Mathematics at Thomas Fairchild Primary School
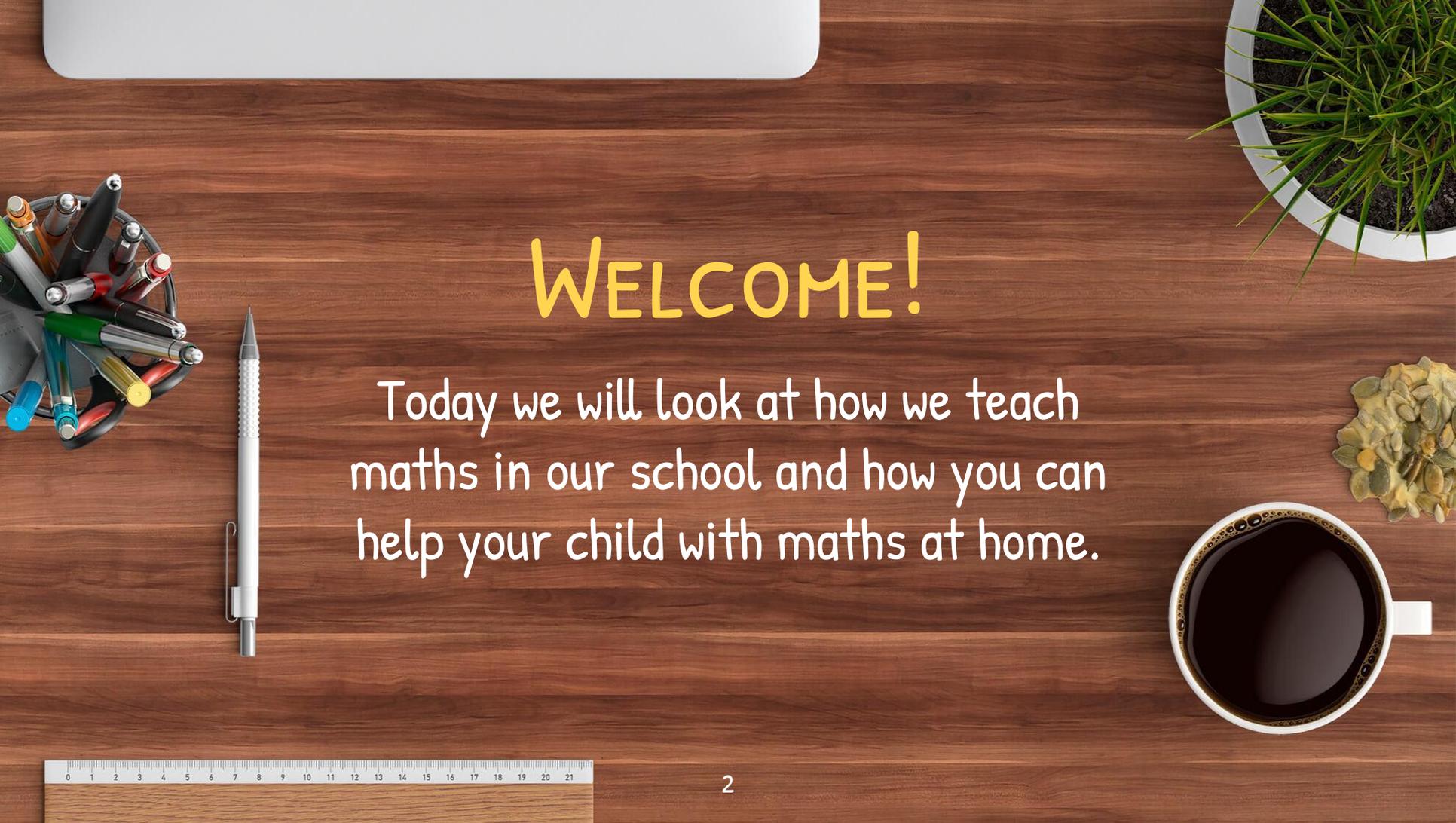
Welcome!

Today we will look at how we teach maths in our school and how you can help your child with maths at home.

1.

Maths Mastery

Why Maths Mastery

What is 'Mastery'?

The 'mastery approach' to teaching mathematics is the underlying principle of Mathematics Mastery. Instead of learning mathematical procedures by rote, we want your child to build a deep understanding of concepts which will enable them to apply their learning in different situations. To achieve this we aim to develop pupils' **Conceptual Understanding, Mathematical Thinking** and **Language and Communication.**

Why Maths Mastery

Representing concepts using **objects**, **pictures**, **words** and **symbols**; making **connections**

Making **conjectures**, trying out specific **examples**, **organising**, **comparing**, looking for **patterns** and **generalising**

Conceptual understanding

Explaining, **justifying** and **discussing** using **accurate** mathematical language

Mathematical problem solving

Mathematical thinking

Language & communication

Central to learning mathematics

The CPA approach

CONCRETE -
using physical objects
to solve maths problems.

PICTORIAL -
using drawings
to solve maths problems.

ABSTRACT -
solving maths problems
using only numbers.

Why Maths Mastery

Success for **all** pupils

Based on research and evidence

Problem solving is at the heart

Focus is on depth, not acceleration

Aligned to National Curriculum

Focus on talk and reasoning about mathematics
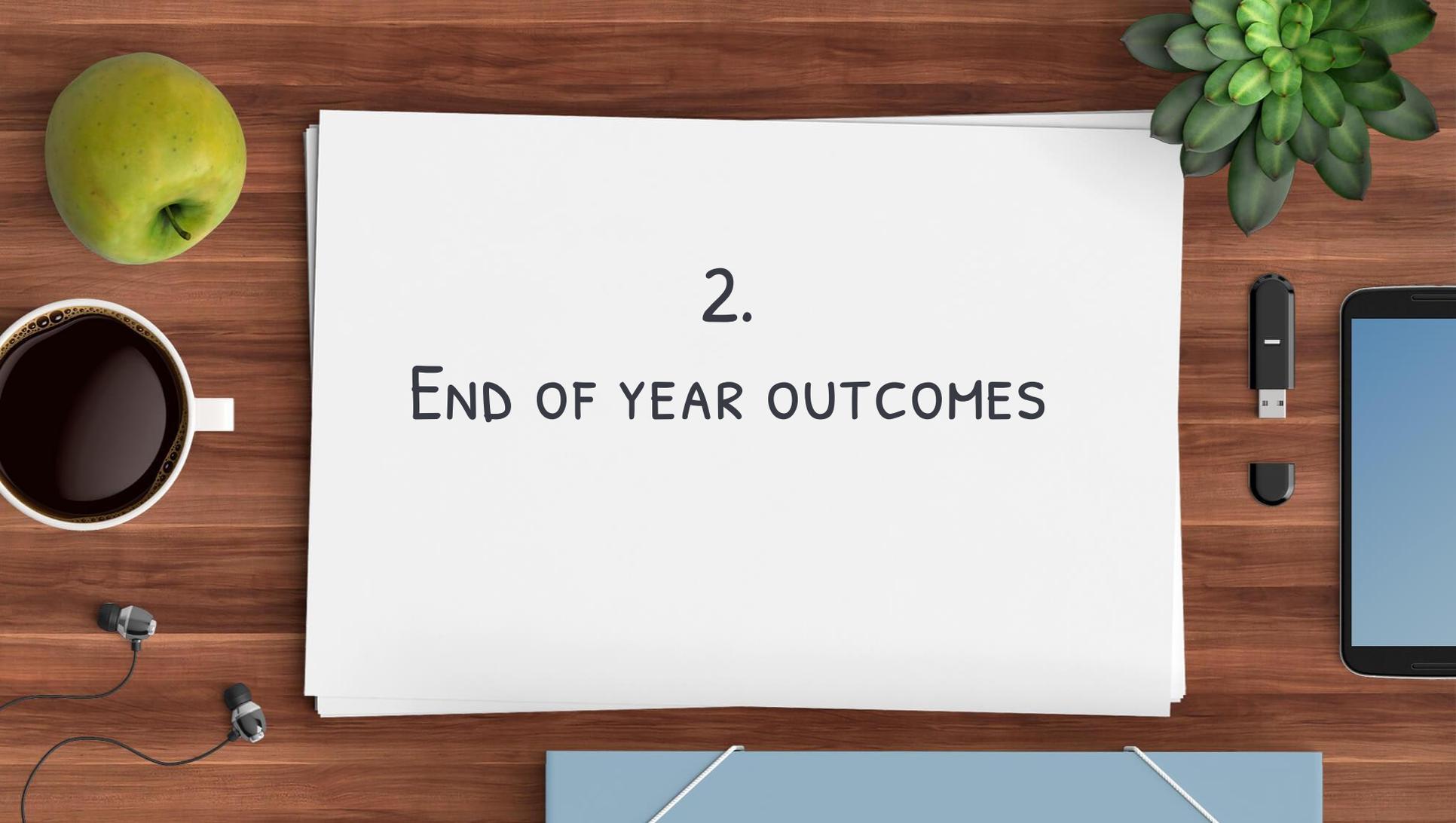
2.

End of year outcomes

What does my child need to know by the end of reception?

☑ To have an understanding of numbers to 10, recognising numerals, value and position in counting order.

☑ To be able to subitise/recognise quantities without counting up to 5.

☑ To be able to recall number bonds for numbers 0-5 and for 10.

☑ To understand the concept of doubling/halving and be able to automatically recall double facts up to 5+5.

☑ To be able to compare sets of objects up to 10 in different contexts, considering size and difference.

☑ To have explored patterns of numbers within numbers up to 10, including odd and even numbers.

☑ To have explored shape and pattern. Investigate 2D and 3D shapes, repeating and creating colour and shape patterns.

☑ To understand and be able to use positional language.

☑ To have investigated measurement including size, capacity, length and weight.

☑ To have explored calendar and time.

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What does my child need to know by the end of year one?

✓ To count, read and write numbers up to 100

✓ To use knowledge of addition and subtraction to solve missing number problems

✓ To identify one more or one less than any number up to 100

✓ To find half of an object, shape or quantity

✓ To count in 2s, 5s and 10s

✓ To tell the time to the hour and half past the hour

✓ To know all number bonds to 20

✓ To recognise and name common 2D shapes

✓ To know doubles and halves up to 20

✓ To recognise and name common 3D shapes

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What does my child need to know by the end of year two?

- ✓ To compare and order numbers from zero up to 100

- ✓ To identify ten more or ten less than any number up to 100

- ✓ To be able to multiply and divide numbers from the 2, 5 and 10 times tables.

- ✓ To be able to add or subtract two 2-digit numbers using a range of strategies

- ✓ To partition any two-digit number into different combinations of tens and ones

- ✓ To be able to mentally add or subtract a single digit number from a 2-digit number

- ✓ To find a half, quarter or third of an object, shape or quantity

- ✓ To read the time on a clock to the nearest fifteen minutes

- ✓ To name and describe the properties of common 2D and 3D shapes

- ✓ To use different coins to make the same amount of money

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What does my child need to know by the end of year three?

✓ To recognise the place value of each digit in a three digit number

✓ To find 100 more or less than a given number

✓ To add and subtract numbers mentally including a three digit number and ones, a three digit number and tens and a three digit number and hundreds

✓ To multiply and divide by 2, 3, 5 and 10

✓ To mentally recall the 3, 4 and 8 times tables

✓ To identify right angles and recognise the number of right angles in a ¼, ½, ¾ and whole turn

✓ To tell and write the time from an analogue clock

✓ To interpret data from bar charts, pictograms and tables

✓ To recognise, find and write both unit and non unit fractions of a set of objects

✓ To measure, compare add and subtract length, mass, volume or capacity

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What does my child need to know by the end of year four?

✓ To recognise the place value of each digit in a four-digit number and find 1000 more or less than a given number

✓ To round any number to the nearest ten, hundred or thousand

✓ To recall the multiplication tables to 12 x 12

✓ To add and subtract numbers up to 4-digits using a range of methods

✓ To calculate fractions of amounts where the answer is a whole number

✓ To read and write roman numerals to 100

✓ To use the formal written column method to add and subtract numbers with up to four digits

✓ To measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres

✓ To read, write and convert time between analogue and digital 12- and 24-hour clock

✓ To identify lines of symmetry in 2-D shapes presented in different orientations

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What does my child need to know by the end of year five?

✓ To read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit

✓ To round numbers to the nearest 10, 100 ,1000, 10,000 and 100,000

✓ To add and subtract whole numbers with more than 4 digits to 3 decimal places

✓ To divide a 4 digit number by a 1 digit number using a formal written method

✓ To multiply numbers up to 4 digits by a one- or two-digit number using a formal written method

✓ Know angles are measured in degrees and estimate, compare, draw and measure acute, obtuse and reflex angles

✓ To count forwards or backwards in powers of 10 for any given number including through zero

✓ Compare and order fractions, including mixed number and improper fractions whose denominators are all multiples of the same number

✓ To mentally multiply and divide any number by 10, 100, 1000

✓ Identify, recognise and use familiar prime numbers, square numbers and cube numbers

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What does my child need to know by the end of year six?

✓ To identify the value of the digits in any whole and decimal number up to 10,000,000 and to three decimal places

✓ To divide numbers up to 4 digits by 1- or 2- digit whole numbers using the appropriate formal written methods

✓ To multiply multi digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication

✓ To add and subtract fractions with different denominators and mixed numbers using the concept of equivalent fractions

✓ To multiply simple pairs of proper fractions and divide a proper fraction by a whole number

✓ To recall and use equivalence between simple fractions, decimals and percentages including in different contexts

✓ To round any whole number to a required degree of accuracy

✓ To choose and use the appropriate formula for finding the area of 2-D shapes, including parallelograms and triangles

✓ To compare and classify geometric shapes based on their properties and sizes and find unknown angles in triangles, quadrilaterals and regular polygons

✓ To use, read write standard units of measurement; converting measurements of length, mass, volume and time

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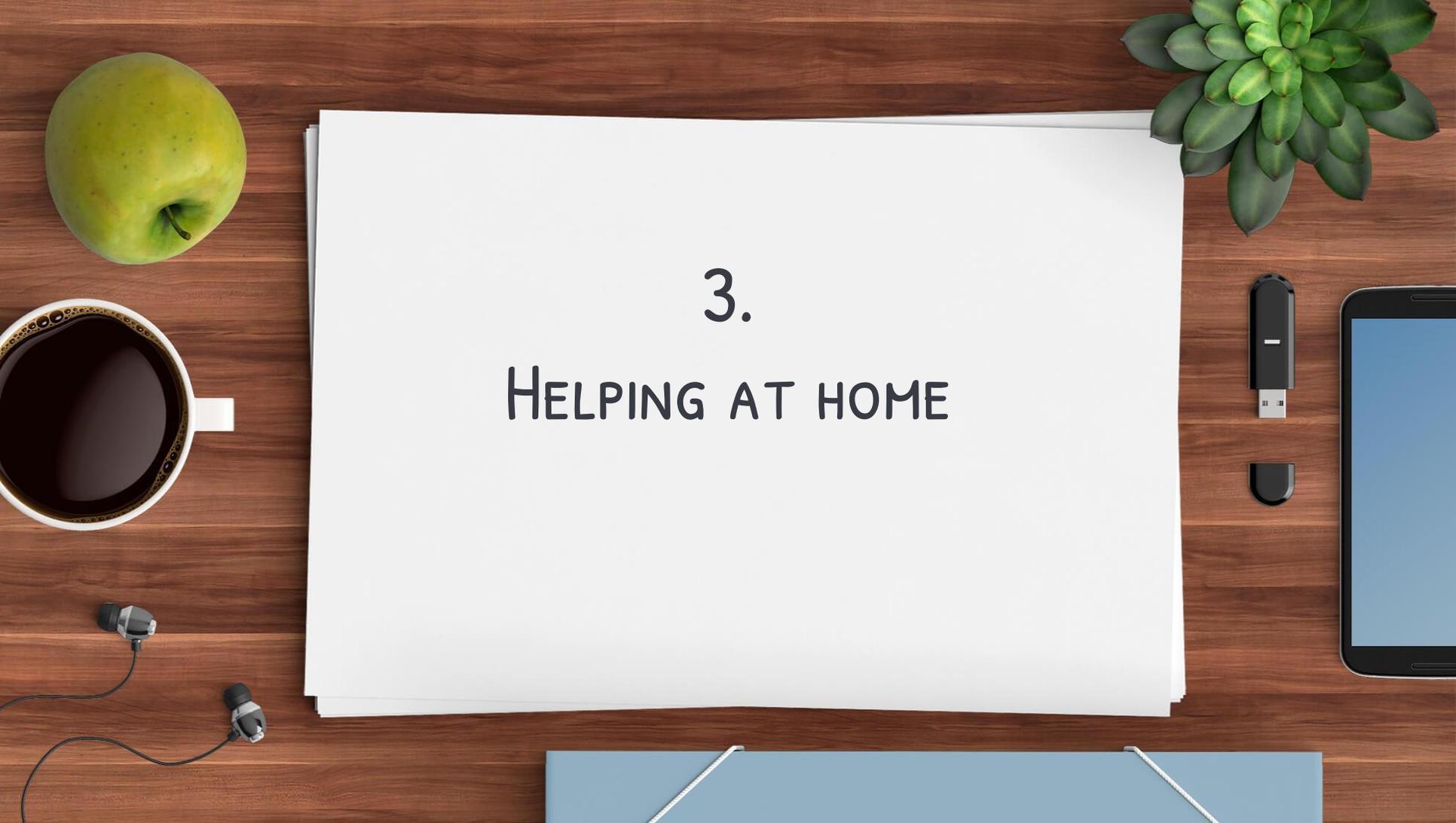
3.

Helping at home

CREATE A POSITIVE ATTITUDE TOWARDS MATHS

> Talk to your children about everyday maths

> Play maths games with them

> Value mistakes as learning opportunities

> Recognise that there is more than one way to work things out

> Praise children for effort over outcome

> Avoid saying things like "I'm useless at maths"

CREATE A POSITIVE ATTITUDE TOWARDS MATHS

> Numbots - 5 Minutes a day

> Times tables Rockstars - 5 minutes a day

> Talking about maths during "everyday" routines e.g. shopping, cooking, daily routine, calendar.

> Board games and playing cards

> Singing

> Practising times tables

> Telling the time (buy an analogue watch not digital!)

CREATE A POSITIVE ATTITUDE TOWARDS MATHS
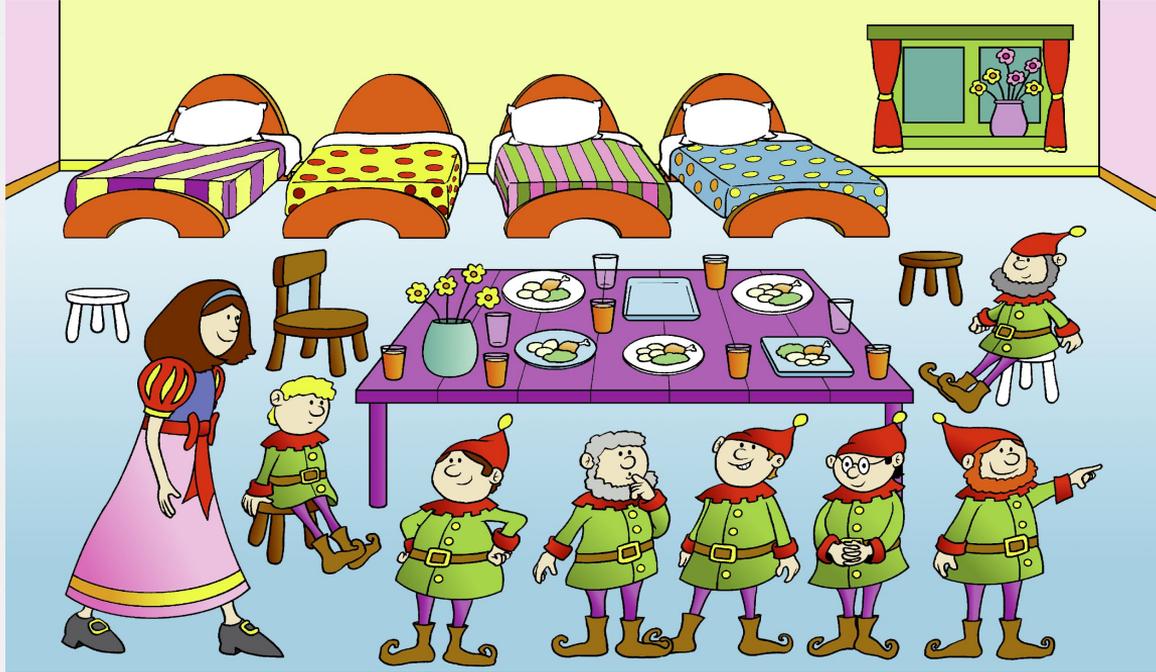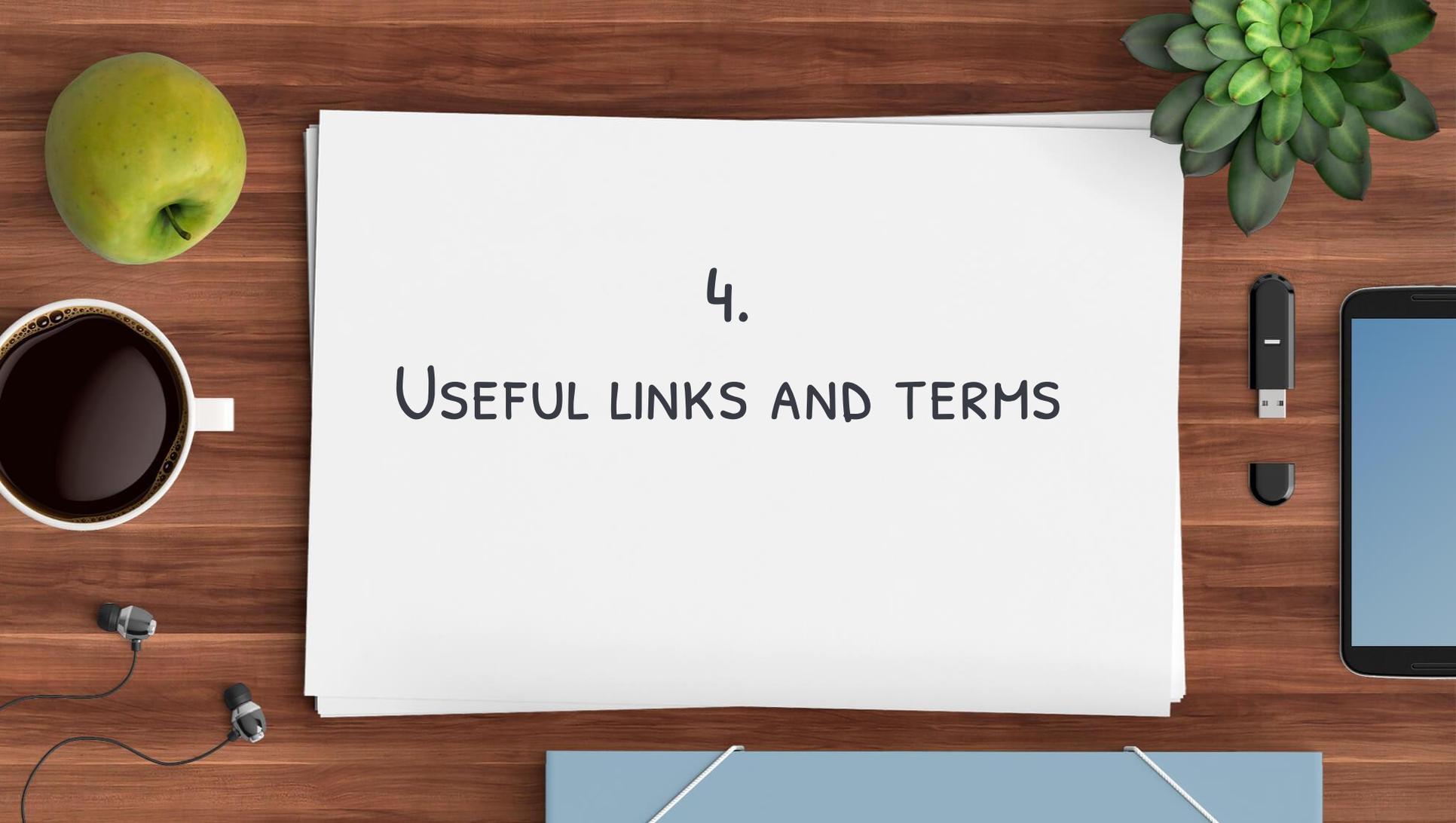
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Useful links and terms

Reception, Y1 and Y2

Use of nursery rhyme and song to introduce mathematical concepts: https://www.bbc.co.uk/rhymes and counting
Interactive games to support counting/recognition of number and shape, space and measure:
https://www.topmarks.co.uk/reception
Fun songs, clips and activity ideas: https://www.bbc.co.uk/cbeebies/topics/numeracy
Maths activities and worksheets at home: https://home.oxfordowl.co.uk/maths/primary-maths-age-4-5-reception/
Early Maths- book suggestions:https://earlymath.erikson.edu/the-best-childrens-books-for-early-math-learning/
Counting to 100: https://www.khanacademy.org/math/early-math/cc-early-math-counting-top
https://www.topmarks.co.uk/learning-to-count/blast-off
Addition and subtraction within 100 –skip counting in 5s and 10s: Addition and subtraction within 100 | Early mat
https://www.oxfordowl.co.uk/api/interactives/24456.html
Number bonds to 10 and 20 fluency game: https://www.mathplayground.com/number_bonds_20.html
2D and 3D shapes: https://www.bbc.co.uk/bitesize/topics/zjv39j6
Counting to 100,+ and - 1s and 10s, + and - 2-digit numbers: Addition and subtraction within 100 | Early math
Fractions (finding ½, ¼ and ⅓ of a shape or amount): Year 2: Fractions
Place value. ordering numbers and partitioning in tens and ones:
https://www.oxfordowl.co.uk/api/interactives/24446.html
BBC Bitesize: https://www.bbc.co.uk/bitesize/subjects/zjxhfg8
A variety of interactive maths games: https://www.topmarks.co.uk/maths-games/5-7-years/counting

Y3 and Y4

Worksheets covering a mix of topics: https://urbrainy.com/maths/year-3-ages-7-8
Interactive maths vocabulary guide: http://www.amathsdictionaryforkids.com/dictionary.html
BBC Bitesize - a wide range of resources and games:
https://www.bbc.co.uk/bitesize/subjects/z826n39
URBrainy - a collection of worksheets about different areas of mathematics:
https://urbrainy.com/
Maths is Fun - breaks down different concepts and even includes a dictionary:
https://www.mathsisfun.com/
Maths Frame - a collection of resources and games which are particularly good for mental recall: https://mathsframe.co.uk/

Y5 and Y6

BBC Bitesize - a wide range of resources and games:
https://www.bbc.co.uk/bitesize/subjects/z826n39

URBrainy - a collection of worksheets about different areas of mathematics:
https://urbrainy.com/

Maths is Fun - breaks down different concepts and even includes a dictionary:
https://www.mathsisfun.com/

Maths Frame - a collection of resources and games which are particularly good for mental recall: https://mathsframe.co.uk/

Worksheets covering a mix of topics: https://urbrainy.com/maths/year-6-age-10-11

Subject guides and example questions, covering mixed topics:https://mathsmadeeasy.co.uk/ks2-revision

Interactive maths vocabulary guide:
http://www.amathsdictionaryforkids.com/dictionary.html

A Glossary of terms

Number bond
A number bond is a relationship between a number and the parts that make it. They are described as a 'part-part-whole' relationship. 7+3=10. The parts are 7 and 3 and the whole is 10. If you subtract a part away from the whole you will be left with the other part. Using this knowledge allows children to find related facts.

One to one correspondence
One to one correspondence is an early learning maths skill that involves the act of counting each object in a set once, and only once with one touch per object.

Substise
The ability to recognise the number of objects in a small group without the need to count them.

Altogether
In total.

Sequence
A series of numbers or objects which follow a rule.

Double
To multiply by two or add a value to itself.

Half
One of two equal parts of a shape, quantity or object.

Group
To make equal size groups. This is one model for division.

Greater
Bigger, more than.

Fewer
A lesser amount – used when counting objects, i.e. countable objects such as, pens, teddies, counters, etc.

Face
One of the plane surfaces of a solid shape.

Vertex/Vertices
The point at which two or more lines intersect.

Edge
A line segment joining two vertices of a plane figure (2-D shape) and the intersection of two plane faces (in a 3-D shape).

Venn diagram
Two or more circles which represent given sets and intersect according these.

Measure
To find the size of something in a given unit.

Capacity
The amount of liquid or material a container can hold.

Compare
Look for similarities and/or differences between at least two objects or sets.

Numerals
A symbol or name that stands for a number.

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A Glossary of terms

Equivalent fractions
Fractions that are the same in terms of shape and size but are expressed using different numbers. For example if you take two identical circles and split one into halves and the other into quarters you will see that 1/2 is exactly the same as 2/4.

Column method
The column method is a written method to solve addition and subtraction equations. The numbers are written under columns separated into ones, tens, hundreds and thousands. You always start by adding or subtracting the ones column first.

Formal written method
A formal written method is a way of solving a calculation using a specific strategy that is recorded. Once children are confident with various mental strategies they learn more formal methods.

Improper fraction
An improper fraction is a fraction in which the numerator (top number) is greater than or equal to the denominator (the bottom number,

Missing number problem
Missing number problems involve using the inverse operation and/or known facts to solve the equation. For example to find the missing number in 3 + ? = 10 children could take three cubes away from a stick of ten cubes. Or they could use their knowledge of bonds to 10 to know that 3+7=10.

Mixed number fraction
A mixed number fraction is made up of a whole number and a fraction.

Non unit fraction
A non unit fraction is a where the numerator (top number) is greater than one.

Number bond
A number bond is a relationship between a number and the parts that make it. They are described as a 'part-part-whole' relationship. 7+3=10. The parts are 7 and 3 and the whole is 10. If you subtract a part away from the whole you will be left with the other part. Using this knowledge allows children to find related facts.

Proper fraction
A proper fraction is a fraction where the numerator is less than the denominator. The value of a proper fraction will always be less than one.

Place value
Every digit in a number has a value defined by its place in the number. Each digit represents a value on the basis of its position in the number.

Unit fraction
A unit fraction is a fraction where the numerator (top number) is one.
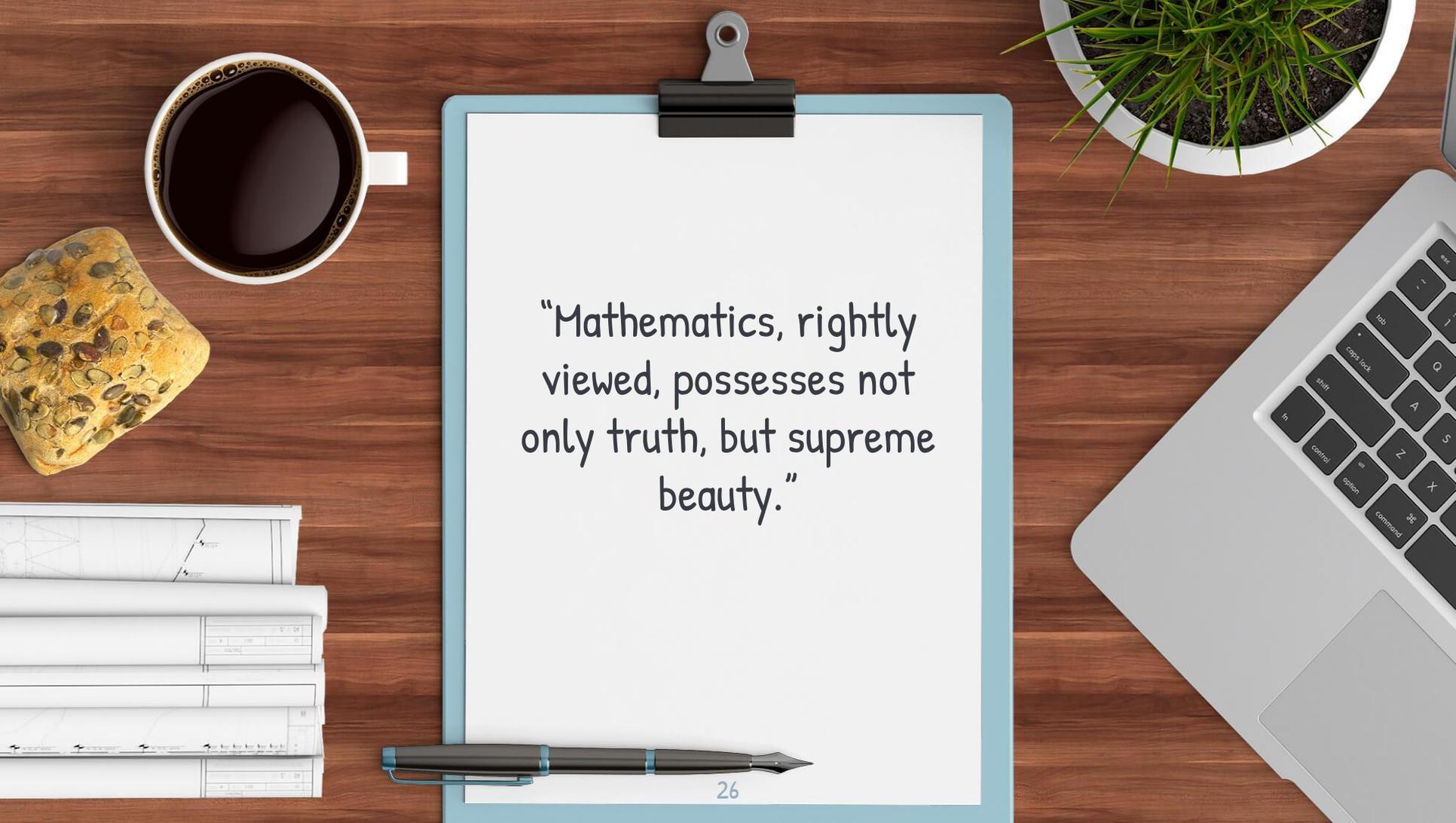
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"Mathematics, rightly viewed, possesses not only truth, but supreme beauty."
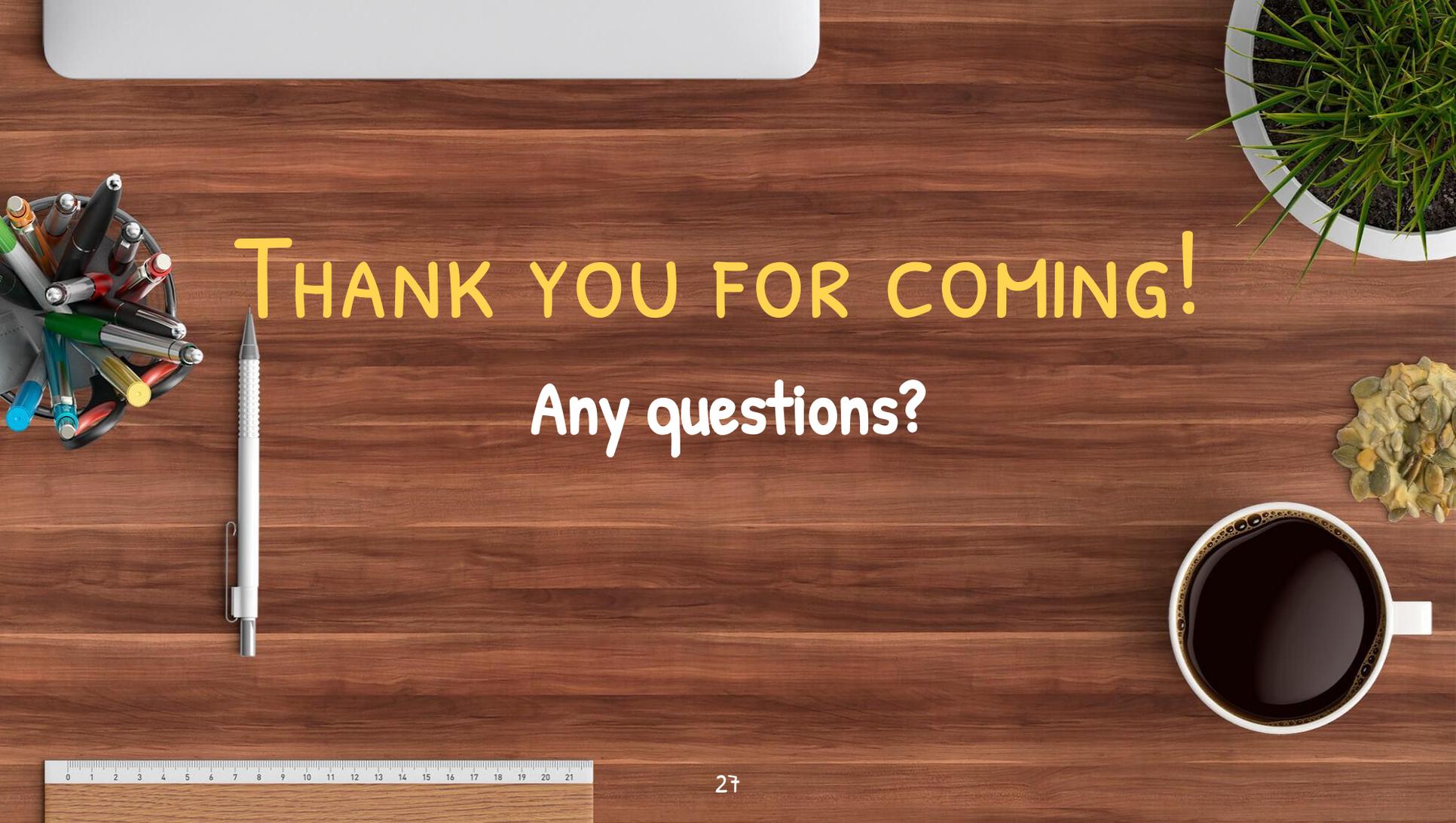
Thank you for coming!

Any questions?