Topic

HCF of Two Numbers

Objective

To find the HCF of two numbers experimentally based on Euclid's Division Lemma.

Previous Knowledge Required

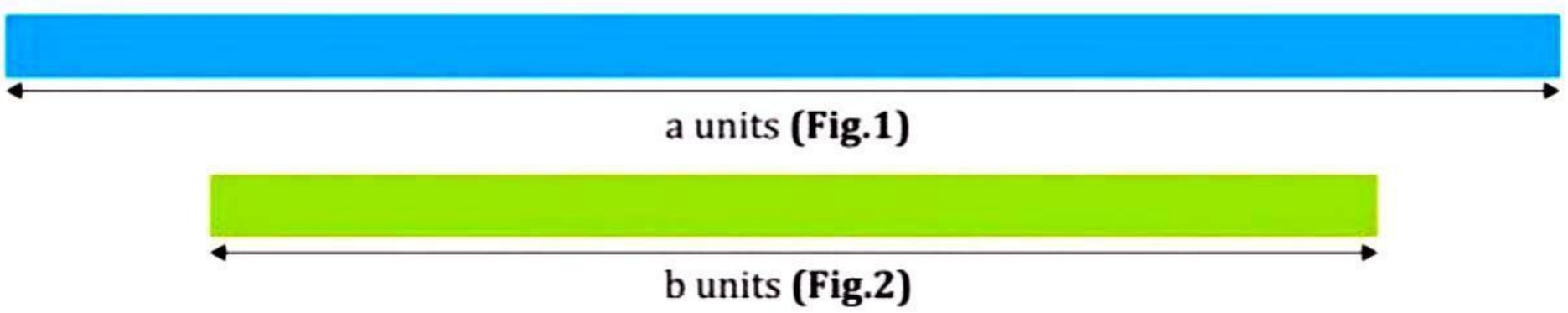
1. Basic concept of HCF
2. Euclid's Division Lemma

Materials Required

1. Cardboard Sheets
2. Glazed papers of different colours
3. A pair of Scissors
4. Geometry box
5. Sketch Pens
6. Fevicol

Procedure

1. Take cardboard sheets of suitable length.
2. Cut out one strip of length a unit, another strip of length b unit such that b<a. Cut out two strips each of length c units such that c<b, one strip of length d units such that d<c and two strips each of length e units such that e<d.
3. Paste these strips on different coloured glazed papers.
   (See Fig 1 to 5.)



a units **(Fig.1)**

b units **(Fig.2)**

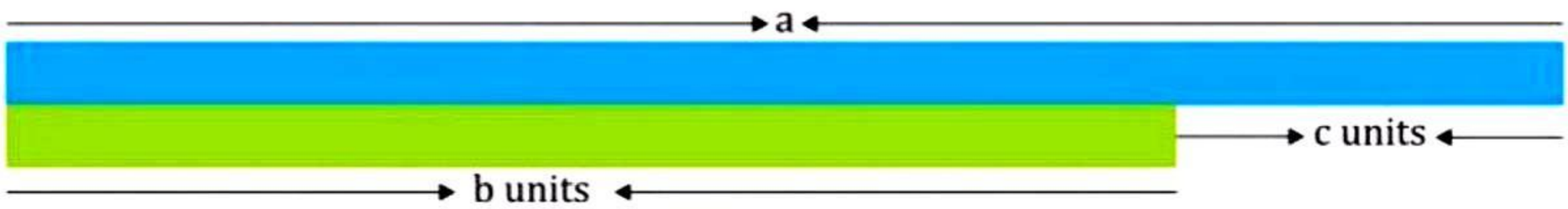
c units c units

(Fig.3)

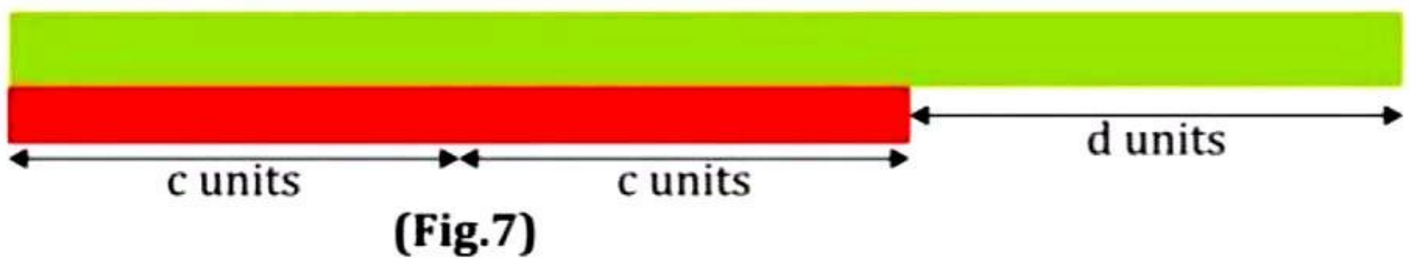
d units **(Fig.4)**

e units e units **(Fig.5)**

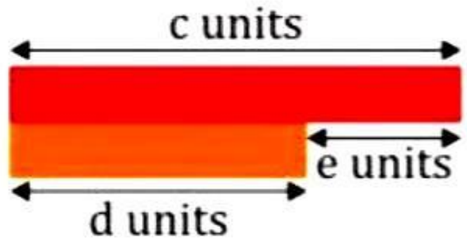
4. Place these strips on other cardboard as shown in Fig. 6 to 9.



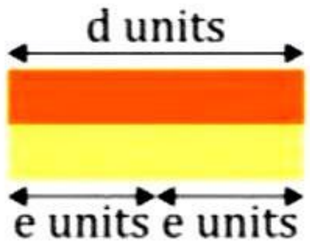
(Fig.6)



(Fig.7)



(Fig.8)



(Fig.9)

Observations

1. According to Euclid's Division Lemma:

Fig. 6 represents $a = b \times 1 + c(q = 1, r = c)$ .....(i)

Fig. 7 represents $b = c \times 2 + d(q = 2, r = d)$ .....(ii)

Fig. 8 represents $c = d \times 1 + e(q = 1, r = e)$ ....(iii)

Fig. 9 represents $d = e \times 2 + 0(q = 2, r = 0)$ .....(iv)

2. Using assumptions in Euclid's Division Algorithm, we have HCF of a and b = HCF of b and c = HCF of c and d = HCF of d and e. The HCF of d and e is equal to e [from (iv) above]

Thus. HCF of a and b is e.

Result

The process shown above can be used for finding the HCF of two or more numbers. This process is known as finding HCF of numbers by Division Method.

VIVA VOCE

Q 1. Define Euclid's Division Lemma.

Ans. For given positive integers a and b, there exist unique integers q and r satisfying $a = bq + r$, where $0 \leq r < b$.

Q 2. What is Algorithm?

Ans. An Algorithm gives a procedure for solving a type of problem.

Q 3. Find ab, if HCF and LCM of a and b are 7 and 14 respectively.

Ans. ab = HCF × LCM = $7 \times 14 = 98$.

Q 4. Can two numbers 9 and 51 be respectively HCF and LCM of two numbers? Give reason.

Ans. No, because HCF (9) does not divide LCM (51).

MULTIPLE CHOICE QUESTIONS

Q 1. The least number that is divisible by all the numbers from 1 to 10 (both inclusive) is:

(a) 10 (b) 100 (c) 504 (d) 2520

Q 2. When a number is divided by 11, its remainder will be always:

(a) Greater than 11 (b) At least 11

(c) Less than 11 (d) At most 11

Q 3. Two numbers with 18 as their HCF and 3672 as their LCM are:

(a) 216 and 306 (b) 256 and 306 (c) 206 and 316 (d) 162 and 216

Q 4. HCF of 847 and 2160 is:

(a) 3 (b) 2 (c) 1 (d) 7

Q 5. The HCF of the two numbers is 29, and their sum is 174. What are the numbers?

(a) 29 and 145 (b) 25 and 111 (c) 30 and 150 (d) 15 and 22

Answer Key

1.(d)	2.(c)	3.(a)	4.(c)	5.(a)