



# Mental Magicians!

## A Framework for Mental Arithmetic

Parent Workshop November 2017

# Mental Arithmetic

## ▶ What is it?

Rapid recall of number facts

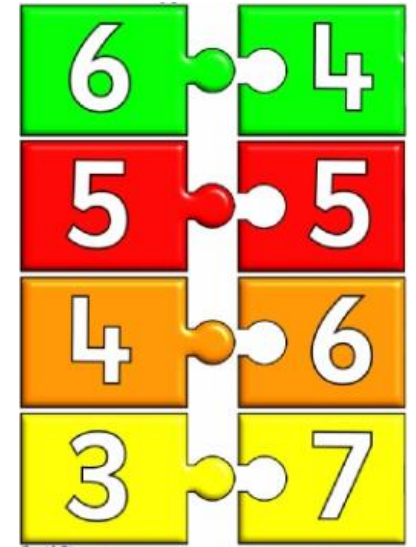
Number bonds to 10, 20, 100, 1000 and 1 (decimals)

12x12 times tables – multiplication and division facts

## ▶ Why is it important?

‘The ability to calculate ‘in your head’ is an important part of mathematics and an important part of coping with society’s demands and managing everyday events.’


(National Numeracy Strategy, 2010)



12 X 12 Multiplication Table

| X  | 0 | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9   | 10  | 11  | 12  |
|----|---|----|----|----|----|----|----|----|----|-----|-----|-----|-----|
| 0  | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0   | 0   | 0   |
| 1  | 0 | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9   | 10  | 11  | 12  |
| 2  | 0 | 2  | 4  | 6  | 8  | 10 | 12 | 14 | 16 | 18  | 20  | 22  | 24  |
| 3  | 0 | 3  | 6  | 9  | 12 | 15 | 18 | 21 | 24 | 27  | 30  | 33  | 36  |
| 4  | 0 | 4  | 8  | 12 | 16 | 20 | 24 | 28 | 32 | 36  | 40  | 44  | 48  |
| 5  | 0 | 5  | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45  | 50  | 55  | 60  |
| 6  | 0 | 6  | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54  | 60  | 66  | 72  |
| 7  | 0 | 7  | 14 | 21 | 28 | 35 | 42 | 49 | 56 | 63  | 70  | 77  | 84  |
| 8  | 0 | 8  | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72  | 80  | 88  | 96  |
| 9  | 0 | 9  | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81  | 90  | 99  | 108 |
| 10 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90  | 100 | 110 | 120 |
| 11 | 0 | 11 | 22 | 33 | 44 | 55 | 66 | 77 | 88 | 99  | 110 | 121 | 132 |
| 12 | 0 | 12 | 24 | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 | 132 | 144 |

# Raising the Profile of Mental Arithmetic: Mental Magicians!

- ▶ New, whole-school reward system
  - ▶ All pupils have been baselined and have a personalised mental arithmetic objective
  - ▶ Children must 'pass' three grades in order to earn a coloured, engraved wristband
  - ▶ Progress logged in a Mental Magician Journal
  - ▶ Achievement celebrated in assembly
- 

# Mental Magicians


## Number Bonds to 10




|            | Objective                                       | Date Completed |
|------------|---|----------------|
| Grade<br>1 | I know my number bonds to 10 in order.          |                |
| Grade<br>2 | I know my number bonds to 10 out of order.      |                |
| Grade<br>3 | I know the subtractions for number bonds to 10. |                |

On \_\_\_\_\_ I achieved  
my number bonds to 10!

# On-Going Assessment

- ▶ Children will be assessed weekly to track progress towards bands (apart from Reception)
  - ▶ Unlimited time on number bonds to 10 and 20
  - ▶ 1 minute to complete rest of tests
  - ▶ Must achieve 10/10 to achieve band
  - ▶ Adults to challenge children around the school once an objective has been achieved
- 

# Going for Gold!

- ▶ When a child achieves the final, gold wristband they receive a prize and special recognition in our newsletter.
  - ▶ Children become Mental Magician Masters and will be displayed and celebrated on the maths board. These masters will help others in the school learn their number facts.
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# How can you help?

## Arithmetic is a Part of Real Life

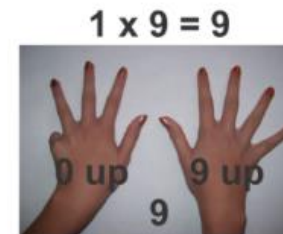
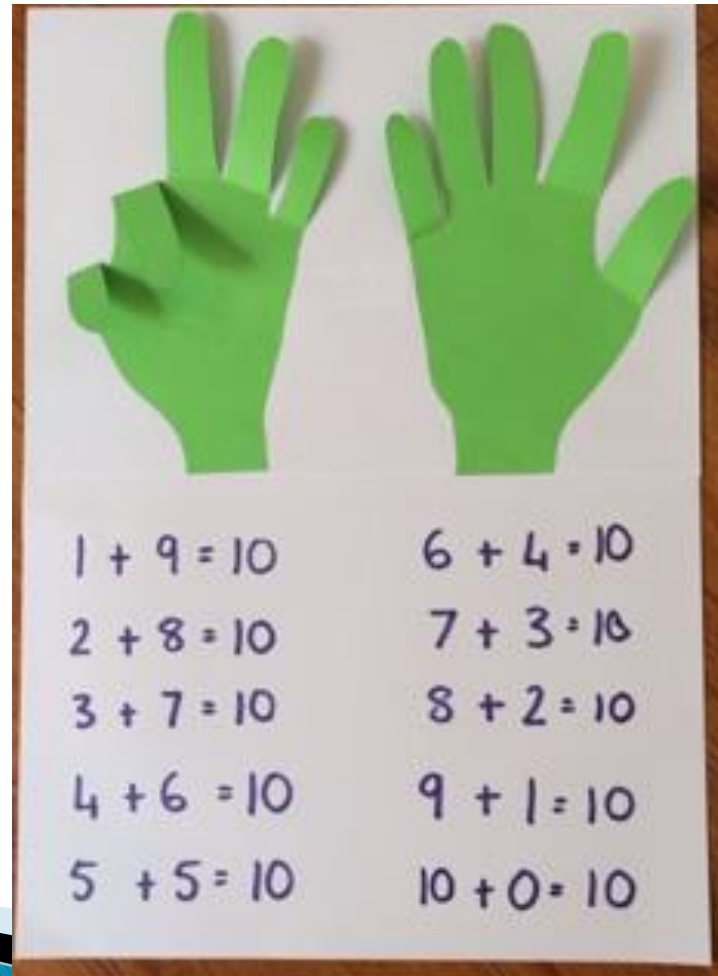
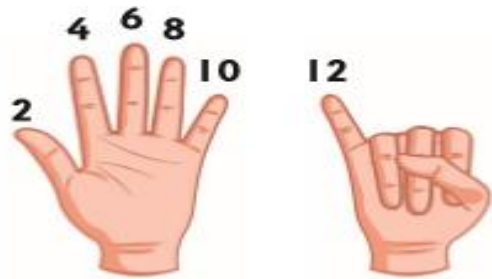
Real things, especially fun or enticing things, bring maths to life and help children to learn using touch and even taste and smell, as well as sight and sound. Family life can give loads of opportunities to make arithmetic real.

We want to give 3 children 2 strawberries each. How many strawberries will we need altogether?

My food shop cost £12 and so far I've counted out £11.21. How much more money do I need?

## Using Fingers to Count in Steps

If fingers help, use them! Children can use fingers to help them count in steps: they can hold up the number of fingers they are multiplying by and count in steps across those fingers. So, for  $6 \times 2$ , children can hold up 6 fingers and wiggle each finger in turn as they recall 2, 4, 6, 8, 10 and 12.



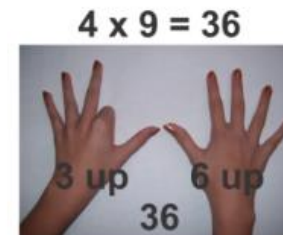
1st finger is down



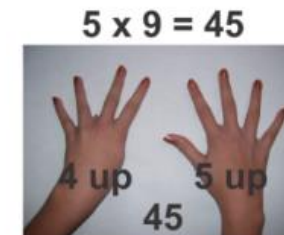
2nd finger is down



3rd finger is down



4th finger is down



5th finger is down



6th finger is down



7th finger is down



8th finger is down



9th finger is down

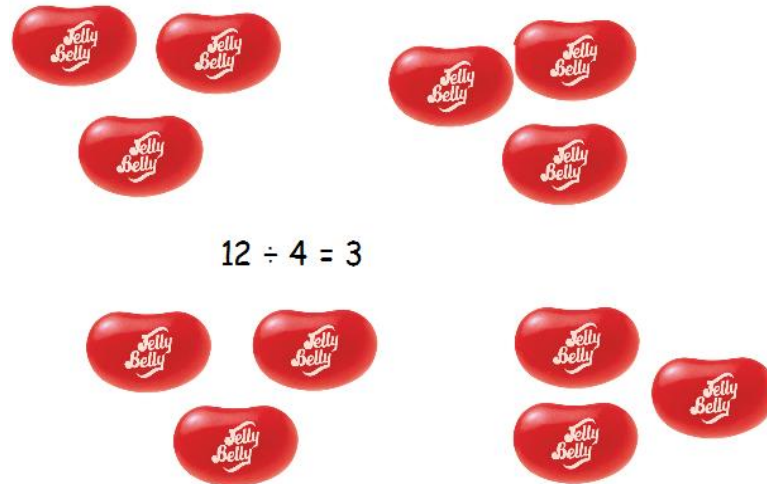


## Using Objects

Using any objects that you have around the house can be a brilliant way for the children to visualize their arithmetic facts.



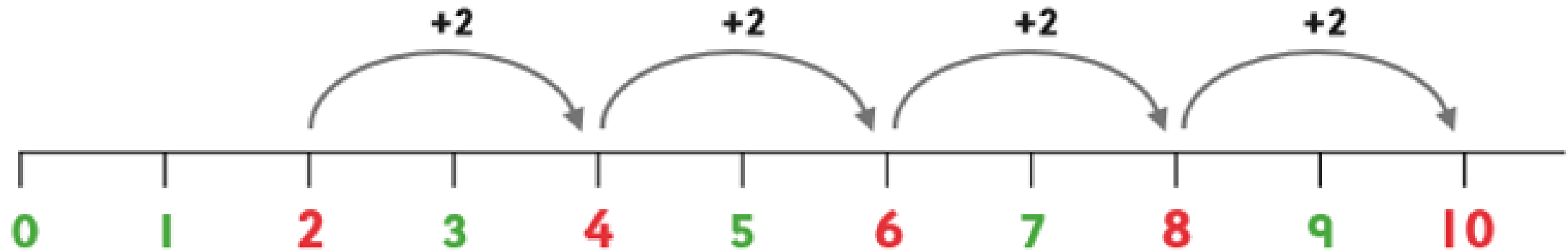
$$2 + 8 = 10$$



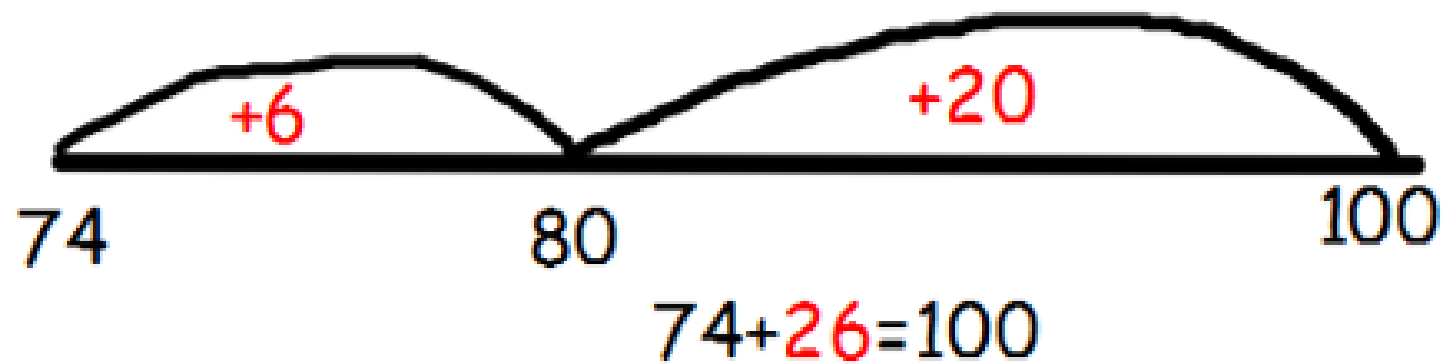
$$12 \div 4 = 3$$

## Number Lines

Number lines are also used to help children to multiply by adding on and counting in steps:



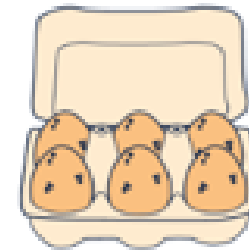
They can also support children with their number bonds:



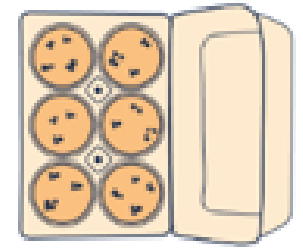
## Arrays

An egg box is an example of an array. An array is a set of objects arranged into rows and columns. Each row has the same number of objects as the other rows; each column has the same as the other columns. The arrays that we find in our daily lives help children to visualize and understand multiplication.

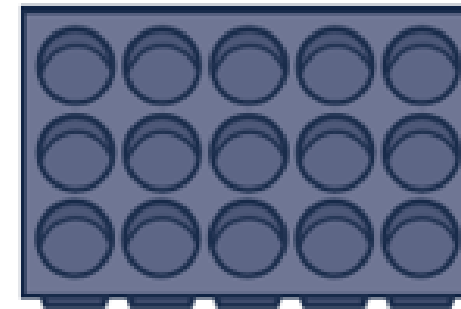
They can also bring home to children an important multiplication fact: multiplication can be done in any order – the answer will still be the same.



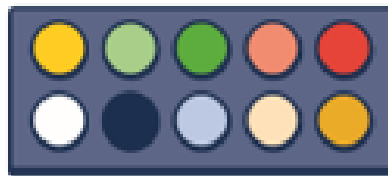
$$2 \times 3 = 6$$



$$3 \times 2 = 6$$



$$5 \times 3$$



$$5 \times 2$$



$$8 \times 2$$

## Language and Times Tables

There are many different ways to say the tables and they're all correct. It is important to use a wide variety so that children are able to make connections between the language.

For example:  $3 \times 8 =$

- three times eight is...
- three multiplied by eight is...
- three eights are...
- three lots of eight is...

# Singing and Chanting

These “old-fashioned” strategies still help. Say the multiples as you go up the stairs – e.g.: 3, 6, 9, 12.... Time how quickly they can do it. Can they run up the stairs? Can they do it backwards when they come back down? (Please walk forwards though we don’t want to be responsible for any A&E trips! 😊)

Catchy songs can be found online and on [www.youtube.com](http://www.youtube.com)

The image shows a screenshot of a YouTube search results page. The search bar at the top contains the text "three times tables song". The page displays three search results:

- Three Times Table Song (Cover of Uptown Funk by Mark Ronson and Bruno Mars)**  
Mr. DeMaio • 2.9M views • 2 years ago  
Mr. DeMaio and friends cover Uptown Funk by Mark Ronson and Bruno Mars in this fun multiplication video that can be used to ...  
Subtitles
- 3 Times Tables - Have Fun Learning!**  
laughalongandlearn • 5.8M views • 5 years ago  
Visit Laugh Along and Learn Website: <http://www.laughalongandlearn.co.uk/> Subscribe to Laugh Along and Learn's YouTube ...  
Subtitles
- 3 Times Table Song - Numberjacks**  
Numberjacks • 465K views • 11 months ago  
How fast can you recite your 3 times table? Practice makes perfect! Remember to subscribe for more learning with Numberjacks!

The left sidebar shows the YouTube navigation menu with options like Home, Trending, History, Music, Sports, Gaming, Films, TV Shows, News, Live, Spotlight, and 360° Video.

## Writing Them

Children could:

- Make a poster for their bedroom wall
- Write their arithmetic facts in different shapes and colours
- Write their arithmetic facts in weird, memorable ways

## Speed Writing

How quickly can you write all the facts? Can you beat your time? Race your friends and family!

## Rhymes and Patterns

Create rhymes to help children remember facts.

- $8 \times 8 = 64$  (I ate and I ate and was sick on the floor,  $8 \times 8$  is 64)
- $8 \times 7 = 56$  ( $56 = 7 \times 8$ ) (the numbers in this times table fact are in order 5, 6, 7, 8!)

### 8-Times Table Pattern

|    |    |    |    |    |    |    |    |    |     |
|----|----|----|----|----|----|----|----|----|-----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10  |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20  |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30  |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40  |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50  |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60  |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70  |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80  |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90  |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

$1 \times 4 = 4$

$6 \times 4 = 24$

$11 \times 4 = 44$

$2 \times 4 = 8$

$7 \times 4 = 28$

$12 \times 4 = 48$

$3 \times 4 = 12$

$8 \times 4 = 32$

$4 \times 4 = 16$

$9 \times 4 = 36$

$5 \times 4 = 20$

$10 \times 4 = 40$

multiplication hints & tricks

**Six's rule!**

if you multiply six by an even number, it will end in the same digit.

$6 \times 4 = 24$

the number in the tens place will be half of the number in the ones place.

## Games

Use board games, playing cards and memory games to create visual patterns, such as Snap, Dominoes and Bingo.

There are also numerous websites that have fun games on that are great for learning and practising mental arithmetic! These include:

<https://www.topmarks.co.uk/>

<http://mathszone.co.uk/>

<https://www.timestables.co.uk/games/> |

<https://www.bbc.co.uk/education>

Also many different apps you can download onto iPhones and iPads too!



**Any questions?**

