Here’s the extracted text from the pages you uploaded — **Factors and Multiples** lesson — ready for you to copy:

**📘 Chapter: Factors and Multiples**

**Page 47**

**To Do**  
✅ Apply the concept of factors and multiples  
✅ Describe and apply the concept of divisibility tests  
✅ Evaluate HCF by common factors, prime factorisation and long division methods  
✅ Calculate LCM by common multiples, prime factorisation and common division methods  
✅ Formulate the relationship between LCM and HCF

**Tune Up**  
A team of 6 members are selected to present a dance performance on Teachers' Day. Their teacher has asked the team to try out different ways to stand while practicing dance steps.

The team tried the following arrangements one by one:

These arrangements give us the following multiplication facts:  
1 × 6 = 6  
2 × 3 = 6  
3 × 2 = 6  
6 × 1 = 6

Illustrations:  
1 row of 6 = 1 × 6  
2 rows of 3 = 2 × 3  
3 rows of 2 = 3 × 2  
6 rows of 1 = 6 × 1

**Page 48**

**FACTORS**

We know that for every multiplication fact, there are two division facts.  
For example: 2 × 3 = 6 is a multiplication fact.

Here, 2 and 3 are the factors of 6.

The division facts for 2 × 3 = 6 are 6 ÷ 2 = 3 and 6 ÷ 3 = 2.

Here, 2 and 3 divide 6 without leaving any remainder. Thus, the factors of a number exactly divide the number. So, a factor can be defined as a divisor that exactly divides the given number.

We conclude that factors of a number can be obtained by two methods — (i) by multiplication and (ii) by division.

**Example 1:** Find the factors of 18.

**Solution:**  
(i) By multiplication  
1 × 18 = 18 ⇒ 1 and 18 are factors  
2 × 9 = 18 ⇒ 2 and 9 are factors  
3 × 6 = 18 ⇒ 3 and 6 are factors

So, 1, 2, 3, 6, 9 and 18 are all factors of 18.

**Properties of Factors**

1. 1 is a factor of every number. It is the smallest factor of a number. It is also called the universal factor.
2. Every non-zero number is a factor of itself. It is also the greatest factor.
3. Every factor of a non-zero number is less than or equal to the number itself.
4. Every number other than 1 has at least two factors — 1 and the number itself.

**Page 49**

**TESTS OF DIVISIBILITY**

The tests of divisibility tell you whether a number is divisible by another number or not, without actually doing division of that number.

**Divisibility by 2, 5 and 10**

| **Divisible by** | **Divisibility rule** | **Examples** |
| --- | --- | --- |
| 2 | If the ones digit is 0, 2, 4, 6 or 8 | 2304, 5678, 9530 |
| 5 | If the ones digit is 0 or 5 | 1520, 2845, 3760 |
| 10 | If the ones digit is 0 | 7890, 6120, 92340 |

**Divisibility by 3 and 9**

| **Divisible by** | **Divisibility rule** | **Examples** |
| --- | --- | --- |
| 3 | If the sum of the digits is divisible by 3 | 5136 → 5+1+3+6=15 → 15 is divisible by 3 |
| 9 | If the sum of the digits is divisible by 9 | 8145 → 8+1+4+5=18 → 18 is divisible by 9 |

**Divisibility by 4, 6, 8, 12, 15, 18, 25**

| **Divisible by** | **Divisibility rule** | **Examples** |
| --- | --- | --- |
| 4 | If the number formed by last two digits is divisible by 4 | 8912 is divisible by 4 |
| 6 | If the number is divisible by 2 and 3 | 9912 is divisible by 6 |
| 8 | If the number formed by last three digits is divisible by 8 | 799728 → 728 is divisible by 8 |
| 12 | If the number is divisible by 3 and 4 | 1236 is divisible by 12 |
| 15 | If the number is divisible by 3 and 5 | 36930 is divisible by 15 |
| 18 | If the number is divisible by 2 and 9 | 5436 is divisible by 18 |
| 25 | If the number formed by last two digits is 25, 50, 75 or 00 | 68975 is divisible by 25 |

**Page 50**

**Divisibility by 7**

A number is divisible by 7 if the difference between the twice of the last digit and the number formed by the remaining digit is 0, 7 or multiple of 7.

**Example 2:** Check the divisibility of 35 and 5019 by 7.

**Solution:**  
Step 1: Write the original number.  
35 | 5019

Step 2: Double the last digit.  
5 × 2 = 10 | 9 × 2 = 18

Step 3: Write the remaining number after removing the last digit.  
3 | 501

Step 4: Subtract the smallest number from the largest number obtained in steps 2 and 3.  
10 − 3 = 7 (So, 35 is divisible by 7)  
501 − 18 = 483 → 48 − 6 = 42 → 42 − 4 = 38 → keep repeating.

**Divisibility by 11**

A number is divisible by 11 if the difference between the sum of the digits at odd places and the sum of the digits at even places is 0, 11 or multiple of 11.

**Example 3:** Check the divisibility of 26378 by 11.

**Solution:** Number is 26378  
Sum of the digits at odd places = 2+3+8 = 13  
Sum of the digits at even places = 6+7 = 13  
Difference = 13 − 13 = 0  
Therefore, 26378 is divisible by 11.

## 📘 ****Prime and Composite Numbers****

**Page 51**

### **Prime Number**

A prime number is a number greater than 1 that can only be divided by 1 or itself. So, a prime number has only two factors — 1 and the number itself.

For example, 2, 3, 5 and 7 are prime numbers.

👉 Grasp It: 2 is the only even prime number. 1 is neither a prime number nor a composite number.

**Page 52**

### **Composite Number**

A composite number is a number that has more than two factors.  
For example, 4, 6, 8 and 9 are composite numbers.

**Example 5:** Identify the prime numbers and composite numbers.  
a) 11  
b) 18  
c) 23

**Solution:**  
a) 11 has only two factors: 1 and 11. So, 11 is a prime number.  
b) 18 has 1, 2, 3, 6, 9 and 18 as factors. So, 18 is a composite number.  
c) 23 has only two factors: 1 and 23. So, 23 is a prime number.

### **Prime Numbers between 1 and 100**

The Greek mathematician, Eratosthenes, created a method to find out prime numbers between 1 and 100. This method is known as **Eratosthenes Sieve**. Let us learn the steps involved in this method:

1. Write the numbers from 1 to 100 in a 10 × 10 grid.
2. Highlight number 1 with yellow, because all prime numbers are greater than 1.
3. Number 2 is a prime number.
   * Encircle it and cross all its multiples (all even numbers).
4. Number 3 is also a prime number.
   * Encircle it and cross all its multiples.
5. The next number left is 5 (because 4 has been crossed).
   * Encircle it and cross all the multiples of 5.
6. The last number left in the first row is 7.
   * Encircle it and cross all its multiples.
7. Keep on doing this till you find all the numbers either crossed out or encircled.

✅ All the encircled numbers are **prime**.  
❌ All the crossed-out numbers are **composite**.

**Page 53**

### **Twin Primes**

Twin primes are two prime numbers that have a difference of 2. Some examples of twin primes between 1 and 100 are (3, 5), (5, 7) and (11, 13).

### **Co-prime Numbers**

If two numbers have only 1 as the common factor, they are called **co-prime numbers**.  
For example: 3 and 11 are co-prime numbers.  
4 and 15 are co-prime numbers.

👉 Get It: All prime numbers are co-prime numbers, but all co-prime numbers need not be prime numbers.

### **Prime Factors**

Factors of a number that are prime numbers are called **prime factors**.  
For example, factors of 24 are 1, 2, 3, 4, 6, 8, 12 and 24. Out of these, 2 and 3 are prime factors.

## ****PRIME FACTORISATION****

Prime factorisation is the process of writing a composite number as a product of prime numbers. There are two methods of prime factorisation:

* Division method
* Factor tree method

### **Division Method**

**Example 6:** Factorise 48 using the division method.

**Solution:**

1. Start dividing 48 by 2, the smallest prime number.
2. 48 ÷ 2 = 24. The quotient is 24, which is divisible by 2.
3. 24 ÷ 2 = 12. Now, the quotient is 12, which is also divisible by 2.
4. 12 ÷ 2 = 6. This time the quotient is 6, again divisible by 2.
5. 6 ÷ 2 = 3. We now get the quotient 3, a prime number itself. It is divisible by 3 only.
6. 3 ÷ 3 = 1. We finally get the quotient 1.

✅ **Answer:** Prime factorisation of 48 = 2 × 2 × 2 × 2 × 3

**Page 54**

### **Factor Tree Method**

In factor tree method, we factorise the given composite number till we get all the prime factors.

**Prime factorisation of 12** is 2 × 2 × 3.

**Example 7:** Factorise 48 using the factor tree method.

**Solution:**

48 →  
2 × 24 →  
2 × 12 →  
2 × 6 →  
2 × 3

✅ **Answer:** Prime factorisation of 48 = 2 × 2 × 2 × 2 × 3

### **Exercise 3.2**

1. Make a table having two columns in your notebook. Give prime and composite numbers as the headings. Now, write the following numbers under the correct column.

22, 11, 19, 25, 28, 40, 23, 8, 41, 63, 97

1. Use the division method to write the prime factorisation of the following numbers.

a) 76  
b) 18  
c) 25  
d) 51  
e) 32  
f) 80  
g) 68  
h) 36

**Page 55**

1. Use the factor tree method to write the prime factorisation of the following numbers.

a) 20  
b) 99  
c) 45  
d) 28  
e) 52  
f) 30  
g) 78  
h) 42

1. List down all the sets of twin primes from 1 to 100.
2. Refer to Eratosthenes Sieve and answer the following questions.  
   a) How many prime numbers are there between 1 and 100?  
   b) List all the prime numbers ending with 3 and 7.
3. Fill in the blanks.  
   a) 68 is a \_\_\_\_\_\_ number. (prime/composite)  
   b) 71 is a \_\_\_\_\_\_ number. (prime/composite)  
   c) 5 and 18 are \_\_\_\_\_\_ numbers. (twin prime/co-prime)  
   d) 5 and 7 are \_\_\_\_\_\_ numbers. (twin prime/co-prime)

## ****HIGHEST COMMON FACTOR (HCF)****

The highest number that exactly divides each number of a set of two or more numbers is known as the **highest common factor (HCF)**.

We can find the HCF by using the following methods:

* Common factors
* Prime factorisation
* Long division

### **HCF by Common Factors Method**

**Example 8:** Find the HCF of 15, 20 and 25 by common factor method.

**Solution:**  
Factors of 15: 1, 3, 5 and 15  
Factors of 20: 1, 2, 4, 5, 10 and 20  
Factors of 25: 1, 5 and 25

Common factors: 1 and 5

Since 5 is the highest among the common factors, so it is the HCF of 15, 20 and 25.

✅ **Answer:** HCF of 15, 20 and 25 = 5

👉 Grasp It:

* HCF of any two consecutive numbers is 1.
* HCF of two consecutive even numbers is 2.
* If one number is the factor of the other numbers, HCF is the smallest of the given numbers.

**Page 56**

### **HCF by Prime Factorisation Method**

**Example 9:** Find the HCF of 18, 24 and 60 by prime factorisation method.

**Solution:**  
Prime factorisation of 18 = 2 × 3 × 3  
Prime factorisation of 24 = 2 × 2 × 2 × 3  
Prime factorisation of 60 = 2 × 2 × 3 × 5

Common prime factors = 2 and 3  
HCF = Product of common prime factors = 2 × 3 = 6

✅ **Answer:** HCF of 18, 24 and 60 = 6

### **HCF by Long Division Method**

**Example 10:** Find the HCF of 275 and 525 by long division method.

**Solution:**

**Step 1:** Write 275 as the divisor and 525 as the dividend and divide.

525 ÷ 275 = 1, remainder = 250

**Step 2:** 250 becomes the new dividend, and the previous divisor 275 becomes the new divisor.

275 ÷ 250 = 1, remainder = 25

**Step 3:** 25 becomes the new divisor and 250 the new dividend. 250 ÷ 25 = 10, remainder = 0.

So, the last divisor 25 is the HCF.

✅ **Answer:** HCF of 275 and 525 = 25

👉 Grasp It: The HCF of two or more numbers is always smaller than or equal to the smallest of the given numbers.

## 📘 ****Continuation****

**Page 57**

Since there are 20 rose plants and 35 marigold plants, we cannot include one each of the two. Hence, we need to find the HCF of 20 and 35.

Factors of 20 = 1, 2, 4, 5, 10 and 20  
Factors of 35 = 1, 5, 7 and 35

So, the number of rows will be **5**.

Thus, the number of rose plants in each row will be 20 ÷ 5 = 4 and the number of marigold plants will be 35 ÷ 5 = 7.

👉 **Apply It**  
Two flower garlands with lengths 48 cm and 60 cm are to be cut into smaller pieces of the same length without wasting anything. Find the greatest possible length of the pieces.

### **Exercise 3.3**

1. Find the HCF of the following numbers.  
   a) 13 and 169  
   b) 16 and 144  
   c) 18 and 72  
   d) 15 and 105
2. List the common factors and determine the HCF.  
   a) 15 and 35  
   b) 14 and 24  
   c) 9 and 21  
   d) 36 and 144
3. Using prime factorisation method, find the HCF.  
   a) 25 and 35  
   b) 18 and 15  
   c) 14 and 35  
   d) 10, 25 and 50
4. Find the HCF using the long division method.  
   a) 16 and 18  
   b) 24 and 72  
   c) 14 and 35  
   d) 21 and 63  
   e) 144 and 252  
   f) 175 and 200
5. Find the largest number that divides 15 and 27 without leaving remainder.
6. Find the greatest number which leaves no remainder when it divides 44 and 121.
7. Sunita has two ribbons of lengths 25 inches and 35 inches. She wants to cut these ribbons into strips of equal length. What is the longest possible length for the strips?
8. The capacity of two containers is 15 litres and 25 litres. Find the capacity of the largest measuring cup that can be used to completely fill both the containers.

**Page 58**

## ****MULTIPLES****

A **multiple** of a number is the product of that number with a natural number. In simple words, multiples are the products of two factors.

Let us find out the multiples of 4.

4 × 1 = 4  
4 × 2 = 8  
4 × 3 = 12  
4 × 4 = 16 and so on.

Thus, multiples of 4 are 4, 8, 12, 16, ...

There are infinite multiples of 4.

### **Properties of Multiples**

1. Every number is a multiple of 1.
2. Every number is a multiple of itself.
3. Every multiple of a number is either equal to or greater than the number.
4. The smallest multiple of a number is the number itself.
5. The multiples of an even number are always even.
6. The multiples of an odd number are alternatively odd and even.
7. There is no end to multiples of a number.

👉 Grasp It: A number exactly divides all its multiples.

👉 Get It: Multiples of a number include the number itself.  
Multiples of 5 = 5, 10, 15, 20, ...

### **Exercise 3.4**

1. Write the first 5 multiples of the following numbers:  
   a) 9 b) 11 c) 21 d) 25 e) 50
2. Is 7209 a multiple of 3? Justify.
3. Find the 9th multiple of 16.
4. Find the first four multiples of 7 and check whether they are odd or even.
5. Select any number with 0 at its ones place and write its first ten multiples. State whether the multiples are odd or even.
6. Write the numbers:  
   a) Multiples of 8 that are less than 32  
   b) Multiples of 15 that are less than 200  
   c) Multiples of 19 that lie between 57 and 152  
   d) Multiples of 21 that lie between 105 and 210

**Page 59**

## ****LOWEST COMMON MULTIPLE (LCM)****

When a number is a multiple of two or more numbers, it is called a common multiple of those numbers. The smallest number among the common multiples is called the **lowest common multiple** or **LCM**.

We can find LCM by using the following methods:  
• Common multiples  
• Prime factorisation  
• Common division

### **LCM by Common Multiples**

**Example 11:** Find the LCM of 3 and 5 by finding common multiples.

**Solution:** Multiples of 3: 3, 6, 9, 12, 15, 18, 21, 24, 27, 30 and so on  
Multiples of 5: 5, 10, 15, 20, 25, 30 and so on

Common multiples of 3 and 5: 15, 30, 45 and so on

Since 15 is the lowest among the common multiples, so it is the LCM of 3 and 5.

✅ **Answer:** LCM of 3 and 5 = 15

👉 Grasp It: The LCM of prime numbers or co-prime numbers is their product.  
Example: LCM of 2, 5 and 7 is 2 × 5 × 7 = 70.

### **LCM by Prime Factorisation**

**Example 12:** Find the LCM of 18, 24 and 60 by prime factorisation.

**Solution:**  
Prime factorisation of 18 = 2 × 3 × 3  
Prime factorisation of 24 = 2 × 2 × 2 × 3  
Prime factorisation of 60 = 2 × 2 × 3 × 5

Product of the common prime factors = 2 × 3 = 6  
Product of the remaining prime factors = 2 × 2 × 5 = 20

LCM = Product of the common prime factors × product of the remaining prime factors  
LCM = (2 × 3) × (2 × 2 × 5) = 6 × 20 = 120

✅ **Answer:** LCM of 18, 24 and 60 = 120

## 📘 ****Continuation****

**Page 57**

Since there are 20 rose plants and 35 marigold plants, we cannot include one each of the two. Hence, we need to find the HCF of 20 and 35.

Factors of 20 = 1, 2, 4, 5, 10 and 20  
Factors of 35 = 1, 5, 7 and 35

So, the number of rows will be **5**.

Thus, the number of rose plants in each row will be 20 ÷ 5 = 4 and the number of marigold plants will be 35 ÷ 5 = 7.

👉 **Apply It**  
Two flower garlands with lengths 48 cm and 60 cm are to be cut into smaller pieces of the same length without wasting anything. Find the greatest possible length of the pieces.

### **Exercise 3.3**

1. Find the HCF of the following numbers.  
   a) 13 and 169  
   b) 16 and 144  
   c) 18 and 72  
   d) 15 and 105
2. List the common factors and determine the HCF.  
   a) 15 and 35  
   b) 14 and 24  
   c) 9 and 21  
   d) 36 and 144
3. Using prime factorisation method, find the HCF.  
   a) 25 and 35  
   b) 18 and 15  
   c) 14 and 35  
   d) 10, 25 and 50
4. Find the HCF using the long division method.  
   a) 16 and 18  
   b) 24 and 72  
   c) 14 and 35  
   d) 21 and 63  
   e) 144 and 252  
   f) 175 and 200
5. Find the largest number that divides 15 and 27 without leaving remainder.
6. Find the greatest number which leaves no remainder when it divides 44 and 121.
7. Sunita has two ribbons of lengths 25 inches and 35 inches. She wants to cut these ribbons into strips of equal length. What is the longest possible length for the strips?
8. The capacity of two containers is 15 litres and 25 litres. Find the capacity of the largest measuring cup that can be used to completely fill both the containers.

**Page 58**

## ****MULTIPLES****

A **multiple** of a number is the product of that number with a natural number. In simple words, multiples are the products of two factors.

Let us find out the multiples of 4.

4 × 1 = 4  
4 × 2 = 8  
4 × 3 = 12  
4 × 4 = 16 and so on.

Thus, multiples of 4 are 4, 8, 12, 16, ...

There are infinite multiples of 4.

### **Properties of Multiples**

1. Every number is a multiple of 1.
2. Every number is a multiple of itself.
3. Every multiple of a number is either equal to or greater than the number.
4. The smallest multiple of a number is the number itself.
5. The multiples of an even number are always even.
6. The multiples of an odd number are alternatively odd and even.
7. There is no end to multiples of a number.

👉 Grasp It: A number exactly divides all its multiples.

👉 Get It: Multiples of a number include the number itself.  
Multiples of 5 = 5, 10, 15, 20, ...

### **Exercise 3.4**

1. Write the first 5 multiples of the following numbers:  
   a) 9 b) 11 c) 21 d) 25 e) 50
2. Is 7209 a multiple of 3? Justify.
3. Find the 9th multiple of 16.
4. Find the first four multiples of 7 and check whether they are odd or even.
5. Select any number with 0 at its ones place and write its first ten multiples. State whether the multiples are odd or even.
6. Write the numbers:  
   a) Multiples of 8 that are less than 32  
   b) Multiples of 15 that are less than 200  
   c) Multiples of 19 that lie between 57 and 152  
   d) Multiples of 21 that lie between 105 and 210

**Page 59**

## ****LOWEST COMMON MULTIPLE (LCM)****

When a number is a multiple of two or more numbers, it is called a common multiple of those numbers. The smallest number among the common multiples is called the **lowest common multiple** or **LCM**.

We can find LCM by using the following methods:  
• Common multiples  
• Prime factorisation  
• Common division

### **LCM by Common Multiples**

**Example 11:** Find the LCM of 3 and 5 by finding common multiples.

**Solution:** Multiples of 3: 3, 6, 9, 12, 15, 18, 21, 24, 27, 30 and so on  
Multiples of 5: 5, 10, 15, 20, 25, 30 and so on

Common multiples of 3 and 5: 15, 30, 45 and so on

Since 15 is the lowest among the common multiples, so it is the LCM of 3 and 5.

✅ **Answer:** LCM of 3 and 5 = 15

👉 Grasp It: The LCM of prime numbers or co-prime numbers is their product.  
Example: LCM of 2, 5 and 7 is 2 × 5 × 7 = 70.

### **LCM by Prime Factorisation**

**Example 12:** Find the LCM of 18, 24 and 60 by prime factorisation.

**Solution:**  
Prime factorisation of 18 = 2 × 3 × 3  
Prime factorisation of 24 = 2 × 2 × 2 × 3  
Prime factorisation of 60 = 2 × 2 × 3 × 5

Product of the common prime factors = 2 × 3 = 6  
Product of the remaining prime factors = 2 × 2 × 5 = 20

LCM = Product of the common prime factors × product of the remaining prime factors  
LCM = (2 × 3) × (2 × 2 × 5) = 6 × 20 = 120

✅ **Answer:** LCM of 18, 24 and 60 = 120

Would you like me to continue with the remaining parts covering **LCM by Common Division Method**, **Real-life Applications of LCM**, **Relationship Between HCF and LCM**, and the final exercises?

##### You said:

yes please

###### ChatGPT said:

Perfect! Let’s complete it — here’s the rest of the **Factors and Multiples** chapter text for you to copy easily:

## 📘 ****Continuation****

**Page 60**

### **LCM by Common Division Method**

**Example 13:** Find the LCM of 6, 12 and 15 by common division method.

**Solution:**

1. Start dividing with the smallest prime number which can divide at least one of the given numbers. Bring down the number(s) which are not divisible as it is.
2. Continue this process till the last row has quotients 1 for all the given numbers.
3. Multiply all the prime factors to obtain the LCM.

✅ LCM = 2 × 2 × 3 × 5 = 60

✅ **Answer:** LCM of 6, 12 and 15 = 60

👉 Grasp It: The LCM of two or more numbers is always greater than or equal to the greatest of the given numbers.

### **Real-life Applications of LCM**

**Example 14:** Jaspreet and Jasmine were each given a piece of ribbon of equal length to decorate their kittens. Jaspreet cuts her ribbons into equal length of 2 m, while Jasmine cuts hers into equal length of 5 m. If there was no ribbon left in both cases, find the shortest possible length of the ribbons given to them.

**Solution:**  
We need to find the LCM of 2 and 5.

Multiples of 2 = 2, 4, 6, 8, 10 and so on  
Multiples of 5 = 5, 10, 15, 20 and so on  
Common multiples = 10, 20 and so on  
LCM of 2 and 5 = 10

✅ Thus, the shortest possible length of the ribbons given to them was 10 m.

👉 Apply It: Ashish goes to the guitar class after every four days. Amita goes to the guitar class after every five days. Both met at the guitar class today. After how many days will they meet at the guitar class again?

### **Exercise 3.5**

1. Find the LCM by common multiples.  
   a) 12 and 15  
   b) 15 and 20  
   c) 9 and 27  
   d) 6, 12 and 18  
   e) 13, 26 and 39  
   f) 11, 22 and 33
2. Find the LCM using prime factorisation.  
   a) 4, 6 and 9  
   b) 10 and 24  
   c) 30, 60 and 15  
   d) 42 and 56
3. Find the LCM by common division method.  
   a) 21, 63 and 105  
   b) 48 and 60  
   c) 45, 70 and 25  
   d) 135, 225 and 315
4. Find the HCF and LCM of the following numbers.  
   a) 14 and 56  
   b) 48 and 60  
   c) 45, 70 and 25  
   d) 135, 225 and 315
5. The number of books in Kara’s collection is divisible by 2, 4, 5 and 10. She has more than 11 books and fewer than 25 books. How many books does Kara have?
6. Meghna cycles around a circular park in 9 minutes. Rahul cycles around the same park in 12 minutes. They start cycling from the same point at the same time. After how much time will they meet again at the starting point?

**Page 61**

## ****RELATIONSHIP BETWEEN HCF AND LCM****

We have learnt in the previous grade that the product of HCF and LCM of two natural numbers is equal to the product of the two numbers.

✅ **HCF of the numbers × LCM of the numbers = Product of the numbers**

**Page 62**

**Example 15:** Find the HCF and LCM of 12 and 18 and check that HCF × LCM = product of the numbers.

**Solution:**

HCF:  
Prime factorisation of 12 = 2 × 2 × 3  
Prime factorisation of 18 = 2 × 3 × 3

Common factors: 2 × 3 = 6

LCM:  
Product of common factors: 2 × 3  
Product of remaining prime factors: 2 × 3

LCM = (2 × 3) × (2 × 3) = 12 × 3 = 36

✅ HCF = 6  
✅ LCM = 36

Product of 12 and 18 = 12 × 18 = 216  
Product of HCF and LCM = 6 × 36 = 216

So, HCF × LCM = product of the numbers.

**Example 16:** If the product of two numbers is 750 and the HCF is 5, find the LCM.

**Solution:**  
HCF × LCM = Product of the numbers  
So, LCM = Product of the numbers ÷ HCF = 750 ÷ 5 = 150

**Example 17:** The product of the HCF and LCM of two numbers is 1280. If one of the numbers is 32, find the other number.

**Solution:**  
Product of the numbers = HCF × LCM = 1280

So,  
First number × Second number = HCF × LCM  
Therefore,  
Second number = (HCF × LCM) ÷ First number  
= 1280 ÷ 32  
= 40

✅ **Answer:** The other number is 40.

### **Exercise 3.6**

1. If the product of two numbers is 84942 and their HCF is 33, find their LCM.
2. The product of HCF and LCM of two numbers is 9072. If one of the numbers is 72, find the other number.

**Page 63**

1. The HCF and LCM of two numbers are 12 and 5040, respectively. If one of the numbers is 144, find the other number.
2. What is the smallest number that is divisible by 20, 48 and 72?
3. Find the greatest number that can divide 510 and 425 exactly.
4. Aditya plays a football match every 4th day and Rahul on every 6th day. Today they both went for their matches. When will they again have their matches on the same day?
5. The art teacher has 120 crayons and 30 sheets of paper for her students. Find the largest number of students to whom she can give equal number of crayons and equal number of sheets of paper.
6. Atul, Dishi and Vidhi start running around a circular track at the same time. Atul completes a round in 10 minutes, Dishi in 15 minutes and Vidhi in 12 minutes. After how many rounds would Dishi have completed when all of them meet again at the starting point?

### **Wrap Up**

✅ 1 is a factor of every number.  
✅ Every number except 1 has at least two factors.  
✅ Prime numbers have only 2 factors — 1 and the number itself.  
✅ Composite numbers have more than 2 factors.  
✅ Twin primes are two prime numbers having a difference of 2.  
✅ Every number is a multiple of 1 and itself.  
✅ The product of HCF and LCM of two natural numbers is equal to the product of the two numbers.

### **Workout**

1. Find the factors of the following numbers using multiplication and division facts.  
   a) 144 b) 225 c) 205

**Page 64**

1. What will be the 9th multiple of the following numbers?  
   a) 7 b) 9 c) 11 d) 13 e) 16
2. Without dividing, find out whether the dividend is exactly divisible by the divisor or not.  
   a) 2477818 ÷ 9  
   b) 6204 ÷ 3  
   c) 2089 ÷ 5  
   d) 75391 ÷ 6  
   e) 73618 ÷ 2
3. Find the HCF of 32 and 80 using long division method.
4. Find the LCM of 24, 36 and 56 by prime factorisation method.
5. Find the smallest number which when doubled will be exactly divisible by 4, 10 and 15.
6. Find the least number which when divided by 5, 6 and 14 leaves 4 as the remainder.
7. The product of two numbers is 864. If the HCF of the numbers is 12, find their LCM.
8. Find the greatest number which when halved will exactly divide the numbers 12, 18 and 30.
9. Rahul is making a board game that is 16 inches by 24 inches. He wants to use square tiles. What are the dimensions of the largest tile he can use?
10. Two bikers are riding bikes in a circular path. The first rider completes a round in 12 minutes. The second rider completes a round in 18 minutes. If they both started at the same place and time and rode in the same direction, after how many minutes will they meet again at the starting point?
11. Ginny was talking to her brother about the job and monthly salary. She told her brother that her salary is the product of the first five odd prime numbers. What is her salary?

**Mental Maths**

|  |  |  |
| --- | --- | --- |
| **13 and 15** (one of the numbers is prime) | **9 and 16** (no common factors or co-prime numbers) | **8 and 64** (one number is a factor of other number) |
| HCF = 1 | HCF = 1 | HCF = 8 (smaller number) |
| LCM = 13 × 15 = 195 | LCM = 9 × 16 = 144 | LCM = 64 (bigger number) |

**Page 65**

### **Perform**

1. Find the HCF and LCM of the following numbers:  
   a) 11 and 21 b) 16 and 19 c) 9 and 27  
   d) 17 and 24 e) 15 and 14 f) 12 and 48
2. The HCF and LCM of two numbers are 15 and 60, respectively. If one number is a multiple of the other number, find the numbers.
3. The LCM of two co-prime numbers is 72. If one of the numbers is 8, find the other number.

### **Maths Lab Activity**

**Aim:** To understand the concept of LCM using grid  
**Materials required:** Crayons of three colours — blue, yellow and green and notebook  
**Method:** (Work in groups of three)

1. The students will make a grid of 10 rows and 10 columns in their notebook.
2. The students will write the numbers from 1 to 100 in it.
3. The teacher will ask the students to find the LCM of three numbers, say 3, 6 and 8.
4. The students will highlight 3 and its multiples using blue crayon, 6 and its multiples using yellow crayon and 8 and its multiples using green crayon.
5. The teacher will tell the students that the numbers which are shaded thrice are the common multiples of 3, 6 and 8. She/he will ask the following questions in the class:  
   a) What is the LCM of 3, 6 and 8?  
   b) What is the position of the LCM in the grid?