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Class 4

Chapter Seven

Multiples and Factors

[Read the Textbook, try to understand every line every topic of the chapter 7]

Multiples:

Products of Times/Multiplication Table of a number are the multiples of the number. Such as the Times Table of 3 is...

$$3 \times 1 = 3$$

$$3 \times 2 = 6$$

$$3 \times 3 = 9$$

$$3 \times 4 = 12$$

$$3 \times 5 = 15$$

$$3 \times 6 = 18$$

$$3 \times 7 = 21$$

$$3 \times 8 = 24$$

$$3 \times 9 = 27$$

$$3 \times 10 = 30$$

.....

.....

$$3 \times 100 = 300$$

.....

.....

Therefore,

The multiples of 3:

3, 6, 9, 12, 15, 18, 21, 24, 27, 30,.....,300,.....

Similarly,

Multiples of 4:

4, 8, 12, 16, 20, 24, 28, 32, 36, 40,....., 400,.....

[dotdot means continuously multiples will be found by multiplying the desired number with any number]

Multiples of 7:

7, 14, 21, 28, 35, 42, 49, 56, 63, 70,....., 700,....

[Multiples of a number start from the number itself that means they are greater than or equal to the number itself, they are unlimited and divisible by the number itself]

Find the multiples of the following numbers:

5, 6, 8, 9, 12, 15, 18, 25, **Excercise: 1(All)**

Common Multiples (CM) and Least Common Multiple (LCM):

Multiples of 6:

6, 12, 18, 24, 30, 36, 42,

Multiples of 12:

12, 24, 36, 48, 60,

Underlined multiples are the multiples of both 6 and 12.

So they (12, 24, 36,....) are the common multiples (CM) of 6 and 12.

And 12 is the Least (Smallest) of them. So the Least Common Multiple (LCM) is 12.

[1) To find common multiples you have to count minimum two number's multiples. Common multiples are also unlimited.

2) Remember that Least means Smallest, Lowest, Fewest, Minimum, Shortest.]

Find CM and LCM of the following numbers:

i) 4, 5 ii) 6, 8 iii) 3, 6, 9 iv) 10, 15 v) 6, 12 vi) 15 vii) 9, 12 viii) 8, 16 ix) 4, 8, 12 x) 7, 14

Exercise: 2(All)

Factors:

Numbers which divide a number without a remainder are called the Factors.

Factors are also called divisors.

Factors of 6:

1, 2, 3, 6

Note: 1 and the number itself will be always factors of a number. And other factors of that number will be between 1 and the number itself.

Such as 1 and 6 itself are factors of 6 and other factors 2, 3 are between 1 and 6.

[Factors of a number are less than or equal to the number and they are limited, countable.]

Find the factors of the following numbers:

2, 3, 4, 8, 10, 12, 15, 25, 30, 36, 45, **Exercise: 3(All)**

Common factors (CF) and Highest Common Factor (HCF):

[To find CF count minimum two number's Factors]

Factors of 8:

1, 2, 4, 8

Factors of 12:

1, 2, 3, 4, 6, 12

Underlined factors are the factors of Both 8 and 12.

So, they (1, 2 and 4) are the common factors (CF) of 8 and 12.

And 4 is the highest of them. So the Highest Common Factor (HCF) is 4.

Find the CF and HCF of the following numbers:

i) 3, 6 ii) 4, 8 iii) 5, 10 iv) 4, 6 v) 5, 15 vi) 8, 10 vii) 4, 6, 12 viii) 12, 15 ix) 10, 20 x) 5, 10, 15

Exercise: 4(All)

****Multiples of a number is divisible by the number:***

$$3 \times 5 = 15$$

Here 15 is Multiple of both 3 and 5. And 15 is also divisible by 3 and 5 or 3 and 5 also divide 15 or 3 and 5 are also divisors/factors of 15.

Prime numbers:

A number which has 2 factors, 1 and the number itself, is called Prime number.

Factors of 5:

1, 5

5 has only two factors, 1 and 5 itself. So 5 is the Prime Number.

Composite numbers:

A number which has 3 or more factors including 1 and the number itself, is called Composite number.

Factors of 9:

1, 3, 9

9 has three factors including 1 and 9 itself. So 9 is the composite number.

Note: 1 has only one factor, 1 itself. So 1 is neither prime nor composite number.

Identify Prime or Composite number:

2, 3, 4, 7, 11, 14, 17, 18, 19, 21, 23, 25

Find the prime numbers within 1-100.

Break apart composite number into prime numbers:

$$12 = 2 \times 2 \times 3$$

$$15 = 3 \times 5$$

$$18 = 2 \times 3 \times 3$$

$$24 = 2 \times 2 \times 2 \times 3$$

Similarly do the followings: 9, 20, 28, 30, 36

Put 2, 3, 5 or 7 in the blanks to make up the following composite numbers:

$$3 \times 5 = 15$$

$$2 \times 2 \times 5 = 20$$

$$2 \times 3 \times 5 \times 5 = 150$$

Similarly do the followings:

$$\text{i) } \quad \times \quad = 14 \quad \text{ii) } \quad \times \quad \times \quad = 45$$

$$\text{iii) } \quad \times \quad \times \quad = 30 \quad \text{iv) } \quad \times \quad \times \quad \times \quad = 60$$

$$\text{v) } \quad \times \quad \times \quad = 70 \quad \text{vi) } \quad \times \quad \times \quad = 90$$

$$\text{vii) } \quad \times \quad \times \quad \times \quad = 56$$

Freely make composite numbers in the similar way:

Exercise: 6(All)

Divisibility of 2, 3 and 5:

**If there is a 0, 2, 4, 6, 8 in the ones place of a number, the number is a multiple of 2 or divisible by 2.*

Find the multiples of 2 or the numbers which are divisible by 2:

648, 552, 7335, 1350, 4487, 9356, 1734, 5291

**If the sum of the digits of a number is divisible by 3, the number is multiple of 3 or divisible of 3.*

Find the multiples of 3 or the numbers which are divisible by 3:

743, 639, 5757, 3552, 7346, 8449

**If there is a 0 or 5 in the ones place of a number, the number is multiple of 5 or divisible by 5.*

Find the multiples of 5 or the numbers which are divisible by 5:

5510, 6761 655 8653, 3530, **Exercise: 7(All) and Page 84 problems.**

Solutions of Exercise word problems:

After reading all the word problems,

Question(1): Can you understand how you will solve the problem?

Answer(1): By applying LCM and HCF method.

Question(2): When will you apply LCM method?

Answer(2): You will apply LCM method when you will understand that the result will be greater than the numbers used in the method from the problem.

Question(3): When will you apply HCF method?

Answer(3): You will apply HCF method when you will understand that the result will be smaller than the numbers used in the method from the problem.

Trick:

**If you see the following words in the word problem, you will apply LCM method.*

(Least, Lowest, smallest, fewest, shortest, minimum, together)

**If you see the following numbers in the word problem, you will apply HCF method.*

(Highest, largest, longest, biggest, maximum, distribute, divide)

8.

We can find out the time by finding LCM of 8 and 6.

Multiples of 8:

8, 16, 24, 32, 40,.....

Multiples of 6:

6, 12, 18, 24, 30,.....

Therefore the LCM of 8 and 6 is 24.

So, 24 minutes after noon (12:00 pm) the bells will ring together.

That means at 12:24 pm they will ring together. (Answer)

9.

The length of the side of biggest square can be found by finding HCF of 36 and 24.

Factors of 36:

1, 2, 3, 4, 6, 9, 12, 18, 36

Factors of 24:

1, 2, 3, 4, 6, 8, 12, 24

Therefore the HCF is 12.

So the length of the side of the biggest square is 12 cm. (Answer)

10.

Length of the side of the smallest square can be found by finding LCM of 5 and 7.

Multiples of 5:

5, 10, 15, 20, 25, 30, 35, 40,.....

Multiples of 7:

7, 14, 21, 28, 35, 42, 49, 56,.....

Therefore the LCM is 35.

So the length of the side of the smallest square is 35 cm. (Answer)

11.

Number of children can be found by finding HCF of 45 and 18.

Factors of 45:

1, 3, 5, 9, 15, 45

Factors of 18:

1, 2, 3, 6, 9, 18

Therefore the HCF is 9.

So the number of children is 9.

And each children gets apples = $45 \div 9$

$$= 5$$

Oranges = $18 \div 9$

$$= 2$$

(Answer)

Do the similar problems:

- 1.st alarm rings every 9 minutes and 2nd alarm rings every 12 minutes. The alarms ring together at 3:20 pm. When is the next time they will ring together?
2. There is a floor with 48 meters long and 32 meters wide. You want to cover it with square size tiles. What will be the length of the side of largest square size tiles possible?
3. You have some rectangular size paper cards each with 14 cm length and 10 cm width. You can make square shape area by keeping them side by side. What will be length of the side of shortest possible square shape?
4. You have 54 pens and 36 pencils. You want to divide them to maximum number of your friends. Find is the number of friends. And how many pens and pencils will each friend get?

End