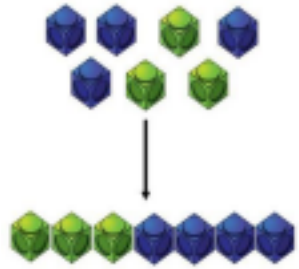
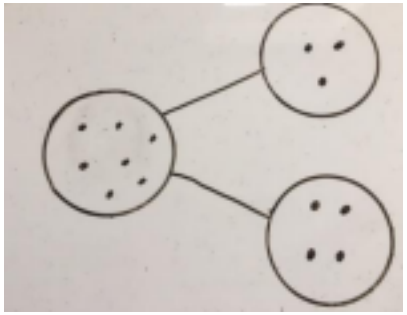
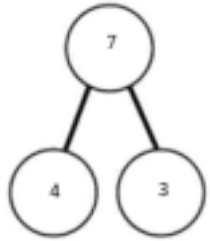
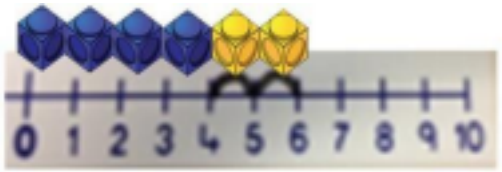
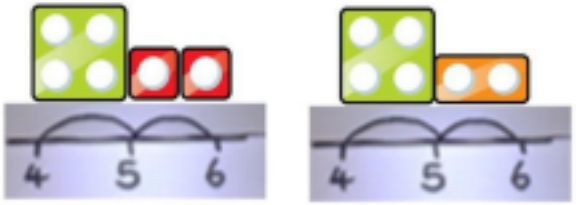
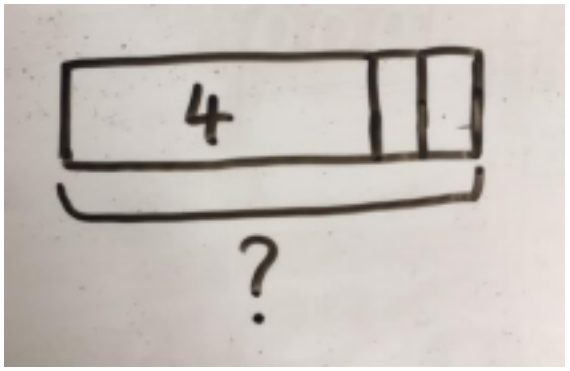
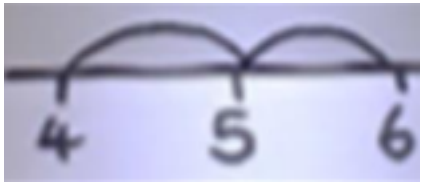


Brington Church of England Primary School

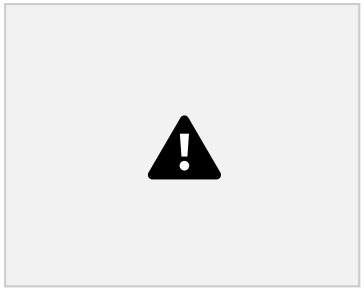
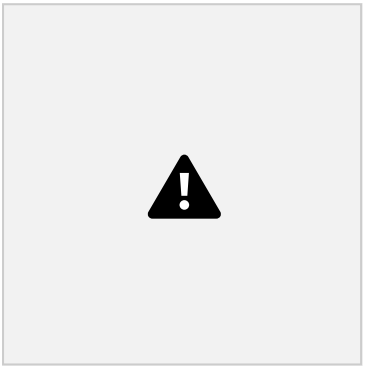
Calculation Policy

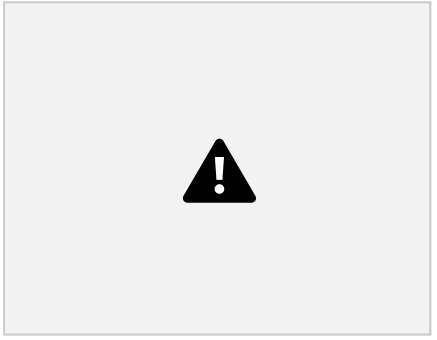
February 2024

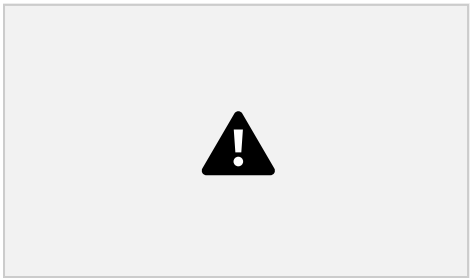
Concrete	Pictorial	Abstract
Combiningtwopartstomakeawhole(useot her resourcestooe.g.eggs, shells,teddybears,cars). 	Children to represent the cubes using dots or crosses. They could put each part on a part whole model too. 	4 + 3 = 7 Fouris a part, 3 is a part and t whole is seven. 

Countingonusingnumberlines usingcubesorNumicon.   	Abarmodelwhichencouragesthechildrentocounton , rather than count all.  	Theabstractnumberline: What is 2 more than 4? Whatisthesumof2and4? Whatisthetotalof4and2? 4 + 2 

Regroupingtomake10;usingtenframesa nd counters/cubes or using Numicon. 6 + 5 	Children to draw the ten frame and counters/cubes. 	Children to develop an understanding of equality e.g. 6 + □ =11 6 + 5 = 5 + □ 6 + 5 = □ + 4

TO +Ousing base 10. Continue to develop understanding of partitioning and place value. 41 + 8 	Children to represent the base 10 e.g. lines for tens and dot/crosses for ones. 	41 + 8 1 + 8 = 9 40 + 9 = 49 
TO + TO using base 10. Continue to develop understanding of partitioning and place value. 36 + 25	ChidlrentorepresentthebaseI0inaplacevaluechart 	Looking for ways to make 10. 30 + 20 = 50 5 + 5 = 10 50 + 10 + 1 = 61 36 +25 61 Formal method:

Useofplace value counters toadd HTO+TO,HTO+ HTOetc. Whenthereare10onesinthe1scolumn-we exchangefor 1ten,when there are 10 tensinthe 10s column- we exchange for 1 hundred.	Chidren to represent the counters in a place value chart, circling when they make an exchange. 	



Conceptual variation; different ways to ask children to solve 21 + 34


?

21 34

Word problems:
Inyear3,thereare21childrenandi
n year 4, there are 34 children.
How many children in

total? 21 + 34 = 55. Prove

it

21 + 34 =

= 21 + 34

Calculate the sum of
twenty-one and thirty-four.



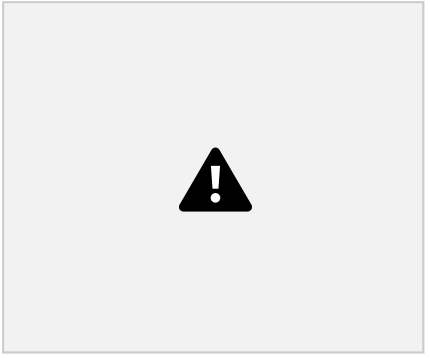
Missing digit problems:









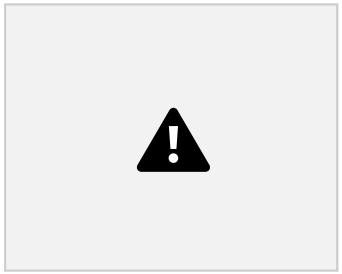
Concrete	Pictorial	Abstract
Physically taking away andremoving objects from a whole (ten frames, Numicon, cubes and other items such as beanbags could be used). 4 – 3 = 1  	Children to draw the concrete resources they are using and cross outthe correct amount.The barmodel can also be used. 	**4- 3 =** **= 4 – 3** 

Countingback (using numberlines or numbertracks) children start with 6 and count back 2. 6 – 2 = 4 	Children to represent what they see pictorially e.g. 	Childrentorepresentthecalculation on a numberline ornumbertrack and show the jumps. Encourage children to use an empty number line  

Finding the difference (using cubes, Numicon or Cuisenaire rods, other objects can also be used). Calculate the difference between 8 and 5. 	Children to draw the cubes/other concrete objects which theyhaveusedorusethebarmodeltoillustratewhat they need tocalculate. 	Findthedifferencebetween8and 5. 8 – 5, the difference is Children to explore why 9 - 6 = 8 – 5 = 7 – 4 have the same difference.

Making10 usingtenframes. 14 – 5 	Children to present the ten frame pictorially and discuss what they did to make 10. 	Childrentoshowhowtheycanmake 10 by partitioning the subtrahend.  14 – 4 =10 10 – 1 = 9
Column method using base 10. 48-7 	Children to represent the base 10 pictorially. 	Column method or children could count back 7. 

Columnmethod usingbase 10and havingto exchange. 41 – 26 	Represent the base 10 pictorially, remembering to show the exchange. 	Formal column method. Children must understand that when they have exchanged the 10 they still have 41 because 41 = 30 + 11. 

Columnmethodusingplacevaluecounters. 234 – 88	Representtheplacevaluecounterspictoriall y; remembering to show what has been exchanged. 	Formal colum method. Children must understand what has happened when they have crossed out digits. 

Conceptual variation; different ways to ask children to solve 391 - 186

= 391 – 186 Missing digit calculations

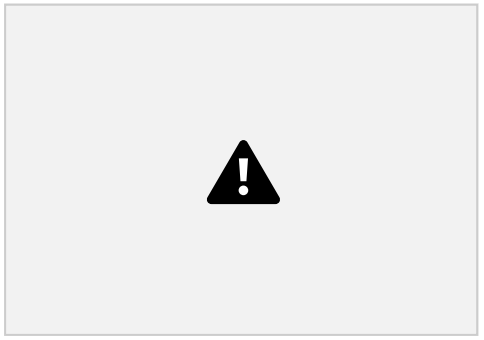
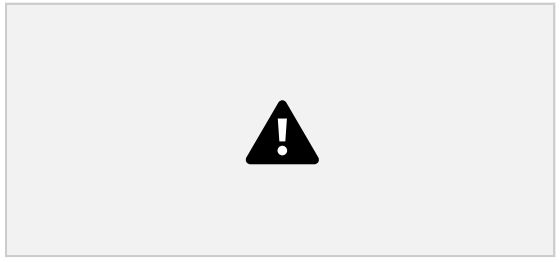
Raj spent £391, Timmy spent £186.
How much more did Raj spend?

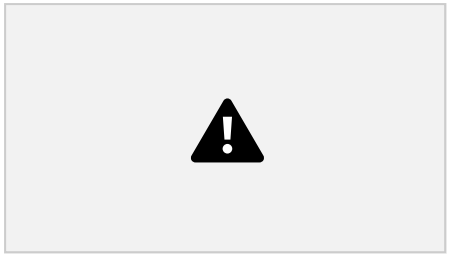
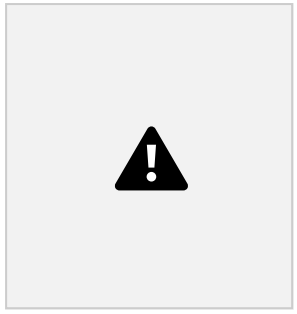
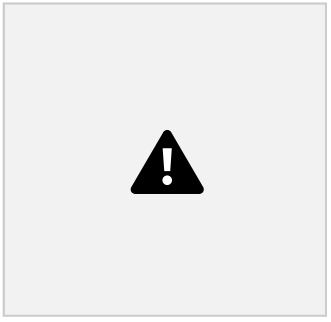
Calculate the difference between 391 and 186.

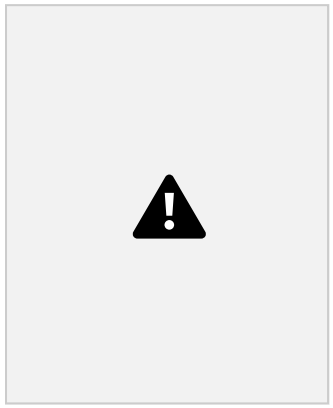
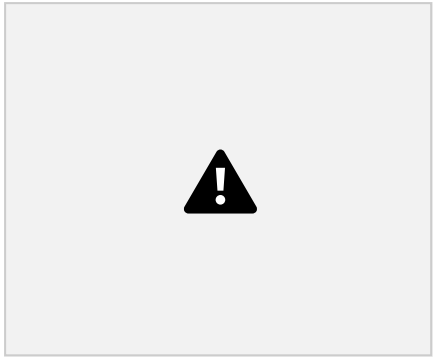


What is 186 less than 391?

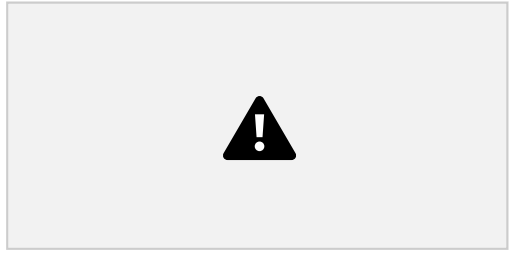


Concrete	Pictorial	Abstract
Repeated grouping/repeated addition 3 × 4 4 + 4 + 4 There are 3 equal groups, with 4 in each  group. 	Children to represent the practical resources in a picture and use a bar model. 	3 × 4 = 12 4 + 4 + 4 = 12
Numberlines to show repeated groups 3 × 4  Cuisenaire rods can be used too.	Representthispictoriallyalongsideanumberlinee. g.: 	Abstractnumberlineshowingthree jumps of four. 3 × 4 = 12 

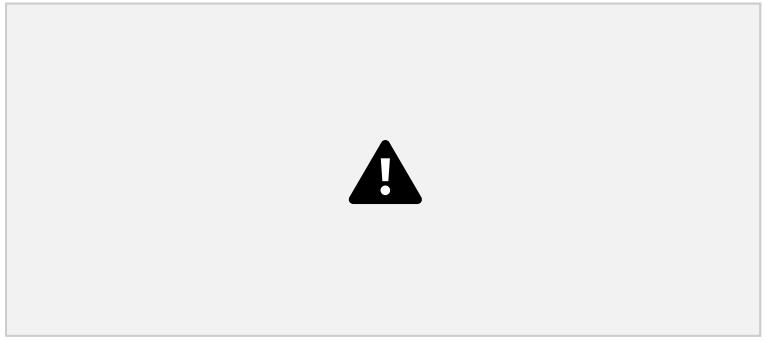
Use arrays to illustrate commutativity counters and other objects can also be used. 2 × 5 = 5 × 2 	Children to represent the arrays pictorially. 	Children to be able to use an array towrite a range of calculations e.g. 10 = 2 × 5 5 × 2 = 10 2 + 2 + 2 + 2 + 2 = 10 10 = 5 + 5
PartitiontomultiplyusingNumicon,base10orCuisenaire rods. 4 × 15 	Children to represent the concrete manipulatives pictorially. 	Children to be encouraged to show the steps they have taken.  A number line can also be used 
Formalcolumnmethodwithplacevaluecounters (base 10 can also be used.) 3 × 23 	Children to represent the counters  pictorially.	Children torecordwhatitistheyare doing to showunderstanding. 3 × 23 3 × 20 =60 3 × 3 = 9 20 3 60 + 9 =69

Formalcolumnmethodwithplacevaluecounters. 6 x 23 	Childrentorepresentthecounters/base10,pictorially e.g. the image below. 	Formal written method 
When children start to multiply 3d × 3d and 4d × 2d etc., they should be confident with the abstract: To get 744 children have solved 6 × 124. To get 2480 they have solved 20 × 124.		

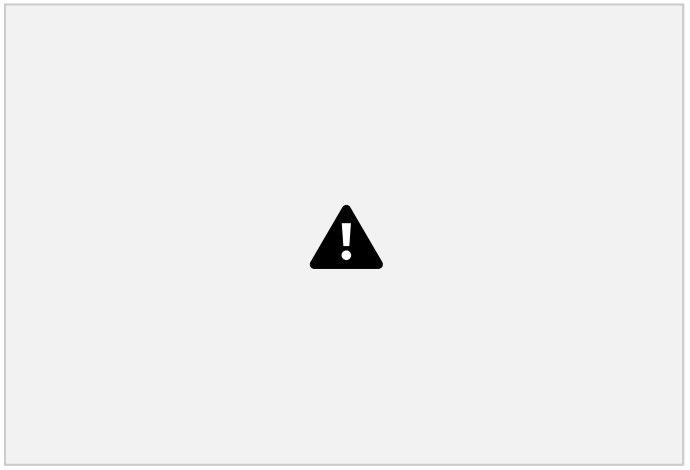
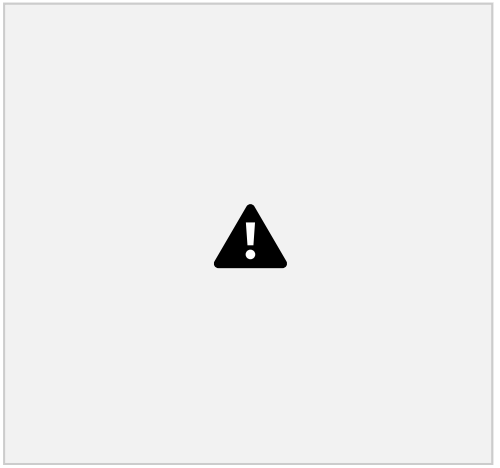
Conceptual variation; different ways to ask children to solve 6 × 23

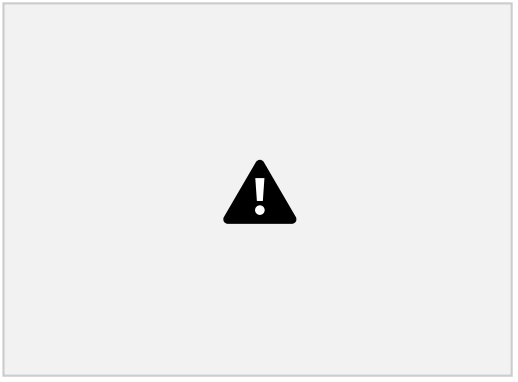
	Mai had to swim 23 lengths, 6 times a week. Howmany lengthsdidsheswimin one week? Withthecounters,provethat6x23 = 138	Find the product of 6 and 23 6 × 23= = 6 × 23	What is the calculation? What is the product? 

Concrete	Pictorial	Abstract
Sharingusingarangeofobjects. 6 ÷ 2	Represent the sharing pictorially.	6 ÷ 2 = 3 Children should also be encouraged to use their 2 times tables facts.

Repeated subtraction using Cuisenaire rods above a ruler. 6 ÷ 2 	Children to represent repeated subtraction pictorially. 	Abstract number line to represent the equal groups that have been subtracted. 

2d÷1dwithremaindersusinglollipopsticks.Cuisenaire rods, above a ruler can also be used. 13 ÷ 4 Useoflollipopstickstoformwholes-squaresaremade because we are dividing by 4.  There are 3 whole squares, with 1 left over.	Childrentorepresentthelollipop stickspictorially.  There are 3 whole squares, with 1 left over.	13 ÷ 4 – 3 remainder 1 Children should be encouraged to use their times table facts; they could also represent repeated additionona numberline. ‘3 groups of 4, with 1 left over’ 

Sharing using place value counters. 42 ÷ 3 = 14 	Children to represent the place value counters pictorially. 	Childrentobeabletomakesenseofthe place value counters and write calculations to show the process. 42 ÷ 3 42 = 30 + 12 30 ÷ 3 = 10 12 ÷ 3 = 4 10 + 4 = 14

Shortdivisionusingplacevaluecounterstogro up. 615 ÷ 5  1. Make 615 with place value counters. 2. How many groupsof 5hundreds can you make with 6 hundred counters? 3. Exchange 1 hundred for 10 tens. 4. Howmanygroupsof5tenscanyoumakewith11ten counters? 5. Exchange 1 ten for 10 ones. 6. How many groups of 5 ones can you make with 15	Representtheplacevaluecounterspictoriall y. 	Children to the calculation using the short division scaffold. 

ones?		

Long division using place value counters
2544 ÷ 12









Conceptual variation; different ways to ask children to solve 615 ÷ 5

Using the part whole model below, how can you divide 615 by 5 without using short division? 	I have £615 and share it equally between 5 bank accounts. How much will be in each account? 615pupilsneedtobeputinto5 groups.Howmanywillbeineac h group?	 615 ÷ 5 = = 615 ÷ 5	What is the calculation? What is the answer? 