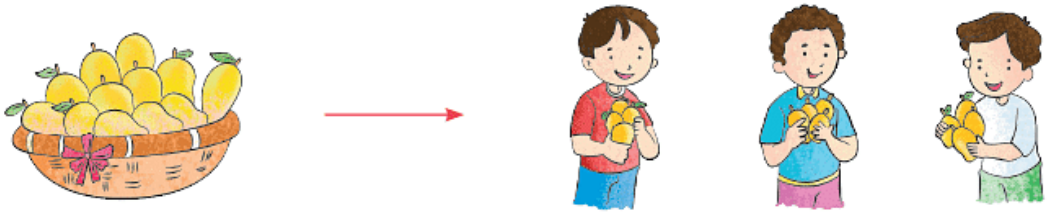
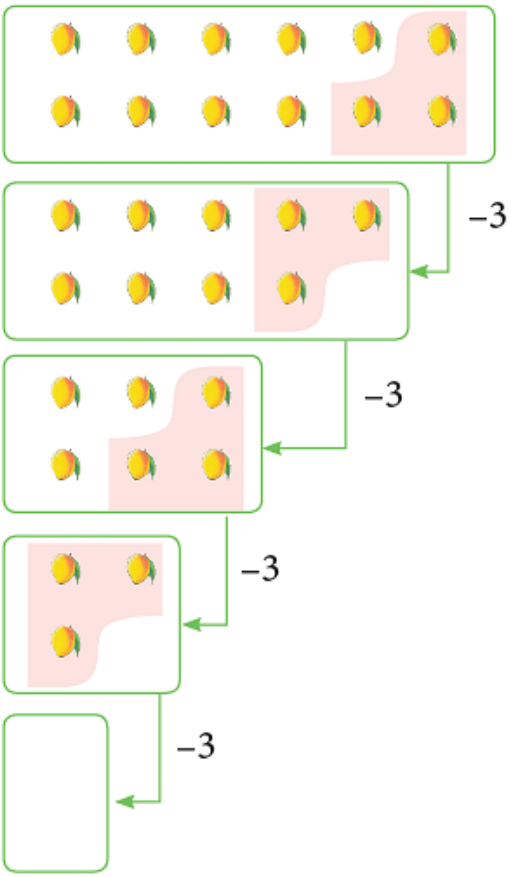
Division

Meaning of Division

Division means equal sharing or equal grouping.
Suppose, 12 mangoes are shared by 3 boys equally. How many mangoes will each boy get?



Clearly, each boy will get 4 mangoes.
You can also find the answer by subtraction. Subtract 3 at a time until there are none left.



$12 - 3 = 9$

$9 - 3 = 6$

$6 - 3 = 3$

$3 - 3 = 0$

Tips: Division and multiplication are inverse operations.

For example: if $42 \div 7 = 6$ then $7 \times 6 = 42$.

How many 3s have been taken away when you reach 0? ☐

How many times has a group of 3 been removed till finally no mango remains? ☐

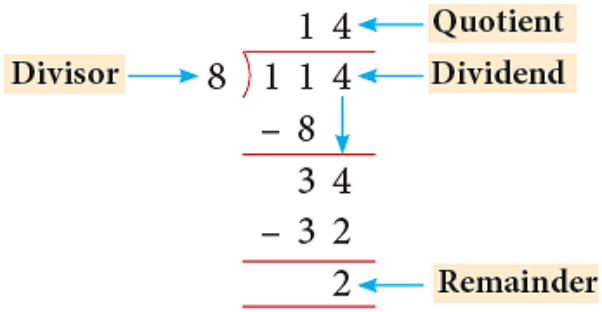
Clearly, 3 has to be subtracted 4 times from 12 to obtain 0 as the final result. So $12 \div 4 = 3$. You may ask this question as:

☐ $\times 3 = 12$ or $12 \div 4 =$ ☐

From the above explanation, we can say that, **division is repeated subtraction.**

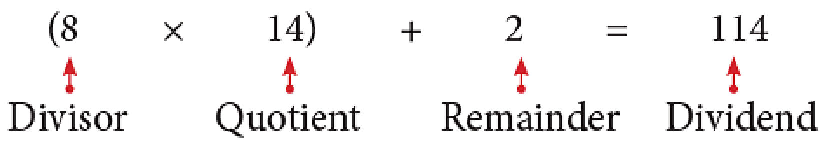
Terms Related to Division

In a division sum, the number to be divided is called the **dividend**, the number by which we divide is called the **divisor**, the result obtained on division is called the **quotient** and the number which is left undivided is called the **remainder**.



Look at the example on the right side:

1. **Checking Division**
   To check a division result, multiply the quotient by the divisor and add the remainder to this product. The result should be equal to the dividend.
   Thus,
   (Divisor × Quotient) + Remainder = Dividend
   From the above division fact, we have,



So, our answer is correct.

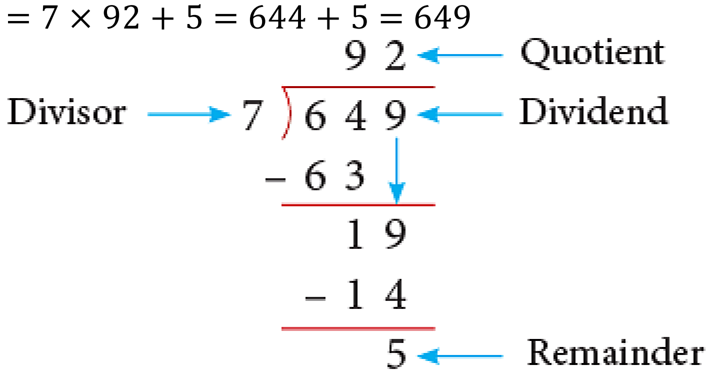
2. **Some Important Points Related to Division**
   We always start division from the place of highest value. In case of 2-digit dividends, we start from tens place and in case of 3-digit dividend, we always start from hundreds place. The remainder is always smaller than the divisor.

3. **Properties of Division**
   (i) When any number is divided by 1, the quotient is the number itself.
   Examples: $62 \div 1 = 62$, $125 \div 1 = 125$
   (ii) When any number is divided by itself (except 0), the quotient is 1.
   Examples: $64 \div 64 = 1$, $586 \div 586 = 1$.
   (iii) When 0 is divided by any number (except 0), the quotient is always 0.
   Examples: $0 \div 58 = 0$, $0 \div 6423 = 0$.
   (iv) Division by zero is not allowed.

Dividing by a 1-Digit Number

Example 1: Divide 649 by 7.
We divide, as shown alongside.

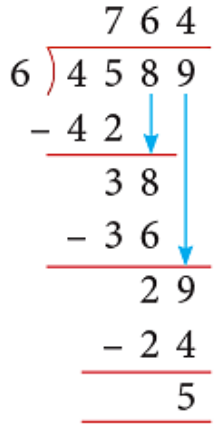
Check:
Divisor × Quotient + Remainder
$= 7 \times 92 + 5 = 644 + 5 = 649$



Thus, $649 \div 7$ gives **Q = 92 and R = 5.**

Dividing 4-Digit and 5-Digit Numbers

Example 2: Divide 4589 by 6.



First, consider the thousands place. The divisor 6 does not divide into the first figure 4 of the dividend, as $6 > 4$, so consider the first two digits 45 of the dividend. 6 goes into 45, 7 times and yields 3 as remainder. Write the quotient 7 above 5 in 45. Then, complete as shown by bringing down the digit 8 and lastly the digit 9 of the dividend.

Check: To check answer, we use the relationship,

Dividend = Divisor × Quotient + Remainder

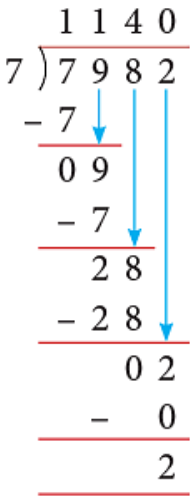
Here, Divisor = 6, Quotient = 764, Remainder = 5 and Dividend = 4589.

So, Dividend = Divisor × Quotient + Remainder.

$= 6 \times 764 + 5 = 4584 + 5 = 4589$

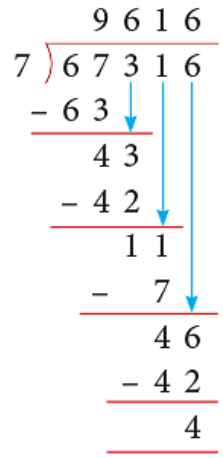
Thus, 4589 ÷ 6 gives **Q = 764 and R = 5.**

Example 3: Divide 7982 by 7.



Thus, 7982 ÷ 7 gives **Q = 1140 and R = 2.**

Example 4: Divide 67316 by 7.

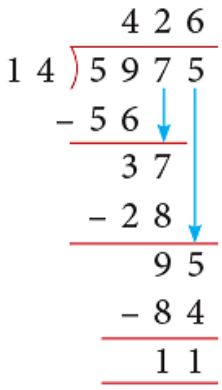


Thus, 67316 ÷ 7 gives **Q = 9616 and R = 4.**

Tips: 7 does not go into 2 so, we put a 0 in the quotient and bring down 2.

Division of a Number by a 2-Digit Number

Example 5: Divide 5975 by 14.

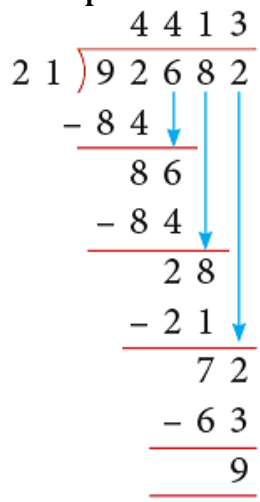


Starting from the leftmost digits, we consider 59, the number formed by the first two digits 5 and 9 of the dividend, as divisor is a 2-digit number. $14 < 59$.
Using the multiplication table of 14, we see that 14 goes into 59, 4 times and yields 3 as a remainder. Write the quotient 4 above 9 of 59. Then, complete the division as shown by bringing down 7 and lastly the figure 5 of the dividend.

Check: Dividend = Divisor × Quotient + Remainder
$= 14 \times 426 + 11$
$= 5964 + 11 = 5975$

Thus, 5975 ÷ 14 gives
Q = 426 and R = 11.

Example 6: Divide 92682 by 21 and check your answer.



Thus, 92682 ÷ 21 gives **Q = 4413 and R = 9.**

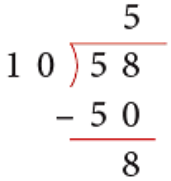
Check:
Here, divisor = 21, quotient = 4413, remainder = 9 and dividend = 92682.
We have,

Dividend = Divisor × Quotient + Remainder
= 21 × 4413 + 9
= 92673 + 9 = 92682
So, the answer is correct.

Division of a Number by 10, 100 and 1000
Example 7: Divide each of the following numbers by 10.

(a) 58
(b) 723
(c) 8165

(a)



Thus, 58 ÷ 10 gives **Q = 5 and R = 8.**

(b)

```
      7 2
1 0 ) 7 2 3
    - 7 0
      2 3
    - 2 0
        3
```

Thus, 723 ÷ 10 gives **Q = 72 and R = 3.**

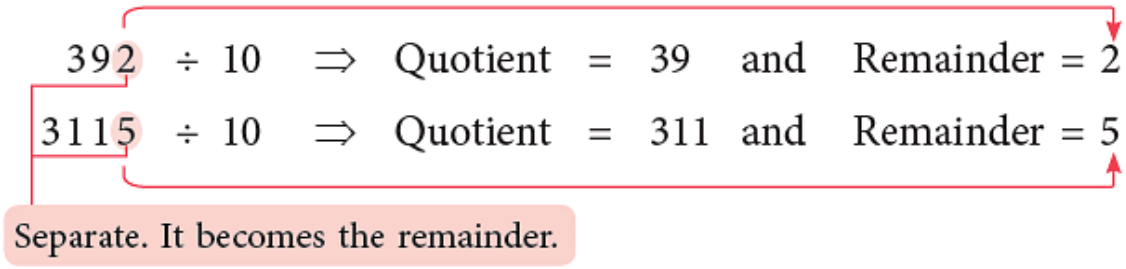
(c)

```
      8 1 6
1 0 ) 8 1 6 5
    - 8 0
      1 6
    - 1 0
        6 5
      - 6 0
          5
```

Thus, 8165 ÷ 10 gives **Q = 816 and R = 5.**

From the above examples, we get the following rule:
Rule: On dividing a number by 10, we remove the digit at the ones place leaving the rest of the digits to form the quotient and the digit we remove from the ones place is the remainder.

Thus,



Example 8: Divide each of the following numbers by 100.
(a) 563
(b) 7289
(c) 17019

(a)

$$\begin{array}{r} 5 \\ 100\overline{)\,563} \\ -\,500 \\ \hline 63 \end{array}$$

Thus, 563 ÷ 100 gives **Q = 5 and R = 63.**

(b)

$$\begin{array}{r} 72 \\ 100\overline{)\,7289} \\ -\,700\downarrow \\ \hline 289 \\ -\,200 \\ \hline 89 \end{array}$$

Thus, 7289 ÷ 100 gives **Q = 72 and R = 89.**

(c)

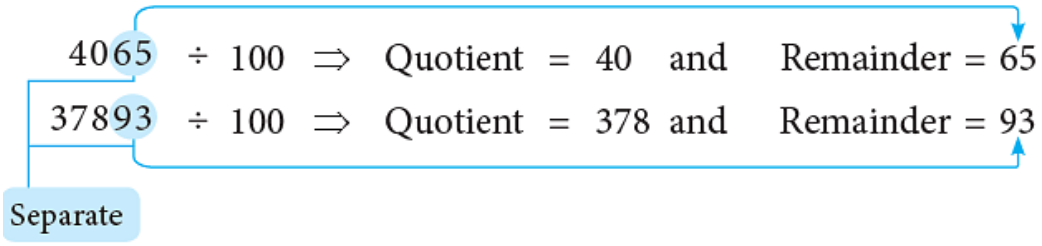
$$\begin{array}{r} 170 \\ 100\overline{)\,17019} \\ -\,100\downarrow \\ \hline 701 \\ -\,700\downarrow \\ \hline 19 \\ -\;\;0 \\ \hline 19 \end{array}$$

Thus, 17019 ÷ 100 gives **Q = 170 and R = 19.**

From the above examples, we get the following rule:

Rule: On dividing a number by 100, we remove the digits at the ones and tens places leaving the rest of the digits to form the quotient and the digits we remove from the ones and tens places form the remainder.

Thus,



Example 9: Divide each of the following numbers by 1000.
(a) 5637
(b) 15863
(c) 743895

(a)

$$\begin{array}{r} 5 \\ 1000\overline{)\,5637} \\ -\,5000 \\ \hline 637 \end{array}$$

Thus, 5637 ÷ 1000 gives **Q = 5 and R = 637.**

(b)

$$\begin{array}{r} 15 \\ 1000\overline{)\,15863} \\ -\,1000 \\ \hline 5863 \\ -\,5000 \\ \hline 863 \end{array}$$

Thus, 15863 ÷ 1000 gives **Q = 15 and R = 863.**

(c)

$$\begin{array}{r} 743 \\ 1000\overline{)\,743895} \\ -\,7000 \\ \hline 4389 \\ -\,4000 \\ \hline 3895 \\ -\,3000 \\ \hline 895 \end{array}$$

Thus, 743895 ÷ 1000 gives **Q = 743 and R = 895.**

From the above examples, we get the following rule:
Rule: On dividing a number by 1000, we remove the digits at the ones, tens and hundreds places to get the remainder and the rest of the digits form the quotient.

Thus,

$94895 \div 1000 \Rightarrow$ Quotient $= 94$ and Remainder $= 895$

$163415 \div 1000 \Rightarrow$ Quotient $= 163$ and Remainder $= 415$

Separate

Division of a Number by Multiples of 10 and 100

Example 10: Divide 6832 by 50.

```
       1 3 6
50 ) 6 8 3 2
   - 5 0
   -------
     1 8 3
   - 1 5 0
   ---------
       3 3 2
     - 3 0 0
     -------
         3 2
```

Thus, $6832 \div 50$ gives **Q = 136 and R = 32.**

Example 11: Divide 52891 by 600.

```
              8 8
600 ) 5 2 8 9 1
    - 4 8 0 0
    -----------
        4 8 9 1
      - 4 8 0 0
      ---------
            9 1
```

Thus, $52891 \div 600$ gives **Q = 88 and R = 91.**

Problems Based on Real Life Situations

When you do a division problem, sometimes the remainder forms the part of your answer and sometimes it doesn't.

Look at the following examples:

Example 12: 996 students of a school went on a picnic. They boarded buses each of which could hold only 24 students. How many buses were required?

At first, we divide 996 by 24 as shown on the right.
If we use the quotient 41 as the number of buses needed, then 12 students cannot go for the picnic.

```
      4 1
2 4 ) 9 9 6
    - 9 6
      ---
        3 6
      - 2 4
      -----
        1 2
```

So, we need to have one more bus to answer the question correctly.
Thus, **42 buses** were needed to take the students for the picnic.

Example 13: The sports teacher is cutting ribbons for the sports medals. How many ribbons of 30 cm length can the teacher get from a roll of ribbon that is 1520 cm long?

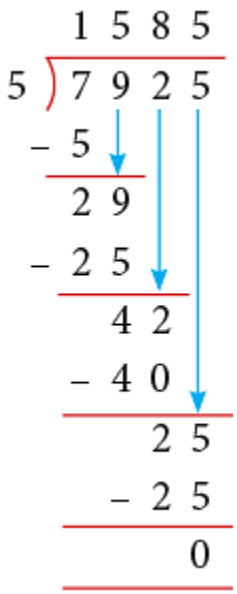
At first, we divide 1520 by 30.

```
          5 0
3 0 ) 1 5 2 0
    - 1 5 0
    -------
          2 0
```

Here, we ignore the remainder as the question asks for the number of pieces exactly 30 cm in length.
Thus, the teacher will get **50 pieces** each of 30 cm length.

Example 14: Five friends together purchased a cricket kit for ₹ 7925. Find the money contributed by each child.

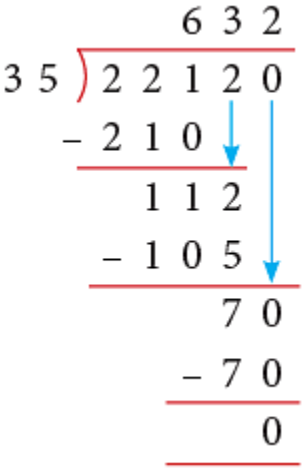
Money contributed by 5 children = ₹ 7925
Money contributed by 1 child = ₹ 7925 ÷ 5
= ₹ 1585



Thus, the money contributed by each child is **₹ 1585.**

Example 15: The product of two numbers is 22120. If one of the numbers is 35, find the other number.

Product of two numbers = 22120
One of the numbers = 35
So, the other number = Product ÷ Given number
= 22120 ÷ 35 = 632



Thus, the other number is **632.**