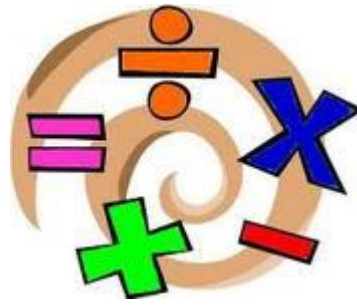# Maths guide for parents and carers of mathematicians in Year 6

Contents

- *Introduction, do's and don'ts*

- *Overview of the year – key concepts that your child will be learning in mathematics*

- *Methods of calculation taught & mental strategies*

- *Vocabulary – mathematical words they need to know*

- *Maths at home, games and internet links*

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, and outlines what your child will be learning this year.

We know that you are keen to help with your child's maths education but may find you do not understand what their child is doing at school. Methods we teach might be different from the way you were taught. Many of you might feel less confident in mathematics because you did not understand it or enjoy the subject when you were at school. We all want your children to feel the opposite. We want them to feel confident in their mathematical abilities and to enjoy maths lessons. Children are taught why the methods work, not just how to perform them. It is the difference between telling someone directions and giving them a map.

We hope that you use this guide to help you support your child with maths at home. If you have any questions about anything in this guide, please ask your child's teacher or Becca Wall(maths coordinator) and we will be more than happy to talk things through.

Reference materials include: Mathematical Vocabulary booklet (DfE), target setting booklet (DfE), Maths for Mums & Dads (Rob Eastaway& Mike Askew), the latter of which is a well worth reading.

Some Do's and Don'ts

- Make maths 'hands on'—remember the three C's of everyday maths: cash, clocks and cooking. All three are perfect opportunities to practise maths (see maths at home section)

- Recognise there's more than one way of doing a calculation. Children's methods may seem long-winded or confusing, but you should always let them try their own way of solving a problem – it's how they will learn to understand maths rather than finding quick short-cuts.

- Discuss how one method may not be appropriate for all calculations e.g. you would use different methods to find 3,786+4,999 and 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.

- 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.

- 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?

- Don't accept it if your child says they are bad at maths and don't say that you are bad at maths either —this can give the message that maths is difficult, not enjoyable and ultimately not important for success in life. This just isn't true; as adults we deal with mathematics every day in cooking, shopping, sharing, games, parking… the list is endless. If you are positive your child will be too.

OVERVIEW OF MATHS IN YEAR 6

This outlines what the children will be learning over the course of the year:

<u>Problem solving</u>

- Solve multi-step problems including word problems that involve fractions, decimals and percentages.

- Choose the best methods to solve problems, including using a calculator.

- Record their working out on paper and check for mistakes. To use a symbol such as *x* or *n* to represent unknown numbers in a problem.

- Suggest ways of solving problems, reasoning and discussing their mathematical ideas.

- Recognise and use sequences, patterns and relationships involving shapes and numbers.

<u>Number and place value</u>

- read, write, order and compare numbers up to 10 000 000 and determine the value of each digit

- round any whole number to a required degree of accuracy

- use negative numbers in context, and calculate intervals across zero

- solve number and practical problems that involve all of the above.

<u>Calculation (see following pages for methods)</u>

- multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication

- divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context

- divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context

- perform mental calculations, including with mixed operations and large numbers

- identify common factors, common multiples and prime numbers

- use their knowledge of the order of operations to carry out calculations involving the four operations

- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

- solve problems involving addition, subtraction, multiplication and division

- use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.

- use common factors to simplify fractions; use common multiples to express fractions in the same denomination

- compare and order fractions, including fractions > 1

- add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions

- multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$]

- divide proper fractions by whole numbers [for example, $\frac{1}{3} \div 2 = \frac{1}{6}$]

- associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$]

- identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places

- multiply one-digit numbers with up to two decimal places by whole numbers

- use written division methods in cases where the answer has up to two decimal places

- solve problems which require answers to be rounded to specified degrees of accuracy

- recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.

Ratio and Proportion

- solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts

- solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison

- solve problems involving similar shapes where the scale factor is known or can be found

- solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.

Algebra

- use simple formulae

- generate and describe linear number sequences

- express missing number problems algebraically

- find pairs of numbers that satisfy an equation with two unknowns

- enumerate possibilities of combinations of two variables.

Shape, space and measure

- solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate

- use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places

- convert between miles and kilometres

- recognise that shapes with the same areas can have different perimeters and vice versa

- recognise when it is possible to use formulae for area and volume of shapes

- calculate the area of parallelograms and triangles

- calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units [for example, mm^3 and km^3].

- draw 2-D shapes using given dimensions and angles

- recognise, describe and build simple 3-D shapes, including making nets

- compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons

- illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius

- recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.

- describe positions on the full coordinate grid (all four quadrants)

- draw and translate simple shapes on the coordinate plane, and reflect them in the axes.

Data handling

- interpret and construct pie charts and line graphs and use these to solve problems

- calculate and interpret the mean as an average.

Moving On – what children will be working on as they enter year 7:

The 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.

METHODS OF CALCULATION

If you would like to see detail of how these methods progress through each year group, please ask your child's teacher for our school calculation policy. If you use different methods, feel free to discuss these with your child but allow them to explain what they have learnt at school too.

MANY MENTAL CALCULATION STRATEGIES WILL CONTINUE TO BE USED THROUGHOUT YOUR CHILD'S SCHOOLING. THEY ARE NOT REPLACED BY WRITTEN METHODS.

Children should be encouraged to

- **consider if a mental calculation would be appropriate before using written methods.**
- **approximate their answers before calculating.**
- **check their answers after calculation using an appropriate strategy.**

ADDITION

| Sum | Plus | Altogether | Total |

-

Mental Calculation Strategies for Addition
These are a **selection** of mental calculation strategies which should continue to be practiced and used in lessons right up to year 6.

Mental recall of number bonds
6 + 4 = 10   □ + 3 = 10
25 + 75 = 100   19 + □ = 20

Using number bonds to add many numbers
5 + 2 + 8 + 9 + 1 combine 9 and 1, 8 and 2 to see the answer is 25

Use near doubles
6 + 7 = double 6 + 1 = 13

Addition using partitioning and recombining
34 + 45 = (30 + 40) + (4 + 5) = 79

Counting on or back in repeated steps of 1, 10, 100, 1000
86 + 57 = 143 (by counting on in tens and then in ones)
460 - 300 = 160 (by counting back in hundreds)

Add the nearest multiple of 10, 100 and 1000 and adjust
24 + 19 = 24 + 20 − 1 = 43
458 + 71 = 458 + 70 + 1 = 529

Use the relationship between addition and subtraction
36 + 19 = 55   19 + 36 = 55
55 − 19 = 36   55 − 36 = 19

Written methods of addition
Children should extend the carrying method to number with any number of digits.

```
  7648                    6584
+ 1486                  + 5848
  9134                   12432
   1 11                   1 11
```

Using similar methods, children will

✓   *add several numbers with different numbers of digits;*
✓   *begin to add two or more decimal fractions with up to four digits and either one or two decimal places;*
✓   *know that decimal points should line up under each other, particularly when adding or subtracting mixed amounts, e.g. 401.2 + 26.85 + 0.71.*

SUBTRACTION

Minus   Take-away   Less   Reduce   Find the difference

Mental Calculation Strategies for Subtraction
These are a **selection** of mental calculation strategies taught throughout the school:

Mental recall of addition and subtraction facts
10 − 6 = 4   17 - □ = 11
20 - 17 = 3   10 - □ = 2

Find a small difference by counting up
82 − 79 = 3

Counting on or back in repeated steps of 1, 10, 100, 1000
86 - 52 = 34 (by counting back in tens and then in ones)
460 - 300 = 160 (by counting back in hundreds)

Subtract the nearest multiple of 10, 100 and 1000 and adjust
24 - 19 = 24 - 20 + 1 = 5
458 - 71 = 458 - 70 - 1 = 387

Use the relationship between addition and subtraction

36 + 19 = 55   19 + 36 = 55
55 − 19 = 36   55 − 36 = 19

Written Methods
Decomposition:

```
  5 13 1
  6̸4̸67
- 2684
  3783
```

Children should:

✓   *Understand the decomposition method as fully as possible;*
✓   *be able to subtract numbers with different numbers of digits;*
✓   *be able to subtract two or more decimal fractions with up to three digits and either one or two decimal places;*
✓   *know that decimal points should line up under each other.*

Where the numbers are involved in the calculation are close together or near to multiples of 10, 100 etc counting on using a number line should be used. We call this 'finding the difference'

3002 − 1997 = 1005
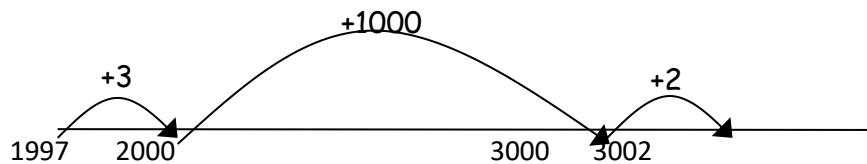
MULTIPLICATION

Times	Lots of...	Product	Double	Groups of...
Multiple		Repeated addition		Array

Mental Calculation Strategies for Multiplication

These are a **selection** of mental calculation strategies:

Doubling and halving

Applying the knowledge of doubles and halves to known facts.

e.g. 8 x 4 is double 4 x 4

Using multiplication facts

Tables will be taught everyday from the last term of year 1 onwards, either as part of the mental oral starter or other times as appropriate within the day, particularly using the times table tournament.

Years 5 & 6   Derive and recall quickly all multiplication facts up to 12 x 12.

Using and applying division facts

Children should be able to utilise their tables knowledge to derive other facts.

e.g. If I know 3 x 7 = 21, what else do I know?

30 x 7 = 210, 300 x 7 = 2100, 3000 x 7 = 21 000, 0.3 x 7 = 2.1 etc

Use closely related facts already known

13 x 11 = (13 x 10) + (13 x 1)

       = 130 + 13 = 143

Multiplying by 10 or 100

Knowing that the effect of multiplying by 10 is a shift in the digits one place to the left.

Knowing that the effect of multiplying by 100 is a shift in the digits two places to the left.

Partitioning

23 x 4 = (20 x 4) + (3 x 4)

       = 80 + 12

       = 92

Use of factors

8 x 12 = 8 x 4 x 3

Written methods of multiplication

ThHTU x U

(Short multiplication – multiplication by a single digit)

4346 x 8

Children will approximate first

4346 x 8 is approximately 4346 x 10 = 43460

This is the **grid method**:

x	4000	300	40	6			
8	32000	2400	320	48			32000

							+ 2400
							+ 320
							+ 48
							34768

HTU x TU

(Long multiplication – multiplication by more than a single digit)

372 x 24

Children will approximate first

372 x 24 is approximately 400 x 25 = 10000

x	300	70	2			
20	6000	1400	40			6000
4	1200	280	8			+ 1400
						+ 1200
						+ 280

						+ 40
						+ 8
						8928

₁

Using similar methods, they will be able to multiply decimals with up to two decimal places by a single digit number and then two digit numbers, approximating first. They should know that the decimal points line up under each other.
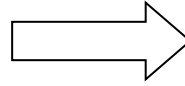
For example:

4.92 x 3

Children will approximate first

4.92 x 3 is approximately 5 x 3 = 15

x	4	0.9	0.02			
3	12	2.7	0.06			12
						+ 0.7
						+ 0.06
						12.76

The grid method will progress for most children, to the standard written methods for long and short multiplication:

x	20	3			
8	160	24			160
					+ 24
					184

```
  23
   8x
 ____
  24
 160
 ____
 184
```

```
  23
   8x
 ____
 184
  2
```
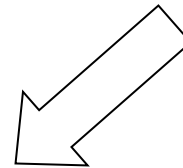
DIVISION

Share   group   lots of   split   divide into

Mental Calculation Strategies for Division

These are a **selection** of mental calculation strategies:

Doubling and halving

Knowing that halving is dividing by 2

Deriving and recalling division facts

Using and applying division facts

Children should be able to utilise their tables knowledge to derive other facts.

e.g. If I know 3 x 7 = 21, what else do I know?

30 x 7 = 210, 300 x 7 = 2100, 3000 x 7 = 21 000, 0.3 x 7 = 2.1 etc

Dividing by 10 or 100

Use of factors

378 ÷ 21   378 ÷ 3 = 126   378 ÷ 21 = 18   126 ÷ 7 = 18

Use related facts

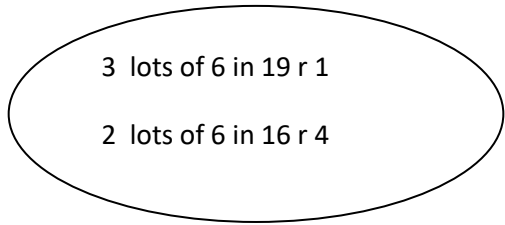Given that 1.4 x 1.1 = 1.54   What is 1.54 ÷ 1.4, or 1.54 ÷ 1.1?

Written methods of division

Short division HTU ÷ U

When children are secure in using the chunking method (see year 5 booklet) and understand how to find remainders accurately, they can be shown the briefer version:

196 ÷ 6

$$32 \text{ r } 4$$
$$6)\,\overline{19^16}$$

3 lots of 6 in 19 r 1

2 lots of 6 in 16 r 4

Long division HTU ÷ TU

972 ÷ 36

```
          27
 36 )   972
      - 720      20x
        252
      - 252      7x
0
```

Answer :   27

Any remainders could be shown as integers or as fractions, i.e. if the children were dividing 32 by 10, the answer should be shown as 3 $^2/_{10}$ which could then be written as 3 $^1/_5$ in it's lowest terms.

This will be extended to decimals with up to two decimal places. Children should know that decimal points line up under each other.

87.5 ÷ 7

```
         12.5
 7 )   87.5
     - 70.0    10x
       17.5
      - 14.0   2x
        3.5
      - 3.5    0.5x
```

0

↓

Answer :   12.5

VOCABULARY

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

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

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 (cm^2), square metre (m^2)
square millimetre (mm^2)

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

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

MATHS AT HOME

<u>Maths props to have in the house</u>

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.

Chess & draughts – a great turn taking game involving strategy.

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

A prominent clock - use 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 eg. The 7 x table since there are 7 days in a week

Board games with dice or spinner

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.

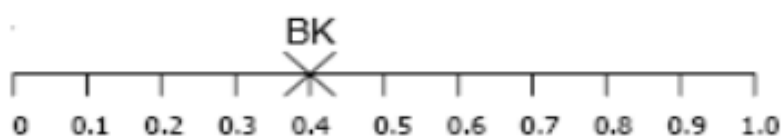Dried beans, pasta - useful for counting, dividing and finding the difference

Money – count with coins and discuss all the ways of making an amount of money with different coins.

Some fun ideas to try at home

Three in a row

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

BK

```
    |   |   |   |   |   |   |   |   |   |   |
    0   0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
```

- Take it in turns to choose a fraction, say 2/5. Use the calculator to convert it to a decimal (i.e. 2 + 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 x 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.

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.

$$1 = (4 + 4)/(4 + 4)$$
$$2 = 4/4 + 4/4$$

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 x 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!

Calculator costs

Use a calculator to find the cost of one sweet:

Clues:

1. Enter the cost of the packet of sweets on the calculator display, for example 35 pence.

2. Press the divide ÷ button

3. Count the number of sweets in the packet, and enter this number on the calculator, for example 42 (sweets).

4. Press the equals = button

5. The answer is 0.833 (pence), which is less than 1p for each sweet.

Now use your calculator to find the cost of:

- One stick of chewing gum;
- One finger of a chocolate bar;
- One segment of a tangerine;

MATHS AT HOME FOR ANY AGE

SHOPPING

£   Looking at prices

£   Calculating change – which coins, different combinations.

£   Weighing fruit and vegetables in the supermarket.

£   Counting pocket money.

£   Reading labels on bottles, packets, in order to discuss capacity, weight, shape and colour.

£   Estimating the final bill at the end of shopping while waiting at the cash out.

£   Calculating the cost of the family going to the swimming baths, etc.

Time

🕐   Looking at the clock – identify the numbers telling the time using analogue and digital clocks.
🕐   Calculating how long a journey will take looking at train/bus/airline timetables.
🕐   Using TV guide to calculate the length of programmes.
🕐   Programming the video or the microwave.
🕐   Looking at the posting times on the post box.
🕐   Discussing events in the day e.g. teatime, bed time, bath time.
🕐   Setting an alarm clock.

Starting off

Discuss with the family what would be the most popular outings. Countryside, seaside, a theme park, a museum, a tourist attraction or just a picnic in the local park?

Which outings can you reach from home in…?

- Less than 1 hour
- Between 1 and 2 hours
- More than 2 hours

SEQUENCING

- The main events of the day;
- Routines and what comes next;
- The parts of a recipe, set of instructions;
- Getting dressed;
- Tying shoe laces;
- Imagine you have a week to do whatever you wish. Plan your week on the timetable

MEASUREMENT

❍ Calculating distances in a journey e.g. how much further?
❍ Calculating heights of family members – who is the tallest?
❍ Measuring weights of ingredients for baking.
❍ Playing with plastic jugs and containers in the bath.
❍ Comparing sizes of clothes – bigger than, smaller than.
❍ Wrapping parcels – what amount of paper, string do we need?
❍ Reading the scale on weighing machines and calculating the calibrations.
❍ Measuring ingredients out for a recipe using different types of spoons
❍ Estimating the quantity of milk from a cow/herd.
❍ Estimate the amount of time to harvest a field

Weigh your child on the bathroom scales.

Weigh them again while they are holding the family pet. Can they work out how much heavier they are?

Can you find two things heavier than your child and two things lighter than your child around the house?

COUNTING

- Collections of objects – shells, buttons, pretty stones.
- Cars on a journey e.g. how many red cars?
- Animals in a field e.g. sheep, cows.
- Stairs up to bed, steps etc.
- Sports scores – cricket averages, goal averages.
- Pages in a storybook.
- Counting up to 10, 20, and 100 – backwards and forwards.
- Counting buttons, shoes, socks as a child gets dressed.
- Tidy a cupboard or shelf and count the contents e.g. tins, shoes, etc.
- Counting particular vehicles on a journey e.g. Eddie Stobartlorries, motorbikes, etc.
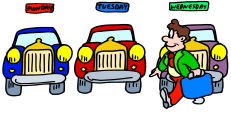
Beat the clock

Time your child as they do one of the following:

- Count back from 100 in tens.
- Count back from 75 in fives.
- Starting at six, count up in tens to 206.
- Starting at 39, count up in twenties to 239.
- Starting at 67, count up in thirties to 367.

Can they beat their record?

REASONING

?   Laying the table for four people, 'How many knives, forks and spoons will I need altogether?

?   Planning a TV viewing session, 'How long will the programme last?'

- How many rectangles can you count?
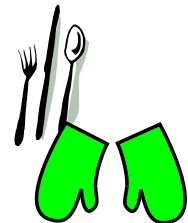
SORTING AND MATCHING

✧   Setting the table and sorting cutlery. This teaches 1 to 1 correspondence and is helpful for you!
✧   Sorting clothes for washing – size, colour.
✧   Matching pairs of socks, gloves, shoes.
✧   Sorting groceries.

ACTIVITIES USING NUMBERS AROUND US

❋ Using car number plates – add the digits to find biggest, smallest and total.
❋ Sharing out sweets, toys etc in groups of 2, 3, 4, 5, 6 etc to help with times tables.
❋ Using telephone numbers – value of each digit.
❋ Using sandwiches to show fractions ½, ¼.
❋ Using a round sandwich cake to show fractions ½, ¼, 1/6, 1/8 etc.
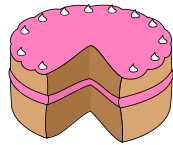
<u>Pizza please!</u>

Your pizza costs £3.60. Cut it into six equal slices.

How much does each slice cost?

The answer is that each slice costs 60p.

- How much is half a slice?
- How much do two slices cost?
- How much does half (1/2) of the whole pizza cost?

What if you cut your pizza into four equal slices (quarters)?

- How much does one slice (1/4) cost now?
- How much does half cost now?
- Is it the same, more or less than above?

GAMES AND INTERNET LINKS

<u>WEB SITES</u>

- www.mathletics.co.uk has mental maths games played live against children from around the world and tutorials and homework sections. Your child's teacher will give your child a login and username.
- http://nrich.maths.org/public/ has heaps of problems for KS1 and 2 which they call 'stage 1' and 'stage 2'
- http://www.mathszone.co.uk/ has links organised by maths area and key objective.
- www.counton.org has lots of ideas and games to play.
- www.learn.co.ukhelp for all children with reading, maths and revision.
- www.bbc.co.uk/schools games to play and links to many subjects.
- http://www.beam.co.uk/mathsofthemonth.php has problem solving activities for each age.

NUMBER GAMES

◎ Skipping – every skip count 2, 3, 4 etc.
◎ Hop scotch
◎ Ludo
◎ Snakes and ladders
◎ Dominoes
◎ Cards – number sequences
◎ Cards – Rummy, Patience, Pontoon, Snap
◎ Bingo
◎ Yahtzee
◎ Darts
◎ Heads & Tails and keep a tally
◎ Chess and draughts
◎ Monopoly
◎ Computer programmes
◎ Beetle
◎ Connect 4
◎ Counting games to practise times tables
◎ I spy a number in town, on a journey
◎ Number jigsaws
◎ Clock golf, croquet, crazy golf on holiday to help counting
◎ Snooker and pool
◎ Number Lotto
◎ Dot to dot with numbers
◎ Skittles
◎ Happy families
◎ Whist
◎ Cribbage
◎ Number crosswords, dot to dot, puzzles

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 $^4/_{20}$ to $^1/_5$, and work out which of two fractions is bigger, e.g. $^7/_{12}$ or $^2/_3$.

☐ 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