Math 4e. Classwork 22.

1 percent of quantity is a $\frac{1}{100}$ th part of it.

Percent.

One percent (1%) means 1 per 100. Percentage is a ratio expressed as a number out of 100. For example, if 20% of the students in grade 4 got a perfect score on the test, it means that 20 out of every 100 students got a perfect score.

$$\frac{20}{100} = \frac{1}{5}$$

Or every 5^{th} student got a perfect score.

1% of this line is shaded green: it is very small, isn't it?

Example 1.

To find 15% of 200 we need to divide 200 by 100 (to find oud how much is 1%) and then multiply the result by 15 (to find out how much is 15%):

$$\frac{200}{100} \cdot 15 = 200 \cdot \frac{15}{100} = 0.15 \cdot 200 = 2 \cdot 15 = 30$$

15% is $\frac{15}{100}$ or 0.15 of a number (quantity).

Example 2.

8% of a number is 25. What is the number?

We need to divide 25 by 8 (to find out how much is 1% of the unknown number) and multiply by 100 to find the number itself.

$$\frac{25}{8} \cdot 100 = 25 \cdot \frac{100}{8} = 25 : \frac{8}{100} = 25 : 0.08 = 312.5$$

Example 3.

Fresh cranberries contain 90% of water, while dry cranberries contain only 15% of water. How much water should be evaporated from 4.25 kg. fresh cranberries to obtain dry cranberries?

To find out how much water is in 4.25 kg. of fresh cranberries we need to calculate:

$$4250 \cdot 0.9 = 4250 : 100 \cdot 90 = 3825g.$$

So, there are 3825 g. of water and 425 g. of fiber/sugar/vitamins and other minor components of cranberries. After drying process, 425 g of fiber/sugar/vitamins will still be in the berries, but some water will be evaporated, leaving only 15% of the final product as water. Therefore, we can tell that 425 g. of fiber/sugar/vitamins is constitute 85% of the final product, and 15% is water. To find the amount of water in the final product:

$$425 : 85 \cdot 15 = 75g.$$

The last step is:

$$3825 - 75 = 3750\ g.$$

During the process. 3750 g. of water should de evaporated.

Exercises:

1. How many squares we have to shade to shade 10% of the line, 15%, 20%, 25%?

2. There are 200 pencils in the box. 3% of the pencils are red, 26% are yellow, and the rest are blue. How many red pencils are in the box?

3. Find:

1% from 100	120% from 250
7% from 200	5% from 50
100% from 49	25% from 48
1% from 300	200% from 300
20% from 15	

4. Find a number, if

1% of it is 2;	200% of it is 400;

10% of it is 12;
15% is 150;
3% of it is 0.24;

100% of it is 0.1;
50% of it is 1;
25% of it is 30;

5. 15% of the participant of math Olympiad solved 1 problem, 25% of the participant solved 2 problems, and the rest 24 students solved all three problems. Haw many students did participate in the math Olympiad?

6. Dry apricots contain 25% of water. How much water should be evaporated from 5 kg of fresh apricots to get dry apricots, if fresh apricots contain 85% of water?

7. Peter spent 15% of his money and 1.5 dollars on a doughnut and $\frac{3}{5}$ of his money and 30 cents on ice-cream. How much money did he have?

8. In Peter's bottle there is 10% more soda than in John's bottle. Peter drank 11% of his soda, while John drank 2% of his soda. So, who has more soda left?

9. Write an expression to find 15% of a number $\boldsymbol{a}$. Calculate 15% of the following numbers: 1540, 220, and 10.

10. Write an expression to find a number, if 4% of it is equal to $\boldsymbol{b}$. Find the numbers for which 4% is equal to 8, 12, and 55.