What words or feelings do you think of when thinking about your own experience of maths?

Parents Attitudes to Mathematics

- Personal experiences
- Positive/ Negative feelings
- Right/wrong answer
- Genuine fear of maths/almost a phobia

- Parents unknowingly pass on their own negative attitudes to their children.(Professor. Jo Bowler)

Fixed Mindset V Growth Mindset

The latest research of expert educational thinkers (Jo Boaler and Carol Dweck) shows that this approach is crucial to enable success for all children in maths.

Jo Boaler's research has uncovered and highlighted several key areas:

▶ Everyone can learn maths to the highest levels

▶ Mistakes are valuable

▶ Questions are really important

▶ Maths is about creativity and making sense

▶ Maths is about connections and communicating

Activa

Key Messages

"In a growth mindset, children believe that their most basic abilities can be developed through dedication and hard work. Brains and talent are just the starting point."

▶ The power of yet – I cannot do it...YET

▶ Power of praise – praising the effort, not the outcome

▶ Talking about Maths and asking questions

▶ Mistakes are valuable – they cause the brain to grow

▶ Parents' beliefs about Maths change their children's achievement

▶ Depth is more important than speed – understanding is crucial
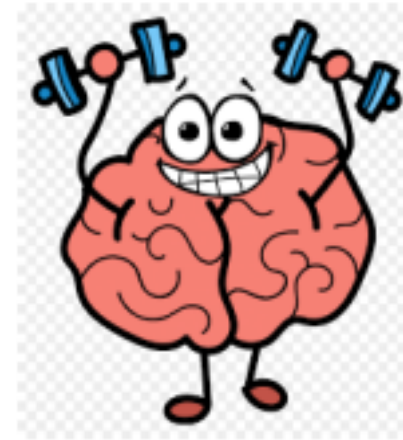
Aims

- To give an awareness of what the primary curriculum for Mathematics includes for children's learning in Key Stage 1.

- To give an overview of the provision of Maths at Carr Head Primary.

- To have an understanding of how you can support your child with their maths outside of school.

- To provide ideas for activities that you can use at home.

What are the aims of the National Curriculum in Maths?

The national curriculum for mathematics aims to ensure that all pupils:

▶ become **fluent** in the fundamentals of mathematics

▶ **reason** mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.

(understand how something works and explain why and can predict what might happen based on what they know)

▶ can **solve problems** by **applying their mathematics** to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions

How would you solve these calculations?

- 2 + 5 =
- 2 + 8 =
- 7 + 7 =
- 6 + 7 =
- 15 + 11 =
- 24 + 9 =
- 32 + 21 =

What method did you use?

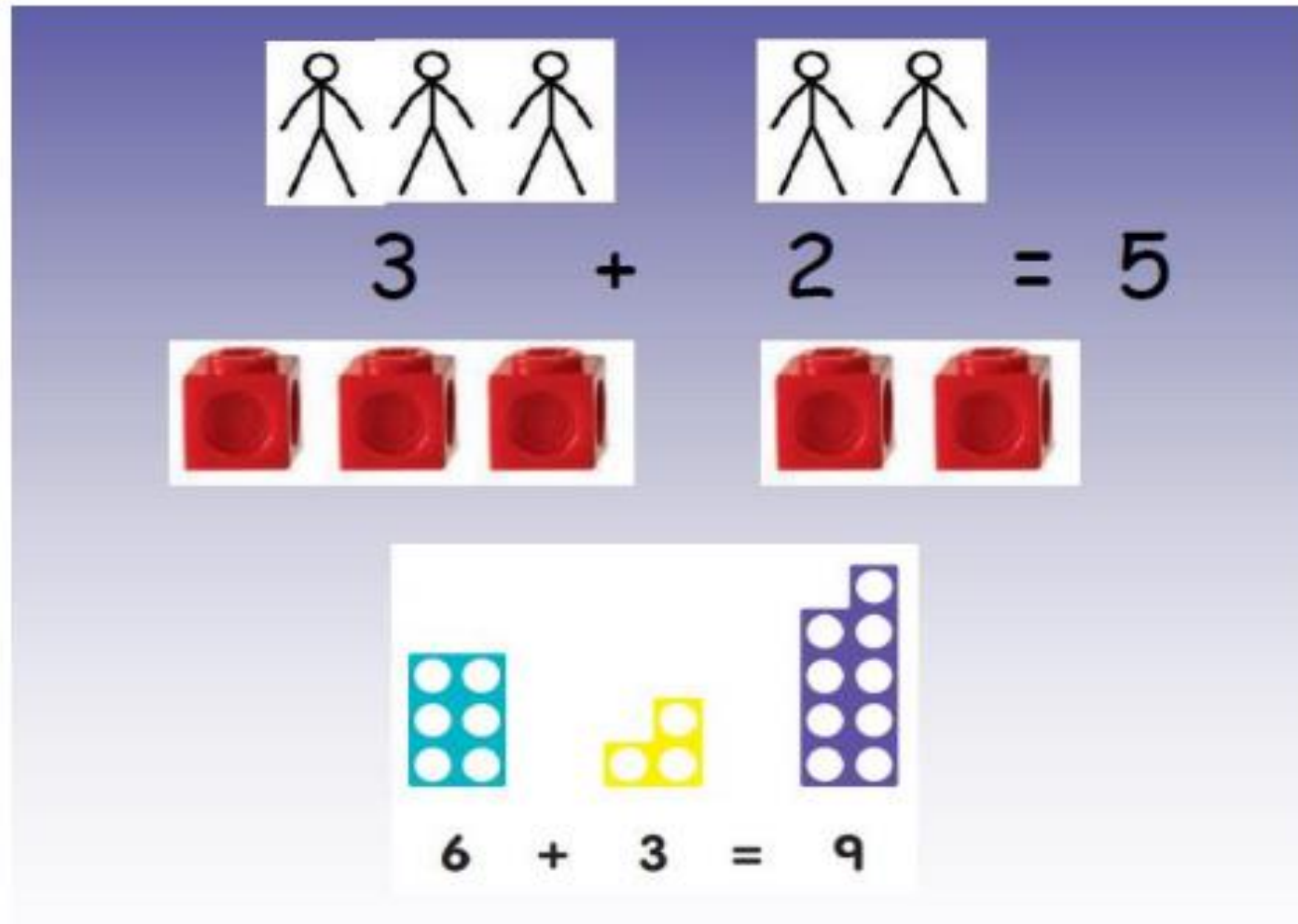Does that method work for all calculations?

How would you solve these calculations?

▶ **2 + 5 =** (start with the larger number and count on)

▶ **2 + 8 =** (number bonds to 10)

▶ **7 + 7 =** (doubling)

▶ **6 + 7 =** (near doubles)

▶ **15 + 11 =** (add 10, add 1)

▶ **24 + 9 =** (add 10, subtract 1)

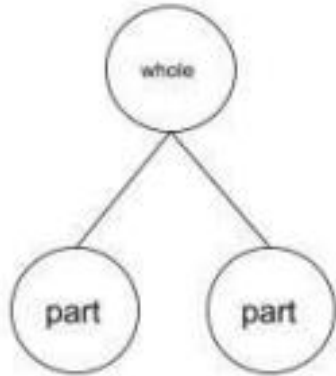▶ **32 + 21 =** (partitioning)

How do we teach Maths in Key Stage 1?

- ▶ Smaller steps through topics
- ▶ Mastery for all pupils
- ▶ Problem solving is central
- ▶ Using and applying
- ▶ Use of practical apparatus

Concrete Apparatus

Different representations

whole

part   part

cherry diagram

Whole	
Part	Part

Bar model

8	
6	2

8   10

2

8

1   4

Using a Numberline

3 + 2 = 5

0 1 2 3 4 5 6 7 8 9

+1 +1

8 + 5 = 13

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

+1 +1 +1 +1 +1

Partitioning

40 · 8 · 30 · 6

|||| ⊡⊡ ⊡⊡⊡ ⊡
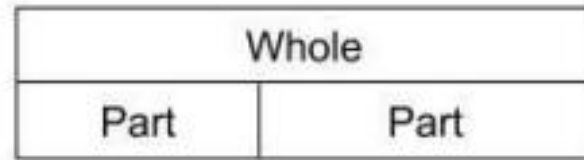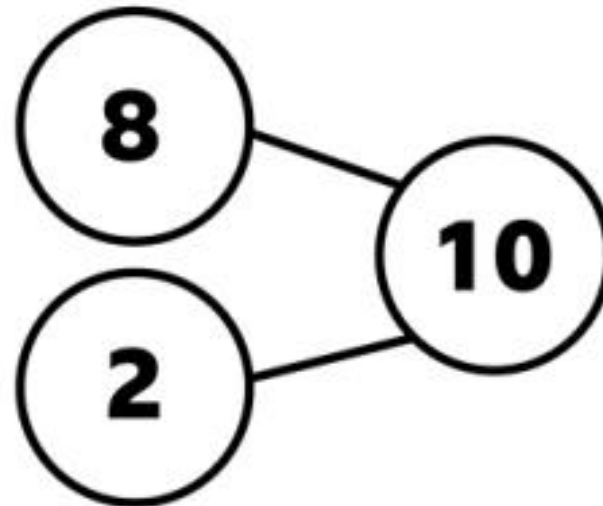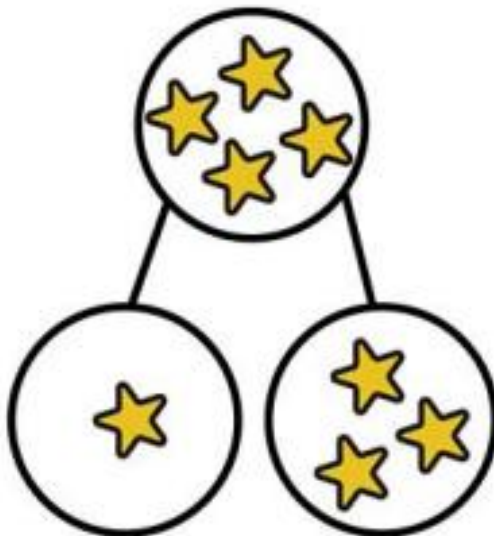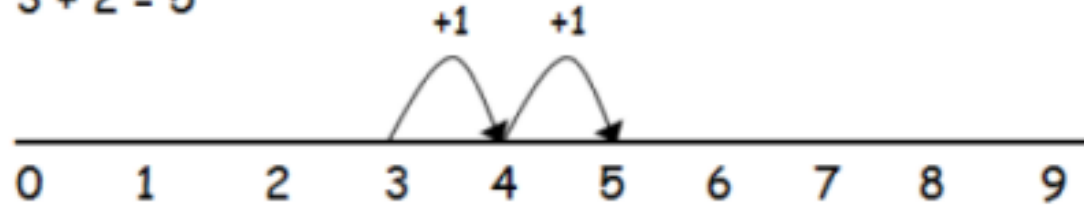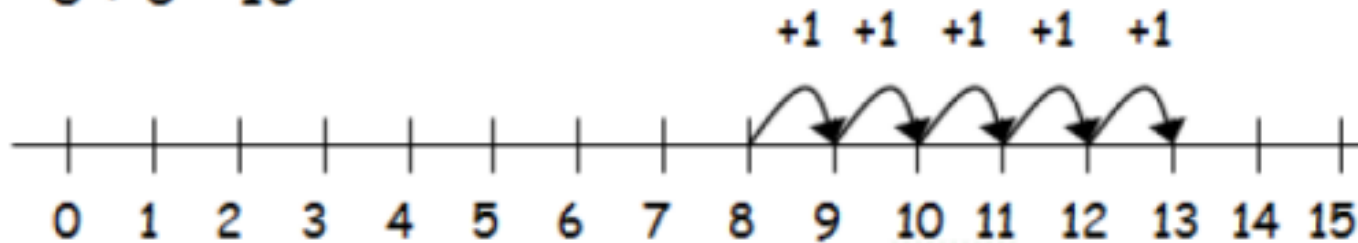
40 + 30 + 8 + 6

40 + 30 = 70

8 + 6 = 14

70 + 14 = 84

$32 + 25 = 57$
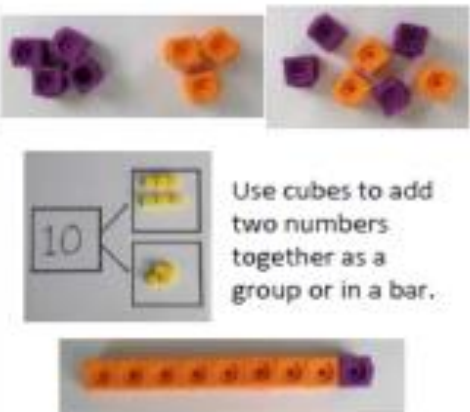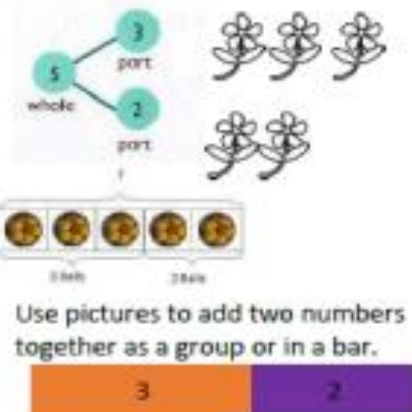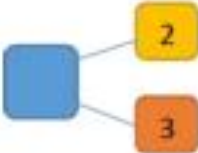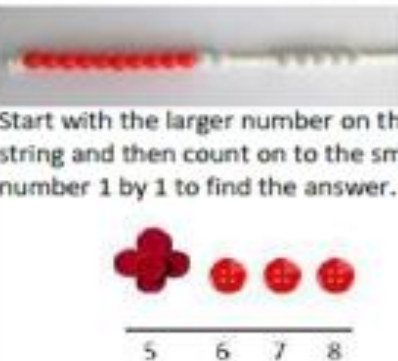
$30 + 20 = 50$

$2 + 5 = 7$

$50 + 7 = 57$

Calculation Policy

CALCULATION GUIDANCE: Addition

	Objective	Concrete	Pictorial	Abstract
Year 1	Number bonds of 5, 6, 7, 8, 9 and 10	Use cubes to add two numbers together as a group or in a bar.	Use pictures to add two numbers together as a group or in a bar.	$2 + 3 = 5$ $3 + 2 = 5$ $5 = 3 + 2$ $5 = 2 + 3$ Use the part-part-whole diagram as shown above to move into the abstract.
	Counting	Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.	Use a number line to count on in ones.	$5 + 3 = 8$

Over to you…

Easy Adds

Throw dice 10 times.

Write the 10 numbers that are generated down.

How many ways can you use the numbers that you throw to make 10 (or your chosen number)? How many numbers can you cross off from the 10 you generated? How many numbers are left?

By doing this and looking at the numbers that have been written down the children are skimming for pairs equalling their target number.

This game can be played competitively by each player throwing the die 10 times and the person with the most pairs being the winner!

1

Maths Mastery

▶ What does it mean to 'master' something?

REDROSE
Mastery Maths

LPDS

What does it mean to master something?

- I know how to do it

- It becomes automatic – I don't need to think about it

- I'm really good at doing it

- I can show someone else how to do it

Mastery in Maths

▶ Deep and sustainable learning

▶ The ability to build on something

▶ The ability to reason and problem solve about a concept

▶ The ability to make connections between concepts

Key Instant Recall Facts

▶ Little and Often
▶ Fluency

Year 1 blue	Year 2 yellow	Year 3 orange	Year 4 purple	Year 5 red	Year 6 green
I know number bonds for each number to 5	I know number bonds to 20	I know number bonds for each number up to 20	I know number bonds of 100	I can find factor pairs of a number	I can identify common factors of a pair of numbers
I know number bonds to 10	I know doubles and halves for numbers to 20	I know the 3 times table (× and ÷)	I know the 6 and 9 times table (× and ÷)	I can recognise prime numbers up to 20	I can convert between fractions, decimals and %s
I can recognise numbers to 50	I know the 2 times table (× and ÷)	I know the 4 times table (× and ÷)	I know the 7 and 11 times table (× and ÷)	I can recognise equivalent fractions and decimals.	I can find a fraction of an amount
I know halves and doubles to 10	I know the 10 times table (× and ÷)	I know the 8 times table (× and ÷)	I know all times tables up to 12 ×12 (× and ÷)	I know decimal number bonds to 1 and 10	I can find a percentage of an amount
I know number bonds for each number up to 10	I know the 5 times table (× and ÷)	I can recall facts about durations of time	I can multiply and divide a single digit by 10 and 100	I can recall metric conversion	
I can tell the time to the nearest half an hour	I can tell the time to the nearest 5 minutes	I can tell the time to the nearest minute	I can recognise simple equivalent fractions	I can recall square numbers to 12 and their square roots	

To know number bonds within 10

By the end of this half term, children should be able to recall all the number bonds within 10. The aim is for them to recall these facts instantly.

Number facts within 10

1 + 2 = 3	2 + 7 = 9
1 + 3 = 4	3 + 3 = 6
1 + 4 = 5	3 + 4 = 7
1 + 5 = 6	3 + 5 = 8
1 + 6 = 7	3 + 6 = 9
1 + 7 = 8	4 + 4 = 8
1 + 8 = 9	4 + 5 = 9
2 + 2 = 4	
2 + 3 = 5	
2 + 4 = 6	
2 + 5 = 7	
2 + 6 = 8	

New from the White Rose team...

It's 1–Minute Maths!

White Rose Maths

1-minute MATHS

KS1

- Subitising
+ Addition
- Subtraction

This app is free to download and is a great resource. If you click on addition and then choose Adding within 10.

Dice Game
Roll two dice and add the spots together?

Numicon
We use Numicon in school.
You can print Numicon and create bonds within 10: bit.ly/NumiconPictures

10 =   1+9   2+8   3+7   4+6

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

KEY VOCABULARY and QUESTIONS
bond/ add/ subtract/ more than/

What do is 3 add 4?
What needs to be added to 6 to make 7?
What is 5 **less than** 10?

Top Tips
The secret to success is practising **little** and **often**. Use time wisely. Can you practise these KIRFs while walking to school or during a car journey? You don't need to practise them all at once: perhaps you could have a fact of the day. Building confidence in mathematics is crucial so be pleased with their efforts and always encourage with praise. Make sure these practice sessions are enjoyable - if your child is really not in the mood it is the wrong time to be practising! If you would like more ideas, please speak to your child's teacher.

To know number bonds to and within 20

By the end of this half term, children should be able to recall all the number bonds of 20 and know the bonds within 20. The aim is for them to recall these facts instantly.

Number facts to 20

1 +19,	19 + 1
2 +18	18 + 2
3 +17	17 + 3
4 + 16	16 + 4
5 + 15	15 + 5
6 +14	14 + 6
7 +13	13 + 7
8 +12	12 + 8
9 +11	11 + 9
10 + 10	

Rainbow to 20

0 1 2 3 4 5 6 7 8 9 10 **20** 10 11 12 13 14 15 16 17 18 19 20

Some of the number facts within 20

1 + 17 = ☐	4 + 12 = ☐
7 + 12 = ☐	9 + 10 = ☐
8 + 7 = ☐	2 + 9 = ☐
12 + 5 = ☐	10 + 2 = ☐
1 + 12 = ☐	18 + 2 = ☐
6 + 4 = ☐	9 + 8 = ☐
14 + 4 = ☐	2 + 17 = ☐
9 + 3 = ☐	19 + 1 = ☐
1 + 19 = ☐	13 + 1 = ☐

KEY VOCABULARY and QUESTIONS
bond/ add/ subtract/ more than/

What do I **add** to 18 to make 20?
What is 20 **take away** 8?
What is 5 **less than** 10?

SCAN ME

Scan this to play Hit the Button. A great game to practise bonds to 20

Top Tips
The secret to success is practising **little** and **often**. Use time wisely. Can you practise these KIRFs while walking to school or during a car journey? You don't need to practise them all at once: perhaps you could have a fact of the day. Building confidence in mathematics is crucial so be pleased with their efforts and always encourage with praise. Make sure these practice sessions are enjoyable - if your child is really not in the mood it is the wrong time to be practising! If you would like more ideas, please speak to your child's teacher.

Progression of Times tables

Year 2	Year 3	Year 4
Counting in multiples of 2s, 3s, 5s, 10s	Fluent 2s, 3s, 4s, 5s, 8s, 10s multiplication facts	Fluent in all times tables, up to 12 x 12, by the end of Year 4.

Arithmetic Expectations – Year 1

Skills	Examples
Counting	
Count in multiples of 2, 5 and 10.	Count from 0 in twos What number would come next in this counting sequence? 0, 5, 10, 15, 20, __ What number is missing from this counting sequence? 0, 10, 20, 40, 50
Recognise even and odd numbers when counting in twos from 0 or 1.	Continue this count: 2, 4, 6, 8, 10, 12, 14… Are these even numbers or odd? How do you know? Continue this count: 1, 3, 5, 7, 9, 11, 13… Are these even numbers or odd? How do you know? Which are the even numbers in this set? 5 16 22 47 32
Number Facts	
Recall number bonds and related subtraction facts for all numbers to 10.	6 + 4 = __ 2 + __ = 10 10 = __ + 5 10 – 3 = __ 10 – __ = 1 7 = 10 – __ 3 + 4 = __ 5 + __ = 7 7 = __ + 6 7 – 2 = __ 7 – __ = 3 5 = 7 – __
Recall doubles of all numbers to 10 and corresponding halves.	3 + 3 = __ double 6 is ___ half of 14 is ___ halve 8 double ___ is 10
Mental Calculation Strategies – Addition and Subtraction	
Count on or back in ones (chain count and link to objects, i.e. 1-1 correspondence). *Concrete – counters, beadstring, cubes on a number track* *Pictorial – number line*	4 + 5 count on in ones from 4 (or in ones from 5) 8 – 3 count back in ones from 8 10 + 7 count on in ones from 10 (or use place value) 13 + 5 count on in ones from 13 17 – 3 count back in ones from 17
Reorder numbers in a calculation. *Concrete – counters, counters in a ten frame*	8 + 3 doesn't need reordering as the greater number is first already 2 + 7 reorder as 7 + 2 5 + 13 reorder as 13 + 5 11 + 6 doesn't need reordering as the greater numbe
Partition small numbers, e.g. 8 + 3 = 8 + 2 + 1 and 11 – 3 = 11 – 1 – 2 *Concrete – counters in a ten frame, beadstring* *Pictorial – number line*	7 + 5 partitioned as 7 + 3 + 2 9 + 7 partitioned as 9 + 1 + 6 6 + 8 partitioned as 6 + 4 + 4 or reordered and part 12 – 5 partitioned as 12 – 2 – 3 14 – 8 partitioned as 14 – 4 – 4
Mental Calculation Strategies – Multiplication and Division	
Apply counting in twos, fives and tens to solve multiplication problems with a repeated addition context. *Concrete – real items to model the context of the problem* *Pictorial – images of the items in the context of the problem*	How much money is the total of six 5p coins? How many fingers would seven children have altogether How many boots are lined up after five children take the
Share an amount into equal parts. *Concrete – real items to model the context of the problem* *Pictorial – images of the items in the context of the problem*	A bunch of 20 grapes are shared equally between two ch do they each get? Five children are given £50 to share equally by their gran they each get?

Arithmetic Expectations – Year 2

Skills	Examples
Counting	
Count in multiples of 2, 3 and 5 from 0. *(Counting in 2s and 5s from 0 is continuation of Year 1 expectations).*	Count from 0 in: twos; fives; threes. Complete these counting sequences: 0, 5, 10, 15, 20, __, __, __ 0, 2, 4, 6, 8, __, __, __ 0, 3, 6, 9, __, __, __ What number is missing from this counting sequence? 0, 3, 6, 9, 12, 15, 18, 24, 27
Count forwards or backwards in steps of 1 or 10 from any one- or two-digit number	Count forwards in ones from 75 to 92 Count back in ones from 54 to 38 Continue these sequences: 24, 34, 44, __, __, __ 89, 79, 69, __, __, __ 44, 34, 24, __, __, __
Count on and back in steps of $\frac{1}{2}$ and $\frac{1}{4}$	Count from 0 in steps of $\frac{1}{2}$ When counting from 0 in steps of $\frac{1}{4}$ what comes immediately after $\frac{3}{4}$? Answer could be $\frac{4}{4}$ or 1 Count back in steps of $\frac{1}{2}$ from $\frac{6}{2}$ Count back in steps of $\frac{1}{2}$ from $2\frac{1}{2}$
Number Facts	
Recall number bonds and related subtraction facts for all numbers to 20	16 + 4 = __ 2 + __ = 20 20 = __ + 5 20 – 13 = __ 20 – __ = 1 6 = 20 – __ 3 + 14 = __ 5 + __ = 14 14 = __ + 6 14 – 2 = __ 14 – __ = 3 5 = 14 – __
Derive and use related facts to 100	60 + 40 = __ 70 + __ = 100 100 = 20 + __ 100 – 40 = __ 100 – __ = 70 20 = 100 – __
Partition numbers into tens and ones.	46 is 40 and 6 46 is 40 and __ 46 is 6 and __ 40 + __ = 46 6 + 40 = __
Recall and use number bonds to 5 totalling 60 (to support time).	40 + 20 = __ 25 + __ = 60 60 = __ + 15 60 – 10 = __ 60 – __ = 30 35 = 60 – __
Recall and use multiplication and division facts for 2, 5 and 10 multiplication tables, including recognising odd and even numbers.	6 × 2 = __ 2 × __ = 16 __ × 5 = 15 __ = 5 × 7 110 ÷ 10 = __ __ = 80 ÷ 10 Which of these numbers are odd? 32, 44, 18, 40, 55, 23, 100
Mental Calculation Strategies – Addition and Subtraction	
Count on or back in ones and tens from any given number, e.g. (36 + 40 =) *Concrete – Dienes equipment, place value counters, beadstring* *Pictorial – Dienes jottings, number line*	36 + 40 = __ 30 + 48 = __ 89 – 50 = __ 76 – __ = 46
Partition and combine multiples of tens and ones. *Concrete – Dienes equipment, place value counters, beadstring* *Pictorial – Dienes jottings, number line*	40 + 37 40 add 30 and 7 = 40 add 30 add 7 15 + 14 10 and 5 add 10 and 4 = 10 add 10 add 5 add 4 or 15 add 10 add 4 37 + 12 37 add 10 and 2 = 37 add 10 add 2 78 – 42 78 take away 40 and 2 = 78 take away 40 take away 2 80 – 35 80 take away 30 and 5 = 80 take away 30 take away 5

How can I help at home?

▶ Talk to your child about their learning, what they learned in their maths lessons each day and anything they might be finding challenging.

▶ Discuss maths in the world around them – it's everywhere!

▶ Encourage them to be problem solvers – asking 'Why?', 'How?' or 'Prove it!' rather than simply giving answers.

▶ FAST Maths

▶ Telling the time.

▶ **Speak positively about mathematics!**

How can I help at home?

Reception	Year 1	Year 2
• Counting – backwards and forwards to 20 • Numbering items – 1st, 2nd, 3rd etc • One more and one less • 2D and 3D shapes in home environment • Doubling and halving (Summer term)	• Mental maths – speed • Number bonds to 10 (Autumn term) and 20 (Spring/Summer term) • Halving and doubling • 2D and 3D shapes • Money – knowing individual worth • Time – o'clock, half past, quarter past, quarter to	• Add and subtract up to 200 (pictorial initially) • Multiply and divide by 2,3,4,5,10 • Time to the nearest 5 minutes • Reading scales (different units) • Symmetry • Find ¼, 2/4, ¾, ½, 1/3, 2/3 of a number / shape

Questioning

- What do you notice?
- What's the same? What's different?
- Do you notice any patterns?
- How do you know?
- Prove it to me
- Convince me
- How did you reach that conclusion?
- Have you tried all the possible solutions?
- What happens when...?

Games

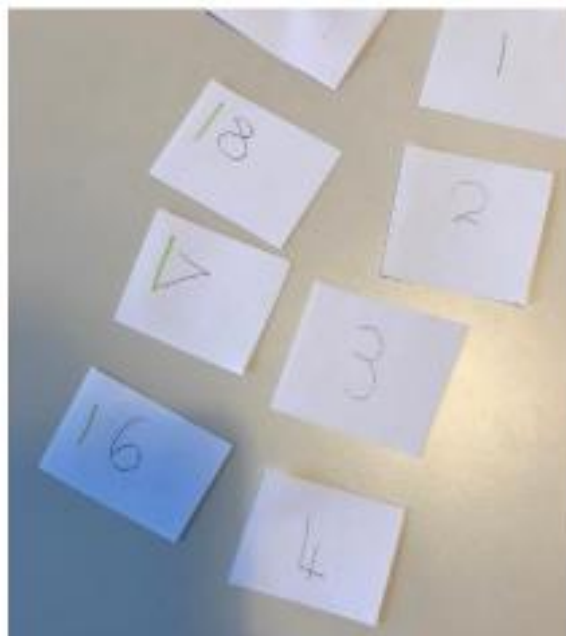▶ **Deck of Cards**
- ▶ Doubles
- ▶ Number Bonds
- ▶ Addition
- ▶ Times Tables

▶ **Times Tables Ping Pong**

▶ **Snap – Post-it notes**
- ▶ Doubles
- ▶ Number Bonds

KS1 Recall number bonds to 10 or 20

▶ Musical Pairs: Place number cards around the room (on the floor). Play some music and children dance or move around. When the music stops they have to go and find a number bond pair to total 10 as quickly as they can.

▶ Number Bond Bingo: Child choose 4 numbers between 0 and 10 (or 20). Over turn a digit card (from a pack of cards). If they have the number bond, cross it off their board.

▶ Number bond Pairs. Number bond Snap