NORD ANGLIA EDUCATION

Maths – A Lesson that Counts!
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# COUNTDOWN CHALLENGE!

- The challenge is to use the 6 grey number cards to make the given target number in the black box.
- You may only use each number once and you can only use the four standard operations (addition, subtraction, multiplication and division)
- You may not need to use all of the cards

# COUNTDOWN CHALLENGE!

Did anybody find a solution?

# Aims of the workshop

- To assist parents in understanding the changes to the new National Curriculum

- To provide an understanding of the developments in teaching methods in maths

- To give practical examples of the types of activity your child will do in maths at BSB

- To provide some helpful hints on how you can develop your child's mathematical ability at home

# Mathematical Fluency

## The New National Curriculum says:

- *Children should become **fluent** in 'fundamentals'of maths, 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.*

…the key questions are…

- How do we do this?
- What is fluency?

# Mathematical Mastery

## Maths is more than just knowing HOW…

The children are required to;

- develop mathematical **fluency**
- **reason** mathematically,
- emphasise **problem-solving** and be flexible with their approaches in doing so
- **make connections** across mathematical ideas
- **apply knowledge** in other subject areas
- place a much greater emphasis on the **use** of calculation for efficiency
- understand there has been a huge emphasis on **high expectations** with movement of objectives downwards!

- What does this look like in practice?

# Mathematical Fluency

## There isn't a specific definition!

It could be;

**It is all about learning something off by heart (memory learning)**

- Does this help working memory?
- Certainly decreases the steps and thought processes that children have to go through but is this a good thing?
- Does it;
- develop conceptual understanding?
- develop the ability to use an apply to other areas?
- encourage spotting patterns in different areas of mathematics? For instance: times tables
- develop confidence?
- develop making connections between different areas of mathematics?
- enable deep learning?

# Mathematical Fluency

## There isn't a specific definition!

But it could also be;

- **All about helping children to spot patterns** which helps to develop generalisations in number skills but spot them quickly due to familiarisation in areas of maths.

- This enables children to see that 6x4 is the same as 12x2 and both give 24 by using application skills, e.g. the use of doubling and halving and making links.

  - Does this approach help to develop a lack of fear and anxiety in development of times tables and other areas?

  - Does it help to develop confidence and speed and improve memory?

  - Does this help children to make links and use and apply?

  - Does it enable speed of processing skills and conceptual understanding?

  - Does it enable deep learning?

# Mathematical Fluency

## At BSB we have:

- Undertaken a review of the old and new curriculums to ensure we maintain **OUR** standards
- Purchased a new maths scheme that is produced by Cambridge and linked to the experts in maths at the National Centre – focus on **INVESTIGATIVE  and PRACTICAL** maths
- Increased **TALK for MATHS** to help improve understanding through discussion and developing **REASONING**
- Committed to providing ongoing training for our teachers to become more proficient in the delivery of maths
- Purchased equipment for children of all ages and abilities to use  - you are NEVER too old or too able!

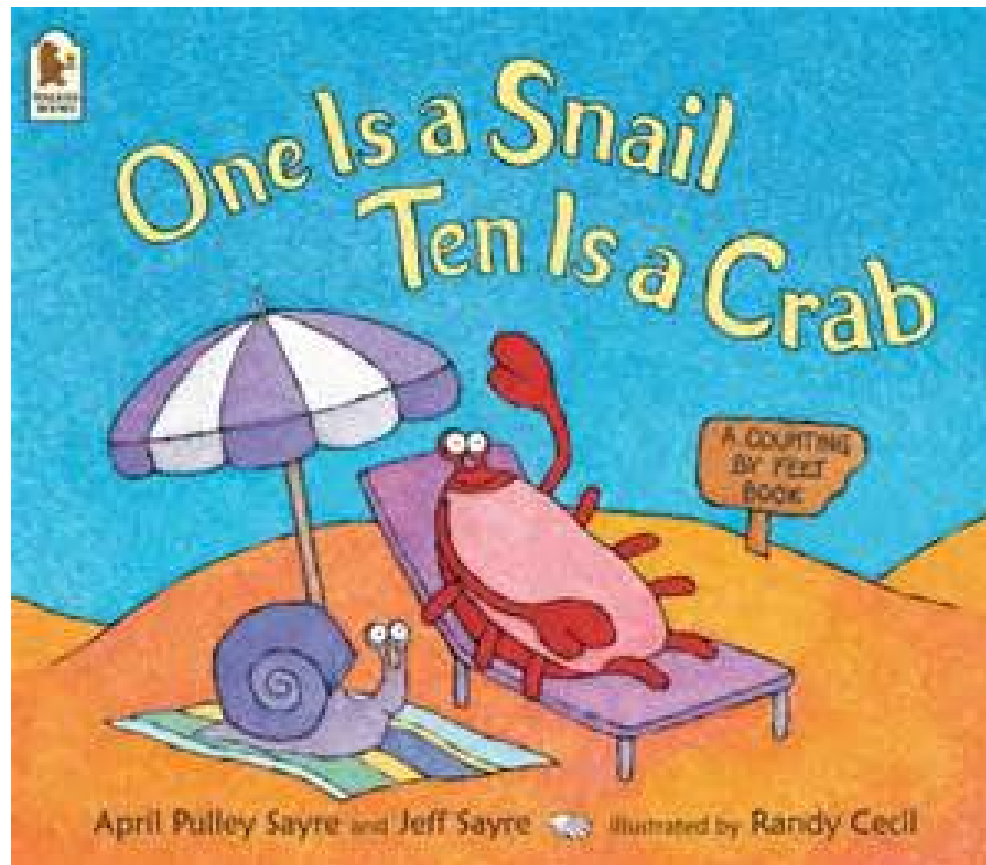# Maths – A lesson that counts

# Time to try it out yourself!

# KS1 Investigation example

## Year 1 maths investigation

- 'One is Snail, Ten is Crab' by April Pulley Sayre and Jess Sayre.
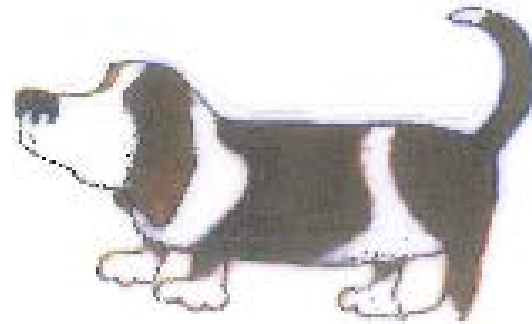
# KS1 Investigation example

## Year 1 maths investigation

- Together the class read the mathematical story book 'One is Snail, Ten is Crab' by April Pulley Sayre and Jess Sayre.

- Children are required to think of **number combinations** to make a given amount. This task builds on their **prior knowledge** of number bonds and simple addition.

- Class teacher can emphasise that with an **investigation there are many possible answers**.

- The task can be **simplified** or **extended** in many ways to **differentiate** for the children in the class.

# KS1 Investigation example

## Possible investigation tasks

- Task 1 – Can you make a total of 20 legs using only a combination of snails, people and dogs. How many of each would you use?

# KS1 Investigation example

## Other possible investigation tasks

- Task 2 – Sam was sunbathing on the beach. When he woke up he saw 14 legs. Which creatures could he see? Is there only one answer? How many ways can you find? How do you know?

- Task 3 – Roll 2 six sided dice and add the numbers together to find the total. Using only the legs of the snails, people and dogs, can you make this total?  Can you find a different combination to make this total? Can be extended as necessary by using a 10 sided dice.

- Task 4 – introduce algebraic concepts  for example;

    Snail =1 and Dog =4

    S = 1, D = 4

    2D+S = 9 (Why is this the case?) *Developing reasoning through questioning*

# KS2 Investigation example

## Other possible investigation tasks

Look at the matrix square.

Can you see how it has been constructed?

Why are some numbers in black and some in red?

Can you explain why the red 6 is in that particular square?

Why is there a 45 in the bottom right-hand corner?

You will notice that the numbers 2 - 9 are used to generate the matrix. **Only one of these numbers is used twice. What is that number?**

| x | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| 2 | 4 | 6 | 8 | 10 |
| 6 | 12 | 18 | 24 | 30 |
| 7 | 14 | 21 | 28 | 35 |
| 9 | 18 | 27 | 36 | 45 |

Investigation from www.nrich.maths.org

# KS2 Investigation example

## Your turn!

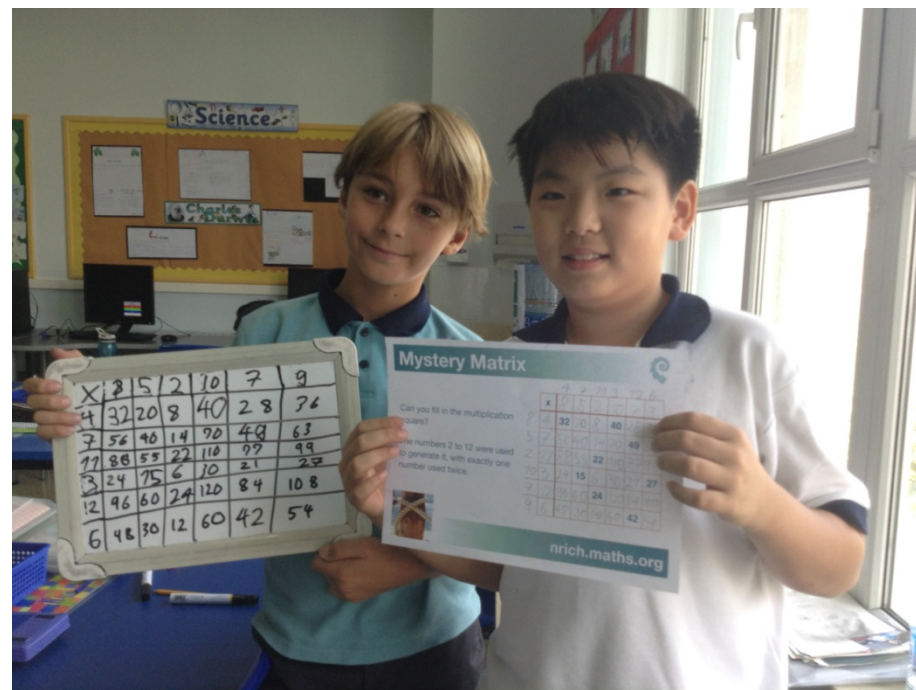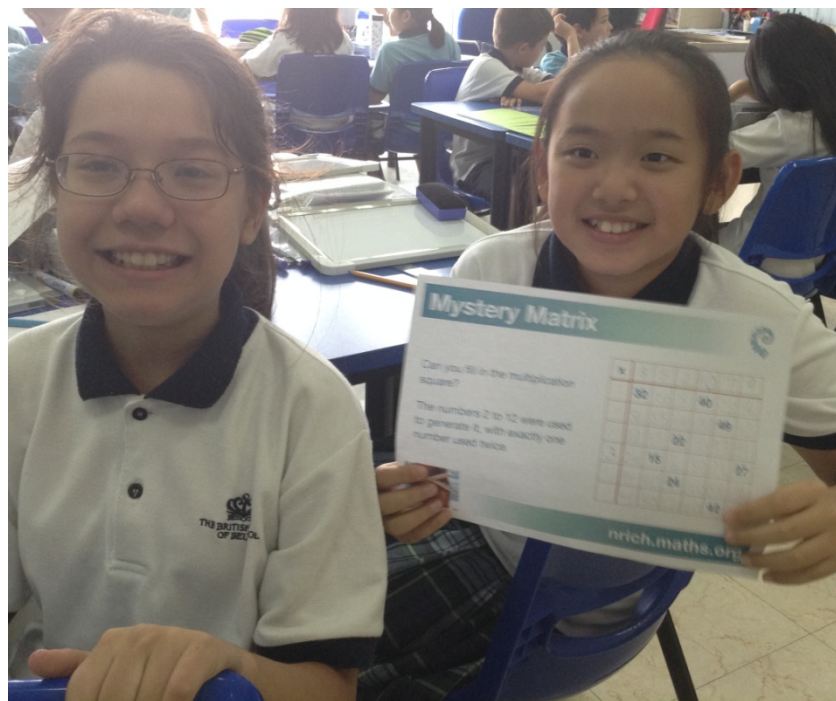The numbers 2 -12 were used to generate it with just one number used twice.

| x | | | | | | |
|---|---|---|---|---|---|---|
| | 32 | | | 40 | | |
| | | | | | 49 | |
| | | | 22 | | | |
| | | 15 | | | | 27 |
| | | | 24 | | | |
| | | | | | 42 | |

# KS2 Investigation example

## The answer!

The numbers 2 -12 were used to generate it with just one number used twice.

# Things you can do at home…that don't involve workbooks!

## Fluency comes through real life practice…

1. Counting the pasta into the pan

2. Measuring ingredients on scales – more/less

3. Friday Night Fractions of amounts – pizza cutting – a whole into smaller parts

4. 'We are leaving for the pool at 2.30pm – how long will that be from now?'

5. Counting up and down stairs – 2s, 3s, 5s etc

6. Counting tiles by multiplication - 7 lots of 5

7. Sorting, grouping and classifying toys, vegetables, fruit, shoes etc.

8. Division – sharing objects/sweets/pieces of fruit between groups

9. Finding the difference 'If you grew 10cm per day how long would it take you to be taller than your Mum/Dad?' (Applying **understanding** of difference)

10. Looking at train timetables to understand how data can be presented

This isn't an exhaustive list but means children are developing understanding not just doing!

# Things you can do at home…that don't involve workbooks!

## Fluency comes through real life practice…

Questions to ask;

What do you notice?

What is the same/different?

What would happen if…?

Tell me the story of how you got that answer?

What is the number sentence you used…?

Does this always/sometimes/never happen?

www.nrich.org is a great place to look for investigative elements

www.7puzzle.org has lots of problem solving using all elements of mathematics

It is about inspiring the children to want to know the **detail** of maths not just the **methods**

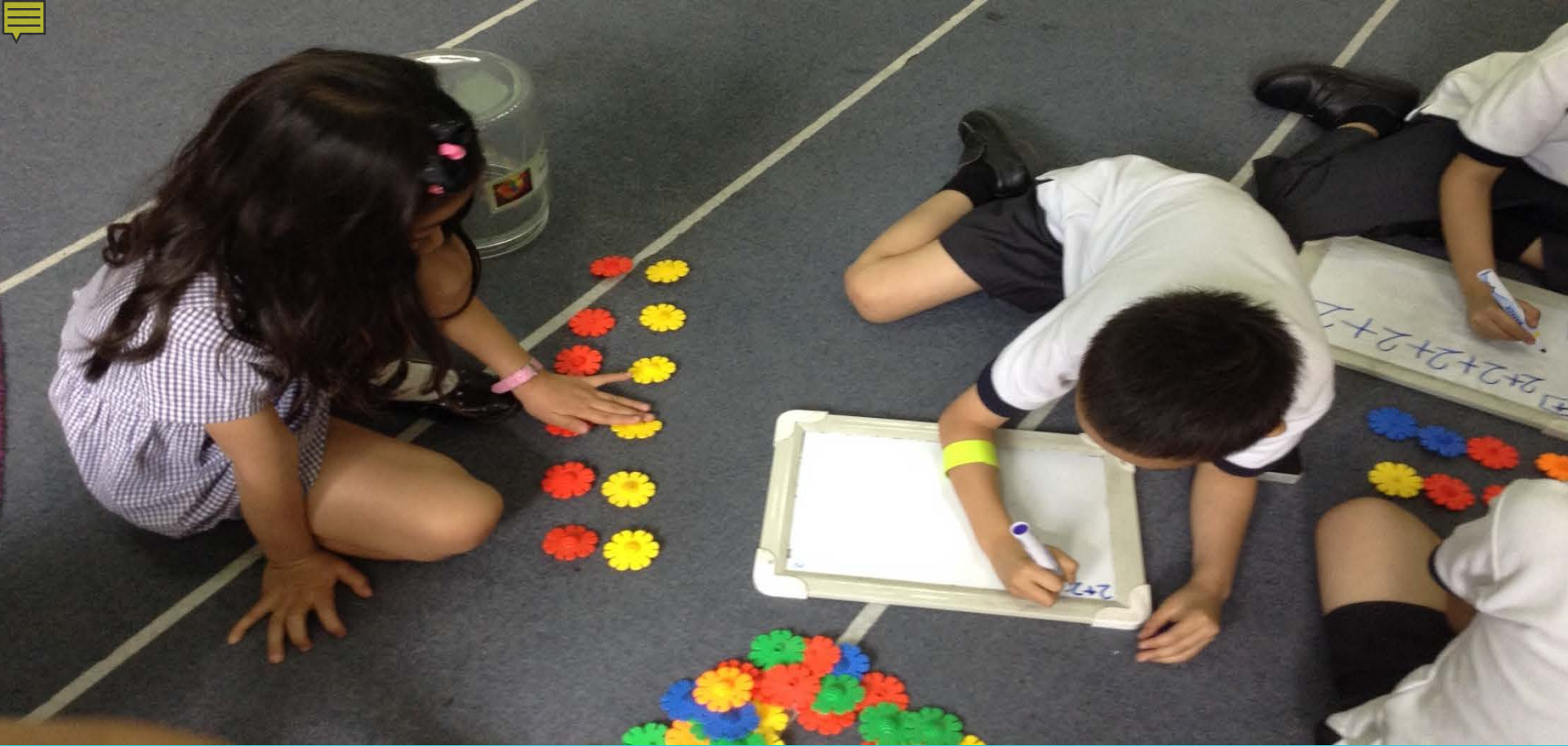# Things you can do at home…that don't involve workbooks!

## Fluency comes through real life practice…

The 2…3…5  game up to 30

# Any questions?

# Thank you