### EXPLORING PATTERNS, SHAPE AND SPACE

shape, pattern  
flat  
curved, straight  
round  
hollow, solid  
corner  
face, side, edge, end  
sort  
make, build, draw

### 3D SHAPES

cube  
pyramid  
sphere  
cone

### 2D SHAPES

circle  
triangle  
square  
rectangle  
star

### PATTERNS AND SYMMETRY

size  
bigger, larger, smaller  
symmetrical  
pattern  
repeating pattern  
match

### POSITION, DIRECTION AND MOVEMENT

position  
over, under  
above, below  
top, bottom, side  
on, in  
outside, inside  
around  
in front, behind  
front, back  
before, after  
beside, next to  
opposite  
apart  
between  
middle, edge  
corner  
direction  
left, right  
up, down  
forwards, backwards, sideways  
across  
close, far, near  
along  
through  
to, from, towards, away from  
movement  
slide  
roll  
turn  
stretch, bend

## Maths Overview Year by Year

### Year 1

Counting is extended to objects up to 20 and recording the total.

Children learn pairs of numbers that add up to 10 (number bonds e.g.  $4+6$  or  $7+3$ .) They also learn that addition can be reversed e.g.  $2+8=8+2$ .

Skills needed for multiplication are developed by learning to count in twos and fives. They also double numbers to 10. Sharing collections of objects into equal groups will help explore division and talk about half and quarter.

Children make patterns, pictures and models of common 2-D and 3-D shapes using their names. They will also talk about the position of things using everyday language like behind, above, next to.

Estimating, measuring, comparing and weighing objects help them to understand measuring. They will talk about when things happen or put events in order to introduce time.

Block graphs and pictograms help to display information. **5**

**Remember this is an overview, not an exhaustive list.**

# Maths Overview Year by Year

## Year 2

The reading and writing of numbers is extended up to 1000. Children learn about odd and even numbers. Number bonds to 20 should be learnt and the patterns in counting to tens help children to answer calculations like  $50+20$  or  $80-30$ .

They work on mental methods to add and subtract single digits or multiples of 10 e.g.  $36+40$ ,  $45-8$ . A key idea is learning that subtraction is the inverse of addition: knowing  $16+7=23$  means you also know  $23-7=16$ .

In multiplication children will be doubling numbers to 20 and halving the answers. Tables are introduced starting with the 2, 5 and 10 times tables.

Children learn common 2D and 3D shapes e.g. square, cube. In addition they look at symmetry of shapes.

Half, quarter and full turns are introduced. Measuring becomes more accurate using metres, centimetres, kilograms and litres. Learning to read divisions on scales is also introduced.

Children gather data linked to topics. This data is then represented in tables, diagrams, block graphs and pictograms.

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# Vocabulary to know by the end of the year

## Solving problems

### REASONING ABOUT NUMBERS OR SHAPES

pattern  
puzzle  
answer  
right, wrong  
what could we try next?  
how did you work it out?  
count, sort  
group, set  
match  
same, different  
list

### PROBLEMS INVOLVING 'REAL LIFE' OR MONEY

compare  
double  
half, halve  
pair  
count out, share out  
left, left over

money  
coin  
penny, pence, pound  
price  
cost  
buy  
sell  
spend, spent  
pay  
change  
dear, costs more  
cheap, costs less, cheaper  
costs the same as  
how much...? how many...?  
total

## Measures, shape and space

### MEASURES (GENERAL)

measure  
size  
compare  
guess, estimate  
enough, not enough  
too much, too little  
too many, too few  
nearly, close to, about the same as  
just over, just under

### LENGTH

length, width, height, depth  
long, short, tall  
high, low  
wide, narrow  
deep, shallow  
thick, thin  
longer, shorter, taller, higher... and so on  
longest, shortest, tallest, highest... and so on  
far, near, close

### MASS

weigh, weighs, balances  
heavy/light, heavier/lighter, heaviest/lightest  
balance, scales, weight

### CAPACITY

full  
half full  
empty  
holds  
container

### TIME

time  
days of the week: Monday, Tuesday...  
day, week  
birthday, holiday  
morning, afternoon, evening, night  
bedtime, dinnertime, playtime  
today, yesterday, tomorrow  
before, after  
next, last  
now, soon, early, late  
quick, quicker, quickest, quickly  
slow, slower, slowest, slowly  
old, older, oldest  
new, newer, newest  
takes longer, takes less time  
hour, o'clock  
clock, watch, hands

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# Vocabulary to know by the end of the year

## Counting and recognising numbers

### COUNTING

number  
zero, one, two, three... to twenty and beyond  
zero, ten, twenty... one hundred  
none  
how many...?  
count, count (up) to  
count on (from, to)  
count back (from, to)  
count in ones, twos... tens...  
more, less, many, few  
odd, even  
every other  
how many times?  
pattern, pair  
guess how many, estimate  
nearly, close to, about the same as  
just over, just under  
too many, too few, enough, not enough

### COMPARING AND ORDERING NUMBERS

the same number as, as many as  
*Of two objects/amounts:*  
greater, more, larger, bigger  
less, fewer, smaller  
*Of three or more objects/amounts:*  
greatest, most, biggest, largest  
least, fewest, smallest  
one more, ten more  
one less, ten less  
compare  
order  
size  
first, second, third... tenth  
last, last but one  
before, after  
next  
between  
above, below

## Adding and subtracting

add, more, and  
make, sum, total  
altogether  
score  
double  
one more, two more, ten more...  
how many more to make... ?  
how many more is... than... ?  
take (away), leave  
how many are left/left over?  
how many have gone?  
one less, two less... ten less...  
how many fewer is... than... ?  
difference between  
is the same as

# Maths Overview Year by Year

## Year 3

Numbers up to 1000 will now be worked with, and placed on a number line. Children should be confident in counting on or back in tens. They will be able to partition a number into hundreds, tens and units and be able to round to the nearest 10 or 100.

Learning to add and subtract pairs of numbers mentally helps children to begin to look at how they can be recorded in writing.

The 3, 4 and 6 times tables will be rehearsed along with multiplying and dividing by 10, 100 and 1000. The idea that division is the inverse of multiplication is introduced to help divide e.g. knowing that  $6 \times 9 = 54$  shows  $54 \div 6 = 9$  or  $54 \div 9 = 6$

Proper fractions are developed further through diagrams, fractions of numbers and amounts. Work on angles is extended to recognising right angles. Children work on relationships in measures e.g. metres in a kilometre.

Telling the time to the nearest 5 minutes on a clock is developed. Venn and Carroll diagrams are used to sort information.

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## Maths Overview Year by Year

### Year 4

Children move from working with whole numbers to meeting decimals, particularly in relation to money and measurement.

Mental calculations like  $700+600$  or  $6000-3000$ , continue to build on knowledge of number bonds. They continue with mental addition and subtraction along with written calculations for 3 digit numbers and money.

Knowing your tables up to  $10 \times 10$  is extended and the use of the grid method for multiplication is shown. The idea of equivalent fractions is introduced along with mixed and improper fractions. Children identify fractions that total a whole and carry out calculations using fractions e.g.  $1/5$  of 30 apples or shading  $5/8$  of a rectangle.

Children work on the ideas of vertical and horizontal. They find areas perimeters of rectangular shapes and measure angles in degrees.

They tell the time to the nearest minute using different clock notations: am, pm or the 24-hour clock.

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## Some fun ideas to try at home

### Car number bingo

- ◆ Each person chooses a target number, e.g. 10. Think about which pairs of numbers add to make your target.
- ◆ You have to see a car that has two numbers that add up to your target number.



**K456 XWL**

- ◆ Say:  $4 + 6 = 10$ , bingo!
- ◆ Change the target number each week.

You can extend this activity by looking for three numbers which add up to your target number.

### Secret numbers



**0123456789**

- ◆ Write the numbers 0 to 20 on a sheet of paper.
- ◆ Ask your child secretly to choose a number on the paper. Then ask him / her some questions to find out what the secret number is, e.g.

Is it less than 10?

Is it between 10 and 20?

Does it have a 5 in it?

He / she may answer only yes or no.

- ◆ Once you have guessed the number, it is your turn to choose a number. Your child asks the questions.

For an easier game, use numbers up to 10. For a harder game, use only 5 questions, or use bigger numbers.

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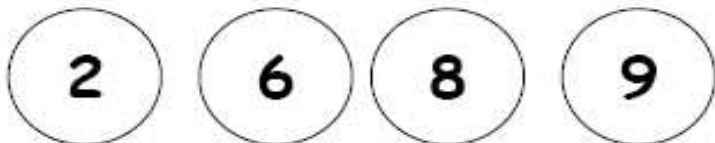


## Some fun ideas to try at home

### Adding circles

For this game, you need a dice and pencil and paper.

- ◆ Each of you should draw four circles on your piece of paper. Write a different number between 2 and 12 in each circle.



- ◆ Roll the dice twice. Add the two numbers.
- ◆ If the total is one of the numbers in your circles then you may cross it out.
- ◆ The first person to cross out all four circles wins.

### Dicey coins

For this game you need a dice and about twenty 10p coins.

- ◆ Take turns to roll the dice and take that number of 10p coins.
- ◆ Guess how much money this is. Then count aloud in tens to check, e.g. *saying ten, twenty, thirty, forty...*
- ◆ If you do this correctly you keep one of the 10p pieces.
- ◆ First person to collect £1 wins.
- ◆ Don't forget to give the coins back!

### Out and about

On the way to school, see how many cuboids, spheres and cylinders you can spot. Which did you see most of?



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## Maths Overview Year by Year

### Year 5

Children are mentally adding, subtracting and doubling simple decimals e.g.  $6.5 - 2.7$  or double 2.4. They use written methods to add and subtract large whole numbers and decimals up to two places e.g.  $23.45 - 17.67$

Children find factor pairs of 2-digit numbers. They learn about common multiples of two numbers. Written methods are now used to multiply and divide 3-digit numbers and decimals.

As well as solving fraction problems like finding  $\frac{1}{100}$  of 5 litres, they find percentages of numbers and quantities e.g. 10% of £60.

Children use co-ordinates and recognise and construct parallel and perpendicular lines. Measuring becomes increasingly accurate e.g. to the nearest millimetre

They meet the idea of mode as a measure of average.

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# Maths Overview Year by Year

## Year 6

Children find the difference between positive and negative numbers in a context e.g. difference between  $+5^{\circ}\text{C}$  and  $-4^{\circ}\text{C}$ .

Children are using a variety of written methods to add and subtract integers (positive and negative) and decimals.

They use their knowledge of table facts to mentally work out decimal multiplications and divisions, e.g.  $0.6 \times 7$ . They figure out squares of numbers. Prime numbers less than 100 are explored and the prime factors of 2-digit numbers are found e.g.  $24 = 2 \times 2 \times 2 \times 3$ .

They learn to multiply and divide integers and decimals with confidence in written methods. Children relate fractions to multiplication and division e.g.  $9 \div 3 = 1/3$  or  $9 = 9 \times 1/3$ . They find fractions and percentages of whole numbers.

Children calculate angles in triangles and convert between metric units using decimals. They use the terms mode, range, median and mean when learning about averages. **10**

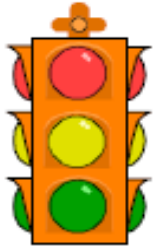
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# Some fun ideas to try at home

## Shape activity

At home, or when you are out, look at the surface of shapes.

- ◆ Ask your child – what shape is this plate, this mirror, the bath mat, the tea towel, the window, the door, the red traffic light, and so on.
- ◆ Choose a shape for the week, e.g. a square. How many of these shapes can your child spot during the week, at home and when you are out?

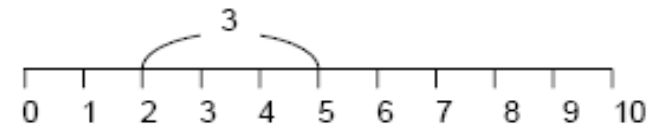


## Dice game

You need a 1–6 dice, paper and pencil.

- ◆ Take turns.
- ◆ Choose a number between 1 and 10 and write it down.
- ◆ Throw the dice and say the dice number.
- ◆ Work out the difference between the chosen number and the dice number, e.g. if you wrote down a 2 and the dice shows 5, the difference is 3.

You could also draw a number line to help your child to see the difference between the two numbers.



## How old?

Start with your child's age. Ask your child:

How old will you be when you are 1 year older?

How old were you last year?

How old will you be 10 years from now?

and so on.

## Learning intentions by the end of the year

- Verbalise some number names in familiar contexts, such as nursery rhymes.
- Counts reliably up to 10 everyday objects.
- Says number names in order to at least 10 and orders them.
- Recognises numerals 1 to 9.
- Finds one more or one less from a group of 10 objects.
- Relates addition by combining two groups.
- Relates subtraction to taking away.
- Begins to use the vocabulary involved in addition and subtraction.
- Begins to use mathematical vocabulary to describes 2D and 3D shapes in simple models, pictures and patterns.
- Talks about, recognises and recreates simple patterns.
- Uses everyday language to describe position.
- Use language such as 'greater', 'smaller', 'heavier', or 'lighter' to compare quantities.
- Uses developing mathematical ideas and methods to solve practical problems.

## Maths Overview Year by Year

### Moving On

By now children work on ordering fractions by converting them into decimals and they use ratio notation. They are familiar with the ideas of multiples, factors, divisors, common factors, highest common factors and lowest common multiples. They calculate percentage increases or decreases and calculate efficiently.

They learn to calculate area of right-angled triangles and volume and surface area of cubes and cuboids.

They work with the probability scale from 0 to 1 and carry out statistical inquiries.

Further mathematical skills are introduced in other areas like trigonometry and algebra.

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