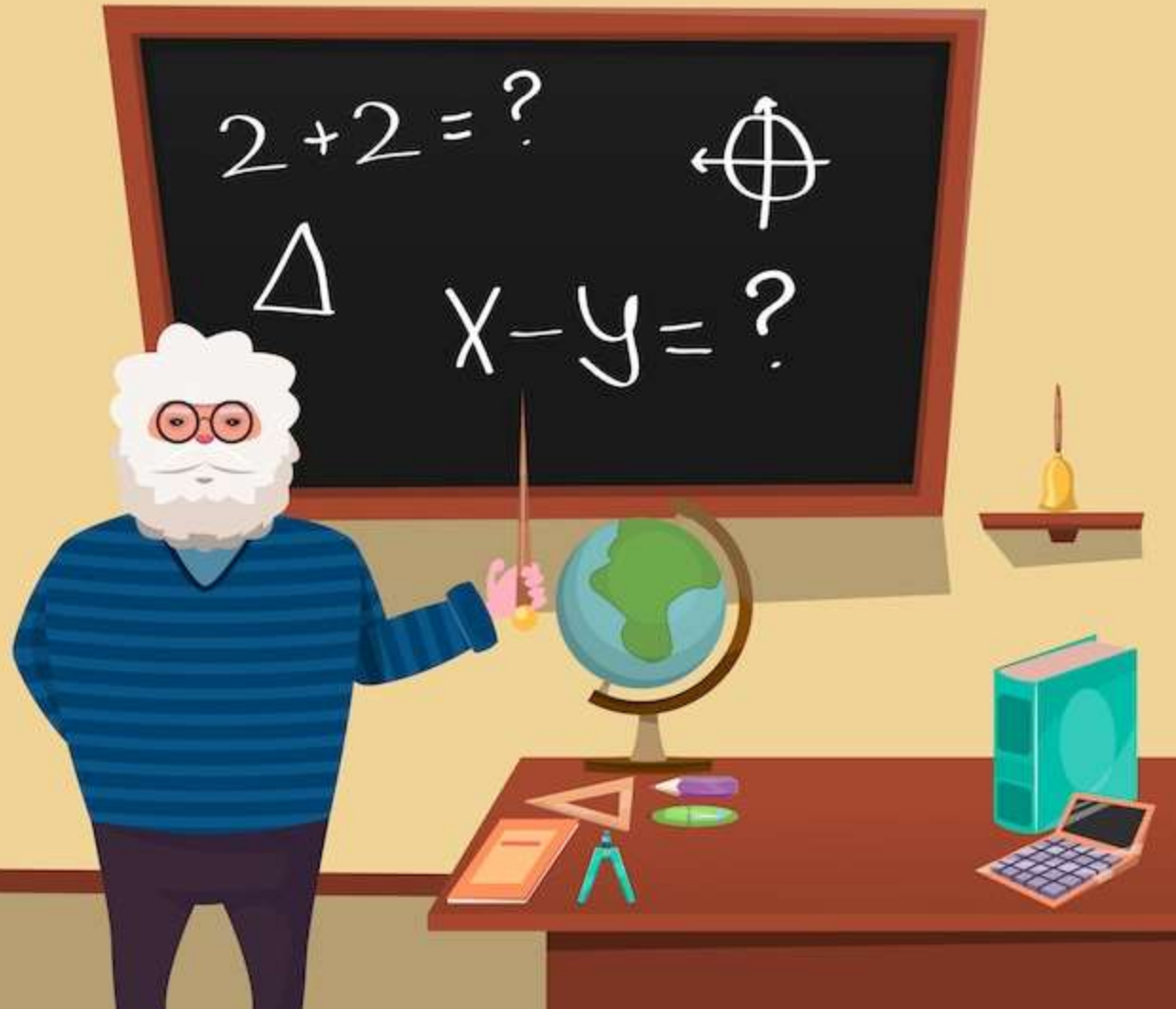
Proportion (Part 2)



▶ Percentage

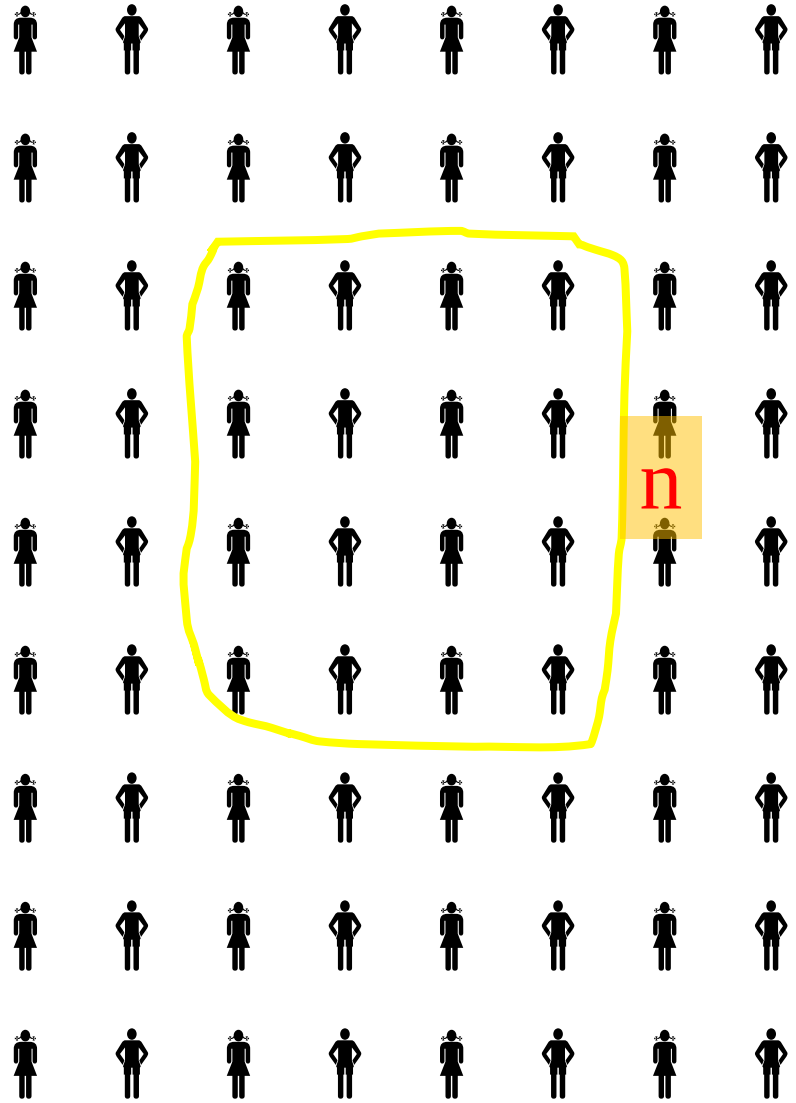
N ⟶ 100%

n ⟶ %

or

Number	N	n
Percentage	100	%

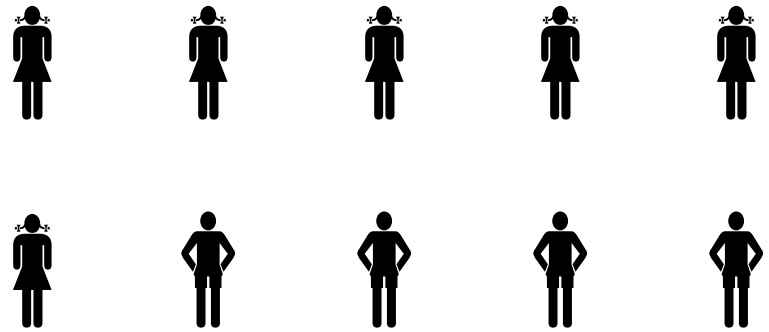
$$\% = \frac{n}{N} \times 100$$



Percentage

Example 1:

In a class there are 10 students: 6 girls and 4 boys.



The percentage of girls is 60%

10 → 100%

6 → %

$$\% = \frac{6 \times 100}{10} = 60\%$$

or

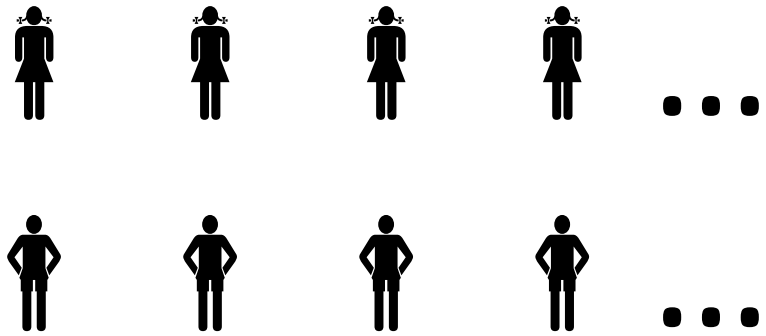
The percentage of girls is:

$$\% = \frac{number\ of\ girls}{Total} \times 100$$

$$= \frac{6}{10} \times 100 = 60\%$$

▶ Percentage

Example 2:
In a class there are 30 students.
40% of the students are boys.
How many boys are there?



30 ⟶ 100%

n ⟶ 40%

$n = \frac{40 \times 30}{100} = 12$ boys

or

The number of boys is:
40% of 30

So, $\frac{40}{100} \times 30 = 12$ boys

$$n = \frac{\%}{100} \times N$$

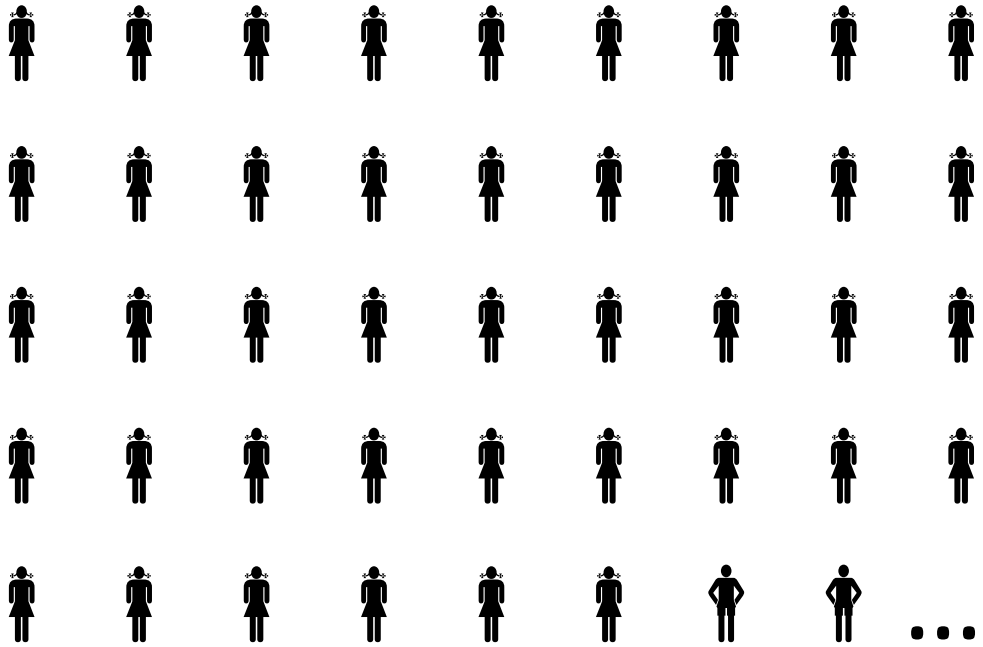
▶ Percentage

Example 3:

In a class there are N students:

- 30% of the students are boys.
- 42 students are girls.

Find N.



The percentage of girls is:

100 – 30 = 70%

N ⟶ 100%

42 ⟶ 70%

$$N = \frac{42 \times 100}{70} = 60 \text{ students}$$

$$N = \frac{n \times 100}{\%}$$

Percentage

In general, to calculate percentage we can use proportionality table or memorize the relation:

$$\% = \frac{n}{N} \times 100$$

$$n = \frac{\%}{100} \times N$$

$$N = \frac{n \times 100}{\%}$$

► Application 1

Joury bought candies of different tastes:

- $\frac{1}{4}$ of candies are of lemon taste.
- 62.5% of candies are of strawberry taste.
- 9 candies are of chocolate taste.

a) What is the total number of candies?

b) Calculate the number of strawberry candies.

► Application 1

Joury bought candies of different tastes:

- $\frac{1}{4}$ of candies are of lemon taste.
- 62.5% of candies are of strawberry taste.
- 9 candies are of chocolate taste.

a) What is the total number of candies?

b) Calculate the number of strawberry candies.

The percentage of lemon candies is $\frac{1}{4} \times 100 = 25\%$

The percentage of chocolate candies is: 100 – (25+62.5) = 12.5%

The total number of candies is $N = \frac{9 \times 100}{12.5} = 72$ candies

► Application 1

Joury bought candies of different tastes:

- $\frac{1}{4}$ of candies are of lemon taste.
- 62.5% of candies are of strawberry taste.
- 9 candies are of chocolate taste.

a) What is the total number of candies?

b) Calculate the number of strawberry candies.

The number of strawberry candies is 62.5% of 72

Then $\frac{62.5}{100} \times 72 = 45$ strawberry candies.

► Application 2

Youssef has 150 marbles:

- 15 marbles are red.
- 20% of the marbles are yellow.
- 28% of the marbles are blue.
- The remaining are green.

How many green marbles are there? (in 2 methods)

First method:

The percentage of red marbles is : $\frac{15}{150} \times 100 = 10$

The percentage of green marbles is 100 – (10+20+28) = 42%

The number of green marbles is $\frac{42}{100} \times 150 = 63$ marbles.

► Application 2

Youssef has 150 marbles:

- $\frac{1}{10}$ marbles are red.
- 20% of the marbles are yellow.
- 28% of the marbles are blue.
- The remaining are green.

How many green marbles are there? (in 2 methods)

Second method:

The number of red marbles is $\frac{1}{10} \times 150 = 15$

The number of yellow marbles is $\frac{20}{100} \times 150 = 30$

The number of blue marbles is $\frac{28}{100} \times 150 = 42$

So the number of green marbles is 150 – (15+30+42) = 63