Mill Hill Primary School
Useful Resources / Hands On Maths at Home

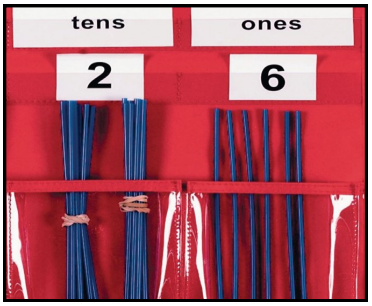
At Mill Hill Primary, for years, we have promoted pupils to use practical equipment to develop a deeper understanding of mathematical concepts. That is why our policies for the four operations: addition, subtraction, multiplication and division have a CPA approach embedded.

C meaning concrete, **P** meaning pictures and **A** meaning abstract

The **concrete-pictorial-abstract** approach, is based on research by psychologist **Jerome Bruner** and is advocated to be used by ALL abilities, including the more able as it helps develop reasoning skills.

Here are useful hands on resources you may like to use - **at home** - some you can make, others you may wish to purchase:

Drinking Straws



I LOVE this resource! It's cheap and so effective! Your child can 'touch move and count' ten straws and bundle them together to make a **group of ten.** Younger pupils—Reception and KS1 can see the 'tenness' - ten straws make one group. Your child needs to know **WHY** an elastic band is used to group ten straws - so you don't lose count!

They are also great to begin understanding counting in tens—up and down!

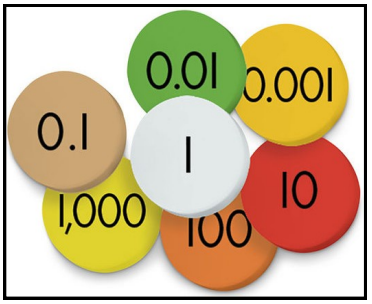
Dienes or Base Ten

Plastic blocks in ones, rows / groups of ten and in blocks / groups of one hundred and one thousand. They are invaluable in developing your child's understanding of place value (Th H T U)

Another option, is to find an image of each type, then copy and print out. Not as ideal as actual blocks but it does mean your child can have some to manipulate.

Although not concrete, there are plenty of **online free resources.** For example, **Top Marks Dienes and Coins** https://www.topmarks.co.uk/Flash.aspx?

Place Value Dics

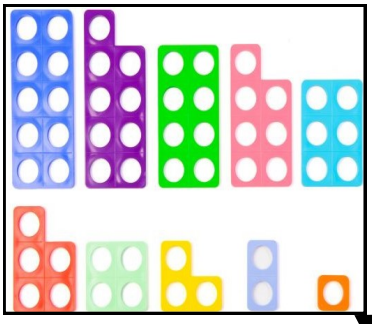


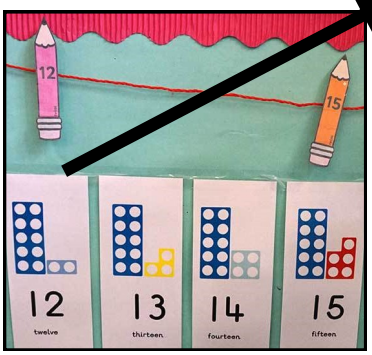
These are used by older pupils and are invaluable when reinforcing place value of LARGER whole numbers and decimals.

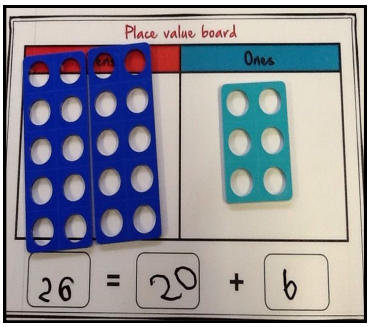
They are easy to make—place a sticker over some coins / counters.

By D. Osmond—Maths Lead

Numicon







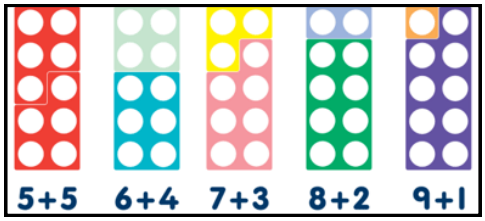
An expensive resource but very versatile and effective! It's structured apparatus with different sized coloured pieces representing each number from one to ten.

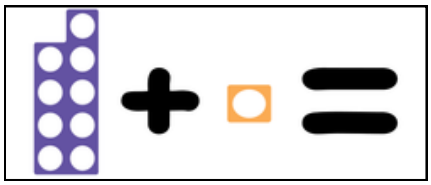
It can be used to **make numbers** and reinforce **place value.** Like all the resources shown on the previous page, it helps pupils **describe** numbers.

"I can see one group of ten and 2 ones and that makes the number twelve."

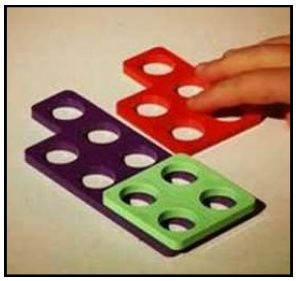
"So ten plus 2 more equals twelve.." *10 + 2 = 12* *or* *12 = 10 + 2*

Addition





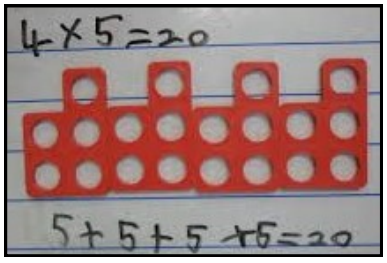
Subtraction



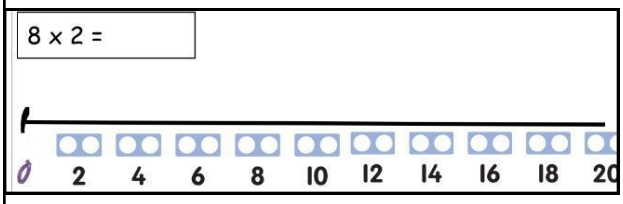
Take 4 away from 9 and it leaves 5

9 - 4 = 5

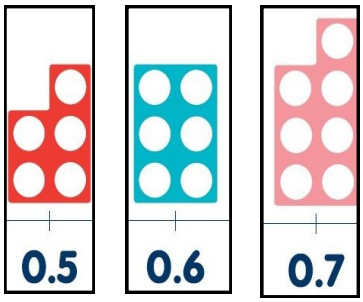
Multiplication



Counting in 2's etc



Tenths



Division

and

with

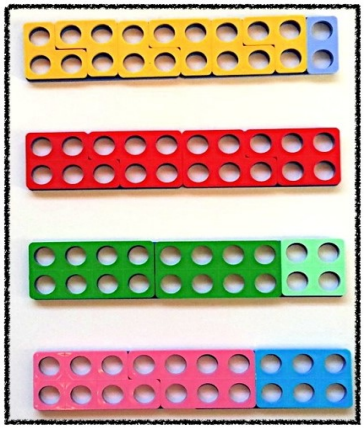
Remainders

20 ÷ 3 = 6r2

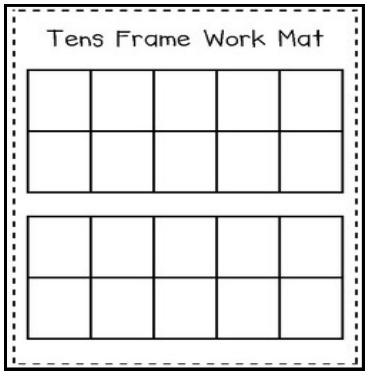
20 ÷ 5 = 4

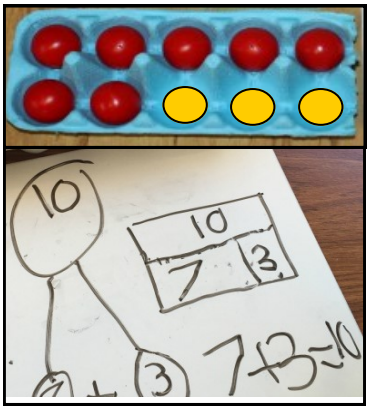
20 ÷ 8 = 2r4

20 ÷ 7 = 2r6



Tens Frames and Counters





Tens frames help your child to calculate rather not count. If an older pupil still uses their fingers to add 37 and 8, they have not grasped the idea that single digits can be partitioned and used to **aid mental addition** (or **subtraction**).

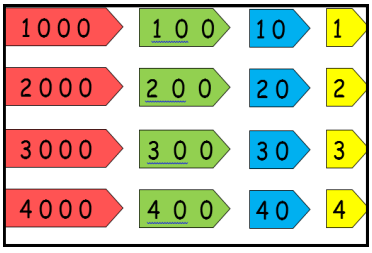
Tens frames can be used by young and older children who struggle to add and subtract mentally. It helps your child to see **why** numbers should be partitioned to make ten and reinforces number bonds (how many different ways to make numbers up to and including ten). Ten frames can be used to teach **fractions** and **decimals**.

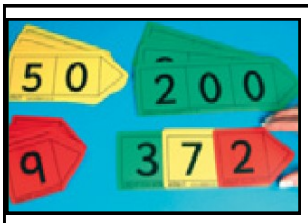
Tens frames are easy to make! Use egg boxes or ice cubes trays (ensure there are ten cups by cutting them down to size). There are many online versions to print out.

Useful Websites

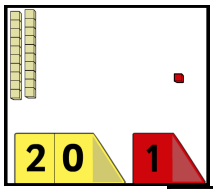
https://www.nctm.org/Classroom-Resources/Illuminations/Interactives/Ten-Frame/

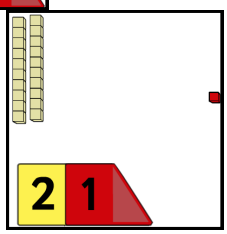
Place Value Arrow Cards





Another great resource for reinforcing **place value** and **partitioning** (splitting numbers up into thousands, hundreds, tens and ones).





There are a number of different types available but the ones with arrow heads are the best because it helps your child line the digits up correctly.

They are cheap to buy or you can download and print your own versions—there's so many on the net.

I REALLY like interactive arrow card games that also show the number using Dienes.

Useful Websites

http://www.ictgames.com/arrowCards_revised_v5.html (HTU / TU)

https://mathsframe.co.uk/en/resources/resource/61/itp-place-value

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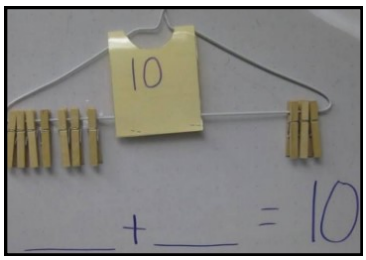
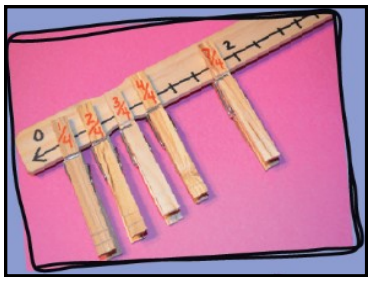
Clothes Pegs

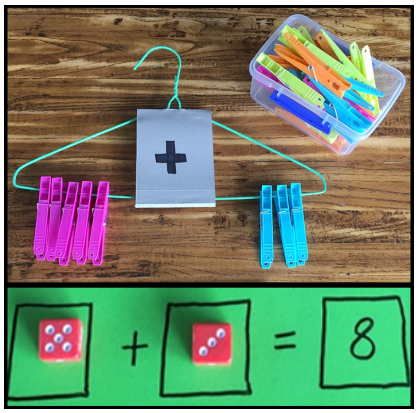




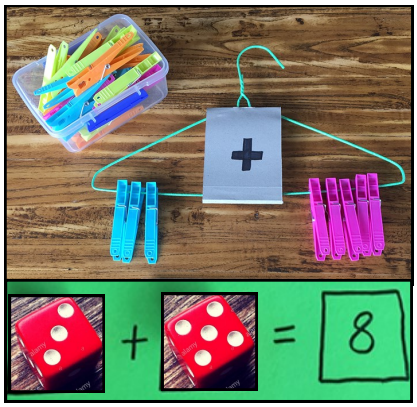
Number Bonds - Clothes pegs are a good, cheap, ready available resource for teaching bonds (how many different ways to make the same number).

You can attach hangers to look at number bonds, write questions on them and get your child to attach the answer.

You can also turn the hanger around to show that addition can be done in any order.

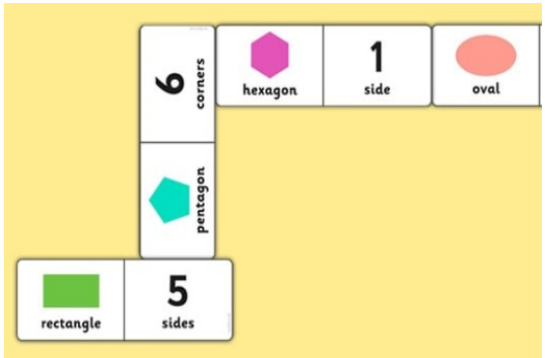


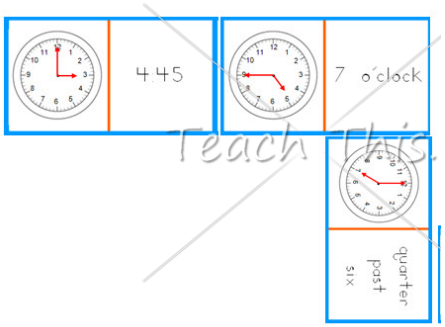
or



Clothes pegs can also be used in KS 2 when looking at fractions and decimal numbers.

Dominoes





Bonds to 5

Useful Websites

By D. Osmond—Maths Lead

http://www.transum.org/Software/Game/Dominoes.asp

https://nrich.maths.org/1200

https://primaryinspiration.blogspot.com/2014/06/keep-em-buzzy-blog-hop.html

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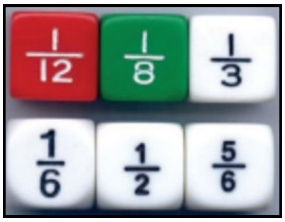
Dice

At school, pupils just LOVE to use dice in maths activities so I'm sure your child will at home. Standard dice are really suitable for getting your child to carry out quick mental maths tasks. You can also get a range of different sided dice.

Dice are inexpensive and you can try creating your own dice using blank ones— you can write on each side whatever you like—fractions, shapes, decimals and percentages etc. The opportunities are endless! You can also purchase dice—here are some examples:

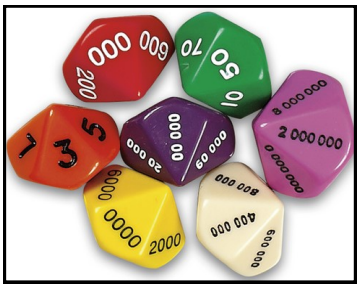


Useful Websites

https://nrich.maths.org/8390

http://www.sowevalleyprimary.co.uk/documents/DiceGames-plus.pdf

Place Value Dice



Deck of Cards

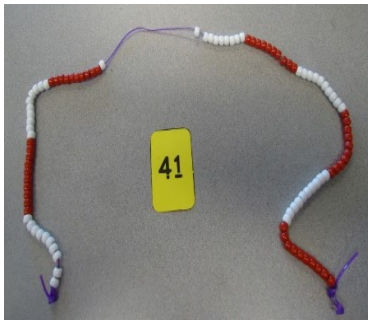
A standard deck of cards shows the digits, as well as symbols showing the value of each number. They are fun to use and there's endless of games to play.

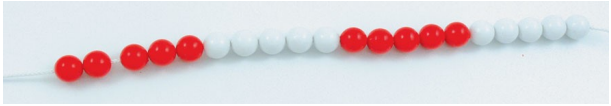
Cards can be used by young children to compare and order the size of numbers, whereas, older children can use them to explore ratio (what is the ratio of picture cards to the rest of the suit?) and solve probability questions.

Useful Website

http://www.houghtonschool.co.uk/wp-content/uploads/2013/09/ideas_using_playing_cards.pdf

Bead Strings





They consist of a string with either ten, twenty or one hundred beads on. These are great for counting on or back in ones or tens but can used in lots of other ways too. You can explore bonds to 5, 10 or 100 and fractions, percentages and decimals.

Useful Website

https://bb.spokaneschools.org/bbcswebdav/institution/Elementary%20Curriculum%202010/Curriclum%20Guides/Math/Second/Place%20Value%20Unit/100%20Bead%20String%20Activities.pdf

By D. Osmond—Maths Lead

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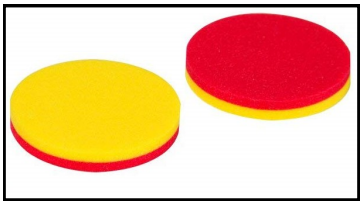
Two Coloured Counters



Counters with a different colour on the flip side are perfect for exploring **number bonds** of all the numbers up to ten and even beyond! These counters clearly show how 8, for example, can be made from 1 and 7, or 2 and 6, or 5 and 3, or 4 and 4 by simply flipping over the counter—conceptually nothing is removed as the counters are not replaced with different coloured ones but just turned over! They are also really good when teaching the concept of **'difference'** between two numbers, which children tend to find tricky.

Useful Website

http://www.earlylearninghq.org.uk/earlylearninghq-blog/maths-activity-two-colour-counters/

Cuisenaire Rods

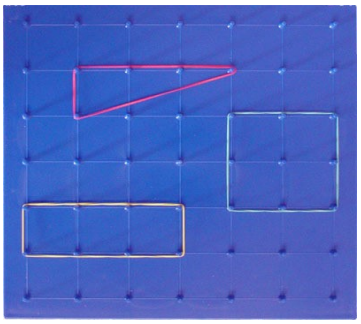
These are plastic or wooden rods that are **colour coded depending on length** (from one unit to ten units). They come in a box and are so easy to tidy away. They are very versatile and you can use them at home to teach your child: number bonds, patterns, fractions, percentages, decimals, ratios and lots more! They are great for younger and older children.

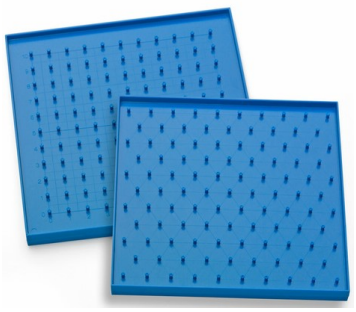
You can use a free online resource: https://nrich.maths.org/4348

Useful website for activities

https://nrich.maths.org/public/leg.php?code=-297

Geoboards





Using elastic bands to stretch over the pegs is a fun, practical way to make different **shapes**, exploring **sides** and **vertices**, investigating **area**, **angles** and much more! There are many assorted boards—have a look!

Younger children may find it tricky— you need to be dextrous to latch the rubber bands on to the pegs. Team work makes the dream work so make 2D shapes together.

You can use a free online resource: https://apps.mathlearningcenter.org/geoboard/

Useful Website

https://nrich.maths.org/public/search.php?search=geoboards

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Peg Boards

You need a board that consists of holes and assorted coloured mushroom pegs. Your child will have great fun, like in class, creating patterns and pictures. However, they are also great for teaching shape, reflection and symmetry.

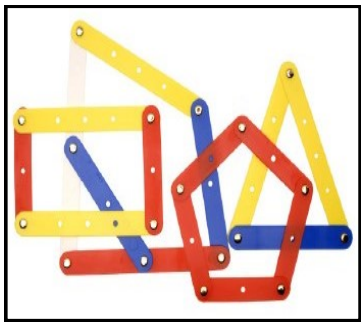
You can use a free interactive resource:

Square Dotty Grid https://nrich.maths.org/4348

Isometric Dotty Grid https://nrich.maths.org/dottyGrid/#/iso-0

Useful website for activities — visit 'NRICH'

Geo-Strips



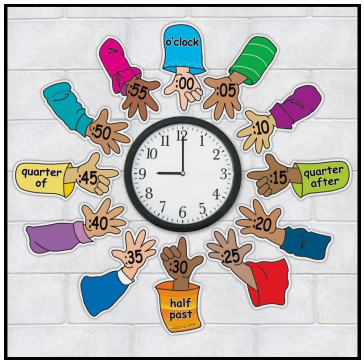
The Geo-Strips are in four colours: red, yellow, white and blue. There are different lengths in each colour and the difference in length between any two strips is measured by the distance between the holes.

This is a super, simple construction kit and is superb for teaching **2 D shape.** Younger children can make different sized squares, rectangles, hexagons, pentagons, octagons.

For older children, Geo-strips are great for understanding the concept of **'regular'**, **'irregular'** , **'concave'** and **'convex'**. It's also super for understanding the size of angles **(right angle, acute, obtuse and reflex).**

Great fun for exploring and investigating!

Can you make me an irregular hexagon with an obtuse angle?



Learning to read the time is soooooo important at school and in life! Start with having real clocks displayed at home where your child can see them. Purchase a watch, with pointers and numbers, for your child to wear and begin teaching o'clock, half (1/2 past), quarter (1/4 past), quarter to (1/4 to) and then reading time in five minute intervals past the hour before teaching 'to' the hour. Only then move on to digital time!

By D. Osmond—Maths Lead