Welcome!!

- While you are waiting......
- Count out 150 matchsticks
- Use loom bands to make a few bundles of 10
- Don't bundle up all the matchsticks- you will need some loose ones as well







Bracknell Forest Community Learning Team



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Counting & Calculation the importance of concrete

1. PARENT PREP:

- using real objects ('concrete') in maths is vital
- written methods practical experience is the key to understanding
- Double digit subtraction partitioning method

2. CHILDREN ARRIVE: work with your child to make and play a fun game that builds understanding and confidence with addition

and

3. Opportunity to try out other activities with your child.

to build lots of other skills as we work together (following school values)

"You didn't give up, even though it was hard for you......" "That's brilliant! thank-you for listening so well"





The purpose of this session is to provide information and experiences that will help you to support your child's learning. However.....

One size doesn't fit all!!



Please share!!!

Children with additional needs?.....

Family Learning is for **everyone**, and all our activities can be adapted to suit any child (or grown up!!)

Please ask!!!

Building Calculation skills It is essential that children have lots of PRACTICAL EXPERIENCE using real objects to help them <u>UNDERSTAND</u> rather than just memorise calculation processes.









Why practical means progress The importance of concrete

(NCETM video 'Using resources to improve fluency and understanding') <u>https://www.youtube.com/watch?v=HGk8F6rRpPg</u>

How to use your matchsticks

Subtraction (small numbers)

e.g. 9 - 5 =

What about subtraction with larger (double digit) numbers?

e.g. 60 – 27 =

Place value

- We count using a 'decimal' column system
- [remember "hundreds, tens, units"?]
- We use the same 10 digits but their value varies depending on which column they are in.
- "place value" describes the value of any digit in a number - for example in 48, the 4 is worth 40 [4 tens]
- Throughout Key Stage 1, children have been developing their understanding of the place value system

(where the value of a digit in a number depends upon its position)

Children learn to:

Identify tens and ones, (hundreds tens & ones), in a number

Recognise/state the value of any digit in a number Partition numbers into tens and ones (hundreds, tens, ones)

- An understanding of place value is essential when learning to add and subtract bigger numbers
- Concrete experience of tens & ones (hundreds, tens & ones, and so on) is provided as they learn calculation processes
- Deep understanding of written methods is achieved by experiences with 'concrete'

Partitioning method - use matchsticks to model place value





tens	ones		



Partitioning method



tens	ones

Use your matchsticks to work out the answer to the following sum:

- Partition 43 into tens and ones (4 bundles of 10 and 3 'ones')
- Remove 9 'ones'..... (problem?)
- "EXCHANGING" Break open a bundle of ten and place the loose 'ones' into the ones column (13 ones)
- 43 is now partitioned into 3 tens and 13 'ones'
- Now you have enough 'ones' to able to remove 9 to find the answer.





43 - 9 = 34



Partitioning method (continued): subtracting a double digit number <u>43 - 19 = ?</u>

- Partition 43 into tens and ones (4 bundles of 10 and 3 'ones')
- Ask your child to remove 19 matchsticks
- Remind them that 19 is one ten and nine 'ones'"so how can we do this?" (hint do we have enough ones?)
 - Because there are 9 'ones' in 19, they will need to 'exchange' in order to complete the subtraction
 - Help your child to re-partition 43 to enable them to remove 19
- You should have 24 left in the form of 2 tens and 4 'ones' (and to one side you will have the 19 that have been taken away)
- Encourage your child to 'back check' if 24 is the correct answer to 43-19, then 24+19 should make 43......





<u>43 – 19 = 24</u>





Where does this fit in?

Column subtraction



Matchsticks give a vital CONCRETE picture of why standard written methods work.







"Children who grasp concepts rapidly should be challenged with reasoning and problem solving activities that apply knowledge and make connections, before moving on to new content"

High Achievers

If your child is achieving well, rather than moving on to the following year group's work many schools will encourage more in-depth and investigative work to allow a greater mastery and understanding of concepts and ideas.

Your games:

Criss cross subtraction – 3 in a row



Equipment

Red and blue counters (or similar), calculator

How to play:

Player 1 uses a pair of (blue) numbers from the list to write a subtraction sum on their paper/whiteboard. They then need to complete the sum, using their matchsticks to help if needed. (They might enjoy using a calculator to check their answer too!!)

If the answer is on the grid they can cover it with one of their counters

Player 2 then does the same.

Players take it in turns to choose pairs of numbers and cover squares on the grid. Once a square has been covered it cannot be covered again.

The winner is the first person to put three counters in a row, across, down or diagonally.





A chance to get your child familiar with how to play the game

A chance to build speed and fluency with subtraction facts to 20

A chance to have fun and be competitive

A chance to explore game strategy and use some higher order thinking skills**

Your games:

Criss cross subtraction – 4 in a row



Equipment: Red and blue counters (or similar), calculator

How to play:

Player 1 uses a pair of (blue) numbers from the list to write a subtraction sum on their paper/whiteboard. They then need to complete the sum, using their matchsticks to help if needed. (They might enjoy using a calculator to check their answer too!!)

If the answer is on the grid they can cover it with one of their counters. Player 2 then does the same.

Players take it in turns to choose pairs of numbers and cover squares on the grid. Once a square has been covered it cannot be covered again.

The winner is the first person to put four counters in a row, across, down or diagonally

©MathSphere



29	19	52	38
33	41	15	55
22	14	44	26
47	23	25	21

www.mathsphere.co.uk

A chance to use the matchstick partitioning method to tackle harder subtractions

A chance to build confidence and understanding of the subtraction process using double digit numbers

A chance to have fun and be competitive

A chance to explore game strategy and use some higher order thinking skills**

Children like to win.....

- Once they know the game they will work strategically - "Which number do I need to find to complete my row of 3 / row of 4?"
- The first time you play, follow the game instructions as written down, choosing pairs of numbers randomly
- The second time you play, if your child starts to plan ahead, go with it

Handy help sheet

Step 1- Play Criss Cross threebuilding speed and fluency with subtraction facts to 20

- · Read the game instructions with your child
- Get 5 counters each & decide who will go first
- Choose a pair of blue numbers (you may use the blue numbers more than once)
- Subtract the smaller number from the larger*-if the answer is on the board you can cover it up!
- Winner is the first person to get 3 in a row
- The aim is to get used to playing the game and have fun building subtraction fact fluency
 *your child may well be able to subtract the numbers in their head, but the matchsticks can be used to support/check the answer



Step 3- Play Criss Cross fourdouble digit subtraction using place value and partitioning

- · Get 8 counters each
- Take it in turns to choose pairs of blue numbers
 subtract the smaller number from the larger using the matchstick method we just tried -if the answer is on the board you can cover it up!
 Winner is the first person

to get 4 in a row



Step 2- Play Criss Cross three again but encourage them to be strategic....

As your child gets used to playing the 'Criss-Cross' game, they may begin to think ahead......you can prompt them by asking:

'Which number on the grid do you think you want to make next?'

(this could be a number that enables them to complete a row of 3 or one that blocks you from doing the same)



"Which 2 numbers might you be able to use

to get there?' (one number must be higher than the target number)

'How many (matchsticks) do you need to take away to reach the target?'

'Is that number available? (check the blues)





2. Do or Die



1. Use a ballpoint pen/sharp pencil to make a SMALL hole in the centre of your 2. CAREFULLY cut out your spinner – it works best if the edges are flat and 3. Add your choice of numbers and decorate your spinner to make it look fabulous. 4. Push a straw/matchstick through the hole you have 5. Use a SMALL PIECE of blue tack around the straw/matchstick to hold it 6. Get spinning!!!

Mathematics Games

www.mathsphere.co.uk

Do or Die (subtraction)

Equipment: A die or spinner A scoring sheet is useful

Rules:

This is a game for two or more people, although usually played in pairs. It is good practice for mental subtraction skills up to 50 (as well as addition skills using several small numbers)

The first player rolls the die as many times as s/he likes, recording each score and adding up the total as s/he goes.

The player may stop at any time and put his/her score in the bank – the 'banked' score can then be subtracted from the running total.

If, however, a 1 is thrown, all the score for that round is lost and the running total remains the same.

When a score has been 'banked' the die is passed to the next player who has her/his turn.

The winner is the first person to reach zero

Make it harder:

- Start on 100 and double the score each time you throw (throw a 4, double it to 8)
- Start on 200 (or more) and use a die/spinner with higher (teen?) numbers on it remember to keep number 1.
- Killer version: 0-9 die or spinner AND multiply each spin score by 10 (you will need to raise the starting score as well)



Family Learning Evaluation



Session Attended: Year 2 Calculation Skills - Criss Cross addition/subtraction Tutor: Heather Williams

We hope you have enjoyed today's session - In order for us to monitor the quality of our courses, we would be grateful if you could spend a couple of minutes completing the sections below:

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1. Glad you came?

Ver/h	-	

Did you learn som ething new? Please rate increase in knowledge/skills:

+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+10

Two things I have found useful today:

Did you enjoy your time in school today?

We want our sessions to be as helpful as possible - what could we do better?

Want to do more/something else? We run a variety of short courses <u>please circle</u> any of interest (many are FREE)

Family Learning sessions: Maths /Literacy /anxiety /transition & change /other.....

Parenting courses: Challenging behaviour/self esteem/sleep/anxious thoughts & worries

<u>Back to work courses:</u> working with children / be your own boss / retail / hospitality / customer service / food safety / health & safety / first aid

Soft Skills: Managing change / confidence building/ team building/ effective communication

English/maths for adults - informal 'café style' sessions (brush up skills / gain a qualification)

IT skills: Word / Excel / Outlook / Power Point / IT for jobseekers

Something else?

Phone number/email address...

Please take a minute to think about what you and your child gained from today's session and consider whether you would like to know more about our other courses ©

Time for the tiddly peeps.....

- 1. Children arrive ask them to sit with you to listen to the instructions for the game
- 2. Heather will explain how to play 🙂
- 3. Choose which game to try first (remember, you don't have to do the harder version today)
- 4. Play the game, choosing pairs of numbers to make a subtraction sum and using the matchsticks to help work out the answer

5. ENJOY!!!

More ideas for later

 Take a look at the following slides at home, there's plenty more you can do with your matchsticks.....



Take groups of objects (matchsticks if you like!!) and.....

- sort into pairs/groups of 5/groups of 10..... and use to practice counting in twos, fives, tens.....
- arrange objects in rows and columns (arrays) to make counting in 2s, 5s....easier - lego is great for this
- start with a certain number of things and find out how many groups of 2/3..... you can get from it

e.g. how many groups of 3 can you make with your 12 superhero figures....?

 start with a certain number of things and share them between 2, 5.....

e.g. can you share your 12 superhero figures equally between 2 people....?

Multiplication & times tables -making arrays & counting in 'groups of'

https://www.khanacademy.org/math/arithmetic/arith-review-multiply-divide/arith-review-mult-intro/v/multiplication-as-groups-of-objects







The road to understanding.....

Concrete (real objects)

Models (pictorial representations)

Abstract (written methods)



MODELS:

Add and subtract using 'base 10' images -Diennes, place value disks, coins.....

Find	148	+	2'	76
First, lay ou	t all of the p	lace v	aluebl	ocks









http://www.harcourtschool.com /activity/elab2004/gr3/3.html online addition game with Diennes as model

Pictorial representations empty number lines

In year 2, addition using an empty number line is widely used





Your child will be familiar with this method (ask them to show you!!)

- <u>https://www.youtube.com/watch?v=XFNyCoMdfsE</u> Video link showing addition using an empty number line
- <u>https://www.youtube.com/watch?v=zox5cJufy7o</u>
 Video link showing harder addition using an empty number line

Need more info? Have a look at these

Looking ahead to Key Stage 2 - written methods for addition

https://www.youtube.com/watch?v=KVi3FFFGKKM

Video link showing addition using partitioning

https://www.youtube.com/watch?v=gdT3v2PAo8I

• Video link showing column addition with partitioning

https://www.youtube.com/watch?v=vaxUcsDtV-Q

 Video link showing column addition, formal (standard) written method

Looking ahead to Key Stage 2.... subtraction methods

https://vimeo.com/70096846

 Video link showing partitioning methods for subtraction

https://vimeo.com/70316059

Video link showing different subtraction strategies

https://vimeo.com/70316060

Video link showing development of column subtraction

More curriculum information?

https://primarysiteprod.s3.amazonaws.com/uploads/d66d612d 6ee34712bc6f6572b0787afb/6edc/Parents_ Complete_Guide.pdf

https://www.schoolguide.co.uk/blog/the-newprimary-national-curriculum-a-parents-guide

Here are some great online resources to try

1. Information about reading writing & saying big numbers <u>http://www.englishlessonsbrighton.co.uk/saying-large-numbers-english/</u>

2. Comparing numbers - scroll down homepage until you see http://www.crickweb.co.uk/ks2numeracy-calculation.html

3. General calculation practice <u>http://www.bbc.co.uk/education/subjects/zjxhfg8</u> <u>http://www.softschools.com/math/games/</u> <u>http://www.coolmath-games.com/numbermonster/index.html</u> <u>http://www.primarystudents.co.uk/year-2/</u>

4. Word Problems/problem solving (stretch and challenge) <u>https://uk.ixl.com/math/year-2/addition-word-problems-up-to-two-digits</u> <u>https://uk.ixl.com/math/year-2/subtraction-word-problems-up-to-two-digits</u>

https://urbrainy.com/maths/year-2-age-6-7/challenges-for-year-2

4. Place value practice

http://www.softschools.com/math/place_value/teaching_place_value/ http://www.softschools.com/quizzes/math/place_value_and_expanded_no tation/quiz677.html



https://www.stem.org.uk/elibrary/resource/28180 https://nrich.maths.org/8940 and for Yr3 and beyond, try https://nrich.maths.org/8958