

Maths Morning & Evening

St Mary's Catholic Academy
Thursday 13th February 2020



Welcome to the session!

- ▶ 9.00 - 9.20 FS
- ▶ 9.20 - 9.40 KS1
- ▶ 9.40 - 10.00 KS2

- ▶ 5.00 - 5.20 FS
- ▶ 5.20 - 5.40 KS1
- ▶ 5.40 - 6.00 KS2

Aims of the Session

- ▶ To understand more about the maths curriculum and how it is delivered in our school.
- ▶ To understand what CPA is and why it is important.
- ▶ To help your child at home and help them to make maths meaningful in their lives.

Maths Curriculum & CPA

Foundation Stage

End of Year Expectations

► Early Learning Goal for number

Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer. They solve problems, including doubling, halving and sharing.

► Early Learning Goal for shape, space and measures

Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. They recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them.

Foundation Stage Assessment

Maths – Number & Shape, space and measure 3 years to 4 years (30 – 50 mths)		
Emerging	Expecting	Exceeding
<ol style="list-style-type: none">1. I know if I get one more object I have more2. I can count to 63. I am beginning to mark make circles4. I can show you under & up5. I can find similar shapes in the environment	<ol style="list-style-type: none">1. I can recognise 1,2,32. I can count out 6 objects3. I can draw a circle4. I am beginning to solve number challenges5. I am beginning to match numerals and quantity correctly6. I can count to 107. I can count to 10 independently8. I can use positional language9. I can use shapes to make a picture & models10. I can create & describe pattern11. I can recognise numbers around12. I can recognise shape around me	<ol style="list-style-type: none">1. I know when to count2. I can write 1,4,7 & 6 & 93. I am using mathematical language to describe shape and size, for example 'tall' and 'round'4. I can count above 105. I can compare groups of objects that are the same number

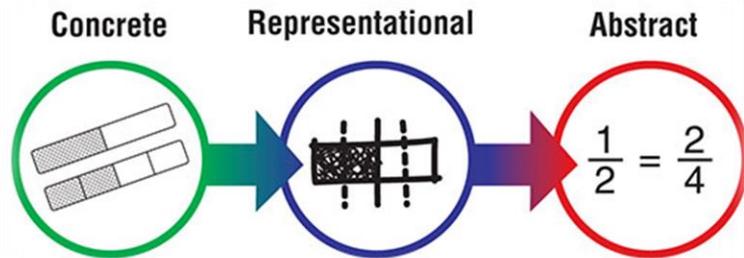
Maths – Number Early learning Goals

Emerging	Expecting	Exceeding
<p>1. Children count reliably with numbers from 1 to 20,</p> <p>2. Place numbers 1-20 in order</p> <p>3. Say which number is one more than a given number.</p>	<p>4. Say which number is one less than a given number.</p> <p>5. Using quantities and objects, they add two single digit numbers</p> <p>6. Using quantities and objects, they subtract two single-digit numbers</p>	<p>7. Using quantities and objects, to calculate addition sums they count on or back to find the answer.</p> <p>8. Using quantities and objects, to calculate subtraction sums they count on or back to find the answer</p> <p>9. They solve problems, including doubling, halving and sharing.</p>

Maths – Shape, Space and Measure Early learning Goals

Emerging	Expecting	Exceeding
<p>1. Children use everyday language to talk about size,</p> <p>2. Children use everyday language to talk about weight,</p> <p>3. Children use everyday language to talk about capacity,</p>	<p>4. Children use everyday language to talk about position,</p> <p>5. Children use everyday language to talk about distance,</p> <p>6. Children use everyday language to talk about time and money</p>	<p>7. To compare quantities and objects and to solve problems using size, weight, capacity, position, distance, time and money.</p> <p>8. They recognise, create and describe patterns.</p> <p>9. They explore characteristics of everyday objects and shapes and use mathematical language to describe them.</p>

Concrete, pictorial, abstract



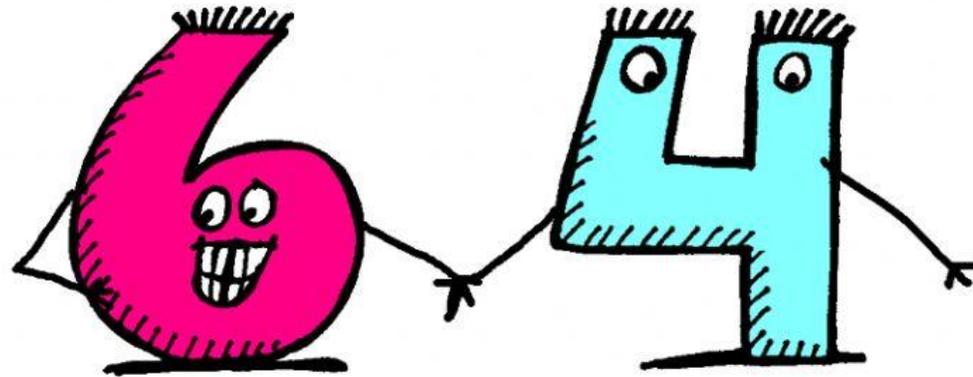
- CPA is a gradual approach between concrete materials, pictorial representations to abstract symbols and problems.
- For this to positively impact children's learning, it must be used from as early on as possible, particularly with new concepts.

CPA

- ▶ **Concrete** is the doing stage - the physical objects.
- ▶ **Pictorial** is the 'seeing' stage which encourages children to make a mental connection between what is handled and the abstract pictures.
- ▶ **Abstract** is the symbolic stage (e.g. numbers, symbols).

Practical Ideas

- ▶ Maths is used everyday and should be part of our children's everyday experiences.



CPA at home - counting



Practical Ideas Going Shopping

- ▶ Recognising numbers in the aisles
- ▶ What number comes next?
- ▶ What number was before?
- ▶ Handling money - coins/notes.



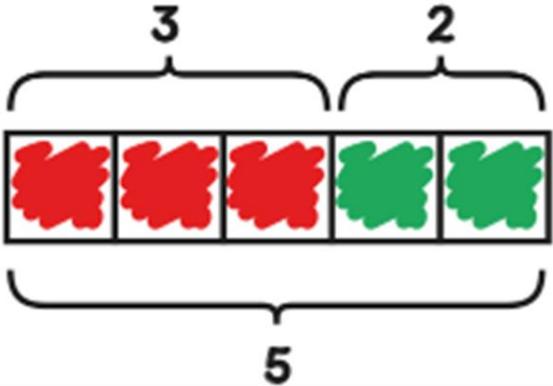
CPA at home - adding



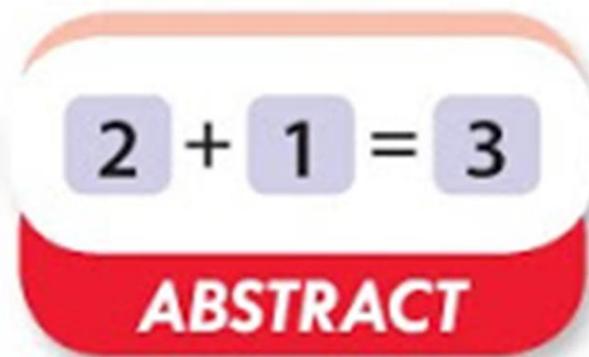
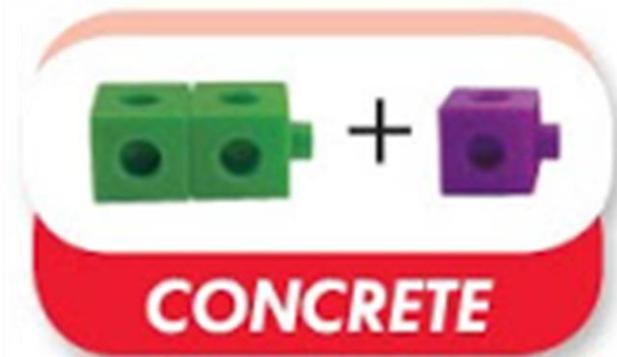
3 2



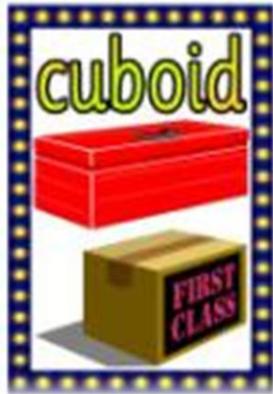
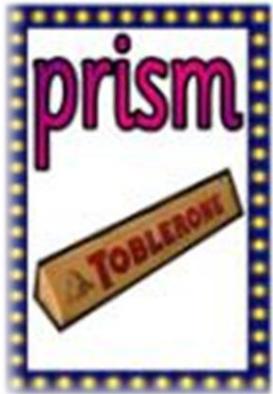
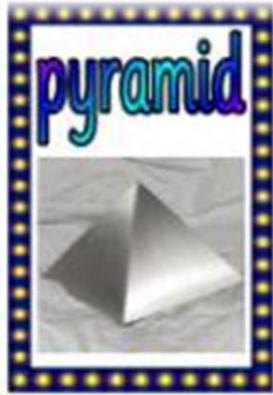
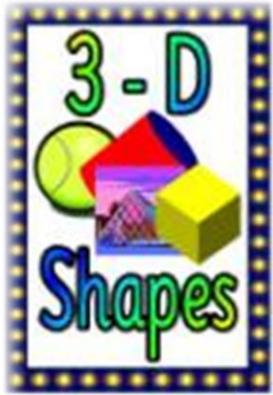
$3 + 2 = \boxed{5}$



CPA at home - adding and making 10



CPA at home - shape



Practical Ideas

Baking Activities

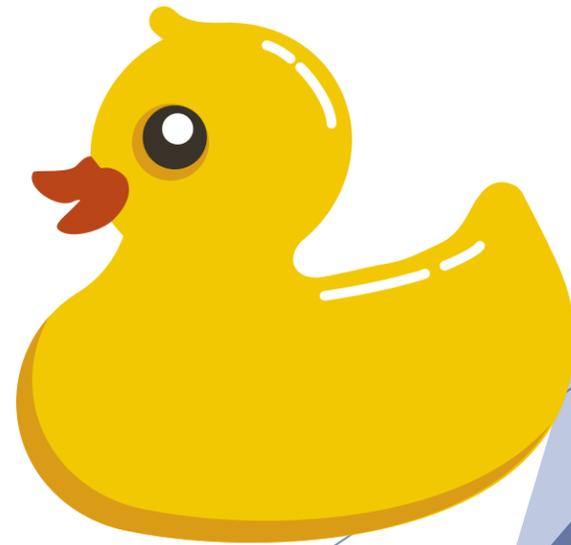
- ▶ Measuring
- ▶ More than / less than
- ▶ $\frac{1}{2}$ full / $\frac{1}{2}$ empty



Practical Ideas

Bath Time

- ▶ Playing with different sized containers.
- ▶ Which one holds more?
- ▶ Which one holds the least?
- ▶ When is it $\frac{1}{2}$ full?



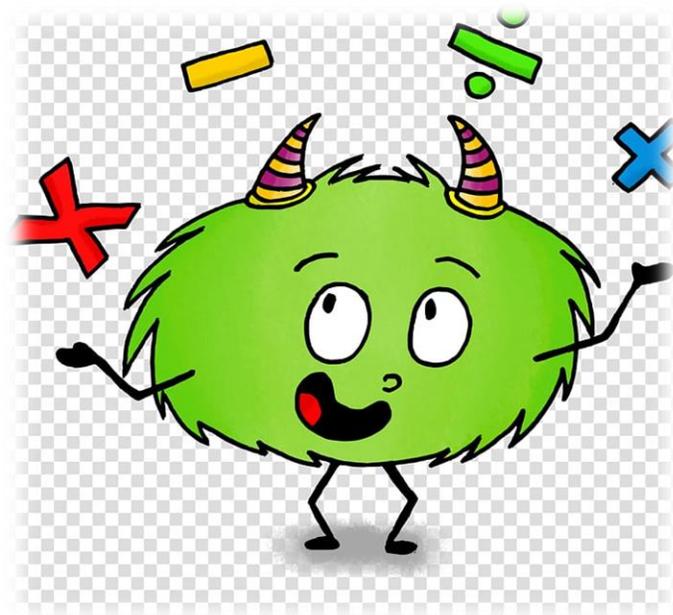
What message are we allowing our children to adopt?

There are 3
types of
people in the
world...
Those who
can count,
and those who
can't!

MATHEMATICS
is not about
numbers, equations,
computations, or
algorithms:
it is about
UNDERSTANDING.

William Paul Thurston

Practical Ideas - Please
pick up a booklet



Any Questions?



Maths Curriculum & CPA

Key Stage 1

What is Ofsted's view?

Learning has been defined in cognitive psychology as an alteration in long-term memory: “If nothing has altered in long-term memory nothing has been learned.”³ Progress, therefore, means knowing more (including knowing how to do more) and remembering more. When new knowledge and existing knowledge connect in learners' minds, this gives rise to understanding. As learners develop unconscious competence and fluency, this will allow them to develop skills. Progress should not be defined by hitting the next data point. Rather, if learners attain within a well-sequenced, well-constructed curriculum, they are making progress.

What does this mean for schools?

- ▶ Fluency - mastering skills
- ▶ Knowing more and doing more
- ▶ Problem solving and applying
- ▶ Reasoning
- ▶ Solving non-routine problems at a greater depth



What is reasoning?

Reasoning

The second aim of the mathematics national curriculum in England (DfE, 2013) is that all pupils will:

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

prove justify reason argue

What does it look like?

Year 1	Year 2
count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number	
count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens	count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward
given a number, identify one more and one less	
Spot the mistake: 5,6,8,9 What is wrong with this sequence of numbers?	Spot the mistake: 45,40,35,25 What is wrong with this sequence of numbers?
True or False? I start at 2 and count in twos. I will say 9	True or False? I start at 3 and count in threes. I will say 13?
What comes next? 10+1 = 11 11+1 = 12 12+1 = 13	What comes next? 41+5=46 46+5=51 51+5=56

Calculation Policies

- ▶ An example from the Year 1 addition policy...

Use the hundred square to support mental calculations and a range of number lines to support recording of written calculations

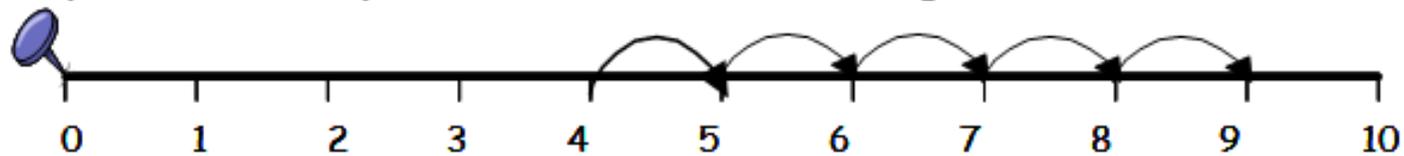
one digit number + one digit number $4 + 5 = 9$

one digit number + two digit number or two-digit number + one-digit number $15 + 4 = 19$

multiple of 10 + one digit number $20 + 5 = 25$

multiple of 10 + two-digit number $20 + 15 = 35$

Fully marked and fully numbered number line - counting on in ones ($4 + 5 = 9$)



Calculation Policies

- ▶ An example from the Year 2 addition policy...

Using empty number line to record calculation strategies in addition and begin to record mental calculations using partitioning and recombining skills working with 2-digit numbers and extend to crossing the tens barrier.

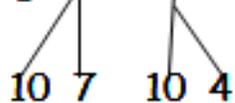
$$? + 43 = 87$$

Calculate the value of the unknown using a 100 square. Count on in tens from 43 to 83 then count on in ones from 83 to 87.

Informal method of partitioning

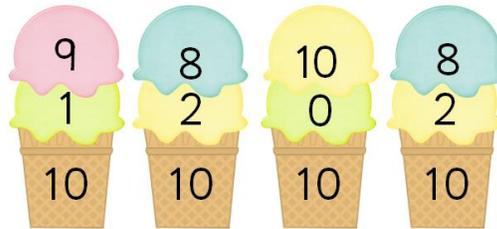
Partition digits into tens and units

e.g. $17 + 14$



Assertive Mentoring

- ▶ Assertive Mentoring starts in Year 1 to secure the children's number bonds (Stage 0)
- ▶ Move onto Stage 1 (Year 1 objectives)
- ▶ On a weekly basis - skills check
- ▶ Taken in class, in a relaxed, familiar environment
- ▶ Half-termly tests - depth
- ▶ '3 Greens in a row'
- ▶ Progress



'Out of this World' Scheme Number Bonds Cards

- ▶ Additional support for children practising their number bonds to 10 - cards can be taken home and practised
- ▶ Stickers rewarded for **bronze**, **silver** and **gold** levels when the children feel ready to be tested

'Out of this World' Number Bonds to 10

Story of 1 $0+1=1$ $1+0=1$			Story of 2 $0+2=2$ $1+1=2$ $2+0=2$			Story of 3 $0+3=3$ $1+2=3$ $2+1=3$ $3+0=3$			Story of 4 $0+4=4$ $1+3=4$ $2+2=4$ $3+1=4$ $4+0=4$			Story of 5 $0+5=5$ $1+4=5$ $2+3=5$ $3+2=5$ $4+1=5$ $5+0=5$		
Bronze	Silver	Gold	Bronze	Silver	Gold	Bronze	Silver	Gold	Bronze	Silver	Gold	Bronze	Silver	Gold
Story of 6 $0+6=6$ $1+5=6$ $2+4=6$ $3+3=6$ $4+2=6$ $5+1=6$ $6+0=6$			Story of 7 $0+7=7$ $1+6=7$ $2+5=7$ $3+4=7$ $4+3=7$ $5+2=7$ $6+1=7$ $7+0=7$			Story of 8 $0+8=8$ $1+7=8$ $2+6=8$ $3+5=8$ $4+4=8$ $5+3=8$ $6+2=8$ $7+1=8$ $8+0=8$			Story of 9 $0+9=9$ $1+8=9$ $2+7=9$ $3+6=9$ $4+5=9$ $5+4=9$ $6+3=9$ $7+2=9$ $8+1=9$ $9+0=9$			Story of 10 $0+10=10$ $1+9=10$ $2+8=10$ $3+7=10$ $4+6=10$ $5+5=10$ $6+4=10$ $7+3=10$ $8+2=10$ $9+1=10$ $10+0=10$		
Bronze	Silver	Gold	Bronze	Silver	Gold	Bronze	Silver	Gold	Bronze	Silver	Gold	Bronze	Silver	Gold
To achieve a bronze star... Recite the story in order			To achieve a silver star... Complete the story, giving missing number bonds (Example: $4 + __ = 10$)			To achieve a gold star... Answer questions within context and/or use the inverse (Example: $10 - 3 = __$)								

'Out of this World' Scheme Maths Challenges

- ▶ When the 'Number Bonds to 10' card has been completed, children move onto their maths reward chart
- ▶ Start with number challenges (expected to complete by the end of KS1)

'Out of this World' Maths Reward Chart

Number Challenges	Times Table Challenges	Mental Maths Challenges
Counting on to 10	2s (x and ÷)	Number bonds to 100
Counting back from 10	10s (x and ÷)	Square numbers (and roots)
Counting on to 20	5s (x and ÷)	Cube numbers (and roots)
Counting back from 20	3s (x and ÷)	Prime numbers
Making 10	4s (x and ÷)	Factors and multiples
Number bonds to 10	8s (x and ÷)	x and ÷ by 10, 100 and 1000
Making 20	6s (x and ÷)	Related x and ÷ facts
Number bonds to 20	7s (x and ÷)	Matching fractions, decimals and %s
Count in multiples of 2	9s (x and ÷)	Equivalent fractions
Count in multiples of 5	11s (x and ÷)	Mixed numbers and improper fractions
Count in multiples of 10	12s (x and ÷)	Adding two 2-digit numbers
Doubles (and halves) to 10	Mixed (x and ÷)	BIDMAS

Name: _____

What does 'secure' look like?

- ▶ Knowing the basics - not about rushing through maths skills but securing greater depth
- ▶ Practising at home frequently - counting, number bonds, 2s, 5s, 10s times tables
- ▶ Using correct vocabulary such as 'more than', 'less than' and 'equal to'
- ▶ Going through Assertive Mentoring skills checks together at home - practise

Reasoning in KS1

Calculation	Inverse	Correct? ✓ or ✗
$12 + 5 = 17$	$17 - 5 = 12$	✓
$25 - 13 = 10$		
$19 + 9 = 28$		
$6 + 15 = 22$		
$32 - 11 = 21$		

Explain the mistake

$$5 + 3$$

5, 6, 7



7a. Jo is making bonds to 100.



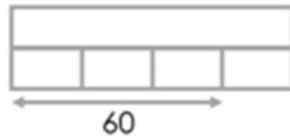
I have seven tens and three ones. I need twenty-seven to make 100.

Is she correct? Prove it.

Which picture?

Draw lines to match the questions to the bar models:

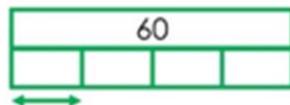
$$60 \div 4$$



$\frac{3}{4}$ of a number is 60.
What is the number?



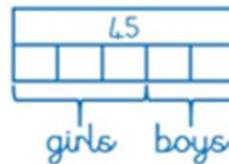
$$\frac{3}{4} \text{ of } 60$$



Which picture?

$\frac{2}{3}$ of the children in the running club are girls.
There are 45 children in the running club.
How many girls are in the running club?

Which drawing(s) represent this question correctly?



girls }
boys } 45

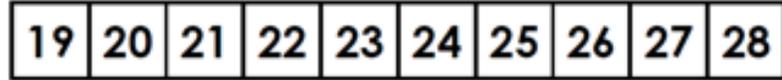
Explain the odd one out:

20, 18, 16, 14, 12, 10

5, 7, 9, 11, 13, 15, 17

13, 15, 18, 22, 28

2a. Ted starts at 19 on a number track.



He says,

If I count on 5, I will
land on 25.



correct not correct

Ted is _____. He will land on _____

7b. Jemima has some silver coins in her pocket. They total 35p.

Her friend Jackey says:



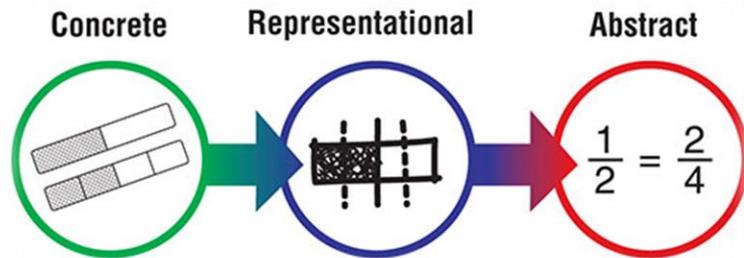
Jemima could have
a 10p coin, a 20p
coin, two 2p coins
and a 1p coin.

Explain the mistake Jackey has made.

Jackey has made a mistake because _____

The silver coins that Jemima could have are _____

Concrete, pictorial, abstract



- CPA is a gradual approach between concrete materials, pictorial representations to abstract symbols and problems.
- For this to positively impact children's learning, it must be used from as early on as possible, particularly with new concepts.
- Unlike traditional maths teaching methods where teachers demonstrate how to solve problems, this approach brings concepts to life (doing stage) by allowing children to experience and handle physical concrete objects.

CPA

- ▶ **Concrete** is the doing stage - the physical objects.
- ▶ **Pictorial** is the 'seeing' stage which encourages children to make a mental connection between what is handled and the abstract pictures.
- ▶ **Abstract** is the symbolic stage (e.g. numbers, symbols).

CPA in KS1

COLUMN ADDITION WITH STRAWS



What is the date today?

What will it be tomorrow?

How many days are there in the month we are in?

How many more days are there until the end of the month?

How many days are there until the next school holiday?



How many Saturdays are there in the month we are in?

How many months have 30 days?
How many have 31 days?

Calendars

How many months is it until your birthday?
... until Christmas?

What page number are you on in your book?
Is this an odd or even number?

How many pages have you read so far?

What is the longest word you can find in your book?
How many letters has it got?

How many more pages do you need to read to finish your book?



How many words on this page start with a vowel?

Reading a book

Can you find a seven letter word in your book?

What is the shortest and longest book you can find?

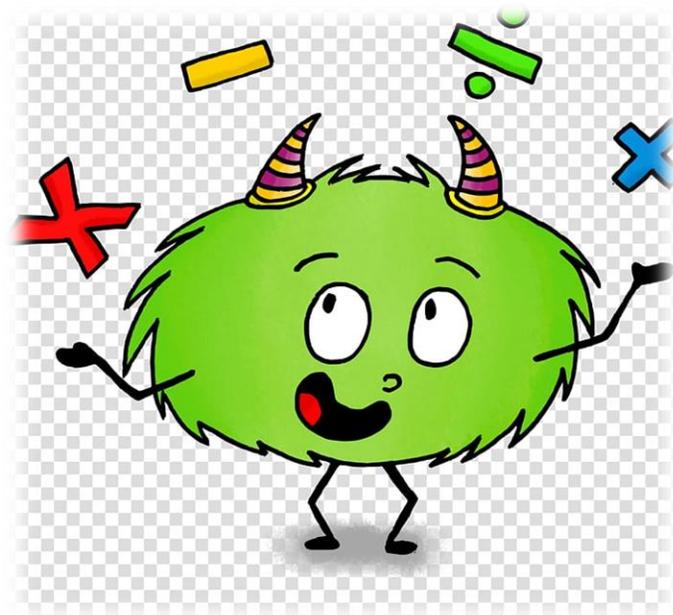
Read the page numbers together. Can you find a number e.g. 27? ... 13?

The bigger picture...

- ▶ Maths isn't an extra thing to do...and it isn't just a lesson in school. It should be incorporated in our children's everyday experiences.



Practical Ideas - Please
pick up a booklet



Any Questions?



Maths Curriculum & CPA

Key Stage 2

National Curriculum Updates

From the 2019/20 academic year onwards, all state-funded maintained schools and academies (including free schools) in England are required to administer the online MTC to year 4 pupils.

The purpose of the MTC is to determine whether pupils can recall their times tables fluently, which is essential for future success in mathematics. It will help schools to identify pupils who have not yet mastered their times tables, so that additional support can be provided.

National Curriculum Updates - Ofsted

Impact

- learners develop detailed knowledge and skills across the curriculum and, as a result, achieve well. Where relevant, this is reflected in results from national tests and examinations that meet government expectations, or in the qualifications obtained
- learners are ready for the next stage of education, employment or training. Where relevant, they gain qualifications that allow them to go on to destinations that meet their interests, aspirations and the intention of their course of study. They read widely and often, with fluency and comprehension.

End of Year Expectations in Lower KS2

Number	Evidence
Compare and order numbers to 1000 and read and write numbers to 1000 in numerals and words.	
Count from 0 in multiples of 4, 8, 50 and 100.	
Recognise the value of each digit in a 3-digit number.	
Understand and count in tenths, and find the fractional value of a given set.	
Add and subtract fractions with a common denominator.	
Derive and recall multiplication facts for 3, 4 and 8 x tables.	
Add and subtract mentally combinations of 1-digit and 2-digit numbers.	
Add and subtract numbers with up to 3-digits using formal written methods.	
Write and calculate mathematical statements for multiplication and division using the 2x, 3x, 4x, 5x, 8x and 10x tables.	
Calculate 2-digit x 1-digit.	
Solve number problems using one and two step problems.	
Measurement, Geometry and Statistics	
Identify right angles and compare other angles stating whether they are greater or smaller than a right angle.	
Identify horizontal and vertical lines and pairs of perpendicular and parallel lines.	
Tell the time to the nearest minute and use specific vocabulary, including seconds, am and pm.	
Measure, compare, add and subtract using common metric measures.	
Solve one and two step problems using information presented in scaled bar charts, pictograms and tables.	

 Maths Targets	
Number	Evidence
Count backwards through zero to include negative numbers.	
Compare and order numbers beyond 1000.	
Read Roman Numerals to 100.	
Find 1000 more or less than any given number.	
Count in multiples of 6, 7, 9, 25 and 1000.	
Recognise the place value of the digits in a 4-digit number.	
Round any number to the nearest 10, 100 or 1000.	
Recall and use multiplication and division facts for all tables up to 12 x 12.	
Add and subtract: numbers with up to 4 digits using the written columnar method.	
Add and subtract: numbers with up to 4 decimal places using the formal written methods of columnar addition and subtraction.	
Solve two step addition and subtraction problems in context.	
Multiply: 2 digit numbers by 1 digit numbers.	
Multiply: 3 digit numbers by 1 digit numbers.	
Divide: 1-digit or 2-digit number by 10 or 100 identifying the value of the digits in the answer as units, tenths or hundredths.	
Solve problems involving multiplication.	
Round decimals with 1 decimal place to the nearest whole number.	
Count up and down in hundredths.	
Compare and order numbers with up to 2 decimal places.	
Recognise and write equivalent fractions.	
Add and subtract fractions with the same denominator.	
Measurement, Geometry and Statistics	
Read, write and convert time between analogue and digital 12 and 24 hour clocks.	
Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes.	
Know that angles are measured in degrees; identify acute and obtuse angles.	
Measure and calculate the perimeter of a rectilinear figure in cm and m.	
I can interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.	

End of Year Expectations in Upper KS2

Number
Count forwards and backward with positive and negative numbers through zero.
Count forwards/backwards in steps of powers of 10 for any given number up to 1,000,000.
Compare and order numbers up to 1,000,000.
Compare and order numbers with 3 decimal places.
Recognise place value of any number up to 1,000,000.
Round any number up to 1,000,000 to the nearest 10, 100, 1000, 10,000 or 100,000.
Round decimals with 2 decimal places to nearest whole number and 1 decimal place.
Identify all multiples and factors, including finding all factor pairs.
Use known tables up to 12 x table to derive other number facts.
Recall prime numbers up to 19.
Recognise and use square numbers and cube numbers.
Add and subtract: - Numbers with more than 4-digits using formal written method.
Solve addition and subtraction multi-step problems in context.
Multiply: - 4-digits by 1-digit/ 2-digit
Divide- Up to 4-digits by 1-digit
Solve problems involving multiplication and division involving large numbers.
Recognise mixed numbers and improper fractions and convert from one to another.
Multiply proper fractions and mixed numbers by whole numbers.
Identify and write equivalent fractions.
Read and write decimal numbers as fractions.
Multiply & divide: Whole numbers and decimals by 10, 100 and 1,000
Recognise the % symbol and understand that percent relates to a number of parts per hundred.
Write percentages as a fraction with denominator hundred and as a decimal fraction.
Solve problems involving numbers up to 3 decimal places.

Number	Evidence
Use negative numbers in context and calculate intervals across zero.	
Compare and order numbers up to 10,000,000.	
Round any whole number to a required degree of accuracy.	
Identify the value of each digit to 3 decimal places.	
Identify common factors, common multiples and prime numbers.	
Multiply: 4-digit by 2 digit	
Divide: 4-digit by 2 digit	
Use knowledge of order of operations to carry out calculations involving all four operations.	
Solve problems involving addition, subtraction, multiplication and division.	
Perform mental calculations, including with mixed operations with large numbers.	
Add and subtract fractions with different denominators and mixed numbers.	
Multiply simple pairs of proper fractions, writing the answer in the simplest form.	
Divide proper fractions by whole numbers.	
Calculate % of a whole number.	
Use common factors to simplify fractions.	
Solve problems involving the calculation of percentages.	
Multiply 1 digit numbers with up to 2dp by whole numbers.	
Algebra	
Use a simple formulae.	
Express missing number problems algebraically.	
Measurement, Geometry and Statistics	
Read, write and convert between standard units of measurement - length, mass, volume and time.	
Recognise, describe and build simple 3D shapes, including making nets.	
Compare and classify geometric shapes based on their properties.	
Find unknown angles in any triangle, quadrilateral and regular polygons.	

Calculation Policies

- ▶ An example of progression throughout KS2...

Column addition (without bridging/exchanging)

$$\begin{array}{r} 23 \\ + 42 \\ \hline 65 \end{array}$$

$$\begin{array}{r} 315 \\ + 624 \\ \hline 939 \end{array}$$

Extra digit in answer

$$\begin{array}{r} 94 \\ + 73 \\ \hline 167 \end{array}$$

$$\begin{array}{r} 561 \\ + 718 \\ \hline 1279 \end{array}$$

DECIMALS: Add two decimal fractions with up to 4 digits and one or two decimal places.

$$\begin{array}{r} 124.9 \text{ Km} \\ + 7.25 \text{ Km} \\ \hline 132.15 \text{ Km} \\ 11 \end{array}$$

What does reasoning look like in KS2?

Year 3	Year 4	Year 5	Year 6
	count backwards through zero to include negative numbers	interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero	use negative numbers in context, and calculate intervals across zero
count from 0 in multiples of 4, 8, 50 and 100;	count in multiples of 6, 7, 9, 25 and 1000	count forwards or backwards in steps of powers of 10 for any given number up to 1000 000	
find 10 or 100 more or less than a given number	find 1000 more or less than a given number		
<p>Spot the mistake: 50,100,115,200 What is wrong with this sequence of numbers?</p> <p>True or False? 38 is a multiple of 8?</p> <p>What comes next? 936-10= 926 926 -10 = 916 916- 10= 906</p>	<p>Spot the mistake: 950, 975,1000,1250 What is wrong with this sequence of numbers?</p> <p>True or False? 324 is a multiple of 9?</p> <p>What comes next? 6706+ 1000= 7706 7706 + 1000 = 8706 8706 + 1000 = 9706</p>	<p>Spot the mistake: 177000,187000,197000,217000 What is wrong with this sequence of numbers?</p> <p>True or False? When I count in 10's I will say the number 10100?</p> <p>What comes next? 646000-10000= 636000 636000 -10000 = 626000 626000- 10000 = 616000</p>	<p>Spot the mistake: -80,-40,10,50 What is wrong with this sequence of numbers?</p> <p>True or False? When I count backwards in 50s from 10 I will say -200</p> <p>True or False? The temperature is -3. It gets 2 degrees warmer. The new temperature is - 5?</p>

Assertive Mentoring

- ▶ Assertive Mentoring starts in Year 1 to secure the children's number bonds (Stage 0)
- ▶ By KS2, children are expected to be at 'Stage 3 Ready' (entering Year 3)
- ▶ On a weekly basis - skills check
- ▶ Taken in class, in a relaxed environment, with prompts/reminders if necessary
- ▶ Half-termly tests
- ▶ '3 Greens in a row'
- ▶ Progress

'Out of this World' Scheme Maths Challenges

- ▶ Children are expected to have completed their number challenges by the end of KS1
- ▶ Move on to 'Times Table' challenges (by end of Year 4)
- ▶ Followed by 'Mental Maths' challenges (Years 5 & 6)

'Out of this World' Maths Reward Chart

Number Challenges	Times Table Challenges	Mental Maths Challenges
Counting on to 10	2s (x and ÷)	Number bonds to 100
Counting back from 10	10s (x and ÷)	Square numbers (and roots)
Counting on to 20	5s (x and ÷)	Cube numbers (and roots)
Counting back from 20	3s (x and ÷)	Prime numbers
Making 10	4s (x and ÷)	Factors and multiples
Number bonds to 10	8s (x and ÷)	x and ÷ by 10, 100 and 1000
Making 20	6s (x and ÷)	Related x and ÷ facts
Number bonds to 20	7s (x and ÷)	Matching fractions, decimals and %s
Count in multiples of 2	9s (x and ÷)	Equivalent fractions
Count in multiples of 5	11s (x and ÷)	Mixed numbers and improper fractions
Count in multiples of 10	12s (x and ÷)	Adding two 2-digit numbers
Doubles (and halves) to 10	Mixed (x and ÷)	BIDMAS

Name: _____

Practical Ideas

- ▶ **Times tables - a MUST!**
- ▶ **MTC from this academic year onwards**
- ▶ 'Out of this World' reward charts - encourage children to ask to be tested
- ▶ Going through skills checks together when returned home
- ▶ Encourage children to ask for help with their maths homework when unsure - not to 'just leave it'
- ▶ Real-life situations - time, money, measuring

Which team(s) scored the most goals?

Which team(s) scored the least number of goals?

Did your favourite team score more than many other teams?

What is the difference between the highest score and the lowest score?

ARSENAL	P	LIVERPOOL	P
Pools Panel assessed: HT: No score draw; FT: Home win			
ASTON VILLA	1	MAN CITY	2
Angel 61		S Wright-Phillips 5 Musampa 12	
HT: 0-2		Att: 39,645	
BLACKBURN	1	FULHAM	3
Neill 5		Malbranque 20, 77 McBride 53	
HT: 1-1		Att: 18,991	
Sent off: Short (Blackburn) 69; Rosenior (Fulham) 70			
CHELSEA	1	CHARLTON	0
Makelele 90			
HT: 1-0		Att: 42,065	
C PALACE	2	SOUTHAMPTON	2
Hall 34 Ventola 72		Crouch 37 (pen) Higginbotham 90	
HT: 1-1		Att: 26,066	
Sent off: Crouch (Southampton) 58; Sorondo (C Palace) 59			
EVERTON	2	NEWCASTLE	0
Weir 43, Cahill 59			
HT: 1-0		Att: 40,438	
Sent off: Aneobi (Newcastle) 56			
MAN UTD	1	WEST BROM	1
Giggs 21		Earnshaw 63 (pen)	
HT: 1-0		Att: 67,827	
MIDDLESBROUGH	1	TOTTENHAM	0
Boateng 11			
HT: 1-0		Att: 34,766	
NORWICH	1	BIRMINGHAM	0
Ashton 45 (pen)			
HT: 1-0		Att: 25,477	
Sent off: Johnson (Birmingham) 31			
PORTSMOUTH	1	BOLTON	1
Yakubu 72		Diouf 11	
HT: 0-1		Att: 20,188	

Football scores

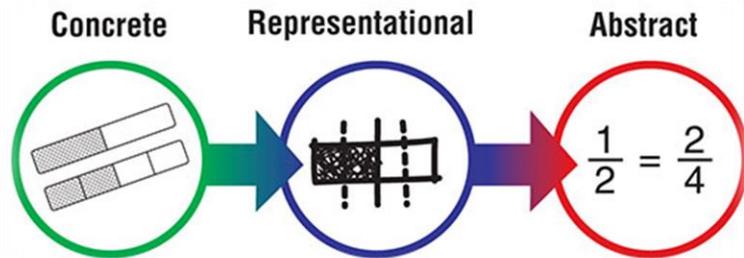
Which game(s) had the most goals scored?

If you add all of the goals together what is the total?

How many teams scored:
1 goal?
2 goals?
3 goals?

How many teams have names beginning with a vowel?

Concrete, pictorial, abstract



- CPA is a gradual approach between concrete materials, pictorial representations to abstract symbols and problems.
- For this to positively impact children's learning, it must be used from as early on as possible, particularly with new concepts.
- Unlike traditional maths teaching methods where teachers demonstrate how to solve problems, this approach brings concepts to life (doing stage) by allowing children to experience and handle physical concrete objects.

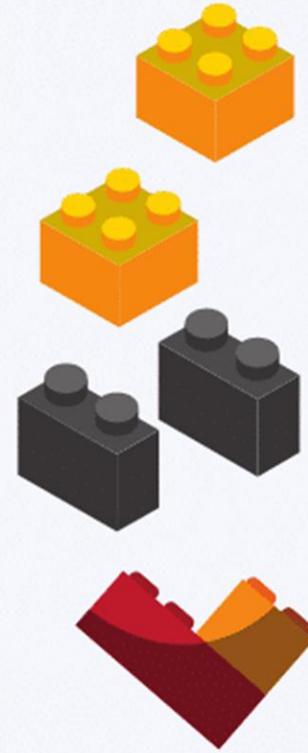
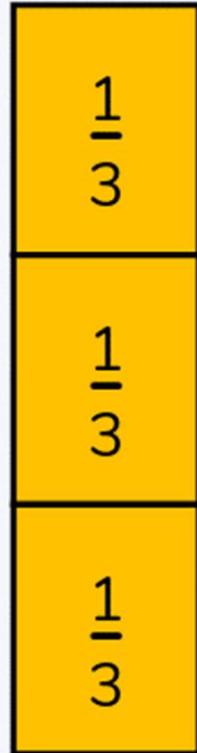
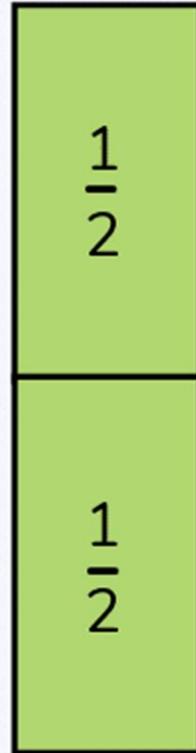
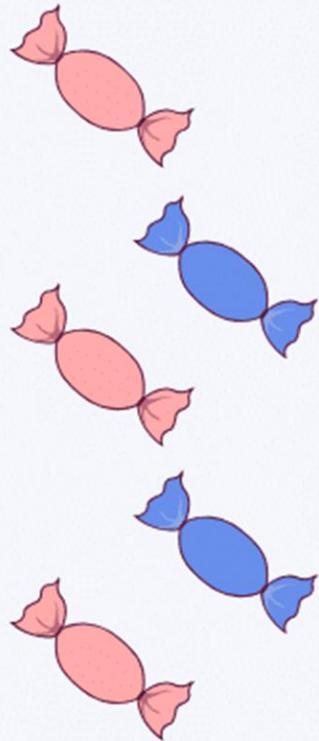
CPA

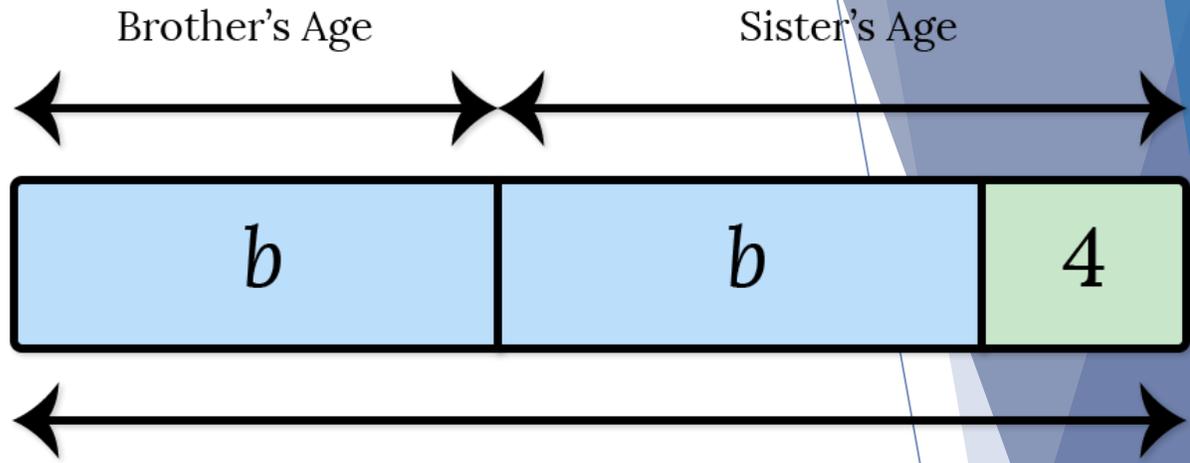
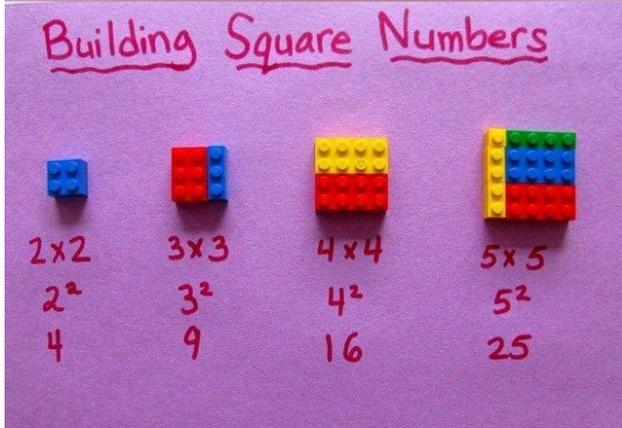
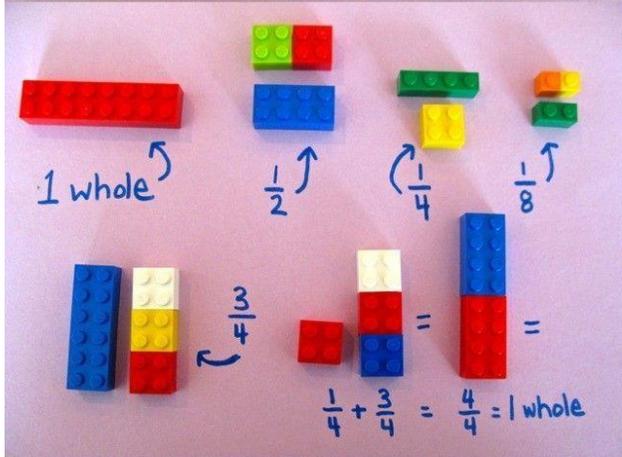
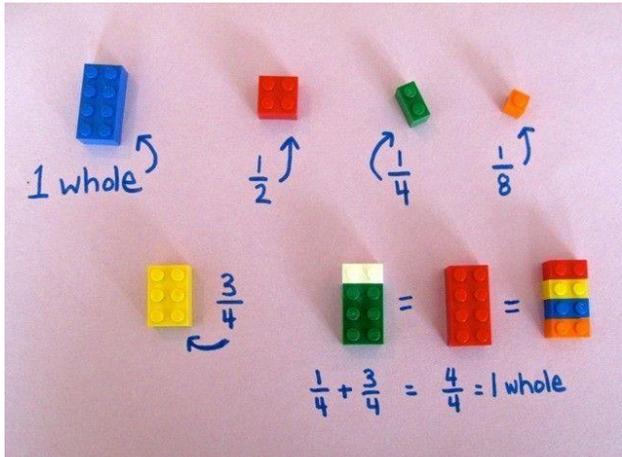
- ▶ **Concrete** is the doing stage - the physical objects.
- ▶ **Pictorial** is the 'seeing' stage which encourages children to make a mental connection between what is handled and the abstract pictures.
- ▶ **Abstract** is the symbolic stage (e.g. numbers, symbols).

CPA in KS2 - manipulatives



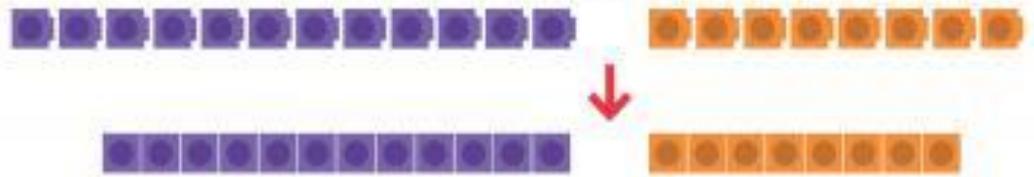
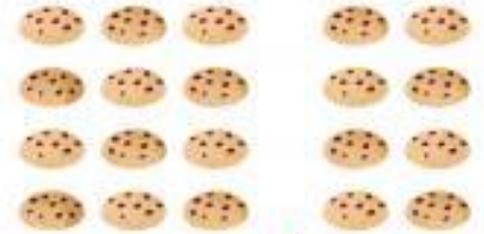
CPA in KS2 - fractions





26

Concrete to pictorial - drawing



© Maths - No Problem!



FRACTIONS OF AMOUNTS USING THE BAR MODEL

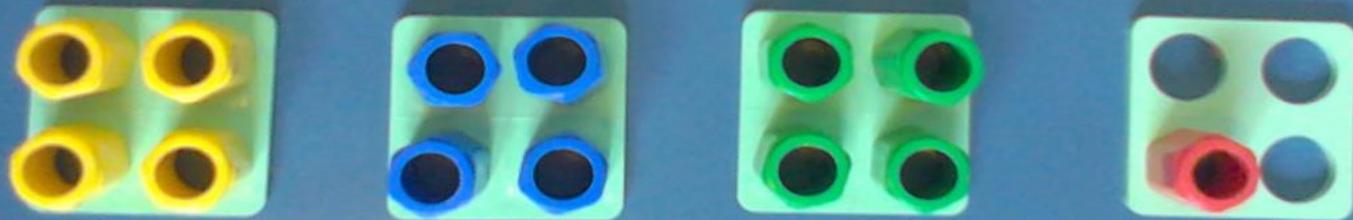


$$\frac{3}{5} \text{ of } 30 = 18$$

$$2 + \frac{1}{3} = \frac{3}{3} + \frac{3}{3} + \frac{1}{3} = \frac{7}{3}$$



Grammazzle



$$3 + \frac{1}{4} = \frac{4}{4} + \frac{4}{4} + \frac{4}{4} + \frac{1}{4} = \frac{13}{4}$$

$$2 \div \frac{1}{4} = 8$$

Concrete

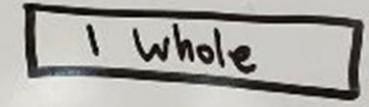
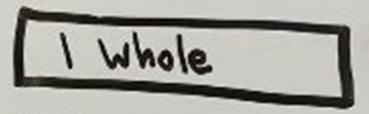


into pieces of $\frac{1}{4}$

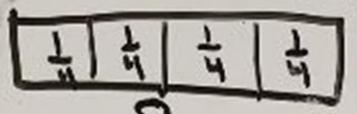
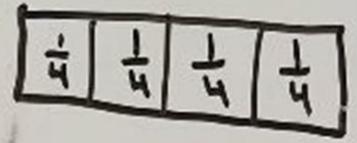


8

Representational



into pieces of $\frac{1}{4}$



8

Abstract

$$2 \div \frac{1}{4} = ?$$

Change Flip

$$\frac{2}{1} \times \frac{4}{1} = ?$$

$$2 \times 4 = 8$$

Is this 8 wholes or 8 of $\frac{1}{4}$?

2 divided into groups of $\frac{1}{4}$, equals 8

2. On a bus there are 16 passengers. $\frac{1}{2}$ are children. How many children are there?



8

4. In the classroom there are 15 children. $\frac{1}{3}$ chose maths as their favourite subject. How many children did not choose maths?



10

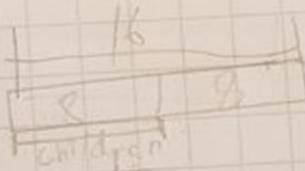
6. There are 24 hours in a day. Molly spends $\frac{1}{4}$ of her day at school. For how many hours is she at school? 6 hours



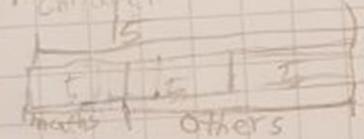
8. I am reading a book which is 55 pages long. I have read $\frac{1}{5}$ of it. How many pages have I got left to read?



10. There are 24 pupils in Justin's class. $\frac{1}{4}$ of the pupils go to the museum and $\frac{1}{3}$ of the pupils go to the theme park. How many children don't go on a trip?

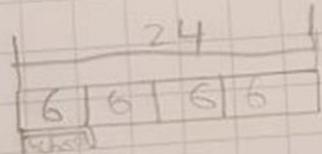


$$16 \div 2 = 8$$



$$15 \div 3 = 5$$

$$2 \times 5 = 10$$



$$24 \div 4 = 6$$



A final thought...

**THERE ARE 3 KINDS OF
PEOPLE IN THIS WORLD
THOSE WHO ARE GOOD AT MATH,
AND THOSE WHO AREN'T**

**WHAT IF THE
ALGEBRA
TEACHERS
ARE
REALLY
PIRATES,
AND ARE
USING
US TO
FIND THE "X"**



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DESPICABLEMEMINIIONS.ORG

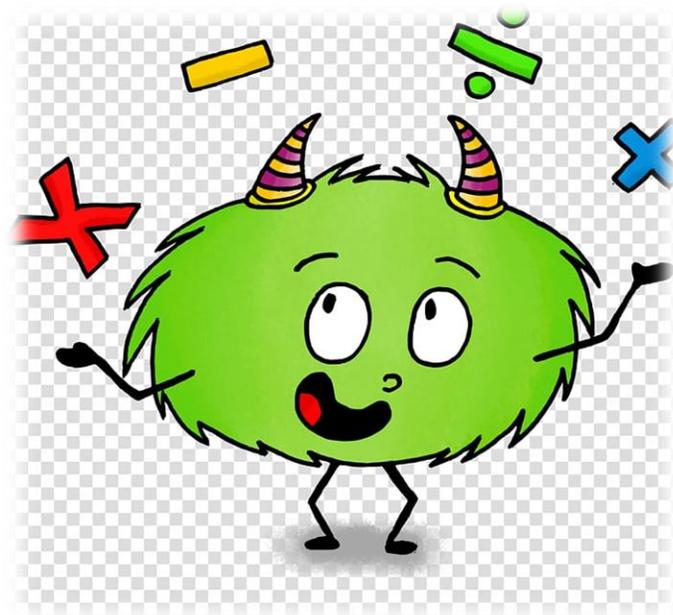
Around 34% of adults openly admit that they are 'bad at maths' in front of their children

Mathematics

MAY NOT TEACH US HOW TO
ADD **LOVE** OR MINUS **HATE**. BUT
IT GIVES US *EVERY* REASON TO
HOPE THAT **EVERY PROBLEM**
HAS A SOLUTION.

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Thank you for your
continued support!
Any Questions?

