Upper KS2 Maths Workshop
How can you help at home?

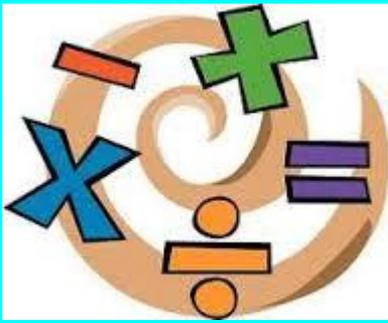https://www.gov.uk/government/collections/national-curriculum-assessments-practice-materials

PAPER 1 – ARITHMETIC 30 MINUTES
PAPER 2 – REASONING 40 MINUTES
PAPER 3 – REASONING 40 MINUTES

Maths is integral to everyday life and we use it all the time, sometimes we don't even realise it!
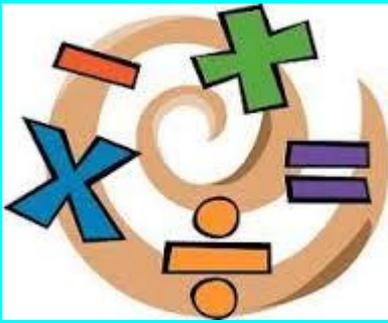
Mental Maths and Times Tables are really important for our mathematical development. If you can help us with this at home, the rest will be a breeze!

# Maths at Thorpedene

- The children at Thorpedene receive an hour long maths lesson every day.
- These are multi-part lessons that include a silent starter – a task to be getting on with as soon as they enter the room and a mental/oral starter such as times tables.
- http://www.transum.org/Software/SW/Starter_of_the_day/
- There is an additional 30 minutes session a week for an arithmetic test.

- Five maths lessons per week:

- Weekly Arithmetic Test

- Word Questions

- Number including the four operations, fractions, decimals and percentages and averages.

- Algebra

- Measurement (including converting between metric & imperial and 12 hour and24 hour clocks)

- 2D and 3D shape

- Statistics

- Weekly homework.

MATHS IN YEAR 5

- Five maths lessons per week:

- Weekly Arithmetic Test

- Word Questions

- Number including the four operations, fractions, decimals and percentages and averages.

- Algebra

- Measurement (including converting between metric & imperial and 12 hour and24 hour clocks)

- 2D and 3D shape

- Statistics

- Weekly homework.

MATHS IN YEAR 6
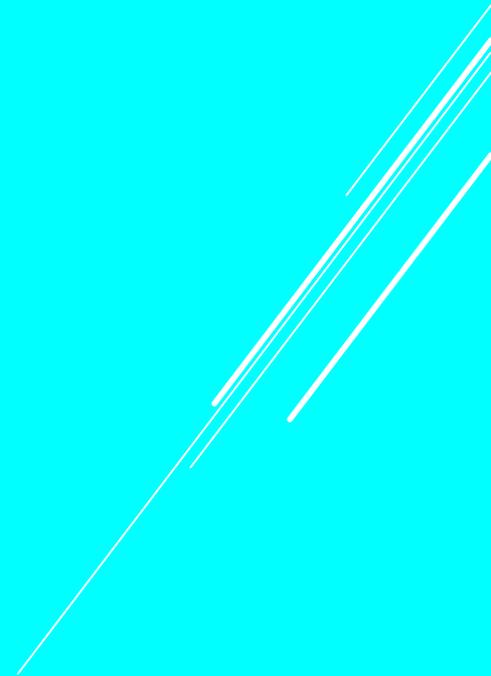
- Times Tables up to 12 (in and out of order)
- Telling the time (12 hr and 24hr clocks, analogue and digital)
- Column addition, subtraction and multiplication.
- 'Bus Stop' method for division.
- Working out money whilst shopping.
- Mental arithmetic – speed and stamina.
- Discussing fractions, decimals and percentages.

WHAT CAN YOU DO TO HELP?
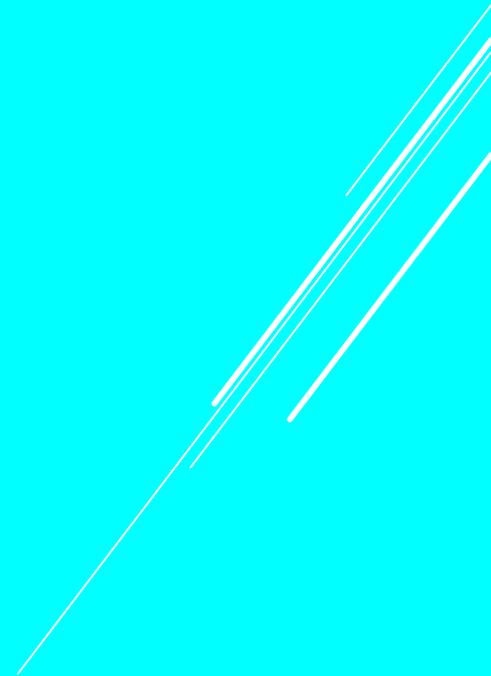
Times Tables Rock Stars
You can use this at home!

An engaging way to learn and practise times tables.

Stats Dashboard

▼ Display Chart Filters

Rock Name	ℹ Baseline Speed	ℹ Current Speed	Rock Status	ℹ Lifetime Earnings	Maths Band	Pastoral Band	Year Group
King Dylan	2.47	2.13	Rock Star	28,707	4F Maths		Year 4
Mia-Belle Bullet	2.65	2.71	Rock Star	1,341	4F Maths		Year 4
Honey Sennett	3.02	2.24	Rock Star	25,367	4F Maths		Year 4
Clyde Cutler	3.64	2.51	Rock Star	7,733	4F Maths		Year 4
Ian Rocky McRockface	3.66	2.93	Rock Star	10,878	4F Maths		Year 4
Mia Farrell	4.00	3.30	Headliner	6,937	4F Maths		Year 4

Times Tables Rock Stars

- Available on the internet and as an app on Android and Apple.

Maths at Thorpedene

- The rest of the lesson is broken down into a series of activities that focus on the children doing rather than sitting and listening for a prolonged period of time.

- Homework is set using [MyMaths](). The children are expected to complete this weekly.

- Years 5 & 6 focusses on an end result of successful decoding of single-step and multi-step word problems.

- We also subscribe to [Purple Mash.]()

Maths at Thorpedene

=   +   x   %

Symbols

subtract

more

add

sum

factor

product

Language

Pictures/ Images

Context/ Concrete Experience
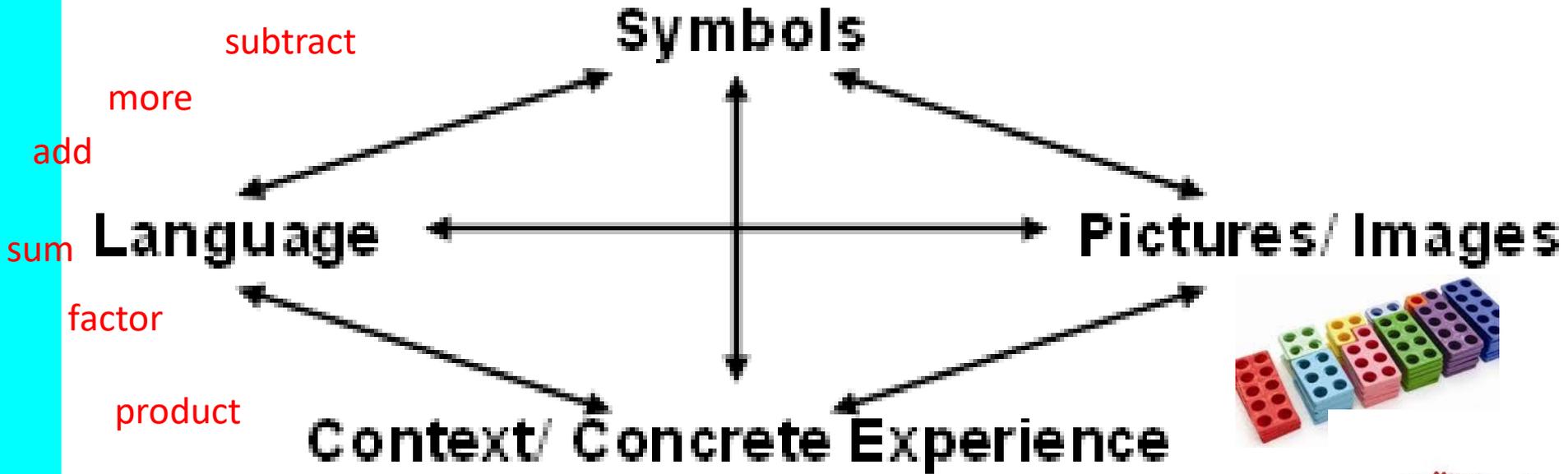
Here is a receipt for some shopping. How much did I spend? How much change did I get from £20?

The Maths Curriculum

Children should:

- Become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.

- **Reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations and developing an argument, justification or proof using mathematical language.

- **Solve problems** by applying their mathematics to a variety of problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Year 5 Curriculum Overview

Year 5 Maths Assessment Framework

1: WTS, 2: EXS, 3: GDS

Number and place value						
To read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit						
To count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000						
To interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero						
To round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000						
To solve number problems and practical problems that involve all of the above						
To read Roman numerals to 1000 (M) and recognise years written in Roman numerals.						
Addition and subtraction						
To add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)						
To add and subtract numbers mentally with increasingly large numbers						
To use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy						
To solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.						
Multiplication and division						
To identify multiples and factors, including finding all pairs of a number, and common factors of two numbers						
To know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers						
To establish whether a number up to 100 is prime and recall prime numbers up to 19						
To multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers						
To divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context						
To multiply and divide whole numbers and those involving decimals by 10, 100 and 1000						
To recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3})						
To solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes						
To solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign						

Year 5 Curriculum Overview

combination of these, including understanding the meaning of the equals sign						
Measurement						
To convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)						
To understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints						
To measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres						
To calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes						
To estimate volume [for example, using 1 cm^3 blocks to build cuboids (including cubes)] and capacity [for example, using water]						
To solve problems involving converting between units of time						
To use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.						
Geometry – properties of shapes/ position and direction						
To identify 3D shapes, including cubes and other cuboids, from 2D representations						
To know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles						
To draw given angles, and measure them in degrees (°)						
To identify: • angles at a point and 1 whole turn (total 360°)						
• angles at a point on a straight line and ½ a turn (total 180°)						
• other multiples of 90						
To use the properties of rectangles to deduce related facts and find missing lengths and angles						
To distinguish between regular and irregular polygons based on reasoning about equal angles						
To identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language and know that the shape has not changed.						
Statistics						
To solve comparison, sum and difference problems using information presented in a line graph						

Year 6 Curriculum Overview

Year 6 Maths Assessment Framework

1: WTS, 2: EXS, 3: GDS

Number and Place Value						
To demonstrate knowledge of place value.						
To explain the value of any digit in a number.						
To round any number to a given value.						
To explain place value of decimal digits.						
To use negative numbers in different contexts.						
To mentally calculate using a mix of the four operations.						
Calculation						
To apply appropriate methods to problem solve						
To use the inverse and/or estimation to check my answers						
To select the correct operation to solve a problem						
To use formal written methods accurately, including borrowing and carrying						
To solve problems with more than one step and operation and explain why I used them.						
To identify common factors, multiples and prime numbers.						
To multiply numbers up to 4 x 4 digits						
To divide numbers of up to 4 digits by a two-digit number using a formal written method						
To use formal written methods accurately, including long division and multiplication.						
To solve multi-step problems, including word problems.						
Fractions, Decimals & Percentages						
To compare and relate fractions, decimals and percentages.						
To calculate equivalents of fractions, decimals and percentages.						
To use common factors to simplify fractions.						
To compare and order fractions, with different denominators.						
To solve problems involving fractions, decimals and percentages.						
To solve problems involving a mix of fractions, decimals and percentages.						

Year 6 Curriculum Overview

Ratio & Proportion						
To solve problems involving ratio and proportion.						
Problem Solving						
To use simple formulae to solve problems.						
To calculate and interpret the mean as an average.						
To find missing values using algebra.						
To use the order of importance of the four operations when answering questions (BODMAS).						
Measurement						
To calculate accurately using measures.						
To find missing angles by measurement.						
To find missing angles using reasoning and mathematical knowledge.						
Geometry & Shape						
To describe positions on grids using coordinates.						
To draw 2D shapes using given values.						
To draw 2-D shapes using dimensions and angles I am given.						
To recognise, describe and build 3D nets.						
To find unknown angles in any triangles, quadrilaterals or regular polygons.						
To compare and classify shapes by their properties.						
To calculate, estimate and compare volumes of cubes and cuboids.						
To calculate the areas of parallelograms and triangles.						
To draw and translate simple shapes on the coordinate plane and reflect these in the axis.						
To illustrate and name parts of circles, including radius, diameter and circumference.						
To solve problems involving shapes where the scale factor is known or can be found.						
Statistics						
To interpret and construct pie charts and line graphs. To use these to solve problems.						

Number Sense!

Children need to understand our number system, starting with counting numbers, building an understanding of how our numbers work and fit together. This includes exploring place value and comparing and ordering n̶ applying this understandi̶ in different contexts.

Recalling Facts

- It is important that children recognise number bonds, different pairs of numbers with the same total.
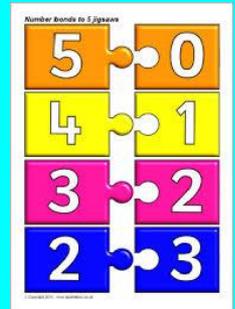
6 + 2

3 + 2

7 + 3

8

5

10

1 + 4

5 + 3

6 + 4

6 + 1

6 + 3

7

3 + 4

5 + 4

9

6

3 + 3

Place Value

- Place value is at the heart of the number system. All digits have a value and a secure understanding of this will enable children to use and understand different calculation methods.
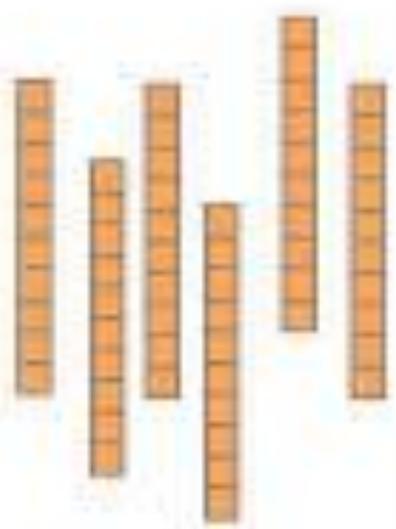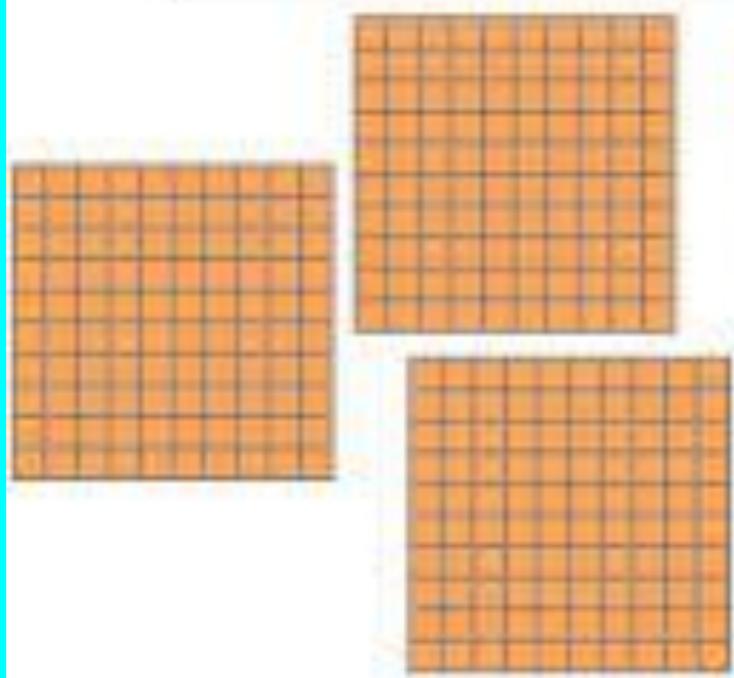
thousands	hundreds	tens	ones
1	2	3	9

| 100 | 10 | 1 |

Column Methods - Addition

- Children with a secure understanding of place value will better understand the column method for addition and subtraction.

National Curriculum Programme of Study:

- Add whole numbers with more than 4 digits, including using formal written methods (columnar addition).
- Pupils practise using the formal written methods of columnar addition with increasingly large numbers to aid fluency (non-statutory).
- Solve problems involving numbers up to three decimal places.
- Practise adding decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places, and complements of 1 (for example, 0.83 + 0.17 = 1) (non-statutory).

Y5 Addition

BY THE END OF YEAR 5…

By the end of Year 5, children will be able to show their understanding as:

```
    1  2  8  3  6              2  1  .  3  0
 +     7  2  8  8          +       9  .  0  8
   ───────────────            ───────────────
    2  0  1  2  4              3  0  .  3  8
    1  1  1  1                        1
```

National Curriculum Programme of Study:

- Pupils practise addition for larger numbers using the formal written methods of columnar addition.
- Solve addition one step and multi-step problems in context.

Y6 Addition

BY THE END OF YEAR 6…

By the end of Year 6, children will be able to show their understanding as:

```
    3  0  2  4  3  2            2  0  6  .  0  3  5
 +  1  1  0  7  0  9        +   1  1  0  .  1  2  4
   ──────────────────          ──────────────────
    4  1  3  1  4  1               2  3  .  3  8  0
          1     1                       2  .  8  0  0
                                 ──────────────────
                                  3  4  2  .  3  3  9
                                        1  1     1
```

- Understanding place value will help children see the relationship between the columns.

Column Methods - Subtraction

- Children with a secure understanding of place value will better understand the column method for addition and subtraction.

National Curriculum Programme of Study:

- subtract whole numbers with more than 4 digits, including using formal written methods (columnar subtraction)
- pupils use all four operations in problems involving money

Y5 Subtraction

BY THE END OF YEAR 5...
By the end of Year 5, children will be able to show their understanding as:

$$4\,6\,1\,3\,2 - 2\,3\,5\,2\,8 = 2\,2\,6\,0\,4$$

$$1\,5\,2\,1\,.\,8\,0\,4 - 3\,7\,9\,.\,0\,8\,3 = 1\,1\,4\,2\,.\,2\,2\,1$$

National Curriculum Programme of Study:

- Pupils practise subtraction for larger numbers using the formal written methods of columnar subtraction.
- Solve subtraction one step and multi-step problems in context.

Y6 Subtraction

BY THE END OF YEAR 6...
By the end of Year 6, children will be able to show their understanding as:

$$3\,0\,2\,4\,3\,2 - 1\,1\,0\,7\,0\,9 = 1\,9\,1\,7\,2\,3$$

$$1\,2\,6\,.\,0\,3\,5 - 5\,2\,.\,8\,0\,3 = 0\,7\,3\,.\,2\,3\,2$$

- Understanding place value will help children see the relationship between the columns.

Multiplication Methods

National Curriculum Programme of Study:

- multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers

Y5 Multiplication

BY THE END OF YEAR 5…

By the end of Year 5, children will be able to show their understanding as:

```
    2 7 4 1
  x       6
  1 6 4 4 6
      4 2
```

```
      4 2 7 6
  x       3 4
    1 7 1 0 4
      1 3 2
  1 2 8 2 8 0
      2 1
  1 4 5 3 8 4
        1
```

National Curriculum Programme of Study:

- multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
- multiply one-digit numbers with up to 2 decimal places by whole numbers

Y6 Multiplication

BY THE END OF YEAR 6…

By the end of Year 6, children will be able to show their understanding as:

```
      4 2 7 6
  x       3 4
    1 7 1 0 4
      1 3 2
  1 2 8 2 8 0
      2 1
  1 4 5 3 8 4
        1
```

Times Tables Toolbox

X	4
1	4
2	8
3	12
4	16
5	20
6	24
7	28
8	32
9	36
10	40
11	44
12	48

'Bus Stop' Division
Year 5

National Curriculum Programme of Study:

- divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context

Y5
Division

BY THE END OF YEAR 5...

By the end of Year 5, children will be able to show their understanding as:

Divide 4 digit number by 1 digit with appropriate remainder (fraction)

$$0 \quad 8 \quad 6 \quad 4 \quad {}^{1}/_{5}$$

$$5 \,|\, 4 \quad {}^{4}3 \quad {}^{3}2 \quad {}^{2}1$$

'Bus Stop' Division
Year 6

National Curriculum Programme of Study:

- 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

Y6
Division

BY THE END OF YEAR 6…

By the end of Year 6, children will be able to show their understanding as:

Divide 4 digit by 2 digit using multiple of the divisor method.
Divide 4 digit by 2 digit using short division method.

Dividing by a two-digit number

Following on from Year 5, children will now be confident using a compact layout for short division of a four-digit number by a single digit number. Where appropriate, children can continue to use this method when dividing by a two-digit number.

E.g.

$$0 \quad 4 \quad 5$$
$$1 \quad 1 \,\big|\, 4 \quad 9 \quad 5$$

More complex division

Often the numbers involved in a division calculation will determine an appropriate method.

$$0 \quad 0 \quad 9$$
$$1 \quad 5 \,\big|\, 1 \quad 3 \quad 5$$

Provide children with a calculation such as 135 ÷ 15.

For this example, children will need to draw upon their mental calculation skills to estimate answers and explain their thinking. They will know that 15 x 10 = 150, and so should be expecting the answer to be less than 10. They may recognise that 135 is 15 less than 150, and so the answer is 9.

Children should be encouraged to draw upon known facts, and establish what they already know about the divisor. This can be recorded in a 'toolbox' to support, if necessary.

E.g. 420 ÷ 15
The chosen multiples of the divisor will depend on each child's known facts and their ability to manipulate these using doubling and halving skills. This needs to be carefully modelled.

A 'toolbox' is then used to complete the calculation.

15 x 10 = 150
15 x 5 = 75
15 x 2 = 30

Expressing remainders as decimals

$$0 \quad 2 \quad 8 \,.\, 2$$
$$1 \quad 5 \,\big|\, 4 \quad {}^{4}2 \quad {}^{12}3 \,.\, {}^{3}0$$

Children will use a toolbox, as above to solve the calculation:

1x15= 15
2x15= 30
4x15= 60
8x15= 120
10x15=150

In Year 6 remainders are recorded as decimals.

$$0 \quad 2 \quad 3 \,.\, 2 \quad 5$$
$$1 \quad 6 \,\big|\, 3 \quad {}^{3}7 \quad {}^{6}2 \,.\, {}^{4}0 \quad {}^{8}0$$

The same method can be used to show answers to 2 decimal places:

1x16= 16
2x16= 32
3x16= 48
4x16= 64
5x16= 80
10x16=160

When problem solving, children in Year 6 will need to select the appropriate way of representing remainders, according to the question being asked. They may need to round to the nearest whole number, round up to the next whole number or state how many of a given amount are 'left over'.

Songs

- Learning songs is a great way to learn maths information.

- Just search for the mathematics your child is learning on YouTube and see what results you get.

- NumberRock, HaveFunTeaching, laughalongandlearn, Mr. DeMaio, Powerdot math, AdamUp Maths – to name just a few!
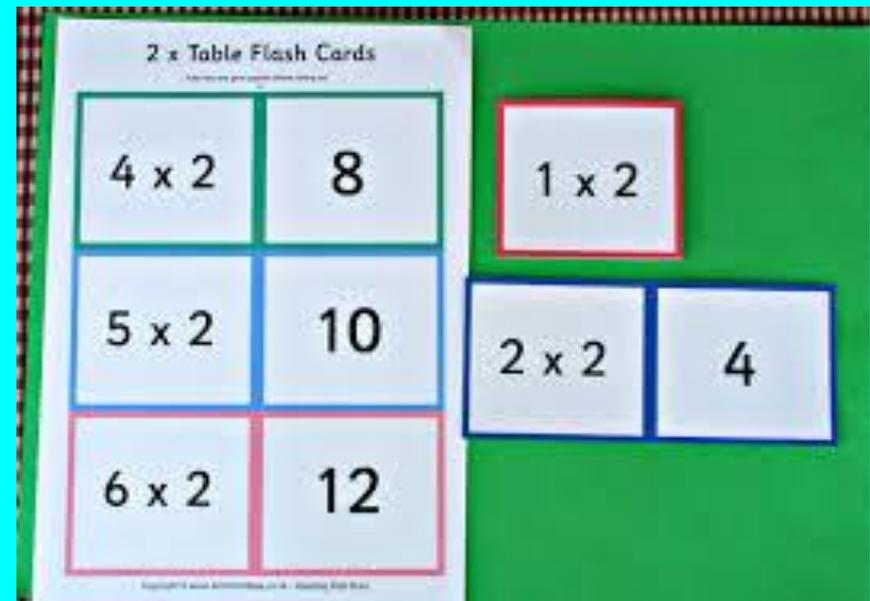
Life!

- Adding up shopping at you put things in your basket.
- Working out how much change you will get.
- Telling the time using an analogue and digital clock or watch.
- Baking – working out ingredients.
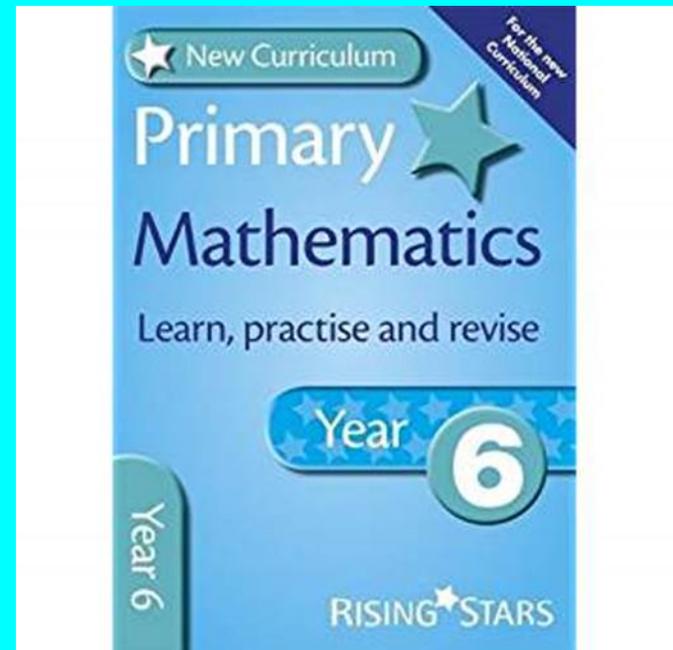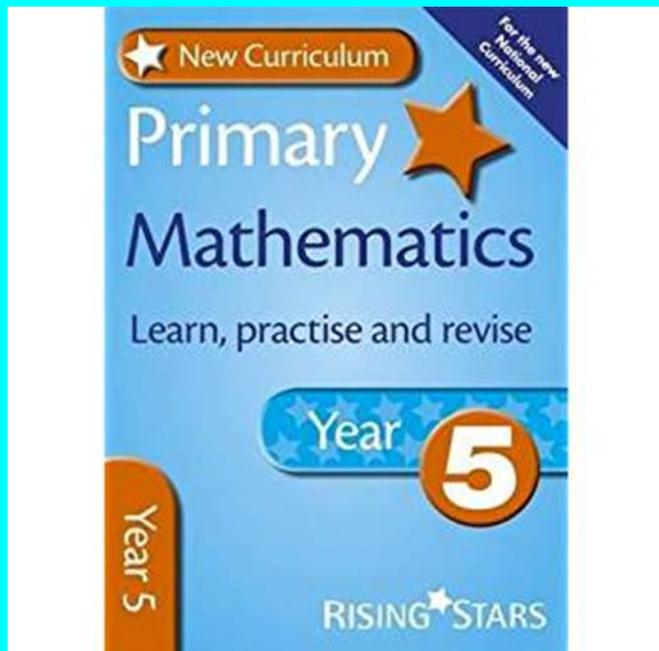- Cooking – working out timings.

Practise Times Tables!

- Good old fashioned singing times tables over and over again is the only way to learn them for life!

Useful Resources

- Available from Amazon, WH smith and Waterstones.

Homework!

- Finally … please, please, please support your child with their homework!