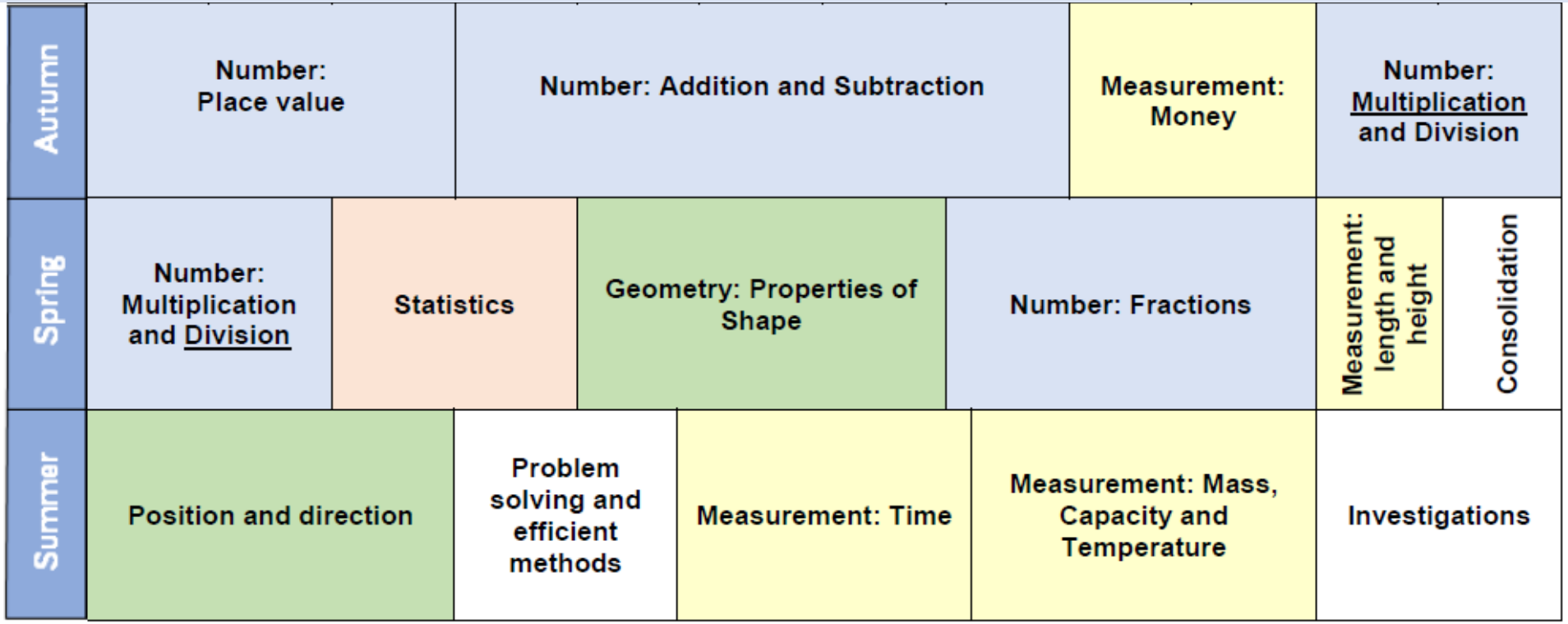
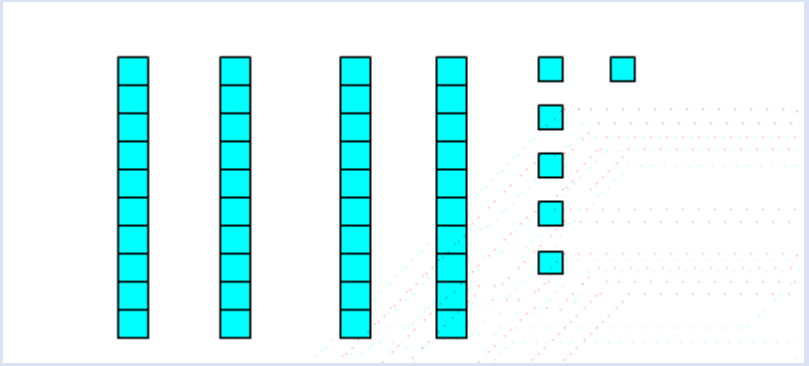
Sequence of learning



TRINITY TEACHING SCHOOL ALLIANCE MathsHUBS White Rose

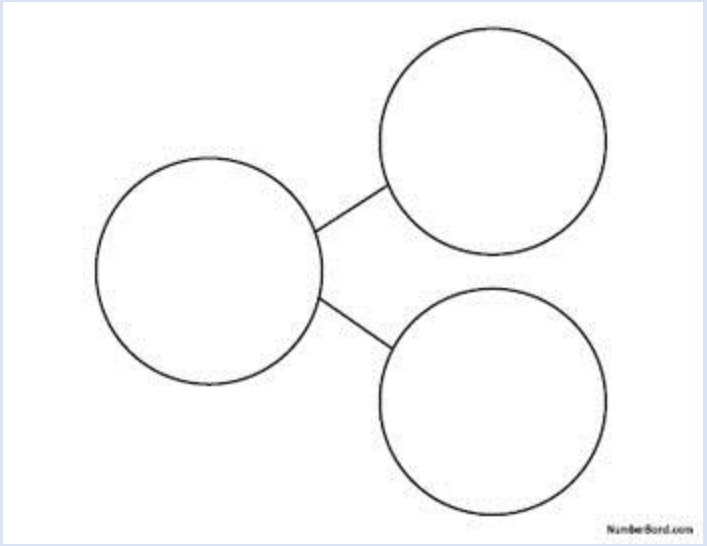
Concrete apparatus

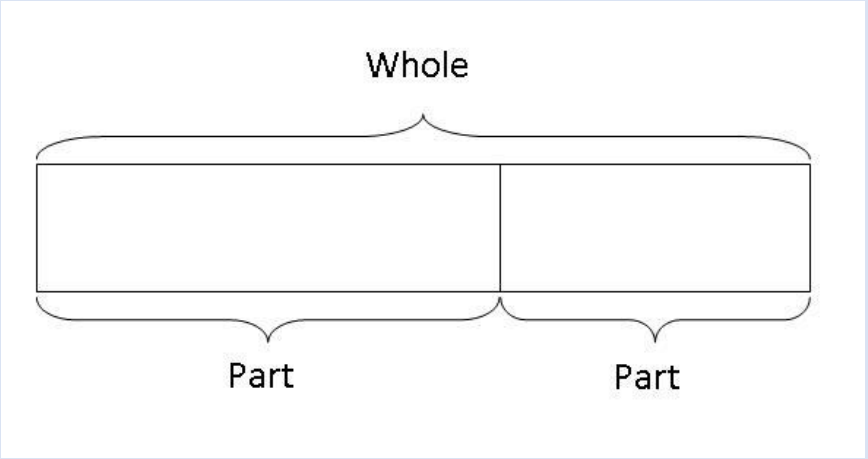
All lessons start with concrete apparatus. Children need to visually see and physically feel the calculation process. Through each method I will aim to show you how we use the concrete apparatus. I know you don't have this at home, but on the internet there are some resources you can use. Lego and money can also be useful at time.

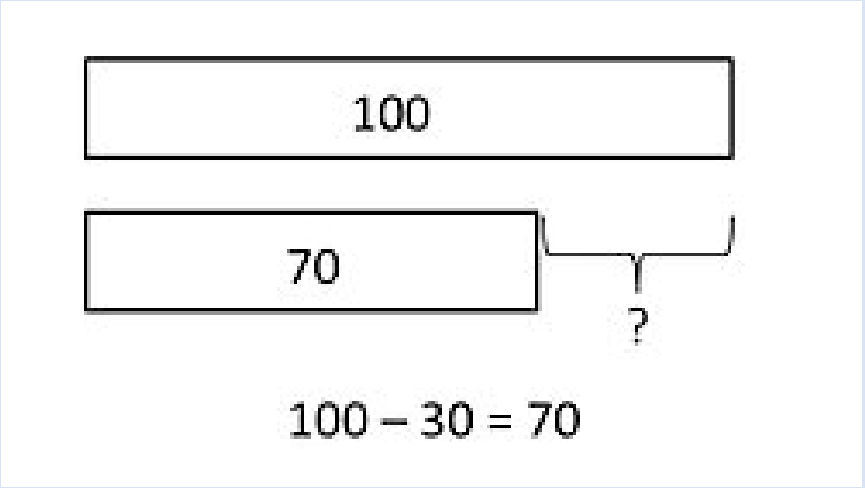


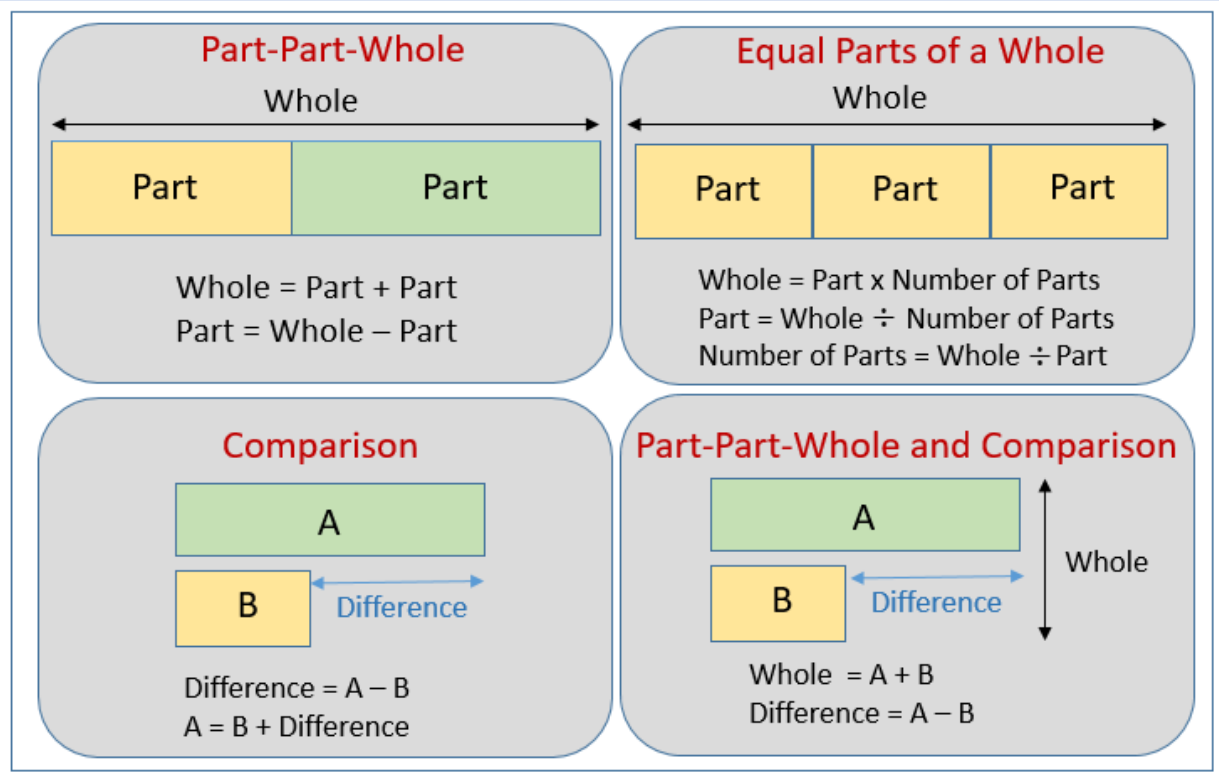
https://www.topmarks.co.uk/Flash.aspx?f=diennesandcoinsv3

Models




Whole
Part
Part


100
70
?
100 – 30 = 70


Part-Part-Whole
Whole
Part
Part
Whole = Part + Part
Part = Whole – Part
Equal Parts of a Whole
Whole
Part
Part
Part
Whole = Part x Number of Parts
Part = Whole ÷ Number of Parts
Number of Parts = Whole ÷ Part
Comparison
A
B
Difference
Difference = A – B
A = B + Difference
Part-Part-Whole and Comparison
A
B
Difference
Whole
Whole = A + B
Difference = A – B

Warm up

- If I know 3+7 I also know….

30+70=100

13+7=20

10-3=7

100-30=70

It is important children know number bonds and facts and use related facts to support them in calculation. It will make them more efficient in their processes.

Using a blank number line

- 24+8= (crossing tens boundary)
- =75-7 (crossing tens boundary)
- 34p+42p= (not crossing tens boundary)
- =64-32 (not crossing tens boundary)
- 5x7= (use knowledge of communicatively)
- =44÷5

- How can we use equipment to model?

- This is why number bonds and confident counting are important and these skills need to be continually revisited.

Finding the difference

- When looking at a calculation children need to begin to decide upon which is the most efficient way to calculate.

- When subtracting if they notice the two numbers are close together they are find the difference between the two numbers rather than counting backwards.

12-9= 25-21=

Partitioning for addition and subtraction

- Without crossing the tens boundary

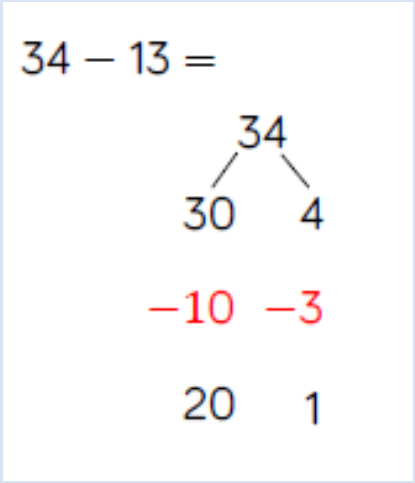
25+33= =78-25

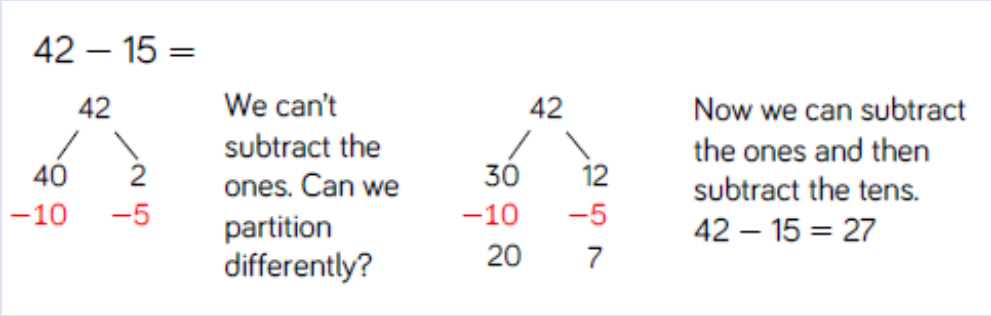
Crossing tens boundary

25+33= =78-25

How can we use equipment to model?

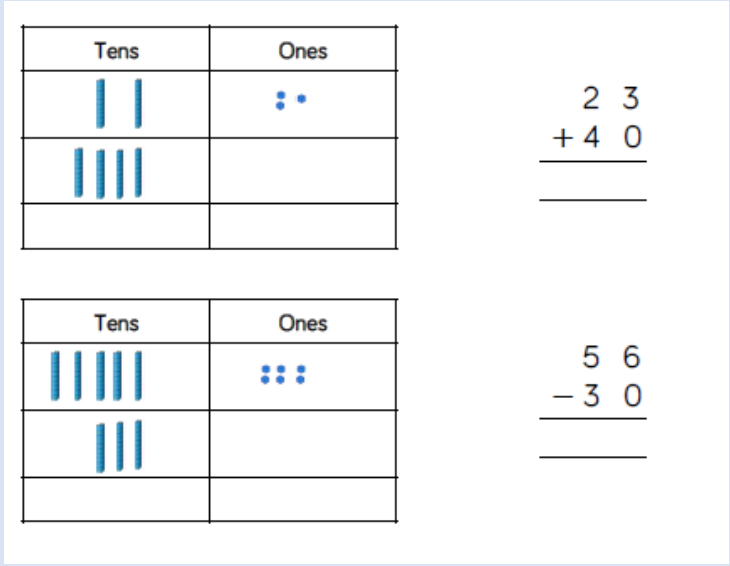
How can we use drawing to model?

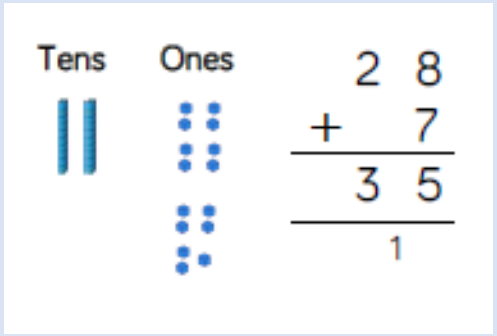


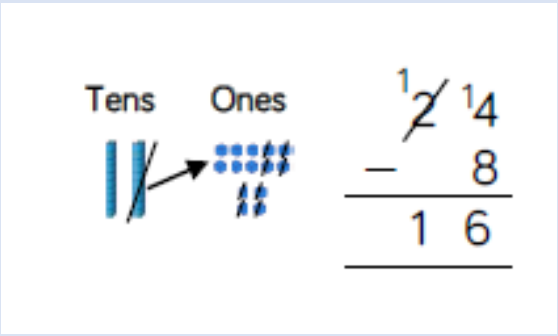


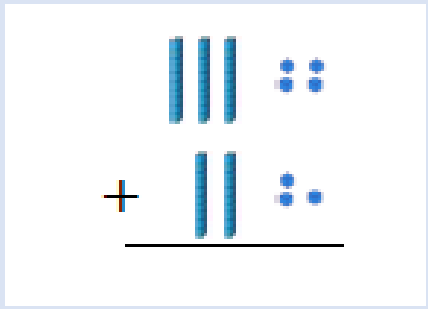
Column method

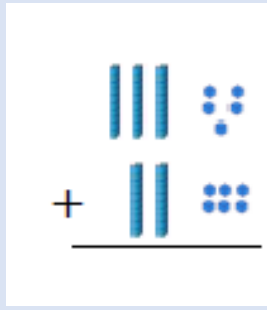
- With Base 10.
- Pictorial representation
- Formal method

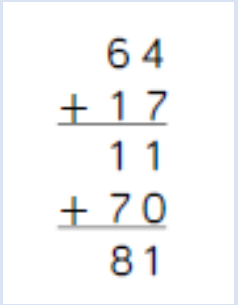


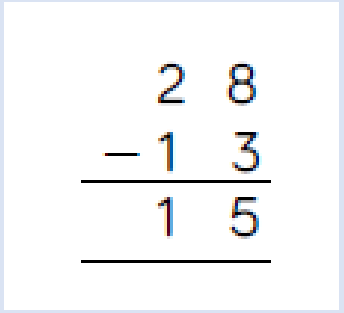












Pictorial method for multiplication and division

- Drawing arrays

24÷2= 12x5=

- Sharing and grouping

20÷5=

Results will be the same.

11x5

Could work out as…

10x5=50 so 11x5 must equal 55

Confidence in counting sequence really does support and using fingers or marks on paper to keep track.

Missing Numbers

- Inverse relationship – if children are familiar with this by writing fact families it will support them in encouraging them to use this know when solving missing numbers.

23+___=47

___-43=36

3x___=15

60÷___=12

Balance equations

- 15+24=8+31
- 45-23=15+7
- 5x2=1x10
- 32-21=___-34

Worded questions

- **Sam is collecting cards. He wants to collect 100 cards altogether. Last week he collected 50 cards. This week he collects 30 cards. How many more cards does he need?**
- **Amy plants 4 rows of carrots. There are 3 carrots in each row. A rabbit eats 2 of the carrots. How many carrots are left?**
- **Sita has 50 raisins. She gives 23 to Ben. She gives 15 to Amy. How many raisins does Sita have left?**
- **There are 29 children on the school bus. 2 boys and 6 girls get off. How many children are left on the bus?**
- **A lollipop costs 35p. Ben gives the shopkeeper 50p. How much change should Ben get?**

Finally…

- You may have noticed calculations are presented in different ways. It is important children are used to it.
- It is great if children can calculate mentally (without necessarily recording anything) and this should be praised. It is important though that they do know a way to record the processes they calculate in their head, so they can share with others. Explaining and reasoning are important aspects of the curriculum.
- Checking answers – can they make an estimate prior to calculating e.g 25+22= will be near 50 because I know double 25=50. This will help them see if their answer could be correct.
- Game give them a set of calculations on post-its and they need to sort them into two piles – those that are correct and those that are incorrect. Then have a conversation about children's thoughts and reasons. Discuss calculation processes they have used.