

Grade 9

Lesson 4 - Rounding off and Scientific Notation

- Writing a number as a product of two numbers, where one is between 1 and 10 or 1 and the other is power of 10, is known as the scientific notation.

- Examples:

$$20 = 2 \times 10^1$$

$$300 = 3 \times 100 = 3 \times 10^2$$

$$450 = 4.50 \times 100 = 4.50 \times 10^2$$

$$756000 = 7.56 \times 100000 = 7.56 \times 10^5$$

$$462.67 = 4.6267 \times 10^2$$

- Do the review exercise to recall your knowledge.
- Study the examples given in text book and do the exercise 13.1

Writing a number between 0 and 1 in scientific notation

$\frac{1}{10^1} = 0.1$ $0.1 = 10^{-1}$	$\frac{1}{100} = 0.01$ $0.01 = 10^{-2}$	$\frac{1}{1000} = 0.001$ $0.001 = 10^{-3}$
---	--	---

- Examples:

$$\begin{aligned} 0.42 &= 4.2 \times 0.1 \\ &= 4.2 \times 10^{-1} \end{aligned}$$

$$\begin{aligned} 0.0025 &= 2.5 \times 0.001 \\ &= 2.5 \times 10^{-3} \end{aligned}$$

- Do the exercise 13.2

Converting numbers expressed in scientific notation to general form

- Examples:

$$\begin{aligned} 4.2 \times 10^2 &= 4.2 \times 100 \\ &= 420 \end{aligned}$$

$$\begin{aligned} 6.751 \times 10^5 &= 6.751 \times 10\,000 \\ &= 675100 \end{aligned}$$

$$\begin{aligned} 4.3 \times 10^{-2} &= 4.3 \times 0.01 \\ &= 0.043 \end{aligned}$$

$$\begin{aligned} 1.5 \times 10^{-3} &= 1.5 \times 0.001 \\ &= 0.0015 \end{aligned}$$

- Do the exercise 13.3

## **Rounding off**

**The number 4276,**

- **Round off to the nearest 10.**

Here, the digit in the tens place is 7. So the multiple of 10 which 76 is closest is 80. Accordingly when 4276 is rounded off to the nearest 10, we obtain 4280.

- **Round off to the nearest 100.**

Here the digit in the hundreds place is 2. So the multiple of 100 which 276 is closest is 300. Accordingly 4276 is rounded off to the nearest 100, we obtain 4300.

- **Round off to the nearest 1000.**

Here, the digit in thousands place is 4. So the multiple of 1000 which 4276 is closest is 4000. Accordingly 4276 is rounded off to nearest 1000, we obtain 4000.

**Do the exercise 13.4 and 13.5**

## **Rounding off decimal numbers**

**The number 18.635,**

- **Round off to the nearest whole number.**

The whole numbers on either side of 18.635 are 18 and 19. The mid value between 18 and 19 is 18.5. The number 18.635 is greater than 18.5. So it is closer to 19 than 18. Therefore the nearest whole number is 19.

- **Round off to the nearest first decimal place.**

The digit in the first decimal place is 6. Accordingly 18.635 lies between 18.6 and 18.7. Since 18.635 is closer to 18.6 than 18.7, Therefore the nearest first decimal place, we obtain 18.6

- **Round off to the nearest second decimal place.**

The digit in the second decimal place is 3. Accordingly 18.635 lies between 18.63 and 18.64. The number 18.635 is exactly at the centre between 18.63 and 18.64. So it is rounded off to the nearest second decimal place which is greater than 18.635. Accordingly when 18.635 is rounded off to the nearest second decimal place is 18.64.

**Do the exercise 13.6**