



Year 6

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.

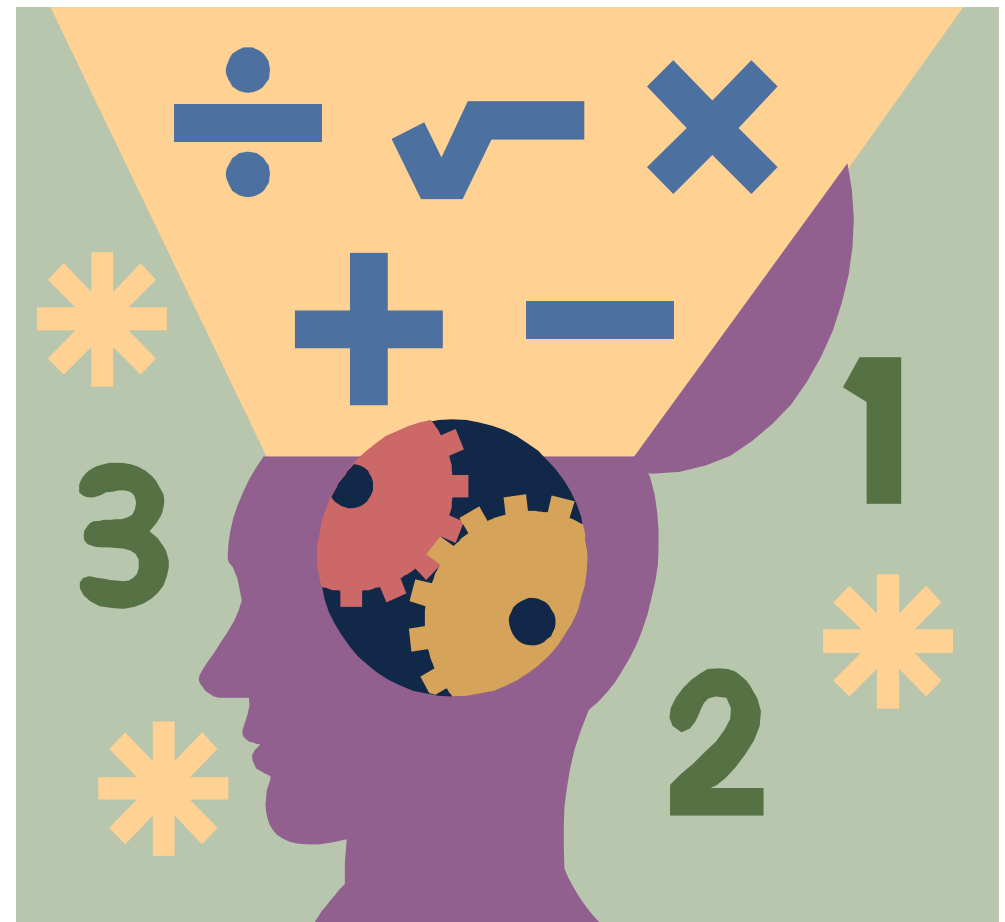
The days are gone when maths lessons are endless pages of calculations to be done in silence. Today it is a lot more about collaboration and investigation. Children are taught why the methods work, not just how to perform them. It is the difference between telling someone directions or giving them a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



A Parent's Guide to Mathematics

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.

2

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!

23

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.

Remember this is an overview, not an exhaustive list.

4

Vocabulary to know by the end of the year

POSITION, DIRECTION AND MOVEMENT

position
over, under, underneath
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, centre
corner
direction
journey, route, map, plan
left, right
up, down, higher, lower
forwards, backwards, sideways, across
close, far, near
along, through, to, from, towards, away from
ascend, descend
grid, row, column
origin, coordinates
clockwise, anti-clockwise
compass point, north, south, east, west (N, S, E, W)
north-east, north-west, south-east, south-west
(NE, NW, SE, SW)
horizontal, vertical, diagonal
parallel, perpendicular
x-axis, y-axis
quadrant
movement
slide, roll
whole turn, half turn, quarter turn, rotate, rotation
angle, ...is a greater/smaller angle than
right angle, acute, obtuse, reflex
degree
straight line
stretch, bend
ruler, set square
angle measurer, compasses, protractor

Instructions

listen, join in, say, recite
think, imagine, remember
start from, start with, start at
look at, point to, show me

put, place
arrange, rearrange
change, change over
adjusting, adjust
split, separate

carry on, continue, repeat
what comes next? predict
describe the pattern, describe the rule

find, find all, find different
investigate

choose, decide
collect

use, make, build, construct, bisect

tell me, define, describe, name, pick out, identify
discuss, talk about
explain
explain your method/answer/reasoning
give an example of...
show how you...
show your working
justify
make a statement

read, write, record
write in figures
present, represent
interpret
trace, copy
complete, finish, end

fill in, shade, colour
label, plot

tick, cross
draw, sketch
draw a line between, join (up), ring, arrow

cost, count, tally

calculate, work out, solve, convert

investigate, interrogate (data), question, prove
answer
check

General

same, identical, different
missing number/s
number facts, number pairs, number bonds
greatest value, least value

number line, number track
number square, hundred square
number cards, number grid
abacus
counters, cubes, blocks, rods
die, dice, spinner
dominoes
pegs, peg board, pin board
geo-strips

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

not
all, every, each

21

Vocabulary to know by the end of the year

MASS

mass: big, bigger, small, smaller, balances
weight: heavy/light, heavier/lighter, heaviest/lightest
weigh, weighs
tonne, kilogram (kg), half-kilogram, gram (g)
pound (lb), ounce (oz)
balance, scales

CAPACITY

capacity
full, half full, empty
holds, contains
litre (l), half-litre, centilitre (cl), millilitre (ml)
pint, gallon
container, measuring cylinder

AREA

area, covers, surface
square centimetre (cm²), square metre (m²)
square millimetre (mm²)

TIME

time
days of the week: Monday, Tuesday...
months of the year: January, February...
seasons: spring, summer, autumn, winter
day, week, fortnight, month
year, leap year, century, millennium
weekend, birthday, holiday
calendar, date, date of birth
morning, afternoon, evening, night
am, pm, noon, midnight
today, yesterday, tomorrow
before, after, next, last
now, soon, early, late, earliest, latest
quick, quicker, quickest, quickly
fast, faster, fastest, slow, slower, slowest, slowly
old, older, oldest, new, newer, newest
takes longer, takes less time
how long ago? how long will it be to...?
how long will it take to...?
timetable, arrive, depart
hour, minute, second
o'clock, half past, quarter to, quarter past
clock, watch, hands
digital/analogue clock/watch, timer
24-hour clock, 12-hour clock
Greenwich Mean Time, British Summer Time
International Date Line
how often?
always, never, often, sometimes, usually

SHAPE AND SPACE

shape, pattern
flat, line
curved, straight
round

hollow, solid
corner
point, pointed
face, side, edge, end
sort
make, build, construct, draw, sketch
centre, radius, diameter
circumference, concentric, arc
net
surface
angle, right-angled
congruent
intersecting, intersection
plane
base, square-based
vertex, vertices
layer, diagram
regular, irregular
concave, convex
open, closed
tangram

3D SHAPES

3D, three-dimensional
cube, cuboid
pyramid
sphere, hemi-sphere, spherical
cone
cylinder, cylindrical
prism
tetrahedron, polyhedron, octahedron, dodecahedron

2D SHAPES

2D, two-dimensional
circle, circular, semi-circle
triangle, triangular
equilateral triangle, isosceles triangle, scalene triangle
square, rhombus
rectangle, rectangular, oblong
pentagon, pentagonal
hexagon, hexagonal
heptagon
octagon, octagonal
polygon
quadrilateral
kite
parallelogram, trapezium

PATTERNS AND SYMMETRY

size
bigger, larger, smaller
symmetrical
line of symmetry, axis of symmetry
line symmetry, reflective symmetry
fold
match
mirror line, reflection, reflect
pattern, repeating pattern, translation

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.

Remember this is an overview, not an exhaustive list.

6

Vocabulary to know by the end of the year

share, share equally
one each, two each, three each...
group in pairs, threes... tens
equal groups of
divide, division, divided by, divided into
remainder
factor, quotient, divisible by
inverse

USING A CALCULATOR

calculator, display, key
enter, clear, sign change
constant, recurring, memory, operation key

Solving problems

MAKING DECISIONS AND REASONING

pattern, puzzle
calculate, calculation
mental calculation
method, strategy
jotting
answer
right, correct, wrong
what could we try next?
how did you work it out?
number sentence
sign, operation, symbol, equation

MONEY

money
coin, note
penny, pence, pound (£)
price, cost
buy, bought, sell, sold
spend, spent
pay
change
dear, costs more, more/most expensive
cheap, costs less, cheaper, less/least expensive
how much...? how many...?
total, amount, value, worth
discount, profit, loss
currency

Handling data

count, tally, sort, vote
survey, questionnaire
data, database
graph, block graph, line graph
pictogram,
represent
group, set

list, chart, bar chart, bar line chart
tally chart
table, frequency table
Carroll diagram, Venn diagram
label, title, axis, axes
diagram
most popular, most common
least popular, least common
mode, range, mean, average, median
statistics, distribution
maximum/minimum value
classify, outcome

PROBABILITY

fair, unfair
likely, unlikely, likelihood, equally likely
certain, uncertain
probable, possible, impossible
chance, good chance,
poor chance, no chance
equal chance, even chance, fifty-fifty chance
risk, doubt
biased, random

Measures, shape and space

MEASURES (GENERAL)

measure, measurement
size
compare
unit, standard unit
metric unit, imperial unit
measuring scale, division
guess, estimate
enough, not enough
too much, too little
too many, too few
nearly, roughly, about, close to
about the same as, approximately
just over, just under

LENGTH

length, width, height, depth, breadth
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, further, furthest, near, close
distance apart/between, distance to... from...
edge, perimeter, circumference
kilometre (km), metre (m)
centimetre (cm), millimetre (mm)
mile, yard, feet, foot, inches, inch
ruler, metre stick, tape measure, compasses

19

Vocabulary to know by the end of the year

Numbers and the number system

PLACE VALUE, ORDERING AND ROUNDING

units, ones
tens, hundreds, thousands
ten thousand, hundred thousand, million
digit, one-, two-, three- or four-digit number
numeral
'teens' number
place, place value
stands for, represents
exchange
the same number as, as many as
equal to
Of two objects/amounts:
>, greater than, more than, larger than, bigger than
<, less than, fewer than, smaller than
≥, greater than or equal to
≤, less than or equal to
Of three or more objects/amounts:
greatest, most, largest, biggest
least, fewest, smallest
one... ten... one hundred... one thousand more/less
compare, order, size
ascending/descending order
first... tenth... twentieth
last, last but one
before, after
next
between, half-way between
guess how many, estimate
nearly, roughly, close to, about the same as
approximate, approximately
≈, is approximately equal to
just over, just under
exact, exactly
too many, too few, enough, not enough
round (up or down), nearest
round to the nearest ten/hundred/thousand
integer, positive, negative
above/below zero, minus

PROPERTIES OF NUMBERS AND NUMBER SEQUENCES

number, count, how many...?
odd, even
every other
how many times?
multiple of
digit
next, consecutive
sequence
continue
predict
pattern, pair, rule

relationship
sort, classify, property
formula
divisible (by), divisibility, factor, **factorise**
square number
one squared, two squared... (1^2 , 2^2 ...)
prime, prime factor

FRACTIONS, DECIMALS, PERCENTAGES, RATIO AND PROPORTION

part, equal parts
fraction, proper/improper fraction
mixed number
numerator, denominator
equivalent, reduced to, cancel
one whole
half, quarter, eighth
third, sixth, ninth, twelfth
fifth, tenth, twentieth
hundredth, **thousandth**
proportion, ratio
in every, for every
to every, as many as
decimal, decimal fraction
decimal point, decimal place
percentage, per cent, %

Calculations

ADDITION AND SUBTRACTION

add, addition, more, plus, increase
sum, total, altogether
score
double, near double
how many more to make...?
subtract, subtraction, take (away), minus, decrease
leave, how many are left/left over?
difference between
half, halve
how many more/fewer is... than...?
how much more/less is...?
equals, sign, is the same as
tens boundary, hundreds boundary
units boundary, tenths boundary
inverse

MULTIPLICATION AND DIVISION

lots of, groups of
times, multiply, multiplication, multiplied by
multiple of, product
once, twice, three times... ten times...
times as (big, long, wide... and so on)
repeated addition
array, row, column
double, halve

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.

Remember this is an overview, not an exhaustive list.

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 10×10 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. $\frac{1}{5}$ of 30 apples or shading $\frac{5}{8}$ 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.

8

Remember this is an overview, not an exhaustive list.

Some fun ideas to try at home

TV addicts

Ask your child to keep a record of how long he / she watches TV each day for a week. Then ask him / her to do this.

- ◆ Work out the total watching time for the week.
- ◆ Work out the average watching time for a day (that is, the total time divided by 7).

Instead of watching TV, you could ask them to keep a record of time spent eating meals, or playing outdoors, or anything else they do each day. Then work out the daily average.

Four in a line

Draw a 6×7 grid.

Fill it with numbers under 100.

26	54	47	21	19	5	38
9	25	67	56	31	49	13
39	41	6	1	75	28	90
14	50	81	23	43	4	37
45	29	72	34	7	58	17
36	2	55	11	22	40	42

- ◆ Take turns.
- ◆ Roll three dice, or roll one dice three times.
- ◆ Use all three numbers to make a number on the grid.
- ◆ You can add, subtract, multiply or divide the numbers, e.g. if you roll 3, 4 and 5, you could make $3 \times 4 - 5 = 7$, $54 \div 3 = 18$, $(4 + 5) \times 3 = 27$, and so on.
- ◆ Cover the number you make with a coin or counter.
- ◆ The first to get four of their counters in a straight line wins.

Rhymes

Make up rhymes together to help your child to remember the harder times-tables facts, e.g.

$6 \times 7 = 42$ phew! $7 \times 7 = 49$ fine! $6 \times 8 = 48$ great!

17

Some fun ideas to try at home

Favourite food

- ◆ Ask your child the cost of a favourite item of food. Ask them to work out what 7 of them would cost, or 8, or 9. How much change would there be from £50?
- ◆ Repeat with his / her least favourite food. What is the difference in cost between the two?

Sale of the century

- ◆ When you go shopping, or see a shop with a sale on, ask your child to work out what some items would cost with:
 - 50% off
 - 25% off
 - 10% off
 - 5% off
- ◆ Ask your child to explain how she worked it out.

Recipes

Find a recipe for 4 people and rewrite it for 8 people, e.g.

4 people	8 people
125g flour	250g flour
50g butter	100g butter
75g sugar	150g sugar
30ml treacle	60ml treacle
1 teaspoon ginger	2 teaspoons ginger

Can you rewrite it for 3 people? Or 5 people?

Fours

- ◆ Use exactly four 4s each time.
- ◆ You can add, subtract, multiply or divide them.
- ◆ Can you make each number from 1 to 100?
- ◆ Here are some ways of making the first two numbers.

$$1 = (4 + 4)/(4 + 4)$$

$$2 = 4/4 + 4/4$$

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 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.

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°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. 0.6×7 . 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.

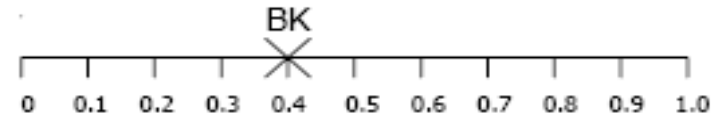
Children calculate angles in triangles and convert between metric units using decimals. They use the terms mode, range, median and mean when learning about averages. **10**

Remember this is an overview, not an exhaustive list.

Some fun ideas to try at home

Three in a row

For this game you need a calculator.
Draw a line like this:



- ◆ Take it in turns to choose a fraction, say $2/5$. Use the calculator to convert it to a decimal (i.e. $2 \div 5 = 0.4$) and mark your initials at this point on the line.
- ◆ The aim of the game is to get 3 crosses in a row without any of the other player's marks in between.
- ◆ Some fractions are harder to place than others, e.g. ninths.

Flowers

- ◆ Take turns to think of a flower.




- ◆ Use an alphabet code, A = 1, B = 2, C = 3... up to Z = 26.
- ◆ Find the numbers for the first and last letters of your flower, e.g. for a ROSE, R = 18, and E = 5.
- ◆ Multiply the two numbers together, e.g. $18 \times 5 = 90$.
- ◆ The person with the biggest answer scores a point.
- ◆ The winner is the first to get 5 points.

When you play again you could think of animals, or countries.

Learning intentions by the end of the year

By the end of Year 6, most children should be able to...

- Know all tables to 10 x 10, especially for division, e.g. $63 \div 7 = 9$, and quickly work out remainders.
- Multiply and divide decimals by 10 or 100 in their heads, e.g. 2.61×10 , $53.2 \div 100$.
- Put numbers, including decimals, in order of size, e.g. 1.06, 0.099, 0.25, 1.67.
- Use pencil and paper to add and subtract decimals, e.g. $3.91 + 8.04 + 24.56$, or $13.3 - 1.27$.
- Use pencil and paper to multiply and divide, e.g. 387×46 , 21.5×7 , $539 \div 13$, $307.6 \div 4$.
- Cancel fractions e.g. reduce $\frac{4}{20}$ to $\frac{1}{5}$, and work out which of two fractions is bigger, e.g. $\frac{7}{12}$ or $\frac{2}{3}$.
- Work out simple percentages of whole numbers, e.g. 25% of £90 is £22.50.
- Estimate angles and use a protractor to measure them.
- Work out the perimeter and area of simple shapes that can be split into rectangles, e.g. 
- Solve word problems and explain their methods.
- Use co-ordinates to plot the position of points.
- Understand and use information in graphs, charts and tables.

14

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.

11

Remember this is an overview, not an exhaustive list.

On this page should be information on our calculation policy.
Unfortunately it would not convert to a PDF format.
These pages can still be found on the website as
Microsoft Word document.
Apologies for any inconvenience caused.