Model Textbook of

Mathematics

3

Based on National Curriculum 2022-23

National Book Foundation
as
Federal Textbook Board, Islamabad

بِسۡمِ اللّٰہِ الرَّحۡمٰنِ الرَّحِیۡمِ

Model Textbook of

Mathematics

Grade 3

Based on National Curriculum 2022-23

National Curriculum Council Secretariat,
Ministry of Federal Education and Professional Training,
Government of Pakistan

Model Textbook of **Mathematics**
for Grade 3

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TEST EDITION

PREFACE

This Model Textbook for Mathematics grade 3 has been developed by NBF according to the National Curriculum of Pakistan 2022. The aim of this textbook is to enhance learning abilities through inculcation of logical thinking in learners. The main objective of this book is to develop higher order thinking processes by systematically building upon the foundation of learning from the previous grades. A key emphasis of the present textbook is on creating real life linkages of the concepts and methods introduced. This approach was devised with the intent of enabling students to solve daily life problems as they go up the learning curve and for them to fully grasp the conceptual basis that will be built upon in subsequent grades.

An amalgamation of the efforts of experts and experienced authors, this book was reviewed and finalized after extensive reviews by professional educationists. Efforts were made to make the contents student friendly and to develop the concepts in interesting ways.

The National Book Foundation is always striving for improvement in the quality of its books. The present book features an improved design, better illustration and interesting activities relating to real life to make it attractive for young learners. However, there is always room for improvement and the suggestions and feedback of students, teachers and the community are most welcome for further enriching the subsequent editions of this book.

May Allah guide and help us (Ameen).

Dr. Raja Mazhar Hameed
Managing Director

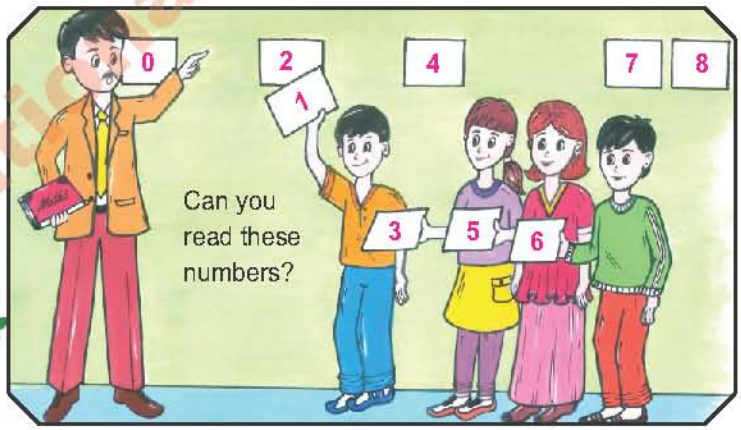
Contents

Unit-1

Whole Numbers

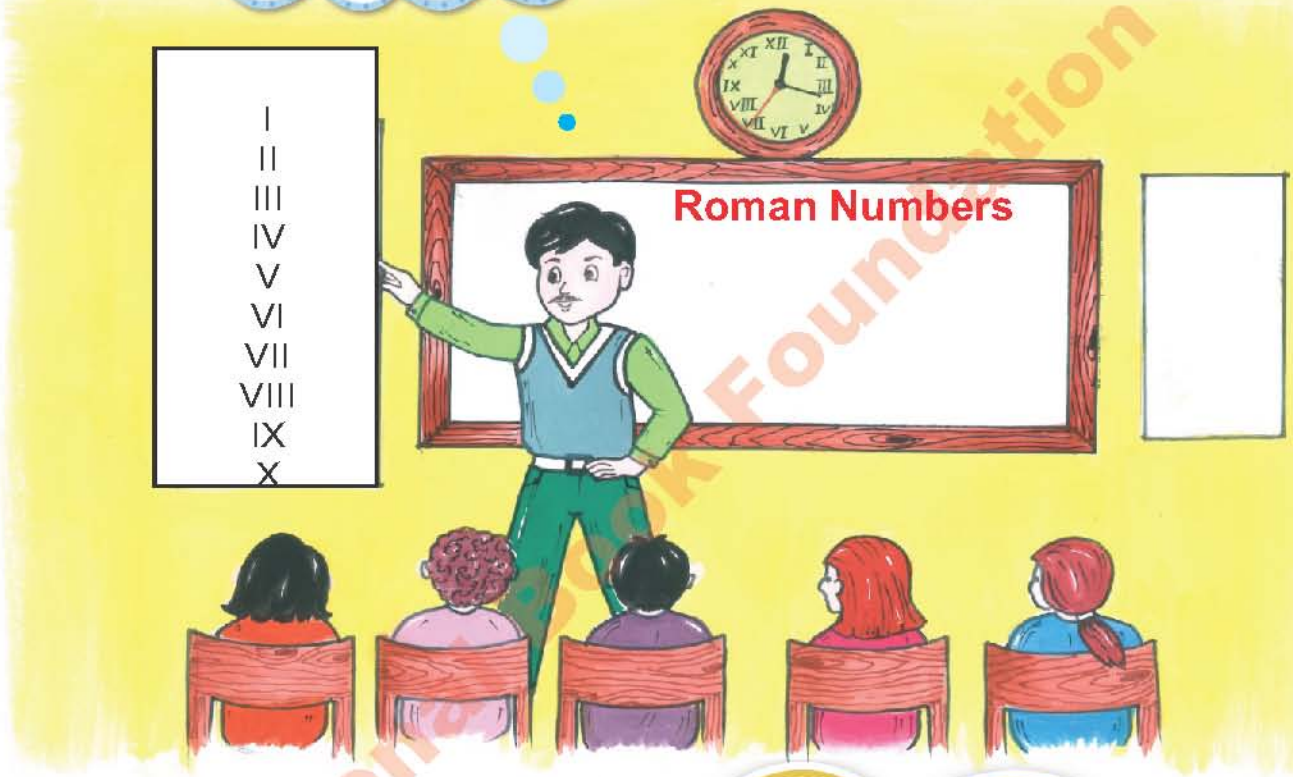
By the end of this unit, you will be able to:

- Count up to 9999 (4- digit numbers).
- Read and write up to 999 in numerals and in words.
- Recognize the place value of each digit in 4- digit numbers.
- Compare numbers using symbols and order numbers up to 9999 using appropriate language
- Round numbers to the nearest tens, hundreds and thousands using different concrete and pictorial representations.
- Recognize even and odd numbers.
- Read and write Roman numbers up to 20.



Roman Numbers

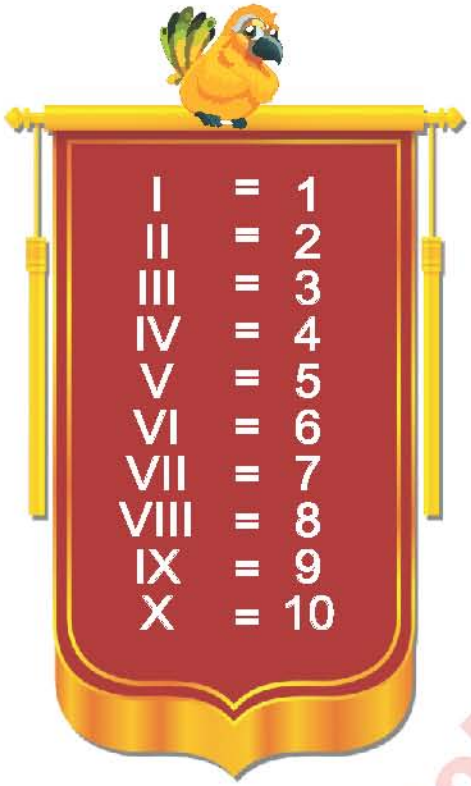
Who can read the numerals written in the chart?



I have never read such numbers before this.

The numbers given on the dial of the watch are called "Roman" numbers.

Roman numbers can be written as:



Read the Roman numbers:
V, VII, IX and X.

V is called 5
VII is called 7
IX is called 9
X is called 10

Count the sharpeners and write in roman numbers.

Key Point

Can you write the following Roman numerals in number form: IV, IX, XI and VII?

Teaching Point

Show/give different objects written in Roman numbers to the children and have them practice reading the numbers.

Roman Numbers upto 20

Numbers	Roman Numbers	Numbers	Roman Numbers
1	I	11	XI
2	II	12	XII
3	III	13	XIII
4	IV	14	XIV
5	V	15	XV
6	VI	16	XVI
7	VII	17	XVII
8	VIII	18	XVIII
9	IX	19	XIX
10	X	20	XX

Challenge yourself

Write the time by looking at the clocks.

EXERCISE-1

1 Write the missing Roman numbers.

I		III		VI					
X		XII		XV					

2 Write in Roman numbers.

2 = ⬡ 5 = ⬡

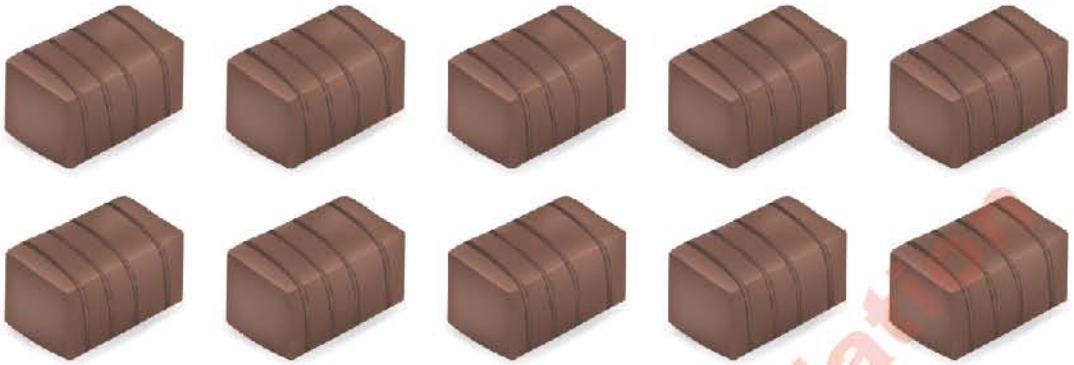
7 = ⬡ 9 = ⬡

12 = ⬡ 16 = ⬡

19 ⬡ 20 ⬡

Teaching Point Give different cards to children on which numbers and Roman numerals are written, to help them recognise both types of numbers.

3 Count the chocolates and write in Roman numbers.



4 Count the given dice and write in Roman numbers.

5 Write the missing numbers.

Even and Odd Numbers

Count the following beads in pairs of 2.

What are the even, and odd numbers?

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 
9. 
10. 

Key Fact

The numbers divisible by 2, are called even numbers.

Key Fact

The numbers not divisible by 2, are called odd numbers.

The number of beads which are in pairs, are called even numbers, and the beads that are not completely in pairs, are called odd numbers.

Odd	Even
1	2
3	4
5	6

Count the following and tick (✓) the appropriate box.

Odd ☐ Even ☐

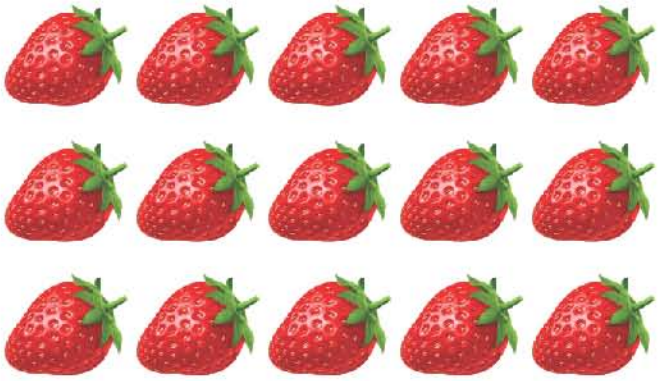
Odd ☐ Even ☐

Odd ☐ Even ☐

Odd ☐ Even ☐

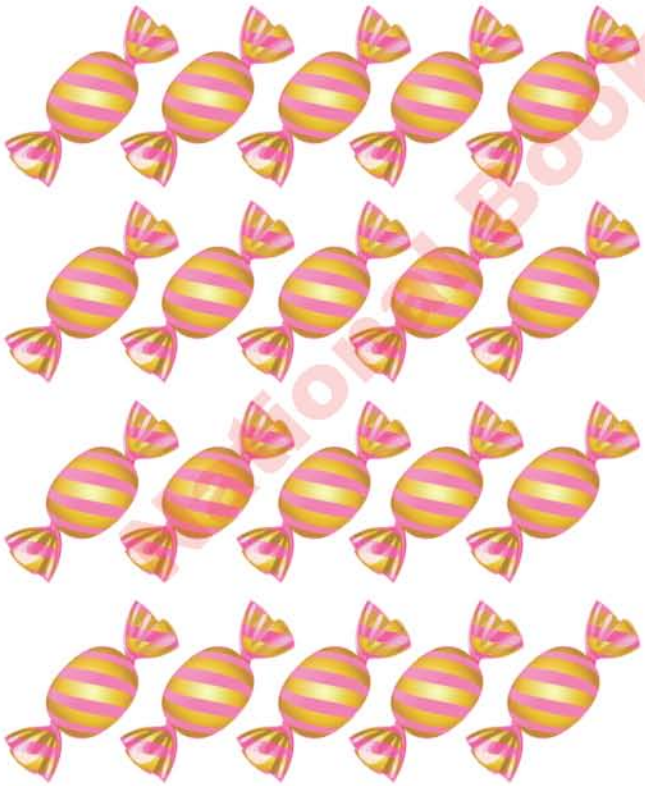
Teaching Point Divide the students of your class into pairs and ask the students whether they are an even or odd number.

Count the following and tick (✓) the appropriate box.



Even | Odd

Even | Odd



Even | Odd

Even | Odd

Write even or odd in front of the given numbers.

2	Even	15	Odd
9		23	
16		64	
42		79	

Separate even and odd numbers in the space below.

Even

8

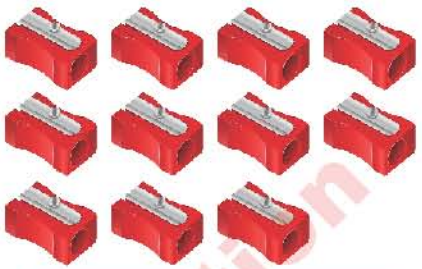
Odd

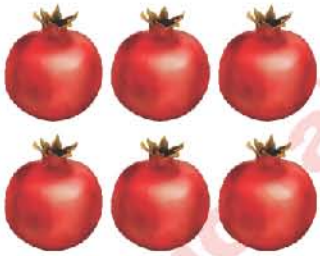
25

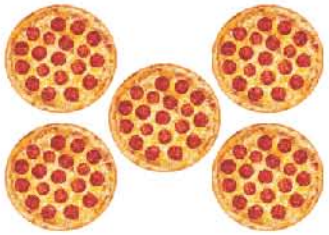
EXERCISE - 2

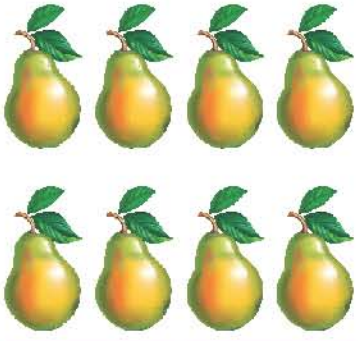
1 Count and write the number of objects and identify the number as even are odd.

Odd	3

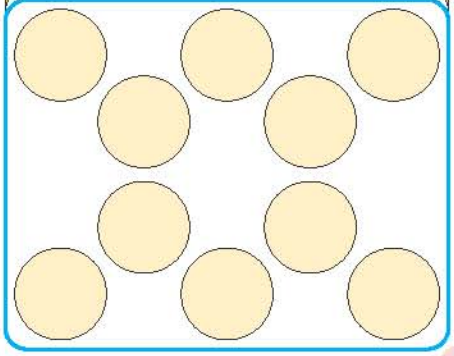
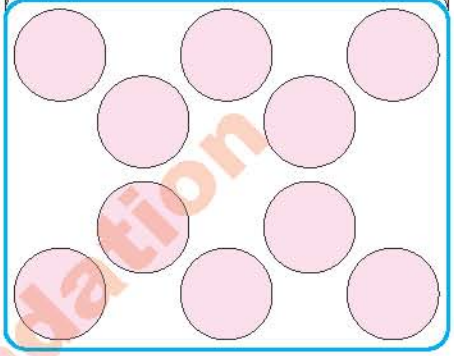








2 Identify the even and odd numbers below and write them separately.

Numbers	Even	Odd
1 8 7 10 23 14 15 30 35 42 55 65 68 72 79 82 83 91 96 100		

3 Write the odd numbers in between the given numbers.

(i) **4** and **16** (ii) **20** and **34**

4 Write the even numbers in between the given numbers.

(i) **1** and **10** (ii) **21** and **35**

5 Sort the even and odd numbers from the following.

Place Value of Numbers up to 5 digits

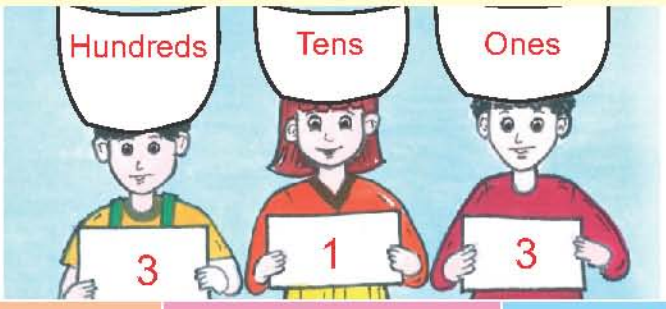
Yesterday my elder brother asked me about the place value of numbers. How can we find the place value?

Activity

Give cards to the children to make a number and find out the place value of each one and then change the place of these cards to make a new number, and find its place value. Repeat the activity for all students.

Activity

Call three children and give them three hats with ones, tens, hundreds and thousands written on them. Also give them digit cards and ask the children to tell the place value of each number on it. Exchange cards few times and encourage students to state place value each time.



Hundreds	Tens	Ones
3	1	3

- 3 is at hundreds, so place value of 3 is: $3 \times 100 = 300$
- 1 is at tens, so place value of 1 is: $1 \times 10 = 10$
- 3 is at ones place, so place value of 3 is: $3 \times 1 = 3$

The, number is:

$300 + 10 + 3 = 313$

The place value of a digit is determined based on the position of the digit in that number.

Activity

Call four children and give them four hats with ones, tens, hundreds and thousands written on them. Also give them digit cards and ask the children to tell the place value of each number on it. Exchange cards few times encourage students to state the place value each time.

Thousands	Hundreds	Tens	Ones
8	3	1	4

- 8 is at thousands, so place value of 8 is: $8 \times 1{,}000 = 8{,}000$
- 3 is at hundreds, so place value of 3 is: $3 \times 100 = 300$
- 1 is at tens, so place value of 1 is: $1 \times 10 = 10$
- 4 is at ones place, so place value of 4 is: $4 \times 1 = 4$

The, number is:

$8{,}000 + 300 + 10 + 4 = 8{,}314$

The place value of a digit is determined based on the position of the digit in that number.

Key Fact

10	= 1 tens	= 10 ones
100	= 1 hundred	= 10 tens
1,000	= 1 thousand	= 10 hundreds

Numbers upto 9999

The greatest 3-digit number is 999.

What is the greatest 4-digit number?

The greatest 4-digit number is 9999.

By adding 1 in 9,999 we get 10,000. It is first 5-digit number. It can be written in place value chart as:

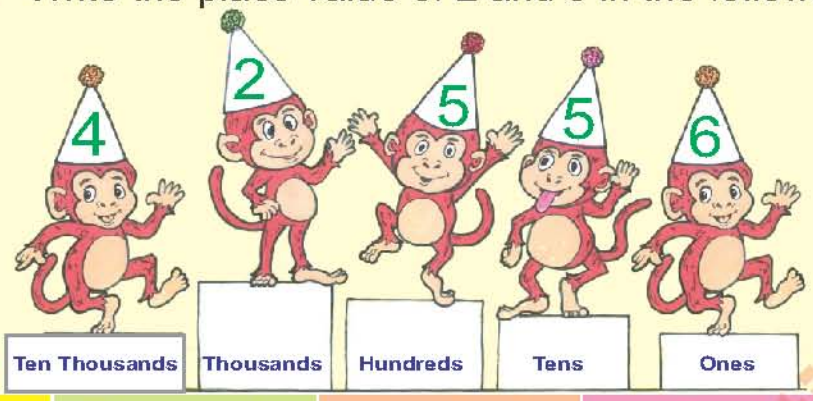
9 9 9 9 + 1 = 1 0 0 0 0

Ten Thousands T. Th	Thousands Th	Hundreds H	Tens T	Ones O
1	0	0	0	0

Ten Thousands T. Th	Thousands Th	Hundreds H	Tens T	Ones O
5	9	8	7	4
50,000	9,000	800	70	4

Place value of 5 = 50,000 Place value of 8 = 800

Example: Write the place value of 2 and 5 in the following.



Solution:

Ten Thousands T. Th	Thousands Th	Hundreds H	Tens T	Ones O
4	2	5	5	6
40,000	2,000	500	50	6

Place value of 4 = 40000
Place value of 2 = 2000
Place value of 5 = 500
Place value of 5 = 50

Example: Read and write (i) 9,231 (ii) 27,616 in words.

Solution:

(i)

Thousands Th	Hundreds H	Tens T	Ones O
9	2	3	1

Nine thousand, two hundreds and thirty one.

(ii)

Ten Thousands T. Th	Thousands Th	Hundreds H	Tens T	Ones O
2	7	6	1	6

Twenty seven thousand, six hundred and sixteen.

Teaching Point Give the students number cards of different numbers up to 5 digits and ask them about the place values.

Example: Read and write 85,405 in words.

Solution:

Ten Thousands T. Th	Thousands Th	Hundreds H	Tens T	Ones O
8	5	4	0	5

Eighty five thousand, four hundred and five.

Example: Write four thousand, seven hundred and nineteen in numerals.

Solution: 4,719

Example: Write forty two thousand, eight hundred and sixty eight in numerals.

Solution: 42,868

Example: Write sixty eight thousand, nine hundred and fifty one in numerals.

Solution: 68,951

EXERCISE - 3

1 Write the following numbers in words.

(a) 5,342

(b) 7,123

(c) 5,321

(d) 8,035

(e) 9,899

(f) 80,321

2 Write the following numbers in numerals.

(a) Five thousand, eight hundred and forty

(b) Six thousand, three hundred and sixty three

(c) Thirty two thousand, three hundred and eight

(d) Eighty thousand, five hundred and eighty seven

(e) Sixty four thousand and thirty three

(f) Forty one thousand, nine hundred and ninety nine

3 Fill in the blanks.

(a) 2,347 = ☐ Thousand + ☐ Hundred + ☐ Tens + ☐ Ones

(b) 6,780 = ☐ Thousand + ☐ Hundred + ☐ Tens + ☐ One

(c) 34,560 = ☐ Ten Thousand + ☐ Thousand + ☐ Hundred + ☐ Tens + ☐ One

(d) 53,406 = ☐ Ten Thousand + ☐ Thousand + ☐ Hundred + ☐ Tens + ☐ One

(e) 92,341 = ☐ Ten Thousand + ☐ Thousand + ☐ Hundred + ☐ Tens + ☐ One

4 Match the following with the correct number.

Seven thousand, eight hundred and twenty	384
Eighty two thousand, six hundred and fifty one	2,357
Fifteen thousand, seven hundred and sixty three	5,326
Fifty three thousand, one hundred and two	7,820
Two thousand, three hundred and fifty seven	15,763
Five thousand, three hundred and twenty six	53,102
Three hundred and eighty four	82,651

5 Write the place value of 4 and 6.

Thousands Th	Hundreds H	Tens T	Ones O
4	7	6	9

6 Write the digits of the numbers given below against the correct place value.

	Ten Thousands T. Th	Thousands Th	Hundreds H	Tens T	Ones O
2,357					
67,815					
82,301					
75,389					

7 Write the place value of the circled digit.

(i) 4,5(6)7 ____

(ii) 5,(3)27 ____

(iii) 8(5),761 ____

(iv) 70,43(1) ____

(v) (6)7,431 ____

(vi) 39,(7)61 ____

(vii 93,2(6)7 ____

(viii) (6)8,037 ____

(ix) 5(4),136 ____

(x) 8(9),791 ____

8 Write the place value of all digits.

(i)

(ii)

Make three smaller numbers by replacing the place of digits in the given number.

Can you make some more smaller numbers?

Teaching Point Give different number cards to students and ask them to make smaller or larger number.

Find the given numbers in crossword puzzle. They may be horizontal or vertical. The first one is done for you.

6	9	2	6	5	7	4	9	0	1
4	1	5	8	7	6	2	0	1	4
5	9	7	3	2	3	7	7	2	9
9	0	3	5	2	7	6	4	5	9
8	6	4	9	7	1	1	0	5	3
4	2	3	8	1	6	7	3	5	8

☆ Seven thousand, three hundred and forty three

☆ Thirty seven thousand, seven hundred and twenty nine

☆ Six thousand, three hundred and seventy one

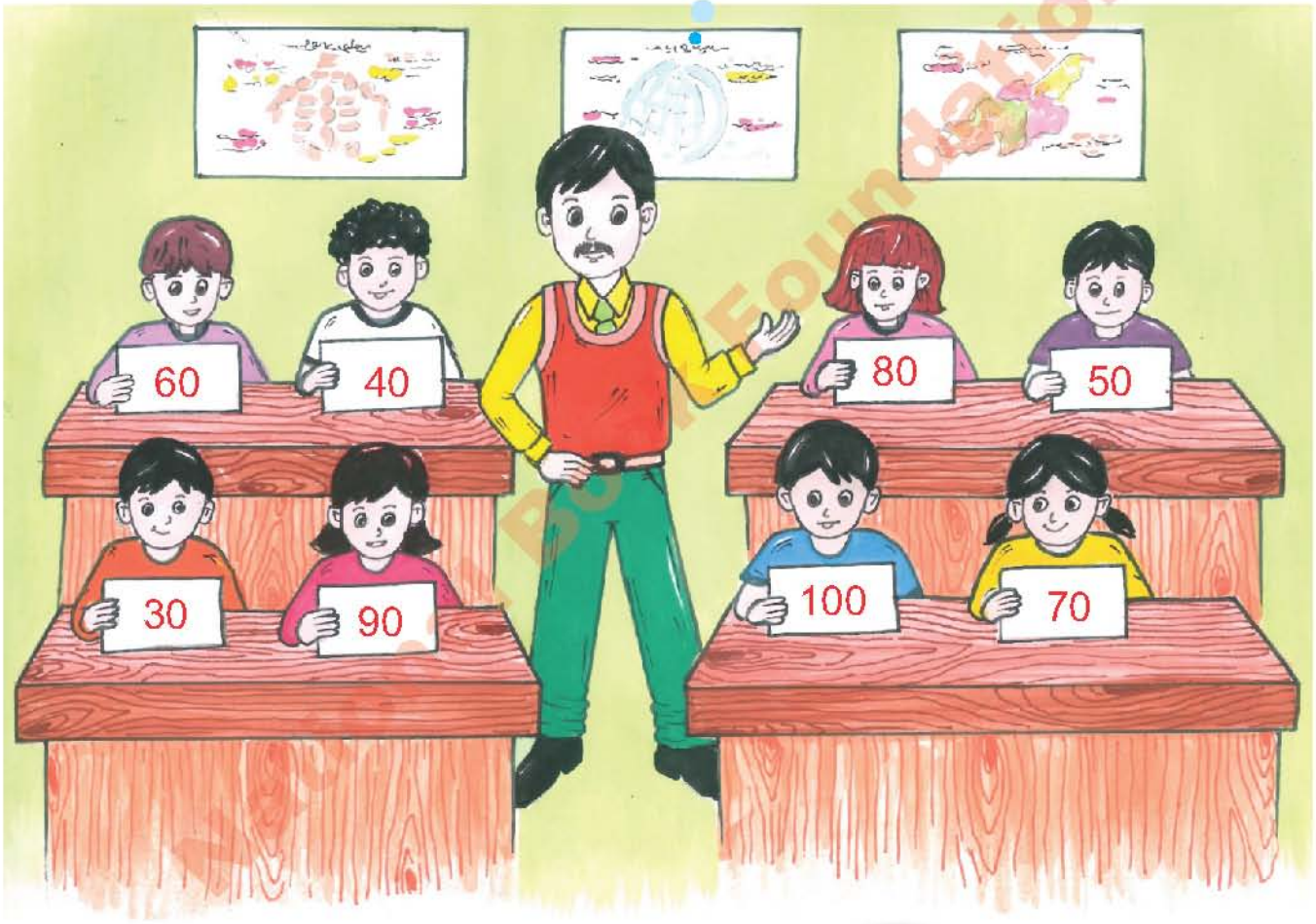
☆ 4 Thousand + 5 Hundred + 9 Tens + 8 ones

☆ 7 Ten thousand + 2 thousand + 2 hundred + 7 tens + 1 one

☆ 3 Ten thousand + 5 thousand + 2 hundred + 7 tens + 6 ones

Comparing and Ordering Numbers

In a cricket match, different players scored runs as shown.



How can we find the highest and the lowest score?

On the number line, encircle the highest and the lowest score.

Highest score = 100
Lowest score = 30

Mathematically, we write 30 < 100.

On a number line:

- numbers increase as we move from left to right.
- each number is greater than the number on the left.

With the help of a number line it is easy to know which number is bigger or smaller.

Examples:

80 is less than 100, so 80 < 100

80 is equal to 80, so 80 = 80

40 is less than 80, so 40 < 80

or 80 is greater than 40, so 80 > 40

Key Fact

Use these symbols when comparing numbers:

= equal to
> greater than
< less than

Rs. 350

Rs. 245

The cost can be compared easily with the help of place value chart.

Hundreds H	Tens T	Ones O
2	4	5
3	5	0

First compare the number at hundreds place. 3, at the hundreds place is greater than 2 at the hundreds place.
Therefore,

350 > 245

A toy worth Rs. 350 is more expensive.

Example: Compare 2567 and 2582.

Solution:

Thousands Th	Hundreds H	Tens T	Ones O
2	5	6	7
2	5	8	2

First compare the digits at hundreds place:

- ☆ The digit 2 at the thousands place is the same for both, so we compare the digits at the hundreds place.
- ☆ The digit 5 at the hundreds place is the same for both, so we compare the digits at the tens place.
- ☆ The digit 6 at the tens place of 2567 is less than digit 8 at the tens place of 2582. Therefore, we can write:

2567 < 2582

Teaching Point Give number cards of different values to the students and ask them to compare numbers.

Compare 8921 and 8952. Which number is greater?

Key Point

Two numbers will be equal when the place value of all the digits is same.

☆ The digit 8 at thousands place in both numbers is same.

☆ The digit 9 at hundreds place in both numbers is same.

☆ The digit 5 at tens place is greater than digit 2 at tens place.

Therefore, 8952 > 8921

Ordering Numbers

Place numbers, keeping in mind the order of the numbers.

1 2 3 4 5 6 7 8 9

The arrangement of numbers or objects from the smallest to the greatest is called an ascending order. Here the numbers are arranged in ascending order.

The arrangement of numbers or objects from the greatest to the smallest is called a descending order. Here the numbers are arranged in descending order.

9 8 7 6 5 4 3 2 1

Teaching Point

Explain the concept of ascending and descending giving examples from real life. For example, the use of stairs. Tell students to count the steps in ascending order while climbing up the stairs.

Write 125, 1450, 100 and 320 in ascending order.

Arrange these numbers starting from the smallest value.

100, 125, 320, 1450 is an ascending order.

Try Yourself

Which picture represents ascending and descending order?

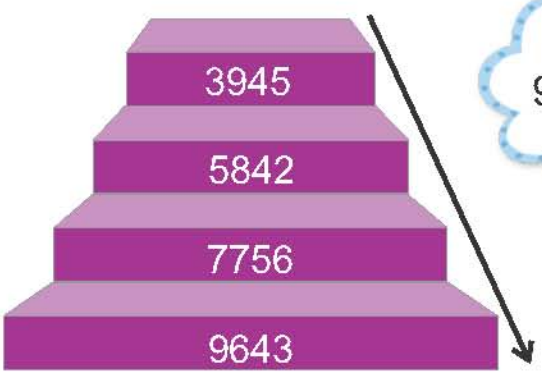
Example: Write the numbers 325, 470 and 1532 in:
(i) ascending order (ii) descending order

Solution:

Ascending order =	**325**	**470**	1532
Descending order =	1532	**470**	**325**

Write 2796 2819 265 273 in ascending and descending order.

Ascending order	Descending order
265	2819
273	2796
2796	**273**
2819	**265**



Write
9643, 7756, 5842 and 3945
in descending order.

EXERCISE - 4

1 Use the **symbols "<", ">" and "=" in the given boxes.**

(i) 873 ☐ 426 (ii) 1694 ☐ 706

(iii) 6857 ☐ 6857 (iv) 9973 ☐ 8824

(v) 5748 ☐ 5748 (vi) 8172 ☐ 6199

2 Encircle the greater number.

(i) 671, 546 (ii) 2484 , 2498

(iii) 3741, 3471 (iv) 1738, 659

(v) 9372, 9369 (vi) 1875 , 8770

3 **Write the given numbers in ascending and descending orders.**

(i) 971, 251, 891, 961

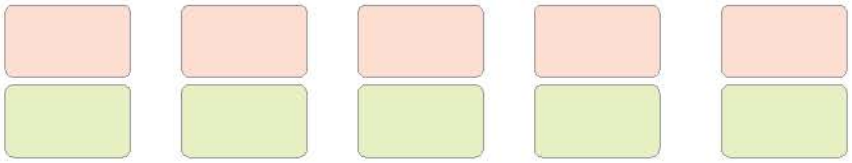
Ascending order ☐ ☐ ☐ ☐

Descending order ☐ ☐ ☐ ☐

(ii) 85, 152, 7235, 4111, 6752

Ascending order

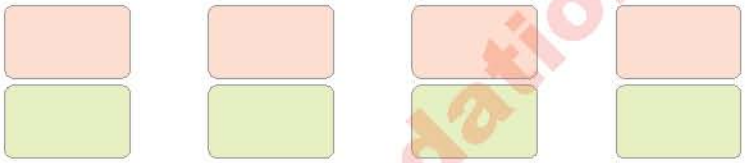
Descending order



(iii) 346, 4511, 231, 5369

Ascending order

Descending order



(iv) 698, 278, 1543, 2231, 1731

Ascending order

Descending order

(v) 4762, 4718, 4721, 3359, 3468

Ascending order

Descending order

4 Choose any five numbers less than 9999 and write them in ascending and descending order.

Ascending order

Descending order

Rounding Off

"≈" approximately equal to

My father paid Rs. 1,209 for buying fuel. How can we round off this amount to the nearest 10?

Key Fact

Use symbol "≈" for rounding off.

Rounding off to the nearest 10, it becomes Rs. 1,210. Keep in mind the following rules:

Rounding Off to the Nearest 10

- While rounding off to the nearest 10 if the digit at units place is between 0 and 4 (less than 5) the unit digit is replaced by zero.

$24 \approx 20$

24 is rounded off to 20.

- If the digit at units place is 5 or greater than 5, then units place is replaced by '0' and tens place is increased by "1".

$36 \approx 40$

36 is rounded off to 40.

Teaching Point

Give cards of different numbers to students and ask them to compare these numbers.

Rounding Off to the Nearest 100

While rounding off to the nearest 100, if the digit at the tens place is between 0 and 5, or less than 5, then we replace the units and tens place with zero. If the digit at the tens place is equal to, or greater than 5, then the units and tens place is replaced by zero and the hundreds place is increased by 1.

It can be written as:

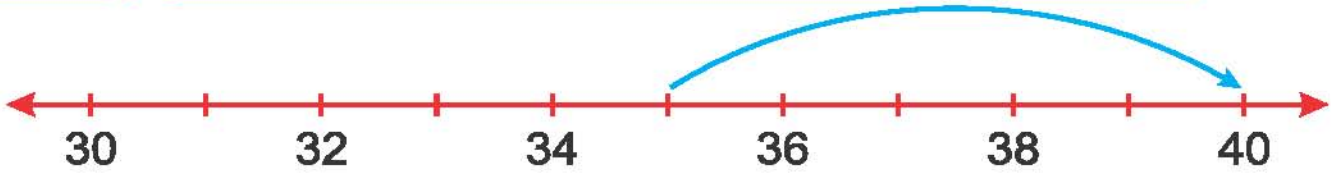
$666 \approx 700$

Example: Round off the following numbers to the nearest 10 and 100.

Solution:

Numbers	to the nearest 10	to the nearest 100
37	40	0
82	80	100
187	190	200
345	350	300
653	650	700

Round off 35 to the nearest 10 on the number line.



It can be written as: $35 \approx 40$

So, 35 is rounded off to 40.

Rounding Off to the Nearest 1000

While rounding off to the nearest 1000, if the digit at the hundreds place is between 0 and 5, or less than 5, then we replace the units, tens and hundreds place with zero. If the digit at the hundred place is equal to, or greater than 5, then the units, tens and hundreds place is replaced by zero and the thousands place is increased by 1.

It can be written as:

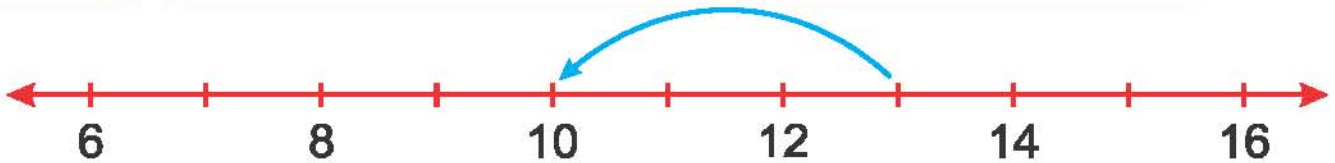
$6666 \approx 7000$

Example: Round off the following numbers to the nearest 10, 100, 1000.

Solution:

Numbers	to the nearest 10	to the nearest 100	to the nearest 1000
1237	1240	1200	1000
1182	1180	1200	1000
1887	1890	1900	2000
3345	3350	3300	3000
7653	7650	7700	8000

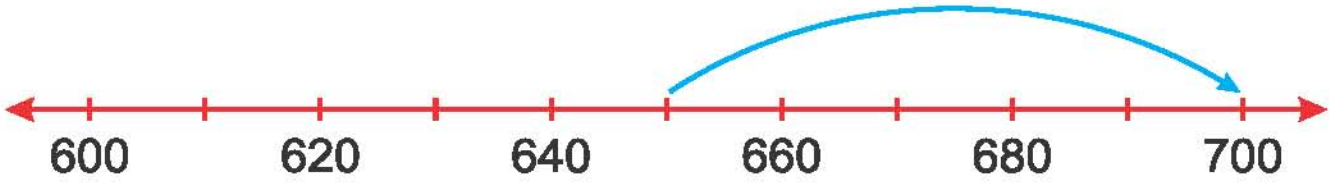
Round off 13 to the nearest 10 on the number line.



$13 \approx 10$

So, 13 is rounded off to 10.

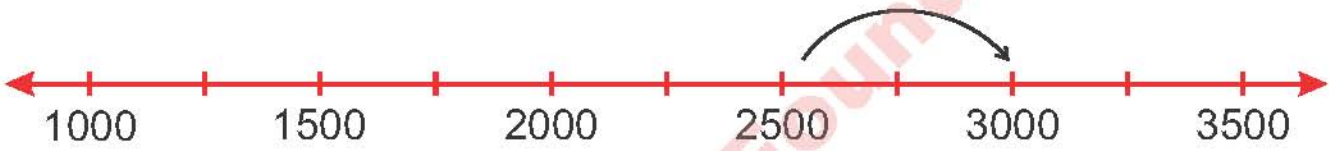
Round off 650 to the nearest 100 on the number line.



$650 \approx 700$

So, 650 is rounded off to 700.

Round off 2681 to the nearest 1000 on the number line.



$2681 \approx 3000$

So, 2681 is rounded off to 3000.

1 Round off the following numbers to the nearest 10,100 and 1000.

Numbers	to the nearest 10	to the nearest 100	to the nearest 1000
1746			
1052			
3327			
8385			
9750			

2 Match the following numbers with correct value after rounding off to the nearest 10, 100 and 1000.

(i) to the nearest 10

19	40
32	50
41	80
52	100
61	20
76	30
95	60

(ii) to the nearest 100

101	400
256	800
384	100
517	900
649	300
789	500
850	600

(ii) to the nearest 1000

1205	6000
2611	5000
6415	1000
6825	2000
4777	3000
8008	8000
2292	7000

3 Round off 26 to the nearest 10 on the number line.

4 Round off 735 to the nearest 100 on the number line.

5 Round off 3549 to the nearest 1000 on the number line.

6 Round off 5139 to the nearest 1000 on the number line.

I Have Learnt

- numbers which can be written in pair form, are called even numbers.
- numbers which can't be written in pair form, are called odd numbers.
- straight line on which the numbers are represented at equal intervals, is called a number line.
- arrangement of numbers from the lowest numbers to the highest numbers is called an ascending order.
- arrangement of numbers from the highest to the lowest numbers is called a descending order.
- rounding off whole numbers nearest to 10, 100 and 1000.
- Roman Number up to 20.

Vocabulary

even
odd
place value
number line
comparing
ordering
estimation
Roman Numbers

Review Exercise

1 Encircle the correct answer.

(i) The Roman number XIX is equal to:

(a) 10 **(b) 11** **(c) 19** **(d) 20**

(ii) The place value of 2 in 2,750 is:

(a) 2 tens **(b)** 2 ten thousands **(c)** 2 thousands **(d)** 2 hundreds

(iii) Eight thousand, seven hundred and twenty is equal to:

(a) 8,720 (b) 8,702 **(c)** 8,072 (d) 87,020

(iv) 123, 2250, 1211 and 279 can be written in descending order as:

(a) 21, 23, 25, 27 **(b) 23, 25, 27**, 21

(c) 27, 23, 21, 25 **(d)** 2250, 1211, 279, 123

(v) 16 can be rounded off to the nearest 10 as:

(a) 10 **(b) 15** **(c) 20** **(d) 16**

2 Fill in the blanks.

(i) 25 can be rounded off _____ to the nearest 10.
(25 or 30)

(ii) In an ascending order, the numbers can be written from _____.
(lowest to highest or highest to lowest)

(iii) The number of wheels of a car are always _____.
(even or odd)

(iv) The numbers of sides of a triangle are _____ .
(even or odd)

(v) In an odd number, unit digits are _____.
(1, 3, 5, 7, 9) or (0, 2, 4, 6, 8)

(vi) 748 can be rounded off _____ to the nearest 100.
(700 or 800)

(vii) 6675 can be rounded off _____ to the nearest 1000.
(6000 or 7000)

(viii) The Roman number VI is equal to _____.
(4 or 6)

(ix) The numbers of sides of a pentagon are _____ .
(even or odd)

(x) In an descending order, the numbers can be written from _____.
(lowest to highest or highest to lowest)

3 **Write the following in Roman numbers.**

2	5	8	11	15

4 Write the place value of circled digits.

5,(3)42	7,(0)63	12,86(5)	8(0),064	96,5(6)3

5 **Write the given numbers in words.**

647 _____

7,265 _____

9,999 _____

9,765 _____

8,701 _____

6 Write the given numbers in ascending and descending order.

(i) 27, 1219, 3, 4562

Ascending order

Descending order

(ii) 9512, 8321, 1445, 2416, 1140

Ascending order

Descending order

7 **Write the even and odd numbers separately.**

15	34	45	64	71	77	84	88

8 Write the missing numbers on the number line.

9 Compare 928 and 985 by inserting > or < sign.

10 Round off the following numbers to the nearest 10 and 100.

Numbers	to the nearest 10	to the nearest 100
46		
83		
765		
847		
956		

11 Round off the following numbers to the nearest 10,100 and 1000.

Numbers	to the nearest 10	to the nearest 100	to the nearest 1000
1046			
2881			
3759			
6486			
2154			

Activity

Suleman called his friends on his birthday party. There were _____ girls and _____ boys. Which group has an even number of children?

Hint:
Count the number of boys and girls.

Unit-2

Number Operations

By the end of this unit, you will be able to:

- Add and subtract numbers mentally and in written form (with and without regrouping) including: 4-digit numbers with 1-, 2-, 3- and 4-digit numbers.
- Solve real-world word problems (including missing numbers and money) involving addition and subtraction.
- Estimate the answer to an addition and subtraction question. (using various approaches)
- Count and write in multiple steps.
- Develop times tables for 6, 7, 8, and 9 and write multiplication sentences using concrete and pictorial representations.
- Reinforce through concrete and pictorial representations that the multiplication of any two numbers can be done in any order.
- Multiply mentally and in written form:
  - 2 digit numbers by 1 digit numbers.
  - 3 digit numbers by 1-digit numbers.
- Solve real-world word problems involving multiplication.
- Reinforce through concrete and pictorial representation that the division of any two numbers cannot be done in any order (Commutative).
- Divide mentally and in written form:
  - 2 digit numbers by 1 digit numbers.
  - 3 digit numbers by 1-digit numbers.
- Divide a number by 1 and itself.
- Solve real-world word problems involving division.
- Solve real-world word problems involving addition, subtraction, multiplication and division.

On Eid day, Irfan received Rs. 500 from his uncle and Rs. 200 from his aunty, as eidi. How much eidi did he receive?

To get the answer, will you add or subtract the numbers?

Addition of Numbers without Carrying

There are 3,516 mango and 2,322 guava trees in the orchard. What is the total number of trees?

To find the total number of trees, we add them:

First Step

Add ones.

6 ones + 2 ones = 8 ones

Second Step

Add tens.

1 ten + 2 tens = 3 tens

Third Step

Add hundreds.

5 hundred + 3 hundred = 8 hundred

Fourth Step

Add thousands.

3 thousand + 2 thousand = 5 thousand

		Th	H	T	O
Number of mango trees	=	3	5	1	6
Number of guava trees	= +	2	3	2	2
Total number of trees	=	5	8	3	8

The total number of trees in the orchard is 5,838.

Teaching Point Guide the students to write numbers in the respective places according to the place value of the digits.

Example: A grocer sold vegetables for Rs. 2,546 on Tuesday and Rs. 3,443 on Wednesday. What is the total sale of vegetables on both days?

Solution:

		Th	H	T	O
Sale on Tuesday	=	2	5	4	6
Sale on Wednesday	= +	3	4	4	3
Total sale	=	5	9	8	9

Total sale of vegetables on both days is Rs. 5,989.

Addition of Numbers with Carrying

Addition

Zeenat has Rs. 6,388 while Daniel has Rs. 2,424, as their saving for the year. What is the total amount of money they have saved?

		Th	H	T	O
Amount Zeenat has	=	6	3 (1)	8 (1)	8
Amount Daniel has	= +	2	4	2	4
Total amount of money	=	8	8	1	2

First Step

Add ones:

8 ones + 4 ones = 12 ones = 1 ten and 2 ones

and carry 1 ten

Write 2 in ones column and carry 1 ten to the tens column.

Second Step

Now, add tens:

8 tens + 2 tens + 1 ten = 11 tens = 1 ten and 1 hundred

carry 1 hundred

Write 1 ten in tens column and carry 1 hundred in hundreds.

Third Step

Now add hundreds:

3 hundreds + 4 hundreds + 1 hundred = 8 hundreds

Write 8 in hundred column.

Fourth Step

Now add thousands:

6 thousands + 2 thousands = 8 thousands

Write 8 in thousands column

Thus, Zeenat and Daniel have a total amount of Rs. 8,812.

Example: There are 2,685 boys and 1,520 girls in a Secondary school. What is the total number of students in the school?

Solution:

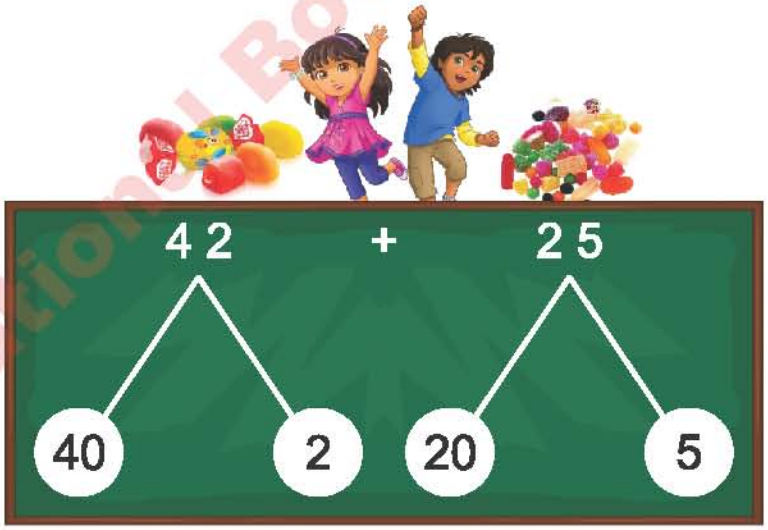
		Th	H	T	O
		(1)	(1)		
Number of boys	=	2	6	8	5
Number of girls	= +	1	5	2	0
Total number of students	=	4	2	0	5

The total number of students in the Secondary school are 4,205.

Addition of Numbers using Mental Strategies

Example: Ahmed has 42 toffees and 25 jellies.
How can he add these items using mental strategies?

Solution:



$40 + 20 = 60$

$2 + 5 = 7$

Thus, the sum of these items $= 67$

Teaching Point Explain the concept of adding with zero (0).

EXERCISE-1

1 Solve the following.

(i
$$\begin{array}{r} 3542 \\ +\ 5137 \\ \hline \end{array}$$

(ii
$$\begin{array}{r} 6643 \\ +\ 3215 \\ \hline \end{array}$$

(iii
$$\begin{array}{r} 6795 \\ +\ 2104 \\ \hline \end{array}$$

(iv
$$\begin{array}{r} 7256 \\ +\ 1423 \\ \hline \end{array}$$

(v
$$\begin{array}{r} 3154 \\ +\ 4000 \\ \hline \end{array}$$

(vi
$$\begin{array}{r} 7000 \\ +\ 2137 \\ \hline \end{array}$$

2 Add the following numbers.

i) 5,794; 3,925

ii) 3,596; 4,752

iii) 2,179; 5,496

iv) 6,243; 5,727

v) 6,495; 2,156

vi) 3,864; 5,676

3 There are 3,454 orange trees and 2,345 guava trees in an orchard. Find the total number of trees.

4 Zubair's mother paid Rs. 6,758 and Rs. 3,441 in March and April for the electricity bill, respectively. Find the total amount paid by her for the electricity bill.

5 The population of a village A is 4,536 and the population of village B is 3,253 in a certain city of Pakistan. Find the total population of both villages.

6 There are 6,540 male and 2,120 female employees in an organization. Find the total number of employees.

7 Aliyan and Shahwaiz save Rs. 4,056 and Rs. 5,430 respectively, in a year. Find their total saving.

8 Add using mental calculation.

i) 15 + 16 = ☐

ii) 52 + 18 = ☐

iii) 59 + 10 = ☐

iv) 47 + 32 = ☐

v) 35 + 55 = ☐

vi) 46 + 24 = ☐

vii) 37 + 23 = ☐

viii) 36 + 54 = ☐

ix) 27 + 43 = ☐

x) 56 + 24 = ☐

xi) 42 + 15 = ☐

xii) 32 + 28 = ☐

Subtraction of Numbers without Borrowing

Zubair's mother had Rs. 9,899. She purchased toys for her children for Rs. 7,545. What amount is left with her?

		Th	H	T	O
Amount Zubair's mother had	=	9	8	9	9
Amount paid for toys	=	− 7	5	4	5
Amount left with Zubair's mother	=	2	3	5	4

First Step

Subtract ones.

9 ones – 5 ones = 4 ones

Write 4 in the ones column.

Second Step

Subtract tens.

9 tens – 4 tens = 5 tens

Write 5 in the tens column.

Third Step

Subtract hundreds.

8 hundreds – 5 hundreds = 3 hundreds

Write 3 in the hundreds column.

Fourth Step

Subtract thousands.

9 thousands – 7 thousands = 2 thousands

Write 2 in the thousands column.

Thus, Rs. 2,354 were left with Zubair's mother.

Key Fact

Always subtract a smaller number from a greater number.

Example: Subtract 4,342 from 8,984.

Solution:

Th	H	T	O
8	9	8	4
– 4	3	4	2
4	6	4	2

The difference between the two number is 4,642.

Teaching Point Explain all steps involving subtraction to students and give them an assignment for practice.

Example: 1,982 men and children offered Eid namaz in a masjid. 1,670 of the total, were men. Find the number of children.

Solution:

		Th	H	T	O
Total number of people	=	1	9	8	2
Number of men	= −	1	6	7	0
Number of children	=	0	3	1	2

Thus, the total number of children were 312.

Subtraction with borrowing

Ali has 2,354 coins and Waleed has 1,260 coins. How many more coins does Ali have than Waleed?

		Th	H	T	O
Number of coins Ali has	=	2	~~3~~ ②	5 ①	4
Number of coins Waleed has	= −	1	2	6	0
Difference	=	1	0	9	4

Thus, Ali has 1,094 more coins than Waleed.

First Step

Subtracts ones.

4 ones – 0 ones = 4 ones

Write 4 in ones column.

Second Step

Key Fact

1 hundred = 10 tens

Subtract tens from tens.
We can not subtract 6 tens from 5 tens.
Therefore, we will borrow 1 hundred from hundreds.
Then, 1 hundred + 5 tens = 10 tens + 5 tens = 15 tens

Since, 1 hundred = 10 tens
Now, 15 tens – 6 tens = 9 tens
Write 9 in tens column.

Third Step

Subtract hundreds.
After giving 1 hundred to tens there are 2 hundreds.
Then, 2 hundreds – 2 hundreds = 0 hundreds.
Write 0 in hundreds column.

Key Fact

If 0 is subtracted from any number, we get the same number.

Fourth Step

Subtract thousands.
2 thousands –1 thousand = 1 thousand
Write 1 in thousands column.

Thus, Ali has 1,094 more coins than Waleed.

Try Yourself

What is the difference between the largest and the smallest 4-digit number?

Teaching Point

Guide the students about all the steps for subtraction and give some questions for practice.

Example: Find the difference between 7,650 and 2,586.

Solution:

	Th	H	T	O
	7	6	5	0
−	2	5	8	6
	5	0	6	4

The difference between the two number is 5,064.

Example: There were 5,434 bags of wheat in a godown.2,956 bags got sold. How many bags of wheat are left in the godown?

Solution:

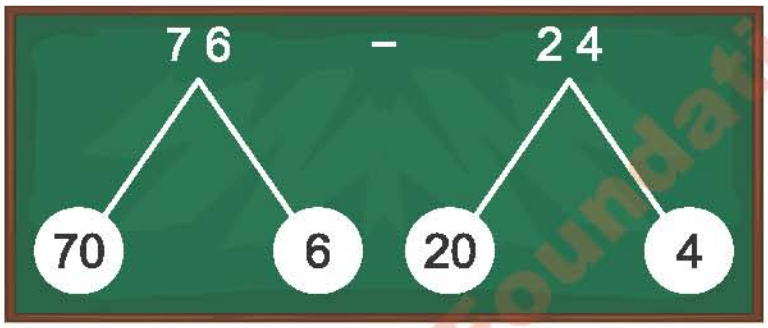
	Th	H	T	O
Total number of bags of wheat in godown =	~~5~~ 4	(1) ~~4~~ 3	(1) ~~3~~ 2	(1) 4
Bags sold = −	2	9	5	6
Remaining bags of wheat =	2	4	7	8

The remaining bags of wheat in the godown were 2,478.

Subtraction of Numbers using Mental Strategies

Bilal has Rs. 76. He spends Rs. 24. How much money does he have left?

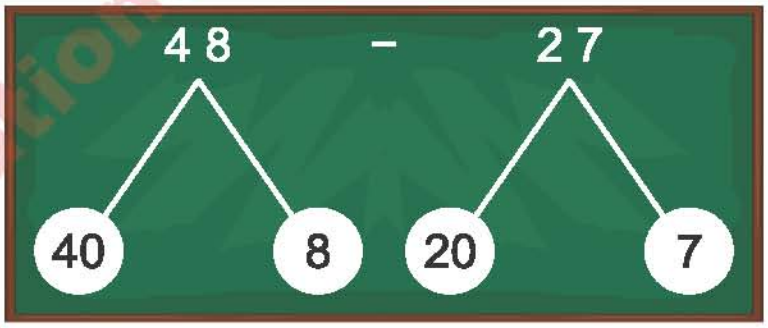
We solve it by mental strategies as follows:



$$70 - 20 = 50$$
$$6 - 4 = 2$$
$$= 52$$

Bilal has Rs. 52 left.

Find the difference between 48 and 27?



$$40 - 20 = 20$$
$$8 - 7 = 1$$
$$= 21$$

Teaching Point Explain the concept of mental subtraction to your students and give them some more questions for practice.

Estimating Sums and Differences

When we estimate addition in numbers, we can use rounded numbers to make the addition easier. We round each number to the nearest ten and hundred.

Example: Add **28** and **67.**

We can round **28** to the nearest 10, which is 30 and **67** to the nearest 10 which is 70.

Add 30 and 70 which is 100.

100 is approximately equal to the actual sum which is 95.

When we estimate subtraction in numbers, we can use rounded numbers to make the subtraction easier. We round each number to the nearest ten and hundred.

Subtract 37 from 88.

We can round **37** to the nearest 10, which is **40** and **88** to the nearest 10 which is **90**.

Subtract **40** from **90** which is **50**.

50 is approximately equal to the actual difference which is 51.

EXERCISE-2

1 Estimate nearest to ten.

32 + 11 = ☐	38 + 21 = ☐	49 + 29 = ☐
26 + 12 = ☐	27 + 18 = ☐	86 + 11 = ☐
47 + 22 = ☐	42 + 77 = ☐	49 + 39 = ☐
57 + 23 = ☐	65 + 28 = ☐	76 + 24 = ☐

2 Subtract and complete the following using mental strategy.

40 − 11 = ☐	88 − 33 = ☐	53 − 28 = ☐
25 − 17 = ☐	27 − 9 = ☐	63 − 21 = ☐
98 − 47 = ☐	49 − 41 = ☐	66 − 44 = ☐
35 − 27 = ☐	48 − 19 = ☐	73 − 32 = ☐

Solve the following.

3

$$\begin{array}{r} 3546 \\ -2324 \\ \hline \end{array}$$

4

$$\begin{array}{r} 5796 \\ -3453 \\ \hline \end{array}$$

5

$$\begin{array}{r} 6354 \\ -4041 \\ \hline \end{array}$$

6

$$\begin{array}{r} 8764 \\ -3653 \\ \hline \end{array}$$

7

$$\begin{array}{r} 4754 \\ -3532 \\ \hline \end{array}$$

8

$$\begin{array}{r} 9876 \\ -6754 \\ \hline \end{array}$$

Solve the following.

9

$$\begin{array}{r} 9765 \\ -8974 \\ \hline \end{array}$$

10

$$\begin{array}{r} 8754 \\ -3974 \\ \hline \end{array}$$

11

$$\begin{array}{r} 6495 \\ -3546 \\ \hline \end{array}$$

12

$$\begin{array}{r} 7965 \\ -6876 \\ \hline \end{array}$$

13

$$\begin{array}{r} 8678 \\ -7896 \\ \hline \end{array}$$

14

$$\begin{array}{r} 8543 \\ -7654 \\ \hline \end{array}$$

15. A book has 1,535 pages in all. Sikandar has read 424 pages. How many pages are left for him to read?

16. Mr. Aamir and Mr. Gulraiz sell cloth. One day's sale of Mr. Aamir is Rs. 6,456 and one day's sale of Mr. Gulraiz is Rs. 4,340. How much more money does Mr. Aamir get from one day's sale?

17. The total number of men and women in a village is 6,753. If the number of women is 3,985. Find the number of men.

18. In a cattle farm, the number of goats and sheep is 7,516. If the number of sheep is 5,728, find the number of goats.

19. There are 12 coconut cookies and 28 chocolate cookies in a plate. Estimate the total number of cookies.

20. The school library has 184 English books and 277 Urdu books. Estimate the difference in the number of books.

Multiplication

Multiplication Table of 6

Faheem has 3 chocolate boxes. In each box, there are 6 chocolates. What is the total number of chocolates in the three boxes?

Chocolates in 1 box = 6

Chocolates in 3 boxes = 6 + 6 + 6 = 18

= 6 × 3 = 18

There are 18 chocolates in 3 boxes.

6 → 12 → 18 → 24 → 30 → 36 → 42 → 48 → 54 → 60

+6 +6 +6 +6 +6 +6 +6 +6 +6

1 × 6 = 6
2 × 6 = 12
3 × 6 = 18
4 × 6 = 24
5 × 6 = 30
6 × 6 = 36
7 × 6 = 42
8 × 6 = 48
9 × 6 = 54
10 × 6 = 60

Key Fact

When an even number is multiplied by 6 then we get the same even number in one's place.

2 × 6 = 12
4 × 6 = 24
6 × 6 = 36
8 × 6 = 48

Teaching Point Guide students to develop the multiplication table of 6, using repeated addition.

Multiplication Table of 7

By adding 7 repeatedly, we get the multiplication table of 7.

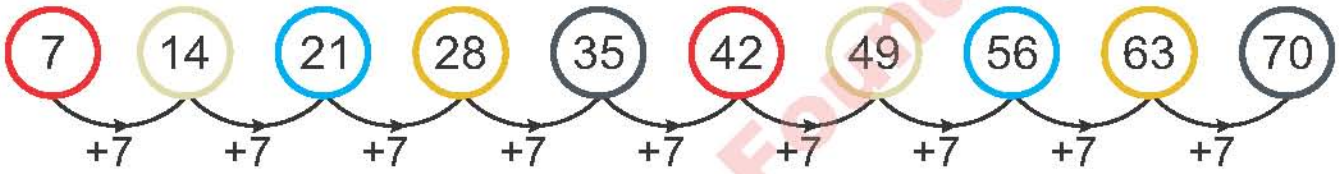
Zain has 3 boxes of biscuits. In each box there are 7 biscuits. What is the total number of biscuits in the three boxes?

Biscuits in 1 box = 7

Biscuits in 3 boxes = 7 + 7 + 7 = 21

= 7 × 3 = 21

So there are 21 biscuits in 3 boxes.



1 × 7 = 7

2 × 7 = 14

3 × 7 = 21

4 × 7 = 28

5 × 7 = 35

6 × 7 = 42

7 × 7 = 49

8 × 7 = 56

9 × 7 = 63

10 × 7 = 70

Key Fact

6 × 7 = 42

or

6 × 7 = 7 × 6 = 42

Key Fact

Repeated addition of numbers is called multiplication.

Teaching Point Guide students to develop the multiplication table of 7 using repeated addition.

Multiplication Table of 8

We can get the multiplication table of 8 by adding 8, repeatedly.

Bisma has 3 boxes of candies. In each box there are 8 candies. What is the total number of candies in the three boxes?

Candies in 1 box = 8

Candies in 3 boxes = 8 + 8 + 8 = 24

= 8 × 3 = 24

There are 24 candies in 3 boxes.

8 (+8) 16 (+8) 24 (+8) 32 (+8) 40 (+8) 48 (+8) 56 (+8) 64 (+8) 72 (+8) 80

1	×	8	=	8
2	×	8	=	16
3	×	8	=	24
4	×	8	=	32
5	×	8	=	40
6	×	8	=	48
7	×	8	=	56
8	×	8	=	64
9	×	8	=	72
10	×	8	=	80

Key Fact

3 × 8 = 24

or

3 × 8 = 8 × 3 = 24

Teaching Point Guide students to develop the multiplication table of 8 using repeated addition.

Multiplication Table of 9

We can get the multiplication table of 9 by adding 9, repeatedly.

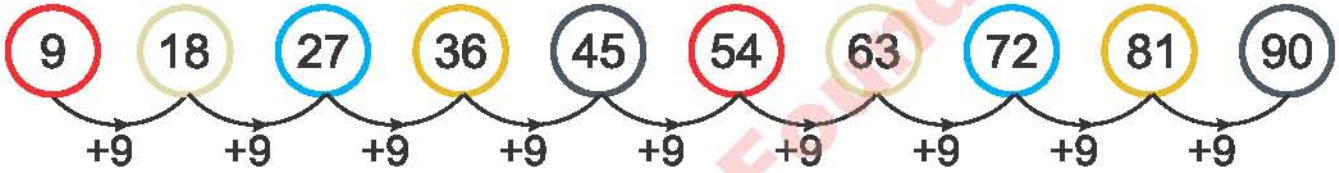
Asad has 3 folders . In each folder there are 9 pages. What is the total number of pages in the three folders?

Pages in 1 folder = 9

Pages in 3 folder = 9 + 9 + 9 = 27

= 9 × 3 = 27

So, there are 27 pages in 3 folders.



1 × 9 = 9

2 × 9 = 18

3 × 9 = 27

4 × 9 = 36

5 × 9 = 45

6 × 9 = 54

7 × 9 = 63

8 × 9 = 72

9 × 9 = 81

10 × 9 = 90

Key Point

4 × 9 = 36

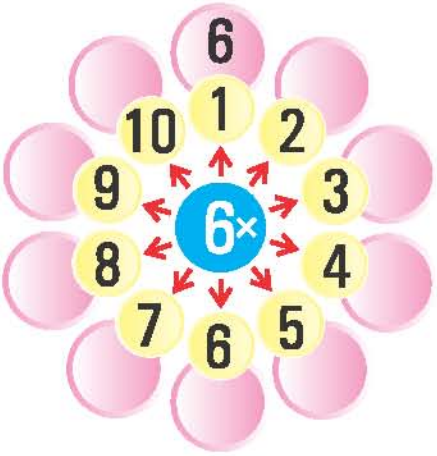
or

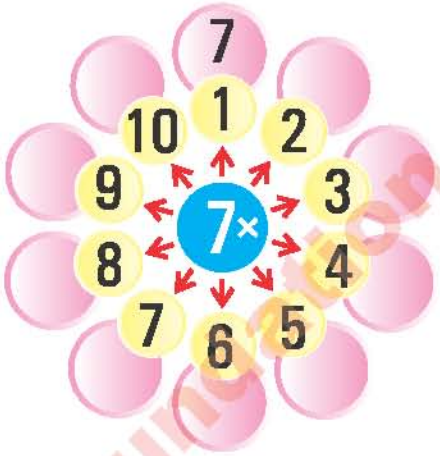
4 × 9 = 9 × 4 = 36

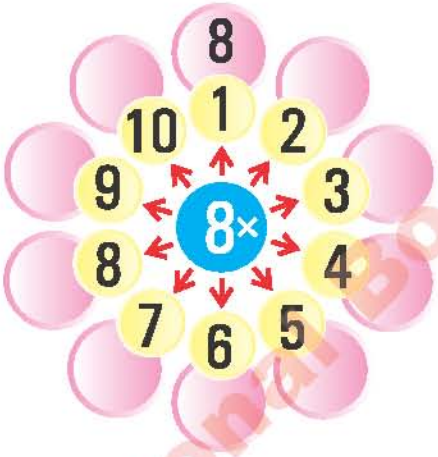
Teaching Point Guide students to develop the multiplication table of 9 using repeated addition.

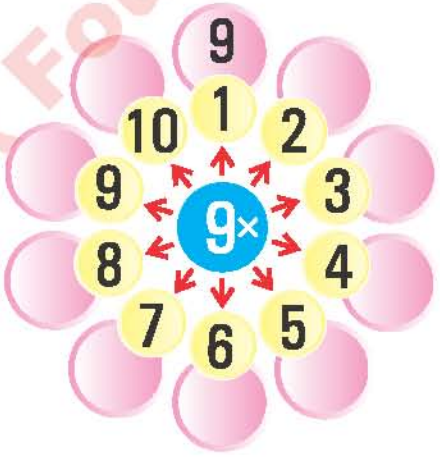
EXERCISE-3

1 Complete the following tables.







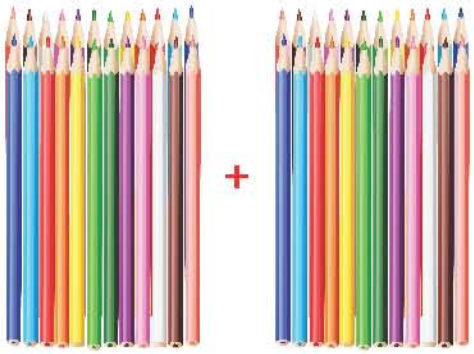


2 Fill in the boxes.

×	1	2	3	4	5	6	7	8	9	10
6	6				30				54	
7		14				42				70
8			24				56			
9				36				72		

Multiplication of Numbers

Hannah has 2 boxes of 24 pencils each. How many pencils does she have altogether?



		T	O
Pencils in a box	=	2	4
Number of boxes	= ×		2
Total number of pencils	=	4	8

Now we multiply 24 by 2.

First Step

Write the given question in vertical form and write ones under ones column.

T	O
2	4
×	2

Second Step

Multiply the digits in ones place

$$4 \times 2 = 8$$

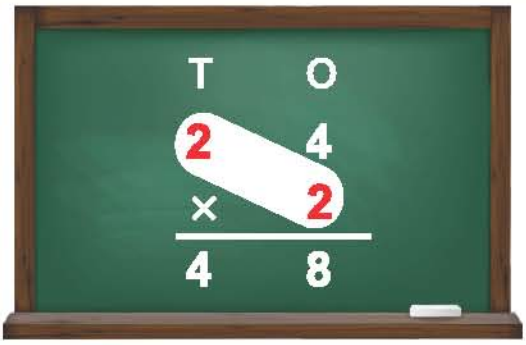
Write 8 in the ones column.

T	O
2	4
×	2
	8

Third Step

Multiply 2 at tens place by 2 at ones place as given.

$$2 \times 2 = 4$$



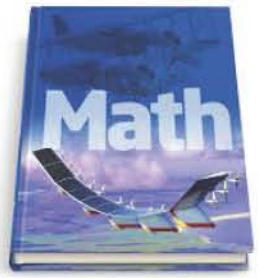
Thus, there are 48 pencils in both boxes.

The cost of a Mathematics book of class II is Rs. 65. What will be the cost of 6 such books?

The cost of 1 book = 65

The cost of 6 books = 65 × 6

= Rs. 390



First Step

Write the numbers in vertical form.

Second Step

Multiply 6 by 5 in ones place.

as 6 × 5 = 30

Write 0 in ones column and carry 3 in tens.

Third Step

$6 \times 6 = 36$

Add 3 tens.

36 tens + 3 tens = 39 tens

Write 9 in column of tens

and 3 in column of hundreds.

The cost of 1 book = 65

The cost of 6 books = 65×6

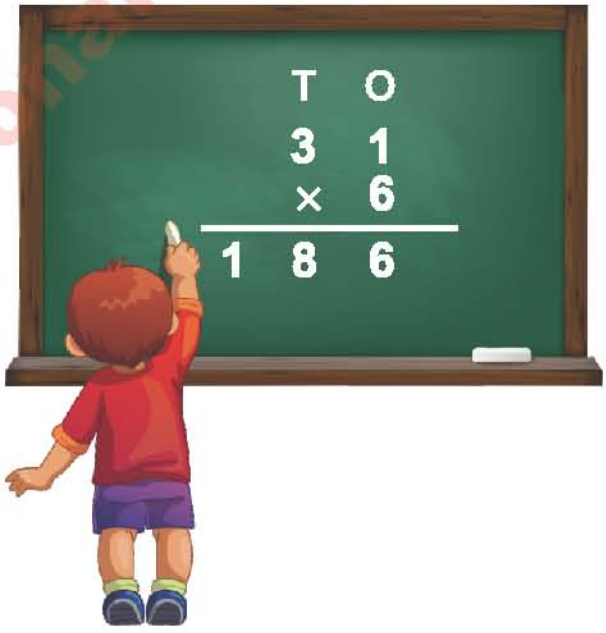
Thus, the cost of 6 such books is Rs. 390.

Example: Mahwish has 6 identical toys. If the cost of one toy is Rs. 31, what is the cost of the 6 toys?

Solution:

The cost of one toy = 31

The cost of 6 toys = 6×31



Thus, the total cost of 6 toys is Rs. 186.

Multiplication of Number by 0 and 1

There are three empty jars of toffees. It means that there is no toffee in each of the jars.

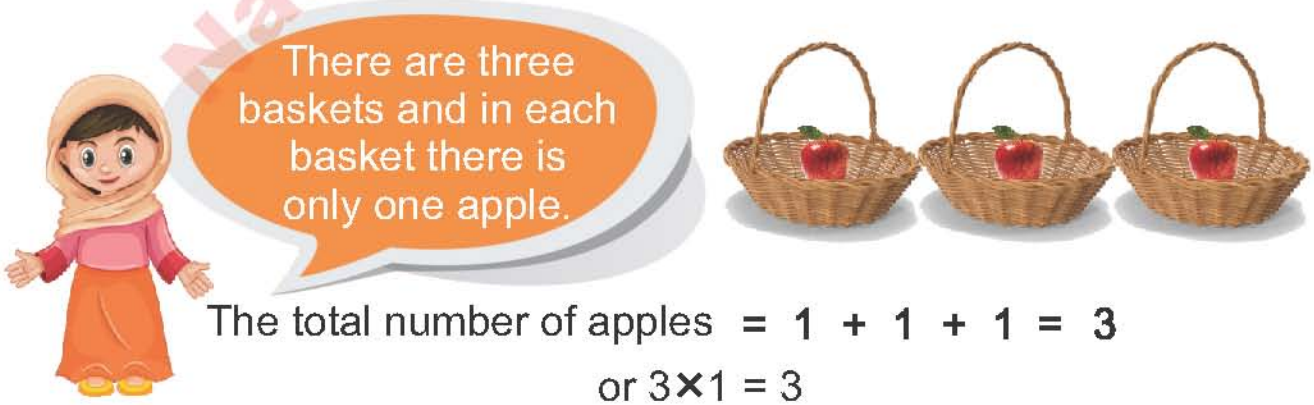
The sum of toffees in three jars = 0 + 0 + 0 = 0

or

Multipling 0 by 3 = 0 × 3 = 0

Similarly, Multiplying 3 by 0 = 3 × 0 = 0

Multiplying a number by 0 we always get 0.



The total number of apples = 1 + 1 + 1 = 3

or 3×1 = 3

Teaching Point Explain the concept of multiplication by giving daily life examples.

If these three apples are placed in one basket then we can write it as:

The number of apples in a basket = $3 \times 1 = 3$

Similarly, $4 \times 1 = 4$

If we multiply a number by 1, we always get the same number.

Multiply Numbers by using Mental Calculations

Let us multiply 12 and 5 using mental calculation.
To multiply mentally, we use the following steps.

12 can be estimated to 10.
Multiply $10 \times 5 = 50$
and multiply $2 \times 5 = 10$
Add 50 and 10, which is 60.

So, $12 \times 5 = 60$

Now we multiply 18 and 6 using mental calculation.
To multiply mentally, we use the following steps.

18 can be estimated to 20.
Multiply $20 \times 6 = 120$
and multiply $2 \times 6 = 12$
Subtract 12 from 120, which is 108.

So, $18 \times 6 = 108$

EXERCISE-4

Solve the following

1

$$\begin{array}{r} 24 \\ \times\ 3 \\ \hline \end{array}$$

2

$$\begin{array}{r} 35 \\ \times\ 4 \\ \hline \end{array}$$

3

$$\begin{array}{r} 32 \\ \times\ 5 \\ \hline \end{array}$$

4

$$\begin{array}{r} 338 \\ \times\ 6 \\ \hline \end{array}$$

5

$$\begin{array}{r} 545 \\ \times\ 7 \\ \hline \end{array}$$

6

$$\begin{array}{r} 648 \\ \times\ 8 \\ \hline \end{array}$$

7

$$\begin{array}{r} 154 \\ \times\ 9 \\ \hline \end{array}$$

8

$$\begin{array}{r} 256 \\ \times\ 7 \\ \hline \end{array}$$

9

$$\begin{array}{r} 562 \\ \times\ 6 \\ \hline \end{array}$$

10 Solve the following using tables.

(i) $7 \times 6 =$ ☐

(ii) $5 \times 6 =$ ☐

(iii) $4 \times 7 =$ ☐

(iv) $9 \times 7 =$ ☐

(v) $4 \times 9 =$ ☐

(vi) $8 \times 7 =$ ☐

11 Find the product of the following.

(i) $5 \times 0 =$ ☐

(ii) $35 \times 0 =$ ☐

(iii) $345 \times 0 =$ ☐

(iv) $48 \times 1 =$ ☐

(v) $1 \times 57 =$ ☐

(vi) $31 \times 1 =$ ☐

(vii) $319 \times 0 =$ ☐

(viii) $732 \times 1 =$ ☐

12 Solve using mental strategies:

(i) $4 \times 9 =$ ☐

(ii) $14 \times 4 =$ ☐

(iii) $21 \times 3 =$ ☐

(iv) $12 \times 7 =$ ☐

(v) $11 \times 6 =$ ☐

(vi) $17 \times 5 =$ ☐

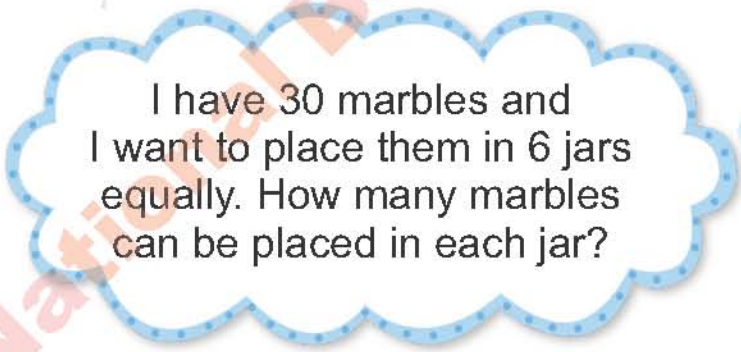
13 If Anas spends Rs. 524 in one day, how many rupees will he spend in 4 days?

14 There are 7 days in a week, how many days are there in 52 weeks?

15 If there are 7 trees in one row, how many trees are in 5 rows?

16 A motorcycle can cover a distance of 162 kilometres in one litre of petrol. How many kilometres will it cover in 4 litres?

Division of Numbers



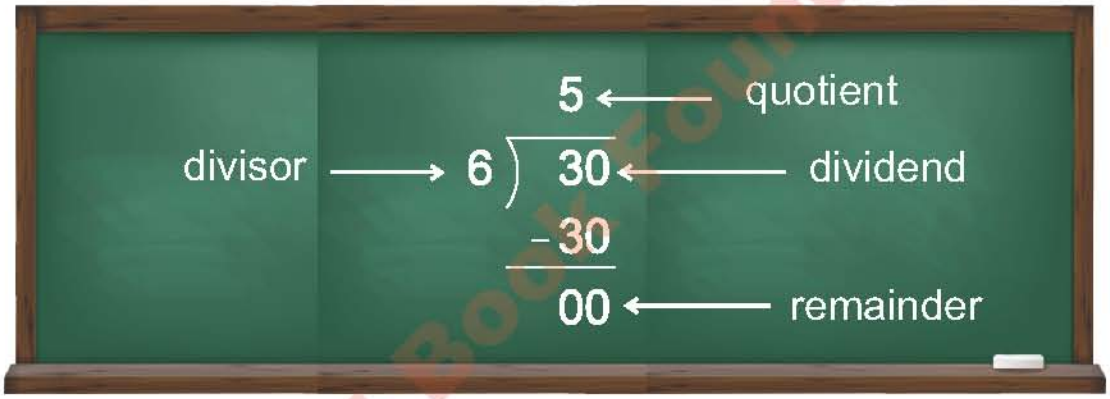
The total number of marble = 30

The number of jars = 6

The number of marbles in jar = 30 ÷ 6

= 5

Dividing 30 by 6, we get 5.



5 marbles can be placed in 1 jar.

The division of two numbers cannot be done in any order:

We can represent this as follows:
30 ÷ 6 = 5

Now, if we try to do this in reverse order, i.e.,

6 ÷30 =?

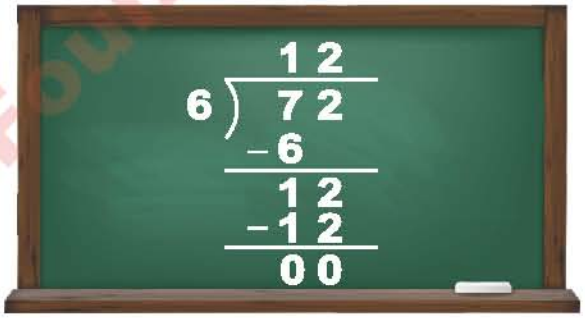
6 is not divisible by 30 which means we cannot place 6 marbles equally in 30 jars.

As you can see, the result is not the same as in the first case. This shows that the division of two numbers cannot be done in any order. The order of the numbers matters when it comes to division.

Example: There are 72 mango trees in 6 rows. How many mango trees are in 1 row?

Solution:

The number of mango trees	= 72
The rows of trees	= 6
The number of trees in 1 row	= 72 ÷ 6

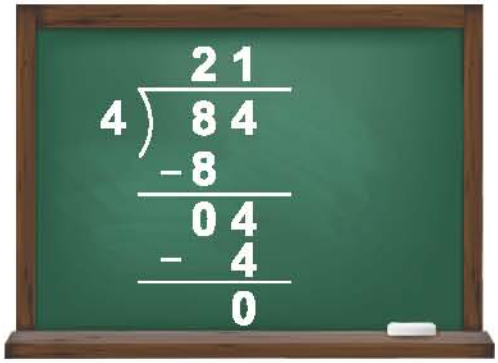


So, there are 12 trees in 1 row.

Example: Distribute 84 pencils in 4 boxes equally.

Solution:

The number of pencils	= 84
The number of boxes	= 4
The number of pencils in 1 box	= 84 ÷ 4
	= 21



So, there are 21 pencils in 1 box.

Teaching Point Explain to the students that the process of division cannot be done in any order by using counters or other real-life objects.

Key Fact

When a 2-digit number is divided by a 1-digit number, we divide the number in tens place first, and then the number in ones place.

Key Fact

Division means to distribute things, equally.

Mental Strategies in Division

Observe the division of the following numbers.

Let us divide 85 by 5 using mental strategies.

Now 85 ÷ 5 is equivalent to 170 ÷ 10

So, 85 ÷ 5

= 170 ÷ 10 (we multiplied the dividend and the divisor by 2 as

= 17 mental division by the multiples of 10 is easier)

Example: Divide 72 by 8 using mental strategies.

Solution:

72 ÷ 8 = 36 ÷ 4 = 18 ÷ 2 = 9

Example: Divide 63 by 9 using mental strategies.

Solution:

63 ÷ 9 = 21 ÷ 3 = 7

Teaching Point Explain to the students that the process of division can be made easy by dividing things into groups.

EXERCISE-5

1 State whether each statement is true or false.

a. 3 is not divisible by 5

b. 10 is not divisible by 2

c. 6 is divisible by 8

d. 11 is divisible by 7

e. 4 is not divisible by 8

Solve the following

2- 20 ÷ 4 = ☐

3- 25 ÷ 5 = ☐

4- 42 ÷ 6 = ☐

5- 49 ÷ 7 = ☐

6- 72 ÷ 8 = ☐

7- 81 ÷ 9 = ☐

8- 48 ÷ 4 = ☐

9- 72 ÷ 6 = ☐

10- 84 ÷ 7 = ☐

11- 51 ÷ 3 = ☐

12- 96 ÷ 8 = ☐

13- 99 ÷ 9 = ☐

14- 124 ÷ 2 = ☐

15- 300 ÷ 5 = ☐

Solve using mental strategies.

16- 15 ÷ 5 = ☐

17- 72 ÷ 6 = ☐

18- 32 ÷ 4 = ☐

19- 300 ÷ 30 = ☐

20- 48 ÷ 12 = ☐

21- 96 ÷ 4 = ☐

22 During the school assembly, 96 students are standing in 6 rows. How many students are there in 1 row?

23 A motorcyclist covered a distance of 56 kilometres in 4 days. How many kilometres does he cover in one day?

24 The price of 1 packet of biscuits is Rs. 5. I have Rs. 70. How many packets can I buy?

25 Nina bought 7 notebooks for Rs. 91. Find the price of one notebook.

26 If the price of 1 pencil is Rs. 8, how many pencils can be bought for Rs. 48?

I Have Learnt

- addition upto 4-digit number (with and without carrying).
- subtraction upto 4-digit number (with and without borrowing).
- when 0 is added in any number, we get the same number.
- subtraction is basically the difference of two numbers.
- to always subtract a smaller number from a greater number.
- when 0 is subtracted from any number we get the same number.
- when 6 is multiplied by an even number, we get the same even number in ones place.

For example, $4 \times 6 = 24$, $6 \times 6 = 36$

$2 \times 6 = 12$

- repeated addition of numbers is called multiplication.
- when any number is multiplied by 1, we get the same number.
- when any number is multiplied by 0, we get 0.
- when a 2-digit number is divided by a 1-digit number, we divide the digit in tens place first and then in ones place.

Vocabulary

addition
subtraction
multiplication
division
mental strategies
box

Review Exercise

1 Fill in the blanks with the correct answer.

i) The sum of 1,564 and 7,325 is _____.

(a) 8,888 **(b)** 8,889 **(c)** 8,899 **(d)** 8,886

ii) The difference of 6,351 and 1,265 is _____.

(a) 5,056 **(b)** 5,076 **(c)** 5,086 **(d)** 5,096

iii) The difference between 3,246 and 1,886 is _____.

(a) 1,350 **(b)** 1,360 **(c)** 1,370 **(d)** 1,380

iv) There are 6 eggs in a basket. There are _____ eggs in 7 baskets.

(a) 21 (b) 28 (c) 35 (d) 42

v) When any number is multiplied by 0 we get _____.

(a) 0 (b) 1 (c) 10 (d) 100

vi) On multiplying 12 by 1, we get _____.

(a) 13 (b) 112 (c) 12 (d) 14

vii) On dividing 24 by 6, we get_____.

(a) 4 (b) 5 (c) 6 (d) 7

viii) On dividing 84 by 4, we get _____.

(a) 18 (b) 19 (c) 20 (d) 21

Add:

2- 4,535; 5314

3- 8,645; 3,456

Solve

4- 4,554 –2,342

5- 5,943 –4,864

Solve using mental strategies:

6- 28 + 13 = ☐

7- 58 – 32 = ☐

8- 8 × 6 = ☐

9- 6 ÷ 3 = ☐

10 In Najeebullah's shop, there is rice worth Rs. 1,457 and sugar worth Rs. 7,321, in a given week. Find the total worth of the rice and sugar, Najeebullah has in his shop, that week.

11 The total number of students in a school is 4,356. If the number of female students is 1,968, find the number of male students.

12 If Hanif spends Rs. 735 in one day, how many rupees does he spend in 7 days?

13 If the price of 8 kilograms of salt is Rs. 296, what is the price of one kilogram of salt?

14 There are 27 students in class 3 and 32 students in class 4. Estimate the total number of students in the two classes.

15 There are 668 girls and 839 boys in the school. Estimate the total number of students in the school.

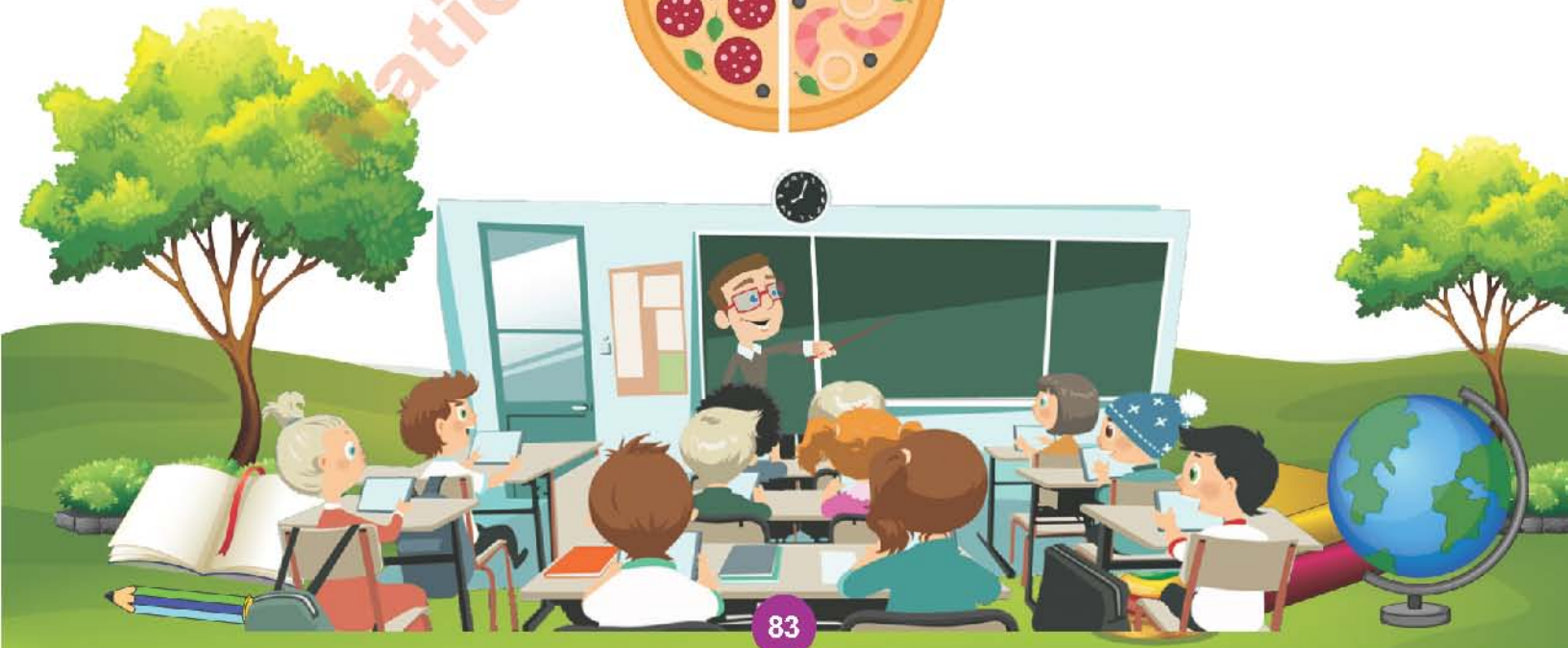
16 There are 197 pages in the mathematics book of Class 3 and 117 pages in the Science book of the same class. Estimate the difference in the number of pages of the two books.

Unit-3

Fractions

By the end of this unit, you will be able to:

- Recognize among:
  - proper fractions
  - improper fractions.
  - mixed numbers
- Identify equivalent fractions and show families of equivalent fractions.
- Simplify fractions to the lowest term.
- Compare and order like fractions using symbols <, > and =.
- Add and subtract like and unlike fractions (with denominators that are multiples of the same number).
- Know and recognize that hundredths arise by dividing an object, single digit numbers and quantities into hundred equal parts.
- Identify that tenths arise by dividing an object, single digit number and quantities into ten equal parts (e.g., 2/10 = 0.2)*



Common Fractions

Zeenat's father brought a watermelon for Iftar. When her mother started cutting the watermelon, Zeenat observed keenly.

Zeenat said to her mother: "It was a whole watermelon but you cut it into two pieces."

Mother explained to her that each piece of watermelon is called half or $\frac{1}{2}$.

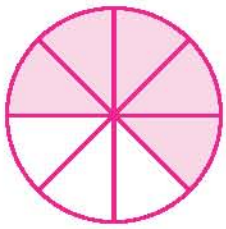
One whole = 1

Half = $\frac{1}{2}$

One fourth = $\frac{1}{4}$

Example: In the figure at the right, one out of four parts is coloured. The figure is divided into 8 equal parts. Five parts out of eight are coloured.

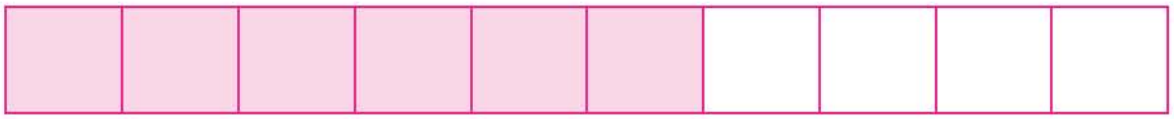
Solution:



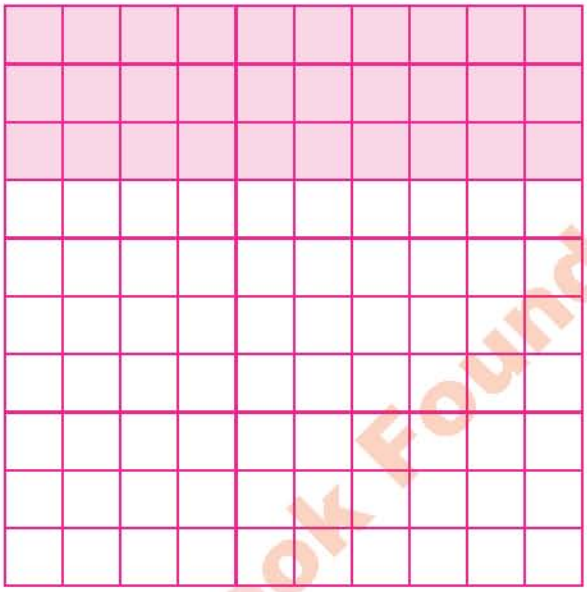
The coloured part can be written as $\frac{5}{8}$.

Teaching Point Explain the concept of fractions, using daily life examples.

Examples:



The coloured part can be written as $\frac{6}{10}$.



The coloured part can be written as $\frac{30}{100}$.

Match the given figures to the fraction.

$\frac{2}{5}$

$\frac{3}{5}$

$\frac{4}{5}$

$\frac{1}{10}$

$\frac{1}{5}$

Key Fact

In a fraction, the

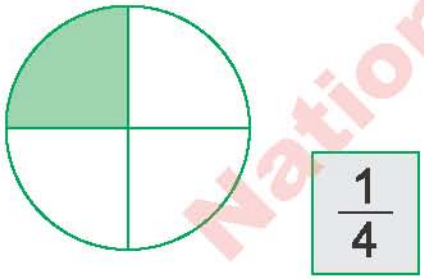
- top number is called the numerator, which shows how many parts are coloured.
- bottom number is called the denominator, which shows how many equal parts the whole is divided into.

EXERCISE-1

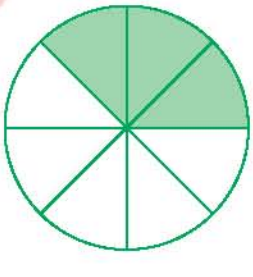
1 Identify numerator and denominator in the following fractions.

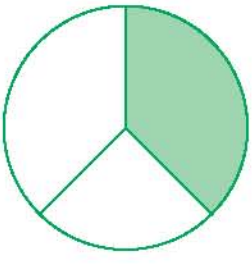
$\frac{2}{7}$, $\frac{3}{7}$, $\frac{5}{8}$, $\frac{2}{5}$, $\frac{10}{13}$, $\frac{9}{10}$, $\frac{1}{8}$, $\frac{2}{3}$, $\frac{4}{7}$, $\frac{3}{4}$

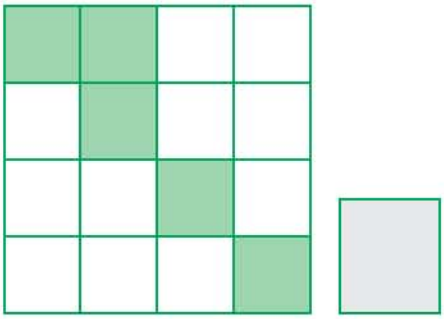
2 Write the fraction representing the shaded part of the following figures.

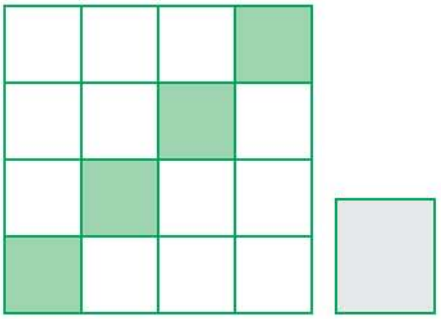


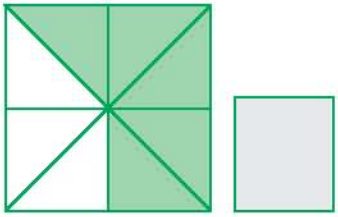
$\frac{1}{4}$

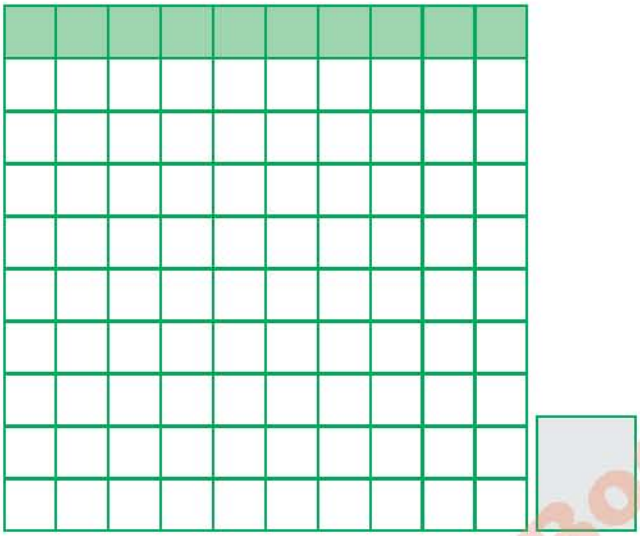


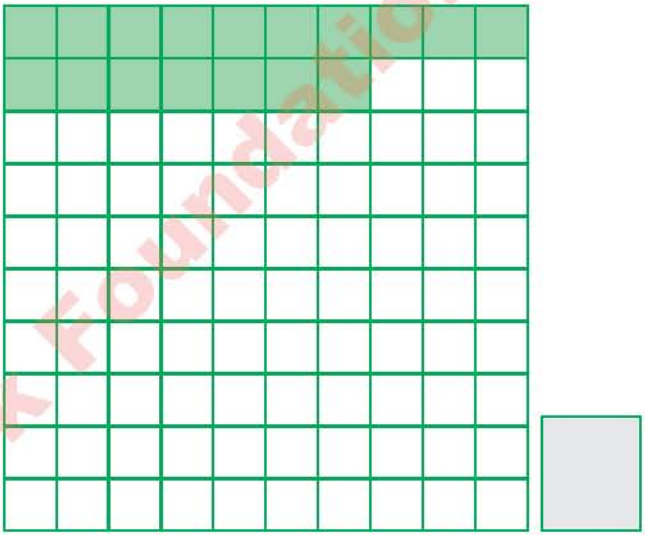




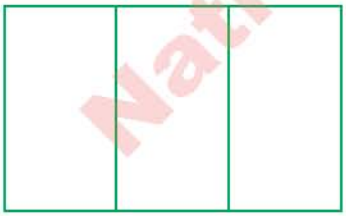






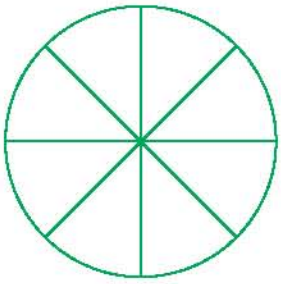


3 Colour the following figures according to the given fractions.

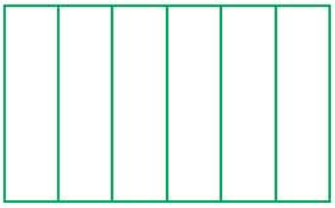


$\frac{2}{3}$

$\frac{3}{4}$



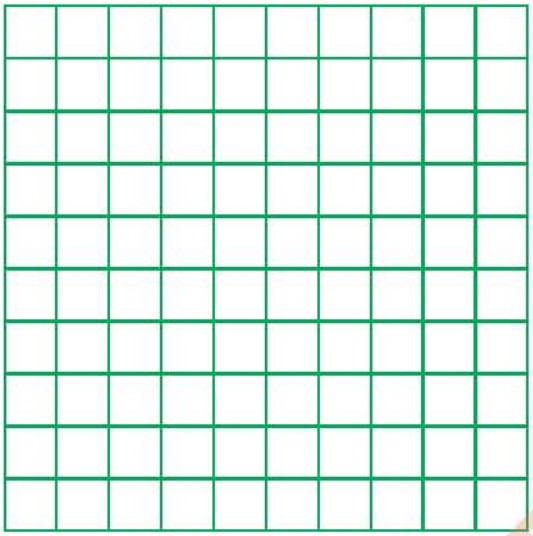
$\frac{3}{8}$



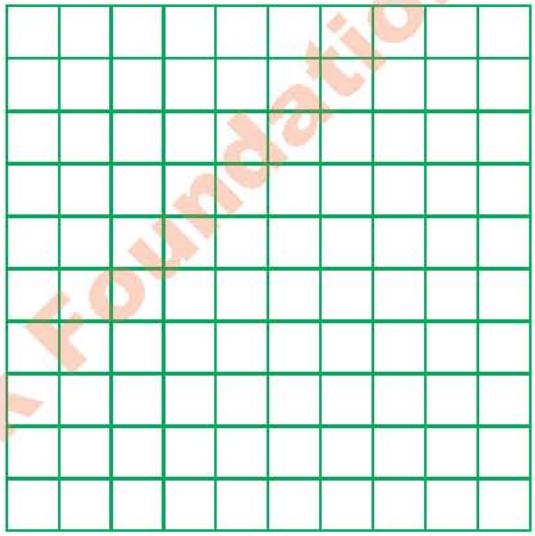
$\frac{3}{6}$

$\frac{2}{10}$

$\frac{7}{10}$



$\frac{50}{100}$



$\frac{35}{100}$

4 Write the fraction from the given numerator and denominator.

(i) Numerator = 4, Denominator = 11 → $\frac{4}{11}$

(ii) Numerator = 3, Denominator = 11 → —

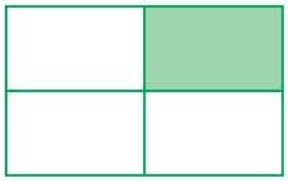
(iii) Numerator = 4, Denominator = 9 → —

(iv) Numerator = 5, Denominator = 7 → —

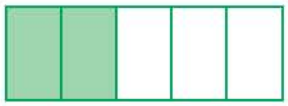
5 Match the following figures to the given fractions.

(i) 

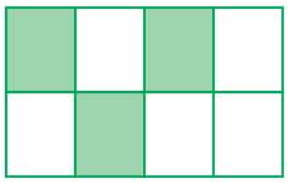
$\frac{3}{4}$

(ii) 

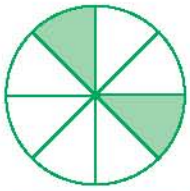
$\frac{3}{8}$

(iii) 

$\frac{1}{4}$

(iv) 

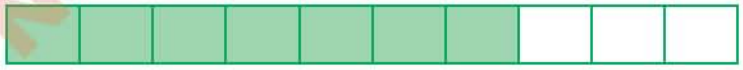
$\frac{2}{8}$

(v) 

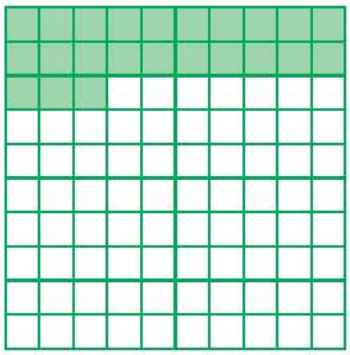
$\frac{2}{3}$

(vi) 

$\frac{2}{5}$

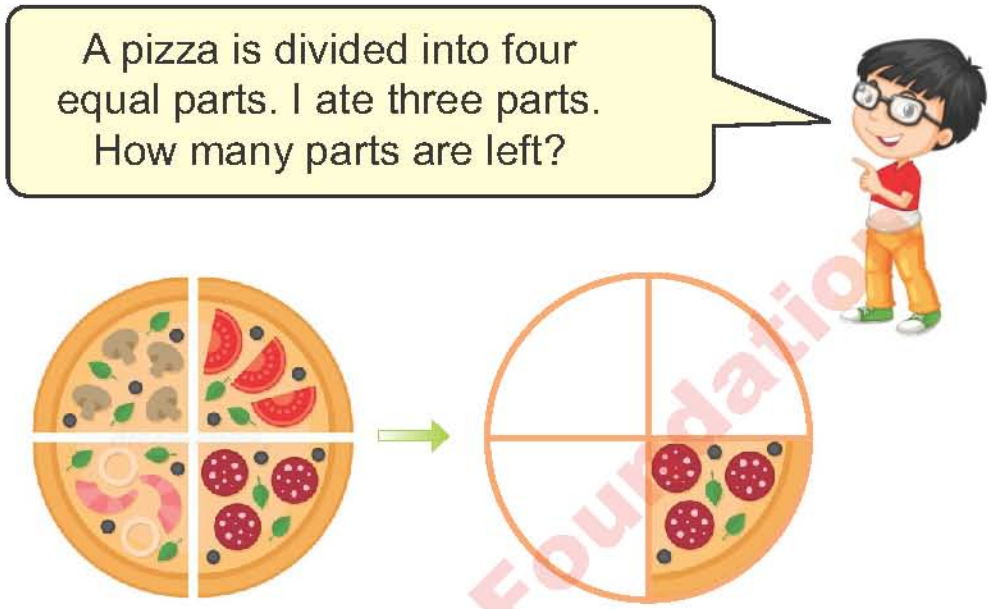
(vii) 

$\frac{23}{100}$

(viii) 

$\frac{7}{10}$

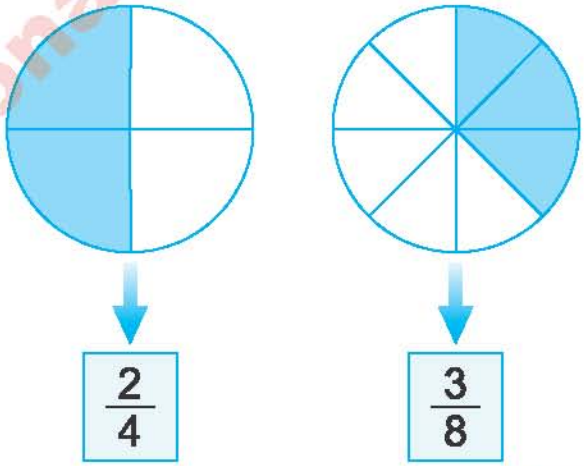
Proper and Improper Fractions



The left over part is $\frac{1}{4}$.

Proper Fractions

Look at the following fraction.

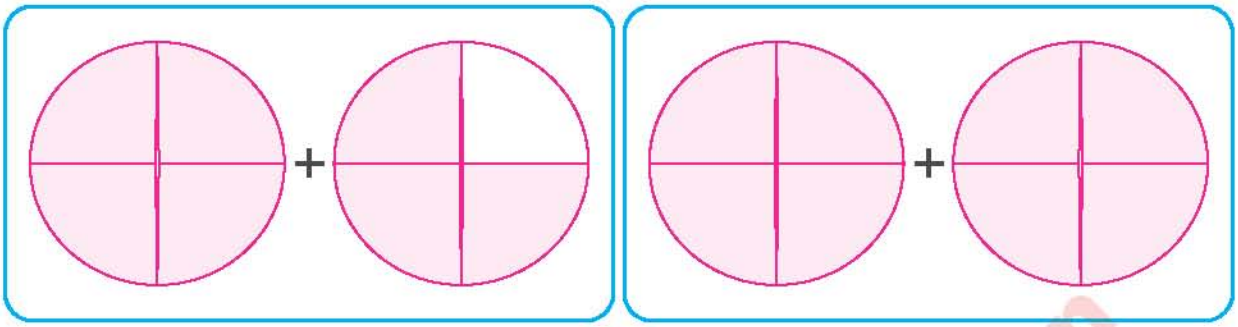


In these fractions, the numerator is less than the denominator. Therefore, these fractions are called Proper fractions.

Check Point

Is $\frac{2}{3}$ a proper fraction?

Improper Fractions



$\frac{4}{4}$ $\frac{3}{4}$ → $\frac{7}{4}$

$\frac{4}{4}$ $\frac{4}{4}$ → $\frac{8}{4}$

In $\frac{7}{4}$, the numerator is greater than the denominator.

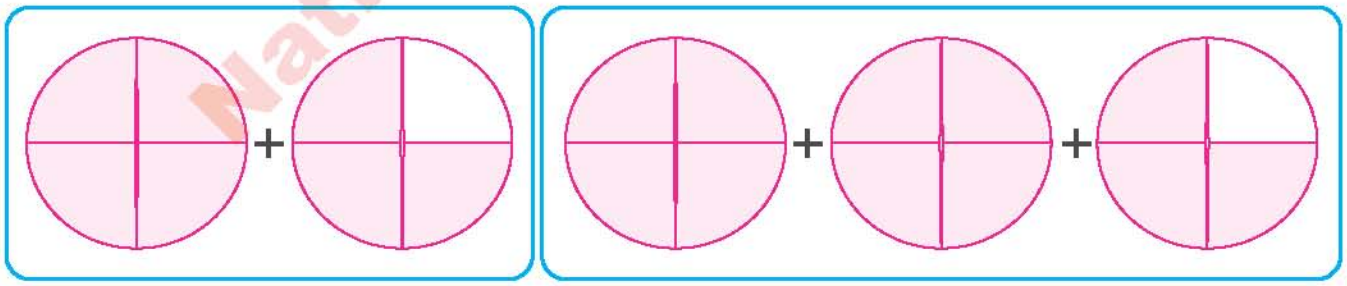
In $\frac{4}{4}$, the numerator is equal to the denominator.

Both of these fractions are improper fractions.

Key Point

If the numerator of a fraction is greater than or equal to the denominator, then the fraction is called an improper fraction.

Mixed Numbers



$\frac{4}{4}$ $\frac{3}{4}$ → $\frac{7}{4} = 1\frac{3}{4}$

$\frac{4}{4}$ $\frac{4}{4}$ $\frac{3}{4}$ → $\frac{11}{4} = 2\frac{3}{4}$

In $\frac{11}{4} = 2\frac{3}{4}$, is a combination of a whole number 2 and a fraction $\frac{3}{4}$.

In $\frac{7}{4} = 1\frac{3}{4}$, is a combination of a whole number 1 and a fraction $\frac{3}{4}$.

Therefore, both of these are mixed numbers. Mixed numbers can be converted to improper fractions.

Key Point

A mixed number is a combination of a whole number and a fraction. It is written in the form of "a $\frac{b}{c}$," where "a" is the whole number, "b" is the numerator of the fraction, and "c" is the denominator of the fraction.

EXERCISE-2

1 Write proper, improper fractions or mixed numbers in the following boxes.

(i) $\frac{3}{4} =$ ☐ (ii) $\frac{4}{5} =$ ☐ (iii) $3\frac{4}{3} =$ ☐

(iv) $\frac{4}{9} =$ ☐ (v) $1\frac{7}{5} =$ ☐ (vi) $\frac{9}{5} =$ ☐

(vii) $\frac{8}{9} =$ ☐ (viii) $\frac{3}{7} =$ ☐ (ix) $\frac{7}{7} =$ ☐

(x) $1\frac{3}{5} =$ ☐ (xi) $1\frac{1}{4} =$ ☐ (xii) $\frac{12}{6} =$ ☐

2 Match proper and improper fractions in the following.

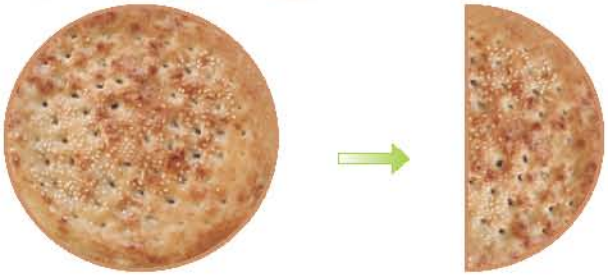
$\frac{13}{6}$ $\frac{14}{5}$ $\frac{4}{5}$ $\frac{9}{4}$

$\frac{8}{5}$ Proper fractions Improper fractions $\frac{7}{12}$

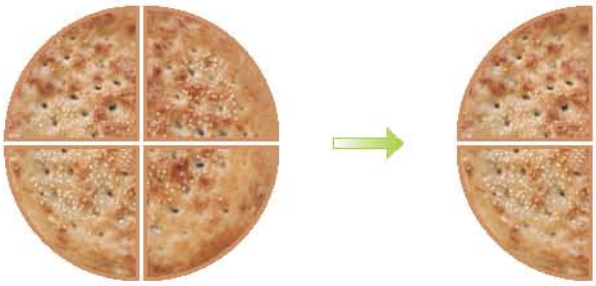
$\frac{7}{19}$ $\frac{8}{15}$ $\frac{7}{9}$ $\frac{7}{4}$

Equivalent Fractions

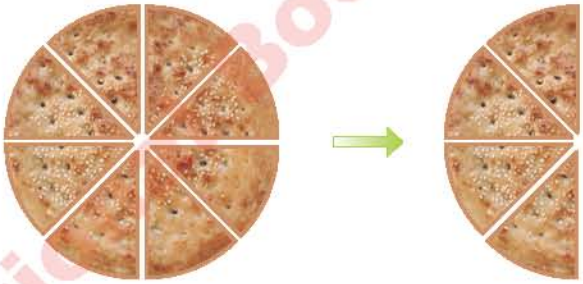
Umair divides a bread into two equal parts and eats $\frac{1}{2}$ of it.



Washain has a bread. She divided it into four equal parts and eats $\frac{2}{4}$ of it.

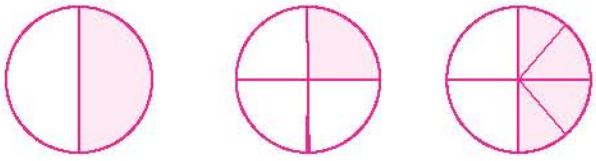


Uzair has a bread. He divided it into eight equal parts and eats $\frac{4}{8}$ of it.



We observe, that Umair, Washain and Uzair ate the same amount of bread.

Fractions $\frac{1}{2}$, $\frac{2}{4}$ and $\frac{4}{8}$ look different but actually they are the same amount of bread.



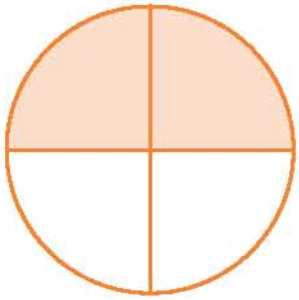
So, we can say that: $\frac{1}{2}$, $\frac{2}{4}$ and $\frac{4}{8}$ are equivalent fractions.

To find equivalent fractions, multiply or divide the numerator and the denominator by the same non-zero number.

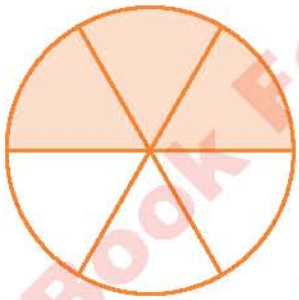
Example: Write three equivalent fractions of $\frac{1}{2}$ as:

Solution:

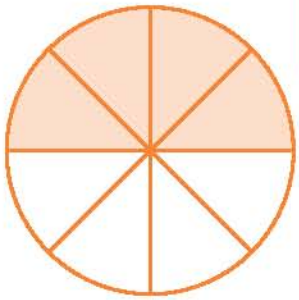
$$\frac{1}{2} = \frac{1 \times 2}{2 \times 2} = \frac{2}{4}$$



$$\frac{1}{2} = \frac{1 \times 3}{2 \times 3} = \frac{3}{6}$$



$$\frac{1}{2} = \frac{1 \times 4}{2 \times 4} = \frac{4}{8}$$



Try Yourself

What will be three equivalent fractions of $\frac{2}{3}$?

Key Fact

To get equivalent fractions, multiply the numerator and the denominator by a number greater than 1.

Thus, the three equivalent fractions of $\frac{1}{2}$ are:

$\frac{2}{4}$, $\frac{3}{6}$ and $\frac{4}{8}$

Teaching Point Explain the concept of equivalent fractions by using real life examples.

Simplifying Fractions

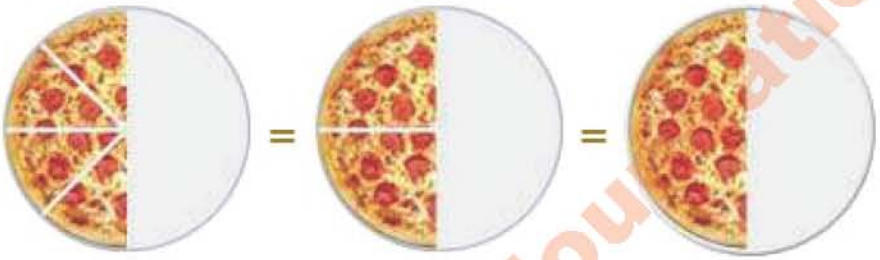
Simplifying a fraction means making the fraction as simple as possible.

Example: Write $\frac{4}{8}$ in the simplest form.

Solution:

$\frac{4}{8}$ = $\frac{2}{4}$ = $\frac{1}{2}$

(Four-Eighths) (Two-Quarters) (One-Half)



When we simplify the fraction $\frac{4}{8}$, $\frac{1}{2}$ is the simplest form of the fraction $\frac{4}{8}$.

EXERCISE-3

1 Write three equivalent fractions of the following.

(i) $\frac{5}{6}$ (ii) $\frac{2}{3}$ (iii) $\frac{1}{4}$

(iv) $\frac{5}{8}$ (v) $\frac{3}{5}$ (vi) $\frac{2}{5}$

2 Match the equivalent fractions.

(i)	$\frac{3}{5}$	$\frac{8}{14}$
(ii)	$\frac{5}{9}$	$\frac{1}{2}$
(iii)	$\frac{4}{7}$	$\frac{15}{21}$
(iv)	$\frac{3}{6}$	$\frac{9}{24}$
(v)	$\frac{3}{8}$	$\frac{6}{10}$
(vi)	$\frac{5}{7}$	$\frac{10}{18}$

3 Simplify the following

(i) $\frac{8}{32}$ (ii) $\frac{16}{20}$ (iii) $\frac{25}{50}$

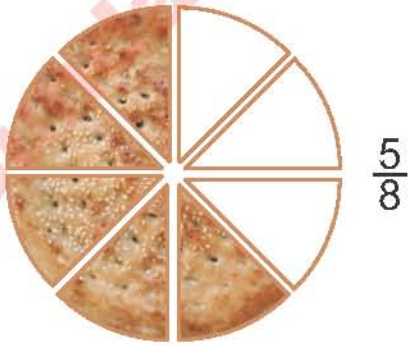
(iv) $\frac{12}{36}$ (v) $\frac{16}{40}$ (vi) $\frac{50}{30}$

Comparing Fractions

Ali eats $\frac{3}{8}$ part of a bread.

Saba eats $\frac{5}{8}$ part of a bread.

$\frac{3}{8}$



$\frac{5}{8}$

Who eats less bread?

When the denominators of the fractions are the same, or equal we compare their numerators.

In $\frac{3}{8}$ and $\frac{5}{8}$, the denominators are same and numearator 3 is less than 5.

So, $\frac{3}{8} < \frac{5}{8}$

Therefore, we can say that Ali ate less.

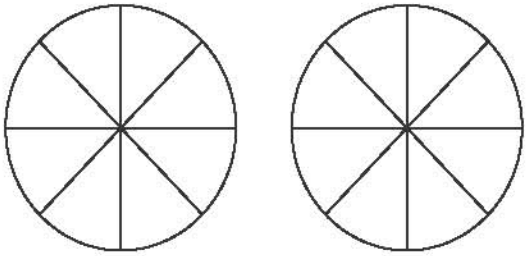
Key Point

- In two fractions with the same denominators, a fraction having the greater numerator, is a greater fraction.
- Fractions of the form $\frac{1}{2}, \frac{2}{4}, \frac{4}{8}$ are called equivalent fractions.

EXERCISE-4

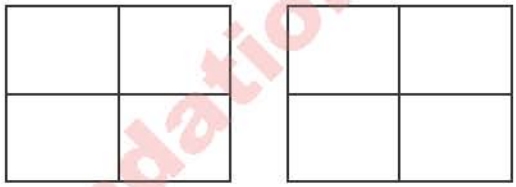
1 Colour the following figures, and then use the < or > sign to compare the fractions.

(i)



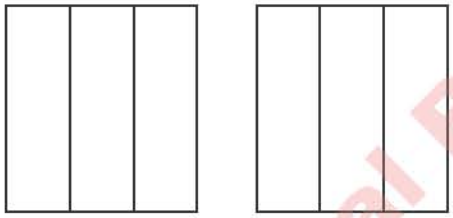
$\frac{3}{8}$ ☐ $\frac{5}{8}$

(ii)



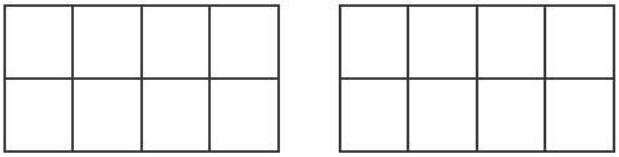
$\frac{3}{4}$ ☐ $\frac{2}{4}$

(iii)



$\frac{1}{3}$ ☐ $\frac{2}{3}$

(iv)



$\frac{5}{8}$ ☐ $\frac{3}{8}$

2 Use the sign < , > or = to compare the following fractions.

(i) $\frac{3}{9}$ ☐ $\frac{5}{9}$

(ii) $\frac{3}{5}$ ☐ $\frac{2}{5}$

(iii) $\frac{4}{7}$ ☐ $\frac{4}{7}$

(iv) $\frac{2}{3}$ ☐ $\frac{1}{3}$

(v) $\frac{4}{9}$ ☐ $\frac{4}{9}$

(vi) $\frac{5}{11}$ ☐ $\frac{3}{11}$

Addition of Fractions

Zaryab and Nayab ordered a pizza. The pizza was divided into 8 equal parts. Zaryab ate 3 pieces of pizza. Nayab ate 2 pieces of pizza. How much pizza did they eat altogether?

Pizza Zaryab ate + Pizza Nayab ate = Total pizza they ate

$$\frac{3}{8} + \frac{2}{8} = \frac{5}{8}$$

To find the total amount of pizza, we will add $\frac{3}{8}$ and $\frac{2}{8}$.

$$= \frac{3}{8} + \frac{2}{8}$$

$$= \frac{5}{8}$$

Hence, the total pizza eaten was $\frac{5}{8}$.

Key Fact

To add fractions with the same denominator, we add the numerators only.

Teaching Point Explain the concept of addition of two fractions with the same denominator to the students.

EXERCISE-5

Solve the following.

(1) $\frac{3}{7} + \frac{2}{7}$

(2) $\frac{3}{5} + \frac{1}{5}$

(3) $\frac{1}{9} + \frac{4}{9}$

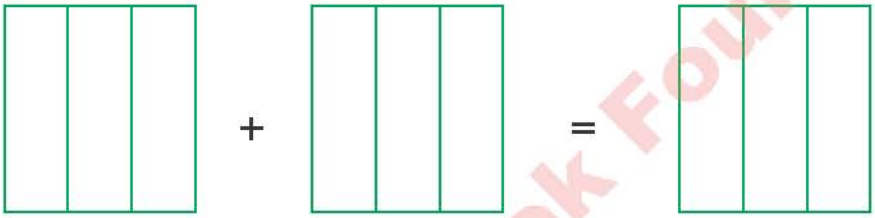
(4) $\frac{5}{12} + \frac{2}{12}$

(5) $\frac{1}{8} + \frac{3}{8}$

(6) $\frac{1}{6} + \frac{3}{6}$

Colour the figures according to the given fractions.

(7)

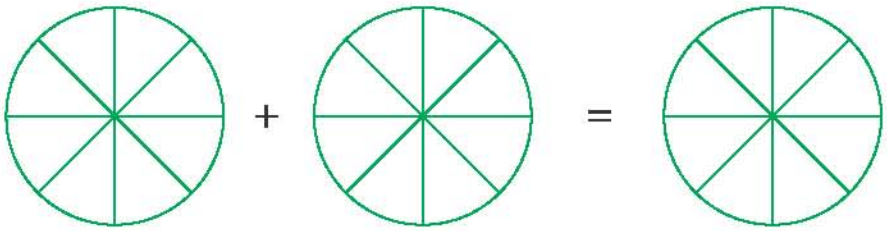


$\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$

(8)

$\frac{3}{10} + \frac{4}{10} = \frac{7}{10}$

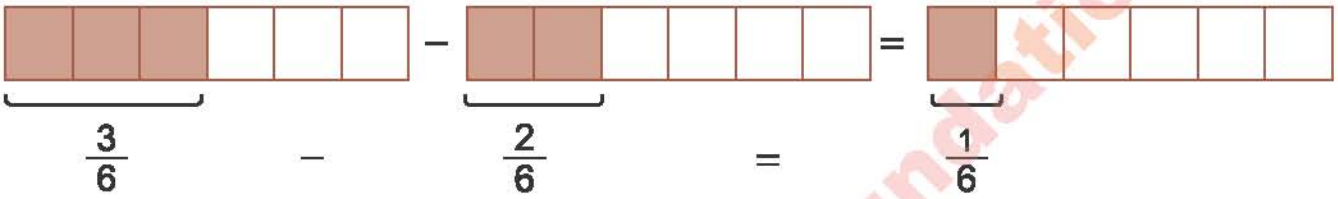
(9)



$\frac{3}{8} + \frac{2}{8} = \frac{5}{8}$

Subtraction of Fractions

Rayyan and Mahrosh bought a chocolate in which Rayyan ate $\frac{3}{6}$ of the chocolate and Mahrosh ate $\frac{2}{6}$ of the chocolate. How much more chocolate was eaten by Rayyan?



Chocolate Rayyan ate $= \frac{3}{6}$

Chocolate Mahrosh ate $= \frac{2}{6}$

Difference $= \frac{3}{6} - \frac{2}{6}$

Rayyan ate more chocolate $= \frac{3-2}{6}$

$= \frac{1}{6}$

Key Fact

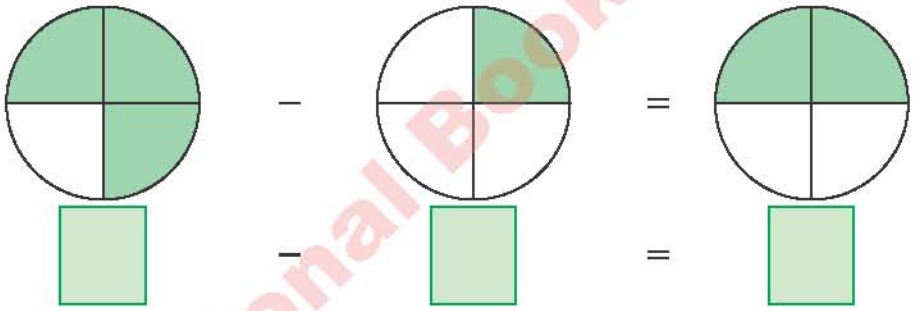
To subtract fractions with the same denominator, we subtract the numerators only.

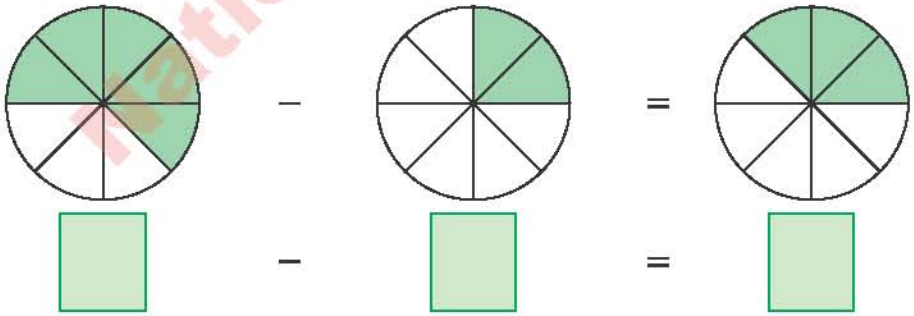
EXERCISE-6

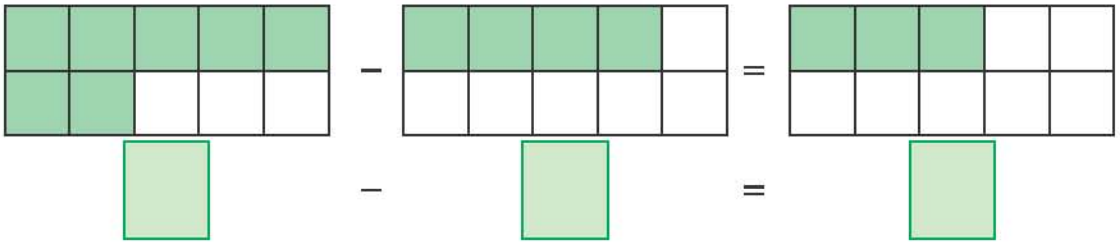
Solve.

1. $\frac{3}{7} - \frac{1}{7}$
2. $\frac{5}{9} - \frac{1}{9}$
3. $\frac{3}{5} - \frac{2}{5}$
4. $\frac{5}{8} - \frac{2}{8}$
5. $\frac{7}{12} - \frac{3}{12}$
6. $\frac{5}{6} - \frac{3}{6}$
7. $\frac{5}{8} - \frac{3}{8}$
8. $\frac{5}{11} - \frac{3}{11}$
9. $\frac{7}{15} - \frac{3}{15}$

Write fractions and solve.

10. 

11. 

12. 

I Have Learnt

- if we are dividing an object into equal parts, then part or parts taken out of the whole, is called a numerator.
- the total number of parts of an object is known as a denominator.
- in a proper fraction, the numerator is less than the denominator.
- in an improper fraction, the numerator is greater than or equal to the denominator.
- those fractions which are equal to each other are called equivalent fractions.
- in two fractions with the same denominator, the fraction having the greater numerator is a greater fraction.
- fractions of the form $\frac{1}{2}, \frac{2}{4}, \frac{4}{8}$ are called equivalent fractions.
- in two fractions with same denominators, we only add the numerators.
- in two fractions with same denominators, we only subtract the numerators.

Vocabulary

proper fraction
improper fraction
equivalent fraction
comparing fractions
common fractions
addition of fractions
subtraction of fractions

Review Exercise

1 Encircle the correct answer.

(i) A fraction in which the numerator is less than the denominator is called _____ fraction.

(a) proper **(b)** improper **(c)** equivalent **(d)** common

(ii) A fraction in which the numerator is greater than the denominator is called _____ fraction.

(a) equivalent **(b)** common **(c)** proper **(d)** improper

(iii) The equivalent fraction of $\frac{2}{5}$ is _____.

(a) $\frac{4}{3}$ (b) $\frac{4}{7}$ (c) $\frac{4}{6}$ (d) $\frac{4}{10}$

(iv) In fractions, $\frac{4}{5}$ ☐ $\frac{3}{5}$.

(a) < (b) > (c) = (d) ≠

(v) In fractions $\frac{4}{15}$ ☐ $\frac{7}{15}$.

(a) > (b) < (c) = (d) ≠

(vi) The sum of two fractions $\frac{3}{15}$ and $\frac{4}{15}$ is _____.

(a) $\frac{1}{15}$ (b) $\frac{7}{15}$ (c) $\frac{7}{30}$ (d) $\frac{1}{30}$

(vii) The difference of two fractions $\frac{7}{9}$ and $\frac{3}{9}$ is _____.

(a) $\frac{4}{9}$ (b) $\frac{10}{9}$ (c) $\frac{10}{18}$ (d) $\frac{4}{18}$

2 Identify the numerators and denominators of the following fractions.

$\frac{2}{9}$, $\frac{3}{7}$, $\frac{4}{5}$, $\frac{10}{7}$, $\frac{4}{15}$, $\frac{11}{6}$

3 Separate the proper and improper fractions from the following fractions.

$\frac{3}{5}$, $\frac{7}{5}$, $\frac{9}{6}$, $\frac{3}{8}$, $\frac{5}{9}$, $\frac{6}{6}$, $\frac{7}{18}$

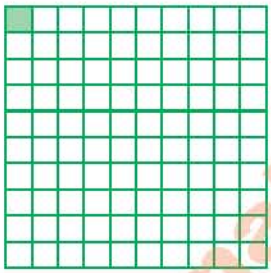
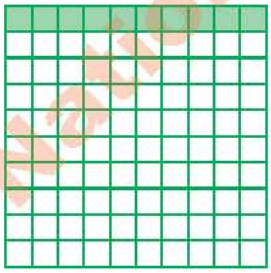
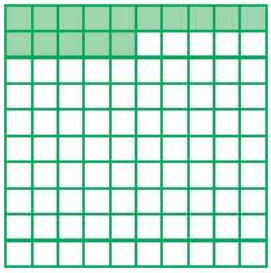
4 Use < , > or = signs between the following fractions.

(i) $\frac{8}{9}$ ☐ $\frac{4}{9}$ (ii) $\frac{5}{7}$ ☐ $\frac{6}{7}$ (iii) $\frac{4}{5}$ ☐ $\frac{4}{5}$

5 Write three equivalent fractions of the following fractions.

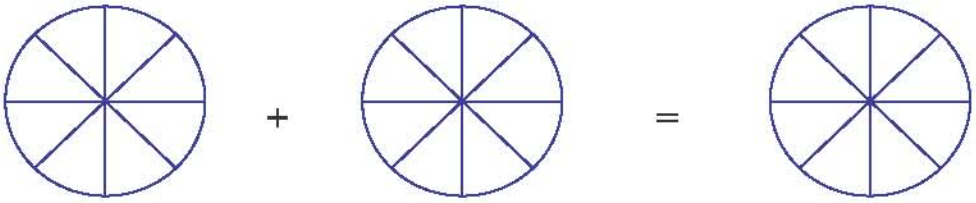
(i) $\frac{2}{3}$ (ii) $\frac{4}{5}$ (iii) $\frac{3}{7}$ (iv) $\frac{3}{8}$

6 Write each of the following as a fraction.

Figures	Fractions
	
	
	
	
	

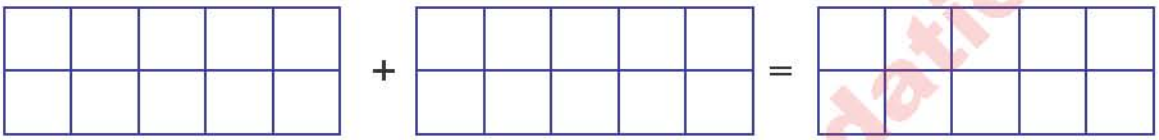
7 Colour the figures according to the given fractions.

(i)



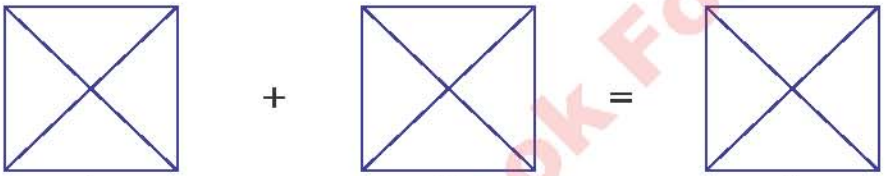
$\frac{4}{8} + \frac{3}{8} = \frac{7}{8}$

(ii)



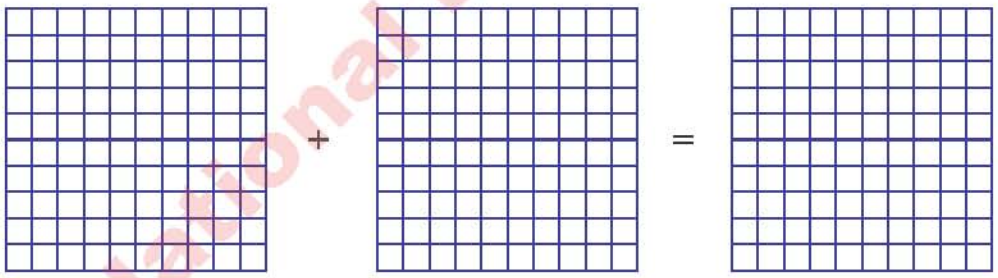
$\frac{3}{10} + \frac{5}{10} = \frac{8}{10}$

(iii)



$\frac{1}{4} + \frac{2}{4} = \frac{3}{4}$

(iv)



$\frac{11}{100} + \frac{21}{100} = \frac{31}{100}$

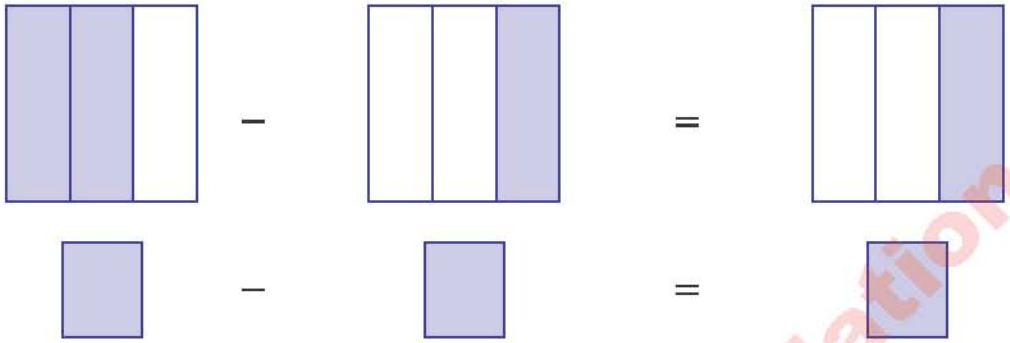
8 Simplify the following.

(i) $\frac{16}{32}$ (ii) $\frac{10}{25}$ (iii) $\frac{9}{27}$ (iv) $\frac{50}{25}$

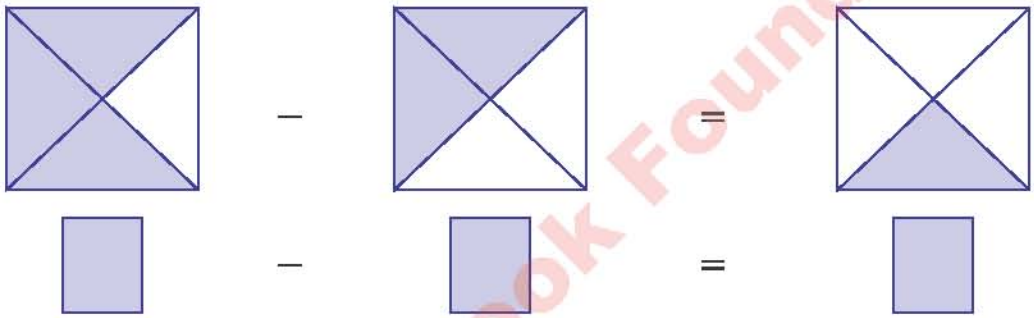
(v) $\frac{10}{35}$ (vi) $\frac{16}{48}$ (vii) $\frac{40}{100}$ (viii) $\frac{25}{100}$

9 Write the fractions below each figure.

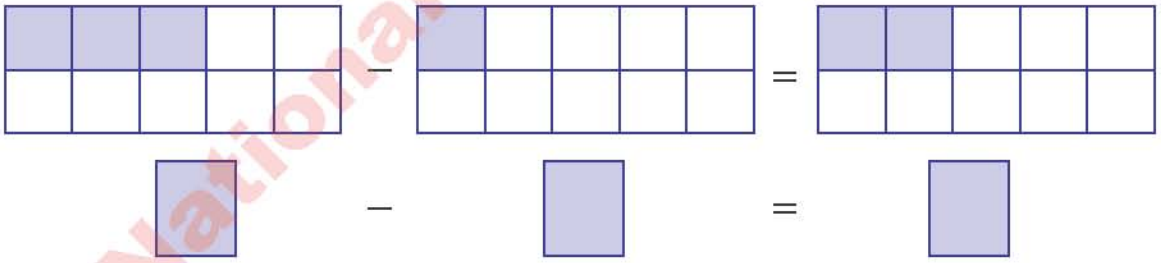
(i)



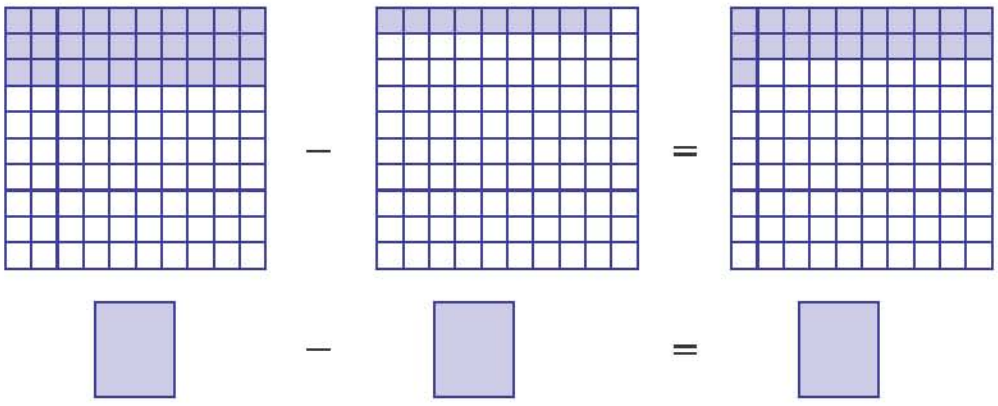
(ii)



(iii)



(iv)



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قومی ترانہ

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مرکزِ یقین شاد باد!

پاک سر زمین کا نِظام قُوّتِ اُخوّتِ عوام
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