

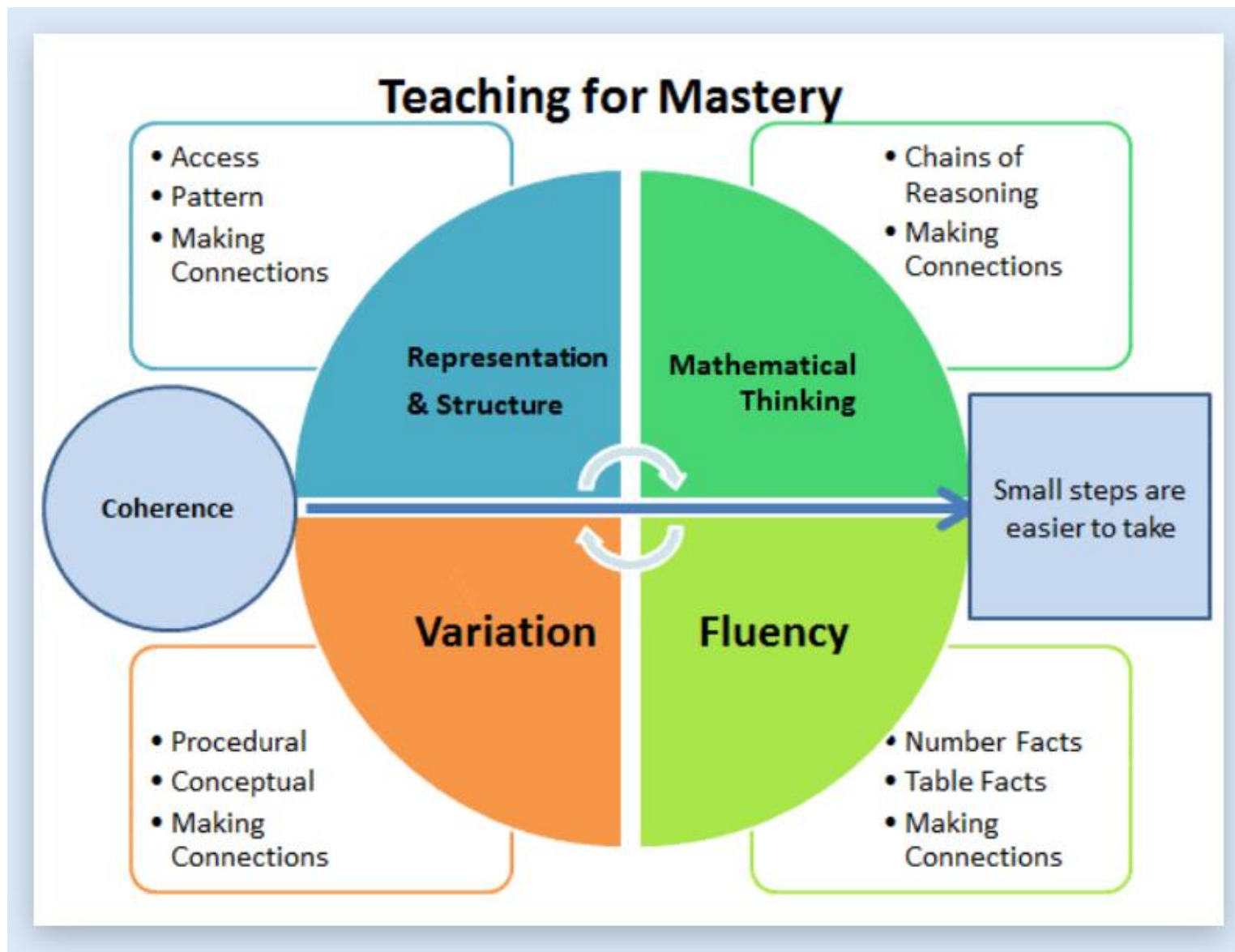
Key Stage 2: Years 5&6 Mathematics Parent Workshop

Our Approaches to Mathematics

Aims of the Session

- Mastery approach to teaching Mathematics
- Expectations– in school and at home
- Mathematical Fluency: KIRFS and times tables
- Calculation Policy
- Reasoning
- Rich mathematical tasks and open– ended questioning
- Assessment
- Useful Websites

Teaching For Mastery



NCETM

NATIONAL CENTRE FOR EXCELLENCE
IN THE TEACHING OF MATHEMATICS

Expectations: At School and At Home

- Maths is taught every day from 10:45 until 12:00
- The lesson begins with a mental starter based on knowledge of times tables and KIRFS (Key Instant Recall Facts) or recalling knowledge from previous topics.
- The teacher models the methods on the board and then children work through questions. Both fluency and reasoning form part of every lesson.
- Challenges for all are built into the lesson and there are always extension questions available for those that are confident to move on.
- Weekly Times Tables Test on Friday.
- At home children need to practise their fluency with times tables and KIRFS. Online programmes such as Mathletics and Times Table Rockstars offer additional support with this.
- Mathletics can be used for consolidation on all the National Curriculum topics for your Year Group.



Times Tables

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

- Ideally these are learned by Year 4
- Still need to be practised
- Quick recall within 5 seconds
- Also related division facts
- E.g. $5 \times 4 = 20$, $20 \div 4 = 5$

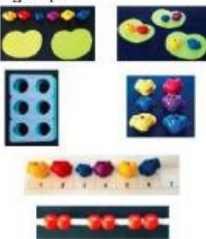
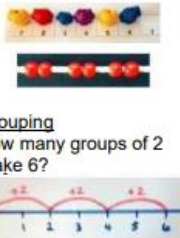

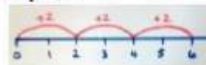


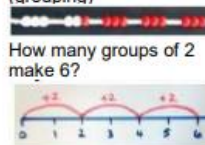

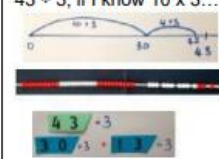
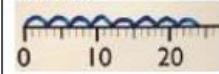
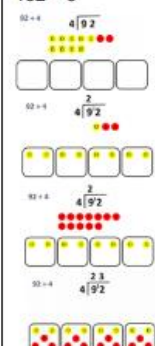

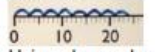
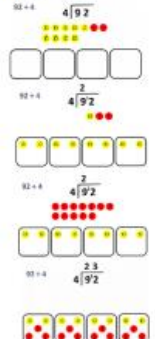
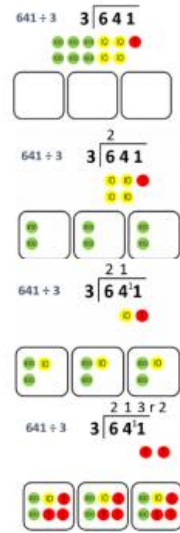
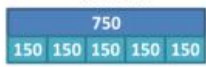
KIRFS (Key Instant Recall Facts)



OVERVIEW OF KIRFs (Key Instant Recall Facts) TERM-BY-TERM

	RECEPTION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
AUTUMN TERM 1	Say the number names in order to 5.	Know all the number bonds for 5.	Know all number bonds for 10 and 20.	Know all number bonds for each number to 20.	Know all number bonds for 100.	Know all decimals that total 1 or 10 (1 decimal place)	Know all previous number bonds including decimals.
AUTUMN TERM 2	Say the numbers in order to 10	Know all number bonds for 10	Know multiplication and division facts for 2x table.	Know multiplication and division facts for 2x, 4x and 8x table.	Know multiplication and division facts for the 7x table.	Consolidate multiplication and division facts for all times tables.	Derive multiplication and division facts using decimal numbers (e.g. $8 \times 0.7 = 5.6$)
SPRING TERM 1	Be able to partition numbers to 5 into two groups	Know all number bonds for 20.	Know multiplication and division facts for 10x table.	Know doubles and halves of all whole numbers to 20	Know the decimal and percentage equivalents of the fractions $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, tenths and fifths	Know the doubles and halves of all two-digit numbers	Know doubles and halves of 2-digit decimals.
SPRING TERM 2	Count in 10s	Know all doubles and halves of even numbers to 20	Know the halves of 1, 3, 5, 7 and 9 as a fraction	Know all number bonds for 100 using multiples of 5	Know all pairs of multiples of 50 with a total of 1000.	Know the prime numbers within 100	Know square numbers to 12×12 .
SUMMER TERM 1	Count in 2s	Know all addition and subtraction facts for all numbers between 0 and 10.	Know all addition and subtraction facts for multiples of 10 to 100.	Know all multiplication and division facts for 3x, 6x and 9x table.	Know multiplication and division facts for the 11 and 12x table.	Know all pairs of factors of numbers up to 100.	Know the tests for divisibility for numbers up to 10
SUMMER TERM 2	Count in 5s	Count forward and backward in steps of 2, 5 and 10.	Know multiplication and division facts for 5x table.	Know multiplication and division facts for 2, 5 and 10x table	Know all number bonds for £1 using decimal notation	Know the decimal and percentage equivalents of the fractions $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, tenths and fifths	Know the square roots of square numbers to 15×15

DIVISION

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Calculation expectations to be solved using a range of strategies.	They solve problems doubling, halving and sharing	Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.	Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.	Write and calculate mathematical statements for x and ÷ using the multiplication tables that they know, (inc. for two-digit numbers times one-digit numbers), using mental and progressing to formal written methods Solve problems, including missing number problems, involving multiplication and division	Solve problems involving multiplying and division	Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes	Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication to the context
Developing conceptual understanding	<p><u>Equal sharing</u> $6 \div 2 = 3$ by sharing into 2 groups</p>  <p><u>Grouping</u> How many groups of 2 make 6?</p> 	<p><u>Equal sharing</u> $6 \div 2 = 3$ by sharing into 2 groups $6 \div 2 = 3$ by sharing into 2 groups and by grabbing groups of 2</p>  <p><u>Grouping</u> How many groups of 2 make 6?</p> 	<p><u>Equal sharing</u> $15 \div 3 = 5$ in each group (sharing)</p>  <p><u>Grouping linked to fractions</u> Splitting in to 3 equal groups is the same as finding thirds.</p>  <p><u>Grouping</u> $15 \div 3 = 5$ groups of 3 (grouping)</p>  <p><u>Use language of division linked to tables</u> $10 \div 2 = 5$</p> 	<p><u>Mental strategies using partitioning and known facts</u> $43 \div 3$, if I know $10 \times 3 \dots$</p>  <p><u>Use language of division linked to tables</u> How many groups of 3 make 24?</p>  <p><u>Using place value counters to support written method</u> $132 \div 3$</p> 	<p><u>Grouping using known facts for partitioning</u> $196 \div 6$ If I know $3 \times 6 \dots$ then 30×6</p>  <p><u>Use language of division linked to tables</u> How many groups of 3 make 24?</p>  <p><u>Using place value counters to support written method</u> $132 \div 3$</p>  <p><u>Short division</u> $641 \div 3 = 213 \text{ r}2$ $3 \overline{) 641}$</p>	<p><u>Using place value counters to support written method</u> $641 \div 3$</p>  <p><u>Bar model used to reinforce 'how many [divisors] in [dividend]?'</u> $750 \div 150$</p> 	<p><u>Using place value counters to support written method</u> Extend previous method to include exchanging ones for tenths to model decimal remainders</p>

Long Multiplication (New Learning in Year 5)

E.g. 436×22

			TTh	Th	H	T	O	
					4	3	6	
				x		2	2	
					8	7	2	
					8	7	2	
					8	7	2	0
		+			9	5	9	2
					1			

- First multiply 436 by 2
- Then multiply 436 by 20
- First put a 0 in the ones as a placeholder
- Then multiply 436 by 2
- Finally, add the two answers

<https://corbettmathsprimary.com/2018/07/21/multiplication-video/>

Long Division (New Learning in Year 6)

$$\begin{array}{r} 2 \\ 15 \overline{) 3640} \\ \underline{- 30} \\ 6 \end{array}$$

15 into 3 doesn't go, so look at the next digit.

15 goes into 36 two times, so put a 2 above the 6.

$$15 \times 2 = 30$$

Take that 30 away from the 36 to get your remainder.

$$36 - 30 = 6$$

$$\begin{array}{r} 24 \\ 15 \overline{) 3640} \\ \underline{- 30} \\ 64 \\ \underline{- 60} \\ 4 \end{array}$$

Next, carry the 4 down to make 64.

15 goes into 64 four times, so put a 4 above the 4.

$$15 \times 4 = 60$$

Take 60 from the 64 to get your remainder.

$$64 - 60 = 4$$

$$\begin{array}{r} 242 \\ 15 \overline{) 3640} \\ \underline{- 30} \\ 64 \\ \underline{- 60} \\ 40 \\ \underline{- 30} \\ 10 \end{array}$$

Carry the 0 down to make 40.

15 goes into 40 two times, so put a 2 above the 0.

$$15 \times 2 = 30$$

Take 30 from the 40 to get your remainder.

$$40 - 30 = 10$$

<https://corbettmathsprimary.com/2020/05/22/long-division-video/>

Long Division (New Learning in Year 6)

$$3\ 640 \div 15$$

			2	4	2	
1	5		3	6	4	0
		-	3	0		
			↓			
			6	4		
			-	6	0	
			↓			
			4	0		
			-	3	0	
			1	0		

1	5
3	0
4	5
6	0

$$2 \times 15 = 30$$

$$36 - 30 = 6$$

Carry down 4 to make 64

$$4 \times 15 = 60$$

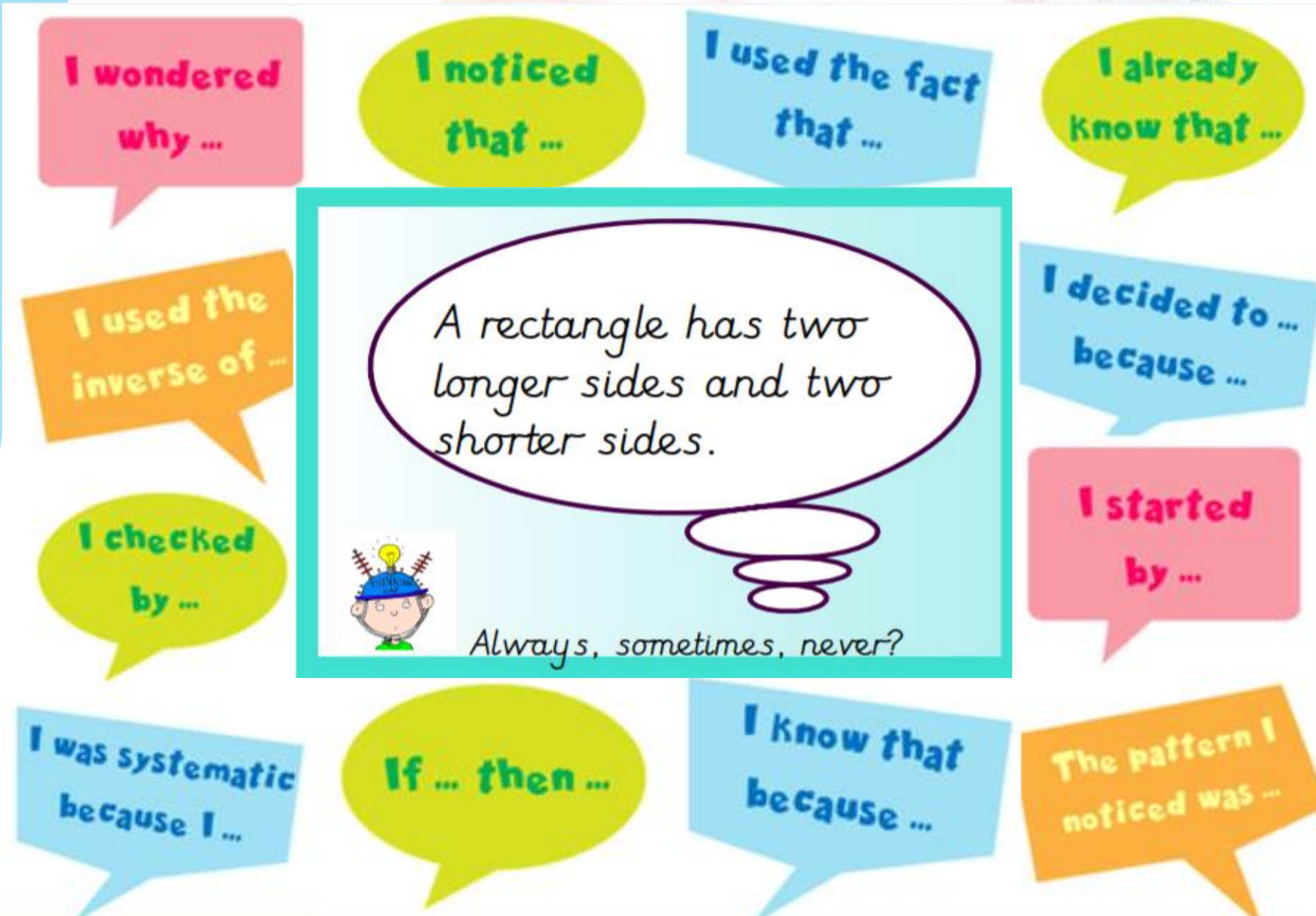
$$64 - 60 = 4$$

Carry down 0 to make 40

$$2 \times 15 = 30$$

$$40 - 30 = 10$$

Answer: 242 r 10



- Going deeper into a problem
- Applying logical and critical thinking

Five Coins

Age 5 to 11

Challenge Level ★★

Ben has five coins in his pocket.

How much money might he have? If possible, talk to someone else about your ideas.

What is the smallest amount of money he could have? How do you know?

What is the largest amount of money he could have? How do you know?

What if he still had five coins, but only 1ps and/or 2ps? How much might he have now?

Can you find all the possibilities?

How do you know you have found them all?




<https://nrich.maths.org/>



Record Keeping & Assessment

- Teachers assess children against the NC content for their year group.
- Daily learning reflection for children to reflect on their understanding and confidence levels.
- End of unit assessments to identify gaps for future teaching and learning opportunities.
- PUMA end of term assessment (standardised score).



Progress in Understanding Mathematics Assessment

SUMMER 5

Name

Boy	Girl	Test date	Year	Month
Date of birth	Year	Month	Year	Month

Item	Mark	Mathematics age	Year	Month
Number	10	Year	Month	
Operations +/−	10	Year	Month	
Operations ×/÷	10	Year	Month	
Fractions	14	Year	Month	
Measures	10	Year	Month	
Geometry	10	Year	Month	
Statistics	10	Year	Month	
Total marks	64			
Problem solving	10			

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RS²ASSESSMENT
FOR A MODERN EDUCATION

Useful Websites

KIRF Practise:

<http://www.conkermaths.org/cmweb.nsf/pages/index.html>

Interactive Games:

<https://www.topmarks.co.uk/maths-games/7-11-years/ordering-and-sequencing>

<https://mathsframe.co.uk/>

<https://www.mathplayground.com/math-games.html>

Resources Organised by Topic

<https://www.bbc.co.uk/bitesize/subjects/z826n39>

<https://corbettmathsprimary.com/>

<https://www.math-salamanders.com/>

Reasoning and Problem Solving

<https://nrich.maths.org/>

<https://www.transum.org/Software/>

Thank you for supporting your children's learning

Supporting your child's number sense and fluency with times tables and arithmetic will help them become confident and successful at Secondary School and beyond!

