Year 1 and 2 Maths parent workshop

Ros Morgan     Deputy Head teacher
Which is the odd one out, and why?

5  10  12
A Conversation between Patrick (aged 4) and Mark (professor in teaching of mathematics):

- Mark: What is four and one more?
- Patrick: Six
- Mark: What is four giraffes and one more?
- Patrick: Five giraffes
- Mark: What is four elephants and one more?
- Patrick: Five elephants
- Mark: What is four and one more?
- Patrick (looks him in the eye): Six.
Objectives:

- Explain and demonstrate how mathematics is taught in Year 1 and 2 at Fox
- Understand what is meant by 'Mastery' in mathematics.
- Identify how fluency impacts upon achieving mastery.
- Increase confidence and understanding in supporting your child at home.
Discuss 3 positive and negative experiences of Maths you had when you were a child.
Fixed vs Growth mindset
Carol Dweck

We believe that everyone can get better at maths...when they put in the effort and work at it.

- Do not praise children for being clever when they succeed at something, but instead should praise them for working hard.
- Children learn to associate achievement with effort (which is something they can influence themselves – by working hard!), not ‘cleverness’ (a trait perceived as absolute and that they cannot change).
If children hear ‘I can’t do maths’ from parents, teachers, friends they begin to believe it isn’t important

People become less embarrassed about maths skills as it is acceptable to be ‘rubbish at maths’
The curriculum is designed so that pupils explore mathematical ideas in depth.

- Number – number and place value
- Number – addition and subtraction
- Number – Multiplication and division
- Number – fractions
- Measurement
- Geometry: properties of shape
- Geometry – position and direction
- Statistics (Year 2 only)

- Mastery curriculum
- Reading and spelling of mathematical vocabulary
Mathematics mastery

- Using spoken and written language with confidence and clarity to explain and justify mathematical reasoning.
- Having a deep conceptual understanding of mathematical concepts and skills.
- Developing mathematical thinking, including generalising, classifying and comparing, and modifying.
Speaking and listening

- Vocabulary
- Questioning
- Full sentences with sentence scaffolds
- Reasoning and explanation
- Problem solving

How do you know?
Can you show me?
Prove it to me…
Can you show me in a different way?
What does it mean to master something?

- I know how to do it
- It becomes automatic and I don’t need to think about it - for example driving a car
- I’m really good at doing it - painting a room, or a picture
- I can show someone else how to do it.
What is mastery in Maths?

“In mathematics, you know you’ve mastered something when you can apply it to a totally new problem in an unfamiliar situation.”
Dr. Helen Drury, Director of Mathematics Mastery

Mastery of Mathematics is more.....

• Achievable for all
• Deep and sustainable learning
• The ability to build on something that has already been sufficiently mastered
• The ability to reason about a concept and make connections
• Conceptual and procedural fluency
What does it look like in the classroom?

Children move together i.e. same objective from National curriculum. Differentiation through scaffolding/resources used.

- 5 lessons per week.
  **Typical** lesson is made up of 6 parts:
  1. Do now
  2. Introduce Learning
  3. Talk task
  4. Develop learning
  5. Independent and/or adult led activity
  6. Plenary

- Maths Meeting x 4/ week
Multi-part Lessons

Do Now  New learning  Talk task  Develop learning  Independent task  Plenary
Example of a talk task

We are learning to recognise the relationship between numbers in division equations.

Divide 12 books into groups of 2.

There are 12 books altogether. We are dividing 12 into groups of 2. I am going to group the unifix in twos, 2, 4, 6, 8, 10, 12.

There are 6 groups of 2. 12 divided by 2 is equal to 6.

Note the focus on language and ‘self-talk’ through maths.

Link between concrete, pictorial and abstract.
Maths Meetings

- Aim is to continually revise previously taught objectives.
What do we mean by depth?

Learning is deeper NOT higher!

**Advantages:**
- Embedded learning
- Slower and richer pace
- Not lead by the clock
- Reasoning focus
- Mathematically makes more sense!
Home learning

- One activity per week
- A mental challenge
- Please add a comment so that we know how you/your child found it.
- Create maths resource box for home.
- Revisit previous Maths learning.

You can always revisit old homework games or activities!
Resources on school website

- [www.fox.rbkc.sch.uk](http://www.fox.rbkc.sch.uk)
- Calculation policy
- Progression in calculation
- Pitch and expectations
Progression in calculation

FOUNDATION

Calculation Strategies

Counting on from a number to find the total
I have 5 pennies in my tin. I put in one, two, three pence more. How many pennies are in the tin now?

Use moveable objects when finding totals.
Touch and align each object as it is counted.

Count first group, start count from first group’s total when counting second group
YEAR 1

Calculation Strategies

Jane had 3 bears. She was given 2 more. How many does she have now?

Addition in any order
Use numberline and Numicon to show that addition can be done in any order:

\[ 3 + 4 + 7 = 3 + 7 + 4 \]

To support learning of number facts using a variety of visual resources:

**Bonds to 10**

Flip Flap

\[ 7 + 3 = 10 \]

Make 6

\[ 2 \text{ and } \ldots \]
\[ 3 \text{ and } \ldots \]
\[ 4 \text{ and } \ldots \]

\[ 0 \text{ and } \ldots \]
\[ 1 \text{ and } \ldots \]
\[ 5 \text{ and } \ldots \]
YEAR 2

Calculation Strategies
Number Stories

There are 50 people on the bus. 16 more get on. How many altogether?

Number bonds
Use knowledge of number bonds to 10 to help with bonds to 20 and multiples of 10 to 100

Addition as partitioning and recombinining:

42 + 36 = 70

12 + 23 = 12 + 20 + 3

23 + 15 = 38
How would you record 0-10 pictorally?
How would you record 0-10 pictorially?
### CPA Approach

<table>
<thead>
<tr>
<th>Stage</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete</td>
<td>Refers to the use of manipulatives, measuring tools or objects that the student handles.</td>
</tr>
<tr>
<td>Pictorial</td>
<td>Refers to the use of drawings, diagrams, charts or graphs that the student draws.</td>
</tr>
<tr>
<td>Abstract</td>
<td>Refers to abstract representations such as numbers and letters that the student writes.</td>
</tr>
</tbody>
</table>

Example:
Tom had 3 apples. His mother gave him 4 more apples. How many apples did he have altogether?

```
3 + 4 = 7
```

- **Concrete**: Give apples and count
- **Pictorial**: Draw apples and count
- **Abstract**: Write the number statement
How can you help at home?

- **Fluency is key**
  - Number facts
    - Including subtraction facts as well.
    - Doubles and halves
  - Skip counting
  - Times tables

- **Practise, practise, practise!**

- **Other activities can include:**
  - Practise writing number formation
  - Match words to numbers

- **Think and talk like a mathematician**
Fluency

Conceptual fluency + procedural fluency = MASTERY
Fluency = how fast a person can retrieve correct maths facts to working memory from storage memory.

What are the implications for this?

Storing in Long term Memory needs lots of rehearsal, repetition and regular retrieval.
What else does number fluency entail?

Number fluency

- Three key goals – efficiency, accuracy and flexibility.
- **Efficiency** – children have strategies that they understand, that don’t have too many steps, where they can keep track of their working etc.
- **Accuracy** – children can record carefully, use known facts correctly and check their answers.
- **Flexibility** – children can choose appropriate skills and strategies to solve problems.
How do we do this....?

Lots of practise!
Short and regular rather than long and irregular.
What facts do they need to be able to recall?

- **Number bonds**
  - Addition and subtraction facts.

- **Doubles and halves**

- **Near doubles**

- **Skip counting**

- **Times tables**
It is important that children recognise number bonds, different pairs of numbers with the same total.
Times tables

- 2s
- 5s
- 10s
- 3s
- 4s (from the 2s)
- 6s (from the 3s)
Fingers game

Videos

Fun games

Mathemagician Andrew Jeffrey shows us how to use games to practise times tables.

Watch the video
Number line ideas

Draw a line. Mark 0 and 10 (or any number range needed). Roll a dice. Decide where that number would go and write it in. Repeat. You can also start at any number and include whatever your child needs.
Inbetweenies

- Start by asking for a 2 digit number. Place it at the start of the line. Now ask for a higher 2 digit number and place at the end of the line. Now keep asking for numbers in between.
Keep Counting!

- Backwards and forwards in 1s, 2s, 5s, 10s, 100s.
  - Count with money.
  - Pairs
Pelmanism/ Memory games

- Make own resources using pictorial or abstract.
- Adapt.
One player is called "PLUS"
The other is called "MINUS" so decide who is who.
Plus moves from left to right and Minus moves from right to left. (The children may be encouraged to think about why that might be.)
Take it in turns to throw the two dice and add up the numbers on the two dice.
Move that number of places in your direction.
If the counter reaches 1, Minus has won and so, of course if the counter reaches 27, Plus has won.
Web sites to use for practising fluency and other resources...

- Oxford Owl Maths
- NNS parents tool kit
- Top Marks times tables
- Maths is fun
- Woodlands resources
- Free numicon resources
- Nrich website
Dice Games

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

Cover the Windows

You will need:
- 2 players
- A quantity of counters for both players
- 2 dice (1-6 spots or numbers)
- A window game board

The window game board consists of two windows with identical numbers. Players sit side by side and play on their own window.

How to play:
Players take turns to roll both dice, they add
Maths Seeds

http://mathseeds.co.uk/

Discover the fun way to grow your child’s maths skills!

Mathseeds teaches kids aged 3-11 the core maths and problem solving skills needed to be successful at school with fun, highly interactive and rewarding lessons.

Mathseeds combines highly structured lessons with fun motivational elements that keep children engaged and keen to learn.

Your kids can start learning with Mathseeds anytime and anywhere there is a computer or tablet – just click the 'free trial' button to get started!

Kids learn while having fun with vibrant animations, songs and multiple rewards.
Other ideas

- **Follow a recipe:** work together to find out the quantities needed, ask your child to weigh the ingredients, discuss how you’d halve or double the recipe and discuss the ratio of ingredients.

- **Talk about the weather forecast:** is today’s temperature higher or lower than yesterday’s? What do the numbers mean?

- **Going shopping:** talk about the cost of items and how the cost changes if you buy two items instead of one. Let your child count out the coins when paying and discuss the change you get back. Use coins to explore addition, subtraction, multiplication and division.

- **Planning an outing:** discuss how long it takes to get to the park, and so work out what time you need to leave the house. Encourage your child to work out the best solution based on the time and distances. Discuss what shapes you see when you get there.
Please do...

- Play (maths) with your child
- There are opportunities for impromptu learning in games with real people that you can't get from an ipad or DS!
- Let your child win or be better than you! Otherwise all they learn is that you are better at maths than them
- Recognise that there is more than one way of doing calculations
  - You may have learned one method, but children are actively encouraged to seek out alternative methods in school and choose one which works for them, no matter how long winded.
- Be an actor!
  - Get excited about maths and your child will get excited too.
Please try not to....

- Don't expect them to understand after you've explained it once.
  - It is normal for a child to 'get it' one day, and then in a different context not know how to find an answer.

- Don't tell them you are hopeless at maths.
  - You may remember maths as being hard, but you were probably not hopeless, and even if you were, that implies to your child, "I was hopeless at maths, and I'm a successful adult, therefore maths is not important."

- Don't get into an argument over homework.
  - It will be something that your child has covered in class, and if they really can't do it without a lot of tears and frustration, leave it and LET US KNOW!

How would you use these manipulatives and focus on encouraging your child to use the correct vocabulary to explain their thinking?
Key models and images used in KS1

- Part, part whole
- Ten frame
- Place Value chart
  - Dienes, Cuisenaire
Part-part whole and number bonds

The whole is 5.

The parts are 2 and 3.

whole

parts

9

whole

part

part
Importance of number bonds and concept of part-part –whole continues...
We are learning to count sets of objects within ten.

**Ten frame**

This is a picture of a ten frame that can be used alongside the ten frame and cubes on the counters. Model placing the cubes on top of the images you are counting and moving them to the ten frame.

**Task 2D**

There are 8 cubes. I see 6 and 2.

There are 8 cubes. I see 4 and 4.
### Write an addition equation for each 20 frame.

<table>
<thead>
<tr>
<th>20 + 0 = 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>17 + 3 = 20</td>
</tr>
<tr>
<td>13 + 7 = 20</td>
</tr>
<tr>
<td>19 + 1 = 20</td>
</tr>
</tbody>
</table>

```
24 + 3 = □
32 + 5 = □
13 + 6 = □
46 + 2 = □
```

```
--- + ---
...
```

```
20
```

```
18
```

```
2
```
Make 10 strategy

To add two single digits by making ten first

How many cubes need to be added to the group of eight to make ten?

To add two single digits by making ten first

Independent task

3 + 9 = 12
10 + 2 = 12
2 + 10 = 12
What is one more than 4?

_____ is one more than 4.
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.
<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

is tens

\[ \square = \square + \square \]

23 = 2 tens and 3 ones.

<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
Place value

We are learning to compare numbers to 40.

Which group has **more** counters?
Which number is **greater**, 23 or 29?

- How many groups of 10 are in 29?
- How many tens are there?
- How many ones are there?

There are 3 tens and 4 loose ones.

Where would 32 go?
Represent 32 on a bead string.
How many tens are there?
How many ones are there?
Chinese Bamboo

When you plant it, nothing happens in the first year, nor in the second year or the third or the fourth years. You don’t even see a single green shoot.

And yet, in the fifth year, in a space of just six weeks, the bamboo will grow nine feet high.

The question is, did it grow nine feet in six weeks or in five years?
Questions...

I sense that a hand is raised, yet I must not turn around.

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