06 - ESTIMATION AND APPROXIMATION

6.1 Estimation of quantities

✎ Activity 6.1

1. At what time did you come to school today?
2. What is your height?
3. What is your age?
4. What is the height of the school building where your class is?
5. What is the length of the classroom?
6. What is the length and breadth of your Mathematics text book?
7. What is the length of your middle finger?

When answering the above questions did you do any measuring?

You have decided on a value here using common sense. Deciding a value in this form is known as "estimation".

Let us consider some more examples.

Example 1.

When buying a cluster of bananas, the number of bananas is not normally counted. A value is arrived considering the number of combs in the cluster. This value is assumed as an estimated value. Here, the number of fruits in a comb are counted and from the number of combs, the total number of fruits is decided.

Example 2.

The value of a jak fruit or a breadfruit is normally fixed according to its size. Here fruits equal in size are given a certain value. Big fruits are valued high and small fruits are valued low.

The fruits are graded by assuming that some fruits are big. The size of the fruit is estimated. You have heard that fruit traders get fruit trees on lease during fructiscence. Without measuring or weighing and guessing correctly using addition, subtraction, multiplication or division and arriving at sizes and numbers is called estimation.

> **Without measuring or weighing but surmising using multiplication, division, addition or subtraction to decide on the number and quantity approximately is known as estimation.**

✍ **Activity 6.2**

Discuss with your parents, the situations where estimation is used.

E.g. * Buying provisions for one week

* Supplying material for a function

Exercise 6.1

1. Select a page from your Sinhala text book. Estimate the number of words in that page. Count the number of words in the page and compare this value with the estimated value.

2. How many normal size cups can be filled with the bottle of water you bring to school if any?

3. Estimate the values of the objects in the table given below.

| Objects	Estimated value
1. Length of the blackboard in the class	
2. Breadth of the blackboard	
3. Length of the teacher's table	
4. Breadth of the teacher's table	
5. Height of your best friend	
6. Weight of your best friend	
7. Capacity of a normal cup of tea	
8. The length and breadth of your Mathematics text book	

Table 6.1

4. Estimate the length of your classroom in metres. Write this in your exercise book. Write the estimated values your friends have and compare with written, what you have written.

Find the length of the classroom by your steps. Write this number in the exercise book, Compare this value with the estimated value.

5.

A   B   How many boxes of size 'B' can be packed in box 'A'?

6.   Y   How many times the height of the column 'X' is in the column 'Y' ?

X

7.   How many complete squares are there in the uneven picture?
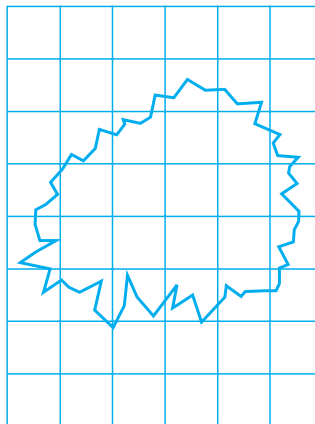
6.2 Approximation

Sometimes it is sufficient to express numbers to the nearest 10, to the nearest 100 etc. Normally, these are not exact values. But for certain purposes it is sufficient.

This process is known as "rounding off to the nearest 10, nearest 100" etc.

(A) If we are expressing a number to the nearest 10, we have to consider the multiples of 10 on either side of the number and decide on the closer ten. When the units place is less than 5 the multiple of 10 lower than the number is taken.

eg. 54 is rounded off to 50. When the units place is 5 or more than 5 then the multiple of 10 above the number is taken.

eg.   57 to the nearest 10 is 60.
        65 to the nearest 10 is 70.

✎ Activity 6.3

Fill in the blanks in the table given below.

| Number	When rounded off to the nearest 10
12	
25	
38	
44	
46	
67	
78	
83	
59	
99	

Table 6.2

Writing a number rounded off to a given number is known as **"Approximation".** Here, the numbers were approximated to the nearest 10.

Exercise 6.2

1. The cost of a mango is Rs. 12. You approximate this to the nearest 10. Find the amount of money needed to buy 18 mangoes based on the approximation.

2. Mother gave Rs. 16 to the son and Rs. 25 to the daughter. Express the total amount of money given to both of them to the nearest 10.

3. There are 12 kg of potatoes for sale and another 33 kg in the store room of a shop. How many 'kg' of potatoes are there in the shop? Approximate the total to the nearest 10.

4. A certain number when approximated to the nearest 10, the answer is 60. Can this number be 65?

Additional Exercises

1.
Floor
A
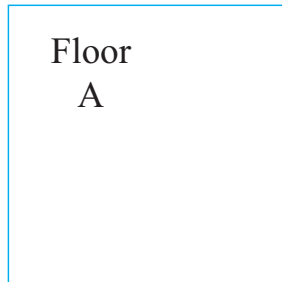
B Tile

Estimate the number of 'B' tiles needed to cover floor 'A' shown in the diagram.

2. The picture below shows two sets of coins. There are 10 coins in the small set. Estimate the number of coins in the large set.
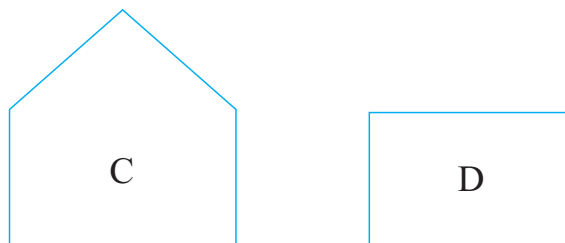
3.

A

B

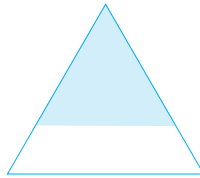Estimate the number of triangles of size 'B' needed to cover triangle 'A'.

4.

C

D

'C' and 'D' are two flower beds. Is the length around flower bed 'C' greater than or less than the length around flower bed 'D' ?
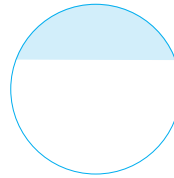
5. In the figures partially shaded , indicate whether the shaded portion of each figure is greater than half, less than half or equal to half, in each case.
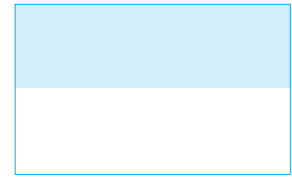
(i)	(ii)	(iii)	(iv)

6. Amal got 65 marks, Ramani got 62 marks, Kumudu got 68 marks and Kavindra got 61 marks in a Mathematics test. Approximate each mark to the nearest 10.

7. Ages of 8 persons are given in the table. Fill in the blanks.

	Age in years	When rounded off to the nearest 10
A	48	....
B	33	....
C	35	....
D	45	....
E	38	....
F	40	....
G	27	....
H	18	....

Table 6.3

8. Mother bought 9 metres of coloured poplin, 8 metres of white cloth and 12 metres of table cloth. Approximate the lengths of cloth she bought to the nearest 10 metres. Find the total length of cloth she bought and approximate this to the nearest 10 metres.

Summary

* **Deciding by taking approximate quantities or amounts related to multiplication, division, addition or subtraction without measuring or weighing, is known as Estimation.**