## West Park CE Primary School PROGRESSION THROUGH CALCULATION GUIDANCE

This policy has been developed from the White Rose Calculation Policy and Surrey Calculation Policy Updated February 2022

CALCULATION GUIDANCE: Number Recognition

| Year Group | Objective | Concrete | Pictorial | Abstract |
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| 증 을 岂 un | Nominal Knowing the name <br> Numbers 40-60 <br> Selects the correct numeral to represent <br> 1-5 <br> Then <br> 1-10 objects | Spotting numbers in the environment | Number flash cards Number tiles Magnetic Numbers Number Fans | Number formation rhymes <br> Knowing a number 4 bus isn't the $4^{\text {th }}$ bus |

## CALCULATION GUIDANCE: Counting

| Year <br> Group | Objective | Concrete | Counting <br> Cardinal <br> Numbers <br> Children count <br> reliably with <br> numbers from 1 <br> -20 | Counting cubes, bears, fingers, <br> pegs. |
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## CALCULATION GUIDANCE: Addition

| Year Group | Objective | Concrete | Pictorial | Abstract |
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|  | One more than from a group of up to 5 objects then 10. <br> Building to a given number to 20 | Sorting objects into 2 groups then combining 2 groups of objects e.g. cubes, bears, fingers, pegs. (Total, all, together) | IWB resources tesiboard <br> Addition stories | Using symbols, numerals and their names $2+1=3$ |
|  | Using objects to add two single digit numbers | Sorting objects into 2 groups then combining 2 groups of objects e.g. cubes, bears, fingers, pegs. <br> (Total, all, together) | IWB resources tesiboard <br> Addition stories | Using symbols, numerals and their names |
|  | Count on | Number line and counters Board Games | Number line without counters | Put in your head and count on |
|  | Solve Problems | Role Play | Picture Cards | Is it a sensible answer/ <br> Simple estimating |




|  | Adding 3 single digit numbers | $4+7+6=17$ <br> Put 4 and 6 together to make 10. Add on 7. <br> Following on from making 10, make 10 with 2 digits (if possible) then add on the third digit. | Add together three groups of objects. Draw a picture to recombine the groups to make 10. | $\begin{aligned} (4+7+6 & =10+7 \\ & =17 \end{aligned}$ <br> Combine the two numbers that make 10 and then add on the remainder |
| :---: | :---: | :---: | :---: | :---: |
|  | Column <br> Method <br> without <br> regrouping | Add together the ones first, then add the tens. Use Base 10 blocks first before moving onto place value counters. $24+15=$ $44+15=$ | After physically using the base 10 blocks and place value counters, children can draw the counters to help them solve additions | $\begin{array}{r} 24+15=39 \\ 24 \\ +15 \\ \hline 39 \\ \hline \end{array}$ |


| $\begin{aligned} & N \\ & \underset{\sim}{\sim} \\ & \underset{\sim}{\sim} \end{aligned}$ | Column method with regrouping | Make both numbers on a place value grid. <br> Add up the ones and exchange 10 ones for 1 ten. | Using place value counters, children can draw the counters to help them solve additions. | $\begin{aligned} & \begin{array}{l} 40+9 \\ \underline{20+3} \\ \underline{60+12} \end{array}=72 \\ & 49 \\ & \frac{+23}{\frac{72}{1}} \end{aligned}$ |
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## CALCULATION GUIDANCE: Subtraction

| Year Group | Objective | Concrete | Pictorial | Abstract |
| :---: | :---: | :---: | :---: | :---: |
|  | 'One less than' from a group of up to 5 objects then 10 , building to a given number to 20 | Practical moving objects from a larger group e.g. eating fruit | Crossing out pictures. <br> IWB resources e.g. tesiboard subtraction stories. | Using symbols, numerals and their names. |
|  | Using objects to subtract 2 single digit numbers (fewer) | Practical moving objects from a larger group e.g. eating fruit | Crossing out pictures. <br> IWB resources e.g. tesiboard subtraction stories. | Using symbols, numerals and their names. $3-1=2$ |


| $\begin{aligned} & \stackrel{ᄃ}{0} \\ & \stackrel{\rightharpoonup}{U} \\ & \ddot{U} \\ & \ddot{\sim} \end{aligned}$ | Count back | Number line and counter <br> Specialist subtraction boards | Number line without counters. | Pu it in your head and count back. |
| :---: | :---: | :---: | :---: | :---: |
|  | Solve problems | Role play with objects e.g. Little Red Riding Hood dropping objects from her basket | Picture Cards | Is it a sensible answer? Simple Estimating. <br> Numicon |
| $\begin{aligned} & \stackrel{\rightharpoonup}{\overline{1}} \\ & \stackrel{\rightharpoonup}{0} \\ & \stackrel{y}{0} \end{aligned}$ | Ones taking away | Use physical objects, counters cubes etc. to show how objects can be taken away. $4-2=2$ | Cross out drawn objects to show what has been taken away. $4-2=2$ | $4-2=2$ |


|  | Counting back | Make the larger number in your subtraction. Move the beads along your bead string as you count backwards in ones. $13-4=9$ | Count back on a number line or number track. <br> Start at the bigger number and count back the smaller number, showing the jumps on the number line. | Put 13 in your head, count back 4. What number are you at? Use your fingers to help. |
| :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \stackrel{-}{1} \\ & \stackrel{1}{\pi} \\ & \underset{\sim}{\sim} \end{aligned}$ | Find the difference | Compare amounts and objects to find the difference. <br> Use cubes to build towers or make bars to find the difference. <br> Use basic bar models with items to find the difference. | Count on to find the difference. <br> Lisa is 13 years old. Her sister is 22 years old. Find the difference in age between them. <br> Draw bars to find the difference between 2 numbers. | Hannah has 8 goldfish. <br> Helen has 3 goldfish. <br> Find the difference between the number of goldfish the girls have. |





## CALCULATION GUIDANCE: Multiplication

| Year Group | Objective | Concrete | Pictorial | Abstract |
| :---: | :---: | :---: | :---: | :---: |
|  | Solve problems including doubling | Multilink <br> Counting bears <br> Pegs | Number pictures <br> Fingers <br> Counting in $2 \mathrm{~s}, 5 \mathrm{~s}$ and 10 s with numicon | Using symbols, numerals and their names $\begin{aligned} & 2+2=4 \\ & 4+4=8 \end{aligned}$ <br> Counting in $2 \mathrm{~s}, 5 \mathrm{~s}$ and 10 s <br> Rhymes and stories |


| $\begin{aligned} & \stackrel{N}{\lambda} \\ & \frac{1}{\overleftarrow{D}} \\ & \underset{\sim}{\sim} \end{aligned}$ | Repeated addition | Use different objects to add equal groups. | There are 3 plates. Each plate has 2 star biscuits on. How many biscuits are there? $2+2+2=6$ | Write addition sentences to describe objects and pictures. $2+2+2=6$ |
| :---: | :---: | :---: | :---: | :---: |


|  | Arrays showing commutative multiplication | Create arrays using counters/cubes to show multiplication sentences. | Draw arrays in different rotations to find commutative multiplication sentences. <br> Link arrays to area of rectangles. | Use an array to write multiplication sentences and reinforce repeated addition. $\begin{aligned} & 5+5+5=15 \\ & 3+3+3+3+3=15 \\ & 5 \times 3=15 \\ & 3 \times 5=15 \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: |


|  | Grid method | Show the link with arrays to first introduce the grid method. <br> 4 rows of 10 <br> 4 rows of 3 <br> Move on to using Base 10 to move towards a more compact method. <br> 4 rows of 13 <br> 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. <br> Fill each row with 126. <br> Add up each column, starting with the ones making any exchanges needed. | Children can represent the work they have done with place value counters in a way that they understand. <br> They can draw counters, using colours to show different columns to show their thinking as shown below. | Start with multiplying by one digit numbers and showing the clear addition alongside the grid. $210+35=24.5$ <br> Move forward, multiply by a 2 digit number showing the different rows within the grid method. $\begin{array}{r} 35 \\ \times \quad 7 \\ \hline \frac{245}{3} \end{array}$ |
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| $\begin{gathered} \underset{\sim}{\underset{\sim}{\omega}} \\ \vdots \\ \stackrel{\rightharpoonup}{\infty} \end{gathered}$ | Expanded method | Show the link with arrays to first introduce the expanded method. |  | $\begin{array}{\|ll}  & 1 \\ 1 & 0 \\ 0 & 0 \\ 0 & 0 \\ 0 & 0 \\ 0 & 0 \\ 0 & 0 \\ 0 & \\ 0 & \\ 0 & \\ 0 & 30 \end{array}$ |  | Start with long multiplication, reminding the children about lining up their numbers clearly in columns. $\begin{aligned} & 18 \\ & \times 13 \\ & \hline 24(3 \times 8) \\ & 30(3 \times 10)) \\ & 80(10 \times 8) \\ & \frac{100}{234}(10 \times 10) \end{aligned}$ |



CALCULATION GUIDANCE: Division

| Year <br> Group | Objective | Concrete | Abstract |  |
| :--- | :--- | :--- | :--- | :--- |
|  | Sharing | I have 8 cubes, can you share them <br> equally between two people? | Children use pictures or shapes to <br> share quantities. | Share 8 buns between two people. <br> $8 \div 2=4$ |




|  | Division with arrays | Link division to multiplication by creating an array and thinking about the number sentences that can be created. <br> E.g. $\begin{array}{ll} 15 \div 3=15 & 5 \times 3=15 \\ 15 \div 5=3 & 3 \times 5=15 \end{array}$ | 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 four linking number sentences. $\begin{aligned} & 3 \times 5=15 \\ & 5 \times 3=15 \\ & 15 \div 5=3 \\ & 15 \div 3=15 \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: |



|  |  | We exchange this ten for 10 ones and then share the ones equally among groups. <br> We look at how many are in each group. |  |  |
| :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \bullet \\ & \stackrel{0}{\omega} \\ & \frac{1}{\infty} \\ & \underset{\sim}{\sim} \end{aligned}$ | Division with remainders | $14 \div 3=$ <br> Divide objects between groups and see how much is left over. | Jump forward in equal jumps on a number line then see how many more you need to find a remainder. <br> Draw dots and group them to divide an amount and clearly show a remainder. <br> revelinder 2 | Complete written divisions and show the remainder using $r$. <br> List table facts to support division e.g. $5,10,15,20,25$ |



