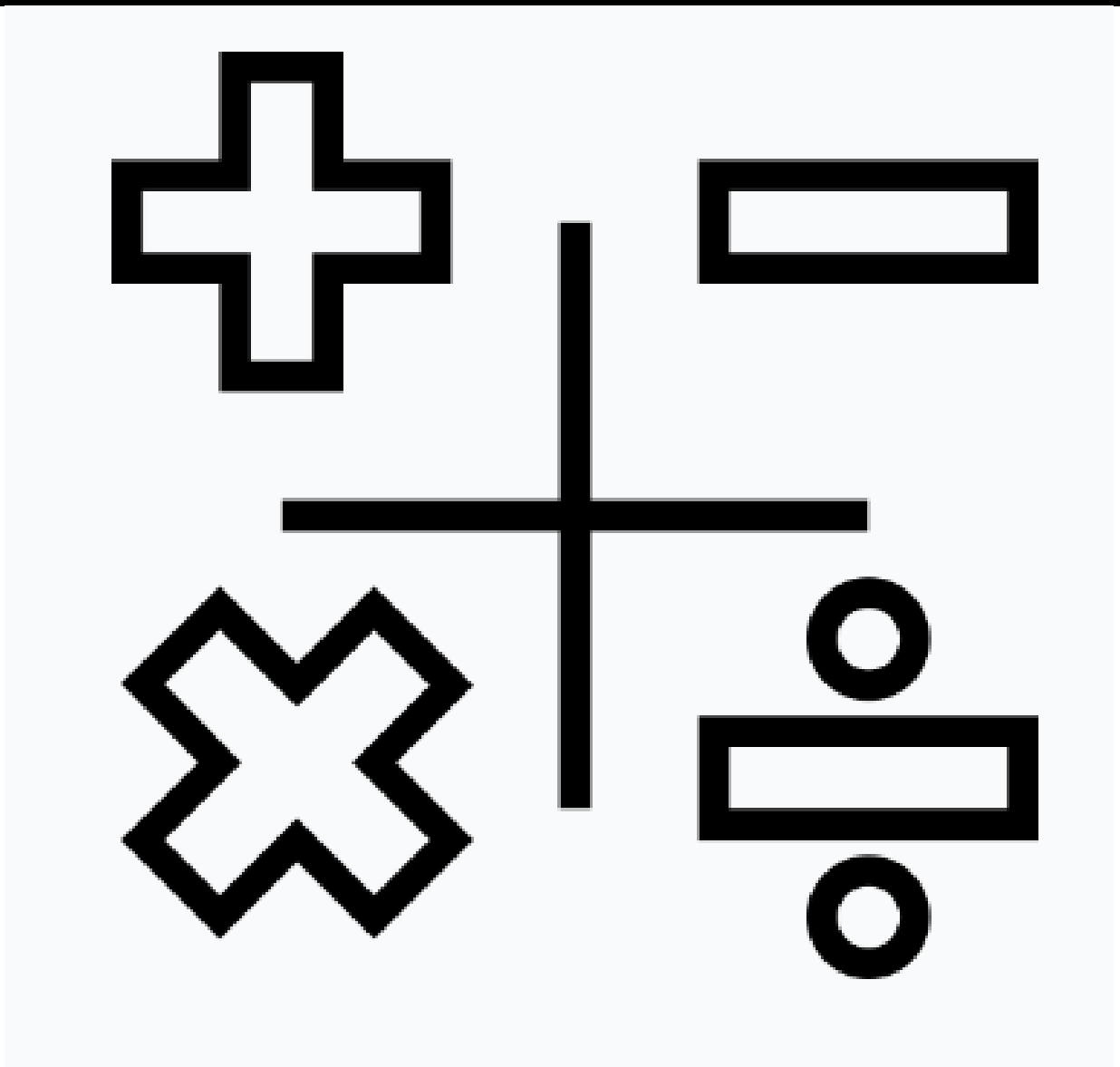
ACOMB PRIMARY SCHOOL



CALCULATION POLICY

ACOMB PRIMARY SCHOOL – CALCULATION POLICY

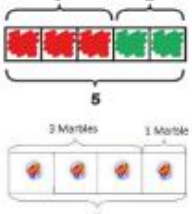
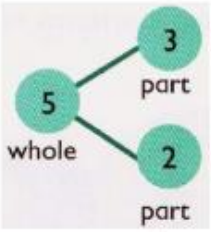
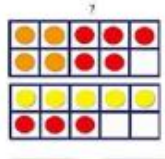
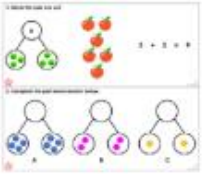
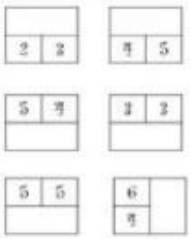
EYFS OUTCOMES - Addition

Children in Reception will be learning to:

- Count objects, actions and sounds
- Understand the 'one more than/one less than' relationship between consecutive numbers
- Link the number symbol (numeral) with its cardinal number value
- Subitise
- Explore the composition of numbers to 10
- Automatically recall number bonds for numbers 0–5 and some to 10
- Count beyond ten

Sentence Stems

- There are ___ objects.
- If I add one more, I would have ___
- How many are here?
- How many are there altogether?
- ____ add____ equals ____
- We have ___ more than ___
- We have ___ in total
- There are ___ here. There are ___ here. There are ___ altogether.

Concrete	Pictorial	Abstract
Use toys and general classroom resources for children to physically manipulate, group/regroup.	Two groups of pictures so children are able to count the total.	A focus on symbols and numbers to form a calculation. $5+2=7$
Use specific maths resources such as counters, snap cubes, Numicon etc.	 Bar model using visuals, pictures/icons or colours.	
Use visual supports such as ten frames, part part whole and addition mats with pictures/icons.	 	 No expectation for children to be able to record a number sentence/addition calculation.
Use visual supports such as ten frames, part part whole and addition mats, with the physical objects and resources that can be manipulated.		

ACOMB PRIMARY SCHOOL – CALCULATION POLICY

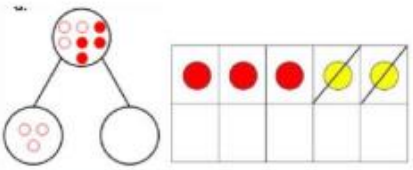
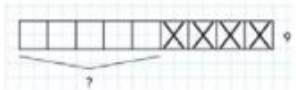
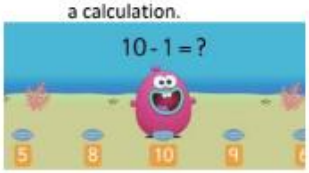
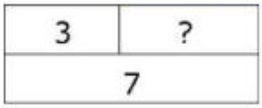
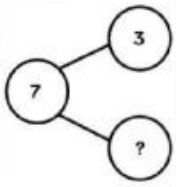
EYFS OUTCOMES - Subtraction

Children in Reception will be learning to:

- Count objects, actions and sounds
- Understand the 'one more than/one less than' relationship between consecutive numbers
- Link the number symbol (numeral) with its cardinal number value
- Subitise
- Explore the composition of numbers to 10
- Automatically recall number bonds for numbers 0–5 and some to 10
- Count beyond ten

Sentence Stems

- There are ___ objects.
- If I subtract one, I would have ___
- If I take away one, I would have ___
- How many are here?
- How many are there altogether?
- ____ subtract____ equals ____
- We have ___ more than ___
- We have ___ in total
- There are ___ here. There are ___ here. There are ___ altogether.

Concrete	Pictorial	Abstract
Use toys and general classroom resources for children to physically manipulate, group/regroup. Use specific maths resources such as snap cubes, Numicon, bead strings etc. Use visual supports such as ten frames, part part whole and subtraction mats, with the physical objects and resources that can be manipulated.	A group of pictures for children to cross out or cover quantities to support subtraction.   Use visual supports such as ten frames, part part whole and bar model with pictures/icons.	A focus on symbols and numbers to form a calculation.  10 - 6 = 4  7 - 3 = ?  * No expectation for children to be able to record a number sentence/addition calculation.

ACOMB PRIMARY SCHOOL – CALCULATION POLICY

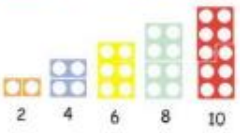
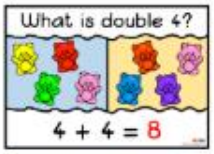
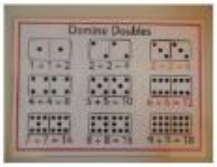
EYFS OUTCOMES - Multiplication

Children in Reception will be learning to:

- Count objects, actions and sounds
- Link the number symbol (numeral) with its cardinal number value
- Subitise
- Count beyond ten

Sentence Stems

- ____ shared equally between two is ____
- I shared ____ into ____ equal groups. There are ____ in each group.
- There will be ____ in each group.
- There are ____ groups of two.
- There are two more. Two more makes ____
- There are ____ groups of ten.
- There are ten more. Ten more makes ____

Concrete	Pictorial	Abstract
 Counting and other maths resources for children to make 2 equal groups. Physical and real life examples that encourage children to see concept of doubling as adding two equal groups.	  Pictures and icons that encourage children to see concept of doubling as adding two equal groups.	1+1= 7+7= 2+2= 8+8= 3+3= 9+9= 4+4= 10+10= 5+5= 11+11= 6+6= 12+12= Addition calculations to model adding two equal groups.

ACOMB PRIMARY SCHOOL – CALCULATION POLICY

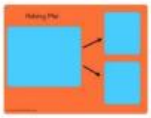
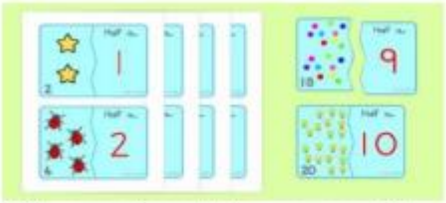
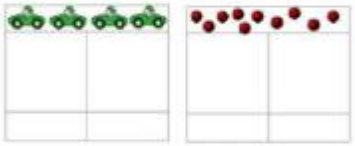
EYFS OUTCOMES - Division

Children in Reception will be learning to:

- Count objects, actions and sounds
- Link the number symbol (numeral) with its cardinal number value
- Subitise
- Count beyond ten

Sentence Stems

- ____ shared equally between two is ____
- I shared ____ into ____ equal groups. There are ____ in each group.
- There will be ____ in each group.
- There are ____ groups of two.
- There are ____ groups of ten.

Concrete	Pictorial	Abstract
Children have the opportunity to physically cut objects, food or shapes in half.  Use visual supports such as halving mats and part part whole with the physical objects and resources that can be manipulated Counting and other maths resources for children to explore sharing between 3 or more Counting and other maths resources for children to share into two equal groups.	 Pictures and icons that encourage children to see concept of halving in relation to subitising, addition and subtraction knowledge. i.e. Knowing 4 is made of 2 groups of 2, so half of 4 is 2.  Bar model with pictures or icons to support understanding of finding 2 equal parts of a number, to further understand how two halves make a whole. Pictures for children to create and visualise 3 or more	

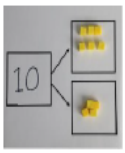
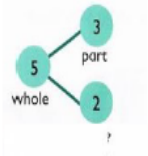
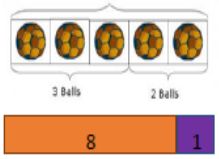
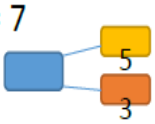
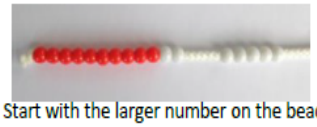
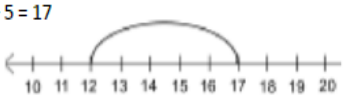
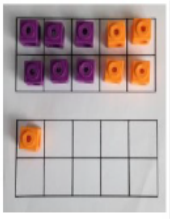
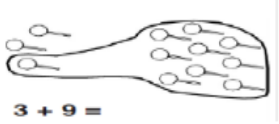
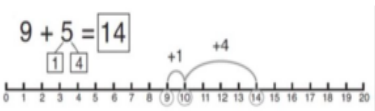
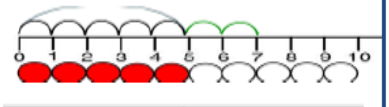
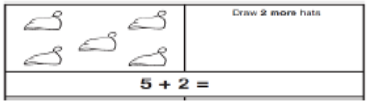
ACOMB PRIMARY SCHOOL – CALCULATION POLICY

YEAR 1 OUTCOMES - Addition

- Read, write and interpret mathematical statements involving addition (+) and equals (=) signs
- Represent and use number bonds and related subtraction facts within 20
- Add and subtract one-digit and two-digit numbers to 20, including
- Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ? – 9

Sentence Stems

- There are ___ objects.
- The whole is ____. The parts are ____ and ____
- ____ plus ____ is equal to____
- _____ is equal to ___ + ____.
- ____ subtract____ is equal to ____
- When we subtract, we start with the whole
- To find the unknown part/whole I need to____
- The difference between ____ and ____ is ____
- ____ is (so many) greater than _____

Objective & Strategy	Concrete	Pictorial	Abstract
Combining two parts to make a whole: part- whole model	 Use part part whole model. 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.	4 + 3 = 7  10= 6 + 4 Use the part-part whole diagram as shown above to move into the abstract.
Starting at the bigger number and counting on	 Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.	12 + 5 = 17  Start at the larger number on the number line and count on in ones or in one jump to find the answer.	5 + 12 = 17 Place the larger number in your head and count on the smaller number to find your answer.
Regrouping to make 10. *This is an essential skill for column addition later.*	6 + 5 = 11  Start with the bigger number and use the smaller number to make 10. Use ten frames.	 Use pictures or a number line. Regroup or partition the smaller number using the part part whole model to make 10. 	7 + 4= 11 If I am at seven, how many more do I need to make 10. How many more do I add on now?
Represent & use number bonds and related subtraction facts within 20	2 more than 5.	 	Emphasis should be on the language *'1 more than 5 is equal to 6.'* *'2 more than 5 is 7.'* *'8 is 3 more than 5.'*

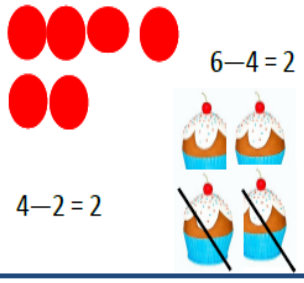
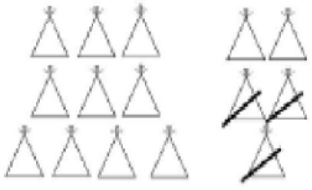
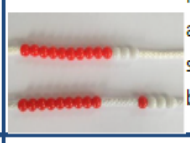
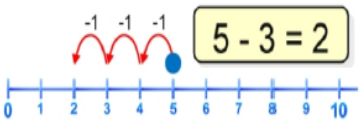
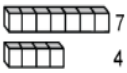
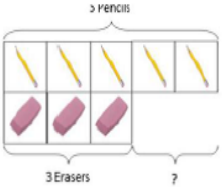
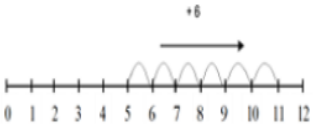
ACOMB PRIMARY SCHOOL – CALCULATION POLICY

YEAR 1 OUTCOMES - Subtraction

- Read, write and interpret mathematical statements involving subtraction (−) and equals (=) signs
- Represent and use number bonds and related subtraction facts within 20
- Subtract one-digit and two-digit numbers to 20, including 0
- Solve one-step problems that involve subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ? − 9

Sentence Stems

- There are ___ objects.
- The whole is ____. The parts are ____ and ____
- ____ plus ____ is equal to____
- _____ is equal to ___ + ____.
- ____ subtract____ is equal to ____
- When we subtract, we start with the whole
- To find the unknown part/whole I need to____
- The difference between ____ and ____ is ____
- ____ is (so many) greater than _____

Objective & Strategy	Concrete	Pictorial	Abstract
Taking away ones.	Use physical objects, counters , cubes etc to show how objects can be taken away.  6—4 = 2 4—2 = 2	 15 – 3 = 12 Cross out drawn objects to show what has been taken away.	7—4 = 3 16—9 = 7
Counting back	 Move objects away from the group, counting backwards.  Move the beads along the bead string as you count backwards.	 Count back in ones using a number line.	Put 13 in your head, count back 4. What number are you at?
Find the Difference	Compare objects and amounts  7 'Seven is 3 more than four' 4 'I am 2 years older than my sister'  Lay objects to represent bar model.	Count on using a number line to find the difference. 	Hannah has12 sweets and her sister has 5. How many more does Hannah have than her sister.?

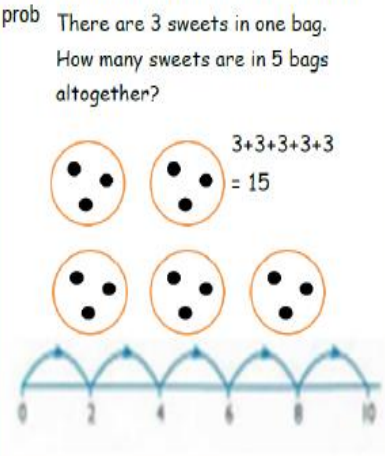
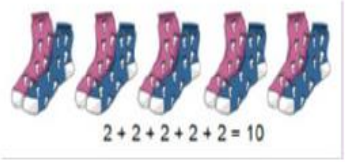
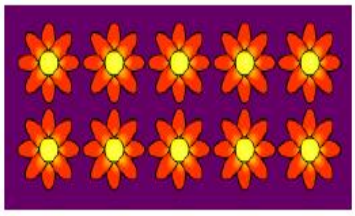
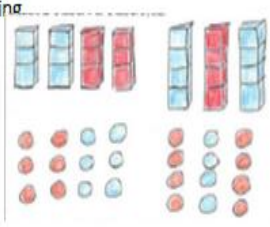
ACOMB PRIMARY SCHOOL – CALCULATION POLICY

YEAR 1 OUTCOMES – Multiplication

- Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher

Sentence Stems

- ____ groups of____ are equal to____
- ____ shared equally into groups of ____ makes ____ groups.
- I shared ____ into ____ equal groups. There are ____ in each group.
- The pattern is increasing in ____
- The pattern is decreasing in ____
- There are ____ groups of ten. There are ____ ones.
- ____ groups of ten are equal to ____
- ____ groups of two are equal to ___,
- There will be ____ in each group.

Objective & Strategy	Concrete	Pictorial	Abstract
Repeated addition	Use different objects to add equal groups	Use pictorial including number lines to solve prob 	Write addition sentences to describe objects and pictures. 
Understanding arrays	Use objects laid out in arrays to find the answers to 2 lots 5, 3 lots of 2 etc. 	Draw representations of arrays to show understanding 	3 x 2 = 6 2 x 5 = 10

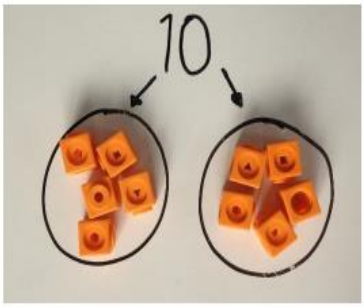
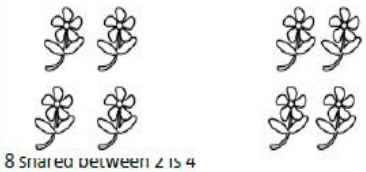
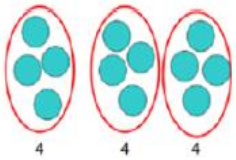
ACOMB PRIMARY SCHOOL – CALCULATION POLICY

YEAR 1 OUTCOMES – Division

- Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher

Sentence Stems

- ____ groups of____ are equal to____
- ____ shared equally into groups of ____ makes ____ groups.
- I shared ____ into ____ equal groups. There are ____ in each group.
- The pattern is increasing in ____
- The pattern is decreasing in ____
- There are ____ groups of ten. There are ____ ones.
- ____ groups of ten are equal to ____
- ____ groups of two are equal to ___,
- There will be ____ in each group.

Objective & Strategy	Concrete	Pictorial	Abstract
Division as sharing *Use Gordon ITPs for modelling*	  I have 10 cubes, can you share them equally in 2 groups?	Children use pictures or shapes to share quantities.  8 shared between 2 is 4 Sharing:  12 shared between 3 is 4	12 shared between 3 is 4

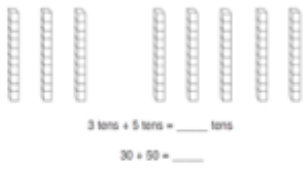
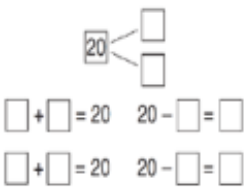
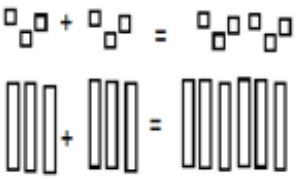
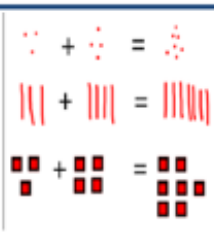
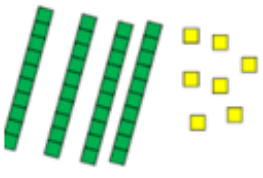
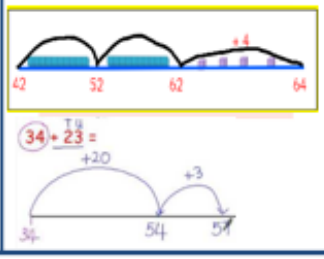
ACOMB PRIMARY SCHOOL – CALCULATION POLICY

YEAR 2 OUTCOMES – Addition

- Applying their increasing knowledge of mental and written methods
- Add numbers using concrete objects, pictorial representations, and mentally, including:
  - a two-digit number and 1s
  - a two-digit number and 10s
  - 2 two-digit numbers
  - adding 3 one-digit numbers
- Show that addition of 2 numbers can be done in any order (commutative)

Sentence Stems

- Picture tells me I need to add/subtract the numbers.
- The parts are known/unknown.
- The whole is known/unknown.
- I can partition ____ into ____ and ____.
- ____ ones/tens add ____ ones/tens is equal to ____.
- I will regroup one ten for ten ones.
- ____ plus ____ is equal to____
- ____ subtract____ is equal to ____
- When we subtract, we start with the whole
- ____ and ____ have a difference of ____

Objective & Strategy	Concrete	Pictorial	Abstract
Adding multiples of ten	50= 30 = 20 Model using dienes and bead strings	 3 tens + 5 tens = ____ tens 30 + 50 = ____ Use representations for base ten.	20 + 30 = 50 70 = 50 + 20 40 + □ = 60
Use known number facts Part part whole	 Children explore ways of making numbers within 20	 □ + □ = 20 20 − □ = □ □ + □ = 20 20 − □ = □	□ + 1 = 16 16 − 1 = □ 1 + □ = 16 16 − □ = 1
Using known facts		 Children draw representations of H,T and O	3 + 4 = 7 *leads to* 30 + 40 = 70 *leads to* 300 + 400 = 700
Addition on a number line	 Use of dienes to add	 42 52 62 64 34 + 23 = +20 +3 34 54 57	34 + 23 = 57

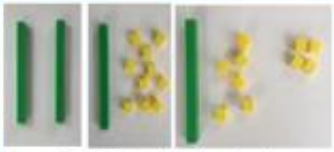
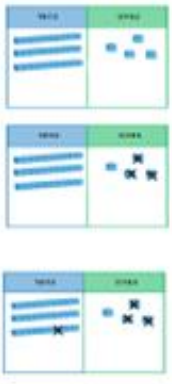
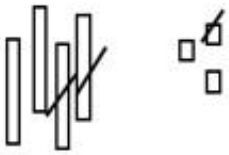
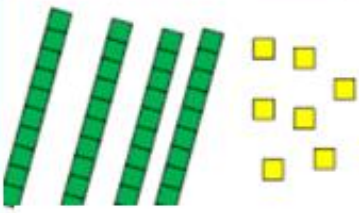
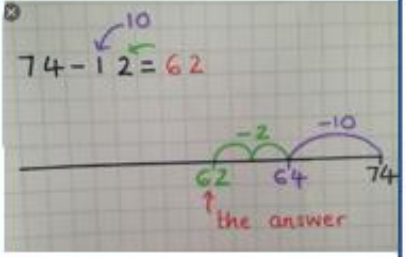
ACOMB PRIMARY SCHOOL – CALCULATION POLICY

YEAR 2 OUTCOMES – Subtraction

- Applying their increasing knowledge of mental and written methods
- Add numbers using concrete objects, pictorial representations, and mentally, including:
  - a two-digit number and 1s
  - a two-digit number and 10s
  - 2 two-digit numbers
  - adding 3 one-digit numbers
- Show that addition of 2 numbers can be done in any order (commutative)

Sentence Stems

- picture tells me I need to add/subtract the numbers.
- The parts are known/unknown.
- The whole is known/unknown.
- I can partition ____ into ____ and ____.
- ____ ones/tens add ____ ones/tens is equal to ____.
- I will regroup one ten for ten ones.
- ____ plus ____ is equal to____
- ____ subtract____ is equal to ____
- When we subtract, we start with the whole
- ____ and ____ have a difference of ____

Objective & Strategy	Concrete	Pictorial	Abstract
Regroup a ten into ten ones	 Use a PV chart to show how to change a ten into ten ones, use the term 'take and make'	20 — 4 =	20—4 = 16
Partitioning to subtract without re-grouping. *'Friendly numbers'*	34—13 = 21  Use Dienes to show how to partition the number when subtracting without regrouping.	Children draw representations of Dienes and cross off.  43—21 = 22	43—21 = 22
Subtraction on a numberline	 Use of dienes to subtract		74 – 12 = 62

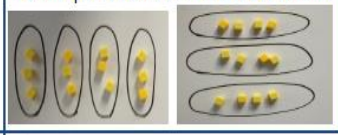
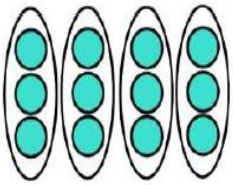
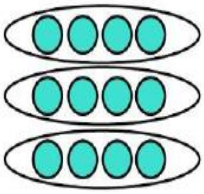
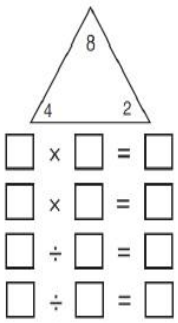
ACOMB PRIMARY SCHOOL – CALCULATION POLICY

YEAR 2 OUTCOMES – Multiplication

- Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs
- Show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot
- Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts

Sentence Stems

- There are ____ parts with a value of ____.
- The whole is ____.
- ____ groups of ____ is equal to ____.
- ____ shared into ____ equal parts ____ is ____.
- ____ divided by ____ is equal to ____.
- When we multiply, the parts are known but the whole is unknown.
- When we divide, the whole is known and the number or parts or the value of the parts is unknown
- ____ multiplied by/divided by ____ is equal to ____.
- Numbers in the multiplication table of ____ always ____

Objective & Strategy	Concrete	Pictorial	Abstract
Multiplication is commutative	Create arrays using counters and cubes and Numicon. Pupils should understand that an array can represent different equations and that, as multiplication is commutative, the order of the multiplication does not affect the answer. 	Use representations of arrays to show different calculations and explore commutativity.  	12 = 3 × 4 12 = 4 × 3 Use an array to write multiplication sentences and reinforce repeated addition. 5 + 5 + 5 = 15 3 + 3 + 3 + 3 + 3 = 15 5 x 3 = 15 3 x 5 = 15
Using the Inverse *This should be taught alongside division, so pupils learn how they work alongside each other.*			2 x 4 = 8 4 x 2 = 8 8 ÷ 2 = 4 8 ÷ 4 = 2 8 = 2 x 4 8 = 4 x 2 2 = 8 ÷ 4 4 = 8 ÷ 2 Show all 8 related fact family sentences.

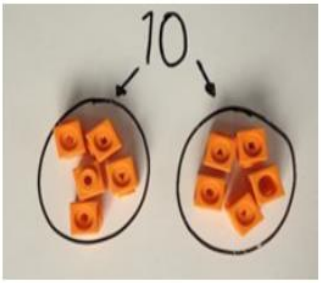
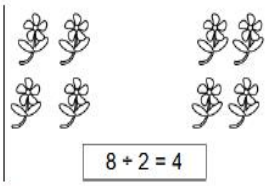
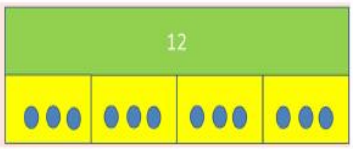
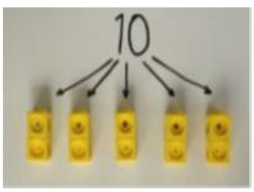
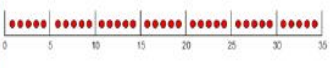
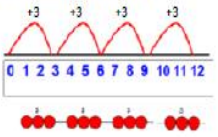
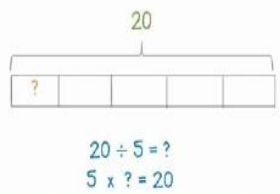
ACOMB PRIMARY SCHOOL – CALCULATION POLICY

YEAR 2 OUTCOMES – Division

- Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs
- Show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot
- Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts

Sentence Stems

- There are ____ parts with a value of ____.
- The whole is ____.
- ____ groups of ____ is equal to ____.
- ____ shared into ____ equal parts ____ is ____.
- ____ divided by ____ is equal to ____.
- When we multiply, the parts are known but the whole is unknown.
- When we divide, the whole is known and the number or parts or the value of the parts is unknown
- ____ multiplied by/divided by ____ is equal to ____.
- Numbers in the multiplication table of ____ always ____

Objective & Strategy	Concrete	Pictorial	Abstract
Division as sharing	 I have 10 cubes, can you share them equally in 2 groups?	Children use pictures or shapes to share quantities.  8 ÷ 2 = 4 Children use bar modelling to show and support understanding.  12 ÷ 4 = 3	12 ÷ 3 = 4
Division as grouping	Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.  	Use number lines for grouping  12 ÷ 3 = 4 Think of the bar as a whole. Split it into the number of groups you are dividing by and work out how many would be within each group. 	28 ÷ 7 = 4 Divide 28 into 7 groups. How many are in each group?

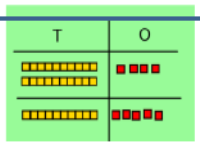
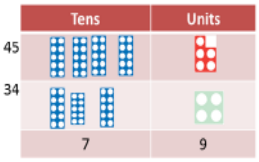
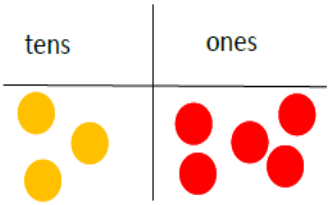
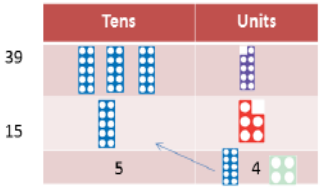
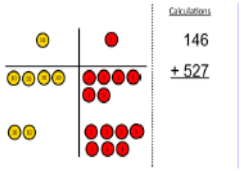
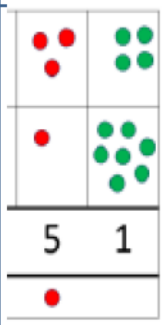
ACOMB PRIMARY SCHOOL – CALCULATION POLICY

YEAR 3 OUTCOMES – Addition

- Add and subtract numbers mentally, including:
  - a three-digit number and 1s
  - a three-digit number and 10s
  - a three-digit number and 100s
- Add and subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction
- Estimate the answer to a calculation and use inverse operations to check answers
- Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction

Sentence Stems

- The calculation tells me I need to add/ subtract the numbers.
- If the column total is equal to ten or more we must regroup.
- Whole minus/subtract a part is equal to the difference.
- I will regroup one hundred for ten tens.
- ____ plus ____ is equal to____
- ____ subtract____ is equal to ____
- When we subtract, we start with the whole
- ____ ones/tens/hundred add ____ ones/tens/hundred is equal to ____.

Objective & Strategy	Concrete	Pictorial	Abstract
Column Addition—no regrouping (friendly numbers) Add two or three 2 or 3-digit numbers.	 Model using Dienes or numicon Add together the ones first, then the tens.  Move to using place value counters	Children move to drawing the counters using a tens and one frame. 	2 2 3 + 1 1 4 3 3 7 Add the ones first, then the tens, then the hundreds.
Column Addition with regrouping.	 Exchange ten ones for a ten. Model using numicon and pv counters. 	 Children can draw a representation of the grid to further support their understanding, carrying the ten **underneath** the line	20 + 5 40 + 8 60 + 13 = 73 Start by partitioning the numbers before formal column to show the exchange. 536 + 85 621 1 1

ACOMB PRIMARY SCHOOL – CALCULATION POLICY

YEAR 3 OUTCOMES – Subtraction

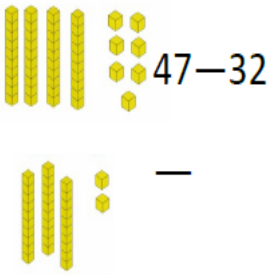
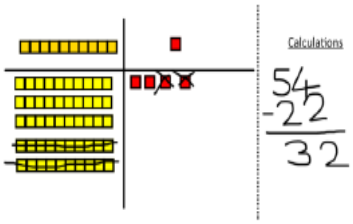
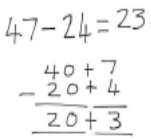
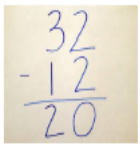
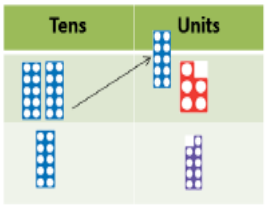
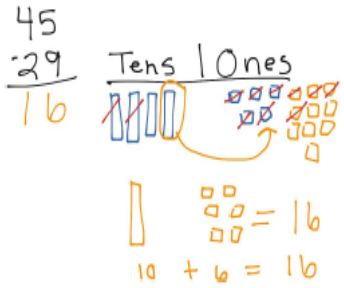
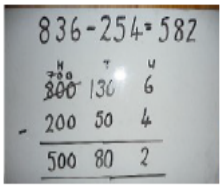
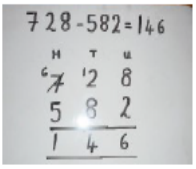
- Subtract numbers mentally, including:

a three-digit number and 1s
a three-digit number and 10s
a three-digit number and 100s

- Subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction
- Estimate the answer to a calculation and use inverse operations to check answers
- Solve problems, including missing number problems, using number facts, place value, and more complex subtraction

Sentence Stems

- The calculation tells me I need to add/ subtract the numbers.
- If the column total is equal to ten or more we must regroup.
- Whole minus/subtract a part is equal to the difference.
- I will regroup one hundred for ten tens.
- ____ plus ____ is equal to____
- ____ subtract____ is equal to ____
- When we subtract, we start with the whole
- ____ ones/tens/hundred add ____ ones/tens/hundred is equal to ____.

Objective & Strategy	Concrete	Pictorial	Abstract
Column subtraction without regrouping (friendly numbers)	 Use base 10 or Numicon to model	 Darw representations to support under-standing	 Intermediate step may be needed to lead to clear subtraction under-standing. 
Column subtraction with regrouping	 Begin with base 10 or Numicon. Move to pv counters, modelling the exchange of a ten into tten ones. Use the phrase 'take and make' for exchange.	 Children may draw base ten or PV counters and cross off.	 Begin by parti-tioning into pv columns  Then move to formal method.

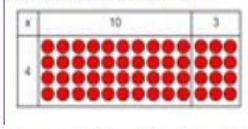
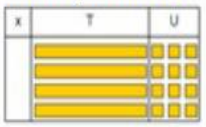
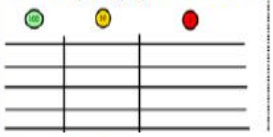
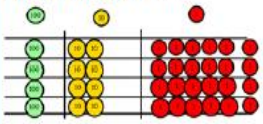
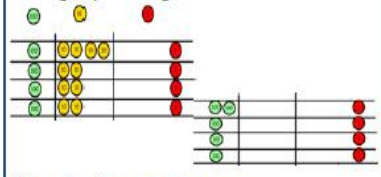
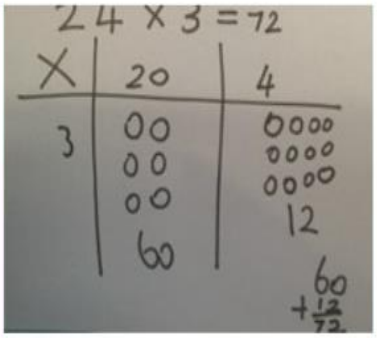
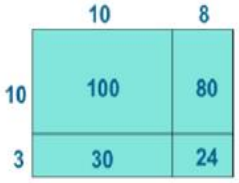
ACOMB PRIMARY SCHOOL – CALCULATION POLICY

YEAR 3 OUTCOMES – Multiplication

- Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
- Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods
- Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects

Sentence Stems

- To find ten times as many, multiply by ten.
- ____ is a multiple of ____ because ____
- ____ multiplied by ____ is equal to ____.
- ____ divided by ____ is equal to ____.
- Products in the ____ time table are also in the ____ time table.
- When we multiply, the parts are known but the whole is unknown.
- When we divide, the whole is known and the number or parts or the value of the parts is also known.
- ____ x ____ is the same as ____ groups of ____

Objective & Strategy	Concrete	Pictorial	Abstract
Grid method	Show the links with arrays to first introduce the grid method.  4 rows of 10 4 rows of 3 Move onto base ten to move towards a more compact method.  4 rows of 13 Move on to place value counters to show how we are finding groups of a number. We are multiplying by 4 so we need 4 rows  Calculations 4 x 126 Fill each row with 126  Calculations 4 x 126 Add up each column, starting with the ones making any exchanges needed  Then you have your answer.	Children can represent their work with place value counters in a way that they understand. They can draw the counters using colours to show different amounts or just use the circles in the different columns to show their thinking as shown below.  Bar model are used to explore missing numbers 	Start with multiplying by one digit numbers and showing the clear addition alongside the grid. 210 + 35 = 245 Moving forward, multiply by a 2 digit number showing the different rows within the grid method. 

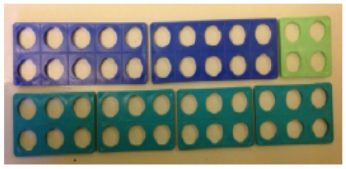
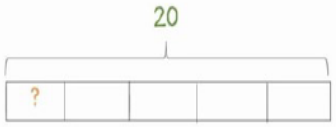
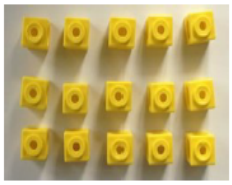
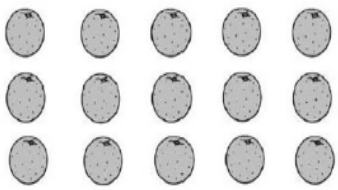
ACOMB PRIMARY SCHOOL – CALCULATION POLICY

YEAR 3 OUTCOMES – Division

- Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
- Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods
- Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects

Sentence Stems

- To find ten times as many, multiply by ten.
- ____ is a multiple of ____ because ____
- ____ multiplied by ____ is equal to ____.
- ____ divided by ____ is equal to ____.
- Products in the ____ time table are also in the ____ time table.
- When we multiply, the parts are known but the whole is unknown.
- When we divide, the whole is known and the number or parts or the value of the parts is also known.
- ____ x ____ is the same as ____ groups of ____

Objective & Strategy	Concrete	Pictorial	Abstract
Division as grouping	Use cubes, counters, objects or place value counters to aid understanding.  24 divided into groups of 6 = 4 96 ÷ 3 = 32 	Continue to use bar modelling to aid solving division problems.  20 ÷ 5 = ? 5 x ? = 20	How many groups of 6 in 24? 24 ÷ 6 = 4
Division with arrays	 Link division to multiplication by creating an array and thinking about the number sentences that can be created. Eg 15 ÷ 3 = 5 5 x 3 = 15 15 ÷ 5 = 3 3 x 5 = 15	Draw an array and use lines to split the array into groups to make multiplication and division sentences 	Find the inverse of multiplication and division sentences by creating eight linking number sentences. 7 x 4 = 28 4 x 7 = 28 28 ÷ 7 = 4 28 ÷ 4 = 7 28 = 7 x 4 28 = 4 x 7 4 = 28 ÷ 7 7 = 28 ÷ 4

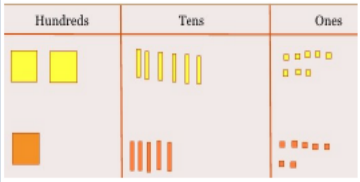
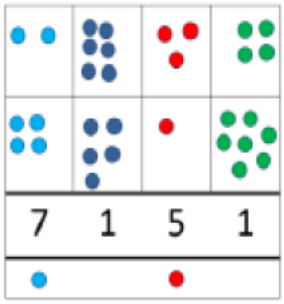
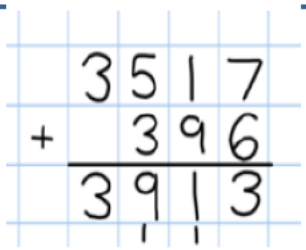
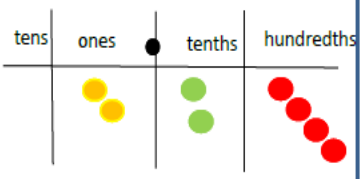
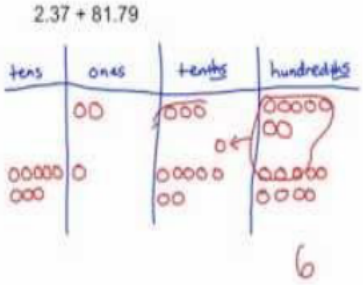
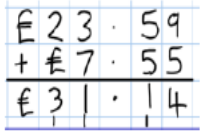
ACOMB PRIMARY SCHOOL – CALCULATION POLICY

YEAR 4 OUTCOMES – Addition

- Add and numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate
- Estimate and use inverse operations to check answers to a calculation
- Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why

Sentence Stems

- The calculation tells me I need to add/subtract the numbers.
- If the column total is equal to ten or more we must regroup.
- Whole minus/subtract a part is equal to the difference.
- I will regroup one hundred for ten tens.
- ____ plus ____ is equal to____
- ____ thousand add ____ thousand is equal to ____.
- When we subtract, we start with the whole
- ____ tenths/hundredths plus ____ tenths/hundredths is equal to ____.
- ____ tenths/hundredths minus ____ tenths/hundredths is equal to ____.

Objective & Strategy	Concrete	Pictorial	Abstract
Y4—add numbers with up to 4 digits	Children continue to use dienes or pv counters to add, exchanging ten ones for a ten and ten tens for a hundred and ten hundreds for a thousand. 	 Draw representations using pv grid.	 Continue from previous work to carry hundreds as well as tens. Relate to money and measures.
Y5—add numbers with more than 4 digits. Add decimals with 2 decimal places, including money.	As year 4  Introduce decimal place value counters and model exchange for addition.		72.8 + 54.6 127.4 1 1 

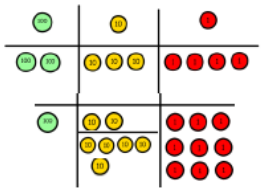
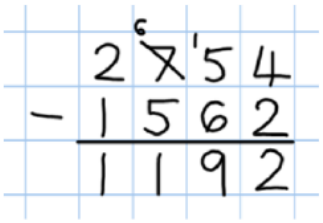
ACOMB PRIMARY SCHOOL – CALCULATION POLICY

YEAR 4 OUTCOMES – Subtraction

- Subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate
- Estimate and use inverse operations to check answers to a calculation
- Solve subtraction two-step problems in contexts, deciding which operations and methods to use and why

Sentence Stems

- The calculation tells me I need to add/subtract the numbers.
- If the column total is equal to ten or more we must regroup.
- Whole minus/subtract a part is equal to the difference.
- I will regroup one hundred for ten tens.
- ____ plus ____ is equal to____
- ____ thousand add ____ thousand is equal to ____.
- When we subtract, we start with the whole
- ____ tenths/hundredths plus ____ tenths/hundredths is equal to ____.
- ____ tenths/hundredths minus ____ tenths/hundredths is equal to ____.

Objective & Strategy	Concrete	Pictorial	Abstract
Subtracting tens and ones Year 4 subtract with up to 4 digits. *Introduce decimal subtraction through context of money*	234 - 179  Model process of exchange using Numicon, base ten and then move to PV counters.	Children to draw pv counters and show their exchange—see Y3	 Use the phrase 'take and make' for exchange

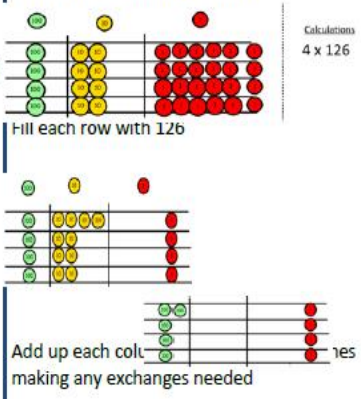
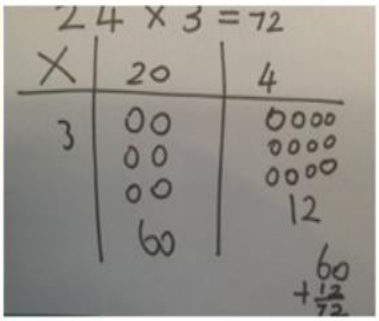
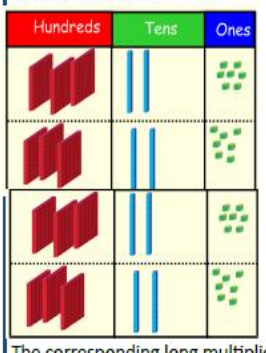
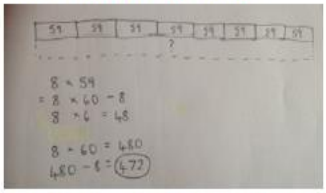
ACOMB PRIMARY SCHOOL – CALCULATION POLICY

YEAR 4 OUTCOMES – Multiplication

- Recall multiplication and division facts for multiplication tables up to 12 × 12
- Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together 3 numbers
- Recognise and use factor pairs and commutativity in mental calculations
- Multiply two-digit and three-digit numbers by a one-digit number using formal written layout
- Solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects

Sentence Stems

- When zero is a factor, the product is zero.
- For every group of one twelve, there are two groups of six.
- All multiple of tens have a ones digit of zero.
- ____ is divided into groups of ____.There are ____ groups and a remainder of ____.
- Products in the ____ time table are also in the ____ time table.
- The remainder is always less than the divisor.
- When we divide, the whole is known and the number or parts or the value of the parts is also known.
- All multiples of one hundred have both a tens and ones digit of zero.

Objective & Strategy	Concrete	Pictorial	Abstract
Grid method recap from year 3 for 2 digits x 1 digit Move to multiplying 3 digit numbers by 1 digit. (year 4 expectation)	Use place value counters to show how we are finding groups of a number. We are multiplying by 4 so we need 4 rows  Fill each row with 126 Add up each col… …es making any exchanges needed	Children can represent their work with place value counters in a way that they understand. They can draw the counters using colours to show different amounts or just use the circles in the different columns to show their thinking as shown below.  	Start with multiplying by one digit numbers and showing the clear addition alongside the grid. | × | 30 | 5 | | --- | --- | --- | | 7 | 210 | 35 | 210 + 35 = 245
Column multiplication	Children can continue to be supported by place value counters at the stage of multiplication. This initially done where there is no regrouping. 321 x 2 = 642  It is important at this stage that they always multiply the ones first. The corresponding long multiplication is modelled alongside	| x | 300 | 20 | 7 | | --- | --- | --- | --- | | 4 | 1200 | 80 | 28 | The grid method my be used to show how this relates to a formal written method.  Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods.	327 x 4 28 80 1200 1308 3 2 7 x 4 1 3 0 8 1 2 This may lead to a compact method.

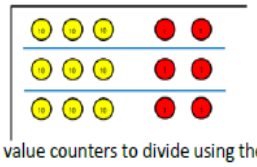
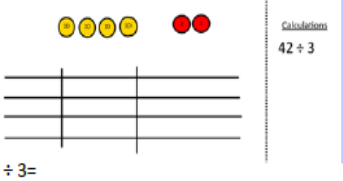
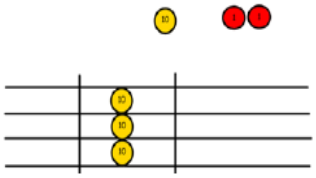
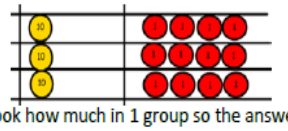
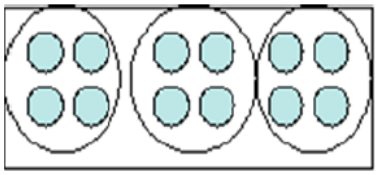
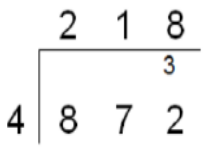
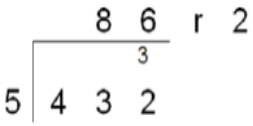
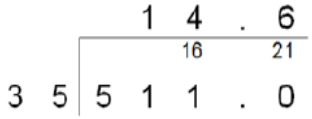
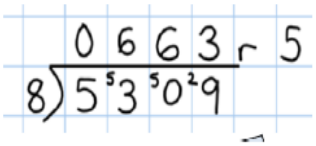
ACOMB PRIMARY SCHOOL – CALCULATION POLICY

YEAR 4 OUTCOMES – Division

- Recall multiplication and division facts for multiplication tables up to 12 × 12
- Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together 3 numbers
- Recognise and use factor pairs and commutativity in mental calculations
- Multiply two-digit and three-digit numbers by a one-digit number using formal written layout
- Solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects

Sentence Stems

- When zero is a factor, the product is zero.
- For every group of one twelve, there are two groups of six.
- All multiple of tens have a ones digit of zero.
- ____ is divided into groups of ____.There are ____ groups and a remainder of ____.
- Products in the ____ time table are also in the ____ time table.
- The remainder is always less than the divisor.
- When we divide, the whole is known and the number or parts or the value of the parts is also known.
- All multiples of one hundred have both a tens and ones digit of zero.

Objective & Strategy	Concrete	Pictorial	Abstract
Divide at least 3 digit numbers by 1 digit. Short Division	96 ÷ 3 Tens Units 3 2 3  Use place value counters to divide using the bus stop method alongside  42 ÷ 3= Start with the biggest place value, we are sharing 40 into three groups. We can put 1 ten in each group and we have 1 ten left over.  We exchange this ten for ten ones and then share the ones equally among the groups.  We look how much in 1 group so the answer is 14.	Students can continue to use drawn diagrams with dots or circles to help them divide numbers into equal groups.  Encourage them to move towards counting in multiples to divide more efficiently.	Begin with divisions that divide equally with no remainder.  Move onto divisions with a remainder.  Finally move into decimal places to divide the total accurately.  

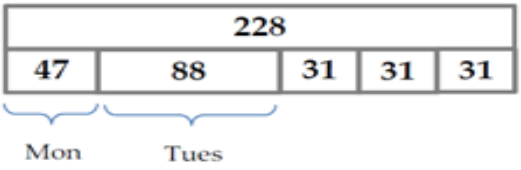
ACOMB PRIMARY SCHOOL – CALCULATION POLICY

YEAR 5 OUTCOMES – Addition

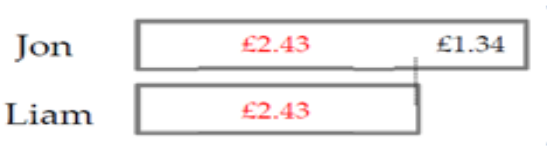
- Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
- Add and subtract numbers mentally with increasingly large numbers
- Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
- Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

- The most efficient way to add these numbers is by ____ because ____
- ____ tens plus the ____ we already have, gives us ____
- To subtract ____ from ____ I can partition ____ into ____
- The calculation tells me I need to add/subtract the numbers.
- If the column total is equal to ten or more we must regroup.
- Whole minus/subtract a part is equal to the difference.
- I will regroup one hundred for ten tens.
- ____ thousandths plus ____ thousandths is equal to ____.
- ____ thousandths minus ____ thousandths is equal to ____.

Addition, Subtraction, Multiplication & Division (multi-step and combination of operations)



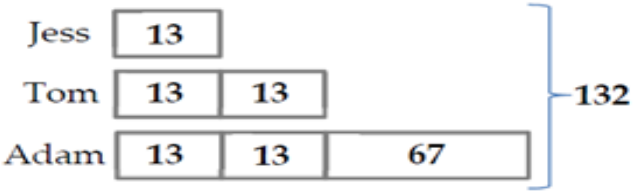
e.g. On Monday, Sarah reads 47 pages of her book and another 88 on Tuesday. If the book has 228 pages and she shares the rest of the pages over 3 days, how many pages will she read each day?



£6.20 – £1.34 = £4.86

£4.86 ÷ 2 = £2.43

e.g. Jon has £1.34 more than Liam. If they have £6.20 in total, how much do they both have?



132 – 67 = 65

65 ÷ 5 = 13

Jess: 13
Tom: 26
Adam: 93

e.g. Tom has twice as many colouring pencils as Jess, but 67 less than Adam. They have 132 altogether. How many do they each have?

ACOMB PRIMARY SCHOOL – CALCULATION POLICY

YEAR 5 OUTCOMES – Subtraction

- Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
- Add and subtract numbers mentally with increasingly large numbers
- Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
- Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

- The most efficient way to add these numbers is by ____ because ____
- ____ tens plus the ____ we already have, gives us ____
- To subtract ____ from ____ I can partition ____ into ____
- The calculation tells me I need to add/subtract the numbers.
- If the column total is equal to ten or more we must regroup.
- Whole minus/subtract a part is equal to the difference.
- I will regroup one hundred for ten tens.
- ____ thousandths plus ____ thousandths is equal to ____.
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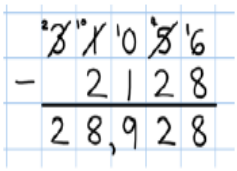
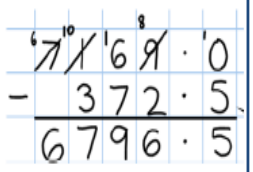
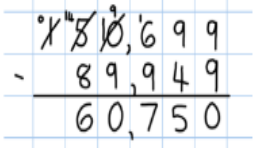
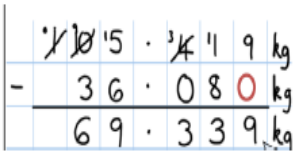
Year 5- Subtract with at least 4 digits, including money and measures. *Subtract with decimal values, including mixtures of integers and decimals and aligning the decimal*	As Year 4	Children to draw pv counters and show their exchange—see Y3	 Use zeros for place-holders. 
Year 6—Subtract with increasingly large and more complex numbers and decimal values.			 

ACOMB PRIMARY SCHOOL – CALCULATION POLICY

YEAR 5 OUTCOMES – Multiplication

- Identify multiples and factors, including finding all factor pairs of a number, and common factors of 2 numbers
- Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers
- Establish whether a number up to 100 is prime and recall prime numbers up to 19
- Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers
- Multiply and divide numbers mentally, drawing upon known facts
- Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context
- Multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000
- Recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3})
- Solve problems involving multiplication and division, including using their knowledge of factors and multiples, squares and cubes
- Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
- Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates

- ____ is a factor/multiple of ____ because ____ x ____ = ____
- ____ is a factor/multiple of ____ because ____ ÷ ____ = ____
- Numbers that have more than two factors are composite numbers.
- Numbers that have only two factors are called prime numbers.
- ____ is not prime because it has the factors ____
- ____ is prime because it only has two factors: 1 and itself.
- ____ squared is ____. The square root of ____ is ____.
- If I multiply ____ by two, I must divide ____ by two for the product to stay the same.

2741 × 6 becomes

	2	7	4	1
×				6
1	6	4	4	6
	4	2		

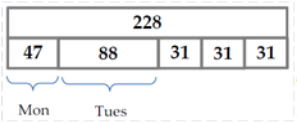
Answer: 16 446

124 × 26 becomes

		1	2	
	1	2	4	
×		2	6	
	7	4	4	
2	4	8	0	
3	2	2	4	
	1	1		

Answer: 3224

Addition, Subtraction, Multiplication & Division (multi-step and combination of operations)



e.g. On Monday, Sarah reads 47 pages of her book and another 88 on Tuesday. If the book has 228 pages and she shares the rest of the pages over 3 days, how many pages will she read each day?

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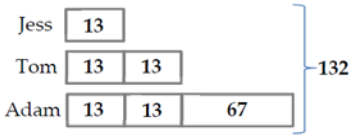

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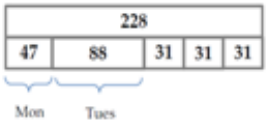
- ____ is not prime because it has the factors ____
- ____ is prime because it only has two factors: 1 and itself.
- ____ squared is ____. The square root of ____ is ____.
- If I multiply ____ by two, I must divide ____ by two for the product to stay the same.

$$5\overline{)123} = 24\tfrac{3}{5}$$

£12.60 ÷ 4 becomes

$$4\overline{)12.60} = £3.15$$

Addition, Subtraction, Multiplication & Division (multi-step and combination of operations)



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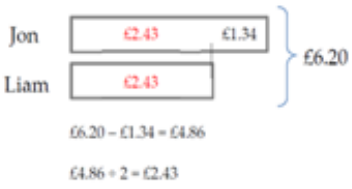

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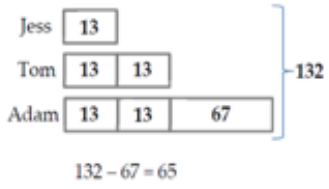

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ACOMB PRIMARY SCHOOL – CALCULATION POLICY

YEAR 6 OUTCOMES – Addition

- Perform mental calculations, including with mixed operations and large numbers
- Identify common factors, common multiples and prime numbers
- Use their knowledge of the order of operations to carry out calculations involving the 4 operations
- Solve addition multi-step problems in contexts, deciding which operations and methods to use and why
- Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy

- When there are no brackets, division is completed before addition and subtraction.
- The mean is the size of each part when a quantity is shared equally.
- The mean is the total of the numbers divided by how many numbers there are.
- The most efficient way to add these numbers is by ____ because ____
- The calculation tells me I need to add/subtract the numbers.
- If the column total is equal to ten or more we must regroup.
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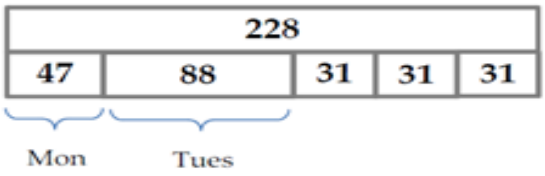
Addition, Subtraction, Multiplication & Division (multi-step and combination of operations)



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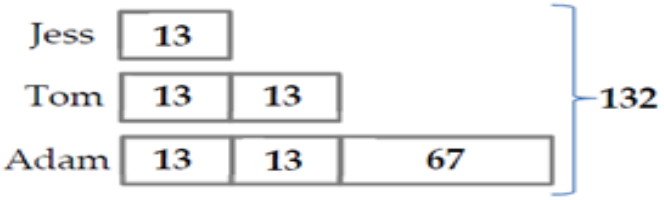

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ACOMB PRIMARY SCHOOL – CALCULATION POLICY

YEAR 6 OUTCOMES – Subtraction

- Use their knowledge of the order of operations to carry out calculations involving the 4 operations
- Solve subtraction multi-step problems in contexts, deciding which operations and methods to use and why
- Solve problems involving subtraction with other operations
- Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy

- When there are no brackets, division is completed before addition and subtraction.
- The mean is the size of each part when a quantity is shared equally.
- The mean is the total of the numbers divided by how many numbers there are.
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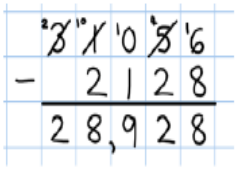
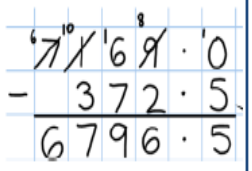
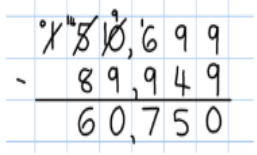
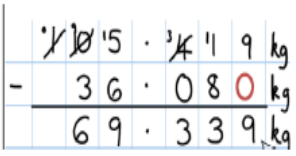
Year 5- Subtract with at least 4 digits, including money and measures. *Subtract with decimal values, including mixtures of integers and decimals and aligning the decimal*	As Year 4	Children to draw pv counters and show their exchange—see Y3	 Use zeros for place-holders. 
Year 6—Subtract with increasingly large and more complex numbers and decimal values.			 

ACOMB PRIMARY SCHOOL – CALCULATION POLICY

YEAR 6 OUTCOMES – Multiplication

- Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
- Perform mental calculations, including with mixed operations and large numbers
- Identify common factors, common multiples and prime numbers
- Use their knowledge of the order of operations to carry out calculations involving the 4 operations
- Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
- Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate

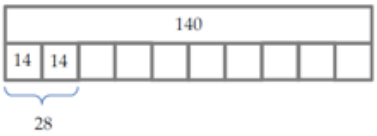
- If ____% of my number is ____, then I need to multiply it by ____ to find the full amount.
- When a number is multiplied by ____ the digits move ____ places to the ____
- I know that 3 ones divided by 3 is ____ ones (see images).
- I know that if I divide ____ by ____, there will be ____ whole ones and ____ left over.
- When a number is multiplied by one thousand, the digits move three places to the left.
- When a number is divided by one thousand, the digits move three places to the right.
- If one factor is made ten times the size, the product will be ten times the size.
- If I double/halve one factor, I must double/halve the product.
- If I multiply/divide one factor by ____, I must multiply the product by ____

124 × 26 becomes

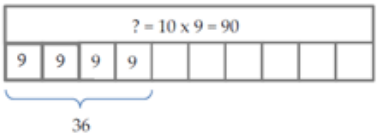
	1	2	4
×		2	6
	7	$^{1}4^{2}$	4
2	4	8	0
3	2	2	4
1	1		

Answer: 3224

Percentages *e.g. find 20%*



e.g. 40% of number = 36.
What is the number?



* Teach and consolidate 12 x 12 times tables facts
* TO x TO
* HTO x TO
* TH H T O x TO
* Decimals
* Carried number below the line, must cross out
* Teach using a place holder first!!!

ACOMB PRIMARY SCHOOL – CALCULATION POLICY

YEAR 6 OUTCOMES – Division

- Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
- Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context
- Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context
- Perform mental calculations, including with mixed operations and large numbers
- Identify common factors, common multiples and prime numbers
- Use their knowledge of the order of operations to carry out calculations involving the 4 operations
- Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
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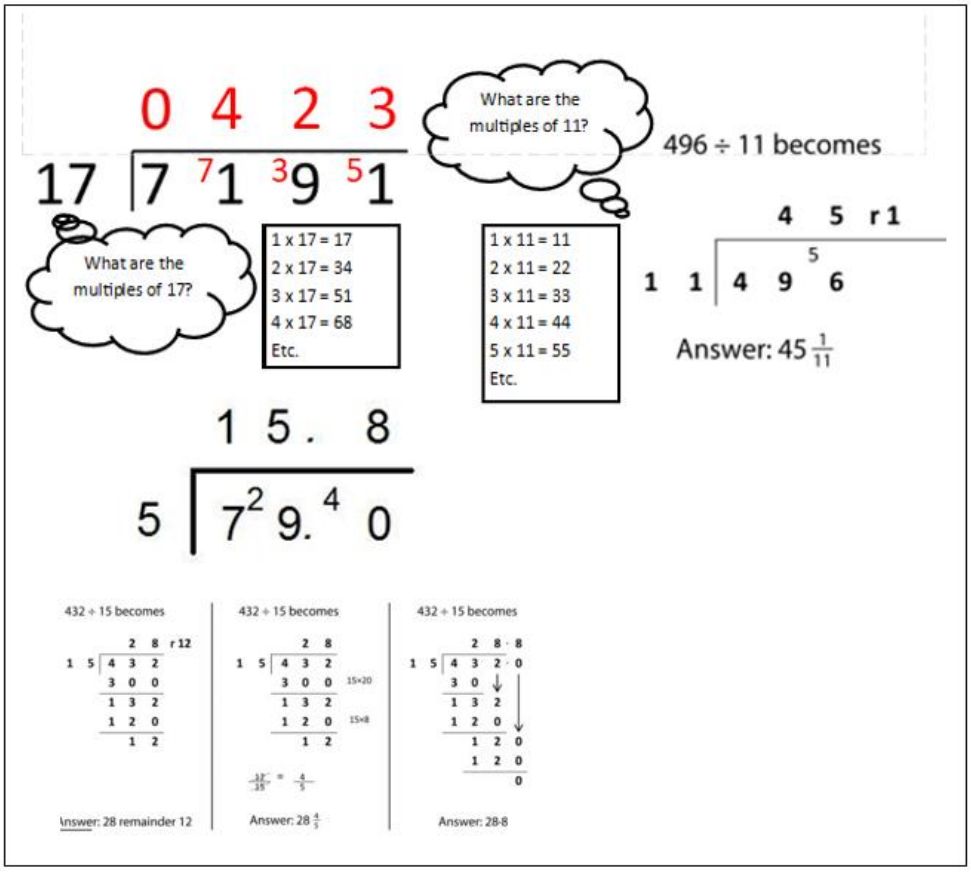
- If ____% of my number is ____, then I need to multiply it by ____ to find the full amount.
- When a number is multiplied by ____ the digits move ____ places to the ____
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- When a number is multiplied by one thousand, the digits move three places to the left.
- When a number is divided by one thousand, the digits move three places to the right.
- If one factor is made ten times the size, the product will be ten times the size.
- If I double/halve one factor, I must double/halve the product.
- If I multiply/divide one factor by ____, I must multiply the product by ____