Textbook

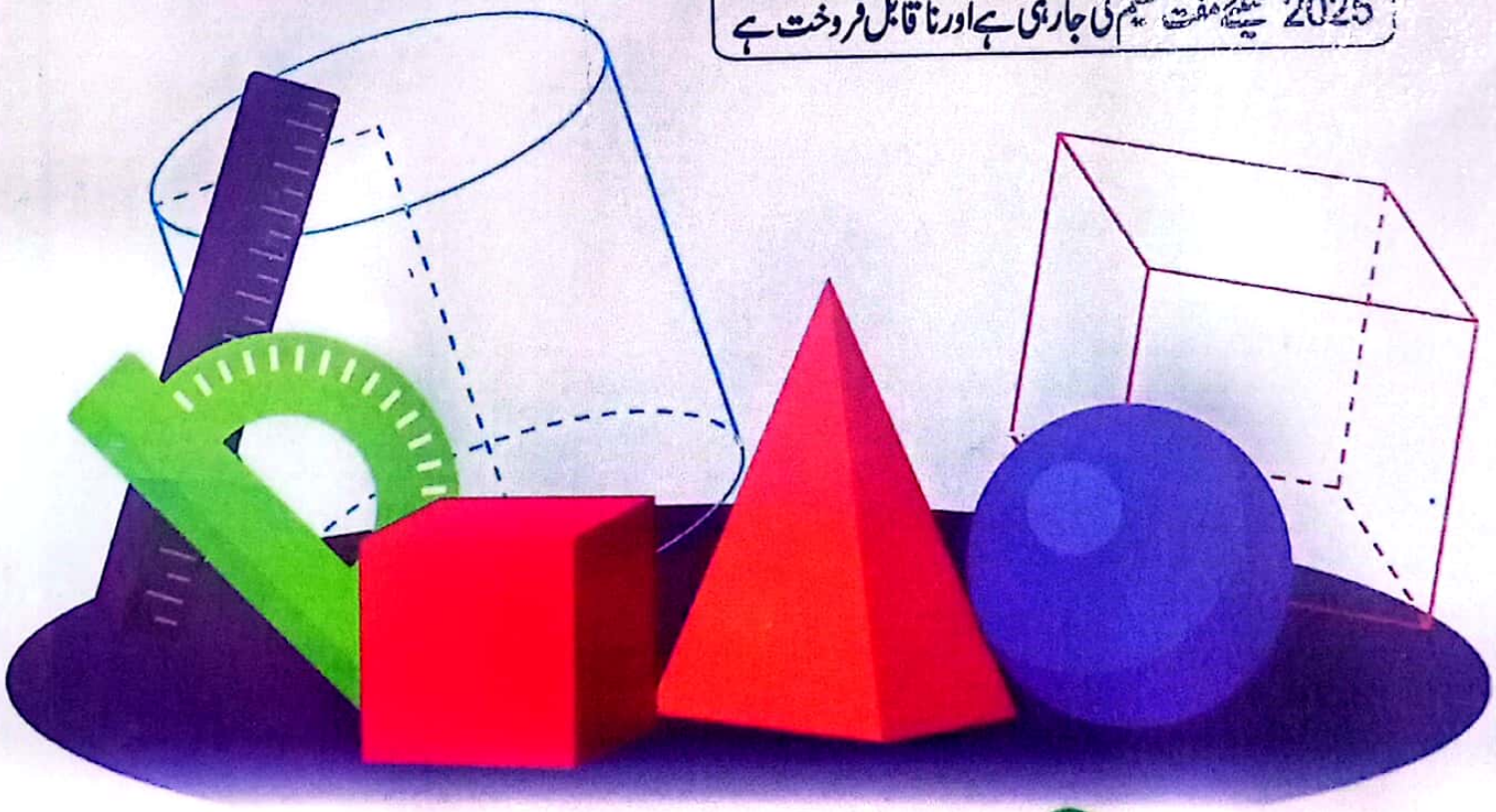
Mathematics

4

Test Edition

Based on Single National Curriculum 2020

یہ کتاب محکمہ تعلیم حکومت بلوچستان کی جانب سے تعلیمی سال 2025 کیلئے مفت تقسیم کی جارہی ہے اور ناقابل فروخت ہے



حکومت بلوچستان کا پروگرام "معیاری تعلیم سب کے لیے"

Balochistan Textbook Board, Quetta

بِسۡمِ اللّٰہِ الرَّحۡمٰنِ الرَّحِیۡمِ

شروع اللہ کے پاک نام سے جو بڑا مہربان نہایت رحم والا ہے۔

Textbook

Mathematics

Grade 4

Based on Single National Curriculum

One Nation, One Curriculum

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2025 کیلئے مفت تقسیم کی جارہی ہے اور نا قابل فروخت ہے

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Textbook

Mathematics

Grade 4

Experimental Edition

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APPEAL

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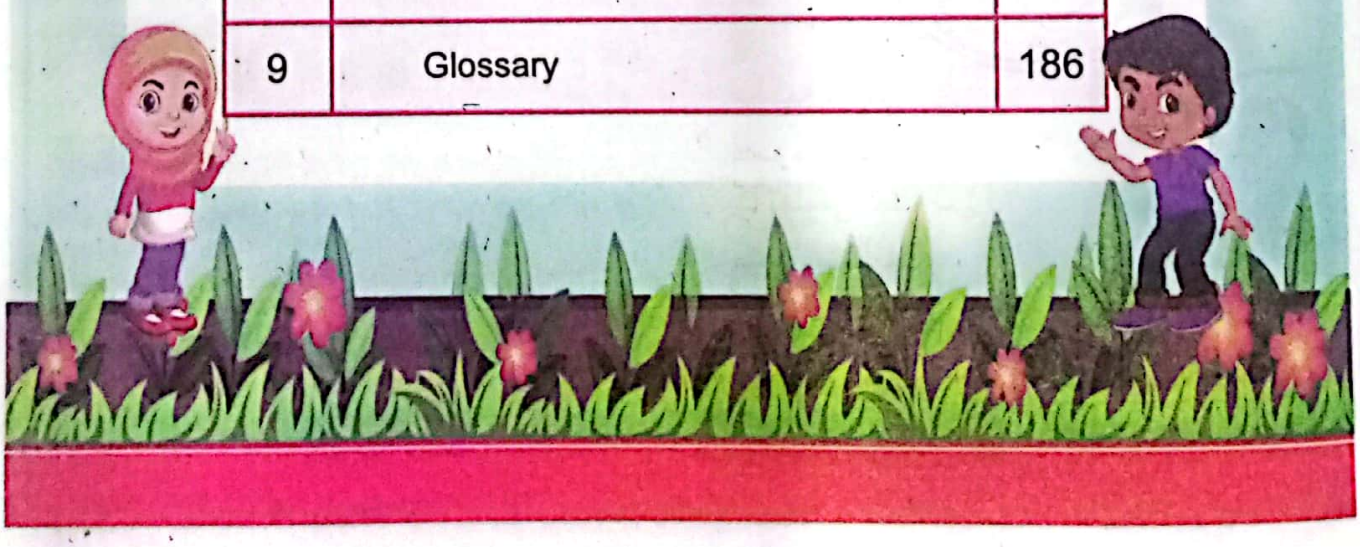
Content



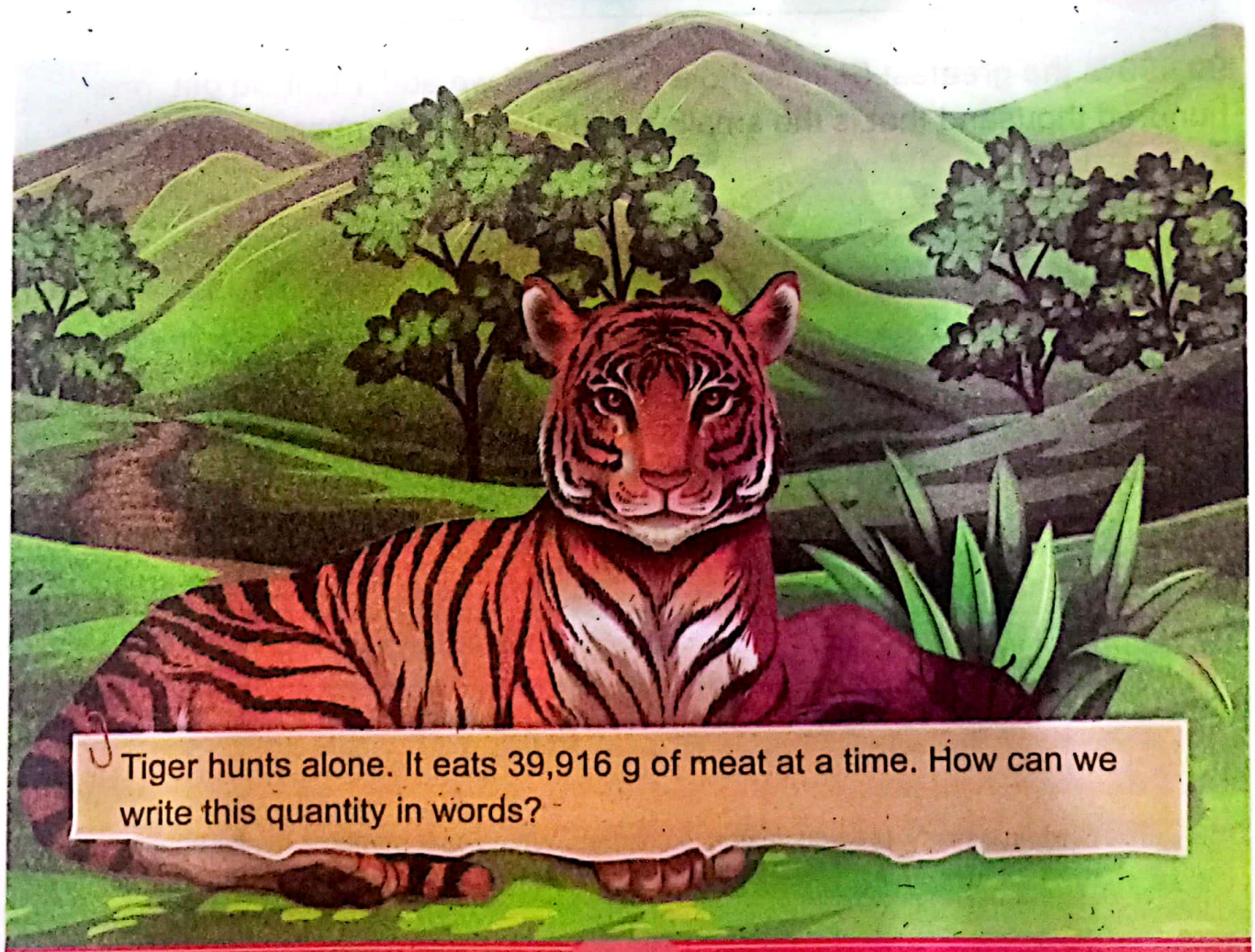
Unit 1

Whole Numbers

Learning Outcomes

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

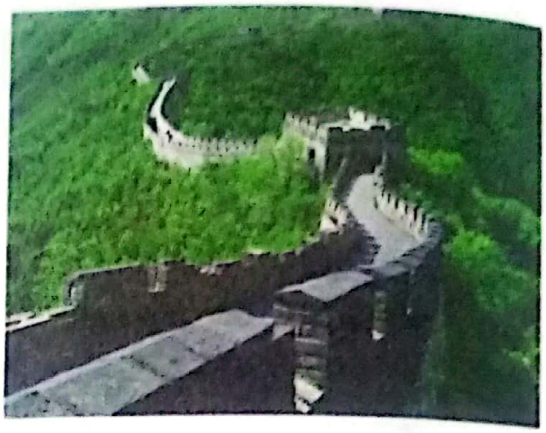
- Identify place values of digits up to one hundred thousand (100,000).
- Read numbers up to one hundred thousand (100,000).
- Write numbers up to one hundred thousand (100,000).
- Write numbers in words up to one hundred thousand (100,000).
- Compare and order numbers up to 5 - digit.



Tiger hunts alone. It eats 39,916 g of meat at a time. How can we write this quantity in words?

Numbers up to Hundred Thousands

The length of the great wall of China is 21196 km. How can we read and write 21196 in words?



To write any number put comma after every three digits from right:
21,196 we read and write it as "twenty-one thousand, one hundred and ninety-six".

99,999 is the greatest 5-digit whole number. If we add 1 to it we get one hundred thousand that is the smallest 6-digit whole number.

Try Yourself

How many ten thousands are there in one hundred thousand?

$$\begin{array}{r} 99,999 \\ +\quad\quad 1 \\ \hline 100,000 \end{array}$$

We write these numbers in the place value chart as:

Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
	9	9	9	9	9
1	0	0	0	0	0

TEACHING POINT

Give flashcards of place values to children. Write some numbers on the board and by pointing every digit of the number one by one, ask children to show correct place value card of that digit.

Let us write 619,273 in the place value chart.

Hundredth Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
6	1	9	2	7	3

We write 619,273 in words as "six hundred nineteen thousand, two hundred and seventy three". The expanded form of this numbers is:

$$19{,}273 = 10{,}000 + 9{,}000 + 200 + 70 + 3$$

Try Yourself

Put commas in the correct place in 402918. Tell the place value of each digit. Then write this number in word.

Now we write place value of every digit in 619,273

6 is in the hundredth thousand place and its value is = $6 \times 100{,}000 = 600{,}000$

1 is in the ten thousand place and its value is = $1 \times 10{,}000 = 10{,}000$

9 is in the thousand place and its value is = $9 \times 1{,}000 = 9{,}000$

2 is in the hundred place and its value is = $2 \times 100 = 200$

7 is in the tens place and its value is = $7 \times 10 = 70$

3 is in the ones place and its value is = $3 \times 1 = 3$

Ask children to write one 6-digit number in the notebook. Then instruct them to write this number in word and write the place and place value of every digits of that number.

Try Yourself

Murree is a tourist and recreational place. It is 7517 feet or 229100 cm approximately above sea level. Write 229100 in words and then write expanded form.

The cost of a photocopy machine is Rs. 200,49. Let's write the place and place value of digits of 200,490.

2 is in the hundredth thousand place and its value is	= 2 × 100,000 = 200,000
0 is in the ten thousand place and its value is	= 0 × 10,000 = 00,000
0 is in the thousand place and its value is	= 0 × 1,000 = 0,000
4 is in the hundred place and its value is	= 4 × 100 = 400
9 is in the tens place and its value is	= 9 × 10 = 90
0 is in the ones place and its value is	= 0 × 1 = 0

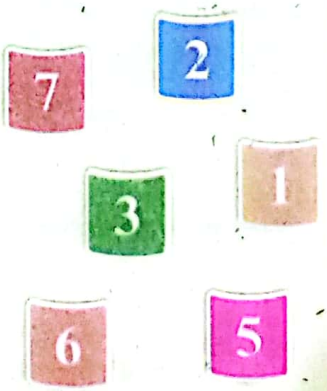
Try Yourself

Can you tell that what is the smallest and greatest 6-digit number?

Try It!

By using the given digits:

- Make a greatest 6-digit number and write it in word.
- Make the smallest 6-digit number and write the place value of each digit of it.
- Write 3-different numbers whose thousand digit is 3.
- Make a 6-digit whole number where sum of digits of hundred thousand place and tens place is 8 and difference is 2.
- Write a 6 digit whole number in which no digit is repeated again.



Exercise 1

1. Write the following numbers in expanded form.

a) 675,432	b) 437,911	c) 210,956	d) 546,743
e) 786,594	f) 509,223	g) 322,167	h) 657,890
i) 236,789	j) 678,324	k) 901,452	l) 756,432

2. Write the following numbers in standard form.

a) 600000+20000+1000+100+70+1=_____

b) 200000+30000+9000+200+30+5=_____

c) 500000+60000+5000+300+40+3=_____

d) 700000+50000+6000+700+90+0=_____

3. Write the place and place value of the coloured digits.

a) 576102	b) 824360	c) 794615d) 700496
e) 573456	f) 218654	g) 234566
h) 200042	i) 956324	

4. Write the following numbers in words.

a) 674325	b) 943711	c) 219560
d) 675434	e) 867459	f) 925302
g) 236721	h) 978065	i) 362897
j) 837264	k) 405129	l) 643275

5. Write the following in numerals.

a) nine hundred and eighty one thousand, six hundred

b) seven hundred thousand, four hundred and two

c) four hundred thousand, sixty one

d) one hundred and twelve thousand, three hundred and one

e) eight hundred and one thousand, five hundred and forty six

f) two hundred seventy two thousand,five hundred and fifity five

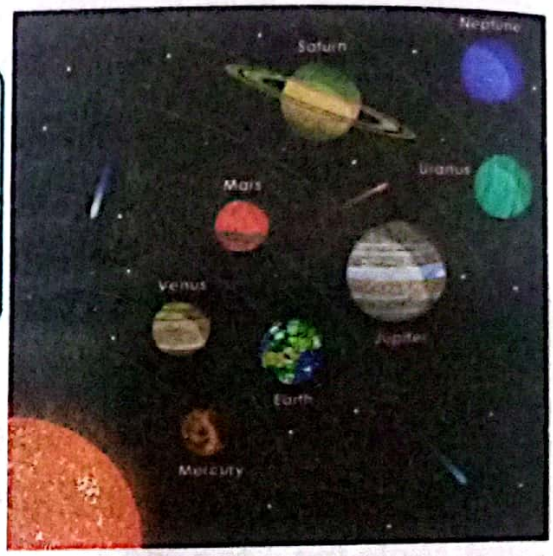
g) seven hundred and ninety-six thousand, five

h) four hundred forty four thousand, four hundred and forty four

i) one hundred and one thousand, three hundred and twenty

Comparing and Ordering Numbers

The diameter of Earth is 12,742 km. The diameter of the Venus is 12,104 km. How can we compare the diameters of both planets?



We can compare the numbers easily with the help of place value of numbers.

Ten Thousands	Thousands	Hundreds	Tens	Ones
1	2	7	4	2
1	2	1	0	4

Try Yourself

Compare 62,323 and 62,199.

1. First compare the digit of the greatest place value. The digit of both numbers at ten thousand place is 1.
2. The digit of both numbers at thousand place is 2.
3. At hundred place digit 7 is greater than the digit 1.

So, 12,742 is greater than 12,104 that is:

$$12{,}742 > 12{,}104$$

So, diameter of Earth is greater than the Venus.

Key Fact

To compare numbers, compare digits from left to right until you find two different digits.

Let's now compare the numbers 32,979 and 40,322.

Try Yourself

Compare the greatest and smallest 5-digit number.

Ten Thousands	Thousands	Hundreds	Tens	Ones
3	2	9	7	9
4	0	3	2	2

Here the digit 3 at ten thousand place is smaller than the digit 4.
so, 32,979 smaller than 40,322
that is: 32979 < 40,322

Try Yourself

Compare 8,799 ; 22,234 and 22,229.

The price of three mobile phone models are Rs. 62,870, Rs. 78,200 and Rs. 75,110 respectively. Compare their prices and write it in descending order.

Ten Thousands	Thousands	Hundreds	Tens	Ones
6	2	8	7	0
7	8	2	0	0
7	5	1	1	0

1. In 62,870 the digit at the ten thousand place is smaller than the remaining two numbers. Therefore, 62,870 is the smallest number.

2. In 78,200 and 75,110 the digits at ten thousand place are equal. At their thousand place digit 8 is greater than 5. Therefore 78.200 is greater than 75,110.
3. Let's now write these numbers in descending order.

78, 200 ; 75,100 ; 62,870

Key Fact

The arrangement of numbers from smallest to the greatest is called ascending order. The arrangement of numbers from greatest to the smallest is called descending order.

Try It!

Make two 4-digit and three 5-digit numbers. In every number the digit at the thousand place is 6 and digit at unit place is 9. Then compare these numbers and write in descending order.

Exercise 2

1. Compare the following numbers by using symbols (<,>, =).

a) 84,325 _____ 93,417

b) 4,853_____ 19,314

c) 56,708_____ 32,156

d) 23,612_____ 23,612

e) 65,356 _____ 65,358

f) 74,932 _____ 74,542

g) 68,709_____43,216

h) 32,567_____23,578

Call some students to the front of the class and give them different numbers flashcards. Now ask them compare numbers and write in ascending and descending order.

2. Write the following numbers in descending order.

a) 83,401; 97,035; 12,337

b) 18,017; 18,221; 13,411

c) 42,734; 53,358; 48,176

d) 36,121; 34,222; 37,923

e) 16,483; 23,601; 36,243

f) 12,683; 24,313; 24,391

g) 32,531; 36,537; 28,540

h) 98,754; 78,543; 89,654

3. Write the following numbers in ascending order.

a) 40,131; 40,735; 31,273

b) 30,817; 28,211; 43,181

c) 70,442; 58,375; 84,176

d) 67,319; 22,342; 97,323

e) 83,624; 36,241; 63,283

f) 48,326; 23,634; 43,124

g) 59,312; 60,337; 24,085

h) 89,675; 84,675; 89,546

I Have Learnt

- Identifying the place value of digits up to numbers one hundred thousand.
- Reading the numbers up to hundred thousand.
- Writing the numbers up to one hundred thousand.
- Reading and writing the numbers in words up to one hundred thousand.
- Comparing and ordering numbers up to 5-digit.

Vocabulary

Number
Digit
Place Value
Compare
Order
Ascending
Descending

Review Exercise

1.Choose the correct answer.

a) The smallest 6-digit number is _____.

i) 111111 ii) 100000 iii) 101010 iv) 111000

b) In number 738,101 the place value of digit 8 is _____.

i) 8 ii) 80 iii) 800 iv) 8000

c) The greatest 6-digit number is _____.

i) 910100 ii) 901101 iii) 999999 iv) 900000

d) 34,8011 is greater than _____.

i) 348010 ii) 348110 iii) 348210 iv) 348310

e) 431,108 is smaller than _____.

i) 431106 ii) 431107 iii) 430100 iv) 431109

2. Write the following numbers in words.

a) 43,567	b) 397,741	c) 95,2016
d) 546,743	e) 758,649	f) 395,202
g) 210,007	h) 986,950	i) 600,000
j) 600032	k) 452,901	l) 536,427

3. Write the following numbers in expanded form

a	453672	b	974311	c	125609
d	465743	e	678945	f	392502
g	316272	h	569078	i	327869
j	432786	k	541902	l	364753

4. Write the following in numerals.

a) Four hundred and fifty-one thousand and one

b) Three hundred and eight thousand, four hundred and four

c) Five hundred and fifteen thousand

d) Six hundred and twenty-one thousand, one hundred and five

e) One hundred and five thousand, five hundred

f) Two hundred and ninety-six thousand,one hundred and twenty-five

g) Nine hundred and sixty-seven thousand,three

5. Write the place and place value of the coloured digits.

a	765,021	b	824,360	c	946,715
d	960,704	e	357,564	f	826,514
g	452,663	h	234,540		

6. Write the following in standard form.

a) 300000 + 40000 + 4000 + 600 + 80 + 3=_____

b) 600000 + 90000 + 0000 + 000 + 50 + 4=_____

c) 400000 + 20000 + 9000 + 100 + 00 + 4=_____

d) 700000 + 10000 + 6000 + 700 + 80 + 5=_____

7. Compare the following numbers by using symbols (<,>, =).

a 5847_____31341

b 34875_____ 98317

c 50678_____ 45321

d 75326_____21635

e 76643_____ 76643

f 37256 _____54490

g 66809_____24351

h 32674_____26228

8. Write the following in descending order.

a) 12,683, 14,601, 18,624

b) 16,283, 26,133, 14,394

c) 23,913, 30,536, 22,480

d) 54,788, 54,786, 54,790

9. Write the following numbers in ascending order.

a) 94,041, 84,405, 33,731

b) 19,375, 12,921, 14,131

c) 45,034,37,358, 42,876

d) 36,172, 35,242, 37,723

Addition and Subtraction

Learning Outcomes

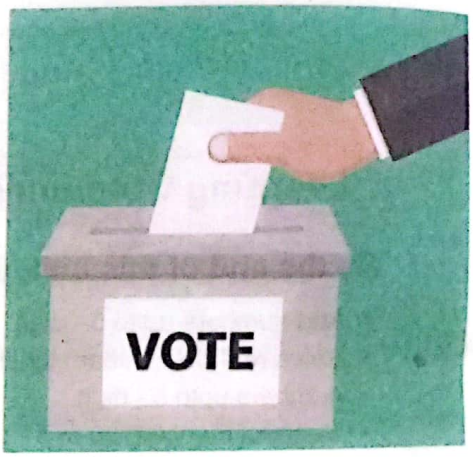
By the end of this unit, you will be able to:

- Add numbers up to 5 - digit.
- Solve real life number stories involving addition of numbers upto 5 - digit.
- Subtract numbers up to 5 - digit.
- Solve real life situations involving subtraction of numbers up to 5- digit.

An airplane covers 11270 km from Peshawar to Toronto. The same plane covers approximately 10921 km from Toronto to Lahore. Find the total distance covered during these two flights.

Addition

In town A, total votes cast were 54,372. In town B total votes cast were 25,617. Can we find, how many votes were cast in both towns altogether?



To find total number of votes cast we add them.

	Ten Thousands	Thousands	Hundreds	Tens	Ones
Votes cast in first town =	5	4	3	7	2
Votes cast in another town =	+ 2	5	6	1	7
Total votes =	7	9	9	8	9

Total votes cast in both towns = 79,989

A publishing house published 25,575 story's book. Considering the popularity of the book, the second edition was also published. In the second edition, 42,195 books were published. Find the total number of books published in both editions.

Try Yourself

Add 51292 and 32602.

TEACHING POINT

Instruct the students to make two 5-digit numbers and ask to them to add these numbers and tell the method of addition.

Here we add the number of books published to get the total quantity.

		Ten Thousands	Thousands	Hundreds	Tens	Ones
The number of books published in first edition	=	2	$^{1}5$	5	$^{1}7$	5
The number of books published in second edition	=	+ 4	2	9	1	5
Total quantity	=	6	8	4	9	0

Try Yourself

Find the sum of the greatest 5-digit and smallest 4-digit whole number.

Total number of books published = 68,490

Try It!

Copy and complete the following addition table.

+	Ten Thousands	Thousands	Hundreds	Tens	Ones
	5			3	
		2	9		4
	7	9	4	1	8

With the help of different examples explain the concept of addition also explain the rule of carrying during process of addition .

یہ کتاب محکمہ تعلیم حکومت بلوچستان کی جانب سے تعلیمی سال 2025 کیلئے مفت تقسیم کی جارہی ہے اور ناقابل فروخت ہے

Exercise 1

1. Solve the following.

a.

	T.th	Th	H	T	O
	1	3	9	2	7
+		2	4	1	5

b.

	T.th	Th	H	T	O
	3	5	3	2	1
+		4	6	4	9

c.

	T.th	Th	H	T	O
	7	5	6	7	9
+	1	6	8	2	8

d.

	T.th	Th	H	T	O
	2	4	5	6	8
+	3	5	3	1	2

2. Solve the following.

a) 58134 + 45367 b) 78954 + 12236 c) 89764 + 97856
d) 53241 + 67543 e) 98756 + 56744 f) 65432 + 87643
g) 42115 + 61537 h) 58764 + 65744 i) 54312 + 68534

3. Nida bought a laptop for Rs 59,453 and spent Rs 12,652 on repairing. How much total amount did she spend?

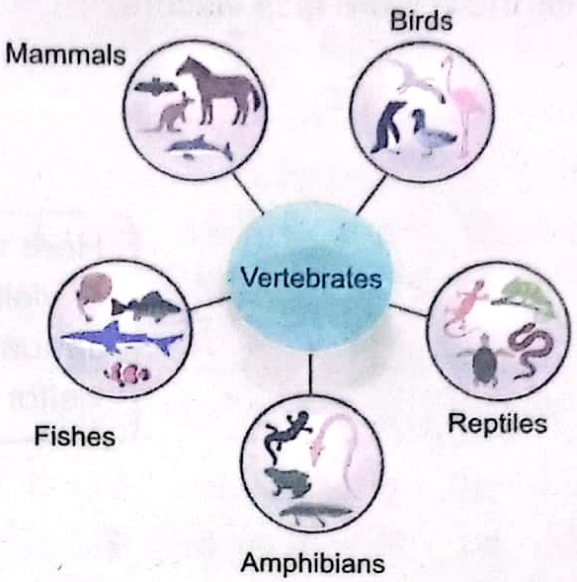
4. In January, 83,215 people travelled from an airport and 21,084 people travelled in February. How many passengers travelled in two months?

5. In a library there are 42,725 books. Administration decided to add 22,500 new books.
a) Find the total number of books in the library?
b) if 23,890 more book are added then find the total number of books?

6. A bus covered distance of 23,672 km in one month, in the next month the same bus covered distance of 31,716 km.
a) Find total distance covered in two months?
b) In which month did it cover more distance?

Subtraction

The animal that have backbone in their body are called vertebrates. If there are 66,178 types of vertebrates out of which 32,900 types are fishes. How many vertebrates are there other than fish?



To find this quantity we have to subtract 32,900 from 66,178.

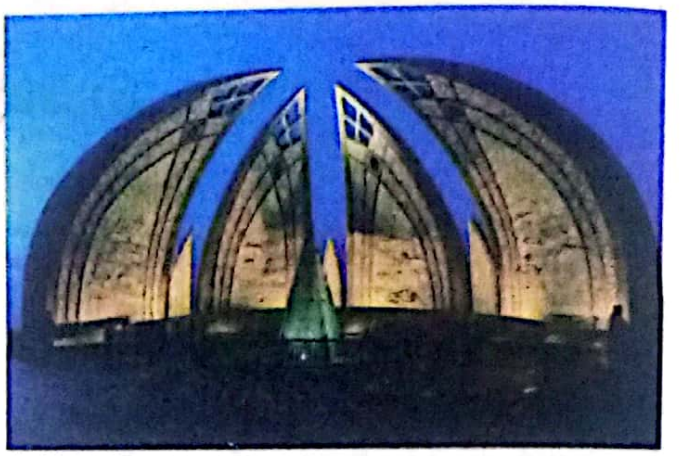
	Ten Thousands	Thousands	Hundreds	Tens	Ones
Total types of vertebrates =	6	⑤ ~~6~~	⑩ 1	7	8
Types of fish =	– 3	2	9	0	0
Remaining types =	3	3	2	7	8

Types of vertebrates other than fish = 33,278

Try Yourself

Make any two 5-digit numbers and subtract smallest number from the greatest number.

55,661 people visited the Pakistan Monument in December. In January 42,255 people visited. In which month there were less visitors?



Here we subtract the number of visitors decreased in January from number of visitor visit in December.

		Ten Thousands	Thousands	Hundreds	Tens	Ones
Number of visitors in December	=	5	5	6	~~6~~ 5	1 10
Number of visitors in January	=	− 4	2	2	5	5
Difference	=	1	3	4	0	6

The number of people comes to visit Pakistan monument in January = 42,255

Try Yourself

Subtract the greatest 4-digit number from the smallest 5-digit number.

Try It!

Find two numbers from the given numbers whose sum is 78,448 and difference is 15,400.

46,924 | 72,876 | 31,524 | 66,234 | 89,076

Make small groups of students and ask them to write two 5-digit numbers and then subtract smaller number from greater number.

Exercise 1

1. Solve the following.

a.

	T.th	Th	H	T	O
	4	3	5	6	2
–		7	3	6	6

b.

	T.th	Th	H	T	O
	5	6	8	4	8
–	3	4	3	8	9

c.

	T.th	Th	H	T	O
	9	3	9	2	1
–	2	4	6	1	8

d.

	T.th	Th	H	T	O
	6	5	6	7	5
–	1	6	4	4	7

e.

	T.th	Th	H	T	O
	5	3	5	2	1
–	3	4	6	4	9

f.

	T.th	Th	H	T	O
	3	3	2	7	5
–	2	6	2	3	8

h.

	T.th	Th	H	T	O
	9	6	2	3	7
–	7	3	4	5	5

i.

	T.th	Th	H	T	O
	6	7	4	5	3
–	3	2	5	1	4

2. Solve the following.

a) 45158 – 34756 b) 97843 – 61732 c) 99754 – 67584

d) 25341 – 16753 e) 85964 – 74544 f) 63541 – 58463

3. Saad has Rs. 52,490. He bought a bicycle of Rs. 15,873.

a) How much money left with him?

b) If the price of the bicycle is Rs. 18,759 then how much money will be left?

4. In granary there are 66,375 bags of wheat and rice. If numbers of wheat bags are 44,468 then find out the number of rice bags?

5 . Class three students collected Rs. 35,278 for a welfare institution while class four students collected Rs. 32,184. How much more amount collected by class three than class four?

6. A candidate got 62,436 votes from one constituency while the other candidate got 86,733. How much more vote did the second candidate get?

I Have Learnt

- Adding numbers up to 5-digits.
- Solving real-life situation related to addition.
- Subtracting numbers up to 5-digit.
- Solving real-life situation related to subtraction.

Vocabulary

Numbers
Digit
Addition
Subtraction

Review Exercise

1. Encircle the correct answer.

a) The sum of 36531 and 41372 is equal to:

i) 77904 ii) 77903 iii) 77901 iv) 77902

b) The sum of 17278 and 62354 is equal to:

i) 78234 ii) 342211 iii) 79632 iv) 213455

c) Ayesha has Rs. 23456. Her friend gave her Rs. 13131 more. Now she has Rs._____.

i) 36587 ii) 35467 iii) 36434 iv) 34567

d) When subtract 73810 from 89654 then we will get_____.

i) 12345 ii) 13245 iii) 14765 iv) 15844

e) In a pond there were 87654 fish. If 34567 fish are shifted to another pond then _____ fish will be left in the first pond.

i) 53123 ii) 53456 iii) 53087 iv) 53567

2. Solve the following.

a)

	T.th	Th	H	T	O
	5	4	8	3	9
+	6	7	4	3	6

b)

	T.th	Th	H	T	O
	6	3	5	6	3
+	4	2	8	2	7

c)

	T.th	Th	H	T	O
	7	8	9	3	8
+	1	2	4	7	5

d)

	T.th	Th	H	T	O
	6	7	3	4	3
−	4	1	2	3	5

e)

	T.th	Th	H	T	O
	8	3	8	9	3
−	2	3	1	0	1

f)

	T.th	Th	H	T	O
	3	3	2	7	5
−	2	6	2	3	8

3. Solve the following.

a) 45234 + 12345 b) 24567 + 13466 c) 90766 + 38967

4. In the first week 23456 people went to visit the beach and in the second week 34567 people went to visit the beach. Find:
a) The total number of people visited the beach in two weeks?
b) In which week less people visited the beach and by how much?

5. There were 12345 cattle in a farm. 34567 more cattle added. Find:
a) How many cattle were there in the farm altogether?
b) If 26754 were goats out of total then what is the number of cattle other than goats?

6. There are 45765 trees in a forest. If 32124 are cactus trees, find the number of trees other than cactus?

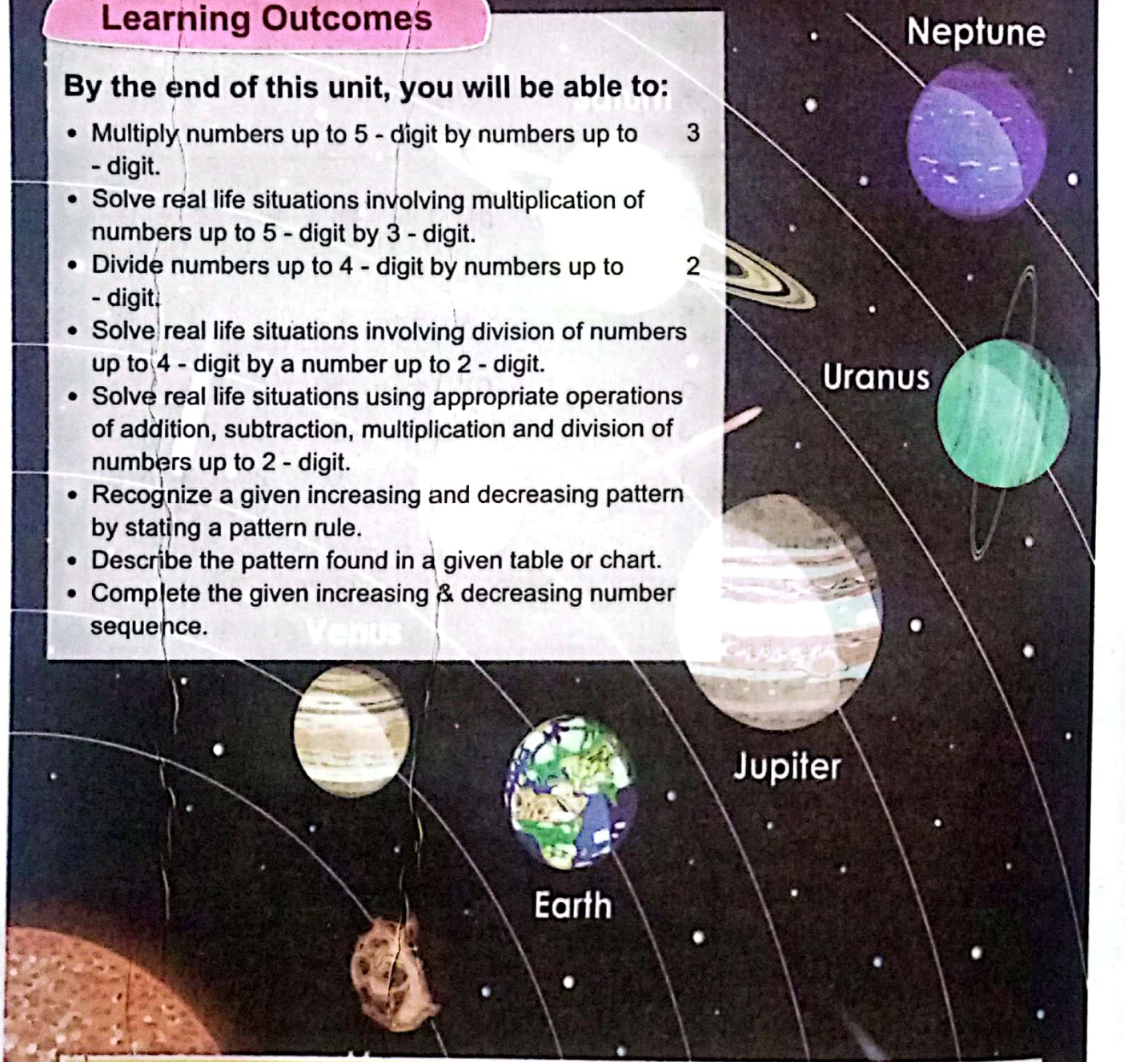
7. Arsalan has Rs. 51,346. He wants to buy a laptop which cost is Rs. 75,432. How much more amount does he need to buy the laptop?

Multiplication and Division

Learning Outcomes

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

- Multiply numbers up to 5 - digit by numbers up to 3 - digit.
- Solve real life situations involving multiplication of numbers up to 5 - digit by 3 - digit.
- Divide numbers up to 4 - digit by numbers up to 2 - digit.
- Solve real life situations involving division of numbers up to 4 - digit by a number up to 2 - digit.
- Solve real life situations using appropriate operations of addition, subtraction, multiplication and division of numbers up to 2 - digit.
- Recognize a given increasing and decreasing pattern by stating a pattern rule.
- Describe the pattern found in a given table or chart.
- Complete the given increasing & decreasing number sequence.



The Earth completes its revolution around the sun in 365 days approximately. In how many days will it complete 3 revolutions?

Multiplication

If a person walks 6213 steps in a day, find out how many steps he will walk in 3 days.

By multiplying 6213 with 3 we will find out the total number of steps. Multiply every digit of 6213 with 3.

Multiply 3 ones with 3.

Th	H	T	O
6	2	1	3
×			3
			9

Multiply 1 ten with 3.

Th	H	T	O
6	2	1	3
×			3
		3	9

Multiply 2 hundreds with 3.

Th	H	T	O
6	2	1	3
×			3
	6	3	9

Multiply 6 thousands with 3.

Th	H	T	O
6	2	1	3
×			3
1	8	6	3	9

He will walk 18,639 steps in 3 days.

Ask the students to write few 5-digit numbers and few 3-digit numbers. Multiply a 5-digit number with a 3-digit number.

Find the product of 10231 and 65.

	1	0	2	3	1	Multiplicand
×				6	5	Multiplier
		5	1	1	5	5	10231 × 5
+	6	1	3	8	6	0	10231 × 60
=	6	6	5	0	1	5	Product

$10231 \times 65 = 665{,}015$

The cost of one phone tablet is Rs. 78,450. If a company sold 525 tablets then find out the total cost is obtained by selling these tablets?

By multiplying the price of one phone tablet with total number of tablets,will get the total amount.

Cost of one phone tablet = 78450

Total tablets = 525

The cost of 525 tablets = 78450 x 525

	T.th	Th	H	T	O	
	7	8	4	5	0	
×				5	2	5
		3	9	2	2	5	0	78450 × 5
	1	5	6	9	0	0	0	78450 × 20
+	3	9	2	2	5	0	0	0	78450 × 500
	4	1	1	8	6	2	5	0	

The company sold 525 tablets for Rs 41,186,250

Try Yourself

Multiply the greatest 4-digit number with the greatest 3-digit number. multiply the smallest 3-digit number with smallest 5-digit number.

Now we will multiply 32 and 5 in a different way.

Write 32 in expanded form.

$32 = 30 + 2$

- Now write 30 + 2 horizontally and 5 vertically in grid as shown in the table.
- Multiply each number in the horizontal cells by the number 5 in the vertical cells.

$150 + 10 = 160$

- Finally, add all the obtained numbers as 160 the product of 32 and 5.

	30	2
5		

×	30	2
5	150	10

Exercise 1

1. Solve the following.

a) 631×4 b) 431×35 c) 8434×31

d) 8046×678 e) 7601×546 f) 41175×80

g) 79762×15 h) 63506×303 i) 11098×237

2. A shopkeeper sold 34523 m cloth in a week. How much cloth will he sell in 21 weeks?
3. Liaquat earns Rs. 11045 in a day. Find:
   a) how much money will he earned in 365 days?
   b) how much money will he earned in 2 years?
4. In a Factory, 20,134 notebooks were printed in a day. How many notebooks will be printed in 210 days?
5. Each member of a group give Rs. 34,156 for a tour of Naran and Kagan. If there are 345 member of the group. How much money will be collected altogether?

Division

84 students visited the river side, there they ride a boat with the capacity of 6 students. How many rounds with the boat take so that all the students will have boat ride. They were given a boat.6 students could visit the river in one round. In how many round will all the students visit the river?

Dividing the total number of students by 6 we can find out the number of rounds taken by the boat so that all the students will have a boat ride.

Number of students visited the river side = 84

Number of students visited in one round = 6

Total number of rounds = 84 ÷ 6

84 divide the highest place value digit 8 by 6.

Recall the table of 6. $1 \times 6 = 6$

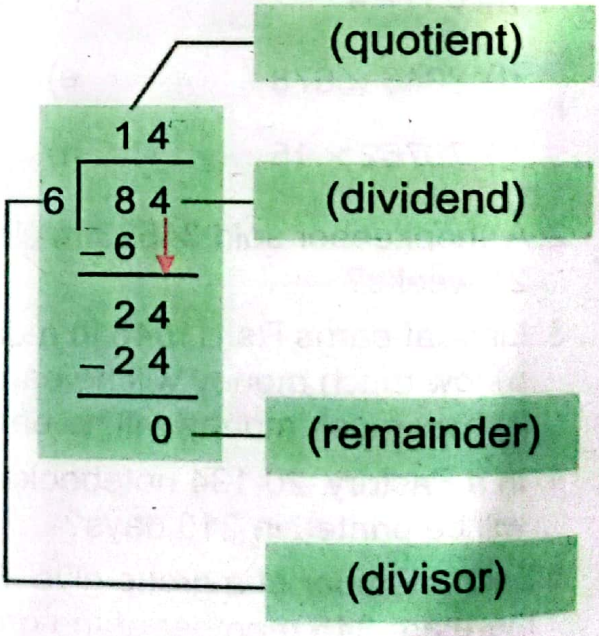
write 1 as the quotient and write 6 below 8.

Subtract 6 from 8. $8 - 6 = 2$

Drop down 4 next to 2. Now we have number 24.

$6 \times 4 = 24$

Write 4 in the quotient and write 24 below 24 and subtract. so now remainder will be 0.



84 ÷ 6 = 14

The rounds in which all students visit the river = 14

Divide 9528 by 48 and find quotient and remainder.

```
      198   ← Quotient
48 | 9528
   - 48
   ----
     472
   - 432
   -----
      408
   -  384
   ------
        24   ← Remainder
```

I have 1455 lego blocks. Can I pack them equally in 12 packets?

For this, 1455 has to be divided by 12.

Total number of lego blocks = 1455

Total number of packets = 12

Lego blocks in each packet = 1455 ÷ 12

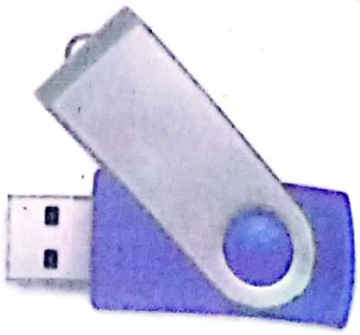
```
      121   ← Quotient
12 | 1455
   - 12
   ----
     25
   - 24
   ----
      15
   -  12
   -----
       3   ← Remainder
```

Number of blocks in each packet = 121

Remaining blocks = 3

Ask the students to write some 4-digit numbers and some 2-digit numbers. Divide a 4-digit number by a 2-digit number.

A company sold two types of USB that are TYPE I and TYPE II overall 9,655 USB's were sold. 3571 were TYPE I of USB. Find:



a) How many TYPE II USB are sold?

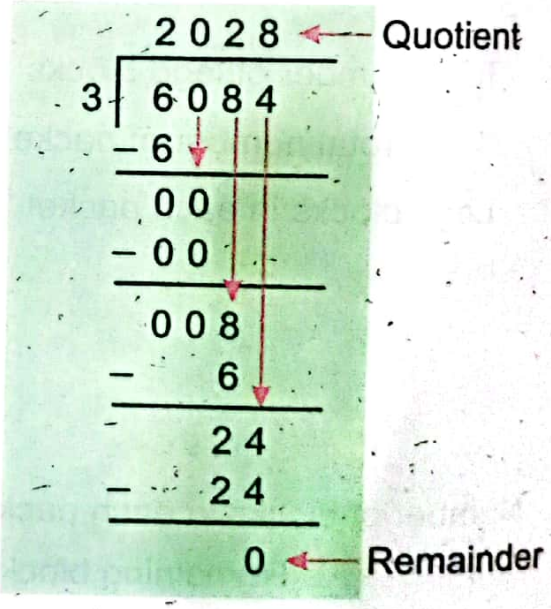
b) If TYPE II of USB are sold to three shopkeepers then how many USB each of them get?

To find the number of TYPE II USB's. Subtract the TYPE I from the total number of USB's.

$$9655 - 3571 = 6084$$

6084 TYPE II USB's were sold.

To find the number of USB's each shopkeeper get we divide 6084 by 3.



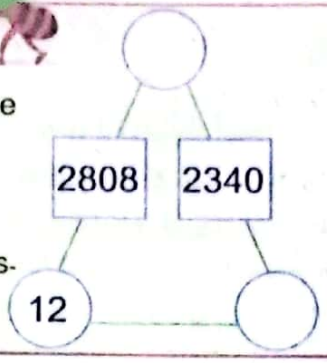
Each shopkeeper get 2028 TYPE II USB's

Try Yourself

A shopkeeper have three coloured blocks. the blocks in blue colour are 245. The red block are three times more than blue blocks. The green blocks are 415 less than the red blocks. Find the total number of bocks?

Try It! Challenge

The numbers given in the boxes are the product of the numbers given in the two circles next to these squares. Find and write the correct numbers in the blank circles.



Exercise 2

1. Solve the following.

a) $3\overline{)585}$ b) $4\overline{)1816}$ c) $42\overline{)6972}$ d) $22\overline{)7546}$

e) $23\overline{)9568}$ f) $31\overline{)9641}$ g) $12\overline{)2868}$ h) $32\overline{)7392}$

i) 133 ÷ 11 j) 1056 ÷ 8 k) 1848 ÷ 88

l) 4662 ÷ 42 m) 6125 ÷ 10 n) 2060 ÷ 23

2. In 45 relief camps, 2244 blankets were distributed. How many blankets did one camp get?
3. If 1107 chairs are placed in 27 rows, how many chairs will be there in a row?
4. If 3032 biscuit are in 11 boxes then find out how many biscuits in a box?
5. If 6666 books are to be kept in 33 cupboards in a library, how many books will be in each cupboard?
6. Saad bought 10 washing machines for Rs 78950 and an oven for Rs 21550. Find:

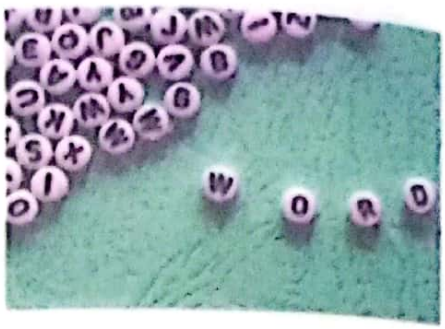
a) How much money did he spend altogether?
b) How much more amount did he spend on washing machines than an oven?
c) How mucn amount did he spend on a washing machine?

7. In 30 packets,1350 kg rice are packed. Find:

a) how many kilogram of rice are in one packet?
b) how many kilogram rice will be packed in 38 packets?

Patterns

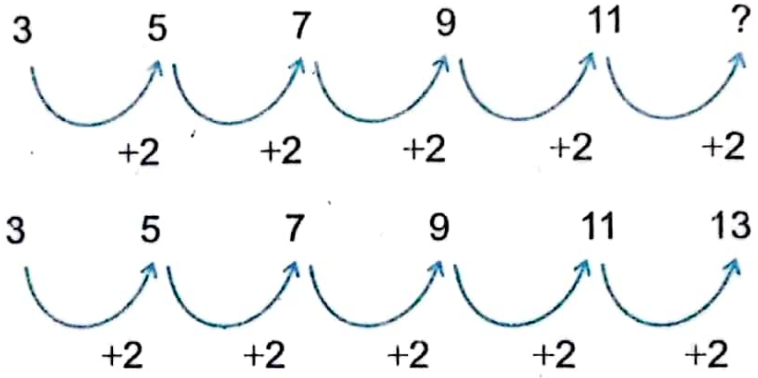
Ibrahim learns few new words with meanings every week. In first week, he learnt 3 words. In second week, he learnt 5 words, in third week 7 words, in fourth week 9 words and in fifth week he learnt 11 words. If he keeps learning new words like this then find the number of words he would learn in sixth week?



Write in order all the number of words that he learnt:

3, 5, 7, 9, 11, ____

Now identify the rule in this order.



He would learn 13 words in sixth week

Ibrahim is learning with a special order. Here the rule is "adding 2" means to get the next term, we add 2 in the previous term. This sequence is known as arithmetic sequence.

Try Yourself

Find the next two element of this sequence.

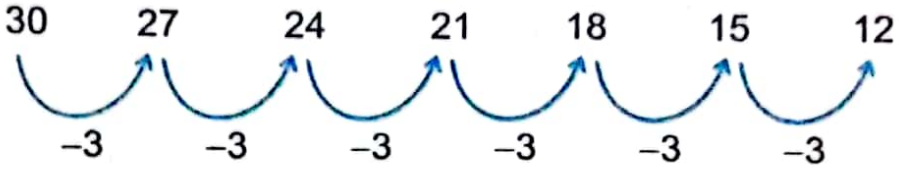
5, 10, 15, 20, ____, ____

Key Fact

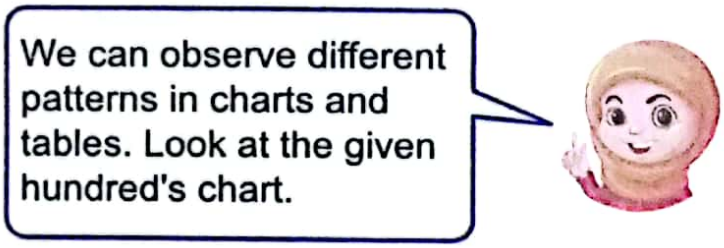
The rule of number pattern tells us how one member or number in this pattern is derived from another member or number.

30, 27, 24, 21, 18, _____, _____

If we look at terms of this pattern we observe that we get the next element by subtracting 3 from the previous term.



So, the rule of pattern is subtracting 3
The next two terms of this pattern will be 15 and 12



1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

The pattern of red boxes shows that, each next number is obtained by adding 10 to the previous number.

If we move from 95 to the top, along the yellow boxes, we can observe that every next digit in the pattern is being formed by subtracting 11 from the previous number.

Try Yourself

Observe the hundred's chart and find at least 2 patterns of different mathematical operations. Also find the rules of that patterns.

Divide the students into two groups, ask them to make at least 5 patterns. Give the pattern developed by one group to the other group and ask them to identify the rule of these patterns.

The table below shows the number of pages of a story Sehrish reads daily. If she continued to read the pages of the story with the same pattern. How many pages would she read on Friday?

If we observe the terms of the number pattern in this table, we will find that two pages are being added every day. Its means, this is the pattern of addition.
Rule of pattern: Adding 2
2, 4, 6,8,10,12,14
Sehrish will read 14 pages on Friday.

Pages Read	Days
2	Saturday
4	Sunday
6	Monday
8	Tuesday
10	Wednesday
12	Thursday
?	Friday

Try It!

Complete the patterns.

a) 2,3,5,8,12, _____, _____.
b) 40,35,29,22, _____, _____.

Exercise 3

1. Observe the given patterns, describe the rule and write the next two terms.

a) 11, 15, 19, 23, 27, _____, _____.

b) 30, 60, 90, 120, 150, _____, _____.

c) 6, 12, 18, 24, 30, _____,_____.

d) 850, 800, 750, 700, 650, _____, _____.

e) 106, 103, 100,97, 94_____, _____.

f) 284, 288, 292, 296,_____, _____.

g) 560, 540,520, 500, _____, _____.

2. Observe the given chart and find at least 5 patterns. Also set the rules for these patterns.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

3. Observe the table given below and describe the rule of pattern.

a)

Rule:____	
Weeks	Height of the plant
1	4 cm
2	8 cm
3	12 cm
4	16 cm
5	20 cm

b)

Rule:____	
Boxes of blocks	Total number of blocks
1	20
2	40
3	60
4	80
5	100

I Have Learnt

- Multiplying 5-digit number with 3-digit numbers.
- Solving real-life situation related to multiplication of 5-digit number with 3-digit numbers.
- Dividing 4-digit numbers by 2-digit numbers.
- Solving real-life situations of division of 4-digit number by 2-digit number.
- Solving real-life situations using appropriate operations of addition, subtraction, multiplication and division of numbers.
- Recognizing increasing and decreasing pattern by stating a pattern rule.
- Describing the pattern found in a given table or chart.
- Completing the increasing or decreasing number sequence.

Vocabulary

Numbers
Digit
Multiply
Division
Pattern
Table

Review Exercise

1. Encircle the correct answer.

a) There are 4500 plants in 90 rows. Each row contains equal number of plants. Find the number of plants in a row.

i) 100 ii) 10 iii) 5 iv) 50

b) If the price of one book is Rs 250 then the price of 22 books will be _____.

i) Rs 5555 ii) Rs 5550 iii) Rs 5500 iv) Rs 5000

c) By dividing 3960 by 88, we will get _____.

i) 41 ii) 47 iii) 46 iv) 45

d) 6,18,30,42_____.

i) 48 ii) 54 iii) 56 iv) 46

e) The next term in 88, 78, 68, is _____ .

i) 98 ii) 58 iii) 48 iv) 47

2. Solve the following.

a) 245 × 2 b) 743 × 12 c) 4324 × 41

d) 1245 × 13 e) 67453 × 345 f) 78965 × 453

3. Solve the following.

a) 380 ÷ 5 b) 196 ÷ 12 c) 2925 ÷ 6

d) 3294 ÷ 61 e) 1766 ÷ 22 f) 2205 ÷ 49

4. A bus has the capacity of 75 passengers. How many buses would be needed for 1575 passenger?

5. A car covers 1288 km in 23 hours. Find:
a) How much distance would it cover in one hour?
b) How much distance would it cover in 11 hours?

6. A man pays Rs 23,452 as one month installment of the car. Find:
a) How much will he pay in 2 years?
b) How much will he pay in 3 years?

7. Zaeem has 1867 lego blocks. His sister gives him 4 more boxes of lego blocks. There are 1205 lego blocks in one box. How many lego blocks Zaeem has in total?

8. Observe the given patterns, identify the rule and write the next two terms.

a) 3, 9, 15, 21, _____, _____.

b) 100, 90, 80, 70, 60 _____, _____.

c) 12, 18, 24, 30, 36, _____,_____.

d) 2, 10, 18, 26, 34_____, _____, _____.

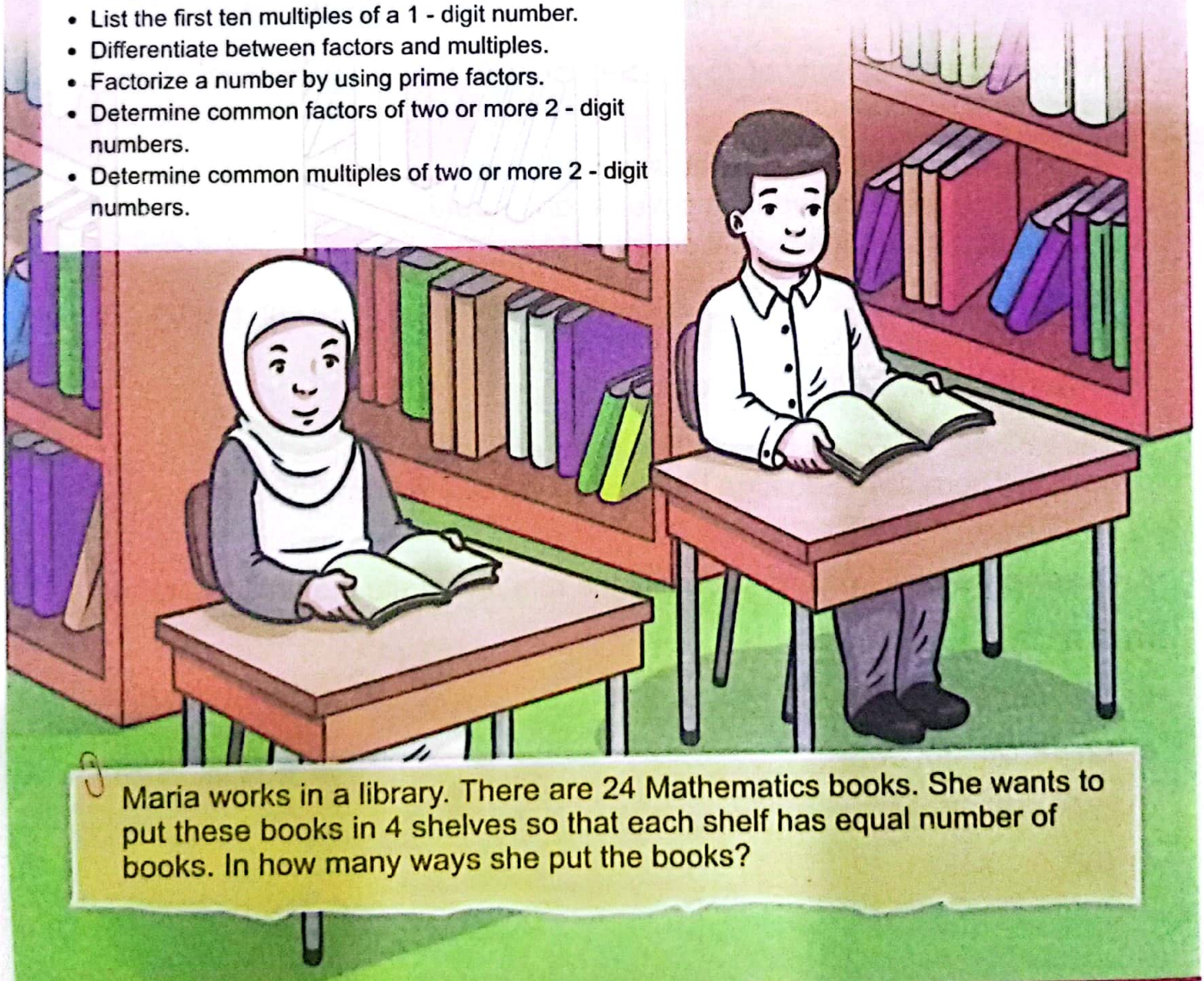
e) 106, 95, 84, 73, 62,_____, _____.

Unit 2 Factors and Multiples

Learning Outcomes

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

- Identify divisibility rules for 2, 3, 5, and 10.
- Use divisibility tests for 2, 3, 5 and 10 on numbers up to 5 digits.
- Identify and differentiate 2 - digit prime and composite numbers.
- Find factors of a number up to 50.
- List the first ten multiples of a 1 - digit number.
- Differentiate between factors and multiples.
- Factorize a number by using prime factors.
- Determine common factors of two or more 2 - digit numbers.
- Determine common multiples of two or more 2 - digit numbers.

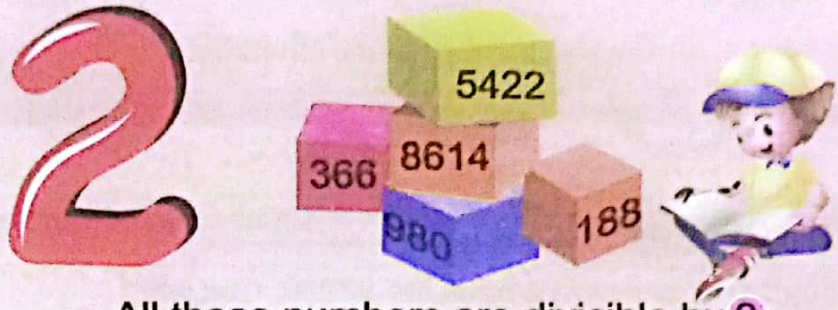


Maria works in a library. There are 24 Mathematics books. She wants to put these books in 4 shelves so that each shelf has equal number of books. In how many ways she put the books?

Divisibility Rule

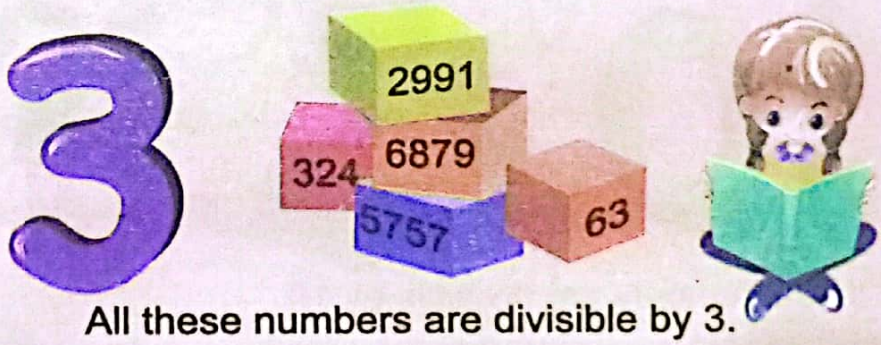
The divisibility rule tells that a number is divisible by another number or not. Here are some rules that would help us.

If the digit at the ones place is 0,2,4,6 or 8 then the number is divisible by 2.



All these numbers are divisible by 2.

If the sum of all digits of a number is divisible by 3 then the number is divisible by 3.



All these numbers are divisible by 3.

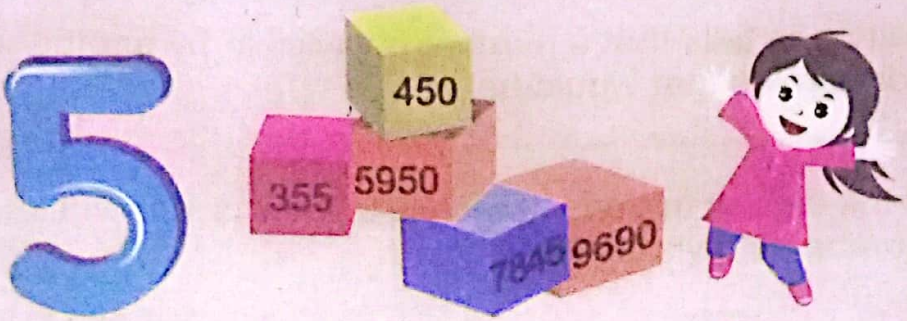
63 is divisible by 3.
$6 + 3 = 9$
9 is divisible by 3.

28 is not divisible by 3.
$2 + 8 = 10$
10 is not divisible by 3.

Try Yourself

Amar has Rs 5040. Is this amount divisible by 3?

If the digit at the ones place is 0 or 5 then the number is divisible by 5.

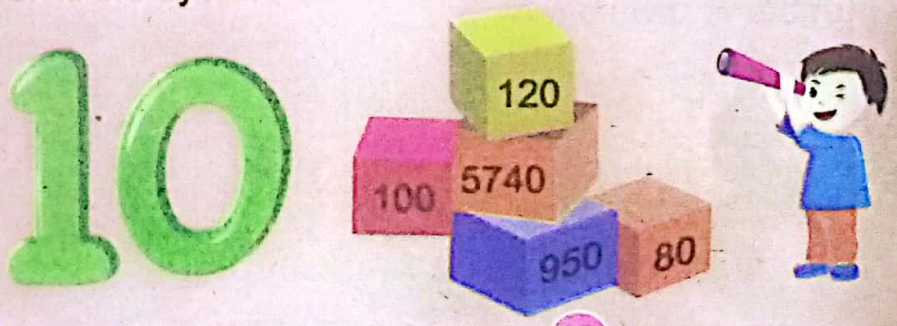


All these numbers are divisible by 5.

Try Yourself

The total number of pages in a book are 98230. Can we divide these pages into groups of 5?

If the digit at the ones place is 0 then the number is divisible by 10.



All these numbers are divisible by 10.

Key Fact

If a number is divisible by 2 and 5 then the number is also divisible by 10.

Try It!

Challenge

Write 5 numbers that are divisible by 2, 3, 5 and 10.

Give flashcards of numbers to students. By using divisibility rules, list numbers that are divisible by 2,3,4,5 or 10.

Exercise 1

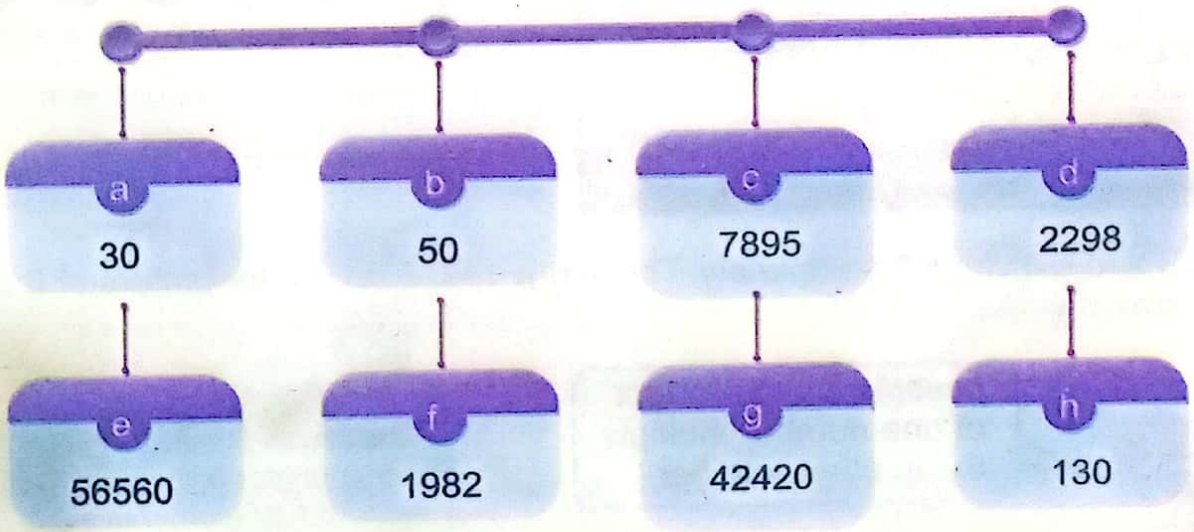
1. Mark the given numbers divisible by 2?

a) 16	b) 43	c) 98	d) 134	e) 6781
f) 2114	g) 9226	h) 67	i) 540	j) 82420

2. Mark the given numbers divisible by 3?

a) 20	b) 27	c) 165	d) 125
e) 6720	f) 8955	g) 52110	h) 21945

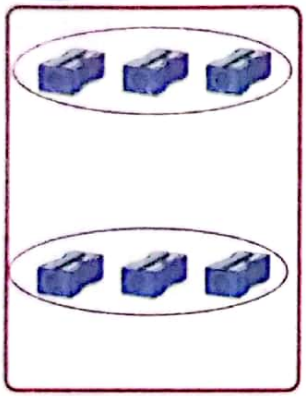
3. Encircle the numbers that are divisible by 10?



Factors and Multiples

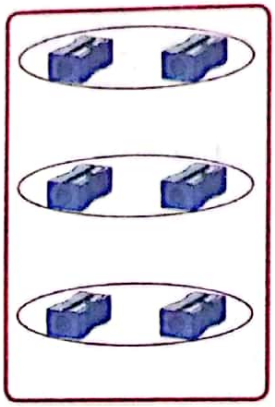
Fawad wants to put 6 sharpeners in rows so that each row has an equal number of sharpeners.In how many ways can he do this?

Fawad will keep them in the equal rows in the following ways.



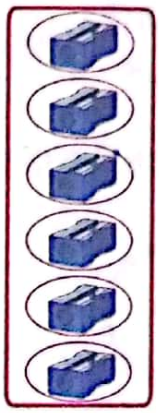
2 rows of 3 sharpeners

$2 \times 3 = 6$



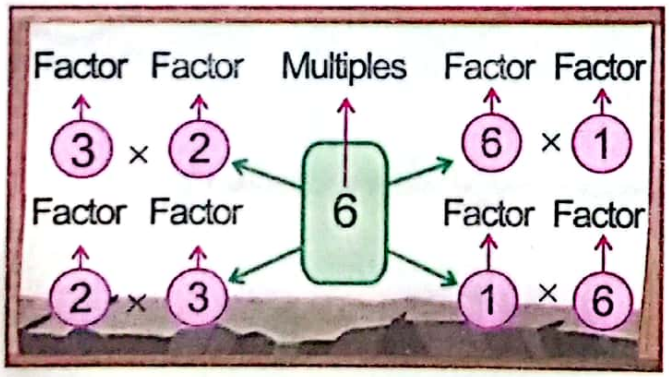
3 rows of 2 sharpeners

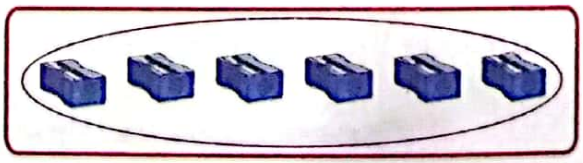
$3 \times 2 = 6$



6 rows of 1 sharpener

$6 \times 1 = 6$





1 row of 6 sharpeners

$1 \times 6 = 6$

1,2, 3 and 6 divides 6 completely. Therefore 1, 2, 3 and 6 are factors of 6 and 6 is their multiple.

Multiple is the product of one number multiply by an other number.

Key Fact

Every number is factor of itself and 1 is the factor of every number.

$$7 = 1 \times 7$$

$$7 = 7 \times 1$$

The factors of 7 are 1 and 7.

So, 7 is a prime number.

The numbers greater than 1 who have two factors, 1 and the number itself. Such numbers are called prime number.

Let's find out the factors of 21.

$$21 = 1 \times 21$$

$$21 = 3 \times 7$$

$$21 = 7 \times 3$$

$$21 = 21 \times 1$$

So, 1, 3, 7 and 21 are factors of 21.

Try Yourself

What is the greatest composite number between 1 and 100 and what is smallest composite number?

Therefore 21 is a composite number.

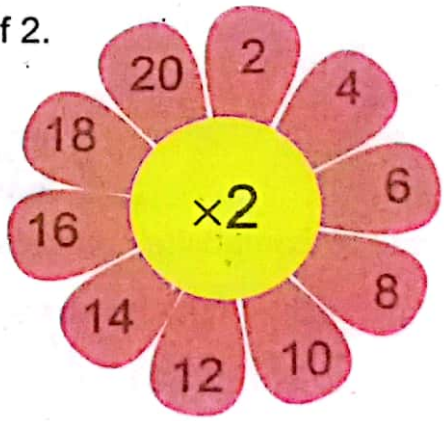
The numbers whose factors are more than two, called composite number.

Find out the first 10 multiples of 2.

To find the first 10 multiples of 2 recall the table of 2.

So the first ten multiples of two are as follows-

2, 4, 6, 8, 10, 12, 14, 16, 18, 20



Try Yourself

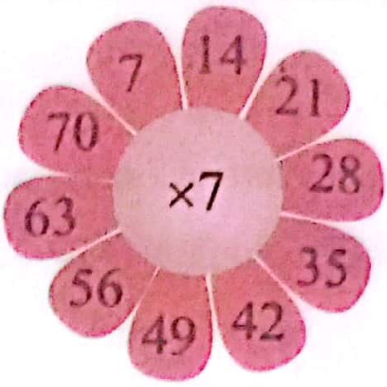
How many numbers that 10 have their multiple?

To remind the students tell the difference between factor and multiple. Ask them to write some numbers in their notebook and find their factors and multiples. Give some flashcards oof numbers to students and ask them to seperate out prime and composite numbers.

Find out the first 10 multiples of 7.

To find the first 10 multiples of 7 recall the table of 7.

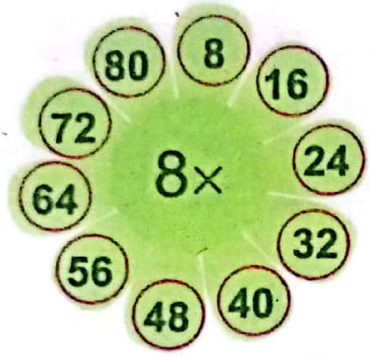
So the first ten multiples of 7 are as follows-



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

Let's consider the factors and multiples of 8.

Multiples of 8



Factors of 8

$8 = 1 \times 8$

$8 = 2 \times 4$

$8 = 4 \times 2$

$8 = 8 \times 1$

1,2,4 and 8 are the factors of 8.

the first ten multiples of 8 are as follow.

8, 16, 24, 32, 40, 48, 56, 64, 72, 80

Try It!

Write 5 prime numbers.

Exercise 2

1. Write all composite numbers between 30 and 50.

2. Encircle the prime numbers.

a) 15	b) 31	c) 42	d) 67
e) 11	f) 52	g) 98	h) 89

3. Write the first 15 prime numbers.

4. Identify the composite numbers and colour them.

1	11	21	31	41	51	61	71	81	91
2	12	22	32	42	52	62	72	82	92
3	13	23	33	43	53	63	73	83	93
4	14	24	34	44	54	64	74	84	94
5	15	25	35	45	55	65	75	85	95
6	16	26	36	46	56	66	76	86	96
7	17	27	37	47	57	67	77	87	97
8	18	28	38	48	58	68	78	88	98
9	19	29	39	49	59	69	79	89	99
10	20	30	40	50	60	70	80	90	100

5. Find the factors of the given numbers.

a) 12 b) 15 c) 32 d) 10 e) 27

f) 22 g) 6 h) 49 i) 40 j) 38

6. Find the first ten multiples of the given numbers.

a) 3 b) 5 c) 8 d) 2

e) 7 f) 6 g) 4 h) 9

Prime Factorization

Do you that what is prime factorization?

$8 = 1 \times 8$

$8 = 2 \times 4$

$8 = 2 \times 2 \times 2$

2	8
2	4
2	2
	1

Let's we find the prime factors of 8.

Prime factor of 8 = 2, 2, 2

Prime factorization of 8 = $2 \times 2 \times 2$

The process of writing a number as a product of its factors is called factorization. The factorization in which all factors are prime is called prime factorization.

Find the factors of 30 that are prime.

Prime factors of 30 = 2, 3, 5

Prime factorization of 30 = $2 \times 3 \times 5$

2	30
3	15
5	5
	1

Common Factors

When two or more numbers have the same factor, that factor is called the common factor.

Write few numbers on the board and ask the students to find the factors using by prime factorization.

Find the common factors of 12 and 16.

Prime factorization of 12 = 2 × 2 × 3

Prime factorization of 16 = 2 × 2 × 2 × 2

2	12
2	6
3	3
	1

2	16
2	8
2	4
2	2
	1

Common factors = 2 × 2 = 4

Find the common factors of 18 and 27.

Prime factorization of 18 = 2 × 3 × 3

Prime factorization of 27 = 3 × 3 × 3

2	18
3	9
3	3
	1

3	27
3	9
3	3
	1

Common factors = 3 × 3 = 9

Find the common factors of 9, 15 and 12.

Prime factorization of 9 = 3 × 3

Prime factorization of 15 = 3 × 5

Prime factorization of 12 = 2 × 2 × 3

Common factors = 3

Try Yourself

Find the common factors of 30 and 45.

Write few numbers on the board and ask the students to find the common factors using prime factorization.

Common Multiples

Find the common multiples of 6 and 8.

To find the common multiples of two or more number first we will write the some multiples of these numbers. then we will circle the common multiples.

- We will write the multiples of numbers.
  Circle the common multiples.

Multiples of 6 = 6, 12, 18, (24), 30, 36, 42, (48), 54, 60

Multiples of 8 = 8, 16, (24), 32, 40, (48), 56, 64, 72, 80

First two common multiples of 6 and 8 are 24 and 48.

A number that is a multiple of two or more numbers is called the common multiple.

Find common multiple of 10, 15 and 12.

Multiples of 10 = 10, 20, 30, 40, 50, (60), 70, 80, 90

Multiples of 15 = 15, 30, 45, (60), 75, 90, 105, 120, 135

Multiples of 12 = 12, 24, 36, 48, (60), 72, 84, 96, 108

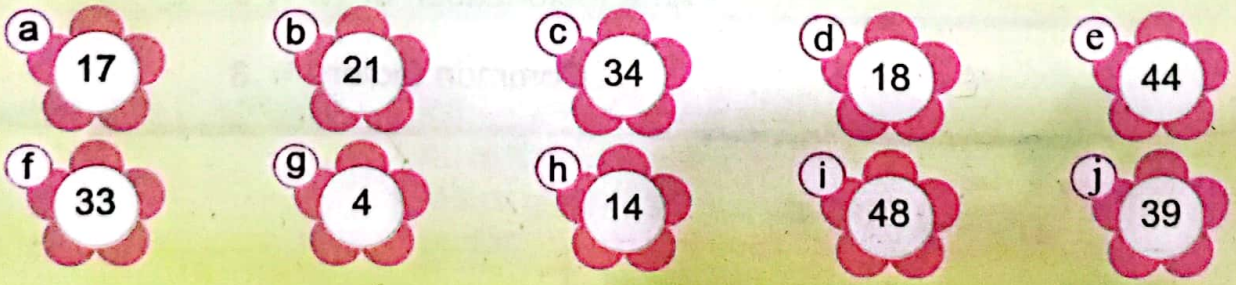
The first common multiple of 10, 15 and 12 = 60

Try Yourself

1. Find first two common multiples of 9 and 15.
2. Find the first common multiple of 8 and 24.

Exercise 3

1. Find the prime factors of the given numbers.



Write few numbers on the board and ask the students to find the common multiples of the numbers.

2. Find the common factors of the given numbers.

a) 6, 18

b) 10, 20

c) 24, 32, 18

d) 14, 30

e) 7, 21, 28

f) 20, 25, 15

g) 4, 8

h) 13, 39

i) 5, 30, 12

3. Find the first common multiple of the given numbers.

a) 3, 5

b) 9, 12

c) 10, 20, 30

d) 12, 22

e) 8, 4, 16

f) 51, 17, 34

g) 7, 14

h) 6, 15

i) 2, 5, 10

I Have Learnt

- Identifying the divisibility rule of 2, 3, 5 and 10.
- Using the divisibility rule of 2, 3, 5 and 10 for 5-digit numbers.
- Identifying and differentiate between prime and composite numbers.
- Finding the factors of numbers up to 50.
- Finding the multiples of 1-digit numbers.
- Finding the difference between factors and multiples.
- Finding the common factors by prime factorization.
- Finding the common factors of two or more numbers.
- Finding the common multiples of two or more numbers.

Vocabulary

Prime Numbers
Composite Numbers
Divisibility Rule
Factors
Multiples
Prime Factorization
Common Factors
Common Multiples

Review Exercise

1. Choose the correct answer.

a) 13 is a_____ number.

i) Composite ii) Common iii) Multiple iv) Prime

b) If _____ of the all digits of a number divisible by 3 than that number is divisible by 3.

i) Sum ii) Difference iii) Product iv) quotient

c) Prime factorization of 24 is:

i) 8×3 ii) 1×24 iii) $2\times2\times2\times3$ iv) $2\times6\times2$

d) The common factor of 2 and 4 is _____.

i) 1 ii) 2 iii) 4 iv) 8

e) The first common multiple of 5 and 10 is _____.

i) 5 ii) 10 iii) 20 iv) 50

2. Use the divisibility rule to complete the given below table.

	Numbers	Divisible by 2	Divisible by 3	Divisible by 5	Divisible by 10
a	112				
b	986				
c	5409				
d	5600				
e	81810				
f	5912				
g	53800				
h	2134				

3. Write first 12 composite numbers.

4. Write Prime numbers between 21 and 60.

5. Find the factors of the given numbers.

a) 10 b) 25 c) 35 d) 46 e) 23
f) 16 g) 4 h) 47 i) 38 j) 20

6. Find the first 6 multiples of the given numbers.

a) 2 b) 6 c) 5 d) 9

7. Find the prime factors of the given numbers.

a) 5 b) 19 c) 22 d) 15 e) 40
f) 21 g) 8 h) 30 i) 41 j) 38

8. Find the common factor of the given numbers.

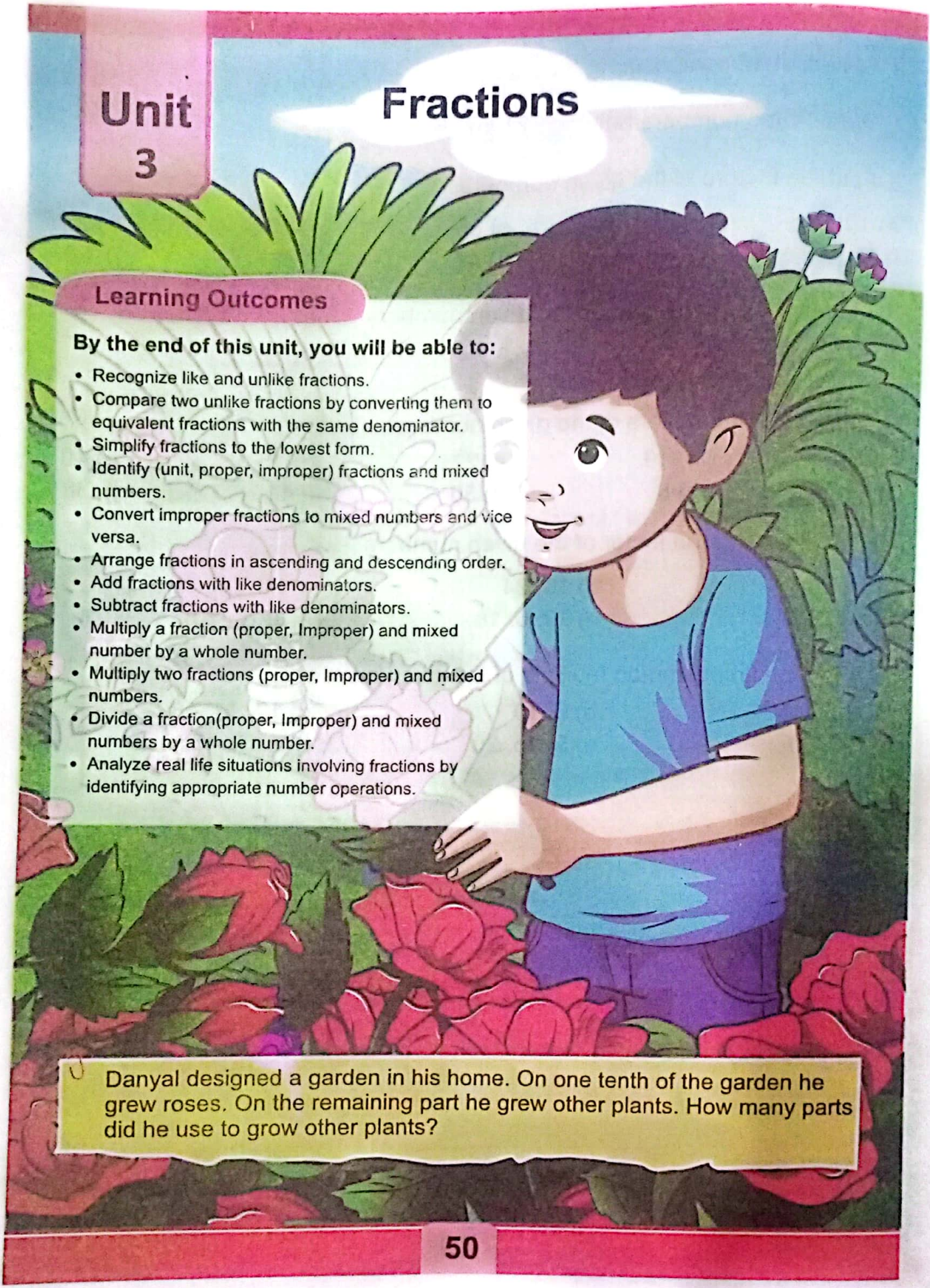
a) 4, 20 b) 16, 24 c) 28, 56, 14
d) 17, 34 e) 12, 6, 18 f) 5, 10, 20

9. Find the first common multiple of the given numbers.

a) 2, 7 b) 6, 10 c) 12, 14, 18
d) 15, 30 e) 5, 15, 20 f) 6, 12, 15

Unit 3

Fractions



Learning Outcomes

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

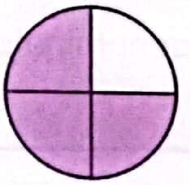
- Recognize like and unlike fractions.
- Compare two unlike fractions by converting them to equivalent fractions with the same denominator.
- Simplify fractions to the lowest form.
- Identify (unit, proper, improper) fractions and mixed numbers.
- Convert improper fractions to mixed numbers and vice versa.
- Arrange fractions in ascending and descending order.
- Add fractions with like denominators.
- Subtract fractions with like denominators.
- Multiply a fraction (proper, Improper) and mixed number by a whole number.
- Multiply two fractions (proper, Improper) and mixed numbers.
- Divide a fraction(proper, Improper) and mixed numbers by a whole number.
- Analyze real life situations involving fractions by identifying appropriate number operations.

Danyal designed a garden in his home. On one tenth of the garden he grew roses. On the remaining part he grew other plants. How many parts did he use to grow other plants?

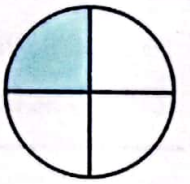
Like and Unlike Fractions

Komal and Waleed start to read a story book. Komal reads $\frac{3}{4}$ pages of the book in one day and Waleed reads $\frac{1}{4}$ pages of the book. What do you think which type of fractions are these?

We represent these fractions using diagram.



$\frac{3}{4}$

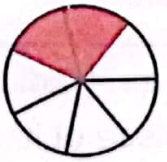


$\frac{1}{4}$

The denominator of both the fractions is same means 4. Therefore $\frac{3}{4}$ and $\frac{1}{4}$ are like fractions.

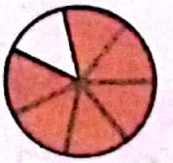
Fractions with same denominator are called like fractions.

Now consider $\frac{2}{7}$, $\frac{3}{7}$ and $\frac{6}{7}$.



$\frac{2}{7}$

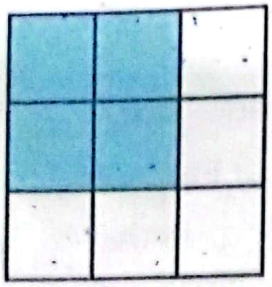
$\frac{3}{7}$



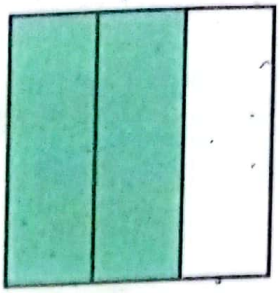
$\frac{6}{7}$

As 7 is the denominator for all three fractions. Therefore $\frac{2}{7}$, $\frac{3}{7}$ and $\frac{6}{7}$ are like fractions.

Consider $\frac{4}{9}$ and $\frac{2}{3}$.



$\frac{4}{9}$



$\frac{2}{3}$

The denominators for $\frac{4}{9}$ and $\frac{2}{3}$ are different.

Fractions with different denominators are called unlike fractions.

Therefore $\frac{4}{9}$ and $\frac{2}{3}$ are unlike fractions.

Try Yourself

Separate the like and unlike fractions.

a) $\frac{1}{8}, \frac{3}{8}$ b) $\frac{4}{5}, \frac{7}{11}, \frac{1}{9}$ c) $\frac{3}{7}, \frac{4}{5}$ d) $\frac{4}{6}, \frac{5}{6}, \frac{1}{6}$

Comparing unlike fractions

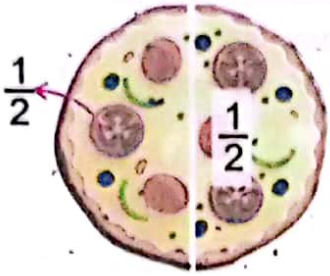
Hadia and Muaz have 2 pizzas of same size. Hadia cut her pizza into two equal pieces and ate one piece of it. Muaz cut his pizza into 5 equal pieces and ate 3 of it. Who ate more?

Write different fractions on the board and ask the students to identify like and unlike fractions.

To find who ate more pizza.

- Write the eaten part of pizza in fraction.
- Convert fraction into their equivalent fractions.

We can show these fractions with the help of figure.



Now compare $\frac{1}{2}$ and $\frac{3}{5}$. To compare these fractions we will convert these fractions into equivalent fractions.
To convert these into equivalent fractions we multiply these fractions with the number to make their denominator same.

$$\frac{1}{2} = \frac{1 \times 5}{2 \times 5} = \frac{5}{10}$$

$$\frac{3}{5} = \frac{3 \times 2}{5 \times 2} = \frac{6}{10}$$

As number 6 is greater than number 5.
Therefore,

$$\frac{6}{10} > \frac{5}{10}$$

or

$$\frac{3}{5} > \frac{1}{2}$$

So, Muaz ate more pizza.

Key Fact

Equivalent fractions are fractions with different numbers representing the same part of the whole.

Key Fact

In like fraction the greater the numerator greater the fraction.

Try Yourself

Compare the following.

a) $\frac{1}{4}, \frac{3}{5}$ b) $\frac{6}{7}, \frac{2}{9}$

c) $\frac{9}{10}, \frac{2}{5}$ d) $\frac{7}{8}, \frac{2}{4}$

Make groups of students and give them some flashcards with square grid. Ask them to colour different squares and write in fractional form.

Simplifying Fractions

Hamid solves 5 questions out of 10 i.e $\frac{5}{10}$. Can we write this in simplest form?

Common factor of 5 and 10 is 5. To write in simplest form divide numerator and denominator of the fractions by 5.

$$\frac{5}{10} = \frac{5 \div 5}{10 \div 5} = \frac{1}{2}$$

Key Fact

To write fraction in simplest form divide numerator and denominator with their common factors.

Let's write $\frac{12}{14}$ in its simplest form.

Common factor of 12 and 14 is 2.

Dividing their numerator and denominator by 2.

$$\frac{12}{14} = \frac{12 \div 2}{14 \div 2} = \frac{6}{7}$$

Now there is no common factor of 6 and 7.

So, $\frac{6}{7}$ is the simplest form of $\frac{12}{14}$.

Try Yourself

Asad have 18 candies. He eats 6 candies i.e. $\frac{6}{18}$ candies. Write this fraction in simplest form?

Types of Fractions

Unit fractions

A farmer cultivates sugarcane on one-fourth of his field. It means that he cultivates $\frac{1}{4}$ of his field.

When the numerator of any fraction is 1 then the fraction is called a unit fraction.
$\frac{1}{4}$ is a unit fraction.

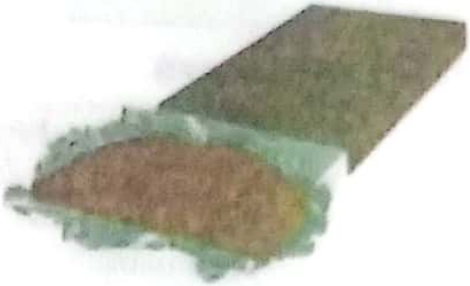
It can be shown with the help of a diagram.

Key Fact

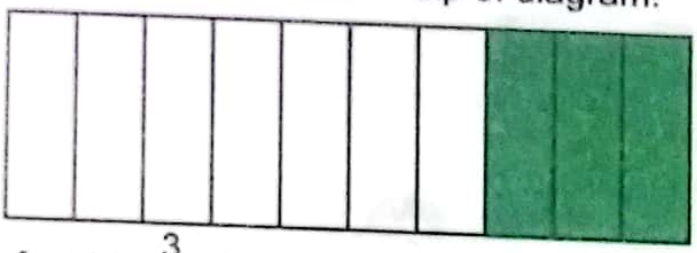
Fractions with 1 as a numerator is called unit fraction.

Proper fractions

I have a chocolate. I ate its 3 pieces out of 10 equal parts. It means that i have eaten $\frac{3}{10}$ of the chocolate.



It can be shown with the help of diagram.



Key Fact

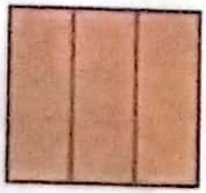
Fraction with numerator smaller than its denominator is called proper fraction.

In fraction $\frac{3}{10}$ the numerator 3 is smaller than the denominator 10.

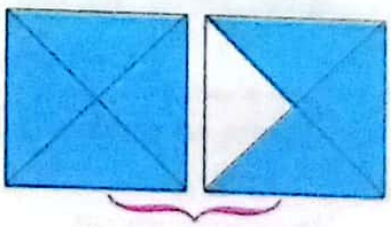
So $\frac{3}{10}$ is a proper fraction.

Improper fractions

Consider the following figures.



$\frac{3}{3}$



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

Key Fact

These are improper fractions as:

- In $\frac{3}{3}$ numerator and denominator are same.
- In $\frac{7}{4}$, numerator is greater than the denominator.

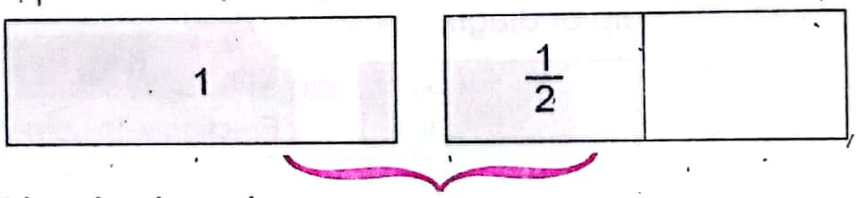
Mixed numbers

Subhan has two packs of juice. He drinks one full and other half pack. How can we write it in fraction.

Key Fact

The fraction with numerator greater than the denominator is called improper fraction.

We can show it with the help of figure as..



We can write it in mixed number as.

$1\frac{1}{2} = 1 + \frac{1}{2}$ Mixed number

Mixed number is the sum of whole number 1 and proper fraction $\frac{1}{2}$.

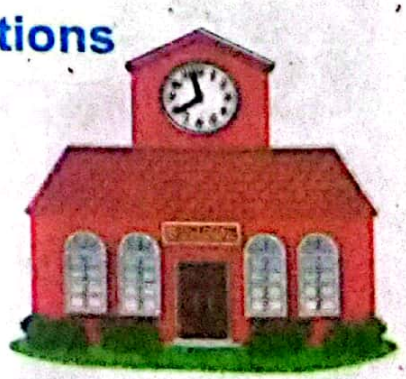
Key Fact

A mixed number consists of a whole number and a proper fraction.

Conversion of fractions

Conversion of improper fractions to mixed numbers

Waheed covers a distance of $\frac{7}{3}$ km from school to home. Write in mixed number.

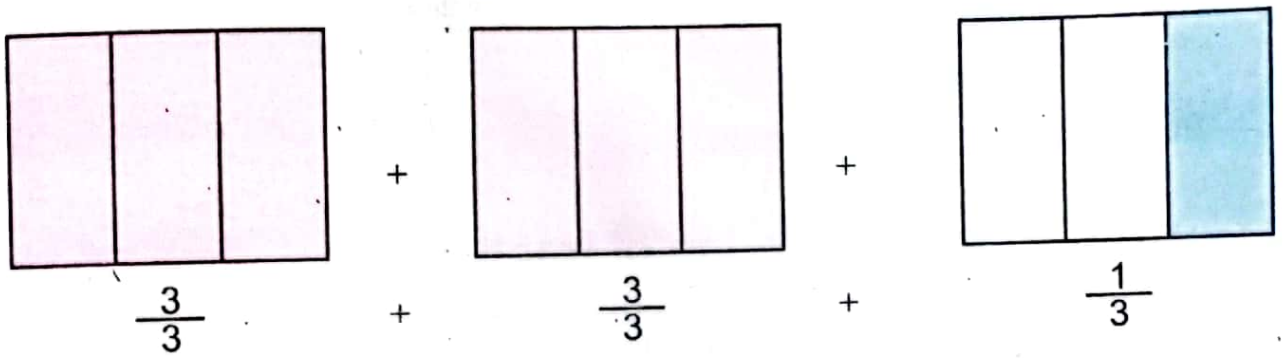


To convert the improper fraction $\frac{7}{3}$ into mixed number we divide numerator by denominator.

$$\begin{array}{r} 2 \\ 3\overline{)\,7} \\ -6 \\ \hline 1 \end{array} \qquad \frac{7}{3} = 2 + \frac{1}{3}$$

$\frac{7}{3}$ in mixed number can be written like this:

$$7 \div 3 = 2\frac{1}{3}$$



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

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

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

Try Yourself

Convert $\frac{9}{4}$ and $\frac{11}{6}$ into mixed number.

Conversion of mixed number to improper fractions

Ahmed walks $2\frac{1}{3}$ hours in garden daily. Convert the mixed number into improper fraction.

$2\frac{1}{3} = \frac{(2\times3)+1}{3} = \frac{6+1}{3} = \frac{7}{3}$

$\frac{7}{3}$ is an improper fraction.

Let's convert $6\frac{2}{3}$ into improper fraction.

$6\frac{2}{3} = \frac{(6\times3)+2}{3}$

$= \frac{18+2}{3}$

$= \frac{20}{3}$

So, $\frac{20}{3}$ is an improper fraction.

Key Fact

When we convert mixed number into improper fraction, its denominator does not change.

Try Yourself

Convert $4\frac{1}{4}$ into improper fraction.

Ordering of fractions

Ali, Usman and Kamal invest in a business. Ali's share is $\frac{2}{3}$, Usman's share is $\frac{1}{2}$ and Kamal's share is $\frac{1}{4}$. How we write their shares in descending order?

To write in descending order first we convert these factions into equivalent fractions.

$\frac{2}{3} = \frac{2\times4}{3\times4} = \frac{8}{12}$

$\frac{1}{2} = \frac{1\times6}{2\times6} = \frac{6}{12}$

$\frac{1}{4} = \frac{1\times3}{4\times3} = \frac{3}{12}$

Now we compare numerator of these fractions.

$$8 > 6$$

That is $\frac{8}{12}$ is greater than $\frac{6}{12}$

$6 > 3$ so, $\frac{6}{12}$ is greater than $\frac{3}{12}$.

$$\frac{6}{12} > \frac{3}{12}$$

So $\frac{3}{12} < \frac{6}{12} < \frac{8}{12}$

We can write these fractions in descending order.

$$\frac{8}{12}, \frac{6}{12}, \frac{3}{12}$$

$$\frac{2}{3}, \frac{1}{2}, \frac{1}{4}$$

Try It!

I am a mixed number between 2 and 10. I am nearer to 8 than 4.if you separate my fractional part then I am an odd number. Who am i?_____

Exercise 1

1. Encircle the unlike fractions of the following.

a) $\frac{3}{5}, \frac{1}{2}$ b) $\frac{7}{9}, \frac{4}{9}$ c) $\frac{6}{11}, \frac{1}{11}$ d) $\frac{2}{8}, \frac{3}{8}$ e) $\frac{6}{10}, \frac{1}{5}$ f) $\frac{5}{9}, \frac{2}{7}$

Make groups of students, give them flashcards of different fraction(improper and mixed number). Ask them to convert improper fractions into mixed number and vice versa.

2. Compare the given fractions and write symbols of $<$, $>$ or $=$.

a) $\frac{1}{2} \square \frac{3}{6}$ b) $\frac{4}{5} \square \frac{9}{10}$ c) $\frac{6}{12} \square \frac{3}{4}$ d) $\frac{1}{7} \square \frac{5}{8}$

e) $\frac{2}{9} \square \frac{5}{6}$ f) $\frac{8}{12} \square \frac{5}{7}$ g) $\frac{1}{3} \square \frac{1}{4}$ h) $\frac{4}{11} \square \frac{7}{10}$

3. Write the following fractions into simplest form.

a) $\frac{4}{20}$ b) $\frac{2}{12}$ c) $\frac{30}{45}$ d) $\frac{9}{27}$ e) $\frac{12}{16}$

f) $\frac{15}{25}$ g) $\frac{16}{24}$ h) $\frac{4}{18}$ i) $\frac{14}{20}$ j) $\frac{17}{34}$

4. Encircle the proper fractions of the given numbers and tick (✓) the mixed number.

a) $\frac{2}{5}$ b) $\frac{7}{8}$ c) $\frac{3}{4}$ d) $3\frac{4}{7}$ e) $1\frac{1}{2}$

f) $\frac{3}{8}$ g) $\frac{9}{11}$ h) $3\frac{7}{11}$ i) $\frac{6}{7}$ j) $11\frac{1}{2}$

5. Convert improper fractions to mixed number.

a) $\frac{8}{5}$ b) $\frac{11}{5}$ c) $\frac{13}{10}$ d) $\frac{20}{9}$ e) $\frac{15}{2}$

6. Convert mixed number to improper fraction.

a) $2\frac{3}{5}$ b) $7\frac{5}{6}$ c) $4\frac{1}{7}$ d) $5\frac{3}{11}$ e) $6\frac{1}{3}$ f) $2\frac{4}{13}$

7. Write the given fraction in ascending and descending order.

a) $\frac{3}{5}, \frac{3}{9}, \frac{3}{7}$ b) $\frac{3}{4}, \frac{1}{3}, \frac{6}{7}$ c) $\frac{3}{5}, \frac{2}{10}, \frac{4}{15}$

8. Ali has three full and one half pizza. How can we write this in mixed number?

9. Majid buys $1\frac{1}{2}$ kg of mangoes. write this in improper fraction:

Addition and Subtraction of Fractions

Addition of Fractions

Shehzad walks $\frac{5}{7}$ km on Saturday and $\frac{2}{7}$ km on Sunday. How many kilometre he walks in two days?

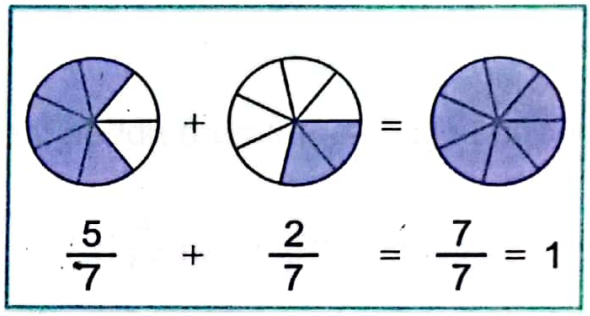
Add the fractions to find the total distance.

Walks on Saturday $= \frac{5}{7}$ km

Walks on Sunday $= \frac{2}{7}$ km

Walk in both days $= \frac{5}{7} + \frac{2}{7}$

$= \frac{5+2}{7} = \frac{7}{7} = 1$ km



So, Shehzad walks 1 km in two days.

Add $\frac{5}{7}$, $\frac{1}{7}$ and $\frac{2}{7}$.

$$\frac{5}{7} + \frac{1}{7} + \frac{2}{7} = \frac{5+1+2}{7}$$

$$= \frac{8}{7}$$

$$= 1\frac{1}{7}$$

Try Yourself

Add the following fractions.

a) $\frac{3}{4} + \frac{1}{4}$ b) $\frac{9}{10} + \frac{7}{10}$ c) $\frac{3}{9} + \frac{7}{9}$

Subtraction of Fractions

Faria buys $\frac{9}{10}$ m ribbon for her shirt and $\frac{7}{10}$ m ribbon for her scarf. How much more ribbons does she buy for the shirt?

Make groups of the students, ask them to write different fractions(with same denominators) in notebook and ask them to add these fractions.

Ribbon for shirt $= \frac{9}{10}$ m

Ribbon for scarf $= \frac{7}{10}$ m

Difference $= \frac{9}{10} - \frac{7}{10}$

$= \frac{9-7}{10}$

$= \frac{2}{10}$ m

So, Faria buys $\frac{2}{10}$ m more ribbon for her shirt.

Subtract $\frac{4}{11}$ from $\frac{5}{11}$.

$\frac{5}{11} - \frac{4}{11} = \frac{5-4}{11}$

$= \frac{1}{11}$

Try Yourself

Solve the following fractions.

a) $\frac{5}{8} - \frac{3}{8}$ b) $\frac{10}{11} - \frac{5}{11}$ c) $\frac{7}{12} - \frac{5}{12}$

Try It!

Maryam wants to make three kinds of biscuits. She needs $\frac{2}{7}$ cup of flour for first kind , $\frac{5}{7}$ cup of flour for the second and $\frac{3}{7}$ cup of flour for the third. How much flour will she need to make three kinds of biscuits?

Make groups of the students, ask them to write different fractions with same denominator in notebook and ask them to subtract these fractions.

Exercise 2

1. Solve the following fractions and write the answer in simplest form.

a) $\frac{6}{7} + \frac{5}{7}$ b) $\frac{11}{13} + \frac{11}{13}$ c) $\frac{5}{17} + \frac{11}{17}$

d) $\frac{7}{15} + \frac{8}{15}$ e) $\frac{5}{16} + \frac{5}{16}$ f) $\frac{2}{19} + \frac{12}{19}$

2. Subtract the smaller fractions from the greater fraction.

a) $\frac{2}{3}, \frac{3}{3}$ b) $\frac{1}{11}, \frac{7}{11}$ c) $\frac{11}{12}, \frac{7}{12}$

d) $\frac{7}{21}, \frac{15}{21}$ e) $\frac{2}{5}, \frac{4}{5}$ f) $\frac{8}{10}, \frac{4}{10}$

g) $\frac{2}{13}, \frac{1}{13}$ h) $\frac{5}{15}, \frac{3}{15}$

3. A painter labour paints $\frac{7}{13}$ part of the wall in one day and $\frac{3}{13}$ on the second day.

a) How much wall he paints in two days?

b) On which day he paints more?

4. $\frac{5}{14}$ kg of artificial fertilizer and $\frac{7}{14}$ kg of natural fertilizer have been used in a field. How much quantity of both fertilizers is used?

5. Saba did her Maths' homework in $\frac{2}{10}$ hours and her sister did her Maths' homework in $\frac{7}{10}$ hours. How many hours did both take to complete their homework?

6. Shiraz and Omar invest money in a business. Shiraz gets $\frac{7}{11}$ share and Omar gets $\frac{10}{11}$ share of the profit. Whose share is more and how much?

Multiplication of Fractions

Multiplication of Fraction by a Whole Number

Government wants to construct 90 home in an area. $\frac{5}{6}$ of total homes are completed. How many homes are completed?

To find the number of constructed home we have to multiply the fraction with total number of homes.

Total number of homes $= 90$

Constructed homes $= \frac{5}{6}$

$= \frac{5}{6} \times 90$

$= \frac{5 \times 90}{6}$

$= 75$

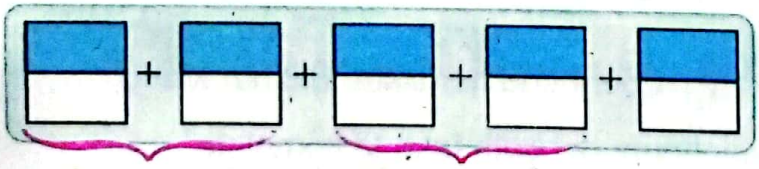
So, government has constructed 75 homes.

Try Yourself

Multiply the following fractions and whole numbers.

a) $\frac{5}{8} \times 12$ b) $\frac{5}{11} \times 22$ c) $\frac{6}{8} \times 4$

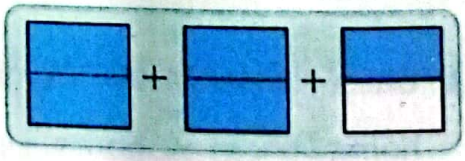
Multiply 5 and $\frac{1}{2}$.



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

$\frac{1}{2} \times 5 = \frac{1 \times 5}{2}$

$= \frac{5}{2}$



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

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

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

Make groups of students, give them flashcards of different fractions and ask them to multiply.

Let's multiply $\frac{3}{4}$ and $\frac{5}{6}$.

$$\frac{3}{4} \times \frac{5}{6} = \frac{3 \times 5}{4 \times 6}$$

$$= \frac{15}{24}$$

Nadia has $6\frac{2}{3}$ kg of birds grain. Haris takes $\frac{3}{4}$ of it from Nadia. How many kilogram grain he takes from Nadia?

To find, how much grain Haris takes from Nadia we have to multiply $6\frac{2}{3}$ and $\frac{3}{4}$.

$$6\frac{2}{3} \times \frac{3}{4} = \frac{20}{3} \times \frac{3}{4}$$

$$= \frac{20 \times 3}{3 \times 4}$$

$$= \frac{60}{12} = 5 \text{ kg}$$

So, Haris takes as much grain $= 5$ kg

Let's multiply $4\frac{2}{5}$ with $5\frac{1}{2}$.

$$5\frac{1}{2} \times 4\frac{2}{5} = \frac{11}{2} \times \frac{22}{5}$$

$$= \frac{11 \times 22}{2 \times 5}$$

$$= \frac{242}{10}$$

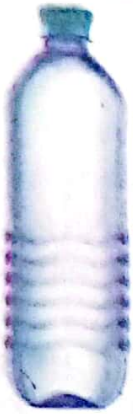
$$= \frac{121}{5} = 24\frac{1}{5}$$

Try Yourself

When we multiply two mixed number then answer will always come in mixed number?

Division of Fraction by a Whole Number

Zaman drinks $35\frac{1}{2}$ litres of water in 10 days. How much water he drinks daily?



To find, how much water he drinks daily, we will divide $35\frac{1}{2}$ by 10.

$$35\frac{1}{2} \div 10 = 35\frac{1}{2} \times \frac{1}{10}$$

Change the division symbol by multiplication.

$$= \frac{71}{2} \times \frac{1}{10}$$

10 will convert by $\frac{1}{10}$.

$$= \frac{71}{20}$$

$$= 3\frac{11}{20}\ \ell$$

So Zaman drinks as much water daily $= 3\frac{11}{20}\ \ell$

Let's divide $\frac{3}{4}$ by 7.

$$\frac{3}{4} \div 7 = \frac{3}{4} \times \frac{1}{7}$$

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

$$= \frac{3}{28}$$

Try It!

$\frac{4}{8}$ of 480 animals in the Zoo are rabbits and $\frac{1}{2}$ of it are white rabbits. Tell in fractions how many rabbits are in white colour?

Make the groups of students, give them flashcards of different fractions and whole numbers and ask them to divide these fractions by whole numbers.

Exercise 3

1. Multiply the following.

a) $\frac{6}{7}$, 4 b) 9 , $\frac{5}{6}$ c) $\frac{13}{11}$, 11 d) $\frac{8}{9}$, 6

e) $\frac{1}{10}$, 2 f) $\frac{6}{13}$, 1 g) $\frac{7}{11}$, 2 h) $3\frac{2}{3}$, 1

2. Solve the given fractions.

a) $\frac{6}{2} \times \frac{3}{6}$ b) $\frac{9}{11} \times \frac{5}{10}$ c) $\frac{3}{17} \times 3\frac{3}{4}$ d) $7\frac{1}{7} \times 1\frac{5}{8}$

e) $\frac{2}{9} \times 1\frac{5}{6} \times \frac{5}{6}$ f) $\frac{8}{12} \times 3\frac{8}{11} \times \frac{5}{7}$ g) $\frac{4}{3} \times \frac{1}{4} \times 7\frac{7}{10}$

3. Solve the following.

a) $\frac{7}{20} \div 2$ b) $\frac{2}{15} \div 5$ c) $\frac{20}{35} \div 9$ d) $\frac{21}{27} \div 3$

e) $\frac{14}{16} \div 7$ f) $\frac{15}{20} \div 21$ g) $\frac{18}{24} \div 3$ h) $\frac{14}{18} \div 18$

4. If the weight of 5 packets of sugar is $4\frac{7}{8}$ kg then what will be the weight of 1 packet of sugar?

5. Ayesha's age is $\frac{1}{2}$ of her sister's age.

a) If her sister is 20 years old. How old is Ayesha?

b) If her sister is 30 years old. How old is Ayesha?

6. Kamal will distribute $4\frac{1}{2}$ packets of candies among 6 children.

a) How many packets of candy will each child get?

b) If he distribute these packets among 9 children then how many packets of candies each child will get ?

7. The distance between Hamid's home and Masjid is $2\frac{3}{4}$ kilometre. if Hamid goes to Masjid for the five prayer then how much distance he covers daily?

I Have Learnt

- Recognizing like and unlike fractions.
- Comparing two unlike fractions by converting them to equivalent fractions with the same denominator.
- Simplifying fractions to the lowest form.
- Identifying (unit, proper, improper) fractions and mixed numbers.
- Converting improper fractions to mixed numbers and vice versa.
- Arranging fractions in ascending and descending order.
- Adding fractions with like denominators.
- Subtracting fractions with like denominators.
- Multiplying a fraction (proper, Improper) and mixed number by a whole number.
- Multiplying two fractions (proper, Improper) and mixed numbers.
- Dividing a fraction(proper, Improper) and mixed numbers by a whole number.
- Analyzing real life situations involving fractions by identifying appropriate number operations.

Vocabulary

Fractions
Like Fractions
Unlike Fractions
Unit Fractions
Common Factor
Equivalent fractions
Proper fractions
Improper fractions
Mixed Numbers

Review Exercise

1. Choose the correct answer.

a) _____ is a proper fraction.

i) $\frac{5}{4}$ ii) $\frac{9}{7}$ iii) $\frac{1}{2}$ iv) $\frac{4}{2}$

b) _____ is an improper fraction.

i) $\frac{5}{4}$ ii) $\frac{1}{2}$ iii) $3\frac{5}{9}$ iv) $\frac{4}{7}$

c) $\frac{1}{4}+\frac{3}{4}$ is equal to.

i) $\frac{1}{4}$ ii) $\frac{3}{4}$ iii) 1 iv) $\frac{2}{4}$

d) $\frac{7}{6}-\frac{2}{6}$ is equal to.

i) $\frac{9}{6}$ ii) $\frac{2}{6}$ iii) $\frac{1}{6}$ iv) $\frac{5}{6}$

e) The product of $\frac{7}{6}$ and 5 is _____.

i) $\frac{34}{6}$ ii) $\frac{34}{7}$ iii) $\frac{35}{7}$ iv) $\frac{35}{6}$

2. Tick(✓) the like fractions.

a) $\frac{4}{9}, \frac{1}{9}, \frac{2}{9}$ b) $\frac{5}{7}, \frac{6}{11}, \frac{2}{13}$ c) $\frac{2}{17}, \frac{9}{23}, \frac{11}{12}$

d) $\frac{6}{14}, \frac{1}{14}, \frac{2}{14}$ e) $\frac{4}{13}, \frac{1}{5}, \frac{6}{7}$ f) $\frac{3}{10}, \frac{9}{10}, \frac{1}{10}$

3. Compare the given fractions and write symbols of $<$, $>$ or $=$.

a) $\frac{9}{10} \square \frac{5}{7}$ b) $\frac{6}{13} \square \frac{1}{12}$ c) $\frac{3}{5} \square \frac{6}{11}$ d) $\frac{8}{9} \square \frac{1}{2}$

4. Write the given fractions into simplest form.

a) $\frac{52}{18}$ b) $\frac{17}{51}$ c) $\frac{9}{19}$ d) $\frac{22}{33}$

5. Encircle the unit fraction and tick(✓) the improper fraction.

a) $\frac{9}{9}$ b) $\frac{1}{6}$ c) $\frac{7}{2}$ d) $\frac{11}{5}$ e) $\frac{1}{9}$

6. Convert the improper fractions to mixed numbers.

a) $\frac{7}{5}$ b) $\frac{11}{8}$ c) $\frac{17}{4}$ d) $\frac{5}{4}$

7. Convert the mixed numbers to improper fractions.

a) $1\frac{3}{5}$ b) $3\frac{5}{10}$ c) $6\frac{4}{7}$ d) $2\frac{1}{9}$

8. Write the given fractions in ascending and descending order.

a) $\frac{4}{8}, \frac{5}{2}, \frac{6}{7}, \frac{1}{6}$ b) $\frac{2}{9}, \frac{8}{9}, \frac{5}{6}, \frac{1}{3}$ c) $\frac{4}{12}, \frac{7}{18}, \frac{3}{10}, \frac{5}{6}$

9. Add the given fractions.

a) $\frac{1}{3}, \frac{2}{3}$ b) $\frac{11}{12}, \frac{7}{12}$ c) $\frac{9}{5}, \frac{4}{5}$ d) $\frac{3}{9}, \frac{7}{9}$

10. Subtract the given fractions.

a) $\frac{9}{10} - \frac{3}{10}$ b) $\frac{8}{13} - \frac{2}{13}$ c) $\frac{6}{17} - \frac{1}{17}$ d) $\frac{4}{7} - \frac{3}{7}$

11. Multiply the given fractions.

a) $\frac{9}{5} \times 7$ b) $4\frac{2}{11} \times \frac{9}{10}$ c) $\frac{1}{2} \times 7\frac{8}{9}$ d) $3\frac{2}{11} \times 1\frac{5}{14}$

e) $1\frac{1}{4} \times 7\frac{3}{9}$ f) $\frac{1}{6} \div 9$ g) $4\frac{7}{12} \div 1$

12. In a garden $\frac{7}{12}$ of the trees are mango trees. In another garden $\frac{9}{12}$ of the trees are mango trees. How many mango trees are there altogether?

13. Hania has $12\frac{8}{14}$ m of ribbon. she wants to cut it into 8 equal pieces. What will be the length of each piece?

14. Jamal Reads $\frac{2}{7}$ of 140 pages of a book and Ferhan reads 2 times more pages than Jamal. How many pages does Ferhan read?

Unit 4

Decimals

Learning Outcomes

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

- Recognize a decimal number as an alternative way of writing a fraction.
- Express a decimal number as a fraction whose denominator is 10,100 or 1000.
- Identify and recognize the place value of a digit in decimals (up to 3 - decimal places).
- Convert a given fraction to a decimal if
  - Denominator of the fraction is 10,100 or 1000.
  - Denominator of the fraction is not 10,100 or 1000 but can be converted to 10,100 or 1000.
- Convert a decimal (up to 3 - decimal places) to fraction.
- Add and subtract 3 - digit numbers (up to 2 - decimal places).
- Multiply a 2 - digit number (up to 1 decimal place) by 10,100, and 1000.
- Multiply a 2 - digit number with 1decimal placeby a 1 - digit number.
- Divide a 2 - digit number with 1 - decimal place by a 1 - digit number
- Solve real life situations involving 2 - digit numbers with 1 - decimal place using appropriate operations.
- Round off a whole number to the nearest 10, 100, and 1000.
- Round off decimal (with 1 or 2 decimal places) to the nearest whole number.

In our home there is a pool. It covers $\frac{1}{100}$ of the house. What is another way of writing this common fraction.

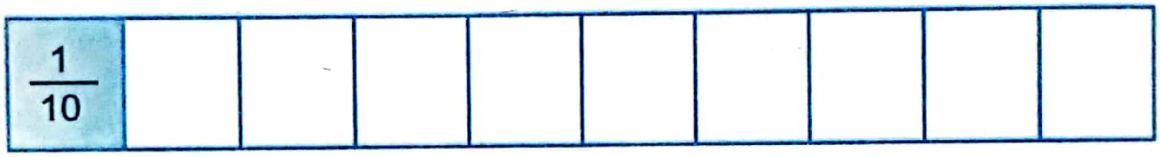
Decimal Numbers

Tenths

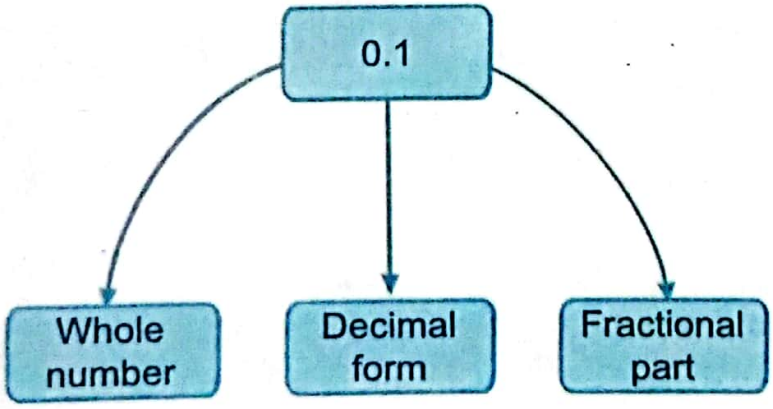
There are Math books in one out of the 10 cupboards in the library. How can we write it in common fraction?

There are Math books in one cupboard. We can write it as 1 out of 10 in a common fraction like $\frac{1}{10}$.

We can show this as:



1 out of 10 parts = $\frac{1}{10}$ (Common fraction) = 0.1 (Decimal)



we can write it as 0.1 and read it zero point one.

Key Fact

The word decimal comes from latin word decimus that means tenth part.

Key Fact

Decimal is a fraction with a denominator of 10,100 and 1000.

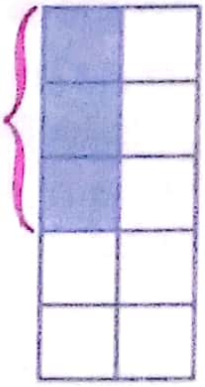
Look at this shape-

3 out of 10 equal parts are coloured.

We write this in common fraction as $\frac{3}{10}$.

$\frac{3}{10} = 0.3$

We write it in decimals as 0.3 and read zero point three.



How do we express non-colored parts in decimals?

7 out of 10 parts are not coloured in this figure.

we write it in common fraction as $\frac{7}{10}$.

In decimal fraction we write it as 0.7 and read zero point seven.

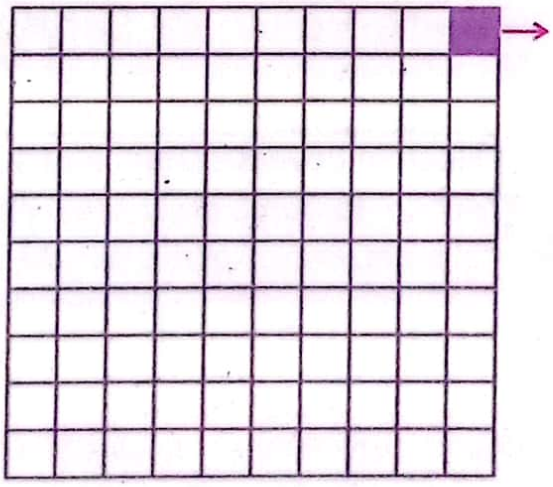
Hundredths

If we divide a square shape into 100 equal parts and colour one part then how will we represent it in decimal fraction?

1 out of 100 parts = $\frac{1}{100}$

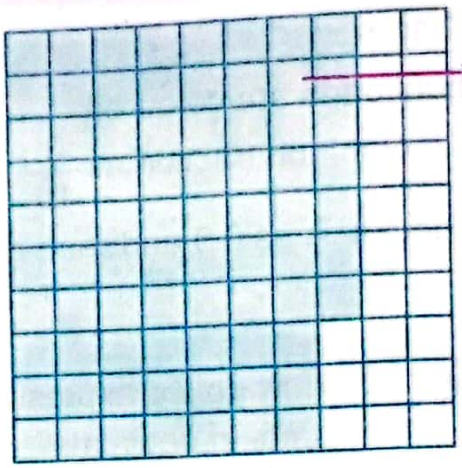
1 out of 100 parts = 0.01

We can write it as 0.01 and read it zero point zero one.



$\frac{1}{100} = 0.01$

Look at this shape-



$\frac{77}{100}$ = 0.77

77 out of 100 equal parts are coloured.

We write this in common fraction as $\frac{77}{100}$.

In decimals we write it as 0.77 and read zero point seven seven.

Thousandths

If we divide a cube shape into 1000 equal parts and colour one part. How we will represent it in decimals?

Try Yourself

Ahmer solves 89 MCQ's out of 100 in a test. write it in decimals?

1 out of 1000 parts = $\frac{1}{1000}$

1 out of 1000 parts = 0.001

In decimals we write it as 0.001and read zero point zero zero one.

Try Yourself

Write the hundredth part of one thousand in decimals.

Place Value of Digits in Decimals

Hashim covers distance of 1.75 km to go from school to home daily. How can we represent this decimal in place value chart?

Give squared shape flashcards to students and ask them to divide each square into 10 equal parts. Students will colour some parts and represent it in decimals.

In 1.75, 1 is whole number and 75 is fractional part. We read it "one point seven five". we represent it in place value chart as:

Ones	Decimal Point	tenths	hundredths
1	·	7	5

Try Yourself

Write 4 kg 987 g quantity in decimals and write place value of each digit.

What will be the place value of each digit in chart?

The value of each digit is represented by its place on the place value chart as above. Represent 1.75 in place value chart.

1 is at ones place the place value of 1 is

$$1 \times 1 = 1$$

7 is at tenths place, the place value of 7 is

$$7 \times 0.1 = 0.7$$

5 is at hundredths place the place value of 5 is

$$5 \times 0.01 = 0.05$$

Key Fact

In decimals value of each digit depends upon its place in the chart.

We will write it in expanded form as.

$$1.75 = 1 + \frac{7}{10} + \frac{5}{100}$$

$$1.75 = 1 + 0.7 + 0.05$$

How we will represent 21.304 in place value chart and find the place value of each digit?

We will represent 21.304 in place value chart as:

Tens	Ones	Decimal Point	Tenths	Hundredths	Thousandths
2	1	·	3	0	4

Give some flashcards with different digits and ask the students to make a number and stand in a row and tell the place value of each digits. Then ask the students to change their position and make a new number and repeat this with different numbers.

We read it as twenty one point three zero four.

Place value of digits:

2 is at tens place, place value of 2 is:

$2 \times 10 = 20$

1 is at ones place, place value of 1 is:

$1 \times 1 = 1$

3 is at tenths place, place value of 3 is:

$3 \times 0.1 = 0.3$

0 is at hundredths place, place value of 0 is:

$0 \times 0.01 = 0.00$

4 is at thousandths place, place value of 4 is:

$4 \times 0.001 = 0.004$

Expanded form of 21.304 is:

$$21.304 = 20 + 1 + \frac{3}{10} + \frac{0}{100} + \frac{4}{1000}$$

$$21.304 = 20 + 1 + 0.3 + 0.00 + 0.004$$

Try It!

Write place value of each digit in 200.149 and express in expanded form.

Exercise 1

1. Write the given fractions in decimals.

a) $\frac{16}{100}$ b) $\frac{1}{10}$ c) $\frac{324}{1000}$ d) $\frac{2}{100}$ e) $\frac{70}{1000}$

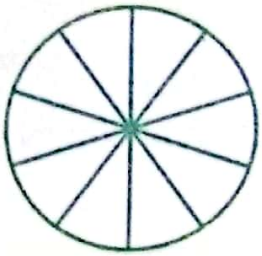
2. Write the place value of the coloured digits.

a) 1.56 b) 45.987 c) 321.17 d) 6.897

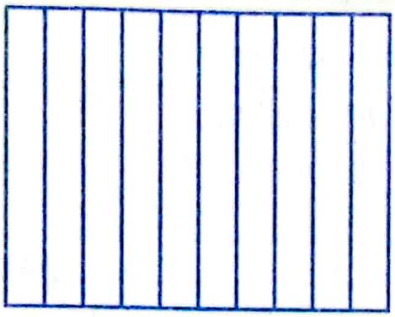
e) 6.340 f) 12.123 g) 78.808 h) 4.009

3. Colour the given shapes with the help of decimals.

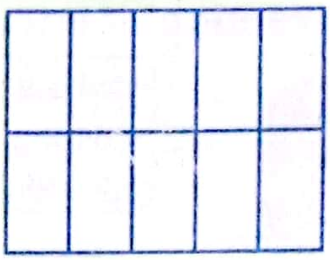
a) 0.2



b) 0.7



c) 0.9



4. Fill in the blanks.

a) 7.45

i) 7 is at ones place, the place value of 7 is:
$7 \times$ ____ = _____

ii) 4 is at tenths place, place value of 4 is:
$4 \times$ ____ = _____

iii) 5 is at hundredths place, place value of 5 is:
$5 \times$ ____ = _____

b) 87.391

i) 8 is at tens place, place value of 8 is
$8 \times$ ____ = _____

ii) 7 is at ones place, place value of 7 is:
$7 \times$ ____ = _____

iii) 3 is at tenths place, place value of 3 is:
$3 \times$ ____ = _____

iv) 9 is at hundredths place then the place value of 9 is
$9 \times$ ____ = _____

v) 1 is in the thousandths place, place value of 1 is:
$1 \times$ ____ = _____

c) 99.999

i) 9 is at tens place, place value of 9 is:
$9 \times$ ____ = _____

ii) 9 is at ones place, place value of 9 is:
$9 \times$ ____ = _____

iii) 9 is at tenths, place, place value of 9 is
$9 \times$ ____ = _____

iv) 9 is at hundredths place, place value of 9 is:
$9 \times$ ____ = _____

v) 9 is at thousandths place, place value of 9 is:
$9 \times$ ____ = _____

Conversion of Fractions to Decimals

Conversion of fraction to decimals

In the science practical exam, 38 out of the100 students are working on the light experiment. Write it in fraction and convert into decimal.

38 students out of 100 = $\frac{38}{100}$ (fractions)

Convert $\frac{38}{100}$ into decimals.

As there are 2 zeros after 1 in denominator of $\frac{38}{100}$.

We will count in numerator 2 digits from right to left and put decimal point before it.

$$\frac{38}{100} = 0.38$$

$$\begin{array}{r} 0.38 \\ 100\overline{)\,38.00} \\ -300 \\ \hline 800 \\ -800 \\ \hline 0 \end{array}$$

Key Fact

To convert fractions with denominator of 10,100 or 1000:

- Count the number of zeros in the denominator.
- Count the digit in the numerator from right to left.
- Put the decimal point according to the number of zeros.

Amar has Rs 1000. He buys a toy for Rs 299. Write the amount spent in decimals.

299 parts out of 1000 = $\frac{299}{1000}$ (fractions).

Convert $\frac{299}{1000}$ into decimals.

There are 3 zeros after 1 in denominator of $\frac{299}{1000}$.

We will count 3 digits from right to left in numerator and put decimal point before it.

$$\frac{299}{1000} = 0.299$$

Try Yourself

About 95 out of 100 patients were recovering from the corona virus in Pakistan. Write it in decimals?

Write common fractions with denominator of 10, 100 and 1000 on the board and convert into decimals. Ask the students to explain the method of conversion.

Asad's teacher divided the students in groups of 5.2 out of which 5 students participated in a game. Write it in decimals.

Number of students participating = $\frac{2}{5}$ (common fractions)

In fraction, $\frac{2}{5}$ the denominator is not 10, 100 or 1000. Therefore we will convert $\frac{2}{5}$ into an equivalent fraction with the denominator of 10.

Convert $\frac{2}{5}$ into equivalent fraction:

$$\frac{2}{5} = \frac{2 \times 2}{5 \times 2} = \frac{4}{10}$$

Convert $\frac{4}{10}$ into decimals:

$$\frac{4}{10} = 0.4$$

So, therefore, 0.4 students participated in a game from each group.

Convert $\frac{4}{25}$ into decimals.

Convert $\frac{4}{25}$ into equivalent fraction:

$$\frac{4}{25} = \frac{4 \times 4}{25 \times 4} = \frac{16}{100}$$

Convert $\frac{16}{100}$ into decimals:

$$\frac{16}{100} = 0.16$$

Conversion of decimals to fractions

The height of an elephant is 3.2 m. Write as common fraction.

Key Fact

To convert decimals into common fraction: Write the decimals in form of tenths, hundredths and thousandths.Convert it into common fraction.

To find the height of the elephant in common fraction: write the decimal 3.2 in form of tenths:

$$3.2 = 3 \text{ ones} + 2 \text{ tenths}$$

$$= 3 + \frac{2}{10}$$

$$\text{common fraction} = \frac{32}{10} = \frac{16}{5} = 3\frac{1}{5}$$

Try Yourself

The highest temperature of Multan is 44.1 °C. what will be this temperature in common fraction?

Convert 5.234 into common fraction.

Write the decimal 5.234 in form of tenths, hundredths and thousandths:

$5.234 = 5 \text{ ones} + 2 \text{ tenths} + 3 \text{ hundredths} + 4 \text{ thousandths}$

$$= 5 + \frac{2}{10} + \frac{3}{100} + \frac{4}{1000}$$

$$\text{common fraction} = \frac{5234}{1000} = \frac{2617}{500} = 5\frac{117}{500}$$

Try It!

Show 7.74 in the place value chart and convert 7.74 into common fraction.

Write some decimal fractions on the board. Ask the students that to convert decimal fraction to common fraction and also tell the method of conversion.

Exercise 1

1. Represent these in decimal fraction.

a) $\frac{24}{100}$ b) $\frac{5}{1000}$ c) $\frac{6}{10}$ d) $\frac{12}{500}$ e) $\frac{3}{250}$

f) $\frac{47}{25}$ g) $\frac{60}{200}$ h) $\frac{606}{1000}$ i) $\frac{80}{1000}$ j) $\frac{1}{50}$

2. Convert the following decimal fractions to common fraction.

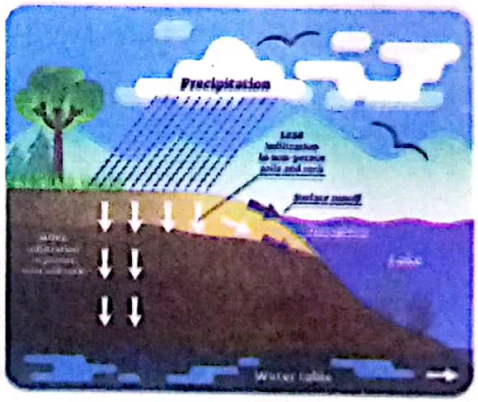
a) 1.3 b) 2.04 c) 6.98 d)5.5 e) 0.68

f) 21.72 g)7.87 h) 0.98 i) 11.11 j) 6.10

Addition and Subtraction of Decimals

Addition of Decimals

There are 0.45 units of minerals and 0.25 units of water in soil.



To find out the quantity of both things in soil we will have to add both quantities.

		Ones	Decimal Point	tenths	hundredths
The quantity of mineral in soil	=	0	.	4	5
The quantity of water in soil	=	+ 0	.	2	5
Total quantity of minerals in soil	=	0	.	7	0

Total quantity of water and minerals in soil is 0.70 units

Make groups of students, ask them to write some decimal numbers in their notebook and then add.

Key Fact

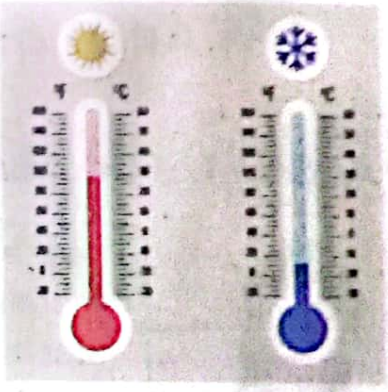
To add the decimals always write the same place values in a column. Add ones in ones, tenths in tenths and hundredths in hundredths.

Try Yourself

Ali has 2.98 kg of sugar and 1.09 kg of rice. How much total amount of sugar and rice will he have?

Subtraction of Decimals

The temperature of Karachi in January is 20.8°C and in June is 40.1°C. Which month is colder and by how much?



To find the difference between two months we will subtract the temperature.

		tens	ones	.	tenths
Temperature in June	=	~~4~~ 3	~~1~~ 09	.	1 1
Temperature in January	=	− 2	0	.	8
Difference	=	1	9	.	3

January is 19.3°C cooler than June

Key Fact

To subtract the decimals always write the same place values in a column. Subtract ones from ones, tenths from tenths and hundredths from hundredths.

Key Fact

Always subtract smaller decimal fraction from the greater decimal fraction.

Try It! Challenge

If the sum of two decimals is 12.8 then find the first decimal fraction if the second decimal fraction is 7.9. What we add in 12.8 that we will get 25.8?

Try Yourself

Sara has two ribbons. The length of a ribbon is 42.9 cm and the other is 56.8 cm. What is the difference between their lengths?

Exercise 3

1. Add the following.

   a) 9.11, 8.03 b) 43.1, 12.7 c) 52.9 , 2.2

   d) 5.69, 2.98 e) 6.02 , 1.89 f) 49.3 , 21.6

2. Solve the following.

   a) 4.91 – 3.92 b) 7.34 – 2.86 c) 5.06 – 2.76

   d) 7.88 – 6.19 e) 9.80 – 1.09 f) 78.9 – 7.84

3. Zubair bought a chocolate for Rs. 45.7 and a candy for Rs. 10.2. How much did he spend altogether?

4. The mass of apples is 38.9 kg and mass of guava is 42.6 kg.
   a) Find the difference between mass of apples and gavas.
   b) Find the total mass.

Teacher will write 3 digit decimal number (up to 2 decimal places) on the board. Students will explain the method of subtractions.

Multiplication and Division of Decimals

Multiplication of Decimals with 10, 100 or 1000

The length of grain of a rice is 0.9 cm. If Sameer has 10, 100 and1000 such grains of rice. How we will calculate the total length?

To find the length of such10, 100 and 1000 grains of rice we will multiply the length of grains of rice with 10, 100 and 1000 respectively.

The total length of 10 grains of rice = 0.9×10

$$= \frac{9}{10} \times 10 = 9\text{cm}$$

The total length of 100 grains of rice = 0.9×100

$$= \frac{9}{10} \times 100 = 90\text{cm}$$

The total length of 1000 grains of rice = 0.9×1000

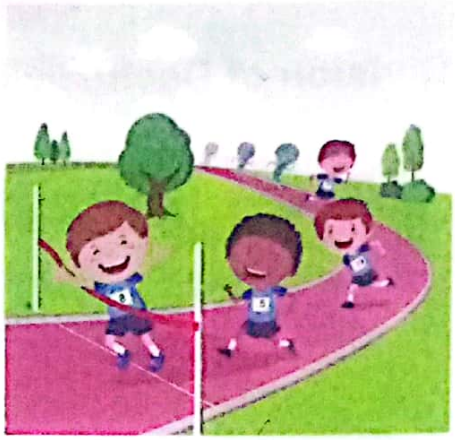
$$= \frac{9}{10} \times 1000 = 900\text{cm}$$

Key Fact

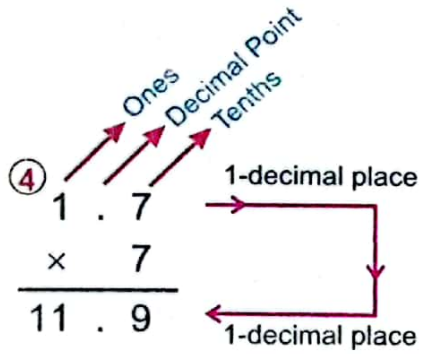
- To multiply any decimal number by 10 we move the decimal point 1 place to the right.
- To multiply the decimal number by 100 move the decimal point 2 places to the right.
- To multiply decimal number by 1000 we move the decimal point 3 places to the right.

Multiplication of Decimals with 1-digit number

Ahmed runs 1.7 km daily. How many kilometres he will run in one week?



To find out how far Ahmed will run in a week, we will multiply 1.7 with 7.

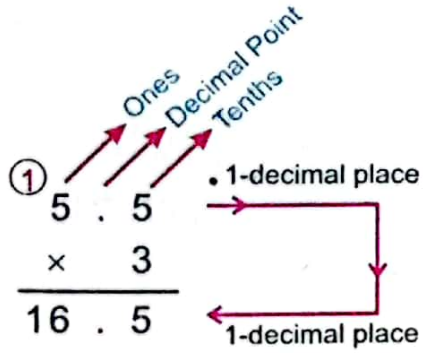


Try Yourself

A bus covers 8.5km when it travels between two towns. It takes five rounds in a day. How many kilometres does it travel?

Ahmed runs in a week = 11.9km

Multiply 5.5 with 3.



Key Fact

In multiplication of decimals, the place of decimal in product is equal to sum of decimal places of multiplicand and multiplier.

Make groups of students. Ask them to write one place decimal number and multiply with 1-digit number.

Division of Decimals

Division of Decimals by Whole Numbers

Komal divide 6.6 kg apples in 3 baskets. How many kilograms of apples are in each basket?

To find how many kilograms of apple in each basket we will divide 6.6 by 3.

Total apples = 6.6kg

Total baskets = 3

Apples in each basket = 6.6 ÷ 3

= 2.2kg

```
      2 . 2
   ┌──────
3  │ 6 . 6
 − 6
   ──────
     0 6
   −   6
   ──────
     0 0
```

Maham has 9.5 m of ribbon and she divides it into 5 equal pieces then find the length of each piece.

Length of ribbon = 9.5

Total pieces = 5

Length of one piece = 9.5 ÷ 5

= 1.9 m

```
      1 . 9
   ┌──────
5  │ 9 . 5
 − 5
   ──────
     4 5
   − 4 5
   ──────
       0
```

Try Yourself

Divide 2.8 by 4.

Ask the students to write decimals with 1-decimal place and divide it by 1-digit number.

Try It! Challenge

Write decimals with one decimal place which when divides by 4 will give 1.2, 0.2 and 0.4.

Exercise 4

1. Solve the following.

a) 5.9 × 10 b) 4.8 × 100 c) 0.3 × 1000

d) 8.2 ×10 e) 4.3 × 1000 f) 9.1 × 100

2. Solve the following.

a) 5.6 × 8 b) 7.1 × 2 c) 4.9 × 4

d) 3.4 × 3 e) 1. 3 × 7 f) 9.8 × 9

3. Solve the following.

a) 1.4 ÷ 2 b) 1.8 ÷ 9 c) 6.4 ÷ 4

d) 8.4 ÷ 6 e) 2. 7 ÷ 3 f) 2.6 ÷ 2

4. Saba uses 9.8 ml of oil to bake a cake. How much oil will she use to bake 10 such cakes?

5. A tailor uses 2.5 m cloth to make a shirt. How much cloth will he use to make 8 such shirts?

6. Length of one piece of rope is 7.2 m. Iram cut this rope into 4 equal pieces.

a) What will be the length of each piece?

b) If she will cut the rope in 2 equal pieces. What will be the length of each piece?

7. Ahmed solves 5 questions of Math in 8.5 minutes. How long he take to solve 1 question?

Estimation

Round off whole numbers to the nearest 10, 100 or 1000

In a garden there are 5271 mango trees. How can we round off the number of trees to the nearest 10, 100 and 1000?

We follow some rules to round off any number to the nearest 10, 100 or 1000.

The rule for rounding off:
Always look at the digit to the right of the one we are supposed to be rounding to:

- If it is 5 or more, then round it up.
- If it is less than 5, then round it down.

If we round off 5271 to the nearest 10 then we will look at the ones digit. As this digit is less than 5, therefore:

$$5271 \approx 5270$$

Remove all the remaining digits from the right and put zero in place of it. If we round off 5271 to the nearest 100 then we will see the digit at tens place. As this digit is 7 and greater than 5, so we add 1 to the digit in the hundredth place, therefore.

$$5271 \approx 5300$$

Remove all the remaining digits from the right and put zeros.

Try Yourself

Write 6789 by rounding off to the nearest 10, 100 and 1000.

Write some whole numbers oon the board and explain the method of rounding off numbers to nearest whole number. Ask the students to round off these numbers to the nearest 10, 100 and 1000.

If we round off 5271 to the nearest 1000 then we will look at the hundredths digit. As this digit is less than 5 therefore:

$$5271 \approx 5000$$

Remove all the remaining digits from the right and write zeros.

Round off decimals to the nearest Whole Number

Children spends approximately 1.7 hours practical work of Science. How can we round off this time to the nearest whole number?

We follow same rules to round off any decimals to the nearest whole number.

The rule for rounding off:
Always look at the digit to the right of the one we are supposed to be rounding to:

- If it is 5 or more, then round it up.
- If it is less than 5, then round it down.

In 1.7 the digit after the decimal point is greater than 5 so, we add 1 to the digit in the ones place.

$$1.7 \approx 2$$

Write some decimals on the board and explain the method of rounding off decimals to nearest whole number.

Let's round off 2.45 to the nearest whole number.

As in 2.45 the digit right of the decimal point is less than 5 so,

$2.45 \approx 2$

Key Fact

Estimation means to find a number that is nearest to the orignal number but not exact.

Try It!

Write 3 decimals that can be rounded off to 68.

Exercise 5

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

a) 9871 b) 5467

c) 1212 d) 6343

e) 5555 f) 3498

g) 1289 h) 4545

i) 1111

2. Round off the following decimal numbers to the nearest whole number.

a) 5.61 b) 54.2

c) 987.4 d) 12.7

e) 8.98 f) 6.5

g) 76.49 h) 8.19

i) 87.87

Try It! Challenge

Write pairs of 3-digit decimals up to 2-decimal places whose product is 1, 2 and 3 respectively. Verify your answer.

I Have Learnt

- Recognize a decimal number as an alternative way of writing a fraction.
- Express a decimal number as a fraction whose denominator is 10,100 or 1000.
- Identify and recognize the place value of a digit in decimals (up to 3 - decimal places).
- Convert a given fraction to a decimal if
  - Denominator of the fraction is 10,100 or 1000.
  - Denominator of the fraction is not 10,100 or 1000 but can be converted to 10,100 or 1000.
- Convert a decimal (up to 3 - decimal places) to fraction.
- Add and subtract 3 - digit numbers (up to 2 - decimal places).
- Multiply a 2 - digit number (up to 1 decimal place) by 10,100, and 1000.
- Multiply a 2 - digit number with 1decimal placeby a 1 - digit number.
- Divide a 2 - digit number with 1 - decimal place by a 1 - digit number
- Solve real life situations involving 2 - digit numbers with 1 - decimal place using appropriate operations.
- Round off a whole number to the nearest 10, 100, and 1000.
- Round off decimal (with 1 or 2 decimal places) to the nearest whole number.

Vocabulary

Fractions
Decimals
Denominator
Tenths
Hundredths
Whole Numbers
Round Off
Decimal Places
Thousandths

Review Exercise

1. Choose the correct answer.

a) Decimal is a fraction with the denominator is 1power of _____ ,

100 or 1000.

i) 10 ii) 2 iii) 15 iv) 0

b) When we divide a shape into 10 equal parts then each part is called

_____.

i) hundredths ii) tenths iii) one iv) half

c) To add the decimals always _____ ones in ones, tenths in tenths and

hundreds in hundredths.

i) add ii) subtract iii) multiply iv) divide

d) When we multiply any decimal by 100 we move the decimal _____

place to the right.

i) 1 ii) 2 iii) 3 iv) 0

e) _____means that to find such a number that is nearest to that

number but not exactly.

i) Decimal ii) Fraction

iii) Round off iv) Estimation

2. Represent the following in decimals.

a) $\frac{17}{100}$ b) $\frac{15}{200}$ c) $\frac{4}{20}$ d) $\frac{19}{100}$ e) $\frac{200}{250}$

3. Convert the following decimals to common fractions.

a) 6.7 b) 45.56 c) 1.02 d) 7.87 e) 15.8

4. Add the following.

a) 6.03, 5.56 b) 8.28 , 1.24 c) 12.8 , 3.14

5. Solve the following.

a) 7.59 – 2.48 b) 6.19 – 4.21 c) 5.06 – 1.09

6. Solve the following.

a) 1.3 ×10 b) 8.9 × 100 c) 4.5 ×1000

d) 8.2 × 7 e) 9.3 × 3 f) 7.1 × 6

7. Solve the following.

a) 6.8 ÷ 4 b) 8.8 ÷ 2 c 8.1 ÷ 9

d) 3.5 ÷ 7 e) 4.8 ÷ 6 f) 5.1 ÷ 3

8. Round off the whole number to the nearest 10, 100 and 1000.

a) 3429 b) 1009 c) 7824

d) 8417 e) 4090 f) 1717

9. Round off the decimals to the nearest whole number.

a) 4.17 b) 78.3 c) 13.45

d) 0.98 e) 41.41 f) 9.82

10. The length of a wire is 3.41 m and length of another wire is 7.56 m.

a) what will be the total length?

b) what is the difference between the lengths?

11. The capacity of a pack of juice is 3.4 litre.

a) What is the capacity of such 7 packs?

b) If the capacity of a pack of juice is 2.8 litre then what will be the capacity of 5 packs?

12. The mass of 4 boxes of pencils is 1.8 kg. What will be the mass of 1 box?

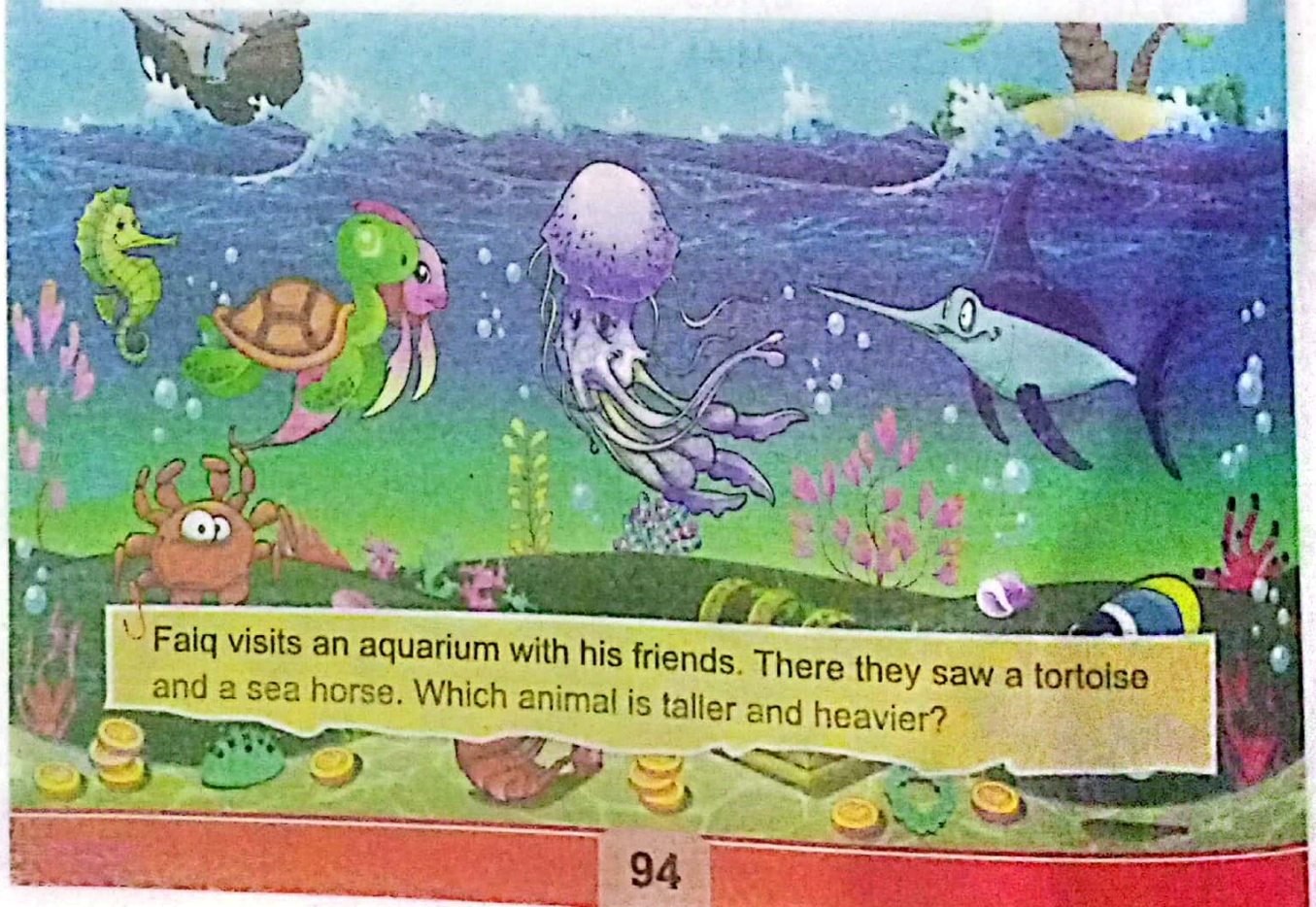
Unit 5

Measurement

Learning Outcomes

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

- Use standard metric units to measure the length of different objects.
- Convert larger to smaller metric units (2 - digit numbers with one decimal place)
  - kilometres into metres
  - metres into centimetres
  - centimetres into millimetres
- Add and subtract measures of length in same units
- Use standard metric units to measure the mass of different objects.
- Convert larger to smaller metric units (2 - digit numbers with one decimal place)
  - kilograms into grams
  - grams into milligrams
- Add and subtract measures of mass in same units
- Use standard metric units to measure the capacity of different containers.
- Convert larger to smaller metric units (2 - digit numbers with one decimal place) litres into millilitres
- Add and subtract measure of capacity in same units
- Solve real life situations involving conversion, addition and subtraction of measures of length, mass and capacity

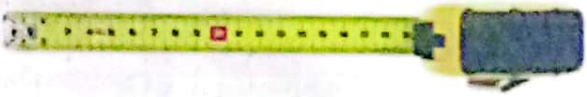


Faiq visits an aquarium with his friends. There they saw a tortoise and a sea horse. Which animal is taller and heavier?

Length

Asif wants to know the length of his classroom. How will he measure its length?

To measure the length of the classroom, we will use tape measure.



We measure the length of short objects(book, table, geometry box) in centimetres and the length of long objects in metres.

How can we measure the distance between two places?

we will use unit of kilometre to measure the distance between two places.
These units of length are closely related to each other.

1cm = 10 mm

1m = 100 cm

1km = 1000 m

Conversion of units of Length

Kilometres to Metres

The distance between the first and last station of Lahore Metro Bus is 27 km. How do I find this distance in metres?

Give flashcards of objects (ribbons, ropes) with different length to students. Ask them to separate out the objects according to their unit of length.

To find this distance in metre we will multiply 27 by 1000.

Key Fact

1km = 1000m

Convert 27 km to metre.

27km = 27 × 1000m

= 27000m

To convert 45 km 7m to metre. First convert 45 km into metre then add 7 m into it.

Convert 45km 7m to metre.

45km 7m = 45km + 7m

= 45 × 1000m + 7m

= 45000m + 7m

= 45007m

Try Yourself

The distance between Faisal Masjid and Damen koh is 7.7 km. Convert this distance in metre?

Conversion of Metres to Centimetres

The height of the great wall of china is 8 m approximately. What will be its height in centimetre?

Key Fact

1m = 100cm

To find the height of the great wall of China in centimetre we will multiply 8m by 100.

Convert 8 m into centimetre.

8m = 8 × 100cm

= 800 cm

The students write some distances in kilometre on board and ask them to convert these in metre.

Convert 13 m 38 cm into centimetre.

To convert 13 m 38 cm into centimetre. First convert 13m into cm then add 38 cm to it.

13m 38cm = 13m + 38cm

= 13 × 100cm + 38cm

= 1300cm + 38cm

= 1338cm

Try Yourself

The length of whale is about 25 m. What will be its length in centimetre?

Conversion of Centimetres to Millimetres

Tania has a 78 cm long toy car. What will be its length in millimetre?

Multiply by 10 to convert cm to mm.

78cm = 78 × 10mm

= 780mm

The length of toy car is 780 mm.

Key Fact

1cm = 10mm

Convert 56 cm 7 mm into mm.

To convert 56 cm 7 mm into mm first we convert 56 cm into mm and then add mm to it.

56cm 7mm = 56cm + 7mm

= 56 × 10mm + 7mm

= 560mm + 7mm

= 567mm

Try Yourself

- Ahmed buys a bag. The length of bag is 42 cm. What is the length of bag in mm?
- If the length of alligator is 4.1 m then what will be its length in cm?

TEACHING POINT

Students will write some distances in metre on the board and convert into centimetres.

Exercise 1

1. Circle the correct units of length.

a) 

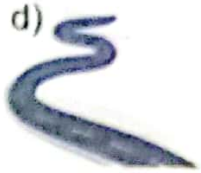
m / cm

b) 

mm / cm

c) 

m / cm

d) 

m / km

2. Convert these units of length.

a) 12 km into m

b) 56 km 930 m into m

c) 88 m into cm

d) 60 m 78 cm into cm

e) 3.2 cm into mm

f) 55 cm 2 mm into mm

Addition and Subtraction in Units of Length

The distance between Faiza's home and her office is 2km 600 m and distance between her office and market is 3 km 200 m. what will be the distance between her home to market?

To find the distance between Faiza's home and market we will add the distance between them.

Distance between home and office	=	2km 600m
Distance between office to market	= +	3km 200m
Distance between home and market	=	5km 800m

The distance between Faiza's home to market is 5 km 800 m.

Now, to convert this distance into metres we will convert 5 km into metre and add 800 to it

$$\begin{aligned} 5\text{km} + 800\text{m} &= 5\text{km} + 800\text{m} \\ &= 5 \times 1000\text{m} + 800\text{m} \\ &= 5000\text{m} + 800\text{m} \\ &= 5800\text{m} \end{aligned}$$

The distance between Faiza's home and market is 5800m

The height of the minar of Faisal Masjid is 90 m and the height of the minar of Badshahi Masjid is 60 m. What is the difference between the heights of two minars? Give your answer in centimetres.

To find the difference between the heights of the minars we will subtract their heights.

Subtract 60 m from 90 m.

Height of minar of Faisal Masjid	=	90m
Height of minar of Badshahi Masjid	=	– 60m
Difference	=	30m

Key Fact

- To add/subtract the units of length, always add/subtract same units.
- Add/subtract km into km, m into m, cm into cm and mm into mm.

The difference between the heights of minars of Faisal Masjid and Badshahi Masjid is 30m. Now 30m = 30x100 cm = 300 cm.

TEACHING POINT

Give ribbons of different length to students. Ask them to measure the length of these ribbons. Add and subtract the lengths.

Exercise 2

1. Solve the given units of length.
   a) 22km + 33km
   b) 88km + 6km 17m
   c) 82m + 22m
   d) 71cm 2mm + 11cm 6mm
   e) 21m 16cm + 20m 14cm
   f) 74km 122m + 13m

2. Solve the given units of length.
   a) 99km – 74km
   b) 52km 48m – 6km 22m
   c) 47m – 10m
   d) 35cm 5mm – 25cm 1mm
   e) 21m 16cm – 20m 14cm
   f) 74km 122m – 13m

3. Tahir has two pieces of rope. The length of one piece is 38 m 87 cm and length of the other piece is 61 m 12 cm. What will be the total length?

4. Ahmed buys 140 cm of ribbon to warp the gift box. Convert the length in millimetres?

5. Kamal covers distance of 2 km 712 m going from school to home. He covers distance of 1 km 216 m to go from home to masjid.
   a) Find the difference between the distances in metre.
   b) Convert the difference into metres.

6. The length of Ahmed's room is 12 m 56 cm. His sister's room is 10 m 44 long.
   a) What will be the total length of both rooms in cm?
   b) what is the difference between the length of both rooms?

Mass

Wajid bought a computer table. He wants to find the mass of his table. Which unit will he use to find its mass?

He will use the unit of kilogram to find the mass of the computer table.

Key Fact

- We use grams to measure the mass of light objects.
- We use kilogram to measure the mass of heavy objects.
- We use milligram to measure the mass of small objects like beads, grain of wheat or medicines.

We want to find the mass of an elephant. Which unit will we use to find its mass?

To find the mass of an elephant we will use kilograms. These units of mass are closely related to each other.

1kg = 1000g

1g = 1000mg

Show objects of different massess to students and ask them to sort out the objects according to the units of mass.

Conversion of units of Mass

Conversion of Kilograms to Grams

The mass of the human brain is 1.5 kg. What will be the mass of brain in grams?

Key Fact

1kg = 1000g

To find the mass of brain in grams we multiply 1.5 kg by 1000.

$$1.5\text{kg} = 1.5 \times 1000\text{g}$$

$$= \frac{15}{10} \times 1000\text{g} = 1500\text{g}$$

The mass of brain is 1500 grams.

Try Yourself

The mass of water melon is 3 kg. what will be its mass in grams?

Convert 60kg 234 g into grams.

To convert 60 kg 234 g into grams, first convert 60 kg into grams and then add 234 g to it.

$$60\text{kg } 234\text{g} = 60\text{kg} + 234\text{g}$$

$$= 60 \times 1000\text{g} + 234\text{g}$$

$$= 60000\text{g} + 234\text{g}$$

$$= 60234\text{g}$$

The students will write mass of some objects in kilograms on the board and convert into grams.

Conversion of Grams to Milligrams

Umar buys 500g rice. What will be the mass of rice in milligrams?

We multiply 500 g by 1000 to convert grams into milligrams.

$$500g = 500 \times 1000mg$$

$$= 500000mg$$

Let's convert 45 g 12 mg into mg.

Try Yourself

The mass of the human heart is 230 g. what will be the heart mass in milligrams?

To convert 45g 12mg into mg first convert 45g into milligrams and then add 12mg to it.

$$45g\ 12mg = 45g + 12mg$$

$$= 45 \times 1000mg + 12mg$$

$$= 45000mg + 12mg$$

$$= 45012\ mg$$

Try It!

The mass of the bulb is 12 mg and mass of tube light is 25 g. Tell how much heavy in milligrams a tube light is than blub?

To remind the students write some mass in grams on the board and ask them to convert these into milligram.

Addition and Subtraction of Units of Mass

Addition of Units of Mass

Ammar has a bag of coins whose mass is 5 kg 600 g. Imran has a bag of coins of mass 2 kg 200 g. What will be the mass of both bags in grams?

To find the total mass of both we have to add the mass of both bags.

The mass of Ammar's bag =		5kg	600g
The mass of Imran's bag =	+	2kg	200g
The mass of both bags =		7kg	800g

So the mass of both bags is 7 kg 800g. Now to convert it into grams we convert 7 kg into grams and then add 800 to it.

7kg 800g = 7kg + 800g

= 7 × 1000g + 800g

= 7000g + 800g

= 7800g

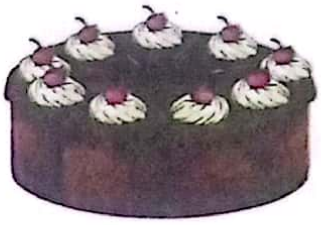
So the mass of both bags is 7800g.

Key Fact

To compare numbers, compare digits from left to right to add the units of mass always add the same units. Add kg into kg, g into g and mg into mg. until you find two different digits.

Subtraction of Units of Mass

Asma bakes a cake, its mass is 500 g and Shazia bakes a cake, its mass is 750 g. What is the difference between the mass of the two cakes?



To find the difference between the masses of the two cake we will subtract.

Mass of Shazia' s cake	=	750g
Mass of Asma's cake	= –	500g
Difference	=	250g

Difference between the mass of the two cakes is 250g

Try it! Challenge

The mass of two boxes is 6.9 kg. if the mass of one box is 4.5 kg then what will be the mass of the other box?

Exercise 1

1. Convert the following units of mass.
   a) 65 kg into g b) 23 kg 139 g to g c) 89g to mg
   d) 43 g 699 mg to mg e) 1.9 g to mg f) 0.8 kg to g

2. Solve the following.
   a) 36kg + 76kg b) 18kg + 17kg 17g d) 8.2g + 2.2g
   e) 71g 2mg + 11g 560mg
   e) 21g 16mg + 60g 14mg
   f) 94kg 122g + 23g

Give some flashcards with different mass to the students. Ask them to add and subtract the masses and convert the units.

3. Solve the following.

a) 99kg – 24kg

b) 58kg 458g – 29kg 303g

c) 904g – 154g

d) 39g 500mg – 25g 100mg

4. Usman has two fish in a jar. The mass of one fish is 29 g 20 mg and mass of the other is 20 g 14 mg. What is the difference between the mass of the two fish in mg?

5. A shopkeeper sells 49 kg 208 g of sugar and 65 kg 750 g of flour. What is the total quantity of sugar and flour in grams?

6. Jamal weighs 67 kg 278 g and his father weighs 89 kg 924 g.

a) What is the difference in their masses?

b) Convert the difference of their masses in grams.

Capacity

Waleed has a water bottle. He wants to find the capacity of the water bottle. How will he find the capacity?

To find the capacity, we use the unit of litre.

Make two groups of students and give them containers with different capacities and ask them to seperate the containers according to units of capacity.

We use of millilitre to measure the capacity of small containers (glass, cup). We use the unit of litre to measure the capacity of large containers.

If we want to find the capacity of a tub then how we will find its capacity?

We will use unit of litre to find the capacity of a tub. The units of capacity are closely related.

$1l = 1000ml$

Conversion of units of capacity

Litres to Millilitres

Minahil drinks 3 litres of water in a day. How many millilitres of water does she drink in a day?

To convert litres into millilitres we multiply litres by 1000.

$3l = 3 \times 1000ml = 3000ml$

Minahil drinks 3000ml of water in a day.

The students are given some flashcards with units of litres. They are asked to convert litre into millilitre.

Convert 10*l* 345 m*l* into m*l*.

Try Yourself

In a human body the quantity of water is 42*l*. Convert this quantity in m*l*.

To convert 10*l* 345 m*l* into m*l*, first convert 10*l* into m*l* and then add 345 m*l* to it.

$$10l\ 345ml = 10l + 345ml$$
$$= 10 \times 1000ml + 345ml$$
$$= 10000ml + 345ml$$
$$= 10345ml$$

Exercise 4

1. convert the following units of capacities.
   a) 9 *l* into m*l*
   b) 74 *l* into m*l*
   c) 56 *l* 506 m*l*
   d) 90 *l* into m*l*
   e) 67 *l* into m*l*
   f) 1.6 *l* into m*l*
2. The capacity of an oil tanker is 98 *l*. Convert the capacity of tanker in millilitres.
3. Faria uses 1.7 litres of milk to make milkshake. Convert the quantity of milkshake into millilitres.

Addition and Subtraction in Units of capacity

Maryam uses 56 m/ of oil to make a pizza and 78 m/ of oil to make biscuits. How much millilitres of oil she use to make both things?

To find the total quantity of oil used in both things we will add the quantity of both.

The quantity of oil used to make pizza	=	56m/
The quantity of oil used to make biscuits	= +	78m/
Total quantity of oil	=	134m/

The total quantity of oil used is 134m/

Add 1.2 / and 7.6 / and convert it into millilitres.

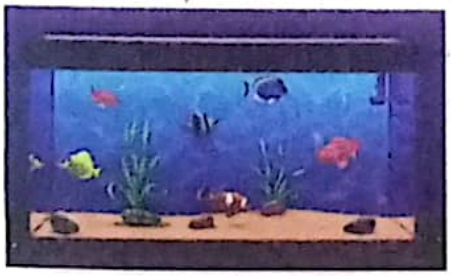
	1.2/
+	7.6/
	8.8/

Now we convert it into millilitres.

8.8 × 1000m/ = 8800m/

Key Fact

To add the units of capacity always add the same units, litre in litre and millilitres in millilitres.



A fish jar has 20 / water and other jar has 18 / water. how much more water is in one jar than the other? Give your answer in millilitres.

To find the difference between the capacity of both jars we will subtract the quantities.

Make two groups of students. Put some flashcards of litre and millilitres in the basket. Ask them to pick some cards and add.

Lets' subtract 18 *l* from 20 *l*.

The capacity of water in a jug	=	20 *l*
The capacity of water in second jug	=	− 18 *l*
Differnce	=	2 *l*

The difference between the capacity of both jars is 2*l*.
To find the capacity of water in m*l* we multiply 2*l* by 1000.

$$2l = 2 \times 1000ml = 2000ml$$

One jar has 2000m*l* more water.

Key Fact

To subtract the units of capacity always subtract the same quantities, litres from litres, millilitres from millilitres.

Try Yourself

A juice pack has 250 m*l* juice and another juice pack has 400 m*l*. What is the difference between the capacity of both juice packs?

Exercise 1

1. Solve the following.

a) 3*l* 109m*l* + 5*l* 304m*l* b) 6.5*l* + 4.2*l* c) 122*l* + 76m*l*

d) 34*l* 200m*l* + 92*l* e) 41*l* 200m*l* + 404*l* 478m*l*

2. Solve the following.

a) 22*l* 500m*l* − 10*l* 109m*l* b) 55*l* − 32*l* c) 2.2m*l* − 1.5m*l*

d) 4*l* 878m*l* − 3*l* 760m*l* e) 78*l* 209m*l* − 16*l* 142m*l*

3. Zara has two containers. The capacity of one container is 67*l* 198 m*l* and the capacity of the other is 84*l* 300 m*l*.
   a) What is the total capacity of the containers?
   b) What is the difference in the capacity of both containers?

4. A shopkeeper sells 72.8 *l* milk on Saturday and 92.6 *l* milk on Sunday. On what day does he sell less milk? Give your answer in millilitres.

Make two groups of students. Put some flashcards of litre and millilitres in the basket. Ask them to pick some cards and subtract.

I Have Learnt

- Useing standard metric units to measure the length of different objects.
- Converting larger to smaller metric units (2 - digit numbers with one decimal place)
  - kilometres into metres
  - metres into centimetres
  - centimetres into millimetres
- Adding and subtract measures of length in same units
- Useing standard metric units to measure the mass of different objects.
- Converting larger to smaller metric units (2 - digit numbers with one decimal place)
  - kilograms into grams
  - grams into milligrams
- Adding and subtract measures of mass in same units
- Useing standard metric units to measure the capacity of different containers.
- Converting larger to smaller metric units (2 - digit numbers with one decimal place) litres into millilitres
- Adding and subtract measure of capacity in same units
- Solveing real life situations involving conversion, addition and subtraction of measures of length, mass and capacity

Vocabulary

(Length)
Kilometre)
(Metre)
(Centimetre)
(Millimetre)
(Mass)
(Kilogram)
(Gram)
(Capacity)
(Litre)
(Millilitre)

Review Exercise

1. Choose the correct answer.

a) There are _____ metre in one kilometre

i) 1 ii) 10 iii) 100 iv) 1000

b) There are _____ grams in one kilogram.

i) 1 ii) 10 iii) 100 iv) 1000

c) To convert cm to mm multiply it with _____.

i) 10000 ii) 100 iii) 10 iv) 1000

d) one metre is equal to _____ centimetres.

i) 1000 ii) 10 iii) 1 iv) 100

e) one litre is equal to 1000 _____.

i) grams ii) metres iii) millilitres iv) litres

2. Convert the given units.

a) 105 km into m b) 3.4 m into cm c) 66 kg into g

d) 60 g 498 mg into mg e) 0.5 g into mg f) 76 *l* 2 m*l* into m*l*

g) 9.8 *l* into m*l* h) 90 cm into mm

3. Add the given units.

a) 5kg 299g + 9kg b) 4.5m + 2.8m c) 78kg 700g + 81kg 172g

d) 212*l* 200m*l* + 92*l* 500m*l* e) 119*l* 329m*l* + 365*l* 262m*l*

f) 65g 313mg + 98g 198mg

4. Subtract the given units.

a) 506kg – 417kg b) 85m 405cm – 13m 21cm

c) 84kg 711g – 75kg 680g d) 78*l* 805m*l* – 63*l* 214m*l*

e) 98*l* 788m*l* – 45l 659m*l*

5. The height of K-2 is 8 km 611 m and Mount Everest is 8 km 848 m.

a) What is the difference between the heights of the mountains? Give your answer in metres?

b) What is the total height of the mountains?

6. On Eid, Asim buys a goat and a camel, to sacrifice. The goat weighs 55 kg and the camel weighs 200 kg.

a) Find the total mass of the animals.

b) Convert the total mass into grams.

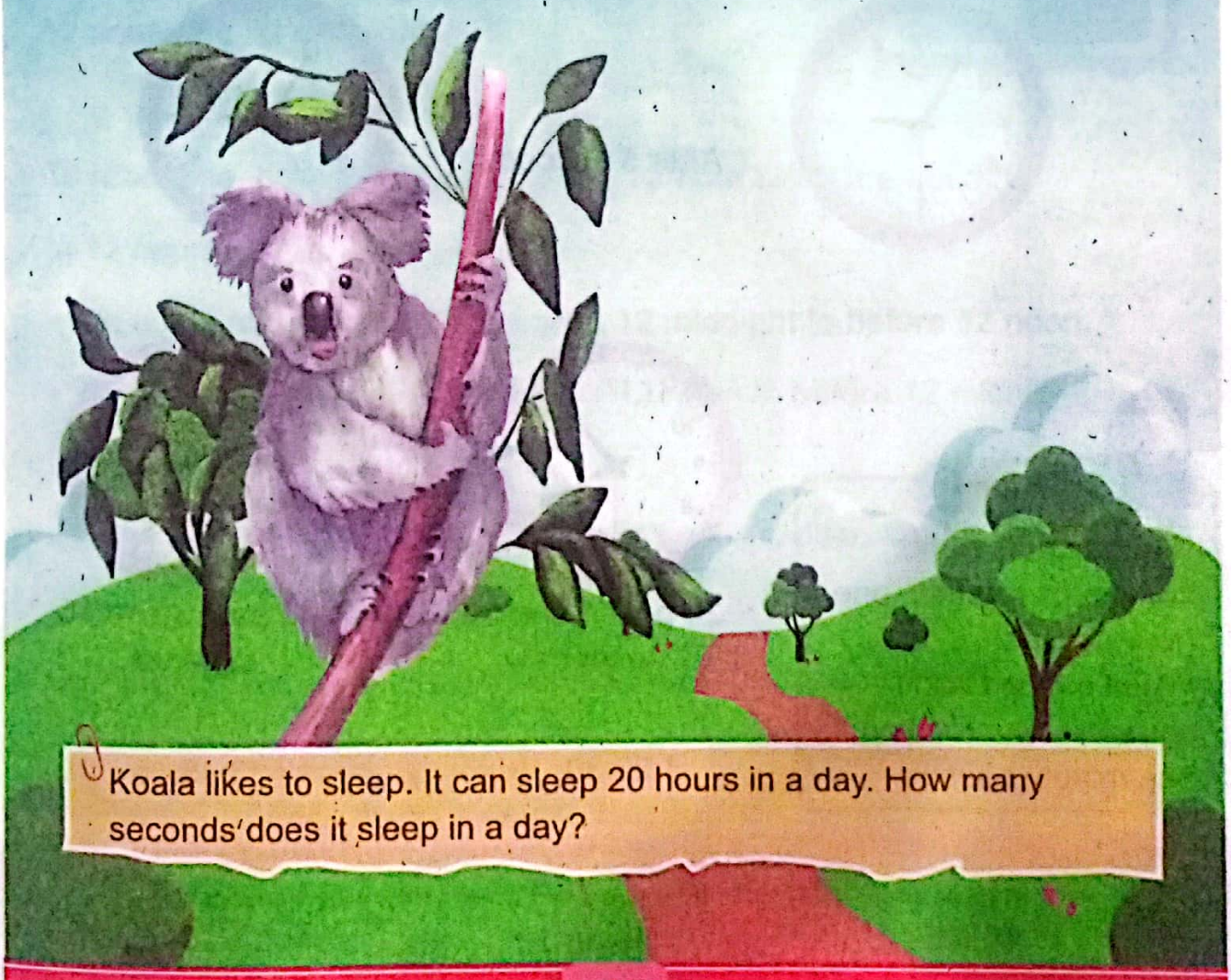
7. Capacity of a bucket is 87*l* and capacity of a tub is 112*l* 456m*l*. What is the total capacity in millilitres?

Time

Learning Outcomes

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

- Read and write the time using digital and analogue clocks on 12-hour and 24- hour format.
- Convert hours to minutes and minutes to seconds.
- Convert years to months, months to days, and weeks to days.
- Add and subtract measures of time without carrying and borrowing.
- Solve simple real-life situations involving conversion, addition and subtraction of measures of time.



Koala likes to sleep. It can sleep 20 hours in a day. How many seconds does it sleep in a day?

Time

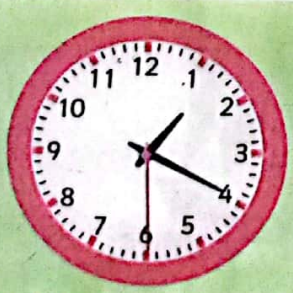
Its time for the Science experiment. Hour's hand is on 10 and minute's hand is on 2. It means that the time is 10 past 10. What is this third hand use for?

The third hand of the clock is seconds. With each move of the second hand from one small mark to another, 1 second passes. Now the time is 10 past 10 and 30 sec. This time can be written as 10:10:30.

After 5 seconds

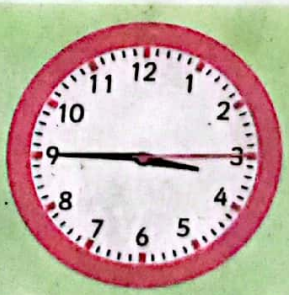
Key Fact

When minute hand completes rotation, one hour passes.
When second hand complete one rotation, one minute passes.



20 past 1 and 30 seconds.

1:20:30

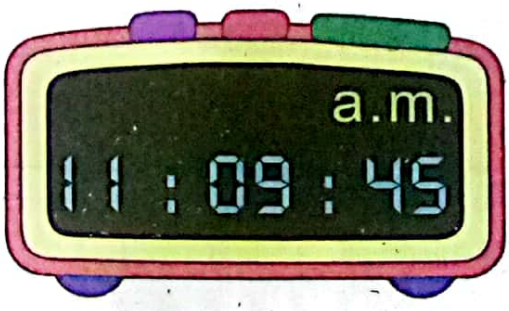


45 past 3 and 15 seconds.

3:45:15

Show a real clock to the students and explain what is meant by 1 second.

To see the time we also use another clock except of analog clock. Can you tell what watch is it? Digital clocks are also used to read the time.



Its 9 past 11 and 45 sec.

Now read the time given on this clock.
Here p.m. means, the time is between 12 noon and 12 midnight.

To read time, both 24 hour clock and 12 hour clock are used.

In 12 hours clock:

- We use a.m. to read the time after 12 midnight to before 12 noon.
- We use p.m. to read the time after 12 noon to before 12 midnight.

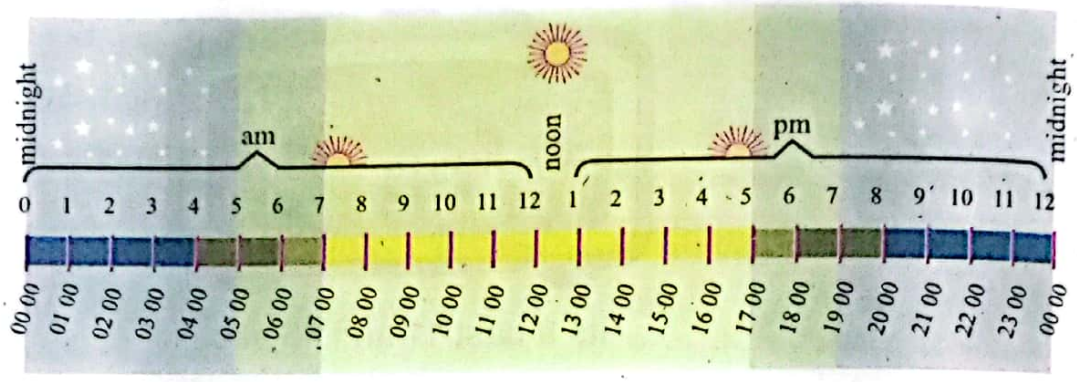
In 24 hours clock:

- A day runs from midnight to midnight and is divided into 24 hours.
- Time is shown in 4 digits.
- 12 O'clock midnight is expressed as 0000 hours and 12 O'clock noon is expressed as 1200 hours.

Ask the students to write about their daily routine by using correctly 12 hours clock time.

Try Yourself

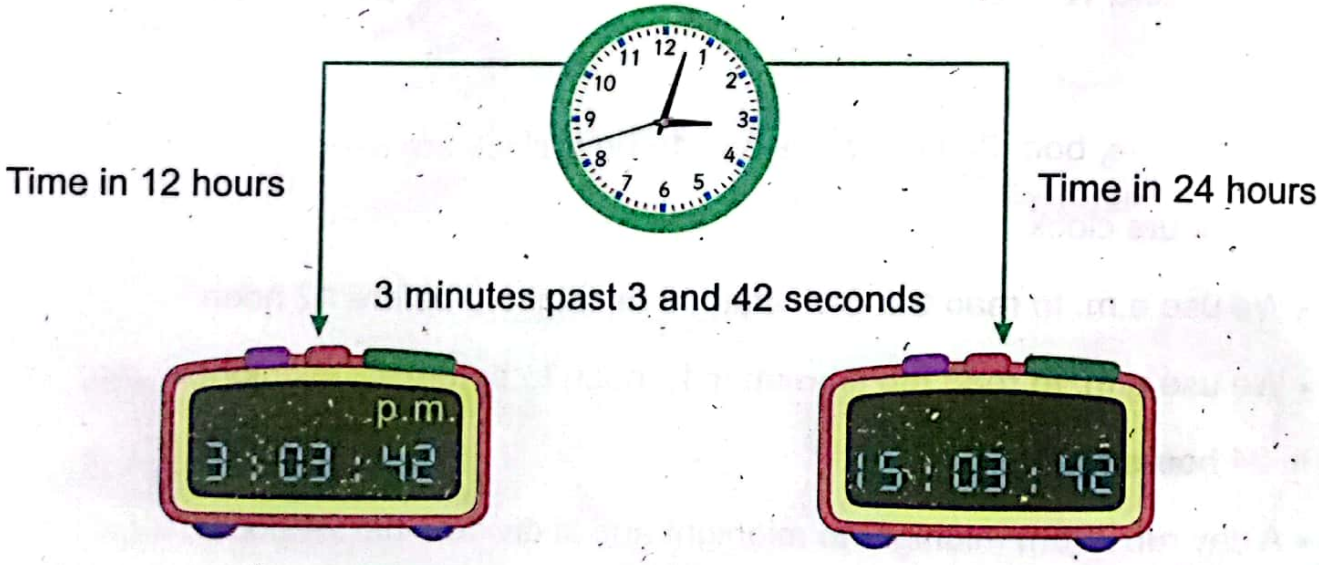
Write 5 a.m. and 5 p.m. in 12-hour and 24 hour format.



Time on 12 hours clock:

Time on 24 hours

In 24 hours clock, can be written as 11:00 in and 11 p.m. can be written as 23:00. The following three clocks show the same time:



Format to write time in 12-hours

Format to write time in 24-hours

We did not use the number 24 in 24 hour format rather we have numbers from 0 to 23.

Ask the students to write about their daily routine by using correctly 24 hours clock time.

Exercise 1

1. Colour the correct time of your daily activities using the 12-hours clock time.

	Day activities	Time in 12 hour	
a	Getting up for the school	6:00 a.m.	6:00 p.m.
b	Going to the school	7:45 a.m.	7:45 p.m.
c	Lunch time in the school	12:30 a.m.	12:30 p.m.
d	Playing time in the evening	4:30 a.m.	4:30 p.m.
e	Isha prayer	8:00 a.m.	8:00 p.m.
f	Sleeping time at night	10:25 a.m.	10:25 p.m.

2. With the help of clocks write the correct time in 24- hour format.

a)

Look at the clock and tell what time Numan has breakfast?

b)

Look at the clock and tell what time Farheen play with her friends?

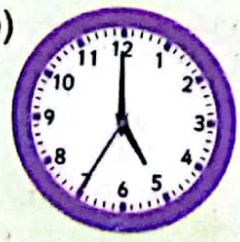
c)

Look at the clock and tell what time Junaid sleep?

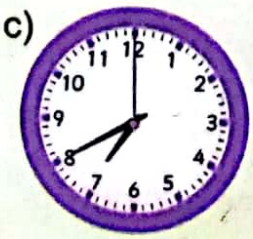
3. Look at the following clocks and tell the time in hours, minutes and seconds.

a)

b)



c)

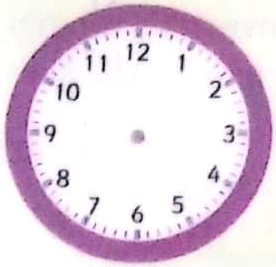


d)

4. Draw hands of hours, minutes and seconds according to the given time.

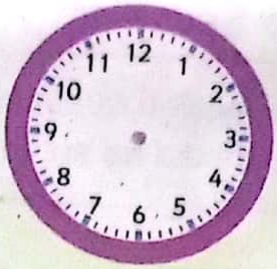
2:15:30

6:25:03



10:22:55

8:20:01



12:42:16

9:11:31

Conversion of Hours, Minutes and Seconds

Convertions of Hours to Minutes

At least 8h of sleep a day is essential for good health, how many minutes are there in 8 hours?

As there are 60 min in an hour therefore to convert hours to minutes we will multiply hours by 60.

$8\text{ h} = 8 \times 60$

$= 480\text{ min}$

Minutes in 8 hours $= 480\text{ min}$

Convert 3 hours 32 min to minutes.

To convert 3 h 32 min to minutes first convert 3 hours to minutes then add 32 min to it.

$$3\text{ h }32\text{ min} = 3\text{ h} + 32\text{ min}$$
$$= 3 \times 60\text{ min} + 32\text{ min}$$
$$= 180\text{ min} + 32\text{ min}$$
$$= 212\text{ min}$$

Try Yourself

Convert 5 hours 5 min into minutes.

Convertions of Minutes to Seconds

Saad solved the division question in 6 min. How many seconds did he solve the question?

To convert minutes to second we multiply minutes by 60.

$$6\text{min} = 6 \times 60$$
$$= 360\text{ sec}$$

So, Saad solved the question in 360 sec.

Key Fact

1min = 60 sec

1hour = 60 min

Try It! Challenge

How many seconds are there in one day?

Convert 12 min 12 sec into seconds.

To convert 12 min 12 sec into second first we convert 12 minutes to seconds and then will add 12 sec into it.

$$12\text{ min }12\text{ sec} = 12\text{ min} + 12\text{ sec}$$
$$= 12 \times 60\text{sec} + 12\text{sec}$$
$$= 720\text{ sec} + 12\text{ sec}$$
$$= 732\text{ sec}$$

Write the time in hours on the board and ask the students to write these hours in minutes. Give some flashcards of minutes and ask them to convert them to seconds.

Exercise 2

1. Convert the following time in minutes.

a) 6h b) 201h c) 14 h 12min d) 5h 55min

e) 17h 28min f) 22h 26min g) 11h 48min h) 22h 15min

i) 9h 43min j) 18h 6min k) 27h 38min l) 42h 26min

2. Convert the following time in seconds

a) 77min b) 43min c) 1min 13sec d) 8min 32sec

e) 6min 53sec f) 63min 58sec g) 88min 59sec h) 65min 37sec

i) 214min 24sec j) 100min 11sec k) 176min 18sec l) 432min 03sec

Conversion of Years, Month and Days

Convertions of Years to Months

The planet Jupiter completes one rotation around the Sun in about 12 years. How many months does he complete a rotation?

There are 12 months in an year therefore to convert 12 years to months we will multiply number of years by 12.
to convert years to months we will multiply the number of years by 12.

$$12 \text{ years} = 12 \times 12$$

$$= 144 \text{ months}$$

Planet Jupiter complete one rotation around the Sun in 144 months.

Convert 4 years 11 months to months.

To convert 4 years 11 months to months, first we convert 4 years to months and add 11 months to it.

4 years 11 months = 4 years + 11 months

= 4 × 12 months + 11 months

= 48 months + 11 months

= 59 months

Conversion of Months to Days

It takes about 2 months to climb Mount Everest during the favourable weather. How many days are there in 2 months?

To convert months to days, we multiply the number of months by 30.

2 months = 2 × 30 days

= 60 days

There are 60 days in 2 months.

Convert 5 months 44 days into days.

To convert 5 months 44 days to days, first we convert 5 months to days and add 44 days to it.

5 months 44 days = 5 months + 44 days

= 5 × 30 days + 44 days

= 150 days + 44 days

= 194 days

Try Yourself

Convert 10 months 22 days into days.

Give some cards to students in which years written and ask them to convert these to months.

Conversions of Weeks to Days

A shark can live about 10 weeks without food. How many days are there in 10 weeks.

There are 7 days in a week. Therefore, to convert weeks to days, we multiply number of weeks by 7.

10 weeks = 10 × 7 days
= 70 days

There are 70 days in 10 weeks.

Key Fact

1 day	= 24 hours
7 days	= 1 week
30 days	= 1 month
12 months	= 1 year

Convert 8 weeks 20 days to days.

To convert 8 weeks 20 days to days, first we convert 8 weeks to days and then add 20 days to it.

8 weeks 20 days = 8 weeks + 20 days
= 8 × 7 days + 20 days
= 56 days + 20 days
= 76 days

Try It!

How many weeks are there in 4 years?
How many days are there in 12 years?

Exercise 3

1. Convert the following into months.

a) 9 years	b) 4 years	c) 12 years
d) 21 years	e) 8 years 3 months	f) 5 years 4 months
g) 20 years 6 months	h) 17 years 10 months	i) 30 years 11 months
j) 29 years 7 months	k) 15 years 11 months	l) 43 years 7 months

2: Convert the given into days.

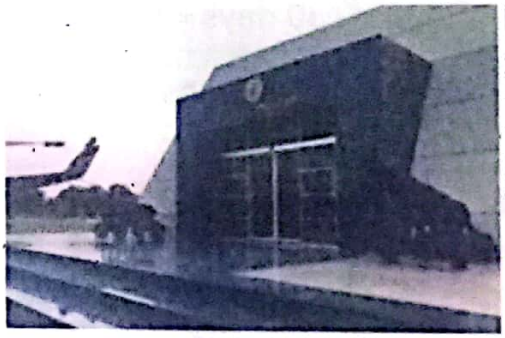
a) 11 weeks b) 8 weeks c) 5 weeks

d) 25 weeks e) 9 weeks 6 days f) 7 weeks 1 day

g) 2 weeks 5 days h) 4 weeks 3 days i) 32 weeks 4 days

j) 27 months 3 days k) 41 months 12 days l) 54 months 13 days

Addition and Subtraction Measures of Time



During an information tour the students spend 3 hours 15 minutes in Army museum and 2 hours 22 minutes in Science museum. How much time did they spend at both places?

To find the total time they spend in both places, we add the time and convert to minutes.

Time spend in Army museum	=	3h	15min
Time spend in Science museum	=	+ 2h	22min
Total time	=	5h	37min

They spent 5 hours 37 minutes. Now we will convert this time to minutes.

$$5 \text{ h } 37 \text{ min} = 5 \text{ h} + 37\text{min}$$
$$= 5 \times 60 \text{ min} + 37\text{min}$$
$$= 300 \text{ min} + 37\text{min}$$
$$= 337 \text{ min}$$

Students spent 337 minutes at both places.

The government launched two development projects simultaneously. First project takes 3 years 7months to complete. It takes 1 year 2 months to complete the other project. Find how much less time does it take to complete the second project. Write your answer in months?

To find out that in how much less time the second project completes. We subtract the time duration and convert it to months.

Key Fact

To add/subtract the units of time always start from smaller unit.

		Years	months
Duration of first project	=	3	7
Duration of second taken project	=	− 1	2
Difference in takes time	=	2	5

The second project taken 2 years 5 months less time than the first project. Convert this duration to months.

2 years 5 months = 2 years + 5 months

= 2 × 12 months + 5 months

= 24 months + 5 months

= 29 months

The second project takes 29 months less than the first project.

Exercise 4

1. Solve the following.
   a) 34 h 11 min 13 sec + 11 h 18 min 32 sec
   b) 24 h 34 min 37 sec + 2 h 21 min 11 sec
   c) 54 h 19 min 45 sec + 43 h 20 min 10 sec
   d) 5 h 15 min 31 sec + 4 h 4 min 25 sec
   e) 14 years 7 months 2 days and 7 years 4 months 2 days
   f) 51 h 02 min 8 sec + 37 h 11 min 09 sec
   g) 49 years 2 months 5 days + 40 years 5 months 11 days
   h) 27 years 3 months 5 days + 32 years 6 months 4 days
2. Solve the following.
   a) 45 h 45 min 49 sec – 10 h 23 min 38 sec
   b) 57 h 22 min 27 sec – 33 h 11 min 12 sec
   c) 65 h 28 min 56 sec – 54 h 20 min 45 sec
   d) 6 h 26 min 42 sec – 5 h 15 min 31 sec
   e) 25 years 8 months 3 days – 23 years 6 months 1 day
   f) 62 h 53 min 29 sec – 51 h 42 min 08 sec
   g) 88 years 11 months 29 days – 46 years 10 months 15 days
   h) 37 years 6 months 29 days – 17 years 6 months 18 days
3. Ahmed went to his grand mother's home on Sunday and he stays there for 2 hours and 20 minutes On Monday, he goes to his aunt's home and he spends 4 hours and 23 minutes. Find:
   a) How much time does he spend at his relative's home?
   b) Write the time in minutes.
4. Ejaz travelled 6 hours 34 minutes 45 seconds in a bus and 4 hours 20 minutes 12 seconds. Find:
   a) How much more time did he travell in the bus than the train?
   b) How much he travelled in all in bus and train? The total he travelled.
5. Maha takes 9 hours 23 minutes to complete a picture while Rohan takes 7hours 10 minutes to complete the same picture. Find:
   a) how much more time does Maha take?
   b) The total time they take altogether.

I Have Learnt

- Read and write the time using digital and analogue clocks on 12-hour and 24- hour format.
- Convert hours to minutes and minutes to seconds.
- Convert years to months, months to weeks, and weeks to days.
- Add and subtract measures of time without carrying and borrowing.
- Solve simple real-life situations involving conversion, addition and subtraction of measures of time.

Vocabulary

Months	Time
Weeks	Hours
Conversions	Minutes
Addition	Second
Subtraction	Days
	Years

Review Exercise

1. Choose the correct option.

a) There is 13: 50 in 24 hour clock, what time will be in 12 hour clock?

i) 1:50a.m.1 ii) 3:50p.m. iii) 1:50p.m. iv) 12:50 p.m.

b) There is 3: 55 in 12 hour clock, what time will be in 24 hour clock?

i) 13:55 ii) 14:55 iii) 15:55 iv) 16:55

c) Which time is longer from the following?

i) 2 years ii) 12 months iii) 1 year 3 months iv) 350 days

d) There are _____ months in 2 years 6 months.

i) 21 ii) 28 iii) 26 iv) 30

e) To convert years into month we multiply the given years by _____.

i) 24 ii) 10 iii) 11 iv) 12

2. Colour the correct time boxes by using the 12-hour format

	Day activities	Time in 12 hour	
a	Time of Fajer prayer	5:00 a.m.	5:00 p.m.
b	Breakfast time	7:30 a.m.	7:30 p.m.
c	School's assembly time	8:00 a.m.	8:00 p.m.
d	Break time in school	12:20 a.m.	12:20 p.m.
e	Time to watch tv at noon	3:00 a.m.	3:00 p.m.
f	Dinner time	9:25 a.m.	9:25 p.m.

3. Convert the following into minutes.

a) 8h b) 112h c) 15h 13min d) 7h 15min

e) 28h 39min f) 33h 25min g) 11h 13min h) 23h 16min

i) 6h 54min

4. Convert the following into seconds.

a) 78min b) 33min c) 4min 17sec d) 9min 42sec

e) 2min 53sec f) 21min 11sec g) 97min 47sec h) 48min 47sec

i) 433min 44sec

5. Convert the following into months

a) 5 years b) 3 years c) 22 years

d) 32 years e) 9 years 4 months f) 15 years 10 months

g) 29 years 8 months h) 19 years 11 months i) 54 years 9 months

6. Convert the following to days.

a) 15 weeks b) 9 weeks c) 6 weeks

d) 27 weeks e) 11 weeks 2 days f) 9 weeks 5 days

g) 11 weeks 6 days h) 56 weeks 4 days i) 43 weeks 3 days

7. Solve the following.

a) 37h 11min 38sec + 32h 34min 16sec

b) 44h 25min 38sec + 32h 34min 06sec

c) 6h 25min 35sec + 3h 13min 14sec

8. Solve the following.

a) 38h 33min 38sec – 00h 22min 26sec

b) 56h 56min 58sec – 44h 43min 37sec

c) 37h 54min 49sec – 21h 32min 00sec

9. Afnan spends 5 hours 23 minutes in study and 1 hour 20 minutes in playing.

a) How much time does he spend in both activities?

b) Write the total time in minutes.

10. It take a cook 2 hours 43 minutes 54 second to make a savoury dish and one hour 12 minutes 24 seconds to make a desert. Find how much more time he takes to make the savoury dish.

11. Asfand Yar spend 7 years 4 months 2 days in Suadi Arabia and 2 years 7 months 7 days in UAE.

a) How much time did he spend out of the country?

b) Write the total time in days.

12. Farheen completed her medical in 4 year10 months 7 days and her house job in 2 year 2 days. How much time did she spend in medical education and house job?

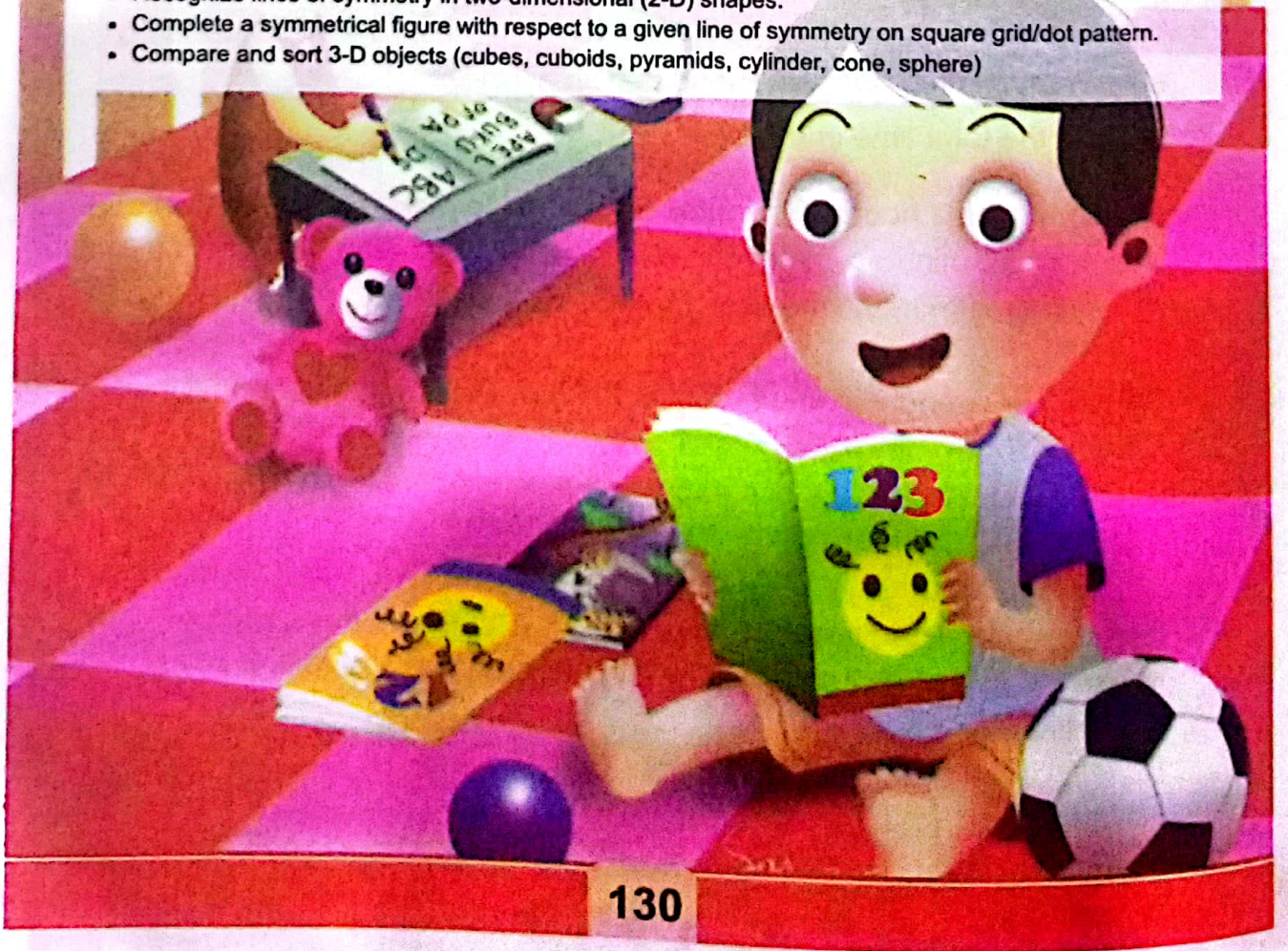
Unit 6

Geometry

Learning Outcomes

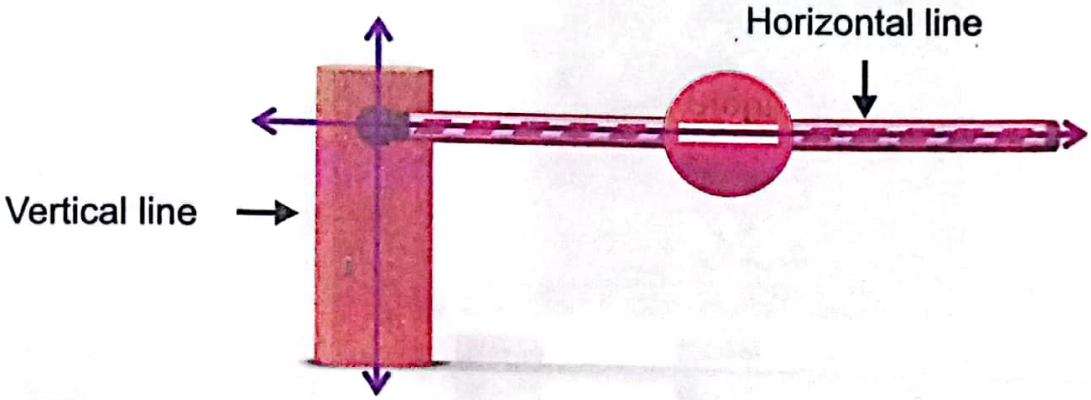
By the end of this unit, you will be able to:

- Recognize and identify parallel and non-parallel lines.
- Recognize an angle formed by intersection of two rays.
- Measure angles in degree (°) by using protractor.
- Draw an angle of given measurement and use the symbol (∠) to represent it.
- Differentiate acute, obtuse and right angles.
- Measure angles using protractor where
  - Upper scale of protractor reads the measure of angle from left to right.
  - Lower scale of protractor reads the measure of angle from right to left.
- identify right angles in 2-D shapes
- Describe radius, diameter and circumference of a circle.
- Find perimeter of a 2-D figures ona square grid.
- Recognize that perimeter is measured in units of length.
- Find area of 2-D figures on a square grid.
- Recognize that area of a square is measured in meter square (m^2)and centimeter square (cm^2)
- Recognize lines of symmetry in two-dimensional (2-D) shapes.
- Complete a symmetrical figure with respect to a given line of symmetry on square grid/dot pattern.
- Compare and sort 3-D objects (cubes, cuboids, pyramids, cylinder, cone, sphere)

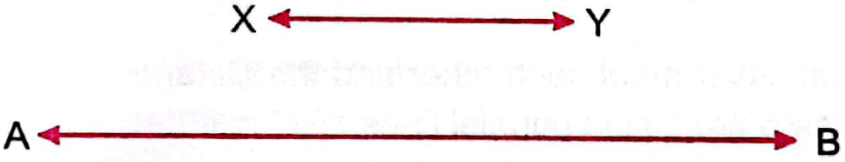


Horizontal and vertical lines

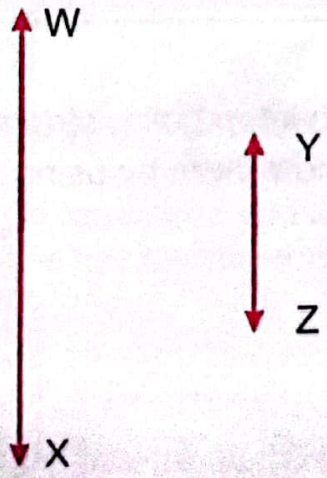
Look at the figure given below.



Look at these lines. Line XY and line AB are horizontal lines.



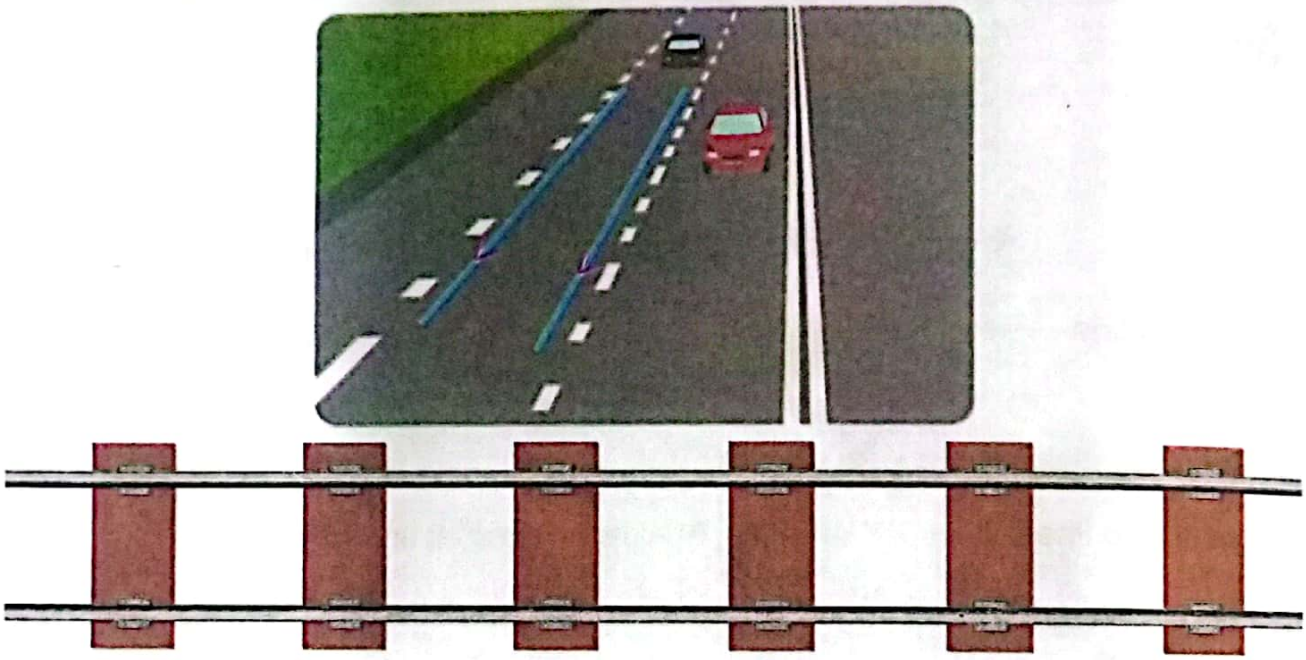
Look at these lines. Line YZ and line WX are vertical lines.



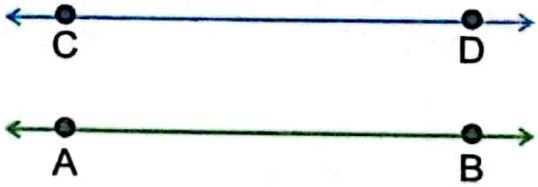
Parallel and non-parallel lines

Parallel Lines:

Take a close look at the following figures.



The lines which never meet each other and the distance between them always remains the same are called parallel lines.
Railway tracks and signs marked on the road are examples of parallel lines.
Look at the two lines given below:



$\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ are parallel lines which keep going straight on both ends and never meet each other. We can show them by using a symbol as:

$\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$

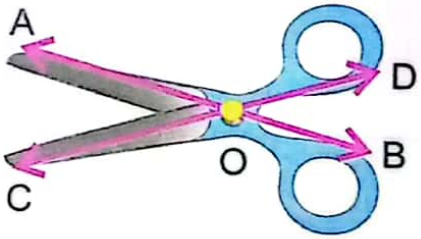
It is read as: $\overleftrightarrow{AB}$ is parallel to $\overleftrightarrow{CD}$.

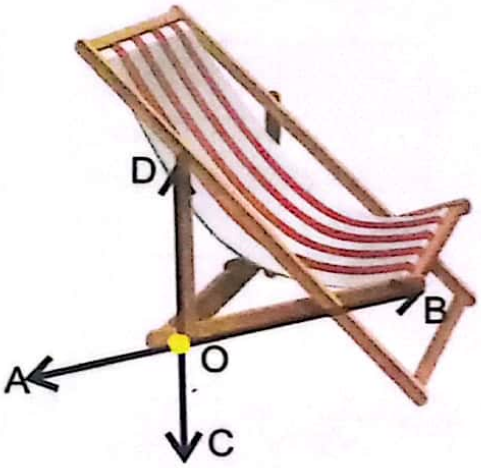
Try Yourself

Look at the things in your surroundings, Can you see parallel lines?

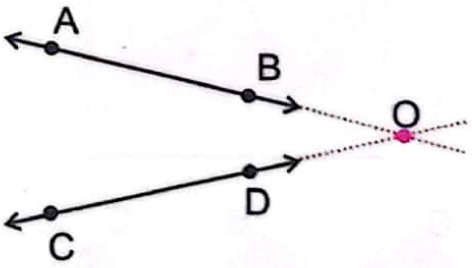
Non-parallel lines:

Let's take a look on these figures:





In the given figures, $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ intersect each other at point O.
All such lines which intersect each other at some point are called non-parallel lines.



Non-parallel lines are those lines which intersect each other at some point if they are extended.

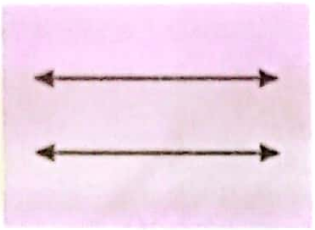
Try It!

Look at the things around you and can you distinguish between parallel and non-parallel lines?

Draw some parallel and non-parallel lines on the board and explain the difference between them.

Exercise 1

1. Identify parallel and non-parallel lines from the given lines and write their names as well.

a) 

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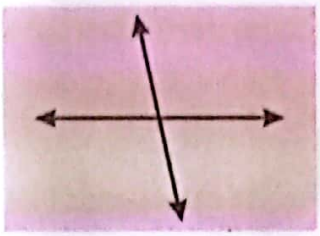
b) 

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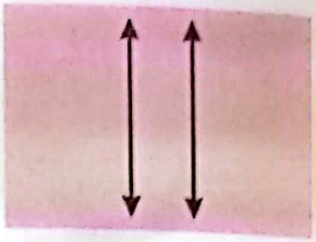
c) 

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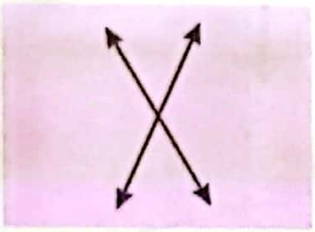
d) 

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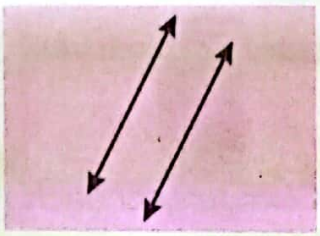
e) 

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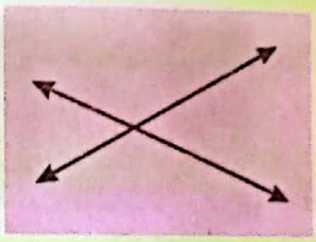
f) 

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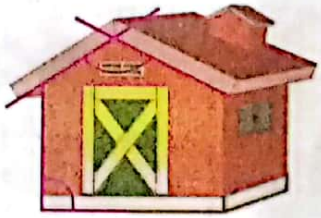
Angle

Let's look at the figures on the left. Here line AB and CD intersect each other at point O.

When two non-parallel lines intersect each other at a point, different angles are formed at the common point.

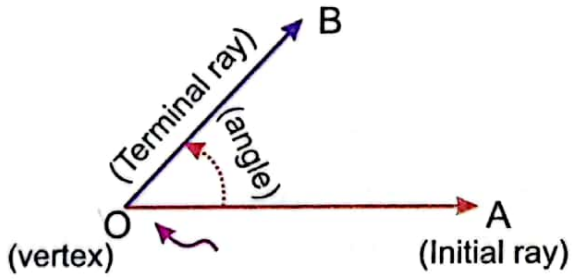
Draw some non-parallel lines on the board and explain about angles.

Look at these figures:



Rays shown in the pictures given above are making different angles.

The following non-parallel lines OA and OB which are intersecting each other at point O, are making an angle AOB.



Here, we call $\overrightarrow{OA}$ initial ray and $\overrightarrow{OB}$ terminal ray.

Their common point O is called vertex of the angle. We can write this angle as:

$\angle AOB$ or $\angle BOA$

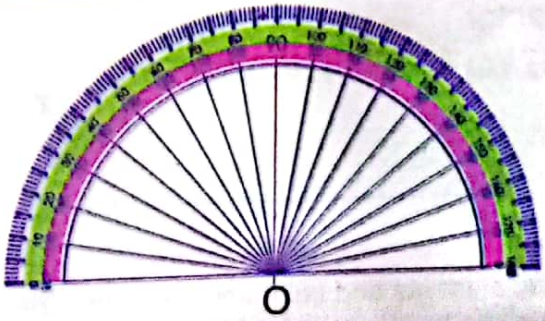
The symbol $\angle$ is used to represent an angle.

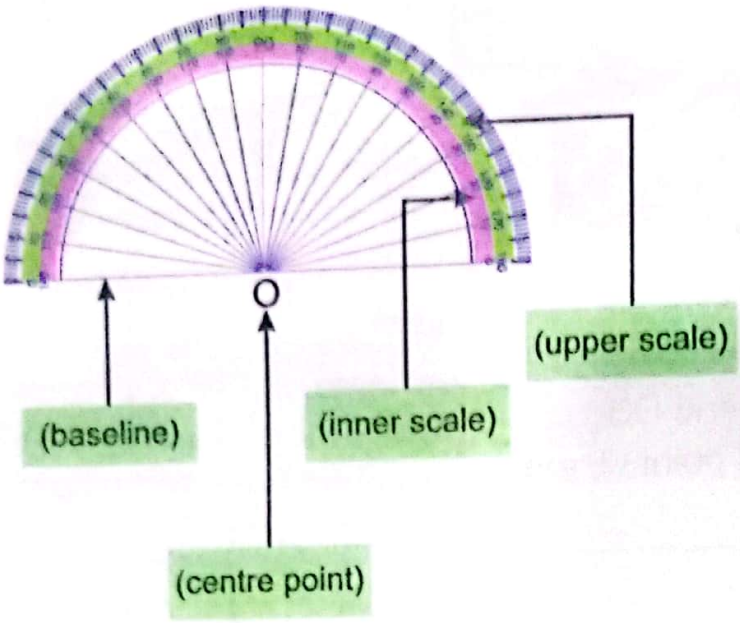
Try Yourself

Look at the clock and find what angles are its hands making?

Measurement and Construction of Angles:

Fozia has a geometry box. There is a protractor. By using it, we can draw and measure an angle.





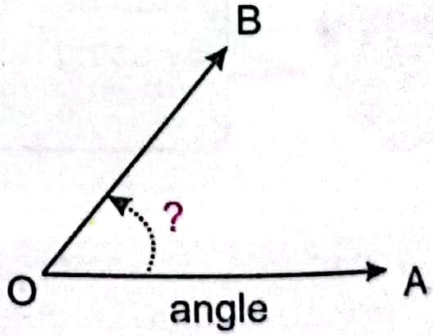
Key Fact

- A protractor has 180 small parts and each small part is equal to 1 degree.
- The unit of measurement of an angle is degree. We represent it by the symbol '°'.

Baseline: The straight line at the bottom of the protractor is called baseline.
Centre point: The middle of baseline is called centre point of the protractor.
Scale: There are two scales in every protractor, an inner scale and an outer scale.
Inner scale: It starts from 0° and is up to 180°. Measurement of angle is taken from right to left on this scale.
Outer scale: It also starts from 0° and is up to 180°. Measurement of angle is taken from left to right on this scale.

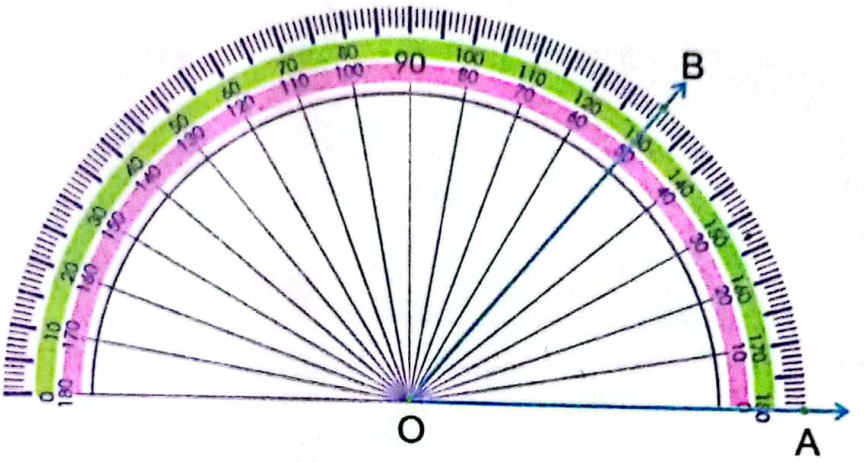
Measurement of an Angle:

∠AOB is an angle. We measure it by using a protractor.



Show protractor to the students and tell them about its parts.

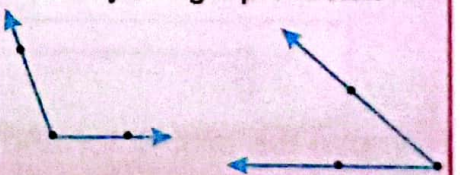
- Place centre point of the protractor on the vertex 0 of an angle AOB.
- Place the baseline of protractor exactly on the ray OA.
- Look at the value of the angle on the inner side.



Here, the angle measures 50° inside the inner scale.
This angle is: m ∠AOB = 50°

Try Yourself

Measure the angles given below by using a protractor.

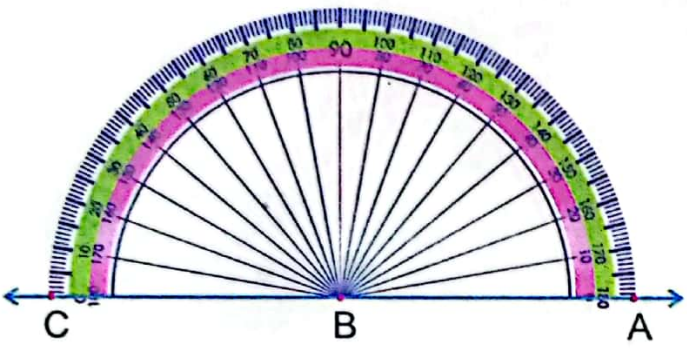


Construction of Angles:

Draw an angle ABC of 180° by using a protractor.

To draw an angle by using a protractor, first draw a ray $\overrightarrow{BC}$ with the help of a ruler.

Place centre point of the protractor on point B and place baseline of the protractor exactly on $\overrightarrow{BC}$.



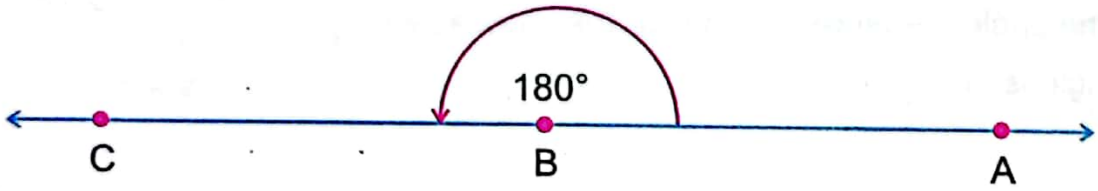
Try Yourself

Draw an angle of 60° and 140° by using a protractor.

Key Fact

This angle can also be drawn by using the inner scale.

Look at the outer scale on the protractor and mark point A on the angle 180°.



Remove the protractor and join point B to point A.

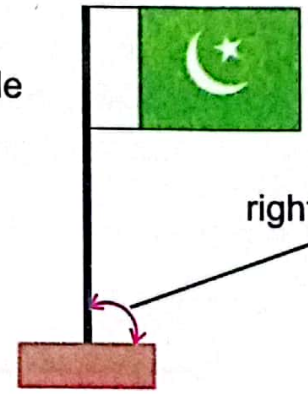
$m\angle ABC = 180°$

Difference between acute, obtuse, and right angle:

As you know the unit of measurement of an angle is degree. The following ray AB completes 360° in one revolution around its initial point A.

Look at the angles formed in the following figures. They are of different measurements.

obtuse angle

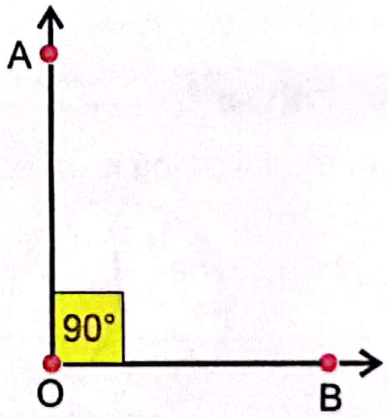


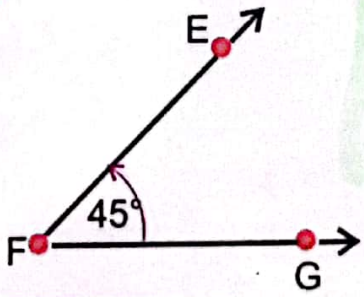
right angle

acute angle

An angle of measure 90° is called a right angle. Angle AOB in the figure is a right angle.

$m\angle AOB = 90°$



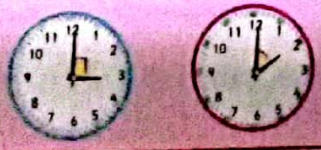


All the angles which measure less than 90° (right angle) are called acute angles. ∠ EFG in the given figure is an acute angle.

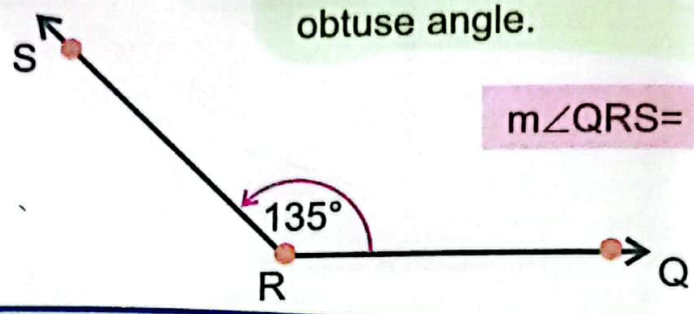
$m\angle EFG = 45°$

Try Yourself

Which of the following angles is acute?



All the angles which measure greater than 90° (but less than 180°) are called obtuse angles. ∠ QRS in the given figure is an obtuse angle.

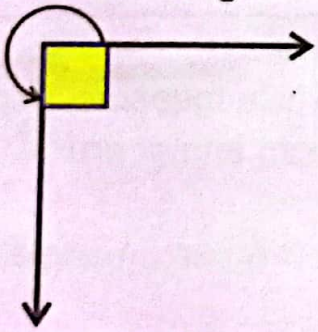


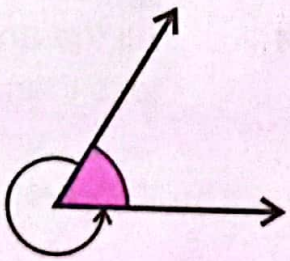
m∠QRS= 135°

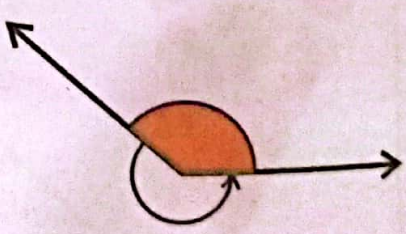
Try Yourself

Which of the following is an obtuse angle?

Measure the angles and write their type.







_____ _____

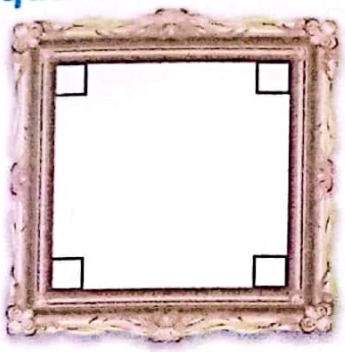
_____ _____

_____ _____

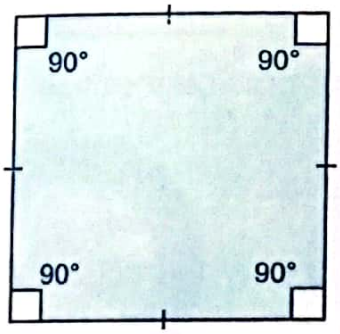
Give students flash cards of different angles and ask them to categorize them as right, acute and obtuse angles.

Right angle in 2-D shapes:

Square:



Dania has a square picture frame. Do you know what angles are formed at each corner of the frame?

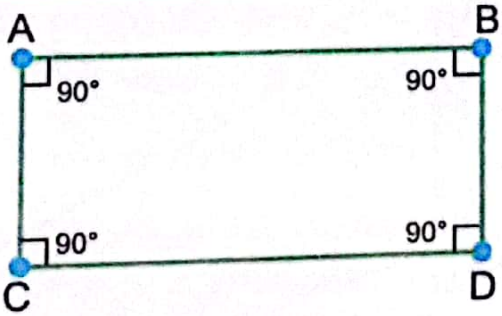


All sides of a square figure are equal in length and all angles are right angles.

Rectangle:

Hina has a rectangular colour box. What angles are there in a rectangle?

The length of opposite sides in a rectangle is equal. Like a square, all the angles of a rectangle are equal.

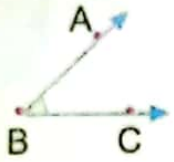


Ask the students to draw a square and a rectangle, measure all the angles by using a protractor, and tell which of them are right angles.

Exercise 2

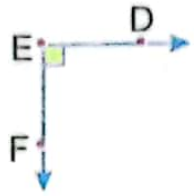
1. Write the names and types of angels in the following:

a)



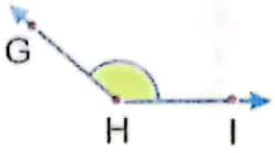
_____

b)



_____

c)

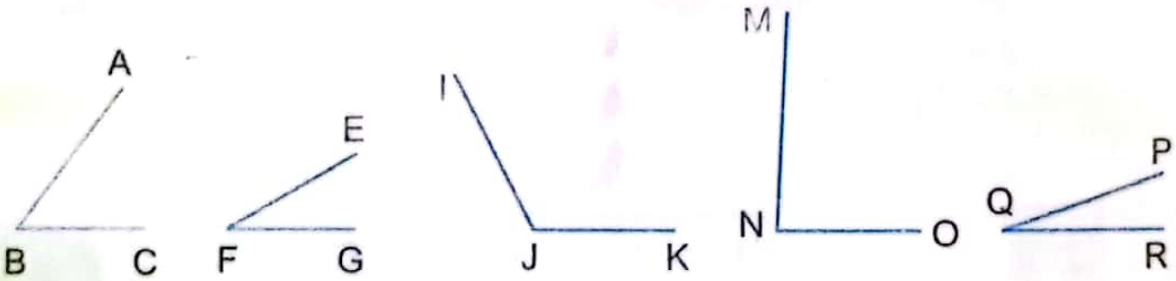


_____

d)

_____

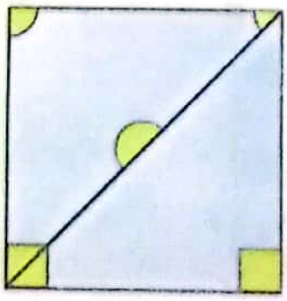
2. Measure the following angles.



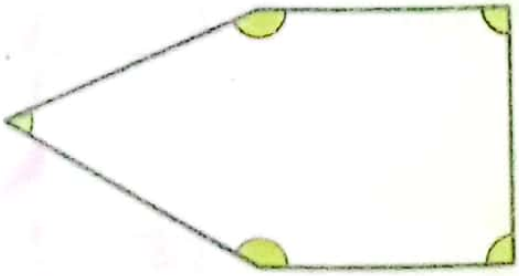
3. Construct the angles of the given measurements:

a) 60° b) 30° c) 115° d) 90°

4. Measure the angles in the following figures and write their names as well.



_____



_____

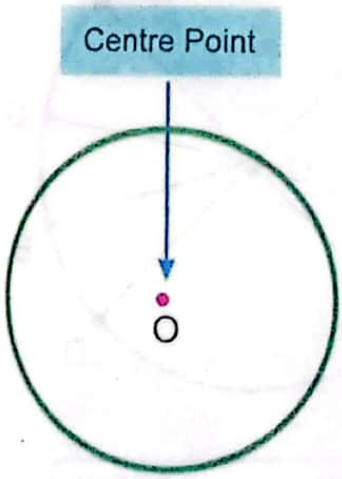
Circle:

Tahir has a cycle which has two wheels. What is the shape of these wheels?

The shape of wheels is like a circle.

Look at the following figures:

All these figures are of circular shape. The figures which have no edge or side are called circular figures. Each circle has a centre point.

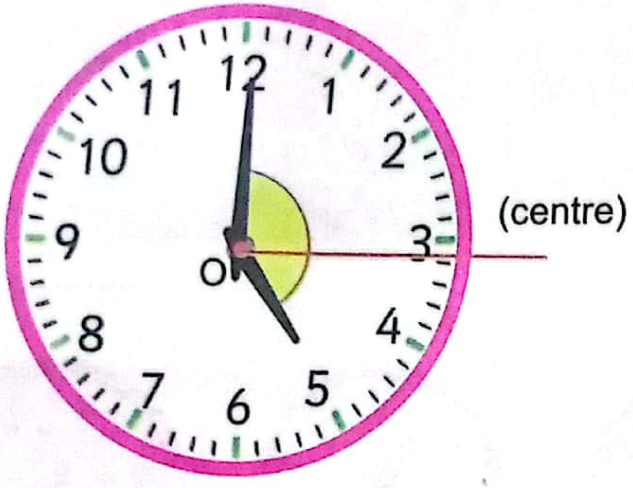


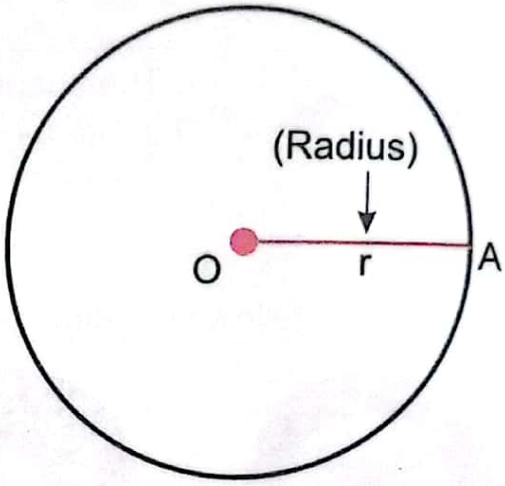
There is a point in the centre of a circle from which the distance of all the points of the circle is same. This point is called the centre point of a circle. Point "O" is the centre point of the circle given on the left. A circle is identified by the name of its centre. We can call this circle "O".

A circle is a set of points in which all the points are at an equal distance from its centre.

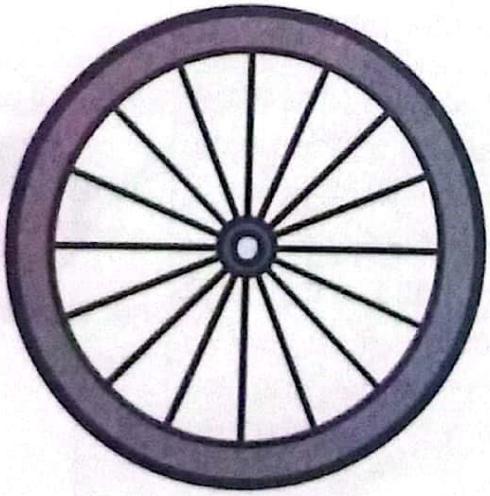
Radius of a Circle:

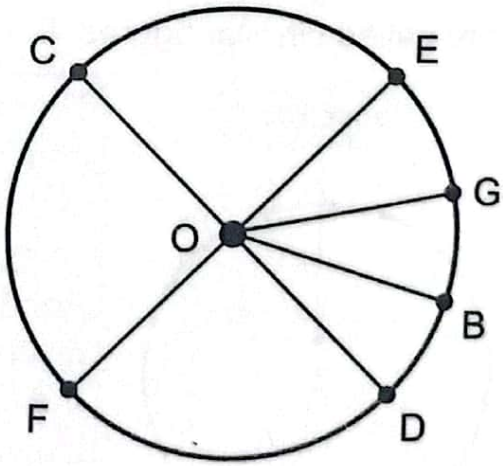
The line segment which joins any point on the circle to its centre is called radius of the circle. Usually, the radius of a circle is represented by "r". In the figure given below, $\overline{OA}$ is the radius of the circle. We can write it as "r" = m$\overline{OA}$.





There can be more than one radius in a circle. Here all line segments $\overline{OB}$, $\overline{OC}$, $\overline{OD}$, $\overline{OE}$, $\overline{OF}$, and $\overline{OG}$ are the radii of the circle.



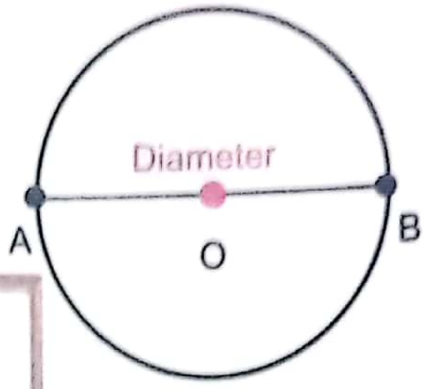


Key Fact

The length of all the radii in a circle is same.

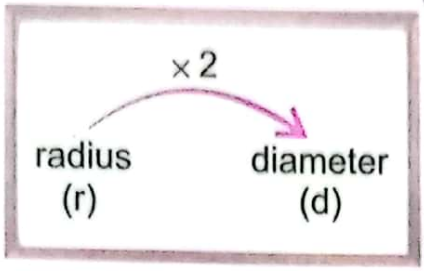
Diameter of a Circle:

The line segment which joins any two points on a circle and passes through its centre called diameter.



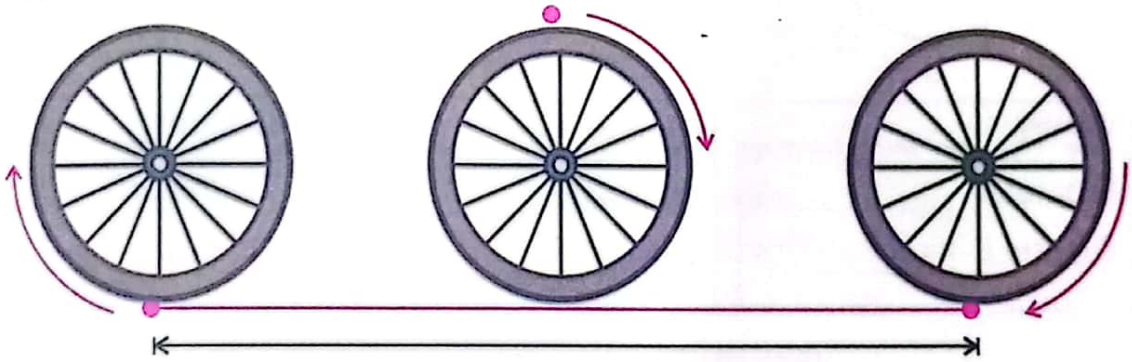
Key Fact

Diameter of a circle is twice its radius.



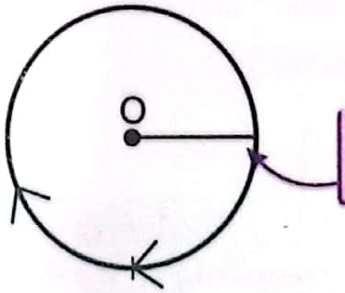
Circumference of a circle:

Tahir has a cycle. How much distance does its wheel cover in one complete revolution?



Distance covered in one revolution

Distance covered in one revolution is equal to circumference of the circle.



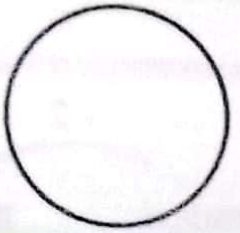
Let's take a look at this circle.

Draw some circles on the board and tell students about each part of a circle. Ask them to draw a circle in the notebooks and write the names of its parts.

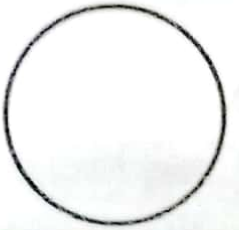
Exercise 3

1. Draw the parts of the following circles.

Diameter of circle



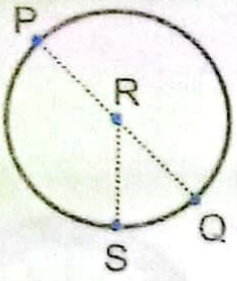
Radius of circle



Centre of circle

2. Write the names of parts of the circles.

a)

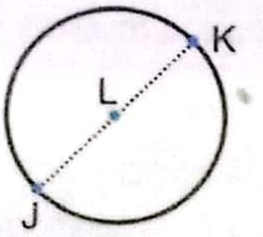


Centre: _____

Diameter: _____

Radius: _____

b)

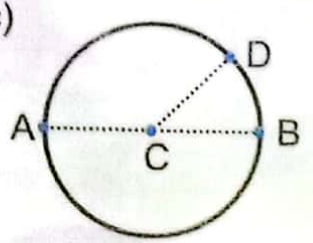


Centre: _____

Diameter: _____

Radius: _____

c)



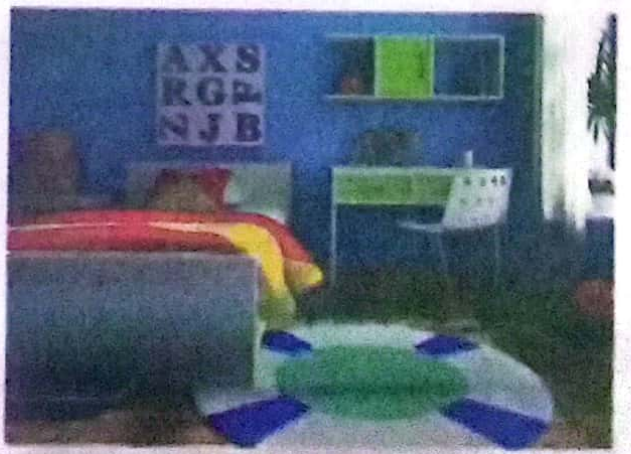
Centre: _____

Diameter: _____

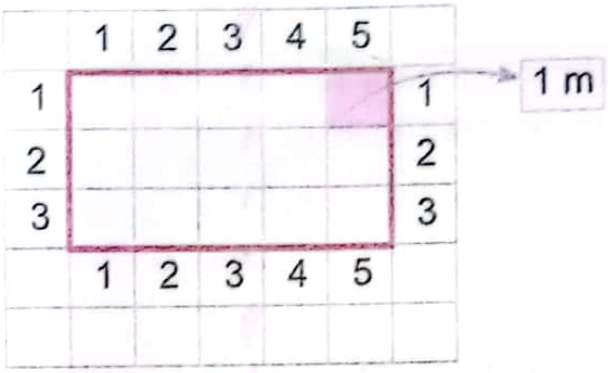
Radius: _____

Perimeter and Area

Zahid's room is rectangular. What is meant by its perimeter?



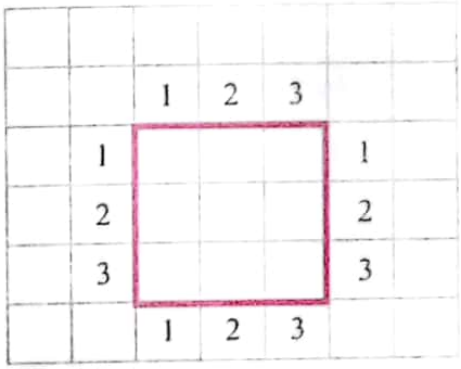
Total length of the boundary of a room is called its perimeter. We can find the perimeter of a room with the help of a square grid.



To find the perimeter, we shall add the lengths of all sides. As the small box is 1 metre long, so we add the lengths of all sides to find the perimeter.

Perimeter of the rectangular room = 5 m + 3 m + 5 m + 3 m = 16 m

Find the perimeter of given figure.



To find the perimeter of square, we shall add its all sides.

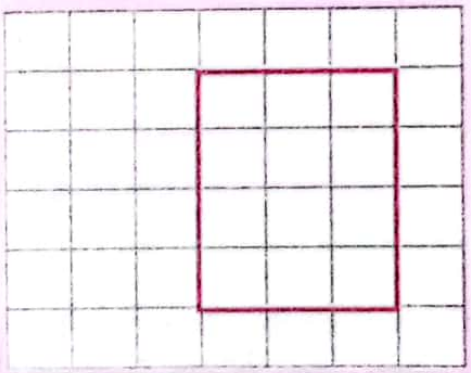
Perimeter of the square = 3 cm + 3 cm + 3 cm + 3 cm = 12 cm

Key Fact

Total length of the surroundings of a closed figure is called perimeter of that figure.

Try Yourself

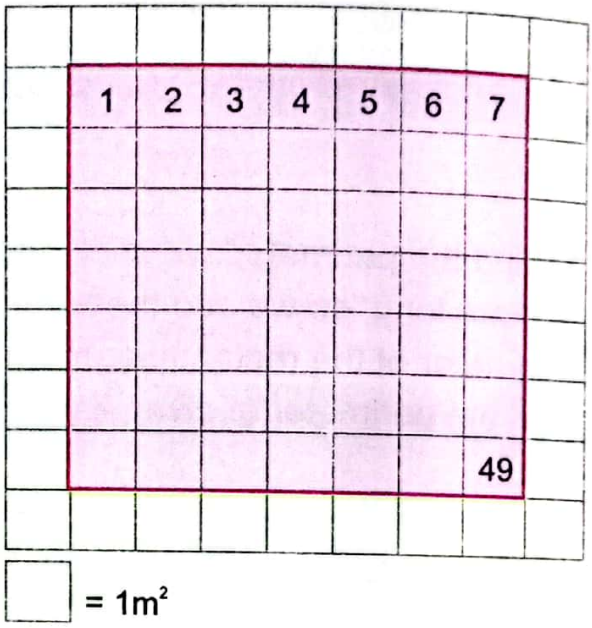
Find the perimeter



Area:

Fawaz's room is of square shape. How many tiles of 1 square meter are required for following.

To find the number of tiles we have to find area of the room first. In the figure below, the area of the room is shown on a square grid.



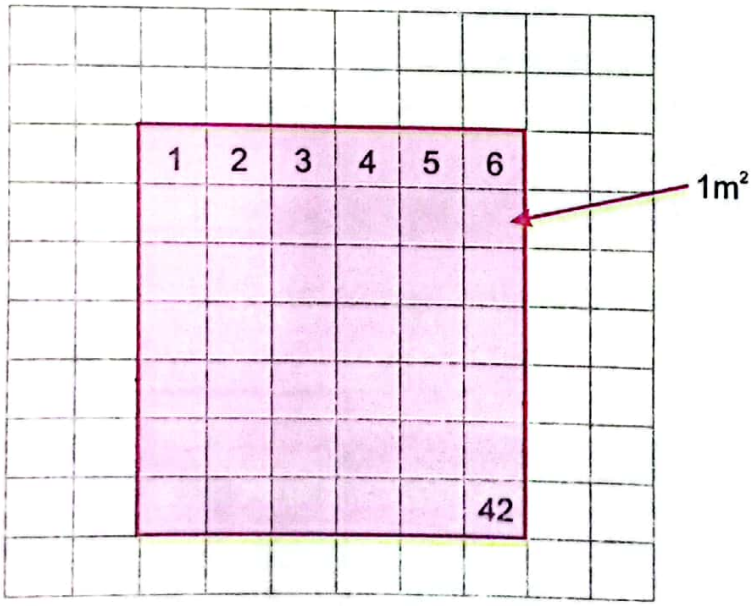
= $1m^2$

The number of square boxes in this square grid represents the area of the room.

Number of squares = 49

Therefore area of the room = $49m^2$

Find the area of square figure.

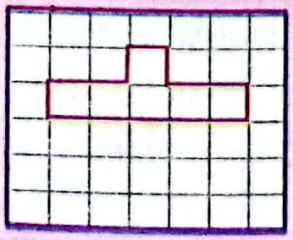


Number of square boxes = 42

Therefore, area of the figure = 42 m^2

Try Yourself

Find the area.



Key Fact

The surface covered by a square is called its area. Area of a square figure can be calculated in centimetre square and metre square.

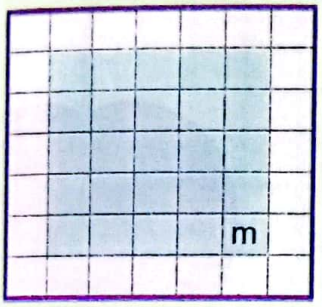
Try Yourself

Draw a square and a rectangular figure on the square grid with same perimeter and area.

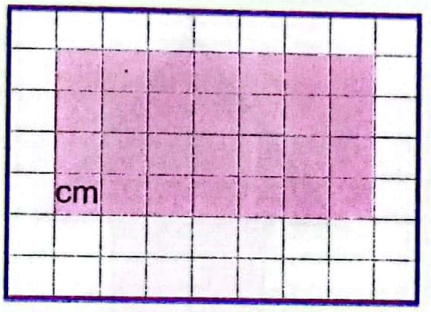
Exercise 4

1. Find the perimeter of the given figures.

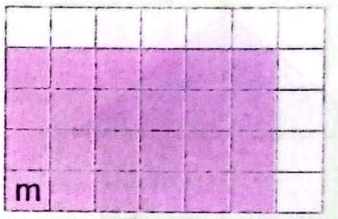
a)



b)



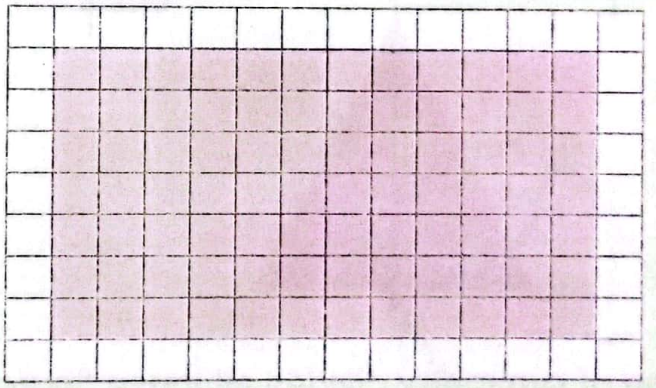
c)



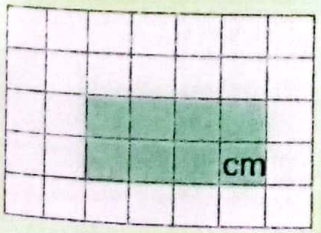
2. Find the area of the given figures.

a)

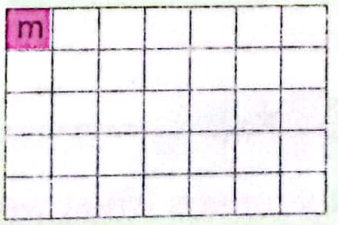
b)



c)



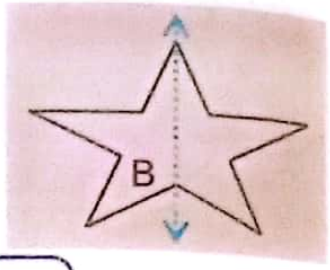
d)



Give a of square grid paper to students and ask them to draw squares and rectangles of different lengths on it and find their perimeter and area.

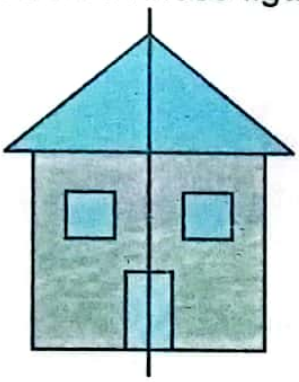
Symmetry:

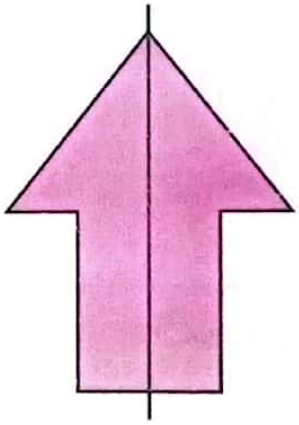
Ahmed's teacher drew a star on his notebook for doing good work.

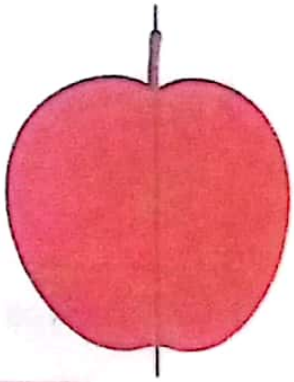


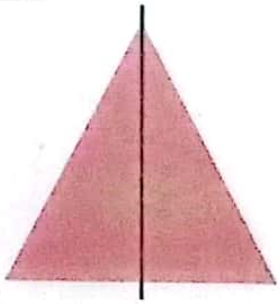
If we draw a line $\overrightarrow{AB}$ as shown in the figure. We see that the star looks the same on both sides. The line AB is called line of symmetry.

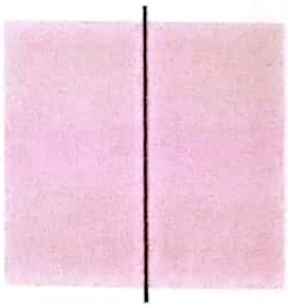
Look at these figures.











The line of symmetry divides all these figures into two equal parts.

Key Fact

Symmetry means when we turn, flip, or rotate a figure, it takes exactly the same shape as before.

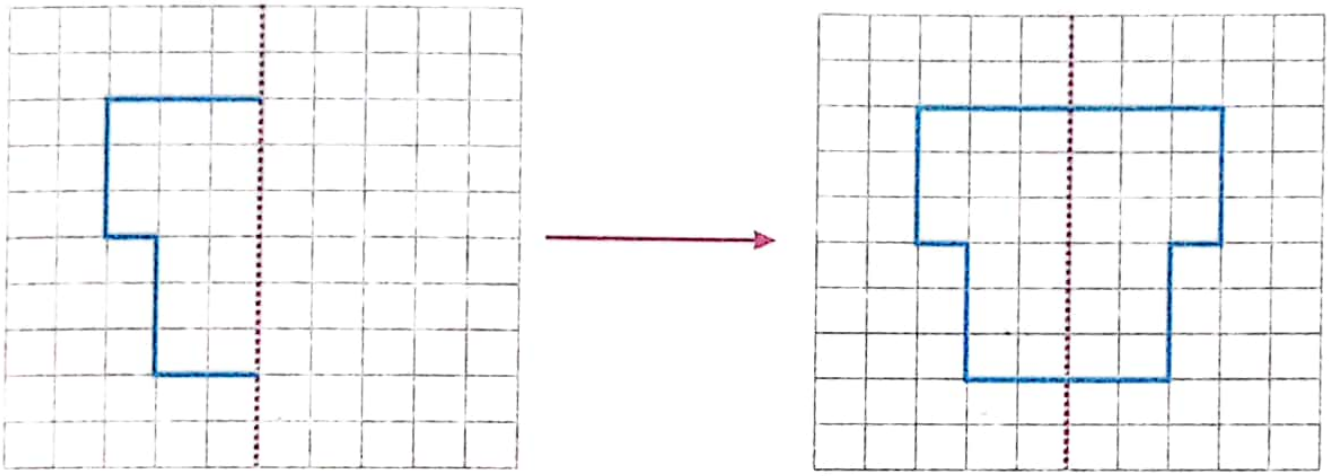
Completing Symmetrical Figures:

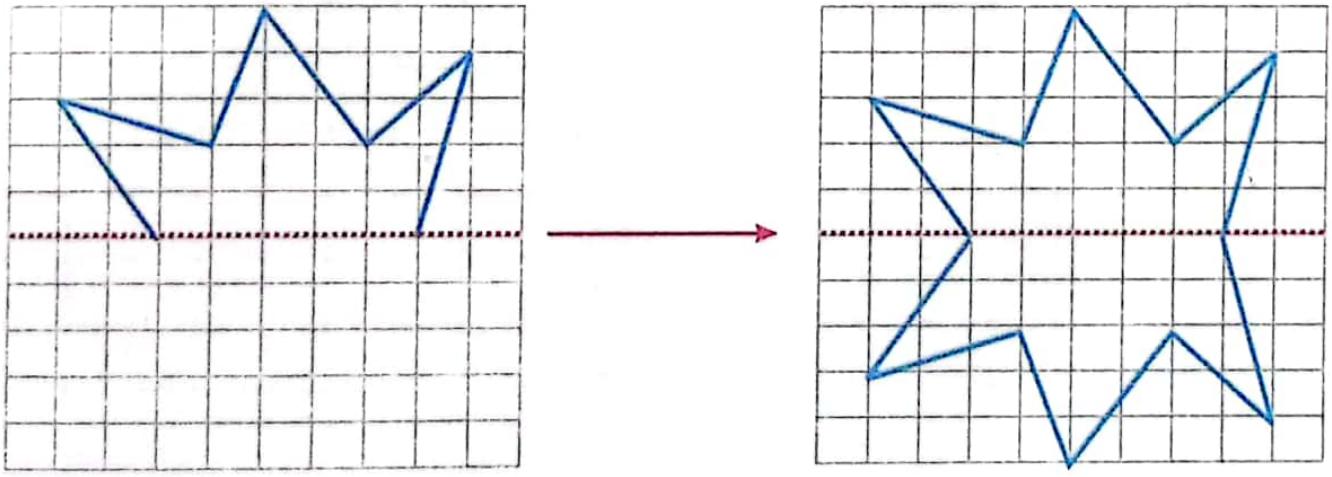
If one half of a symmetrical figure is given, we can complete it by drawing its remaining half.

Key Fact

There can more than one line of symmetry for different figures.

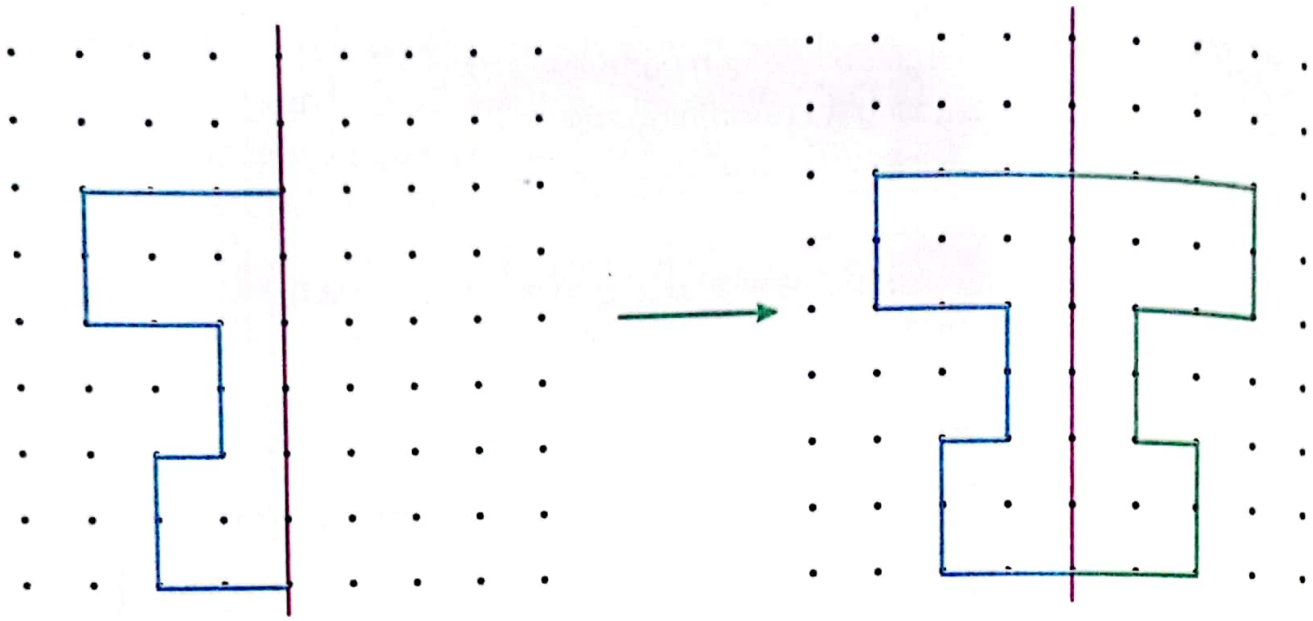
We complete the following figures about the line of symmetry.

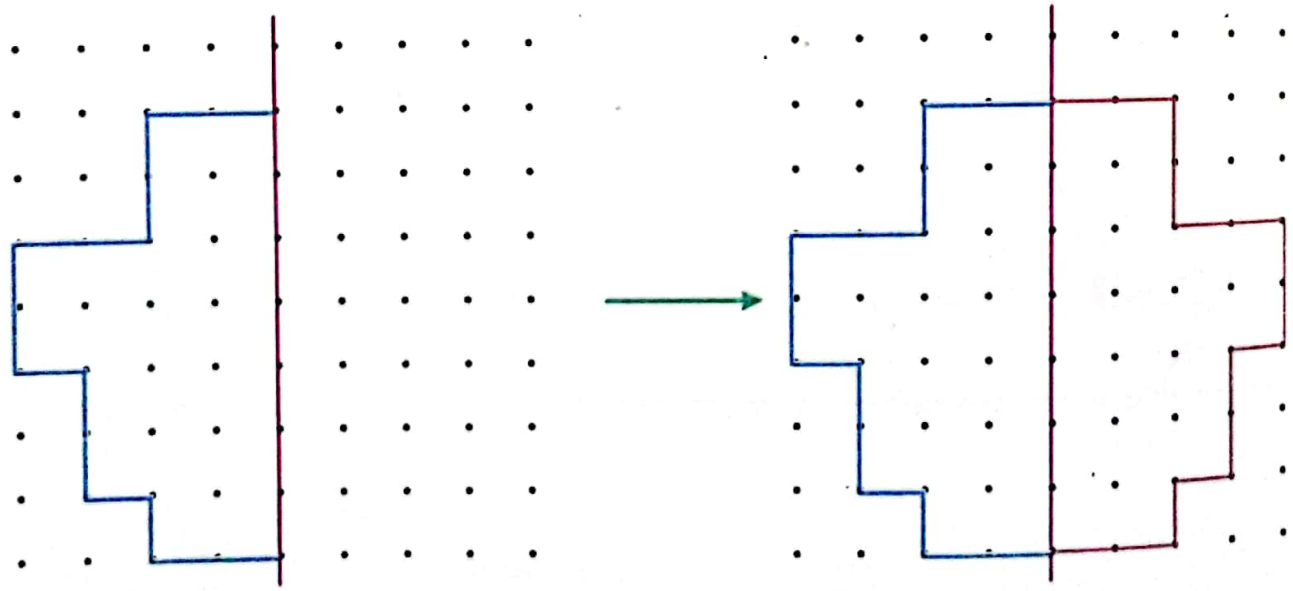




Give cards of different shapes to the students and ask them and identify symmetrical shapes.

We complete the following symmetrical figures on dot paper.

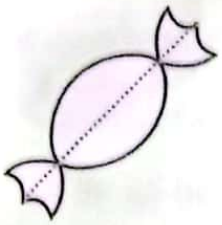


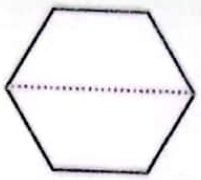


Give different dotted cards of half-figures to the students and ask them to complete the figures.

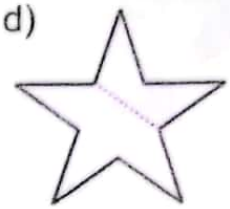
Exercise 5

1.Mark (✓) on the figures where you can see line of symmetry.

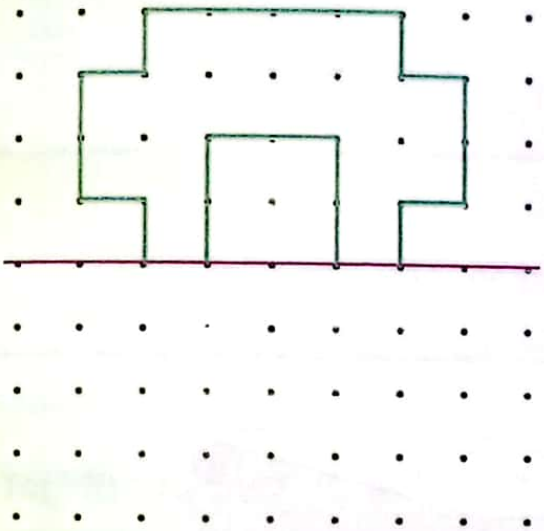
a) 

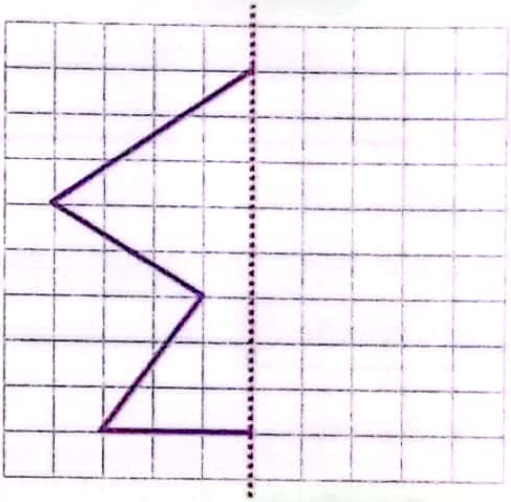
b) 

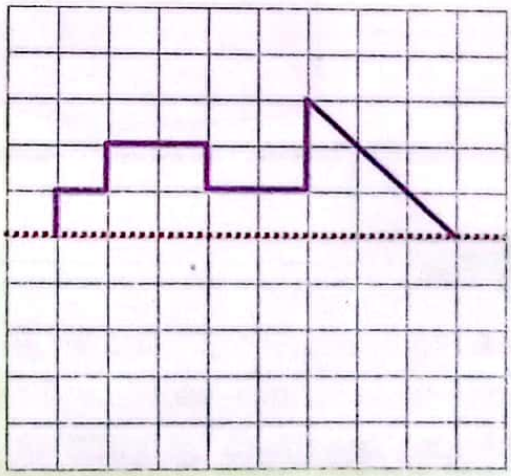
c) 

d) 

2. Complete the given figures.







Comparison of 3-D shapes:

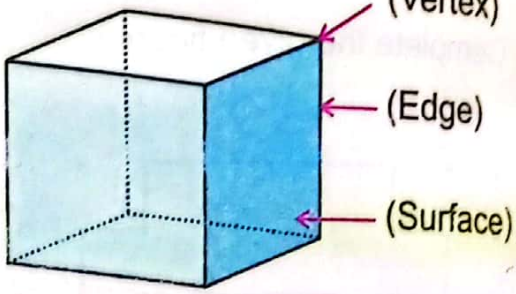
Cube:

Faraz's father gave a gift on his birthday. Can you tell the shape of the gift box?

Length, height, and width of a cube are same. This box is a cube its all surface are square.

Properties:

- 8 vertices
- 6 surfaces
- 12 edges

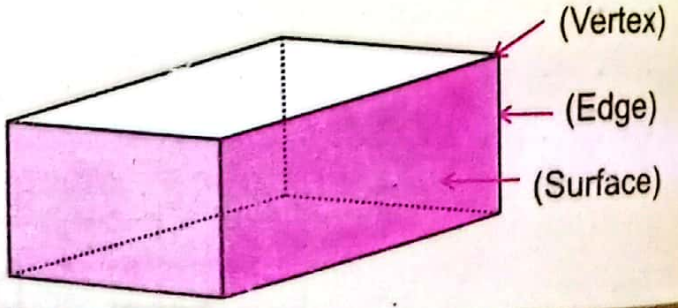


Cuboid:

This is a cuboid. All the surfaces of a cuboid are of rectangular shape.

Properties:

- 8 vertices
- 6 surfaces
- 12 edges



Key Fact

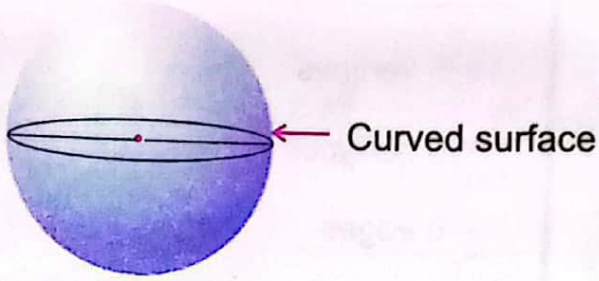
- 2-D figure have only, length and width.
- 3-D shapes have length, width, and height.
- All 3-D shapes are made by combining 2-D figure.

Sphere:

This is a sphere. It has a curved surface. It does not have vertices and edges.

Properties:

- 0 vertex
- 1 surface
- 0 edges

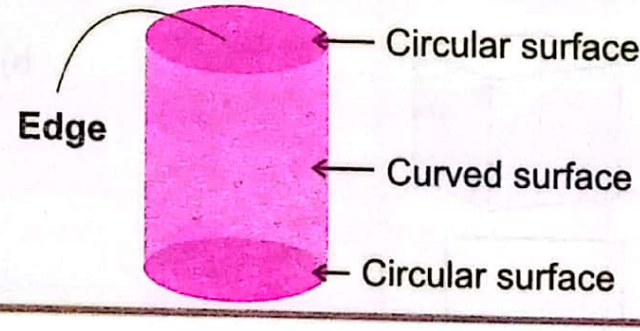


Cylinder:

This is a cylinder. It has there surfaces, one curved and the two circular.

Properties:

- 0 vertices
- 3 surfaces
- 2 edges

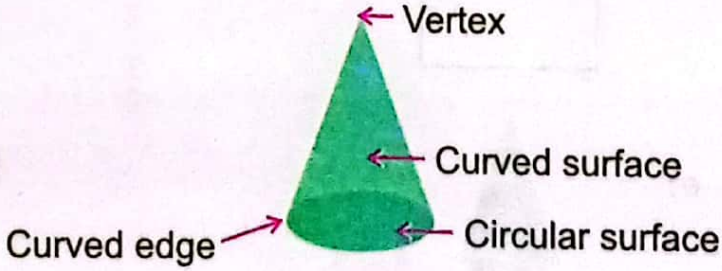


Cone:

This is a cone. It has two surfaces, one curved and the other circular.

Properties:

- 1 vertex
- 2 surfaces
- 1 edge



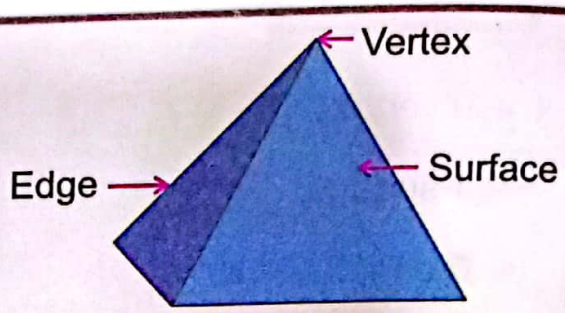
Give students cards of different figures and ask them to sort of 3-D figures from them. Ask the students to write their names as well and compare properties.

Pyramid:

This is a pyramid with base as a square. It has five surfaces, one square and four triangular.

Properties:

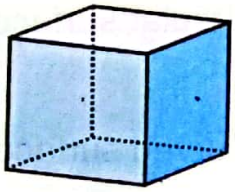
- 5 vertices
- 5 surfaces
- 8 edges



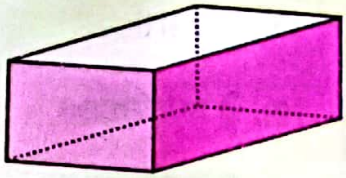
Exercise 6

1. Write the names of these figures and label their vertices, edges, and surfaces.

a)



b)

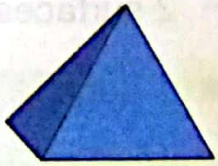


c)

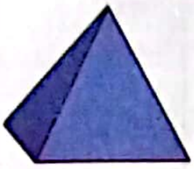
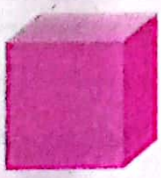
d)

e)

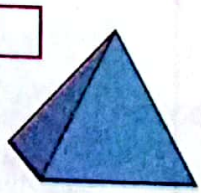
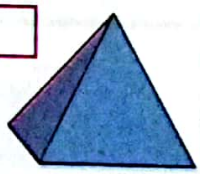
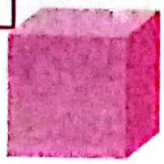
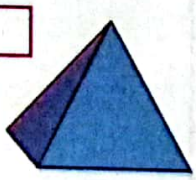
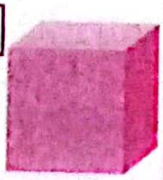
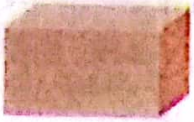
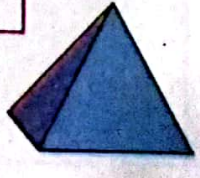
f)



2. Look at the figures given below and write their properties.

	3-D shapes	Vertices	Edges	Surfaces	Shapes of surfaces
a)		0	0	1	Curved
b)					
c)					
d)					
e)					
f)					

3. Mark (✓) the figure which has the given properties.

	Properties	3-D shapes		
a)	• 0 vertices • 3 surfaces • 2 edges	☐ 	☐ 	☐ 
b)	• 8 vertices • 6 flat surfaces • 12 edges	☐ 	☐ 	☐ 
c)	• 0 vertices • 1 surface • 0 edges	☐ 	☐ 	☐ 
d)	• 5 vertices • 5 surface • 8 edges	☐ 	☐ 	☐ 
e)	• 1 vertex • 2 surfaces • 1 edge	☐ 	☐ 	☐ 
f)	• 8 vertices • 6 rectangular surfaces • 12 edges	☐ 	☐ 	☐ 

I Have Learnt

- Recognizing and identify parallel and non-parallel lines.
- Recognizing an angle formed by intersection of two rays.
- Measuring angles in degree (°) by using protractor.
- Drawing an angle of given measurement and use the symbol ($\angle$) to represent it.
- Differentiateing acute, obtuse and right angles.
- Measureing angles using protractor where
- Identifying right angles in 2-D shapes
- Describeing radius, diameter and circumference of a circle.
- Finding perimeter of a 2-D figures on a square grid.

Vocabulary

- Parallel lines
- Non-parallel lines
- Angle
- Right angle
- Acute angle
- Obtuse angle
- Symmetry
- 3-D shapes
- 2-D shapes
- Sphere
- Cube
- Cylinder
- Cuboid
- Cone
- Pyramid

- Recognizing that perimeter is measured in units of length.
- Finding area of 2-D figures on a square grid.
- Recognizing that area of a square is measured in meter square (m^2)and centimeter square (cm^2)
- Recognizing lines of symmetry in two-dimensional (2-D) shapes.
- Completing a symmetrical figure with respect to a given line of symmetry on square grid/dot pattern.
- Comparing and sorting 3-D objects (cubes, cuboids, pyramids, cylinder, cone, sphere)

Review Exercise

1. Choose the correct answer.

a) The lines which keep going straight and never meet each other are called:

i) horizontal lines ii) vertical lines

iii) non-parallel lines iv) parallel lines

b) There are _____ small parts in a protractor and each part is equal to 1 degree.

i) 150 ii) 120 iii) 180 iv) 360

c) When horizontal and vertical lines intersect each other at a point, they form:

i) right angles ii) obtuse angles

iii) acute angles iv) horizontal angles

d) An angle less than _____ is called acute angle.

i) 90° ii) 80° iii) 100° iv) 180°

e) The length of boundary of a circle is called _____ of the circle.

i) circumference ii) centre iii) diameter iv) radius

f) The area covered by a closed figure is the _____ of that figure.

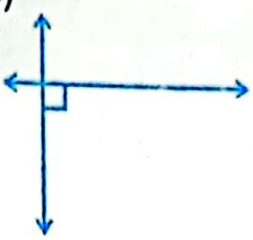
i) length ii) side iii) perimeter iv) area

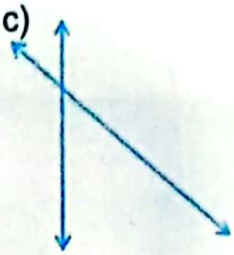
g) Line of symmetry divides a figure into _____ equal parts.

i) 5 ii) 4 iii) 3 iv) 2

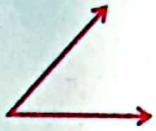
2. Encircle the parallel lines from the given lines.

a) 

b) 

c) 

3. Differentiate right, acute and obtuse angle in the following.

a) 

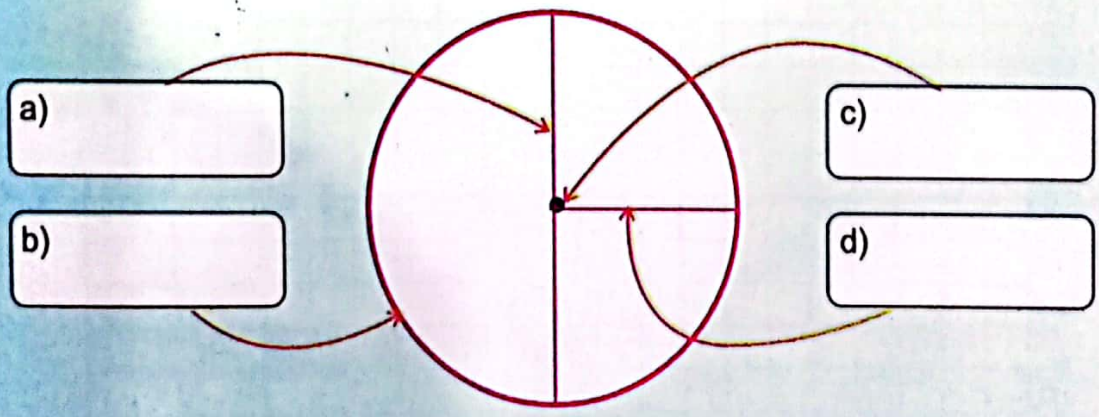
b) 

c) 

4. Draw the angles of given measurements.

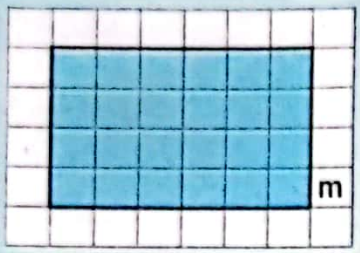
a) 135° b) 95° c) 70° d) 20°

5. Label the circle.

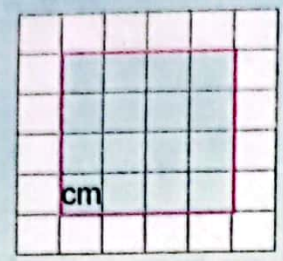


6. Find the perimeter and area of the given figures.

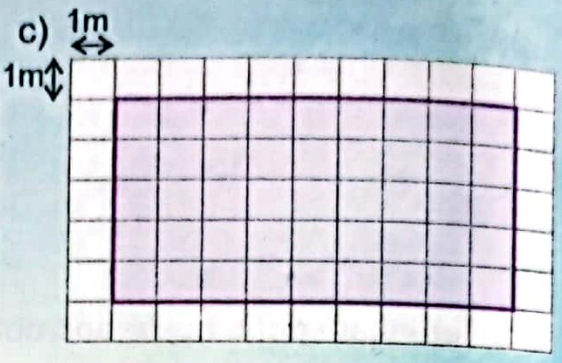
a)



b)

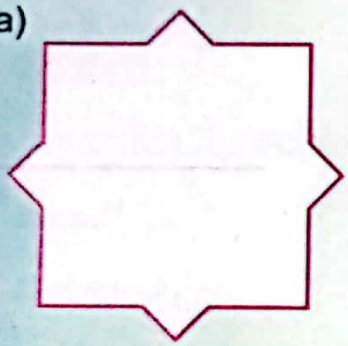


c)

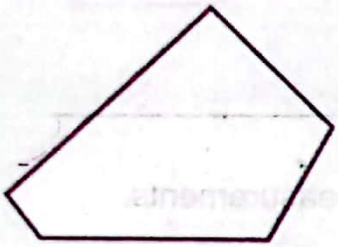


7. Identify the symmetry in the given figures and draw lines of symmetry, where possible.

a)



b)

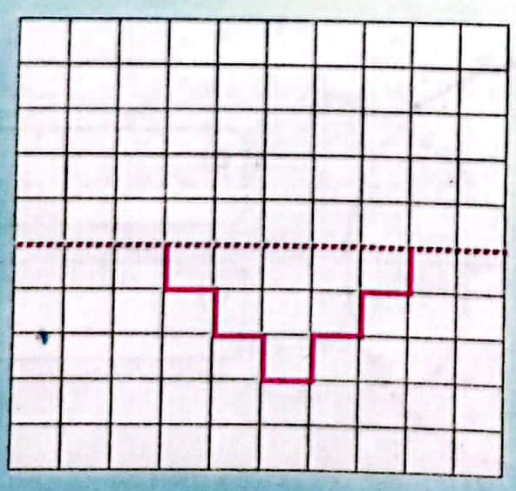


c)

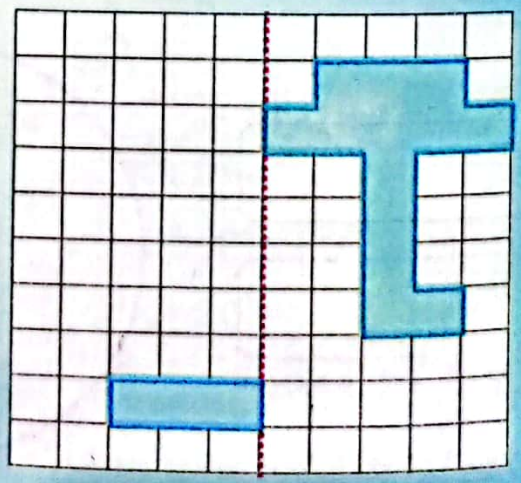
d)

8. Complete the given figures and find their perimeter and area as well.

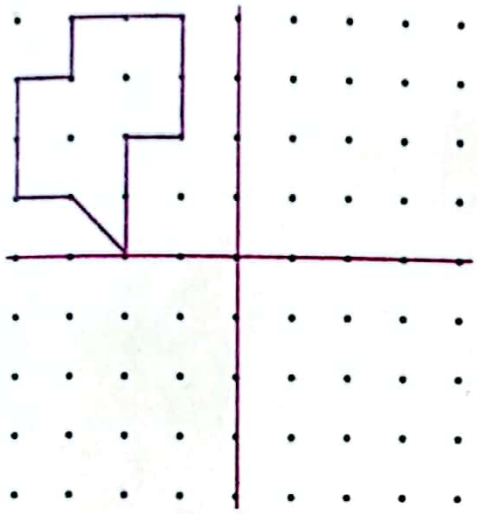
a)



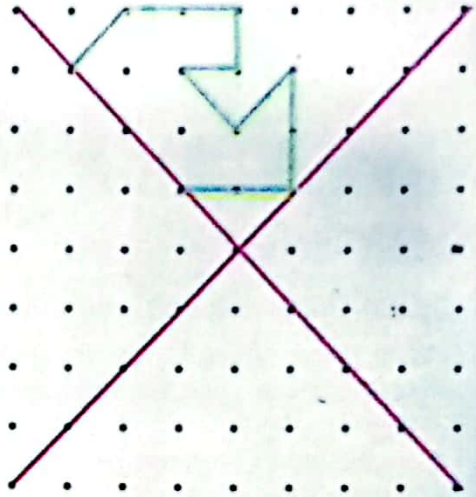
b)



c)

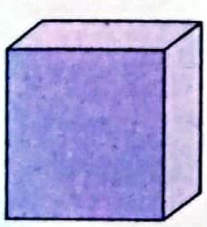


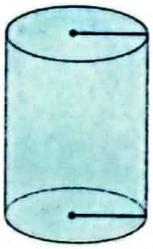
d)

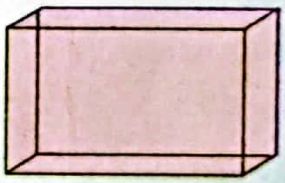


9. Encircle the figures which have the following properties:

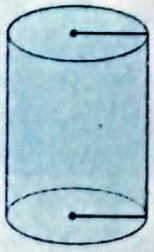
a) 6 flat surfaces

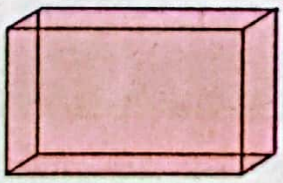


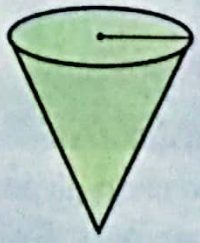




b) 1 vertex







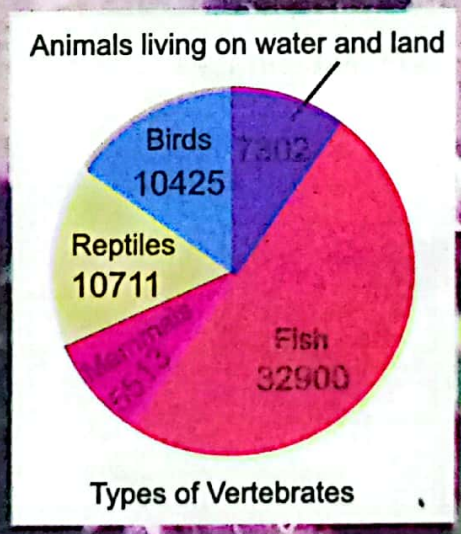
Unit 7

Data Handling

Learning Outcomes

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

- Read simple bar graphs given in horizontal and vertical form.
- Interpret real life situations using data presented in bar graphs.
- Read line graph.
- Interpret real life situations using data presented in line graphs.
- Read Pie Chart.
- Interpret real life situations using data presented in Pie Chart.



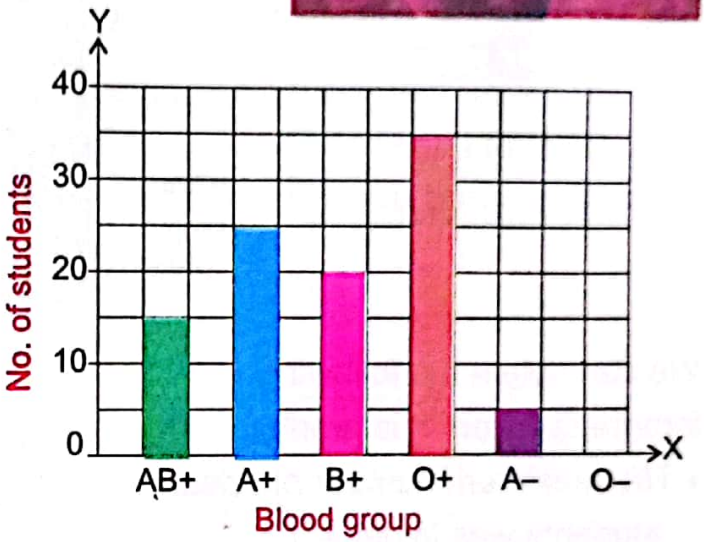
Types of Vertebrates

The chart given above shows the types and number of vertebrates. By looking at the chart, can you write these types in the ascending order of their number?

Bar Graph

Nida did a survey of three sections of her class in which she asked about the blood groups of students. She has prepared a bar graph based on this information. How can we read this graph?

In the vertical direction of this graph, a small square is representing 5 students. If we look at each bar one after the other, we can obtain following information from it:



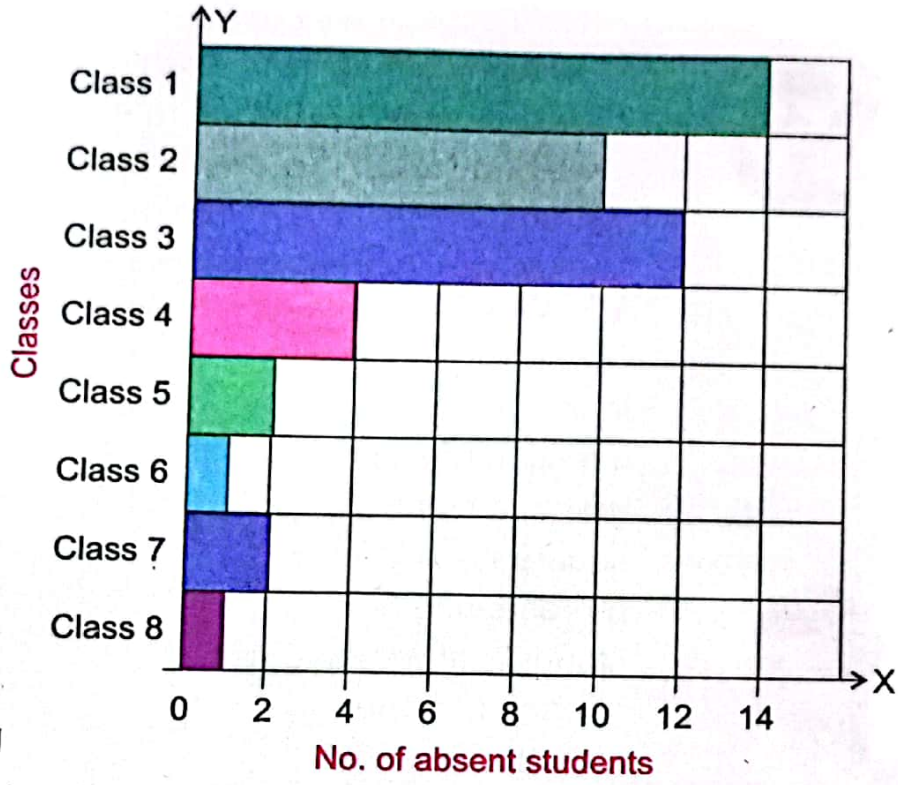
Scale: A small square in vertical direction is showing 5 students

- No students have O^- blood group.
- The students having O^+ blood group are maximum in number.
- The students having A^- blood group are minimum in number.
- Total number of students with blood groups A+ and AB^+ is 40
- 20 students have blood group B^+.
- Nida collected information of 100 students.

The bar graph given above is a vertical bar graph. Similarly a horizontal bar graph can be drawn as well.

The following graph is about the students who were absent from school for three months.

In this graph, the bar is horizontal. That is why it is called a horizontal bar graph.



Key Fact

The width of each bar in a bar graph is same.

We can obtain the following information from this graph:

- The maximum number of absent students was in class 1.
- The minimum number of absent students was in classes 6 and 8.
- The difference between absent students of class 1 and class 8 is 13. (14 – 1 =13)
- The number of absent students in classes 5 and 7 is same, i.e. 2.
- The number of absent students in classes 6 and 8 is same, i.e. 1.
- The information of 45 students in total is shown in this bar graph.

Scale: A small square in horizontal direction is showing 2 students.

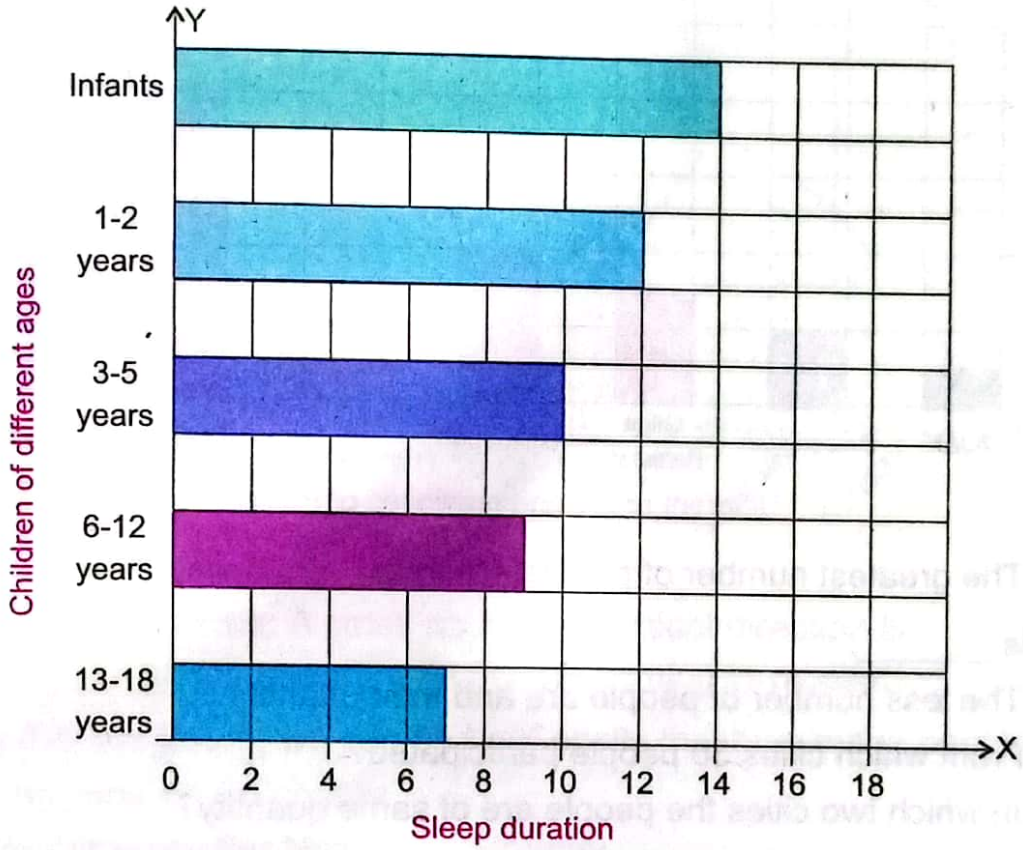
Try Yourself

In which classes, difference between the number of absent students is the least?

Draw graphs about favourite subjects, foods, hobbies of students and ask questions about them.

Exercise 1

1. The minimum time for suggested sleep for children of four months to eighteen years is shown by using the following bar graphs. Look at the graph closely to answer the questions.



Scale: A small square in horizontal direction is equal to 2 hours.

a) For children of 6 to 12 years, time duration of suggested sleep is _____.

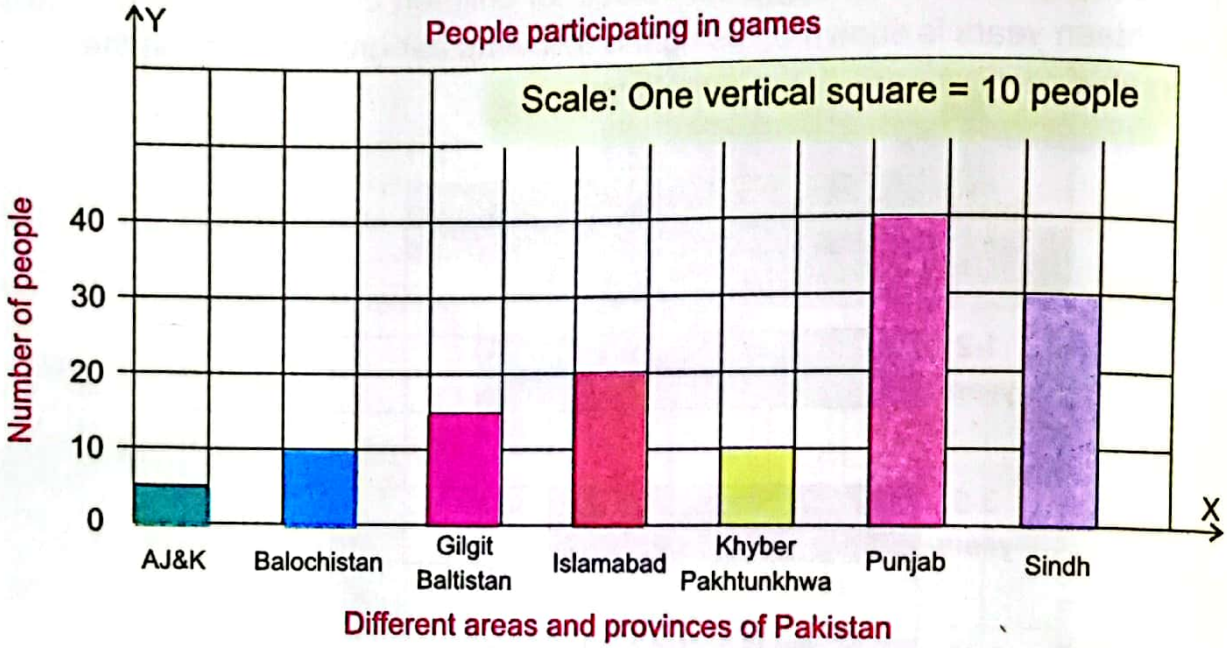
b) For which age group, the time duration of sleep is maximum?

_____ and how much? _____

c) The sleep duration for children of age 13 to 18 years is _____ hours less than the sleep duration for children of age 3 to 5 years.

d) For which age group the time duration for sleep is minimum and how much?_____

2. In April 2020, people from different areas and provinces of Pakistan participated in games. The number of participants is shown with the help of this bar graph. Read the graph and answer the questions.



a) The greatest number of people are from _____ and their quantity is_____.

b) The less number of people are and their quantity is.

c) From which cities 30 people participated?

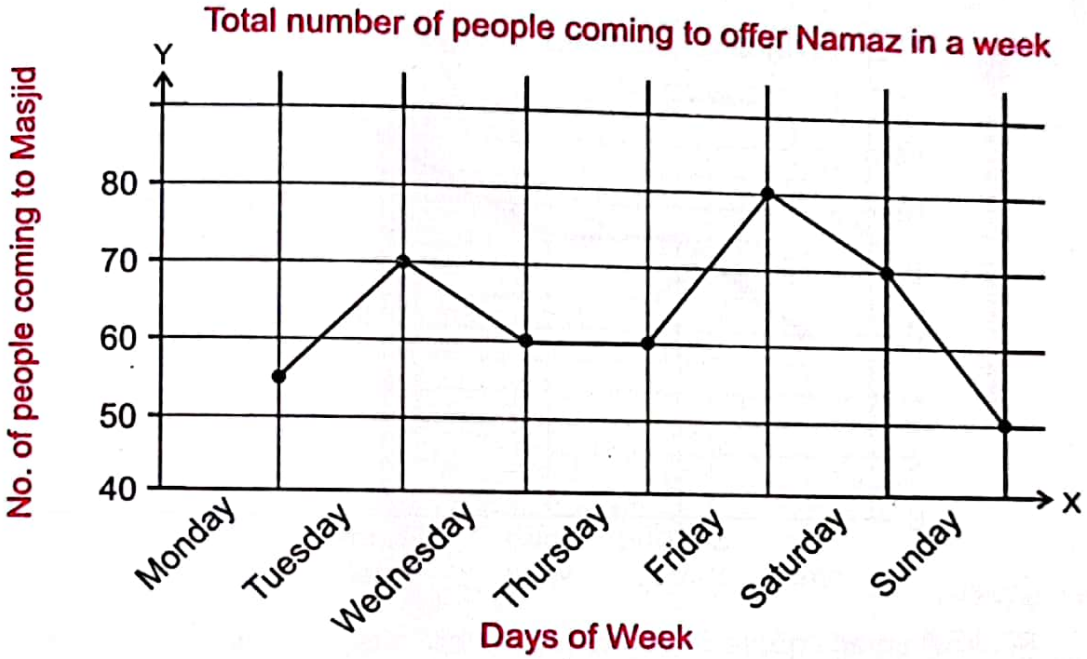
d) In which two cities the people are of same quantity?

e) What is the total number of people participated in Game.

Line Graph

The number of people who came in a Masjid every day to offer Zuhr Namaz for a week is represented by this graph. What type of graph is it and what information can we obtain from this graph?

This is a line graph. It is drawn by joining different points which represent the values of some data.



Scale: A small square in vertical direction is representing 10 people coming to masjid.

By reading this line graph, we can find out easily that how many people came to offer Namaz and on which day.

a) 55 people came to offer Namaz on Monday.

b) On Tuesday, 70 people came while on Wednesday 60 people came to offer Namaz.

c) The least number of people coming to offer Namaz was on Sunday who were only 50 in number.

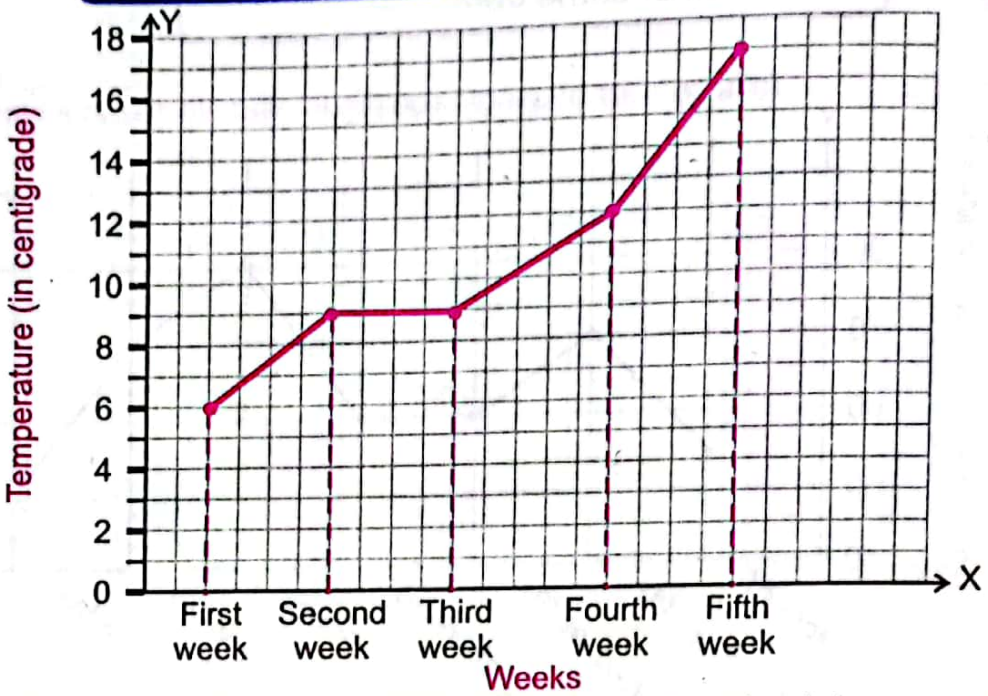
d) The maximum number of people, i.e. 80 came on Friday.

Key Fact

Usually, a line graph represents data which changes with time.

Tell students how to read a line graph with the help of examples. Familiarize them with the concept of scale and tell them to read the scale of a graph

A graph is drawn with the help of maximum temperatures of a city during 5 weeks.



Scale: A small square in vertical direction is representing 1 degree centigrade.

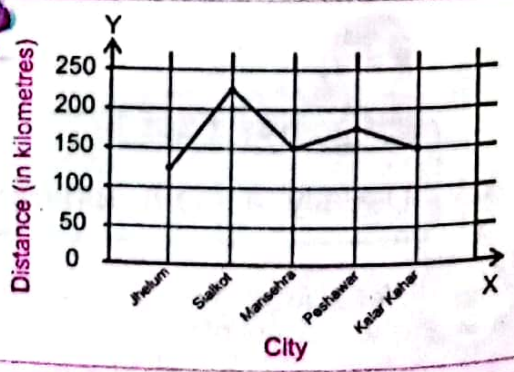
In this line graph, we can see that:

- Except on second and third week, the temperature throughout the week has increased gradually.
- In the second and third week, the temperature remained same, i.e. 9 degree centigrade.
- The minimum temperature was recorded in the first week, i.e. 6 degree centigrade.
- The maximum temperature was recorded in the fifth week, i.e. 17 degree centigrade.
- In five weeks, the difference between the maximum and minimum temperatures is 11 degree centigrade.

Try It!

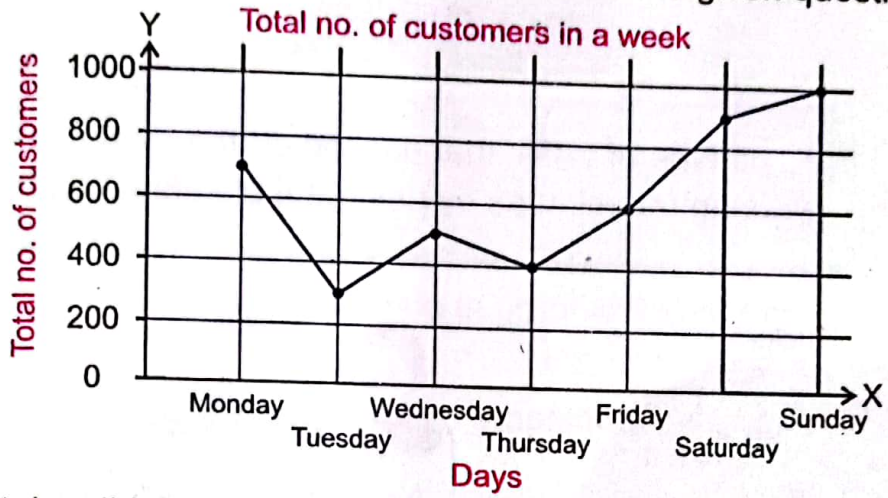
Observe the given line graph and find the mistake in it.

City	Jhelum	Sialkot	Mansehra	Peshawar	Kalar kahar
Distance from Islamabad in kilometres	125	275	150	175	150



Exercise 2

1. In a superstore, the number of customers who came for shopping from 11 am in the morning to 6 pm in the evening for a week, is shown in this line graph. Read the graph carefully to answer the given questions.



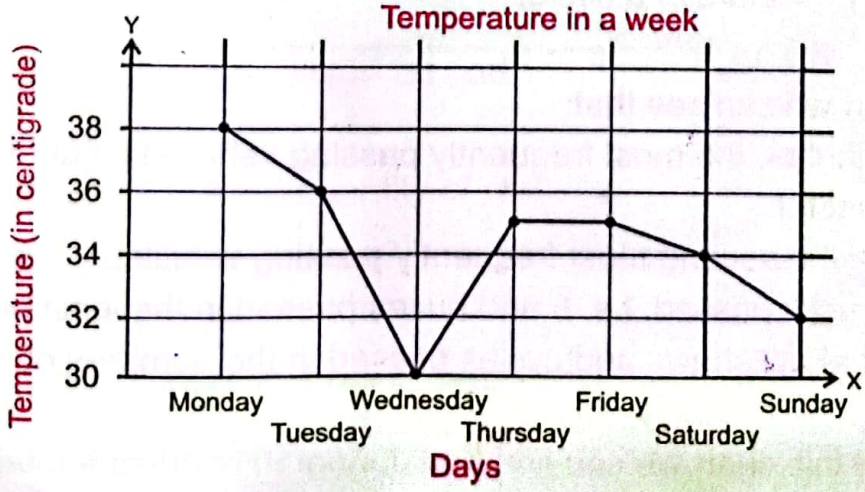
a) On what day did the maximum number of customers came and how many?

b) Is the total no. of customers coming on Monday and Thursday more or less than the no. of customers coming on Sunday?

c) On what day did the minimum number of customers come and how many?

d) How many customers came on Friday.

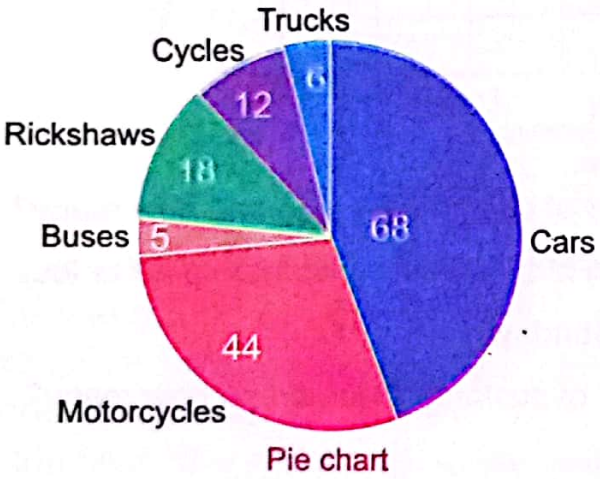
2. During a week of August, the maximum temperature (in centigrade) of Peshawar is shown in this line graph. Read it to answer the questions.



a) On what day the temperature was highest?
b) Which two days had the same temperature and how much?
c) What was the lowest temperature and on what day?
d) What was the temperature on Friday?

Pie Chart

The type of traffic that passed on the road near my house during ten minutes by using the pie chart given below.



Pie chart

Key Fact

A pie chart is also called a circle graph. It can be divided into many sectors and each sector represents only one type of things.

Pie chart is also used for organization and representation of information. The form of sectors of a circle.

In this pie chart we can see that:

- During 10 minutes, the most frequently passing vehicle is a car which is shown by the blue sector.
- Motorcycle is the second most frequently passing vehicle.
- Only a few trucks passed, i.e. 6 and buses passed in the least number, i.e. 5.
- Other than that rickshaws and cycles passed in the numbers of 18 and 12 respectively.
- By looking at this chart we can find that during 10 minutes a total of 153 vehicles passed from this road.

In the following pie chart, information of 1250 people taking admission in different courses during vacation is shown.

a) The most number of admissions were taken in calligraphy.

b) The least number of admissions were taken in baking.

No. of admissions in courses

150 people got admission in baking course.

$= 1250 - (500 + 200 + 400)$

$= 1250 - 1100$

$= 150$

What fraction of people got admission in graphic designing.

Fraction of people getting admission in graphic designing $= \frac{400}{1250} = \frac{8}{25}$

Exercise 1

1. The food components present in a boiled egg are shown in this pie chart. Read the chart carefully to answer the given questions.

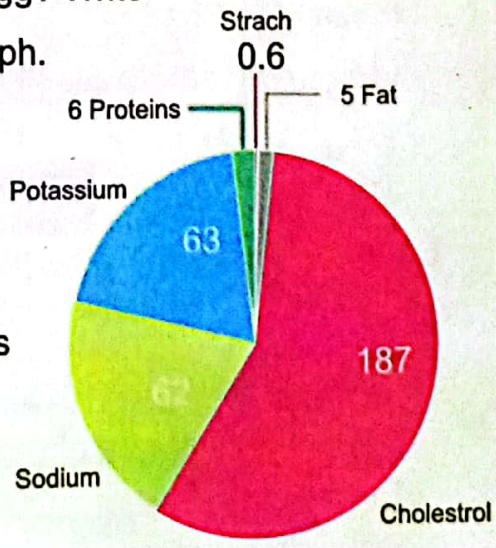
a) What is the quantity of fat in the boiled egg? Write Food components of boiled egg from graph.

b) What component is present in the most amount?

c) What is the total quantity of fat and proteins?

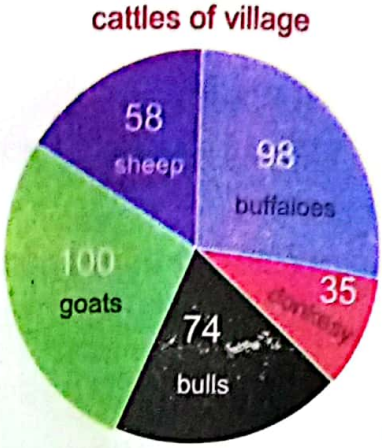
d) How much less is the quantity of proteins than the quantity of sodium?

e) What is the component that is present in the least amount in a boiled egg?



Tell students the method of reading a pie chart with the help of different examples. Tell them that a complete pie chart represent a 'total' and its sectors represent different parts of that "total.

2. A survey in a village was carried out to find what cattle are bred by the people of the village.



a) Which cattle is bred the most?
b) Which cattle is bred the least?
c) Is the total number of sheep and goats more or less than the total number of donkeys and buffaloes, and how many more or less?
d) Write in the form of fraction what part is the number of bulls to the total number of cattle?

I Have Learnt

- to read simple bar graphs given in horizontal and vertical form
- to interpret real life situations using data presented in bar graphs
- to read line graph
- to interpret real life situations using data presented in line graphs
- to read Pie Chart
- to interpret real life situations using data presented in Pie Chart

Vocabulary

- Data
- Bar Graph
- Horizontal Bar Graph
- Vertical Bar Graph
- Line Graph
- Pie Chart
- Sector

Review Exercise

1. Choose the correct answer.

a) It is important that in a bar graph, the _____ of each bar is same.
i) length ii) colour iii) width iv) value

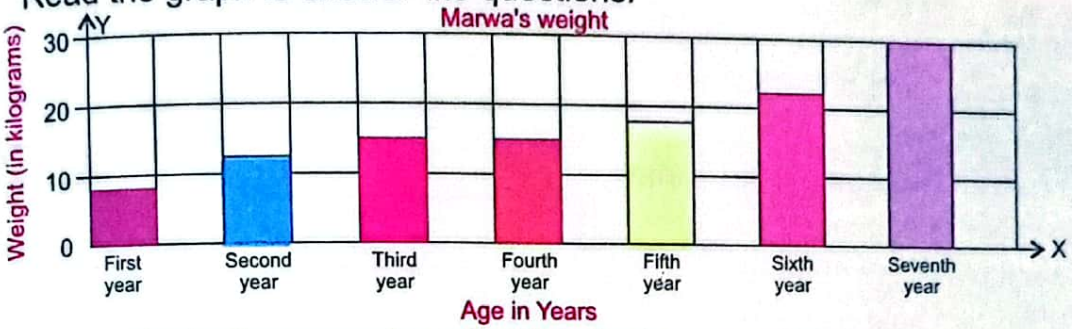
b) Bar graphs can be of _____ types
i) two ii) three iii) four iv) five

c) _____ is also called a circle graph.
i) Pie chart ii) Line graph
iii) Vertical bar graph iv) Horizontal bar graph

d) _____ is drawn by joining the dots representing the quantity of a given value in the question.

i) Pie chart
ii) Line graph
iii) Vertical bar graph
iv) Horizontal bar graph

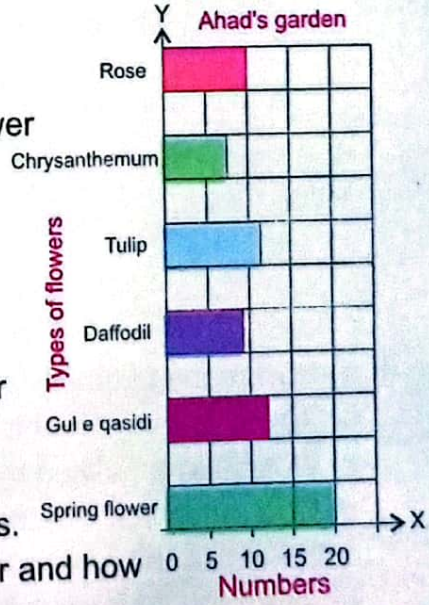
2. Marwa's weight from birth to 7 years is shown in the following bar graph. Read the graph to answer the questions.



Scale: One square in vertical direction is representing 10 kg.

a) What was Marwa's weight at the age of one year?
b) In what years Marwa's weight was same and how much?
c) What was the age duration in which Marwa's weight increased the most and how much?
d) What was the age duration in which Marwa's weight increased the least and how much?
e) How much did Marwa's weight increase in total from the age of one year to 7 years?

3. Ahad has planted different flowers in his garden. Their number and type is shown in this bar graph. Read the graph to answer the questions.

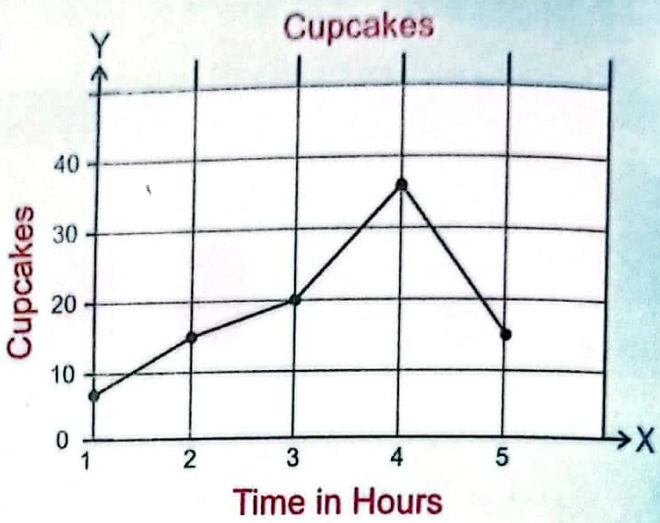


a) How many roses are there in Ahad's garden?
b) How much less are the tulips than the Gul e qasidi?
c) Which flowers are present in the most number in Ahad's garden and how many are they?
d) Write in fraction form the number of tulips as compared to the total number of all the flowers.
e) Which flowers are present in the least number and how many are they?

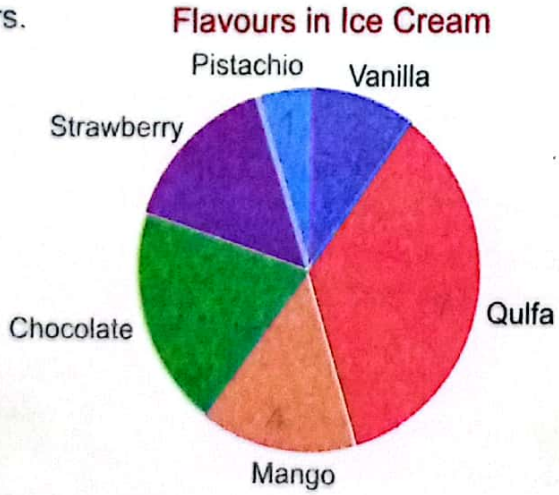
Scale: One square in vertical direction is representing 5 flowers.

4. Ibrahim set up a stall of cupcakes on the spring festival of his school. Ibrahim drew a line graph of the cupcakes sold in each hour from 9 in the morning to 2 in the afternoon. Look at the graph to answer the questions.

a) How many cupcakes were sold in the third hour?
b) In which hour were the most cupcakes sold and what was their number?
c) In which two hours were same number of cupcakes sold? What was their number?
d) If Ibrahim sold 92 cakes in total, how many cakes were sold in the first hour?



5. Arham asked 20 members of his family about their favourite flavors of ice cream. Arham prepared a pie chart based on the answers given by all the family members.



a) How many people like vanilla ice cream?
b) Which flavor is liked the most?
c) Which flavor is liked by the same number of people and how many?
d) How much less are the number of people preffering pistachio ice cream than the number of people preffering qulfa ice cream?
e) There are 20 family members in total while people preffering chocolate ice cream are 4. How will you show this number as a fraction?

(Answers)

Unit 1 Whole Numbers

Exercise 1

1. a) 600,000 + 70,000 + 5000 + 400 + 30 + 2 b) 400,000 + 30,000 + 7000 + 900 + 10 + 1
   c) 200,000 + 10,000 + 0000 + 900 + 50 + 6 d) 500,000 + 40,000 + 6000 + 700 + 40 + 3
   e) 700,000 + 80,000 + 6000 + 500 + 90 + 4 f) 500,000 + 00,000 + 9000 + 200 + 20 + 3
   g) 300,000 + 20,000 + 2000 + 100 + 60 + 7 h) 600,000 + 50,000 + 7000 + 800 + 90 + 0
   i) 200,000 + 30,000 + 6000 + 700 + 80 + 9 j) 600,000 + 70,000 + 8000 + 300 + 20 + 4
   k) 900,000 + 00,000 + 1000 + 400 + 50 + 2 l) 700,000 + 50,000 + 6000 + 400 + 30 + 2
2. a) 621171 b) 239235 c) 565343 d) 756790
3. a) 00 tens b) 20000 ten thousand c) 70000 hundred thousands d) 6 ones
   e) 70000 ten thousand f) 8000 thousands g) 500 hundreds h) 0000 thousand i) 4 ones
4.
   a) six hundred and seventy-four thousand, three hundred and twenty-five
   b) nine hundred and forty-three thousand, seven hundred eleven
   c) Tow hundred and nineteen thousand, five hundred and sixty
   d) Six hundred seventy-five thousand, four hundred and thirty-four
   e) eight hundred and sixty-seven thousand, four hundred and fifty-nine
   f) nine hundred and twenty-five thousand, three hundred and two
   g) two hundred and thirty-six thousand, seven hundred and twenty-one
   h) nine hundred seventy-eight thousand, sixty-five
   i) three hundred and sixty-two thousand, eight hundred and ninety-seven
   j) eight hundred and thirty-seven thousand, two hundred and sixty-four
   k) four hundred and five thousand, one hundred and twenty-nine
   l) six hundred and forty-three thousand, two hundred and seventy-five
5. a) 981,600 b) 700,402 c) 400,061 d) 112,301 e) 801,546
   f) 272,555 g) 796,005 h) 444,444 i) 101,320

Exercise 2

1. a) < b) > c) > d) = e) < f) > g) > h) >
2. a) 97035; 83401; 12337 b) 18221; 18017; 13411 c) 53358; 48176; 42734
   d) 37923; 36121; 34222 e) 36243; 23601; 16483 f) 24391; 24313; 12683
   g) 36537; 32531; 28540 h) 98754; 89654; 78543
3. a) 31273; 40131; 40735 b) 28211; 30817; 43181 c) 58275; 70442; 84176
   d) 22342; 67319; 97323 e) 36241; 63283; 83624 f) 23634; 43124; 48326
   g) 24085; 59312; 60337 h) 84675; 89546; 89675

Review Exercise

1. a) ii b) ii c) iv d) iii e) i f) iv

2.

a) forty-three thousand, five hundred and sixty-seven
b) three hundred and ninety-seven thousand, seven hundred and forty-one
c) nine hundred and fifty-two thousand, sixteen hundred and forty-three
d) five hundred and forty-six thousand, seven hundred and forty-three
e) seven hundred and fifty-eight thousand, six hundred and forty-nine
f) three hundred and ninety-five thousand, two hundred and two
g) two hundred and ten thousand, seven
h) nine hundred and eighty-six thousand, nine hundred and fifty
i) six hundred thousand
j) six hundred thousand, thirty-two
k) four hundred and fifty-two thousand nine hundred and one
l) five hundred and thirty-six thousand, four hundred and twenty-seven

3. a) 400,000 + 50,000 + 3000 + 600 + 70 + 2 b) 900,000 + 70,000 + 4000 + 300 + 10 + 1
c) 100,000 + 20,000 + 5000 + 600 + 00 + 9 d) 400,000 + 60,000 + 5000 + 700 + 40 + 3
e) 600,000 + 70,000 + 8000 + 900 + 40 + 5 f) 300,000 + 90,000 + 2000 + 500 + 00 + 2
g) 300,000 + 10,000 + 6000 + 200 + 70 + 2 h) 500,000 + 60,000 + 9000 + 000 + 70 + 8
i) 300,000 + 20,000 + 7000 + 800 + 60 + 9 j) 400,000 + 30,000 + 2000 + 700 + 80 + 6
k) 500,000 + 40,000 + 1000 + 900 + 00 + 2 l) 300,000 + 60,000 + 4000 + 700 + 50 + 3

4. a) 451001 b) 308,404 c) 515000 d) 621,105 e) 105,500 f) 296125 g) 968,003
5. a) 5000 thousand b) 20000 ten thousand c) 900000 hundred thousand
e) 4 ones f) 6000 thousand g) 50000 ten thousand h) 200000 hundred thousand
6. a) 344683 b) 690054 c) 429104 d) 716785
7. a) > b) < c) > d) > e) = f) < g) > h) >
8. a) 18624,14601,12683 b) 26133,16283,14394
c) 30536,23913,22480 d) 54790,54788,54786
9. a) 33731,8405,94041 b) 12921,14131,19375
c) 37358,42876,45037 d) 35242,36172,37723

Addition and Subtraction

Exercise 1

1. a) 16,342 b) 39,970 c) 92,507 d) 59,880
2. a) 103,501 b) 91,190 c) 187,620 d) 120,784 e) 155,500 f) 153,075
g) 103,652 h) 124,508 i) 122,846 3. Rs 72,105 4. 104,299
5. a) 55,388 b) second month 6. a) 65,225 b) 66,615 books

Exercise 2

1. a) 36,196 b) 22,459 c) 69,303 d) 49,228 e) 18,872 f) 7037 g) 22,782 h) 34,939
2. a) 10,402 b) 36,111 c) 32,170 d) 8588 e) 11,420 f) 5078
3. a) Rs 36, 617 b) Rs 33, 731 4. 21907 5. Rs 3094 6. 24,297

Review Exercise

1. a) iii b) iii c) iv d) iv e) iii
2. a) 122,275 b) 106,390 c) 91413 d) 26,108 e) 60,792 f) 7037
3. a) 57,579 b) 38,033 c) 129,733 d) 23,380 e) 2081 f) 25,027
4. a) 58,023 people b) 11,111 first week 5. a) 46,912 cattles b) 20158
6. 13,641 trees 7. Rs 24,086

Multiplication and Division

Exercise 1

1. a) 2524 b) 15085 c) 261,454 d) 5455,188 e) 4150,146 f) 3,294,000
g) 1,196,430 h) 19,242,318 i) 2,630,226
2. 724,983cm 3. a) Rs 4,031,425 b) Rs 8,062,850 4. 4,228,140books
5. Rs 11,783,820

Exercise 2

1. a) 195 b) 454 c) 166 d) 343 e) 416 f) 311 g) 239 h) 231 i) 12r1
j) 132 k) 21 l) 111 m) 612r5 n) 89r13
2. 52 blankets 3. 41 rows 4. 276 biscuits 5. 202 books 6. a) Rs 100,500
b) Rs 57,400 b) Rs 7895 7. a) 45 kg b) 1710 kg

Exercise 3

1. a) 31,35 by adding 4 b) 180,210 by adding 30 c) 36,42 by adding 6
d) 600,550 by subtracting 50 e) 91,88 subtracting 3 f) 300,304 by adding 4
g) 480,460 by subtracting 20
3. a) adding 4 b) adding 20

Review Exercise

1. a)iv b)iii c)iv d) ii e) ii
2. a)490 b) 8916 c) 177,284 d) 16185 e) 23,271,285 f) 35,771,145
3. 21 buses 4. a)76 b)16 r4 c) 487r3 d) 54 e) 80r6 f) 45
5. a) 56 km b) 616 km 6. a) Rs 562,848 b) Rs 844,272 7. 6687 blocks
8. a) 27,33 adding 6 b) 50,40 subtracting 10 c) 42,48 adding 6 d) 42,50 adding 6
e) 51,0 subtracting 11

Unit 2 Factors and Multiples

Exercise 1

1. a, c, d, f, g, i, j 2. b, c, e, f, g, h 3. a, b, e, g, h

Exercise 2

1. 49, 48, 46, 45, 44, 42, 40, 39, 38, 36, 35, 34, 33, 32 2. h, e, d, b
3. 47, 43, 41, 37, 31, 29, 23, 19, 17, 13, 11, 7, 5, 3, 2
5. a) 12, 6, 4, 3, 2, 1 b) 15, 5, 3, 1 c) 32, 16, 8, 4, 2, 1 d) 10, 5, 2, 1 e) 27, 9, 3, 1
f) 22, 11, 2, 1 g) 6, 3, 2, 1 h) 49, 7, 1 i) 40, 20, 10, 8, 5, 4, 2, 1 j) 38, 19, 2, 1
6. a) 30, 27, 24, 21, 18, 15, 12, 9, 6, 3 b) 50, 45,40,35,30,25,20,15,10,5
c) 80,72,64,56,48,40,32,24,16,8 d) 20,18,16,14,12,10,8,6,4,2

e) 70,63,56,49,42,35,28,21,14,7 f) 60,54,48,42,36,30,24,18,12,6

g) 40,36,32,28,24,20,16,12,8,4 h) 90,81,72,63,54,45,36,27,18,9

Exercise 3

1. a)17,1 b) 3,7 c) 2,17 d) 2,3,3 e) 11,2,2 f) 11,3 g) 2,2 h) 7,2 i) 2,2,2,2,3 j) 3,13

2. a)1,2,3,6 b) 1,2,5,10 c)1,2 d) 1,2 e)1,7 f) 1,5 g) 1,2,4 h) 1,13 i) 1

3. a)15 b)36 c) 60 d)132 e) 16 f) 102 g)14 h) 30 i) 10

Review Exercise

1. a)iv b) i c) iii d) iii e) ii

2. a) 2 b) 2 c)2,3 d)2,5,10 e) 2,3,5,10 f) 2 g)2,5,10 h)2

3. a)1,2,5,10 b) 1,5,25 4. 21,20,18,16,15,14,12,10,9,8,6,4 5. 59,53,47,43,41,37,31,29,23

c) 1,5,7,35 d) 1,2,23,46 e)1,23 f) 1,2,4,8,16 g)1,2,4 h) 1,47 i) 1,2,19,38 j) 1,2,4,5,10,20

6. a) 12,10,8,6,4,2 b) 36,30,24,18,12,6 c) 30,25,20,15,10,5 d) 54,45,36,27,18,9

7. a) 1,5 b)1,19 c) 2,11 d) 3,5 e)2,2,2,5 f) 3,7 g) 2,2,2 h) 2,3,5 i) 41 (j 2,19

8. a) 1,2,4 b) 1,2,4,8 c) 1,2,7,14 d) 1,17 e) 1,2,3,6 f) 1,5

9. a)14 b) 30 c) 252 d) 30 e) 60 f) 60

Unit 3 Fractions

Exercise 1

1. a,e,f

2. a)= b) < c) < d) < e) < f) < g) > h) <

3. a) $\frac{1}{5}$ b) $\frac{1}{6}$ c) $\frac{2}{3}$ (d $\frac{1}{3}$ e) $\frac{3}{4}$ f) $\frac{3}{5}$ g) $\frac{2}{3}$ h) $\frac{2}{9}$ i) $\frac{7}{10}$ (j $\frac{1}{2}$

4. a) $1\frac{3}{5}$ b) $2\frac{1}{5}$ c) $1\frac{3}{10}$ d) $2\frac{2}{9}$ e) $7\frac{1}{2}$ 5. j, h, e, d = mined number

a,b,c,f,g,i = proper fractions 6. a) $\frac{13}{5}$ b) $\frac{47}{6}$ c) $\frac{29}{7}$ d) $\frac{58}{11}$ e) $\frac{19}{3}$ f) $\frac{30}{13}$

7. a) $\frac{3}{9}$ ‘$\frac{3}{7}$ ‘$\frac{3}{5}$ ascending order $\frac{3}{5}$ ‘$\frac{3}{7}$ ‘$\frac{3}{9}$ descending order

b) $\frac{1}{3}$ ‘$\frac{3}{4}$ ‘$\frac{6}{7}$ ascending order $\frac{6}{7}$ ‘$\frac{3}{4}$ ‘$\frac{1}{3}$ descending order

c) $\frac{2}{10}$ ‘$\frac{4}{15}$ ‘$\frac{3}{5}$ ascending order $\frac{3}{5}$ ‘$\frac{4}{15}$ ‘$\frac{2}{10}$ descending order 8. $3\frac{1}{2}$ 9. $\frac{3}{2}$ kg

Exercise 2

1. a) $\frac{11}{7}$ b) $\frac{22}{13}$ c) $\frac{16}{17}$ d) 1 e) $\frac{5}{8}$ f) $\frac{14}{19}$

2. a) $\frac{1}{3}$ (b $\frac{6}{11}$ c) $\frac{1}{3}$ d) $\frac{8}{21}$ e) $\frac{2}{5}$ f) $\frac{2}{5}$ g) $\frac{1}{13}$ h) $\frac{2}{15}$

3. a) $\frac{10}{13}$ (b $\frac{4}{13}$ 4.a) $\frac{12}{16} = \frac{3}{4}$ 5. $\frac{9}{10}$ 6. $\frac{3}{11}$ boy

Exercise 3

1. a) $\frac{24}{7}$ b) $\frac{45}{6}$ c) 13 d) $\frac{16}{3}$ e) $\frac{1}{5}$ f) $\frac{6}{13}$ g) $\frac{14}{11}$ h) $\frac{11}{3}$

2. a) $\frac{3}{2}$ b) $\frac{9}{22}$ c) $\frac{45}{68}$ d) $\frac{325}{28}$ e) $\frac{55}{162}$ f) $\frac{410}{231}$ g) $\frac{77}{30}$

3. a) $\frac{7}{40}$ b) $\frac{2}{75}$ c) $\frac{4}{63}$ d) $\frac{7}{27}$ e) $\frac{1}{8}$ f) $\frac{1}{28}$ g) $\frac{1}{4}$ h) $\frac{7}{162}$

4. a) $\frac{39}{40}$ kg 5. a) 10 years b) 15 year 6. a) $\frac{3}{4}$ packets b) $\frac{1}{2}$ packets 7. $\frac{55}{2}$ km

Review Exercise

1. a) iii b) i c) iii d) iv e) iv 2. a,d,f 3. a) > b) > c) > d) > 4. a) $\frac{26}{9}$ b) $\frac{1}{3}$ c) $\frac{9}{19}$ d) $\frac{2}{3}$

5. a,c,d = improper fraction e, b = unit fraction 6. a) $1\frac{2}{5}$ (b $1\frac{3}{8}$ c) $4\frac{1}{4}$ d) $1\frac{1}{4}$

7. a) $\frac{8}{5}$ b) $\frac{35}{10}$ c) $\frac{46}{7}$ d) $\frac{19}{9}$

8. a) $\frac{1}{6}, \frac{4}{8}, \frac{6}{7}, \frac{5}{2}$ = ascending order $\frac{5}{2}, \frac{6}{7}, \frac{4}{8}, \frac{1}{6}$ = descending order

b) $\frac{2}{9}, \frac{1}{3}, \frac{5}{6}, \frac{8}{9}$ = ascending order $\frac{8}{9}, \frac{5}{6}, \frac{1}{3}, \frac{2}{9}$ = descending order

c) $\frac{3}{10}, \frac{4}{12}, \frac{7}{18}, \frac{5}{6}$ = ascending order $\frac{5}{6}, \frac{7}{18}, \frac{4}{12}, \frac{3}{10}$ = descending order

9. a) $\frac{3}{5}$ b) $\frac{6}{13}$ c) $\frac{5}{17}$ d) $\frac{1}{7}$ 10. a) $\frac{3}{3} = 1$ b) $\frac{3}{2}$ c) $\frac{13}{5}$ d) $\frac{10}{9}$

11. a) $\frac{63}{5}$ b) $\frac{207}{55}$ c) $\frac{71}{18}$ d) $\frac{95}{22}$ e) $\frac{55}{6}$ f) $\frac{1}{54}$ g) $\frac{55}{12}$ 12. $\frac{4}{3}$ tree 13. $\frac{11}{7}$ m

14. a) $\frac{4}{7}$ b) $\frac{6}{7}$

Unit 4 Decimals

Exercise 1

1. a) 0.16 b) 0.1 c) 0.324 d) 0.02 e) 0.070

2. a) 0.5 b) 0.08 c) 300 d) 0.09 e) 0.00 f) 2 g) 0.008 h) 0.0

4. a) i) 1,7 ii) 0.1, 0.4, iii) 0.01, 0.05 b) i) 10, 20 ii) 1, 6 iii) 0.1. 0.9

c) i) 10, 80 ii) 1, 7 iii) 0.1, 0.3 iv) 0.01, 0.09 v) 0.001, 0.001

d) i) 10, 90 ii) 1, 9 iii) 0.1, 0.9 iv) 0.01, 0.09 v) 0.001, 0.009

Exercise 2

1. a) 0.24 b) 0.005 c) 0.6 d) 0.024 e) 0.012 f) 1.88 g) 0.300 h) 0.606 i) 0.080 j) 0.02

2. a) $\frac{13}{10}$ b) $\frac{51}{25}$ c) $\frac{349}{50}$ d) $\frac{11}{2}$ e) $\frac{17}{25}$ f) $21\frac{18}{25}$ g) $7\frac{87}{100}$ h) $\frac{49}{50}$ i) $11\frac{11}{100}$ (j $6\frac{1}{10}$

Exercise 3

1. a) 17.14 b) 55.8 c) 55.1 d) 8.67 e) 7.91 f) 70.9

2. a) 0.99 b) 4.48 c) 2.30 (d 1.69 e) 8.71 f) 71.06

3. Rs 55.9 4. a) 3.7kg b) 81.5kg

Exercise 4

1. a) 59 b) 480 c) 300 d) 82 e) 4300 f) 910

2. a) 44.8 b) 14.2 c) 19.6 d) 10.2 e) 9.1 f) 88.2

3. a) 0.7 b) 0.2 c) 1.6 d) 1.4 e) 0.9 f) 1.3

4. 98mm 5. 20m 6. a) 1.8m b) 3.6m 7. 1.7min

Exercise 5

1. a) 10,000,9900,9870 b) 5000,5500,5400,5470 c) 1000,1200,1210 d) 6000,6300,6340

e) 6000,5600,5560 f) 3000,3500,3500 g) 1000,1300,1290 h) 5000,4500,4550

i) 1000,1100,1110

2. a) 6 b) 54 c) 987 d) 13 e) 9 f) 7 g) 76 h) 8 i) 88

Review Exercise

1. a) i b) ii c) i d) ii e) iv 2. a) 0.17 b) 0.075 c) 0.2 d) 0.19 e) 0.8

3. a) 11.59 b) 9.52 c) 15.94 4. a) $6\frac{7}{10}$ b) $45\frac{14}{25}$ c) $1\frac{1}{50}$ d) $7\frac{87}{100}$ (e $15\frac{4}{5}$

5. a) 13 b) 890 c) 4500 d) 57.4 e) 27.9 f) 42.6 6. a) 5.11 b) 1.98 c) 3.97

7. a) 1.7 b) 4.4 c) 0.9 d) 0.5 (e 0.8 (f 1.7

8. a) 3000,3400,3430 b) 1000,1000,1010 c) 8000,7800,7820 d) 8000,8400,8420

9. e) 4000,4100,4090 f) 2000,1700,1720 a) 4 b) 78 c) 13 d) 1 e) 41 f) 10

10. a) 10.97m b) 4.15m 11. a) 23.8l b) 14l 12. 0.45kg

Unit 5 Measurements

Exercise 1

1. a) cm b) cm c) m d) km

2. a) 1200m b) 56930m c) 8800cm d) 6078cm e) 32mm f) 552mm

Exercise 2

1. a) 55km b) 94km 17m c) 104m d) 82cm 8mm e) 41m 30cm

f) 74km 135m g) 90m 27cm

2. a) 25km b) 36km 26m c) 37m d) 10cm 4mm e) 1m 4cm

f) 74km 109m

3. 99m 99cm 4. 1400mm 5. a) 1km 496m b) 1496m 6. a) 2300cm b) 2m 12cm

Exercise 3

1. a) 65000g b) 23139g c) 89000mg d) 43699mg e) 1900mg f) 800g

2. a)112kg b)35kg 17g c)10.4g d) 82g 562mg e)81g 30mg f) 94kg 145g

3. a)75kg b)29kg 155g c) 750g d) 14g 400mg e)11g 181g f) 302kg

g)58g 122mg 4. 9g 6mg 5. 114kg 958g, 114958g 6. a) 22kg 646g b)22646g

Exercise 4

1. a)9000m/ b) 74000m/ c) 56506m/ d) 90000m/ e)67000m/ f) 1600m/

2. 98000m/ 3. 1700m/

Exercise 5

1. a) 8l 413m/ b) 10.7/ c) 198m/ d)126l 200m/ e) 455l 678m/

2. a) 12l 391m/ (b 23/ c)0.7m/ d) 1l 118m/ e) 62l 67m/

3. a) 19.8/ b)19800m/ 3. a) 151l 498m/ d) 17l 102m/

Review Exercise

1. a) iv b) iv c) iii d) iv e) iii

2. a) 105000m b) 340cm c) 66000g d)40698mg

e)500mg f) 76002ml g) 9800ml h) 900mm

3. a)14kg 299g b) 7.3m c) 159kg 872g d) 304l 700m/ e)484l 591m/ f) 163g 511mg

4. a)89kg b) 72m 384cm c) 9kg 31g d) 15l 591m/ e)53/129m/

5. a)237m (b 17km 459m 6. a)255kg b) 255000g 7. 199456m/, 199l456m/

Time

Exercise 1

1. a) 6:00 a.m. b) 7:45 a.m. c)12:30 p.m. d) 4:30 p.m. e) 8:00 p.m. f) 10:25 p.m.

2. a)7:30:15 b)5:30:36 c)9:00:58

3. a)5:00:15 b) 5:00:35 c) 7:40:00 d) 3:10:00

Exercise 2

1. a) 360min b) 12060min c) 852min d) 355min e) 1048min f) 1346min g)708min

h) 1335min i) 583min j) 1086min k) 1658min l) 2546min

2. a) 4620sec b) 2580sec c) 73sec d) 512sec e) 413sec f) 3838sec g)5339sec

h) 3937sec i) 12864sec j) 6011sec k) 10578sec l) 25923sec

Exercise 3

1. a) 108months b) 48months c) 144 months d) 252months e) 99months f)64months
   g) 246months h) 214months i) 371months j) 355months k) 191months l) 523months
2. a) 77months b) 56days c) 35days d) 750days e) 69days f) 50days
   g) 19days h) 31months i) 228days j) 813days k) 1242days l) 1633days

Exercise 4

1. a) 45h 29min 45sec b)26h 55min 48sec c)97h 39min 55sec
   d) 9h 19min 56sec e)21 years 11 months 4 days f) 88h 13min 17sec
   g) 89 years 7 months 16 days h)59 years 9 months 9 days
2. a) 35h 22min 11sec b)24h 11min 15sec c)11h 8min 11sec
   d) 1h 11min 11sec e)2 years 2 months 2 days f) 11h 11min 21sec
   g) 42 years 1 months 14 days h)20 years 0 months 11 days
3. a) 2h 4min 3sec ii) 10h 54min 57sec 4. a) 6h 43min 25sec b) 24205sec
5. a)2h 13min b) 16h 33min

Review Exercise

1. a) iii b) iii c) i d) iv e) iv
2. a) 5:00a.m. b) 7:30a.m. c) 8:00a.m. d)12:20p.m. e) 3:00p.m. f) 9:25p.m.
3. a) 480min b) 6720min c) 913min d)435min e)1719min
   f) 2005min g)673min h) 1396min i) 414min
4. a) 4680sec b)1980sec c) 257sec d)582sec e)173sec
   f) 1271sec g)5867sec h) 2927sec i) 20,024sec
5. a) 60 months b)36 months c)264 months d)384 months e) 112 months f) 190 months
   g) 356 months h)239 months i) 657 months
6. a) 105 days b) 63 days c) 42 days d) 189 days e) 79 days f) 68 days g) 83 days
   h) 396 days i) 304 days
7. a) 69h 45min 54sec b) 76h 59min 44sec c) 9h 38min 49sec
8. a) 38h 11min 12sec b) 12h 13min 21sec c) 16h 22min 49sec
9. a) 6h 43min b) 403min
10. 1h 31min 30sec 11. a) 9 years 11 months 9 days b) 3624 days.
12. 6 years 10 months 9 days

Unit 6 Geometry

Exercise 1

1. parallel = a,c,e non-parallel = b,d,f

Exercise 2

1. a) acute angle b) right angle c) obtuse angle d) acute angle

Exercise 3

2. a) centre = R, diameter = PQ, radius = PR,RQ,RS
   b) centre = L, diameter = JK, radius = LJ,LK
   c) centre = C, diameter = AB, radius = CD,AC,CB

Exercise 4

1. a) $4cm^2$ b) $84m^2$ c) $8cm^2$ d) $1m^2$ 2. a) 20m b) 22cm c) 20m

Exercise 5

1. a,b

Review Exercise

1. a) iv b) iii c) i d) i e) i f) iv g) iv 2. a 3. a) acute angle b) obutse angle
   c) right angle 5. a) diameter b) circumfercen c) centre d) radius
6. a) 20m = b) 16cm = c) 28m =
9. a) cuboid, cube b) cone $24m^2$ = area $16cm^2$ = area $45m^2$ = area

Unit 7 Data Handling

Exercise 1

1. a) 9h b) 12h, in fant c) 3h d) 13-18 year children
2. a) 40, punjab b) 5, AJ&K c) singh d) balochistan and khyber pakhtunkhwa e) 130 people

Exercise 2

1. a) 1000, sunday b) 100, more c) tuesday d) 500
2. a) sunday b) Wednesday and thursday c) 30° C, Tuesday d) 34° C

Exercise 3

1. a) 5 b) cholestrol c) 11 d) 56 e) stroch
2. a) goats b) donkey c) 25, more d) $\frac{74}{365}$

Review Exercise

1. a) ii b) i c) i d) iv
2. a) 8kg b) 14kg third and fourth year c) 8kg, sixth and seventh year
   d) 4kg, second and third year e) 22kg
3. a) 10 b) 1 c) 20 گل بہ d) $\frac{7}{71}$ e) گل داؤدی
4. a) 20 cupcakes b) 35 in fourth hour c) 15 second and fifth d) 8cupcakes
5. a) 2 b) Qulfa c) mango, chocolate d) 6 e) $\frac{1}{5}$

Glossary

Expanded form: To write the number as sum of place values of the digits of the numbers are called expanded form.
Ascending order: The arrangement of numbers from smallest to the greatest is called ascending order.

Descending order: The arrangement of number from greatest to the smallest is called descending order.

Number pattern: the number pattern is the sequence of numbers that can increase, decrease and repeat according to some rule.
Increasing pattern: if we get the next number or term by adding or multiplying then that pattern is called increasing pattern.
Decreasing Pattern: If we get the next number by subtracting or dividing then that pattern is called decreasing pattern.
Prime number: The numbers greater than 1 who have two factors, 1 and the number itself. Such numbers are called prime number.

Composite Number: The numbers whose factors are more than two, called composite number.

Factors: When a number completely divide the other number then that number is called factor of that number.

Multiples: Multiple is the product of one number multiply by an other number.

Prime Factorization: The process of wiritng a number as a product of its factors is called factorization. The factorization in which all factors are prime is calle prime factorization.

Common factor: When factors of two or more number are same then that factors are called common factors.

Common multiples: A number that is the multiple of two are more numbers is called the common multiple.

Web Links

www.mathworksheets4kids.com/triangles.html

www.ixl.com/math/grade-5/types-of-triangles

www.mathsisfun.com/geometry/triangles-interac_ve.html

www.bbc.co.uk/schools/teachers/ks2_ac_vi_es/maths/angles

www.icteachers.co.uk/children/sats/symmetry.htmh

www.mathplayground.com/grade_5_games.html

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www.math-play.com/5th-grade-math-games.html

https://www.chinahighlights.com/greatwall/fact/great-wall-length.htm

https://historypak.com/murree-2/

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https://www.caringforkids.cps.ca/handouts/healthy_sleep_for_your_baby_and_c

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- بدعنوانی اور رشوت ستانی ضمیر کی موت ہے۔
- بدعنوانی ملکی ترقی کی راہ میں سب سے بڑی رکاوٹ ہے۔
- بدعنوانی اخلاقی دیوالیہ پن کو جنم دیتی ہے۔
- بدعنوانی سے خود بھی بچیں اور دوسروں کو بھی روکیں۔

قومی احتساب بیورو بلوچستان

قومی ترانہ

پاک سَرزمین شادباد کِشورِ حَسین شادباد
تُو نِشانِ عَزمِ عالی شان اَرضِ پاکِستان
مرکزِ یقین شادباد
پاک سَرزمین کا نِظام قُوّتِ اُخُوّتِ عوام
قوم، مُلک، سَلطنت پائِندہ تابِندہ باد
شادباد منزلِ مُراد
پَرچَمِ سِتارہ و ہِلال رَہبرِ تَرَقّی و کمال
ترجمانِ ماضی، شانِ حال جانِ اِستِقبال
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