Abstract

Expanded columnar method for addition.

Step 1.

22 + 34 =

Set out your calculation.

```
  22
+ 34
____
____
```

Step 2.

First, add the ones.

Then, add the tens.

```
  22
+ 34
   6 (2+4)
  50 (20+30)
____
```

Step 3.

Add the sum of the ones (6) to the sum of the tens (50).

50 + 6 = 56

```
  22
+ 34
   6 (2+4)
  50 (20+30)
  56 (50 + 6)
```

So 22 + 34 = 56

Remember; you can check this with lines and dots.

| | ••

||| ••••

Step 4.

When bridging, you may choose to partition the answer to help simplify the calculation.

```
  66
+ 17
  13 (6+7)
  70 (60 + 10)
   3 (3 + 0)
  80 ( 70 + 10)
  83
```

Pictorial representations for addition

Lines and dots to show addition. | = 10 ● = 1

6 + 5 = 11

●●●●●●

●●●●●

16 + 5 = 21

| ●●●●●●

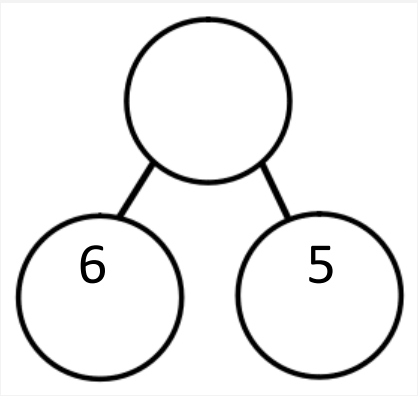
●●●●●

21 + 15 = 36

|| ●

| ●●●●●

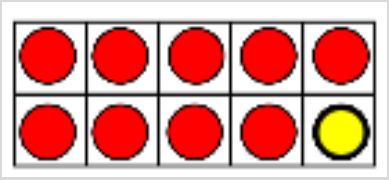
Part whole model



6 + 5 =

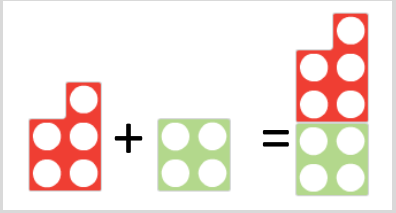
Concrete apparatus

Ten frames



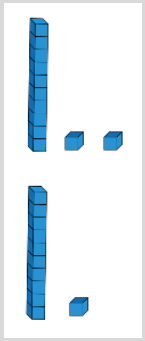
9 + 1 = 10

Numicon

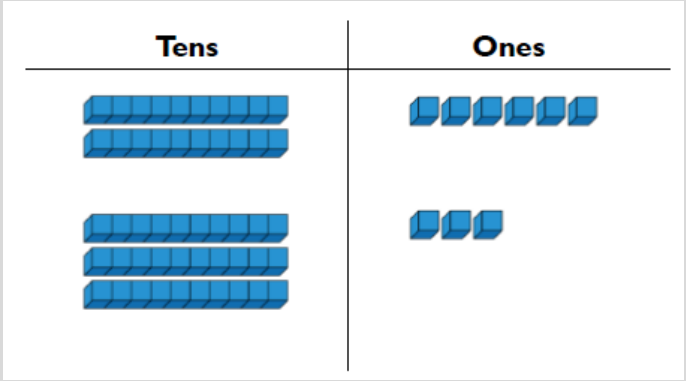


5 + 4 = 9

Dienes



12 + 11 = 23



26 + 33 = 59

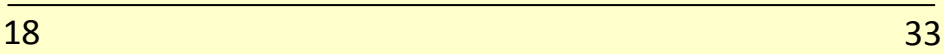
You can use tens and ones counters too.

Abstract

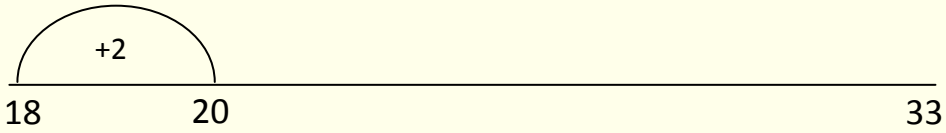
How to use a number line for subtraction (finding the difference).

Step 1. **Question: 33 - 18 =**

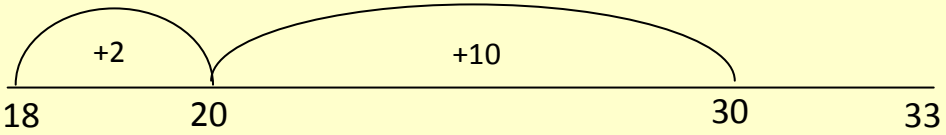
Write the smallest number at the beginning (left) of the number line and the largest at the end (right).



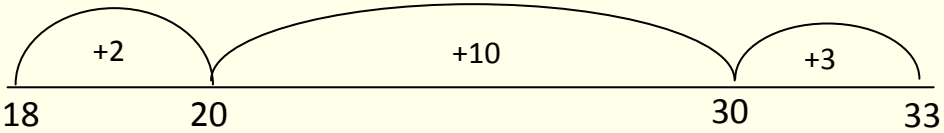
Step 2. **Find the next multiple of 10 (number which ends in 0) and make your first jump. Use your number bonds to 10 to help.**



Step 3. **Jump in multiples of ten until you reach the ten which the larger number is in.**



Step 4. **Make your final jump by adding any remaining ones until you reach the target number.**



Step 5. **Draw your lines and dots to help count the total of the jumps and write your answer.**

Answer: 33 - 18 = 15

Pictorial representations for subtraction

Dots and cross out to show subtraction.

9 - 5 = 4

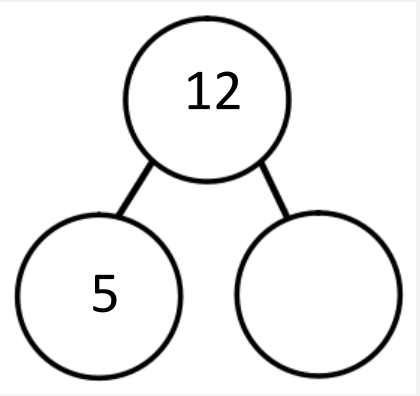
●●●●XXXXX

16 - 5 = 11

●●●●●●●●●●

●XXXXX

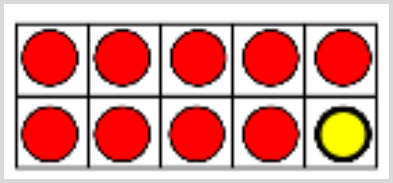
Part whole model



12 - 5 =

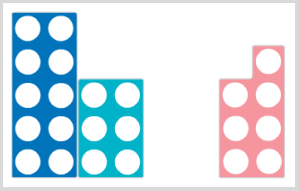
Concrete apparatus

Ten frames



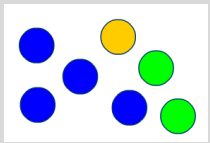
10 - 1 = 9

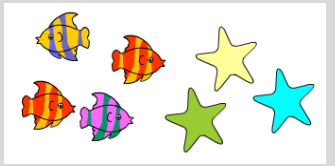
Numicon

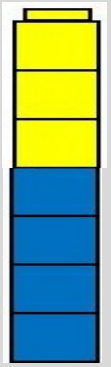


16 - 7 = 9

Lay the 7 over the 16 to show the difference is 9.







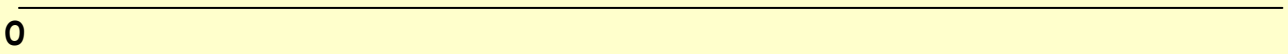
7 - 3 = 4

Abstract

Using a number line for multiplication (repeated addition).

Step 1. Question: 6 x 3 = "You can say 6 lots of 3."

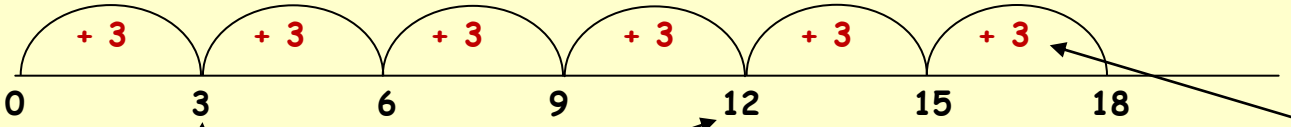
Draw a blank number line beginning at 0.



Step 2. Rewrite 6 x 3 as a repeated addition number sentence.

3 + 3 + 3 + 3 + 3 + 3 =

Step 3. Show the repeated addition on the number line.

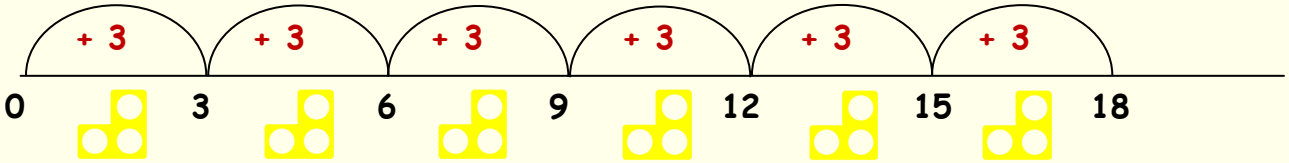


Show the number each jump lands on to help.

Show the repeated addition in the jumps.

Step 4. 6 x 3 = 18

Use numicon to check your answer.



Pictorial methods to solve multiplication calculations (arrays).

6 + 6 + 6 + 6 = 24

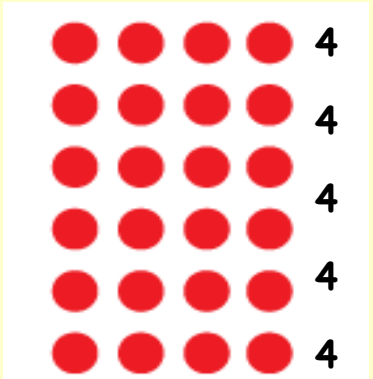
4 x 6 = 24

X means

lots of

or

groups of



4 + 4 + 4 + 4 + 4 + 4 = 24

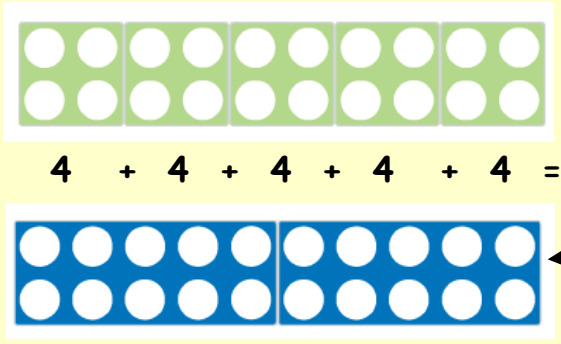
6 x 4 = 24

This is called repeated addition. It's the same as multiplication.

You can show your arrays with counters too.

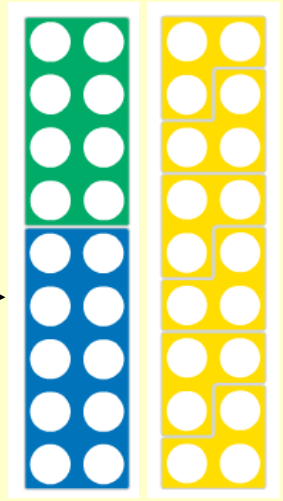
Concrete methods to solve multiplication calculations (repeated addition).

5 x 4 = 20



4 + 4 + 4 + 4 + 4 = 20

You can use tens to help count totals quickly.



6 x 3 = 18

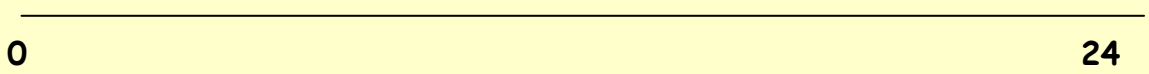
3 + 3 + 3 + 3 + 3 + 3 = 18

Arrange the numicon in a train before you count it.

Abstract

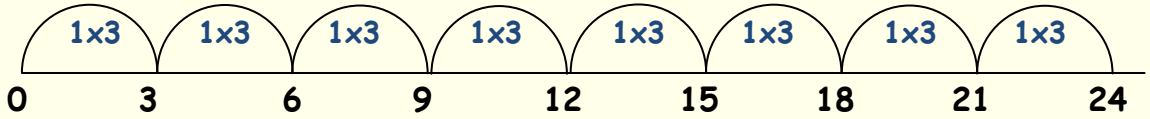
Using a number line for division.

Step 1. **Question: 24 ÷ 3 =**

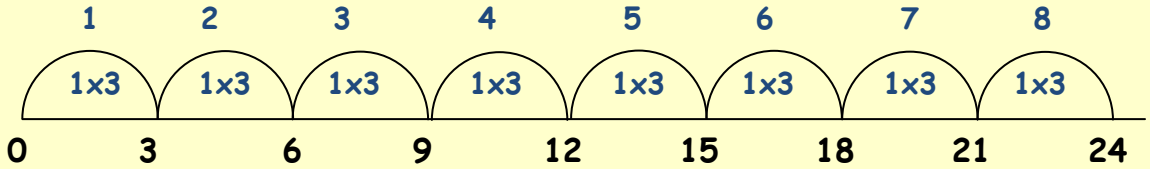


Draw the number line and put zero at the beginning and the number you are dividing (the dividend) at the end.

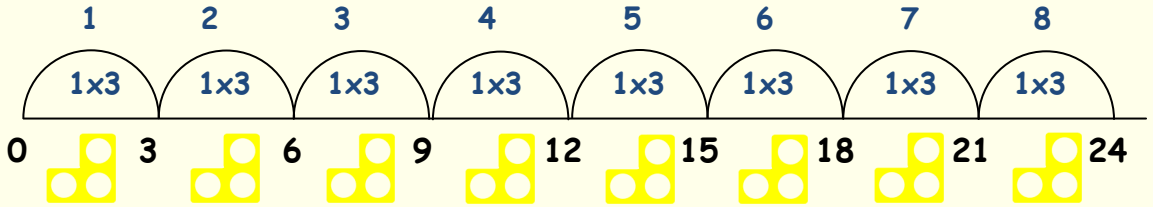
Step 2. **All you need to do is to keep adding 3 (the divisor) until you reach 24 (the dividend).**



Step 3. **Count the jumps of 3 to find the answer.** **Answer: 24 ÷ 3 = 8**

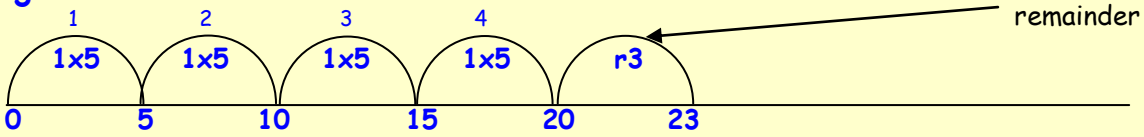


Step 4. **Use numicon to check your answer.**



Step 5. **Sometimes there will be remainders (numbers lower than the divisor).**

23 ÷ 5 = 4 r 3



Make sure that you don't count the remainder as the 5th jump!

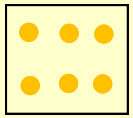
Pictorial methods to solve division calculations.

24 ÷ 4 = 6 means share 24 equally between

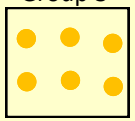
4 groups and count how many are in each

equal group. There are 6 in each group.

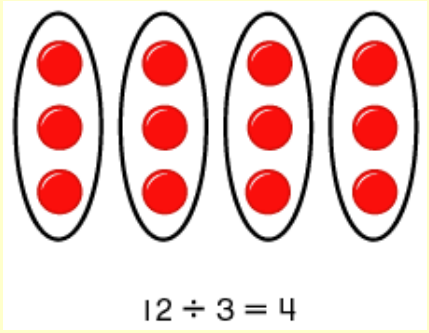
Group 1 Group 2



Group 3 Group 4



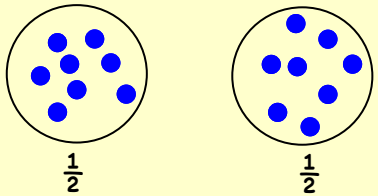
You can draw arrays.



12 ÷ 3 = 4

Remember $\frac{1}{2}$ means divide by 2.

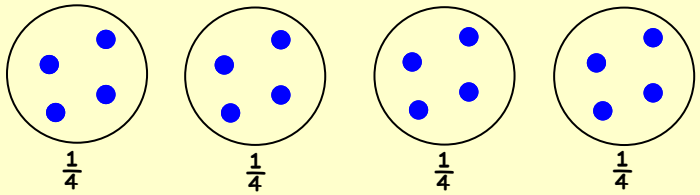
$\frac{1}{2}$ of 16 = 8



$\frac{1}{2}$ $\frac{1}{2}$

Remember $\frac{1}{4}$ means divide by 4.

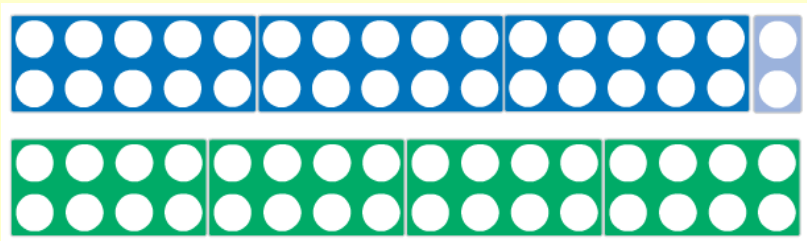
$\frac{1}{4}$ of 16 = 4 **so** $\frac{3}{4}$ of 16 = 12



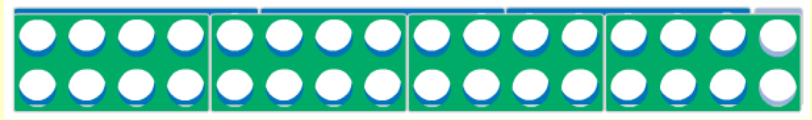
$\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$

Concrete methods to solve division calculations.

32 ÷ 8 = 4



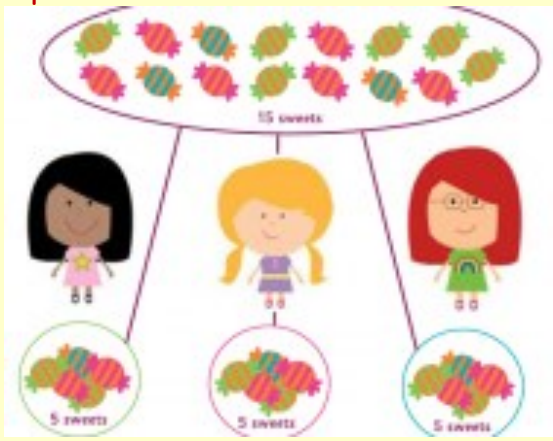
Make 32 with numicon and lay as many 8s as you can over the top.



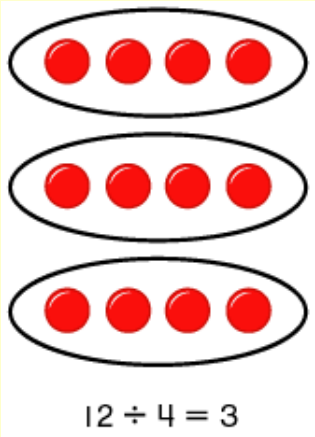
Count the 8s and any remainders to find the answer.

15 ÷ 3 = 5

Share items equally between people or groups.



You can make arrays with objects such as counters.



12 ÷ 4 = 3