Purlwell Infant and Nursery School

# Calculations Policy

## 2024-2025

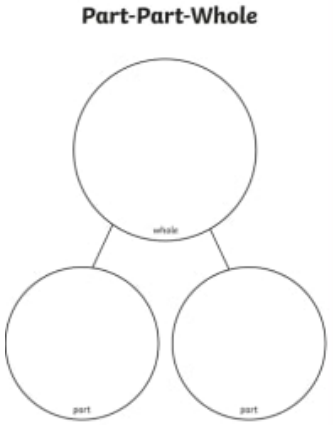
Aims of the Policy

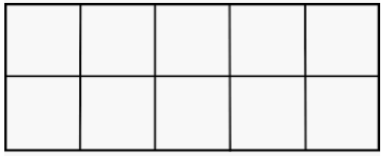
This calculations policy has been created to meet the expectations of the National Curriculum and helps to develop the three main aims of **fluency, reasoning** and **problem solving.** It is designed to give pupils a consistent and smooth progression of learning, using the CPA (concrete, pictorial, abstract) approach.

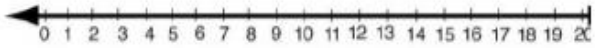
The methods chosen match the National Curriculum guidance but have also been specifically selected after considering the learning styles of the children at Purlwell.

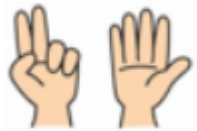
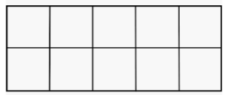
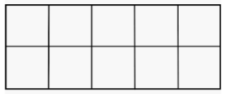
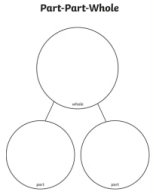
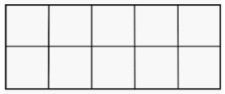
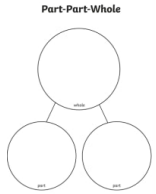
This policy must be used alongside the Purlwell Maths Long term and Medium Term Plans.

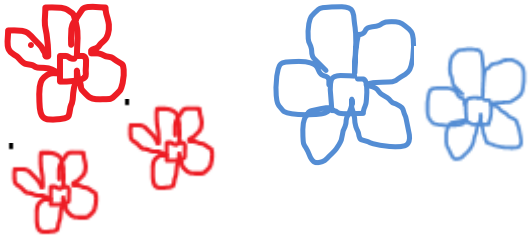
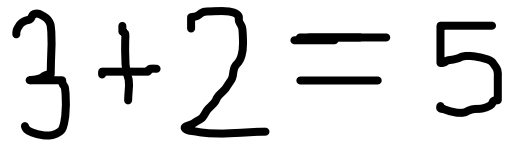
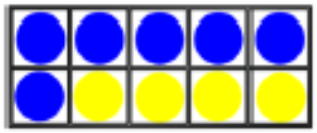
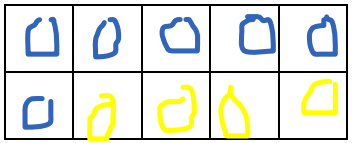
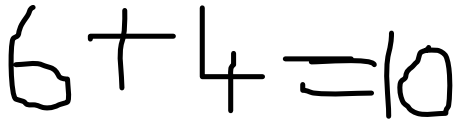
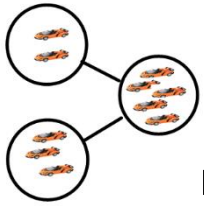
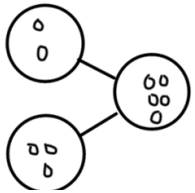
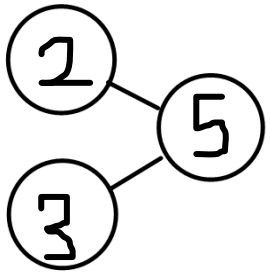
# Key Resources to develop and support understanding in Mathematics

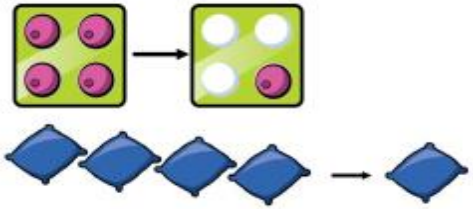
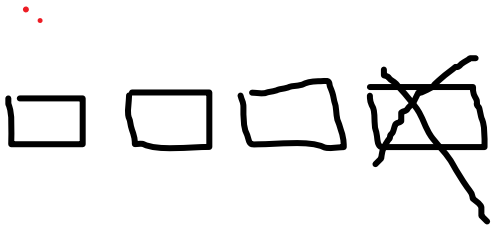
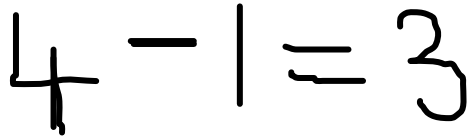


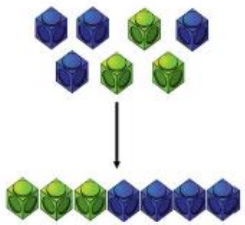
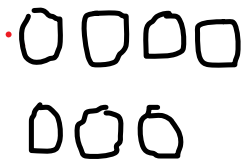
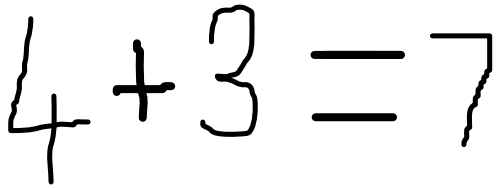
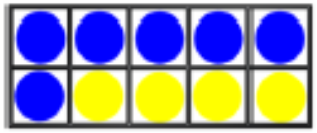
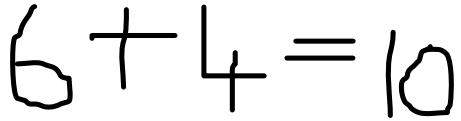



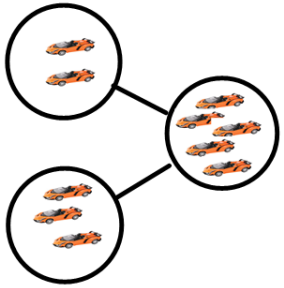
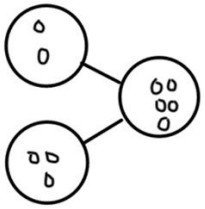
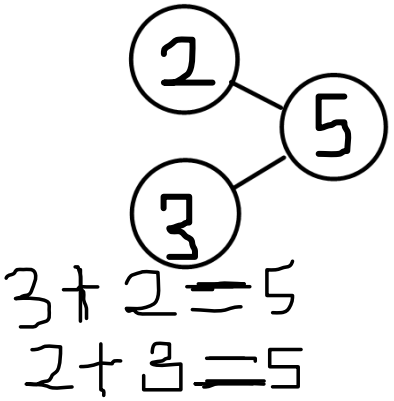
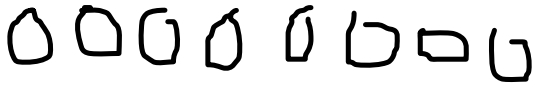
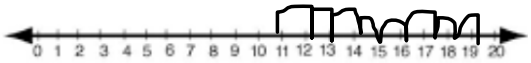



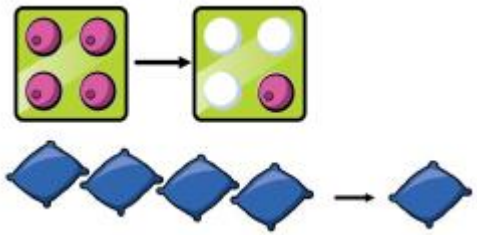
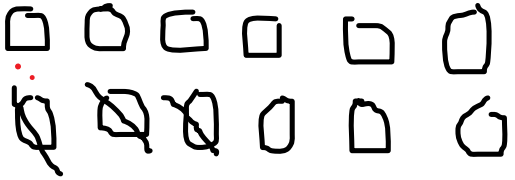
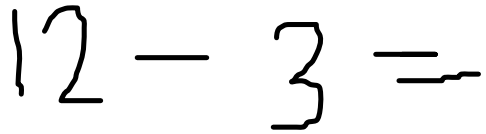
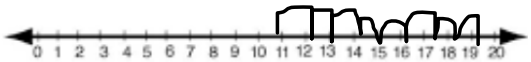

| Representing numbers | | |
|---|---|---|
| Early Years | Year 1 | Year 2 |
|     Numicon, cubes, counters, other everyday objects, fingers, ten frames |      Numicon, ten frames, base 10, part part whole |      Base 10, place value counters, ten frames, part part whole |

| Early Years: Addition | | |
|---|---|---|
| Concrete | Pictorial | Abstract |
|  Using everyday resources to combine two parts to make a whole (use different resources such as cars, teddy bears, dinosaurs, counters etc.). |  Representing the objects using drawings. |  Using a number sentence to represent the drawings. |
|  Using a ten frame and counters- explore number bonds of 10. |  Children to draw the counters. |  Using a number sentence to represent the drawings. |
|  Using a part | with everyday resources. |  Representing the objects pictorially on a part whole model. |  3 is a part, 2 is a part and the whole is 5. |

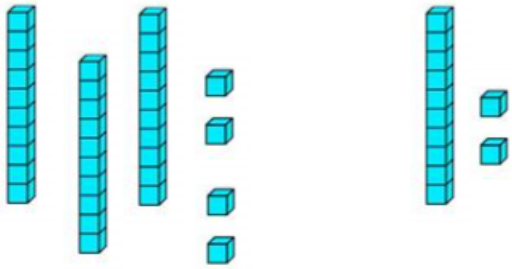
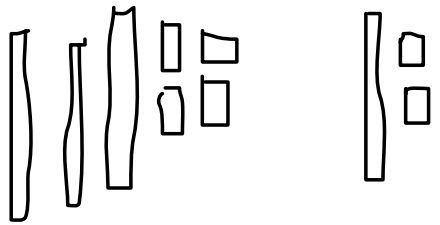
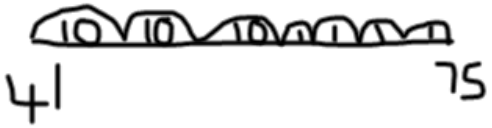
| Early Years: Subtraction | | |
|---|---|---|
| Concrete | Pictorial | Abstract |
|  |  |  |
| Using everyday resources to physically take away and remove objects from a whole. (use different resources such as cars, teddy bears, dinosaurs, counters etc.). | Children draw the concrete resources and cross out the correct amount. | Using a number sentence to represent the drawings. |

| Year 1: Addition | | |
|---|---|---|
| Concrete | Pictorial | Abstract |
|  <br>Using counters and cubes to combine two parts to make a whole. |  <br>Representing the counters using pictures. |  <br>Using a number sentence to represent the drawings. Relating the number sentence to a number story (I had 4 blue marbles and 3 green marbles…_ |
|  <br>Using a ten frame and counters- becoming familiar with number bonds of 10. |  <br>Children to draw the counters. |  <br>Using a number sentence to represent the drawings. |

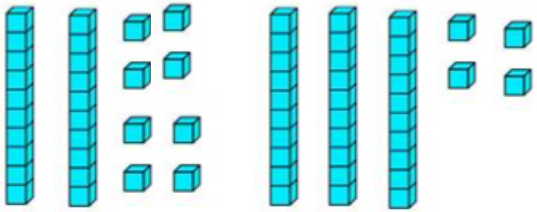
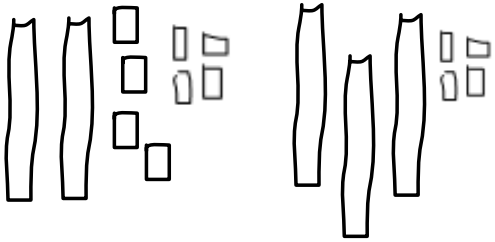
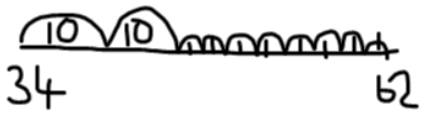
| Concrete | Pictorial | Abstract |
|---|---|---|
|  <br>Using a part whole model with everyday resources. |  <br>Representing the objects pictorially on a part whole model. |  <br>3 is a part, 2 is a part and the whole is 5. |
|  <br>8 + 11 =<br>Counting on from the larger number using apparatus. |  <br>8 + 11 =<br>Counting on from the larger number by drawing counters. |  <br>8 + 11 =<br>Counting on using a numbered number line. |

| Year 1: Subtraction | | |
|---|---|---|
| Concrete | Pictorial | Abstract |
|  |  |  |
| Using everyday resources to physically take away and remove objects from a whole. (use different resources such as cars, teddy bears, dinosaurs, counters etc.). | Children draw counters to represent the concrete resources and cross out the correct amount. | Using a number sentence to represent the drawings. |
| **Concrete** | **Pictorial** | **Abstract** |
|  |  |  |
| 17- 8 =<br><br>Counting back with apparatus (circle 17 then count back 8 counters). | 19 - 8 =<br><br>Counting back by drawing counters (circle 19 then count back 8 pictorial counters). | 19 - 8 =<br><br>Counting back using a numbered number line. |

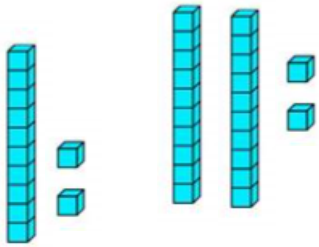
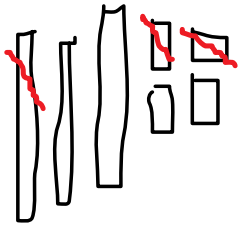
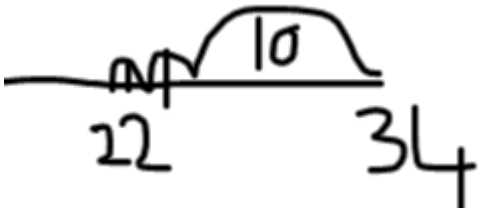
## Year 2: Addition (not crossing 10)

| Concrete | Pictorial | Abstract |
|---|---|---|
|  Using Base 10<br>34 + 12 =46 |  Drawing Base 10.<br>34 + 12 = 46 | 34 + 41 =<br>  <br>Drawing a blank number line. |

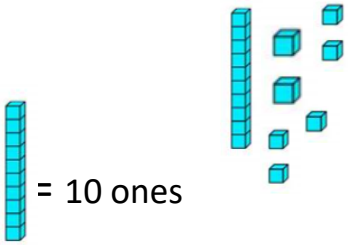
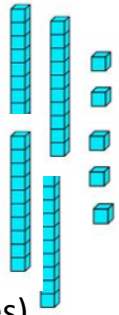
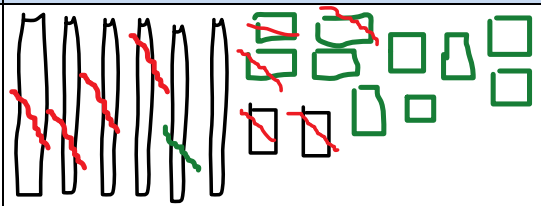
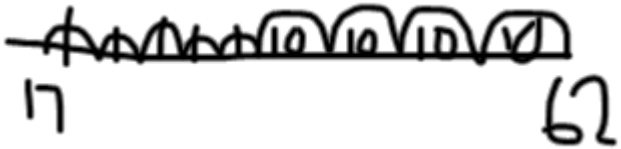
## Year 2: Addition (crossing 10)

| Concrete | Pictorial | Abstract |
|---|---|---|
|  Using Base 10<br>28 + 34 = 62 |  Drawing Base 10.<br>28 + 34 = 62 |  <br>Drawing a blank number line |

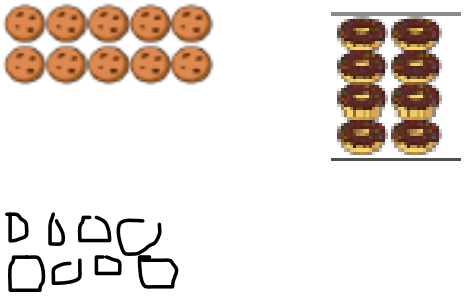
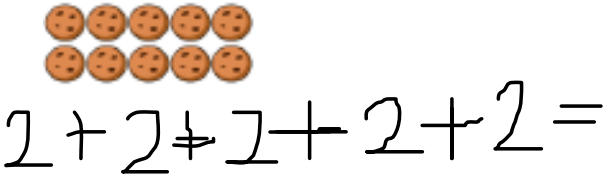
## Year 2: Subtraction (not crossing 10)

| Concrete | Pictorial | Abstract |
|---|---|---|
|  Using Base 10<br>34 - 12 =22 |  Drawing Base 10.<br>34 - 12 = 22 |   Drawing a blank number line.<br>34 – 12 = 22 |

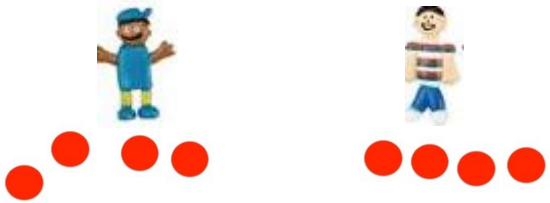
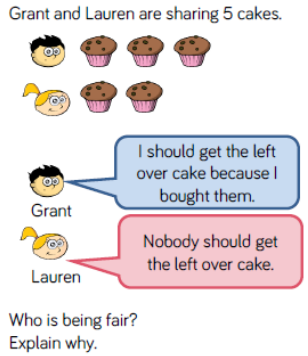
## Year 2: Subtraction (crossing 10)

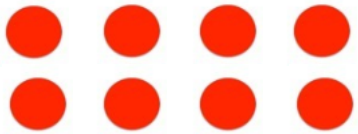
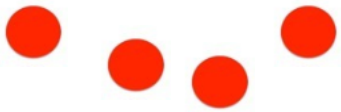
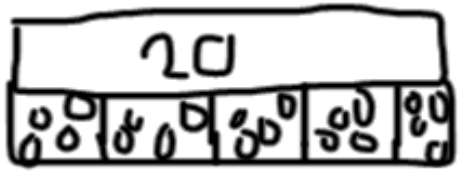
| Concrete | Pictorial | Abstract |
|---|---|---|
|  = 10 ones<br>  Using Base 10<br>62 - 45 =17<br>(exchange one ten for ten ones) |  Drawing Base 10<br>62 - 45 =17<br>(exchange one ten for ten ones) |   Drawing a blank number line.<br>62 – 45 = 17 |

## Year 1: Multiplication (Counting in multiples of twos, fives and tens)

| Concrete | Pictorial | Abstract |
|---|---|---|
|  Placing objects in arrays (fingers on hands, socks in pairs, numicon etc). Counting the objects in twos, fives or tens. |  Looking at pictures of arrays and counting them. Drawing own arrays to solve problems. |  Write a repeated addition to go with an array. Solving problems by counting in multiples. |

## Year 1: Division

| Concrete | Pictorial | Abstract |
|---|---|---|
|  Using concrete apparatus such as counters, to share objects equally, |  Drawing pictures and sharing equally. |   Solving problems involving division. |

| Year 2: Multiplication | | |
|---|---|---|
| Concrete | Pictorial | Abstract |
|  Placing counters in arrays of twos, fives or tens. Counting in the correct multiple. |  Drawing arrays to solve number sentences. | 2 + 2 + 2 + 2 = 8<br>2 x 4 = 8<br>4 x 2 = 8<br>Making links between the repeated addition and the multiplication number sentences. |
| **Year 2: Division** | | |
| Concrete | Pictorial | Abstract |
|  Using concrete apparatus to divide numbers equally. |  Draw a bar model to solve division number sentences. | 20 ÷ 5 = 4<br>Count in multiples of twos, fives and tens to solve number sentences. |