Mathematics at
Cheam Common Junior Academy
The national curriculum for mathematics aims to ensure that all pupils:

- become **fluent** in the fundamentals of mathematics, 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.

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

- 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.
The National Curriculum

• One set of mathematical concepts and big ideas for all.

• **All** pupils need access to these concepts and ideas and to the rich connections between them.

• There is a need for **all** pupils to **master** the curriculum and for some to gain greater depth of proficiency and understanding.

• Challenge is provided by going deeper rather than accelerating into new mathematical content.

• Mathematics is mathematics and the key ideas and building blocks are important for everyone.
Year 3 and 4

• Focus on mastering essential arithmetic at an early stage

• Emphasis on problem solving, practice and fluency

• Children know multiplication facts up to 12 x 12 by the end of Year 4

• Arithmetic, fractions and decimal numbers
Mastery

- Mastery is not just being able to memorise key facts and procedures and answer test questions accurately and quickly.

- It involves knowing ‘why’ as well as knowing ‘that’ and knowing ‘how’. It means being able to use one’s knowledge appropriately, flexibly and creatively and to apply it in new and unfamiliar situations.

Mastery is:
- Knowing how to do something
- Doing it automatically (driving a car)
- Being really good at something
- Showing someone else how to do it
The review of the curriculum looked at the curricular of high performing countries in mathematics - those which regularly out-perform us in international tests.

**The Maths – No Problem! mission**

We believe that every child can master an understanding and love of maths with the right kind of teaching and support.

Our mission is to improve the standard of maths education in the UK by providing world-class textbooks, teaching resources and professional development based on the transformational teaching methods developed in Singapore.

[http://www.mathsnoproblem.co.uk/english-national-curriculum](http://www.mathsnoproblem.co.uk/english-national-curriculum)
Why Maths-No Problem!?

The Maths-No Problem! approach to mathematics is rooted in the following fundamentals:

- CPA approach (Concrete, Pictorial, Abstract)
- Rich discussion and peer talk – children discovering for themselves
- Multiple methods to achieve the same outcome
- Exploration not instruction
- Fluency as well as reasoning and explaining. It focuses on creating mathematicians who understand concepts not just procedures
- Spiral curriculum which builds from one lesson to the next as well as one concept to the next, revisiting the key essentials along the way.
How it works...

Adding Fractions

Guided Practice

1. Add $\frac{2}{7}$ and $\frac{3}{7}$.

2. (a) $\frac{1}{2} + \frac{1}{2}$
   (b) $\frac{1}{9} + \frac{2}{9}$
   (c) $\frac{1}{7} + \frac{2}{7}$

3. Find the sum of $\frac{1}{11}$ and $\frac{2}{11}$.

In Focus

Let's share this chocolate bar. I will have a piece. How much of the chocolate bar did the two children eat?

I will have 2 pieces.

Journaling

- Reflections
- Explanations
- Methods
- Photographs

Worksheet 3

Adding Fractions

1. Add the following:
   (a) $\frac{1}{10} + \frac{2}{10}$
   (b) $\frac{1}{10} + \frac{3}{10}$
   (c) $\frac{1}{10} + \frac{4}{10}$

2. Fill in the blanks:
   (a) $\frac{2}{5} + \frac{1}{5}$
   (b) $\frac{3}{10} + \frac{1}{10}$
   (c) $\frac{4}{10} + \frac{2}{10}$

Challenge:

Fill in the numerators to make the calculation correct. How many ways can you do it?

Explain how you know you have found them all.

$\frac{8}{8} + \frac{8}{8} = 1$
The Anchor/In Focus Task

In Focus

Evergreen Primary School has 213 pupils.
There are 400 more pupils in Lakeside Primary School than in Evergreen Primary School.

How many pupils are there in Lakeside Primary School?
The Anchor/In Focus Task
Let’s Learn

Add 213 and 400.

Method 1  
Count on in hundreds from 213.
213 + 400 = 613

Method 2  
Add the hundreds.
213 + 400 = 613
200 + 400 = 600
13 + 600 = 613

There are 613 pupils in Lakeside Primary School.
Guided Practice

1. Add 125 and 600.
2. Add 279 and 200.
3. \(398 + 500 = \) \(\underline{898}\)
4. \(700 + 23 = \) \(\underline{723}\)
Independent Practice

Simple Adding

1. Fill in the blanks.
   (a) Add 194 and 400.
   
   \[
   \begin{array}{ccc}
   & & \\
   & & \\
   & & \\
   & & \\
   \end{array}
   \]
   \[= \begin{array}{ccc}
   & & \\
   & & \\
   & & \\
   & & \\
   \end{array}\]

   (b) Add 200 and 368.
   
   \[
   \begin{array}{ccc}
   & & \\
   & & \\
   & & \\
   & & \\
   \end{array}
   \]
   \[= \begin{array}{ccc}
   & & \\
   & & \\
   & & \\
   & & \\
   \end{array}\]

2. Add by counting on in hundreds.

   \[
   \begin{array}{cccccccccccc}
   163 & 263 & 363 & 463 & 563 & 663 & 763 & 863 & 963 \\
   \hline
   (a) 263 + 200 = & & & & & & & & & & \\
   (b) 563 + 400 = & & & & & & & & & & \\
   (c) 700 + 165 = & & & & & & & & & & \\
   (d) 363 + 300 = & & & & & & & & & & \\
   \end{array}
   \]

3. There are 128 sweets in Container A. There are 600 more sweets in Container B. How many sweets are there in Container B?

   \[
   \begin{array}{ccc}
   & & \\
   & & \\
   \end{array}
   \]
   
   \[
   \begin{array}{ccc}
   & & \\
   & & \\
   \end{array}
   \]
   
   There are \[\boxed{\text{ sweets in Container B.}}\]

4. Fill in the blanks.

   \[
   \begin{array}{cccc}
   (a) 266 + 500 = & & & \\
   (b) 683 + 200 = & & & \\
   (c) 837 + 100 = & & & \\
   (d) 300 + 455 = & & & \\
   (e) 400 + 201 = & & & \\
   (f) 500 + 110 = & & & \\
   \end{array}
   \]
Challenge

NEED A CHALLENGE?

**PICK YOUR FAVOURITE EQUATION FROM THE LESSON.**
**WRITE A STORY ABOUT IT.**

**IS THERE ANYTHING INTERESTING YOU NOTICED IN THE LESSON?**
**CAN YOU SEE ANY PATTERNS?**

**WRITE AN ‘EINSTEIN’ EXPLANATION TO SHARE WITH A FRIEND.**

**CAN YOU INVENT A NEW METHOD FOR WHAT YOU HAVE BEEN DOING?**
**AS YOU INVENTED IT, NAME IT AFTER YOU!**

**ANSWER ANOTHER QUESTION USING YOUR CHOSEN METHOD.**
**EXPLAIN HOW YOU DID IT AND WHY YOU CHOOSE IT.**

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LEO ACADEMY TRUST
LEARNING. EXCELLENCE. OPPORTUNITY.
## Challenge

### Need a Challenge?

<table>
<thead>
<tr>
<th>National Curriculum Statement</th>
<th>Fluency</th>
<th>Reasoning</th>
<th>All students</th>
<th>Problem Solving</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Addition and Subtraction</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Add and subtract numbers mentally, including: a three-digit number and ones; a three-digit number and tens; a three digit number and hundreds.</td>
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<tr>
<td><strong>Calculate:</strong></td>
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<td></td>
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<tr>
<td>153 + 6</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>153 + 60</td>
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<td></td>
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<tr>
<td>153 + 600</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Calculate:</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>356 – 9</td>
<td></td>
<td></td>
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<tr>
<td>356 – 90</td>
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<tr>
<td>356 – 200</td>
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<td></td>
</tr>
<tr>
<td><strong>Fill in the missing numbers</strong></td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Start</th>
<th>Add 5</th>
<th>Add 50</th>
<th>Add 500</th>
</tr>
</thead>
<tbody>
<tr>
<td>342</td>
<td>322</td>
<td>246</td>
<td></td>
</tr>
</tbody>
</table>

- **Are these number sentences true or false?**
  - 396 + 6 = 412
  - 504 – 70 = 444
  - 556 + 150 = 706
  - Justify your answers.

- **Always, Sometimes, Never**
  - When you add 7 to a number ending in 8, your answer ends with 5. Explain your answer.
  - Which questions are easy, which are hard?

- **Always, Sometimes, Never**
  - 2 odd numbers add up to make an even number.
  - 3 odd numbers add up to make an even number.
  - Adding 8 to a number ending in 2 makes a multiple of 10.

- **Three pandas ate 25 bamboo sticks. Each of them ate a different odd number of bamboo sticks. How many bamboo sticks did they each eat? Find as many ways as you can to do it.**

- **A magician is performing a card trick. He has eight cards with the digits 1-8 on them. He chooses four cards and the numbers on them add up to 20. How many different combinations could he have chosen?**
Journal writing can be a valuable technique to further develop and enhance your mathematical thinking and communication skills in mathematics. Journal entries in mathematics provide opportunities for individuals to self-assess what they've learned.

When one makes an entry into a maths journal, it becomes a record of the experience received from the specific maths exercise or problem solving activity. The individual has to think about what he/she did in order to communicate it in writing; in so doing, one gains some valuable insight and feedback about the mathematical problem solving process.
Feedback from children at CCJ regarding their journaling.

- I like that you can share your ideas with the teacher and get all of your thinking out of your brain.
  - Isla

- I like to journal because you can draw what you are thinking.
  – Matthew

- If you don’t understand a question you can draw it out to help you get the answer.
  - Melissa

- I like getting onto the challenges because it keeps me thinking.
  - Helen
Congratulations
for
on becoming
a member of the

Signed
Date
Example:

- Fluency objectives
- Cover previous objectives
- Year 4-6 30 minutes
- Year 3 20 minutes
- Include weekly open ended maths challenge

Weekly Maths Challenge!

Imagine you have a hundreds, tens and ones chart. You have 8 counters to put on it to make different numbers. What different numbers can you make?

Do you notice a pattern about the numbers you make? Look closely at the digits!

Example: 314
Example:

Previous year group objective (should be quicker)

Current year group objective

Challenge activity
Supporting your child at home
Board Games and Card Games
Here are a few ideas for board games and card games that you can buy to play at home. All these games are fun to play but also develop essential maths skills including number, shape and problem solving.

Games that you can buy:

- Battleships
- Rush Hour
- Connect Four
- Trionimos
- Swish
- Square by Square
- Addition Snap
- Maths Snap Plus
- Fraction Action Snap
- Monopoly Junior
- Uno
- Rubiks Cubes
- Dominoes
- Hexago Continuo
- Quirkle
- Shape by Shape
- Subtraction Snap
- Four Function Snap
- Times Tables Snap

Monopoly Junior
Supporting your child at home

How should we practise at home?
Little and often is the best approach. 30 minutes fluency home learning can be spread out across the week and topped up with games.

Maths Apps
There are thousands of educational apps which will support your child’s maths learning. We have selected just a few that we would recommend as being particularly good.

**Number Bonds**
- [Bubble Pop Number Bonds](#) (free)
- [Wipeout Wall Addition and Subtraction](#) (69p)
- [Number Bonds and Fact Families](#) (69p)
- [Number Bonds Pro](#) (£1.49)

**All 4 Operations**
- [6 Numbers](#) (free)
- [Pop Maths Lite](#) (free)
- [Mathletics](#) (free)
- [Super Tiles](#) (69p)
Supporting your child at home

Maths Apps

Times Tables
- Tables Lite (free)
- Cloud Tables (free)
- DK Times Tables (free)
- Wipeout Wall Multiplication and Division (69p)
- Eggs on Legs (69p)
- Table Mountain (69p)
- Division Descent (69p)
- Frontier Factors (69p)

Shape
- Banana Hunt (69p)
- Billy Bug and his Quest for Grub (69p)
- Beebot (69p)

Telling the Time
- Telling Time Quiz (free)
- Stop the Clock (free)
- Interactive Telling Time Lite (free)
Supporting your child at home

Maths Websites
These websites have links to lots of different maths games which can be played online:

[Woodlands Junior](#)
[Maths Zone](#)
[Timestableme](#)

Here are some of our favourite maths games:
[Banana Hunt](#) – estimating angles
[Billy Bug and his Quest for Grub](#) – coordinates
[Hit the Button](#) – rapid recall of facts
[You Can’t Do Simple Maths Under Pressure](#)
Supporting your child at home

**Pencil and Paper Maths Games**
These games just need a pencil and some paper to be played and can be easily adapted to practise other maths skills.

**Bingo**
This game can be played to practice any fluency skill such as time, multiples, factors, measures conversions, shape names, square numbers, square roots etc.

**Mixed Up Multiples**
This game can be played with multiples of any number. Write out all the multiples in a mixed-up fashion on a piece of paper. Write the factors onto post-it notes (1x, 2x, 3x... up to 12x). The aim is to cover the multiple with the correct factor in the quickest time possible. This game can be played against another player or by yourself simply trying to beat your own best time.
Real Life Maths
Maths skills are vital in everyday life. Please support your child in becoming a confident mathematician by discussing the maths involved in these “real life” situations:

Time
Tell the time using an analogue clock/watch.
Convert between analogue and digital time, 12 and 24 hour time.
Work out what time it will be in ____ minutes.
Work out how many minutes it is until a certain time.

Handling money
Coin recognition.
Totalling the cost when shopping.
Calculating change when shopping.
Calculating discounts when shopping in the sales.

Measures
Weighing ingredients when cooking/baking.
Measuring length in art/craft activities.
Verbal Maths Games
These games do not need any resources to be played and are a fun way of practising key maths skills.

Bang Bang
This game can be played with any number facts including number bonds, times tables, division facts, square numbers, square roots... Two players challenge each other with the third player asking the questions. The quickest player to say the correct answer followed by “bang bang” gets the point. The person with the most points wins.

Fizz Buzz
This game can be played with multiples of any number. Sit in a circle and count up from one. Say “fizz” for all multiples of 3, “buzz” for all multiples of 4 and “fizz buzz” for numbers which are multiples of both 3 and 4. e.g. 1, 2, fizz, buzz, 5, fizz, 7, buzz, fizz, 10, 11, fizz buzz...
Any Questions?