MATHEMATICS

First Term

Module - 1, 2, 3

Grade 6

Department of Mathematics
Faculty of Science and Technology
National Institute of Education
Sri Lanka
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Mathematics

First Term - Module

Module 01

Numbers I

Module 02

Geometry and Measurements

Module 03

Numbers II

Grade 6

Department of Mathematics
Faculty of Science and Technology
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Mathematics - Grade 6

First term

Module 1: Numbers I

Place Value, Numbers and Mathematical Operations, Number Line

Module 2 : Geometry and Measurements

Angles, Time

Module 3 : Numbers II

Estimation and Rounding Off, Factors and Multiples, Types of Numbers and Number Patterns

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Message of the Director General

Prof. Manjula Vithanapathirana (PhD)
Director General
National Institute of Education.

Message of the Commissioner General of Educational Publications

Educational Publications Commisnor General,

Educational Publications Department.

Foreword

Broad learning areas identified with regard to the total school curriculum reflect the ability of a nation to overcome the challenges emerging for sustainable development in a continuously changing country and a world. Besides, broad learning areas need to be identified in synchrony with the demands changing from time to time. This not only modernizes the subjects in the prevailing school curriculum but also introduces new subjects to the school curriculum. It is clear that learning teaching process too should develop timely corresponding to these changes taking place. As a result of this, under the new curriculum that will be implemented with effect from 2026, learning - based modules have been introduced for every subject from grade 6 upwards. For the primary grades and the junior secondary grades, it has been proposed to introduce the new curriculum as follows: for grades 1 and 6 in 2027, grades 2 and 7 in 2028, grades 3 and 8 in 2029, grades 4 and 9 in 2029 and grades 5 in 2030. Modules containing new learning methodologies have been prepared from the junior secondary level and the teacher is expected to give guidance for the leaner. The modules have also created the environment essential for self - learning It, is our belief that these modules are much helpful to develop strongly the knowledge on the concepts required for the students and their abilities and interests while directing them to apply the acquired knowledge to pragmatic situations. The learning transferred by these modules will also help strengthen the literacy, interpersonal relations and values necessary for the 21st century.

Every module indicates the guide to use modern technology. They also will provide students assessment tools needed to evaluate transparently the performance and educational objections achieved by them. Always, every module is very important to give guidance for a real learning applying new talents and knowhow to applied situations. I highly appreciate the services of Dr. Upali Sedare, the former secretary of the state ministry of Education who pioneered the preparation of module based learning methodologies and Dr. Sunil Jayantha Navartne and Prof. Prasad Sethunga , the former Director Generals of the National Institute of Education. I also wish to remind that the service rendred by the teachers, in- service advisers,directors as well as the contribution given by the government and private institutions through respective fields helped raise the quality of these modules. Further,I state that the suggestions made through the practical experience gained in the use of these modules are momentous and I respectfully invite you are all it.

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Deputy Director General
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Introduction

Mathematics has its own importance and beauty, and these modules aim at assessing the strength and the beauty of mathematical reasoning in students. Each module has been compiled in a way to make it easy for the teacher or the facilitator to support the learners who are to fulfill the expected learning outcomes at the end of the grades 6 - 9 and also to give opportunities for the learner to be able to develop their skills. The presentations included here are prepared in order to assure the understanding of the students. Each module consists of solution strategies as a guidance to make students easily identify each concept or any special features highlighted. There are both self learning activities and teacher guided activities designed to be done by students at their own speed and time. The specialty of Each module is that students can achieve the expected learning outcomes with patience and relentless effort along with cooperation with their colleagues.

Further, provision of support for the students to acquire 21st century skills, considering their needs and situations is also an objective of each module.

First module has been prepared with three chapters related to Place value of a number, Basic operations on numbers and Number line under the theme Numbers.

Second module has been prepared with two chapters related to Angles and Time under the themes Geometry and Measurements respectively.

Third module has been prepared with three chapters related to Estimation and Rounding Off, Factors and Multiples, and Number Patterns under the theme Numbers.

Mr. G.P.H. Jagath Kumara,

Director,

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Content

Mathematics

Grade 6

First Term - Module- 1

Numbers I

Chapter 1

Place Value

By studying this chapter you will be able to,

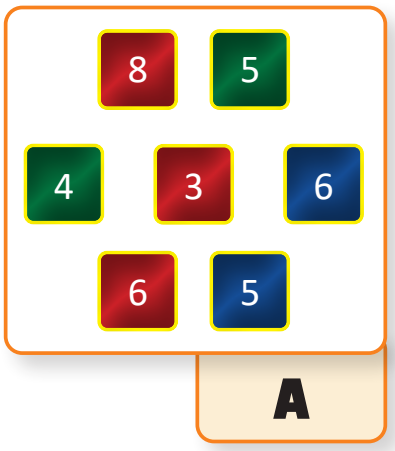
- identify the place value of each digit in a whole number hp to the billion zone
- identify the value represented by each digit in a whole number
- identify the number zones
- write and read the numbers hp to the billion zone in the standard form.

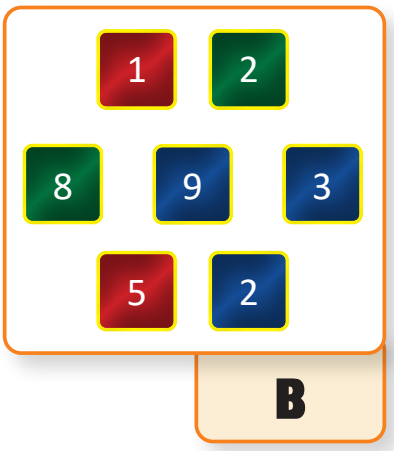
What I know

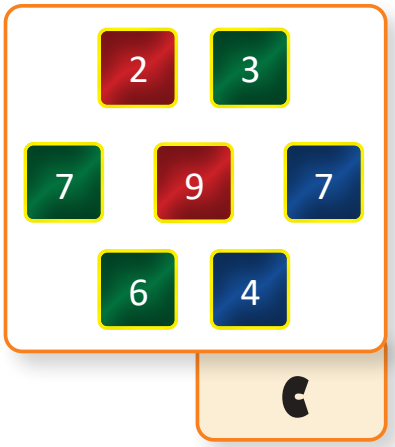
1. Let us identify the hundreds, tens and ones places and, arrange numbers with three places.

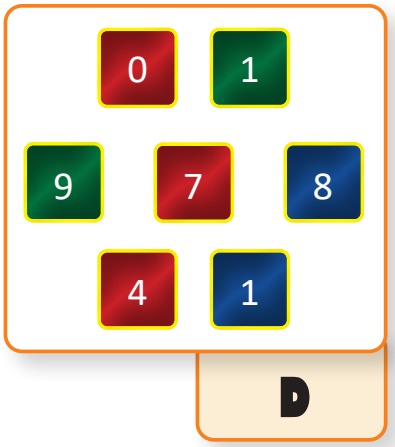
   Your mathematics teacher will divide all the students in your class into four separate groups A, B, C and D and will provide each group with few cards of colours green, red and blue. Every card has a number written on it. Arrange all possible three digit numbers by placing a green colour card in the hundreds place, red card in the tens place, blue card in the ones place and complete the table referring to the numbers you have written.

How to construct a number









Number	Hundreds place		Tens place		Ones place	
	Digit	Value represented by the digit	Digit	Value represented by the digit	Digit	Value represented by the digit

2. The number of bank notes and coins owned by six people are shown below. State the amount of money that each person has in the column "number" and complete the table given at the end.

Susantha

Chamara

Ravi

Lakshman

Nipun

This reproduction is approved by central Bank of Sri Lanka.

Ajith

Name	Number	Digit	Name of the place of the digit	Value represented by the digit
Susantha		5		
Chamara		5		
Ravi		1		
Lakshman		3		
Nipun		1		
Ajith		2		

3. Consider the digits given below. Think about the numbers that can be written using these digits only once and answer the questions given.

9 1 5 0 8

(i) Write the largest number that can be written using the above five digits.

(ii) What is the largest five digit number that can be written with zero in the thousands place?

(iii) In the number you wrote above in (ii), what is the digit in the hundreds place?

What is the value represented by that digit?

(iv) Write the smallest five digit number that can be written using the digit 1 in the ten thousands place. Write the value represented by each digit in that number.

(v) Write the largest odd number that can be written using three digits.

(vi) Write the number written in (v) above in words.

(vii) Write the largest even number that can be written using four digits.

(viii) Write the smallest number that can be written using the five digits above.

4. **Complete the following table relevant to the digit underlined in each given number.**

Number	The place value of the underlined digit	The value represented by the underlined digit
43 <u>5</u>82		
1<u>8</u> 008		
60 7<u>9</u>3		
<u>9</u>5 215		
2<u>9</u> 307		
80 64<u>6</u>		
37 <u>1</u>24		
<u>7</u>1 439		

Number Zones

Writing and reading a number in standard form

- Due to the pandemic that spread throughout the world in the years 2020 and 2021, 3954871 people have died by the end of June 2021. How do you read this number ?
- How do you write this number in words?

Let us discuss how this number is written and read in standard form in mathematics.

Millions Zone

Step 01

Let us write the number **3954871** by separating it into grohps of three digits starting from the ones place, as given below.

3	954	871

A grohp separated in the above manner with three places is known as a **number zone.**

In this separation, the number of places with digits in the last zone, that is, the leftmost zone, may be less than three. Only one digit can be seen in the leftmost zone of the above number. However, the maximum number of places in a zone can only be three.

Step 02

Let us name the zones of the above grohped numbers as follows.

3	954	871
Millions zone	Thousands zone	Units zone

Step 03

Now, let us read this number as follows.

Three million nine hundred fifty four thousand eight hundred and seventy one

Billions Zone

By the end of June 2021, the population in China was about 1444885630. How do we read this number?

1	444	885	630
?	Millions zone	Thousands zone	Units Zone

The zone left to the million zone is known as the billions zone.

1	444	885	630
Billions zone	Millions zone	Thousands zone	Units zone

This number is read as,

One billion four hundred forty four million eight hundred eighty five thousand six hundred thirty

- Writing a number by separating it into groups of three digits, starting from the ones place to the left, is known as writing that number in standard form.
- When writing a number in standard form, a small space is left between two zones to identify the zones separately.

1 444 509 291

Number Zones and Place Value

The places of the digits of the number “Four hundred twenty five billion eight hundred thirty seven million five hundred twenty five thousand six hundred and twenty” can be named as follows. Accordingly, write the value represented by each digit in the number.

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

Hundred billions place
Ten billions place
Billions place
Hundred millions place
Ten millions place
Millions place
Hundred thousands place
Ten Thousands place
Thousands place
Hundreds place
Tens place
Ones place

425 837 525 620

The value represented by 0 at the ones place is = ... ones = ...

The value represented by 2 at the tens place is = ... tens = ...

The value represented by 6 at the hundreds place is = ... hundreds = ...

The value represented by 5 at the thousands place is = ... thousands = ...

The value represented by 2 at the ten thousands place is = ... ten thousands = ...

The value represented by 5 at the hundred thousands place is = ... hundred thousands = ...

The value represented by 7 at the one millions place is =

..... millions = ...

The value represented by 3 at the ten millions place is =

..... ten millions= .....

The value represented by 8 at the hundred millions place is=

.....hundred thousands = ...

The value represented by 5 at the one billions place is

= ..... billions = ...

The value represented by 2 at the ten billions place is

= ..... ten billions = ...

The value represented by 4 at the hundred billions place is

= ..... hundred billions = ...

What I learnt

Let us write numbers up to billions zone in standard form

1. According to the Census of Population and Housing 2024 report, the population in the three districts of the Western province is given below.

District	Population
Colombo	2374461
Gampaha	2433685
Kalutara	1305552

Write each population given above in standard form and write the number in words.

2. The number of patients infected by the Corona pandemic by the end of June 2021 in a few countries of the world is given below. Write number of patients in each country in standard form and write the number in words.

Country	Number of patients	Standard form	The number in words
France	5772844		
America	34527493		
Sri Lanka	257225		
China	91780		
India	30362848		
Russia	5514599		

3. The expected population by the year 2050 of a few countries in the world are given below.

Country	Population
Sri Lanka	24812185
India	1667873933
Nigeria	401314996
Pakistan	371863793
Australia	40618436
China	1313000000
Finland	6177141
Denmark	6266278

Complete the following table by using the numbers in the above table.

Country	Number written in zones				Standard form
	Billions	Millions	Thousands	Ones	
Sri Lanka					
India					
Nigeria					
Pakistan					
Australia					
China					
Finland					

4. Forest cover of few countries in the world in the year 2018 are given below in square kilometers (km^2), a unit used to measure large extent of land. Write the numbers written in words in standard form.

   (i) Eight million four hundred fifty thousand four hundred eighty seven - Russia

   (ii) Five million two hundred fifty six thousand five hundred fifty seven – Brazil

   (iii) Two hundred forty eight thousand six hundred eighteen - Finland

   (iv) Three hundred eleven thousand nine hundred sixty six - Sweden

   (v) Three million four hundred twenty thousand four hundred eighty seven - Canada

   (vi) Nineteen thousand four hundred twenty nine - Sri Lanka

   (vii) One hundred thirty seven thousand five hundred forty three - Surinam

5. Write each of the following numbers in standard form and write the number in words.

   (i) 600300400200 (ii) 902004050109 (iii) 29000035007

   (iv) 300001200 (v) 780000000

6. Write the following numbers in standard form.

   (i) Fifty one billion five thousand one

   (ii) Nine hundred nine million eight hundred eight thousand seventy seven

   (iii) Eighty four million two hundred twenty five

   (iv) Seven million two hundred thousand six hundred thirty three

   (v) Four billion fourteen million thirty eight thousand two hundred forty

7. The annual income of a person in a country in a specific year is known as per capita income of that country. The following table gives the per capita income of few countries in the world for the year 2019, in Sri Lankan rupees. Complete the table and answer the given questions.

(The per capita income of a country can be calculated by dividing the annual income of a country by the average annual population of the country.)

Country	Per capita income (rhpees)	Standard form (rhpees)
Sri Lanka	689687	
Sudan	79118	
India	376616	
China	1836898	
South Korea	5685398	
Japan	7204213	
Finland	8714794	
Australia	9828353	
Singapore	11676707	
Switzerland	14676926	

(i) Which country has the highest per capita income?

(ii) Write the highest per capita income in words.

(iii) Which country has the lowest per capita income?

(iv) Write the lowest per capita income in words.

(v) What are the countries that have values of per capita income starting from thousands zone?

(vi) Write the annual income you expect to earn in the year 2035, in words.

8. The distance from the sun to few planets are given in the following table. Complete the table.

Name of planet	Distance from the sun / km	**Digit**	Place value of the digit	Value represented by the digit
Mercury	57 910 000	9		
Venus	108 200 000	1		
Earth	149 600 000	4		
Mars	227 900 000	7		
Jhpiter	778 500 000	5		
Saturn	1 434 000 000	1		
Uranus	2 871 000 000	2		
Neptune	4 495 000 000	9		

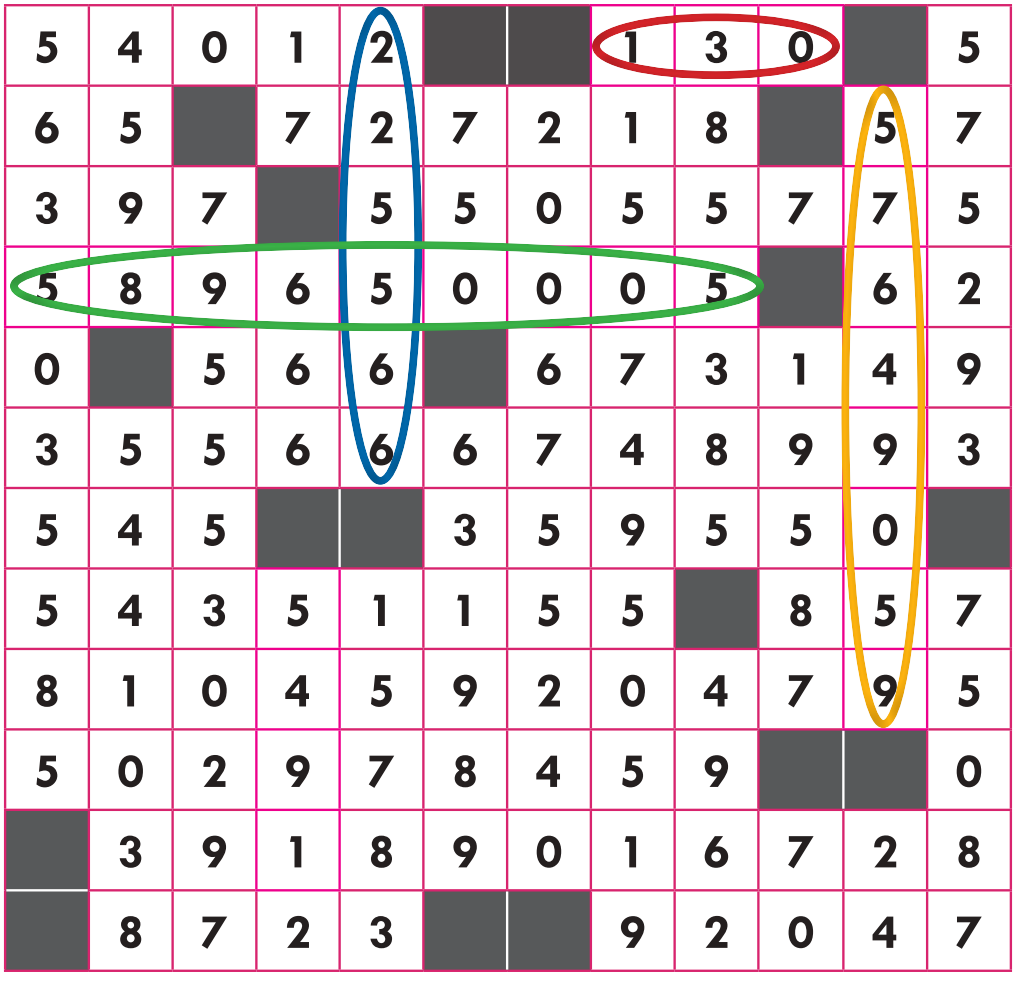
Activity 1

Let us compete with friends and identify numbers hp to billion; write in standard form; write in words

Follow your teacher's instructions and get into groups. First, read the given instructions carefully. Next, study the given table of numbers. After that, get together with your team and answer the given questions within 10 minutes. (When writing a number, it should be written in standard form.) The team which completes the table first wins.

Instructions on reading numbers

- You should read numbers from left to right or from top to bottom.
- The number encircled in red colour shows how to read a number from left to right. 130
- The number encircled in blue colour shows how to read a number form top to bottom 225 566



Questions

1. Write the number encircled in orange colour in standard form and in words.

2. Write the number encircled in green colour in standard form and in words.

3. Encircle the number "Ninety two thousand forty seven" on the table, in purple.

4. Write two numbers that have digits only hp to hundred millions place.

5. Write three numbers that have digits only hp to billions place.

6. Write a number that has digits only hp to ten billions place.

7. Write a number that has digits only hp to hundred billions place.

8. Write two numbers that have 6 in the millions place.

9. Select and write the largest number and the smallest number that has digits only hp to the ten thousands place.

10. Select and write the largest number that has digits only hp to the ten millions place.

Note

The common names of few numbers used in day-to-day life are given below.

Number	Name of the number	Name in common practice
100 000	Hundred thousand	Lakh
1 000 000	Million	Ten lakhs
10 000 000	Ten million	Crore
100 000 000	Hundred Million	Ten crores

Today's winning prize

Three crores eighty five lakhs forty two thousand seven hundred ninety rhpees

Standard form

38 542 790

Name of the number

Thirty eight million five hundred forty two thousand seven hundred ninety

For further study watch the video related to the lesson through this QR code

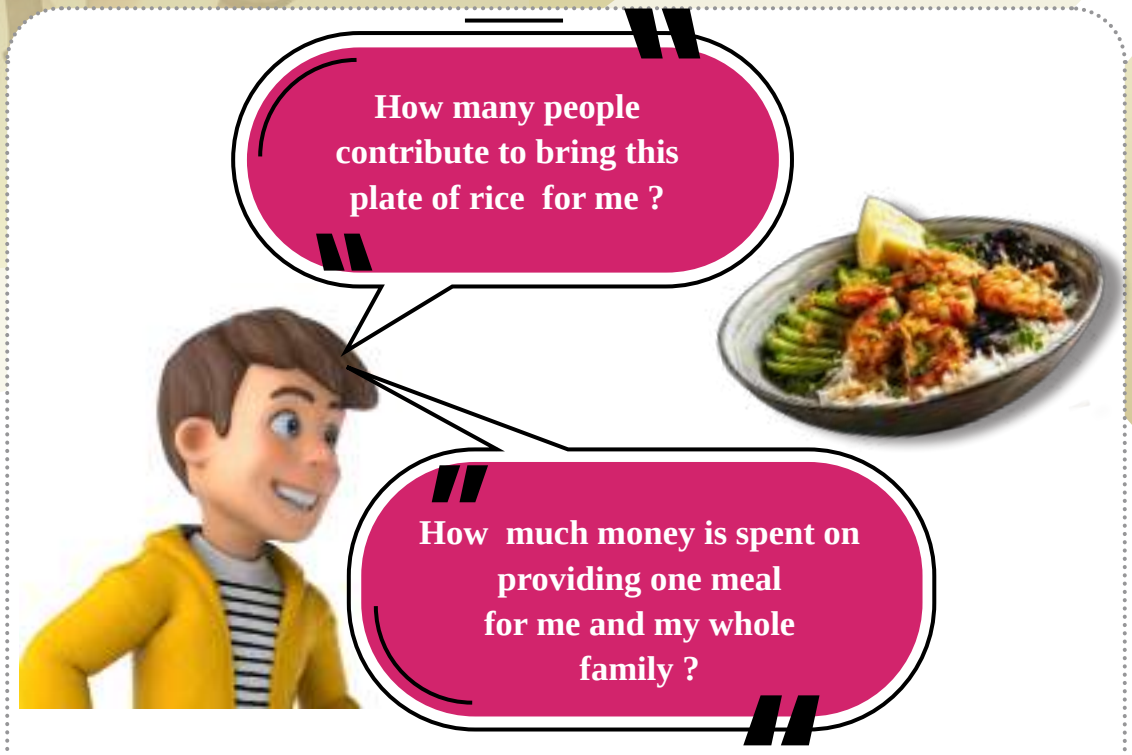
Sinhala Medium | Tamil Medium

Chapter 2

Numbers and Mathematical Operations

By studying this chapter you will be able to,

- describe the applications of mathematics in agriculture
- add and subtract whole numbers of more than four digits in solving mathematical problems related to agriculture
- multiply and divide whole numbers by 100, 1000 and by two digit numbers in solving mathematical problems related to agriculture
- cultivate a selected crop domestically
- uplift the knowledge in economics and business entrepreneurship and thereby be encouraged for a business in relation to the field of agriculture

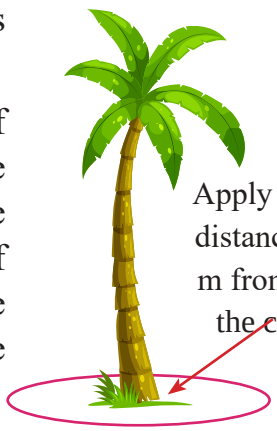


Food is a basic need for all of us and it is important to maintain our lives. It is important to know about the people who work hard to provide a meal for us and also the cost incurred in providing meals. Agriculture is the main field of supplying food.

Agriculture and Mathematics

Farmers use mathematics in various ways for farming.

Farmers should have the ability of selecting the amount of seeds, the amount of fertilizers according to the area of the land and the distance of applying fertilizer. He can do all these tasks efficiently using the knowledge of mathematics.



Do you think mathematics is an important skill for farmers ? Write occasions where farmers need mathematical skills.

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We know that mathematics is used in various ways in farming. It is seen that addition, subtraction, multiplication and division are mostly used in activities related farming. We already know how to add, subtract, multiply and divide numbers. Let us recall them again.

What I learnt

Let us answer the following questions and recall how to perform addition, subtraction, multiplication and division related to numbers.

1. Add the following numbers.

(i)	(ii)	(iii)	(iv)	(v)
388	678	1 388	3 170	4 221
+ 87	+ 792	+ 87	+ 687	328
				+ 2 060

2. There were 2 853 mangoes, 3 678 rambutans, and 1350 guava fruits yielded from an orchard. Find the total number of fruits yielded.

3. The amount of coconuts plucked from two estates during three seasons are given below.

Month	Estate A	Estate B
April	1 958	1 050
June	3 578	2 986
August	1 048	1 184

(i) How many coconuts were plucked during the three seasons in the estate A?

(ii) How many coconuts were plucked during the three seasons in the estate B?

4. Subtract

(i) $\begin{array}{r} 388 \\ -\ 47 \\ \hline \\ \hline \end{array}$ (ii) $\begin{array}{r} 680 \\ -\ 387 \\ \hline \\ \hline \end{array}$ (iii) $\begin{array}{r} 2435 \\ -\ 248 \\ \hline \\ \hline \end{array}$ (iv) $\begin{array}{r} 3086 \\ -\ 1877 \\ \hline \\ \hline \end{array}$ (v) $\begin{array}{r} 7322 \\ -\ 2060 \\ \hline \\ \hline \end{array}$

5. In the year 2025, Burj Khalifa located in Dubai is the tallest tower in the world and it stands a height of 830 metres. The Lotus tower located in Sri Lanka is 356 metres in height. How tall is the Burj Khalifa than the Lotus tower?

6. There are 2 475 books in a library. Out of them 592 books are borrowed by the readers. How many books are remaining in the library now?

7. Multiply

(i) (ii) (iii) (iv) (v)

(i)	(ii)	(iii)	(iv)	(v)
416 × 2	118 × 5	260 × 8	206 × 10	123 × 9

8. Some books are donated to a certain library. There are three boxes containing 120 translated books in each. Calculate the number of translated books donated.

9. There are 9 packets of biscuits in a box of biscuits. 585 such boxes are loaded to a vehicle to distribute them to the shops. How many packets of biscuits are there in total?

10. A seller at an aquarium earns a commission of Rs.5 for each goldfish he sells. If 185 goldfish were sold in a month, how much commission did he earn?

11. Divide the following numbers.

(i) $580 \div 10$ (ii) $175 \div 5$ (iii) $96 \div 8$ (iv) $810 \div 9$ (v) $927 \div 9$

12. How many 10 kg bags of rice can be made from of 520 kg of rice?

13. A boat brought 86 boxes full of fish and loaded them equally into two lorries. How many boxes were loaded to one lorry ?

14. 64 veralu fruits are divided within a group of friends. Each one receives 3 veralu fruits. How many friends received veralu fruits. How many fruits will remain ?

Things I have to do

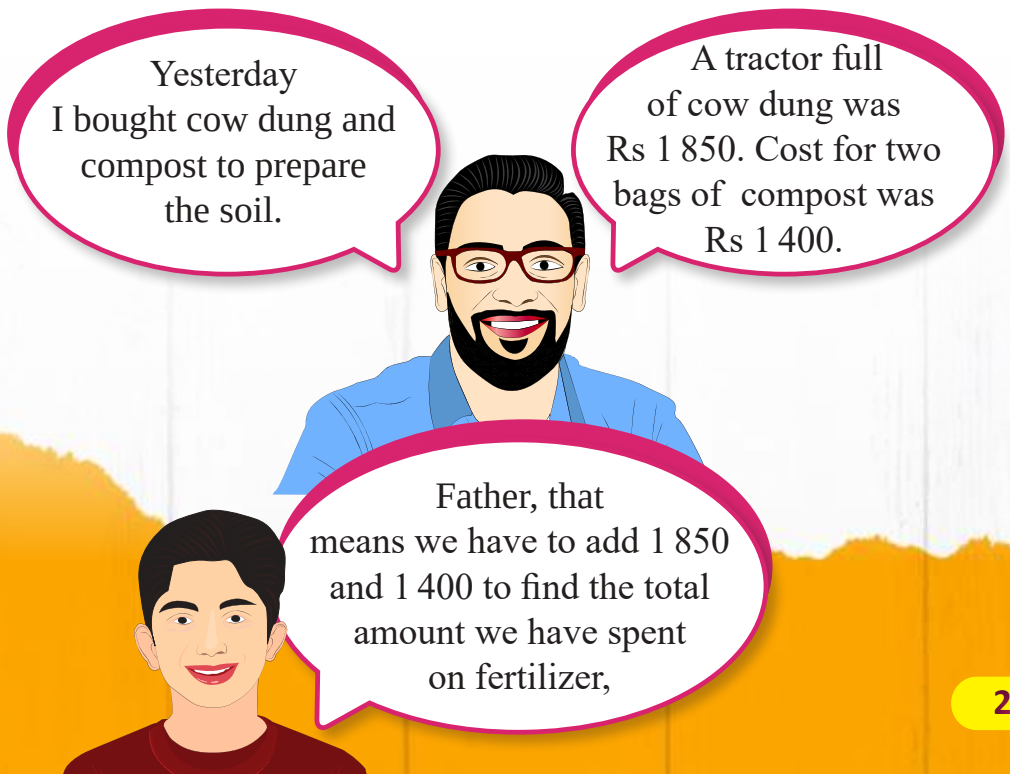
Let us do futher calculations on addition, subtraction, multiplication and division of numbers

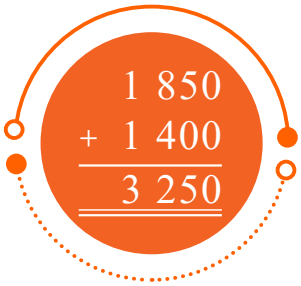
Vegetable Garden

In times when it is difficult to find essential food items or when prices of food items have been increased due to shortage of food, wouldn't it be great if we had a way to supply our food on our own?

Not only in the above circumstances, but also consuming clean and fresh vegetables and fruits is good for our health and also beneficial to our wallet.

Sithum plans to grow vegetables in the home garden with his father.

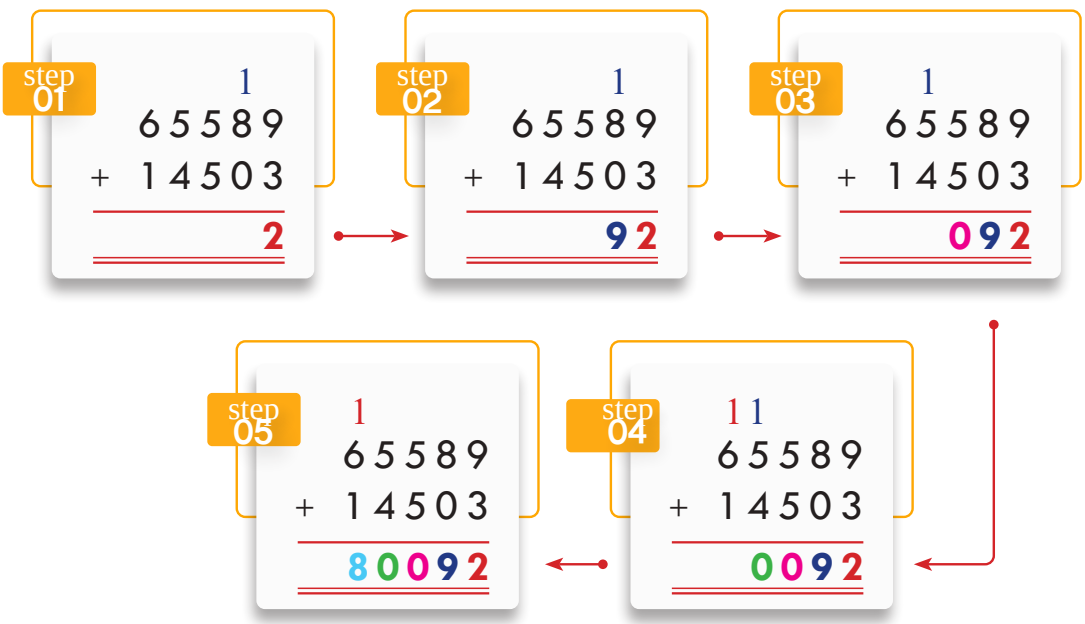




We have solved these types of problems previously. Although there are more digits in these numbers, the procedure of addition does not change.

Let us add whole numbers

Let us study the following steps carefully about adding two numbers of five digits.



What I learnt

Let us solve problems on addition of whole numbers.

1. **Add**

(i) 1 688 + 3 167

(ii) 3 185 + 7 163

(iii) 4 528 + 3 613

(iv) 7 305 + 1 897

(v) 15 189 + 10 003

(vi) 11 322 + 33 523

(vii) 10 975 + 30 888

(viii) 321 009 + 103 117

(ix) 140 782 + 11 563 + 10 008

(x) 3 204 532 + 738 721 + 1 093 765

2. For a home gardening competition between schools, A price of Rs. 150 000 is allocated for the first place, Rs. 100 000 is allocated for the second place and Rs. 75 000 is allocated for the third place. What is the total amount allocated for the prizes?

3. The tax income from rubber exports in the years 2017, 2018 and 2019 were approximately 2 775, 2 543 and 2 493 million rupees. What were the total tax income from rubber exports within these three years.

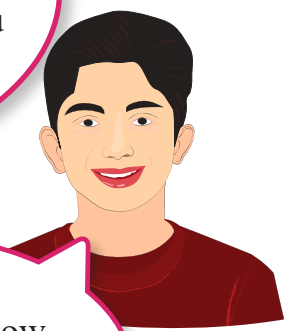
4. The area of tea plantations owned by small holders in Sri Lanka is 122 448 hectares. There are also 77 553 hectares of tea estates belonging to the government. What is the total area of tea plantation in Sri Lanka in hectares?

Hectares a unit used to measure the area of large lands

Let us balance our income and expenditure

Sithum's father has a habit of writing his daily expenses. He has told Sithum that this habit helps him to balance his income and expenditure.

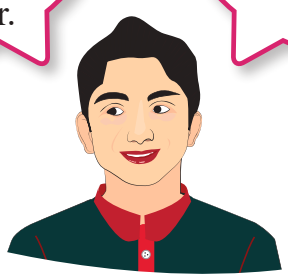
My son,
from today onwards,
you should note down our monthly expenses on vegetables. Here you can see the expenses I noted down last year.



That is good.
Then I can find how much we spend on vegetables each month.

Before growing vegetables in our home garden, we spent Rs. 32 483 on vegetables last year.

After growing vegetables in our home garden, only Rs.12 268 was spent on vegetables for the whole year.



Let us subtract whole numbers

Sithum wanted to check how much extra money has been spent on vegetables before growing vegetables in the home garden. To find this, 12 268 must be subtracted from 32 483.

Let us carefully study the following steps of subtracting a number from a five digit number.

$$\begin{array}{r} 65\ 589 \\ +\ 14\ 503 \\ \hline \\ \hline \end{array}$$

step 01

$$\begin{array}{r} {\scriptstyle 7\ 13} \\ 32483 \\ -\ 12268 \\ \hline 5 \end{array}$$

step 02

$$\begin{array}{r} {\scriptstyle 7} \\ 32483 \\ -\ 12268 \\ \hline 15 \end{array}$$

step 03

$$\begin{array}{r} 32483 \\ -\ 12268 \\ \hline 215 \end{array}$$

step 04

$$\begin{array}{r} 32483 \\ -\ 12268 \\ \hline 0215 \end{array}$$

step 05

$$\begin{array}{r} 32483 \\ -\ 12268 \\ \hline 20215 \end{array}$$

What I learnt

Let us solve problems on subtraction of whole numbers

1 **Simplify**

(i)
$$\begin{array}{r} 4\ 508 \\ -\ 1\ 265 \\ \hline \\ \hline \end{array}$$

(ii)
$$\begin{array}{r} 14\ 388 \\ -\ 1\ 263 \\ \hline \\ \hline \end{array}$$

(iii)
$$\begin{array}{r} 61\ 033 \\ -\ 7\ 286 \\ \hline \\ \hline \end{array}$$

(iv)
$$\begin{array}{r} 23\ 100 \\ -\ 12\ 708 \\ \hline \\ \hline \end{array}$$

(v) 23 400 - 12 000

(vi) 14 908 - 12 389

(vii) 854 167 - 481 959

(viii) 937 401 - 526 304

(ix) 938 570 - 685 128

(x) 400 118 000 - 205 180 063

2. A farmer sells his tractor for Rs.1 200 000 and purchases a new tractor for Rs.1 795 000. How much money he has to pay more to buy the new tractor.

3. A company produces 10 000 cans of fish daily. Within the next two years, they expect to increase this daily production hp to 20 000 cans. How many more cans of fish should be produced daily after two years?

4. Susantha had to take a loan of Rs 75 000 to buy a paddy field that is being sold for Rs. 250 000. How much money did Susantha have with him?

5. Sri Lanka is a leading prawn exporting country in the world. However, in the year 2014 the income of prawn exports was Rs. 3 375 000 and in the year 2015 it was Rs. 1 971 000. By how much did the income of prawn exports decrease in the year 2015 than in the year 2014?

Let us share with friends

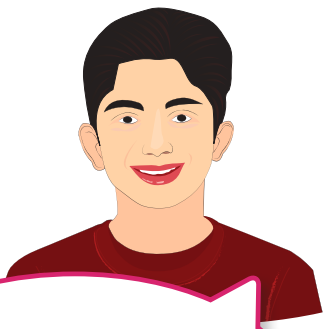
I have lots of veralu. Let's see how we can divide them equally among my two friends and myself by placing them one at a time in three lots.

Now tell me sister how many veralu you have got.

There are 26 veralu in a lot. Then the total number of veralu in three lots is

$26 + 26 + 26 = 78$

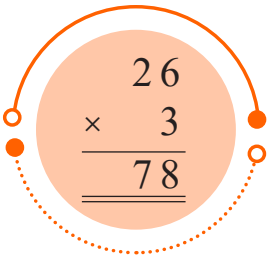
So, in total there are 78 veralu



There is an easy way to find it.

3 lots of 26

Let us multiply whole numbers



There are 3 lots of 26. Then we can easily calculate it by multiplying the two numbers.

If there are more than 10 lots of veralu, how can we find the total number of veralu?

Now let us see how to calculate the total number of veralu if we had 13 lots with 26 veralu in each lot.

26×13 can be done in two ways. The problem can be solved by choosing the easiest method.

method 01

There is 1 ten and 3 ones in 13. Therefore, we can take the 13 lots of 26 as, 10 lots of 26 and 3 lots of 26. The addition of them gives us 13 lots of 26.

$26 \times 10 = 260$ and $26 \times 3 = 78$

Then $26 \times 13 = 260 + 78$

Therefore $26 \times 13 = 338$

method 02

26×13 can be done in the following way too.

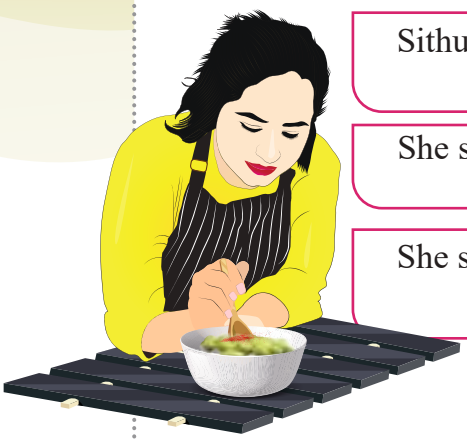
$$\begin{array}{r} 26 \\ \times\ 13 \\ \hline 78 \\ 260 \\ \hline 338 \end{array}$$

$26 \times 3 = 78$

$26 \times 10 = 260$

Let us strengthen the home economy using the excess harvest

Sithum's mother makes veralu pickles and sells it.



Sithum's mother sells one pickled 'veralu' at Rs. 4 each for a person who buys 10 veralu

She sells one pickled 'veralu' at Rs. 3 each for a person who buys 100 veralu

She sells one pickled 'veralu' at Rs. 2 each for a person who buys 1 000 veralu

Let us multiply whole numbers by 100 and 1 000

Sithum explained his mother how to calculate the price of 10 pickled 'veralu' and 100 pickled 'veralu' as follows.

If 10 pickled 'veralu' are bought for Rs. 4 each, then it becomes $4 \times 10 = 40$. Therefore, the price of 10 pickled 'veralu' is Rs.40.

If 100 pickled 'veralu' are bought for Rs 3 each, then it becomes $3 \times 100 = 300$. Therefore, the price of 100 pickled 'veralu' is Rs. 300.

Sithum didn't stop at that. He explained how the price of 1 000 pickled 'veralu' sold at Rs 2 each is calculated.

Then the price becomes, $2 \times 1\,000 = 2\,000$. Therefore, the price of 1 000 pickled 'veralu' is Rs. 2 000.

Based on the above calculations, study the following multiplications.

$2 \times 10 = 20$ $\quad 2 \times 100 = 200$ $\quad 2 \times 1\,000 = 2\,000$

$3 \times 10 = 30$ $\quad 3 \times 100 = 300$ $\quad 3 \times 1\,000 = 3\,000$

After studying the above examples, let 's find the value of numbers like 14, 16 and 23 multiplied by 10,100 and 1000

$14 \times 10 = 140$	$14 \times 100 = 1 \ldots 0$	$14 \times 1\,000 = 14\,0 \ldots\ldots$
$18 \times 10 = 18 \ldots$	$18 \times 100 = 1 \ldots\ldots\ldots$	$18 \times 1\,000 = 18 \ldots\ldots\ldots$
$23 \times 10 = \ldots\ldots\ldots$	$23 \times 100 = \ldots\ldots\ldots$	$23 \times 1\,000 = \ldots\ldots\ldots\ldots$

What I learnt

Let us solve problems on multiplication of whole numbers.

1. Complete the blanks in the following multiplication table.

×	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
1	0									
2	0					10		14		
3	0				12					
4	0		8						32	
5	0									
6	0			18						
7	0		14							63
8	0									
9	0	9								

2. Simplify.

(i) 12×3 (ii) 422×9 (iii) $8\,308 \times 7$ (iv) 83×18

(v) 138×22 (vi) 453×10

(vii) 105×100 (viii) $3\,909 \times 100$

(ix) $71 \times 1\,000$ (x) $3\,909 \times 1\,000$

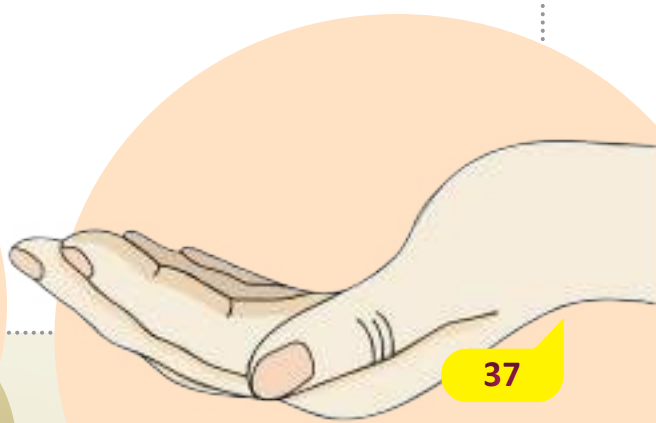
3. A lorry is carrying 1 000 bags of rice weighing 50 kg each. What is the total quantity of rice in the lorry in kg ?

4. 1 398 grams of sunflower seeds are needed to produce 1 litre of sunflower oil. Calculate the amount of sunflower seeds in grams needed to produce 10 litres of sunflower oil?

5. The wholesale price of 1 kg of a certain type of fish on a given day at the Peliyagoda fish market is Rs. 700. How much does a fisherman has to pay for 25 kg of that fish he buys?

Let us share what we have

Sharing is a very good habit and it is worth to share what you have even in small portions with others.



Sithum and his sister expect to share 27 lady's fingers plucked from their home garden among Nadeera, Yasmin and Ganesh equally. These lady's fingers are divided equally into three lots by placing one at a time in each lot.

$$27 \div 3 = 9$$

Total number of lady's fingers is 27

Yasmin gets 9 lady's fingers

Nadeera gets 9 lady's fingers

Ganesh gets 9 lady's fingers

Let us divide whole numbers

Now let us consider a similar situation where division is used.

Assume that 195 tomatoes are plucked from a farmland and packs of 15 tomatoes are prepared to be sold at a super market.

Let us calculate how many such packets can be made. We can do it by using the following steps of division. Study the steps of the procedure.

step 01

```
    1
15 | 195
     15
     ---
      4
```

step 02

```
    1
15 | 195
     15↓
     ---
     45
```

step 03

```
    13
15 | 195
     15↓
     ---
     45
     45
     ---
      0
```

Let us divide whole numbers by 100 and by 1 000

Let us consider how some food items received at a welfare centre can be divided among 10 individuals, 100 individuals and 1 000 individuals.

Consider the situation which 30 kg of rice is divided into 10 households.

30÷10 . Here we can find how many 10s are there in 30.

Since $10 \times 3 = 30$

$30 \div 10 = 3$

Look at the following divisions carefully and fill in the blanks.

$20 \div 10 = 2$ $200 \div 100 = 2$ $2\,000 \div 1\,000 = 2$

$30 \div 10 = 3$ $300 \div 100 = 3$ $3\,000 \div 1\,000 = 3$

$200 \div 10 = 2\ldots$ $2\,000 \div 100 = 2\ldots$ $20\,000 \div 1\,000 = \ldots\ldots$

Dividing a number by another number can also be indicated as follows.

$\frac{150}{10} = 15$ $\frac{3\,400}{100} = 34$ $\frac{13\,000}{1\,000} = 13$

Fill in the blanks and find the value obtained when 134 000 is divided by 10, 100 and 1000.

$\frac{134\,000}{10} = 134$ ..... $\frac{134\,000}{100} = 13$.....

$\frac{134\,000}{1\,000} = 13$.....

What I learnt

Let us solve problems on division of whole numbers.

1. Simplify.

(i) $9 \overline{)50\,679}$ (ii) $8 \overline{)74\,432}$ (iii) $11 \overline{)308}$ (iv) $32 \overline{)2\,496}$

(v) $42 \overline{)546}$ (vi) $17 \overline{)1\,122}$ (vii) $26 \overline{)8\,450}$

(viii) $480 \div 10$ = ... (ix) $100\,050 \div 10$ = ...

(x) $2\,500 \div 100$ = ... (xi) $32\,500 \div 100$ = ...

(xii) $4\,800\,800 \div 100$ = ... (xiii) $25\,000 \div 1\,000$ = ...

(xiv) $43\,000 \div 1\,000$ = ... (xv) $1\,000 \div 1\,000$ = ...

2. Somapala earns Rs. 15 925 from his spine gourd (thumbakarawila) harvest. If the amount of spine gourd he sold was 25 kg, what was the selling price of 1kg of spine gourd?

3. When producing cotton wool manually, a single person could remove seeds from 50 pounds of cotton per day (in the past pounds was used as a measuring unit). When the "Cotton Jin" machine is used, seeds can be removed from 1 000 pounds of cotton per day. How many people should work to do the same task manually within a day ?

Cotton Jin" Eli Whitney

Inventor Eli Whitney introduced the "Cotton Jin" machine to remove cotton seeds from cotton.

4. The water tank on a machine used to spray water for a wheat plantation can hold 5 000 litres of water. If one section of the wheat field needs 100 litres of water, how many such sections can be sprayed by a machine with a full tank of water?

5. A bee keeper has 65 bee hives and he obtained 520 bottles of bee honey from all the hives. How many bottles of bee honey has he got from a single bee hive?

What I learnt

Mathematics on the farm

There is a large scale farm that carries out both livestock farming and crop cultivation. There cattle, goats and chickens are introduced as livestocks while vegetables and fruits are cultivated as crops.

1. If the farm has 86 dairy cows, 132 goats and 1 370 chickens, what is the total number of livestock in the farm?
2. Due to a spread of a disease among chickens, 115 of them were taken outside the farm for a treatment. How many chickens were left at the farm?
3. If the farmer needs to send his dairy cows equally to two grasslands, how many dairy cows will be sent to one grassland
4. Strawberries are grown in the farm and 4 labourers should work 3 days to harvest the strawberries in one season. The daily wage of a labourer is Rs. 1 500.
   (i) What is the total amount paid for the labourers per day?
   (ii) Calculate the amount of money paid for the labourers during one season.

5. In the farm 688 liters are milked from the dairy cows. Find the amount of milk that can be obtained from a dairy cow by assuming that the same volume is milked daily from each cow.

The owner of the farm wants to expand his farm to a regional level. Accordingly he establishes a lagoon - based prawn farm and a freshwater fish canning factory.

Due to the establishment of the prawn farm, 26 labourers are employed for a daily wage of Rs. 1 850.

A capital of Rs. 840 000 000 has been spent on establishing the fish canning factory.

After establishing the factory, the cost of importing canned fish has decreased by Rs. 82 million.

6. How much is paid for all the laboures working in the prawn farm daily?

7. The statistical reports show that Sri Lankan government spends Rs. 738 million per month to import canned fish. In order to completely stop importing of canned fish, how many such canned fish production factories should be established in the country?

8. If the owner of the canned fish production factory had obtained a bank loan of Rs. 250 000 000 to start his factory, what is the amount of money that he has put into the project on his own?

Things to do together

Activity 1

Creating a poster to sell vegetables

Engage in the following activity with your friends in groups and present it to the class after finishing.

"Fresh Market" is the new shop opened closer to the farm to sell vegetables. The owner expects to display a poster including the price of the vegetables with the images. He expects **to increase the sales by getting the customers' attraction.**

Following is an invoice given to a customer from the farm.

Invoice Date (2025.05.29)		
Vegetables	Amount (kg)	Price (Rs).
Carrot	35	23 100
Leeks	28	6 720
Beans	25	7 500
Cauliflower	15	14 700
Beetroot	22	10 560
Red cabbage	8	24 960
Total		87 540

Create a poster including the images of these vegetables with the price of 250 g each, to be displayed in front of the farm.

Ginger farming that can earn you millions

Scientific Name : *Zingiber officinale*

Uses:
- As a spice in cooking food
- As a medicine in Ayurvedic medicine
- As an ingredient in preparation of various cosmetics

The health benefits of ginger has been scientifically proven.

The approximated cost of growing ginger in an acre of land is as follows (with respect to prices as of year 2020).

Activity	Cost (Rs)
Preparation of the land (ploughing, preparing plant beds, planting seeds etc.)	30 000
Buying 500 kg of seeds (pieces of rhizome)	150 000
Buying chemical fertilizer	30 000
Harvesting	30 000
Miscellaneous	10 000

- Seed ginger needed for 1 acre of land is about 500 kg.
- There are different varieties of ginger namely Local ginger, Chinese ginger and Rangoon ginger.

The harvest from 1 kg of ginger :

- Local : between 5 - 10 kg
- Chinese or Rangoon : between 10 - 15 kg

Even though the price of one kilogram of ginger varies depending on the demand, it can at least be sold for Rs. 300 per kilogram.

For those who grow more than 10kg of ginger, the government provides Rs. 100 per kg as an incentive.

What I learnt

Read the above poster on " Grow ginger and be a successful farmer" and answer following questions.

1. How much money should be invested to grow ginger in an acre of land?
2. If a farmer grows the Local variety of ginger harvests 10 kg from planting 1 kg of ginger, what would be his harvest from 1 acre of land?
3. If he sells 1 kg of ginger for Rs. 300, what will his income from selling ginger?
4. After deducting the amount spent on growing ginger from his income the rest was his profit. Find his profit.
5. What is the amount of incentive received from the government for a farmer having a ginger plantation of one acre?
6. If a farmer received an incentive of Rs. 250 000 from the government, for growing ginger, how much land is used to grow ginger?
7. Agriculture officer says that Rs. 10 000 can be saved per acre of land if organic fertilizer is used. What will be the expenditure for organic fertilizer in an acre of land?

Sunimal hopes to start an organic ginger cultivation in one of his lands. For this he needs 35 kg of seed ginger, and he had to pay Rs. 400 to buy a bag of 20 kg of organic fertilizer.

8. If Sunimal hopes to get the incentive given by the government to ginger farmers, how much incentive will he get for his ginger cultivation?

9. If Sunimal spent Rs. 11 900 to buy the seed ginger, then what was the price for 1 kg of ginger?

10. If Sunimal needed 100 kg of organic fertilizer for his ginger cultivation,

    (i) how many bags of organic fertilizer has he bought?

    (ii) How much money has he spent on organic fertilizer?

11. If Sunimal has got a harvest of 280 kg after nine months, what was his harvest per 1 kg of seed ginger?

12. Since Sunimal has used organic fertilizer, he could get Rs. 700 per 1 kg of his ginger when selling. If he kept 50 kg of ginger for seeds and sold the rest,

    (i) what is the amount of ginger he sold?

    (ii) What was Sunimal's income from the sale of ginger?

What I learnt

Answer the following questions and do a self-assessment. Discuss your answers with friends.

1. **Simplify.**

(i) 12 889 + 33 675	(ii) 183 900 - 102 789	(iii) 38 × 22
(iv) 1 380 ×32	(v) 1 785÷12	(vi) 396 ÷ 18
(vii) 1 002 × 10	(viii) 900 × 100	(ix) 37 × 1 000
(x) 12 820 ÷ 10	(xi) 70 000 ÷ 100	(xii) 301 000 ÷ 1 000

2. Cinnamon is one of the main export products of Sri Lanka. There are about 75 000 acres of cinnamon plantations island wide. The number of cinnamon plants needed for 1 acre of land is 5 600 and an acre of cultivated land can produce around 1 000 kg of cinnamon at a time.

   (i) When planting cinnamon plants, five plants can be planted together in one pit. How many such bushes of cinnamon can be found in an acre of land?

   (ii) What is the expected total cinnamon yield in Sri Lanka at a turn ?

   (iii) In a certain year the income from the export of cinnamon was US $ 152 279 000 and in the previous year it was US $ 182 666 000. By how much that the income from cinnamon exports decreased ? (US $ - American dollars)

All 15 answers are correct

10 - 14 answers are correct

5 - 9 answers are correct

1 - 4 answers are correct

All 15 answers are incorrect

For further study watch the video related to the lesson through this QR code

Sinhala Medium

Tamil Medium

Chapter 3

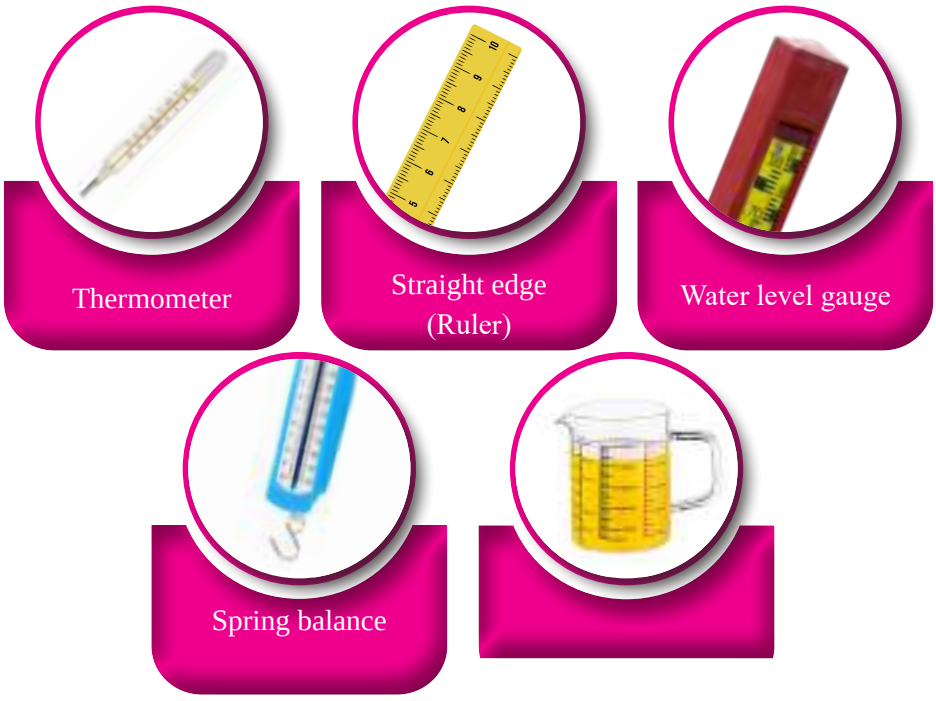
Number Line

By studying this lesson you will be able to,

- recognize the number line
- recognize negative numbers
- recognize integers
- represent integers on the number line
- compare integers
- find an integer between two non-consecutive integers
- study about the real life situations where knowledge on number line is used

You would be familiar with the following items that are used in our day-to-day life. Observe them carefully.

Let us identify the number line



You can observe that the above measuring instruments have a straight line with numbers which are equidistant.

Give 4 more similar items that have the same property as above.

....

....

Activity 1

Let us consider few measuring instruments.

Instruments needed

A centimetre ruler, metre ruler, measuring tapes of two different lengths

What are the features that you can observe in all these instruments?

.....

.....

Are the numbers marked on the edge equidistant from each other or at different distances on the instruments ?

.....

.....

What is the initial value marked on each of these instruments ?

.....

.....

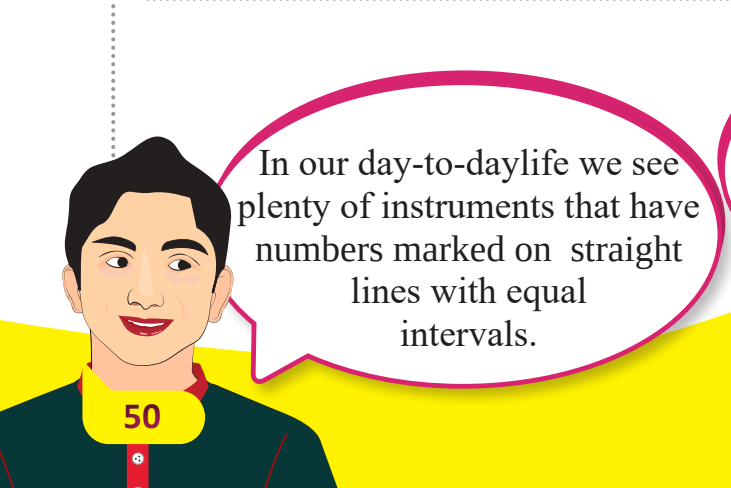
When moving from the initial point to the right of each item, do the marked numbers decrease or increase?

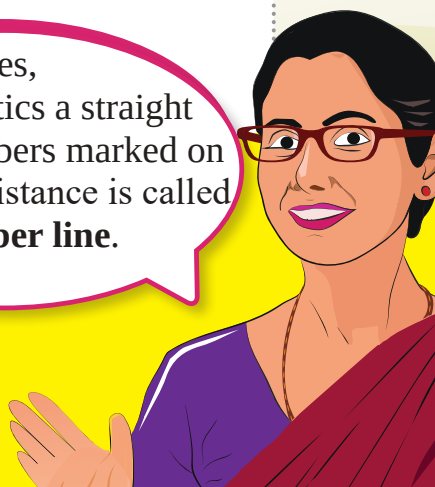
.....

.....

Are the values marked at the end of each instrument same or different ?

.....





Activity 2

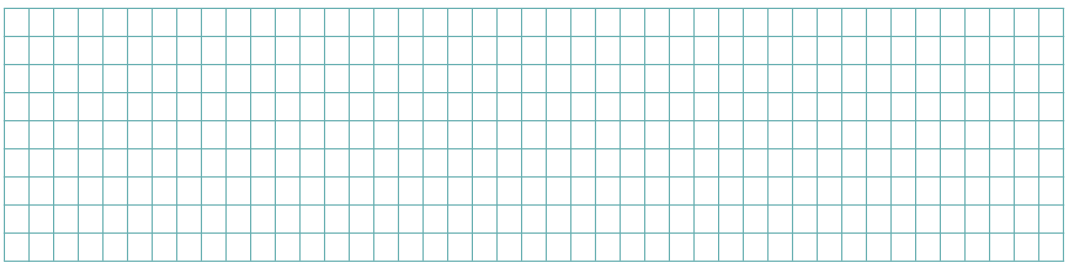
Let us create a number line including all properties.

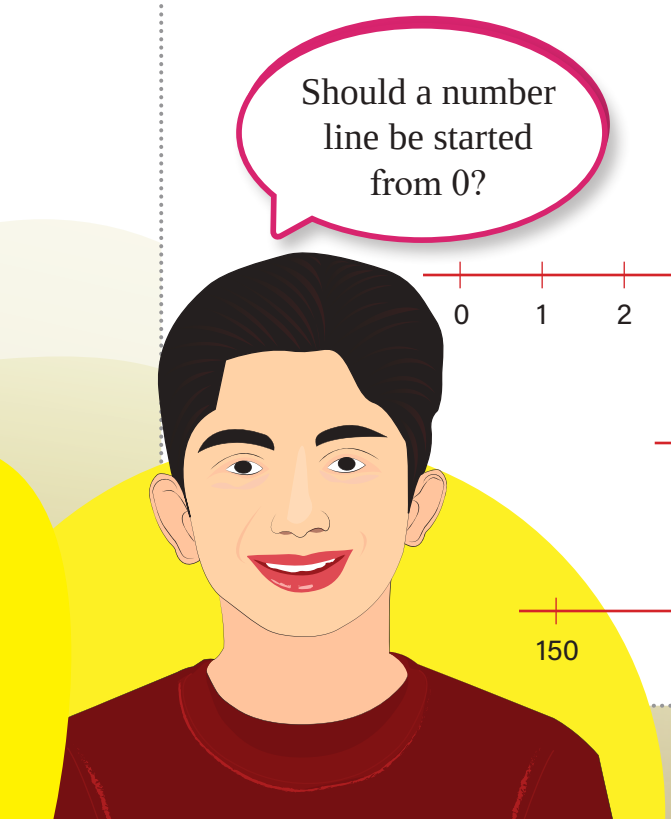
Draw a straight line on the grid using a ruler.

Mark several points on the line, leaving equal gaps between the points.

Name the points starting from 0 and increasing hp to 9 to the right as 0, 1, 2, 3, 4, ... etc.

Draw an arrowhead on the right end of the line and complete the number line.





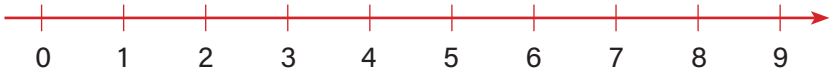
Marking whole numbers on a number line

A number can be depicted on a number line in the following manner.

To depict numbers 8 and 9 on the number line, mark the places with a small coloured circle as shown below.

Activity 3

Represent 1, 3 and 6 on the following number line.



What I learnt

Let us solve problems related to representing numbers on a number line.

1. Following figures depict a few items with their weights marked beside them. Mark those weights on the given number line.

Wheat flour 1 kg

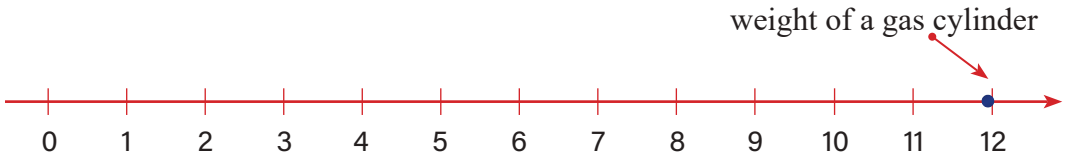
Sugar 2 kg

Potatoes 9 kg

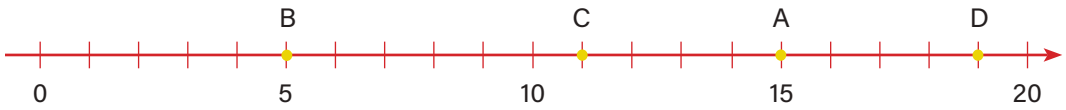
Pumpkin 4 kg

Gas cylinder 12 kg

Rice 10 kg



2. The following number line shows the marks obtained for an assignment by 4 teams of students A, B, C and D who participated in a mathematics quiz which awarded a maximum mark of 20.



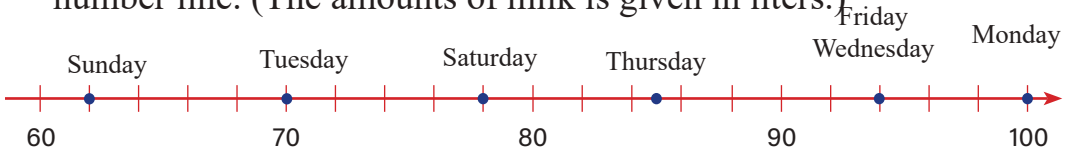
(i) Which team got the highest mark ? What was their mark ?

(ii) Which team got the lowest mark ? What was their mark ?

(iii) What is the mark obtained by team A ?

(iv) Arrange the teams in the ascending order according to the marks they have obtained.

3. The quantity of milk received at a milk collecting centre during the 7 days of a week has been marked numerically on the following number line. (The amounts of milk is given in liters.)



(i) Write the amount of milk brought to the centre on the 7 days of the week.

Sunday	.....	Monday	.....
Tuesday	.....	Wednesday	.....
Thursday	.....	Friday	.....
Saturday	.....		

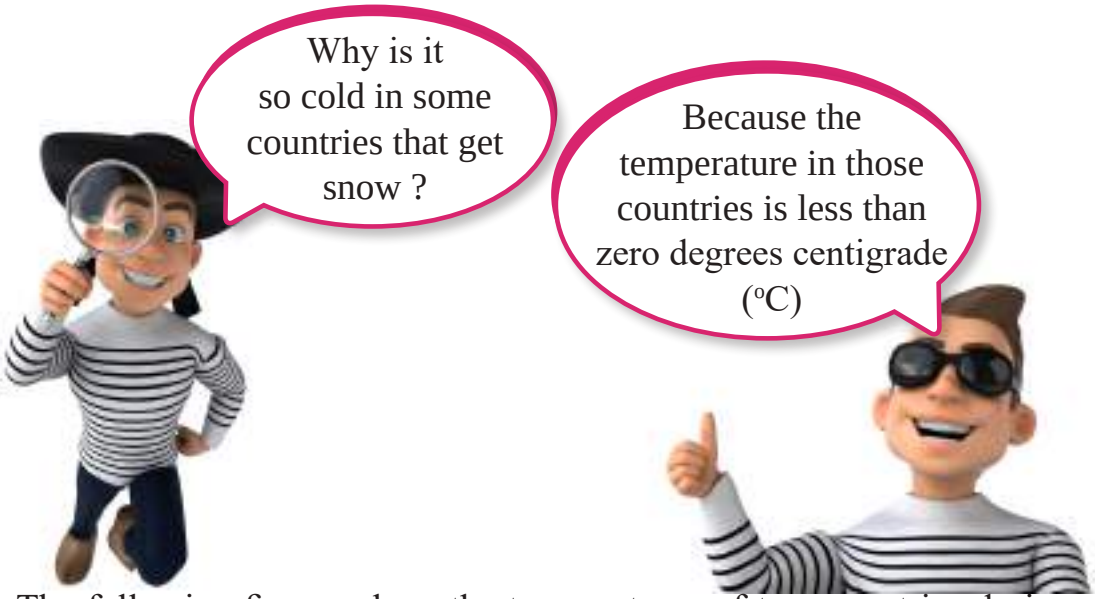
(ii) On which day was the highest amount of milk received?

(iii) On which days were the amounts of milk received equal? What was that quantity ?

(iv) Arrange in ascending order the amounts of milk received on each day along with the day it was received.

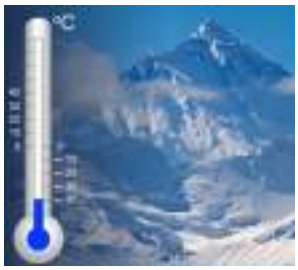
(v) How much more milk was received on Monday than on Sunday?

Let us identify negative numbers



The following figures show the temperatures of two countries during winter.

Finland

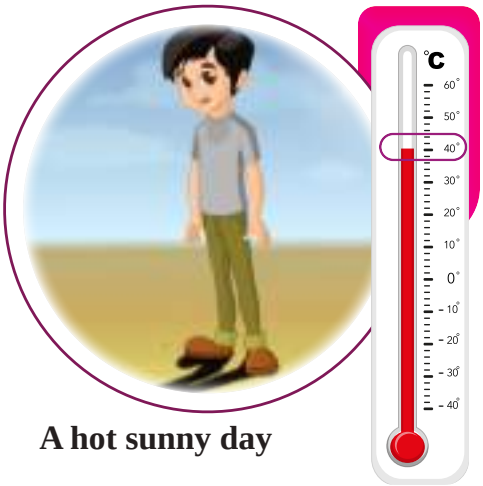


Sweden

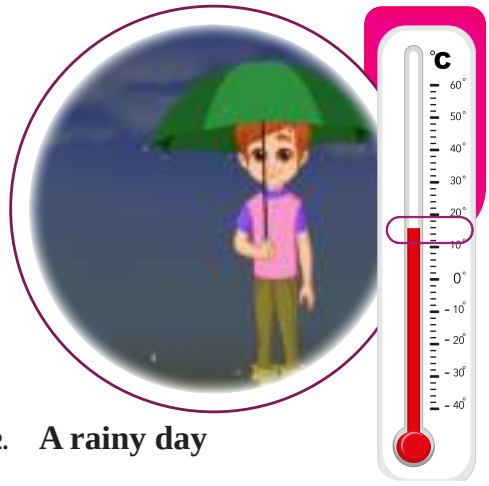
The temperature in both countries was recorded less than zero.

Activity 4

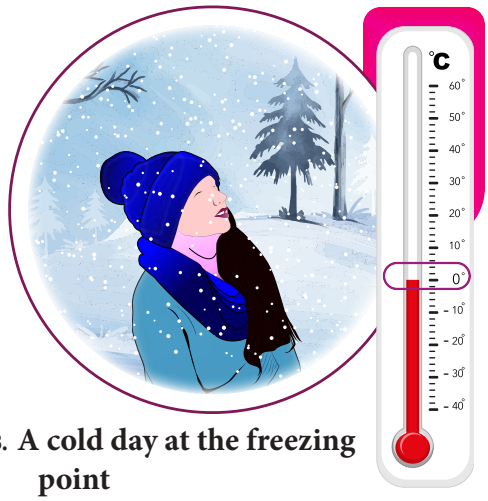
Let us identify negative numbers



1. **A hot sunny day**



2. **A rainy day**

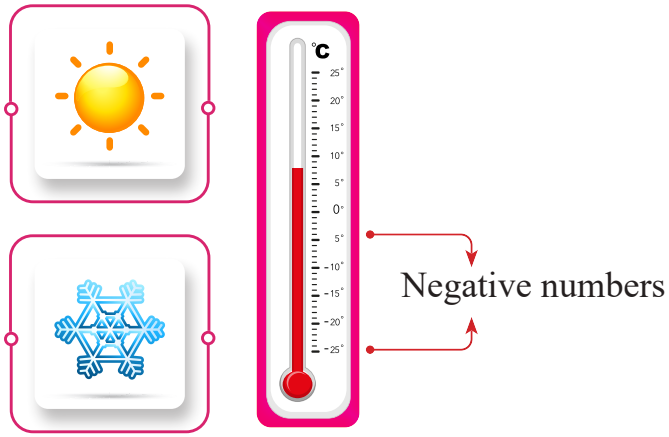


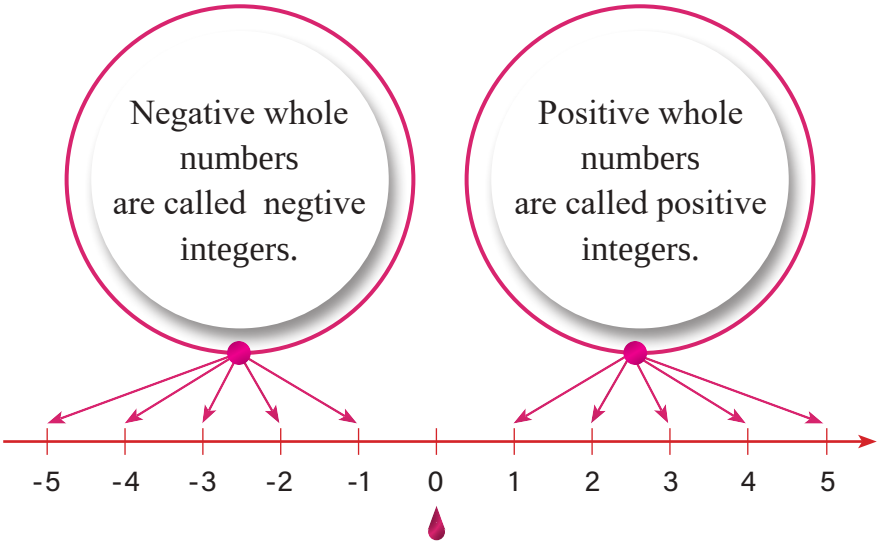
3. **A cold day at the freezing point**

4. **A very cold day with heavy snow**

Write down the temperatures recorded in the thermometers in the first three instances above.

1. A hot sunny day : .....
2. A rainy day .....
3. A cold day at the freezing point .....
4. In first three instances above, the temperature on the thermometer was zero or a value greater than zero, but on the fourth instance the temperature on the thermometer was ..... than zero. That temperature was .....





Zero is neither a negative nor a positive integer.

Note

- When writing positive integers " + " sign is not essential. Therefore, positive integers are written as 1, 2, 3, 4, ... and so on.
- When writing negative integers " – " sign must be written. Therefore, negative integers are written as ... -4, -3, -2, -1.
- Positive integers, negative integers and zero are all known as integers. Therefore, ...-4, -3, -2, -1, 0, 1, 2, 3, 4, … are integers.

What I learnt

Let us represent integers on the number line and write them in order.

1.

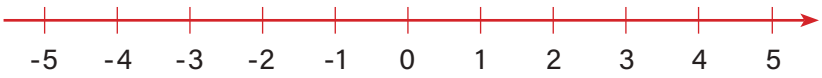
When moving from bottom to the top of a vertical number line, the values of numbers increase gradually.

(i) Mark the numbers 3, -1, 0, 4, -5 and 2 on the vertical number line given here.

(ii) Rewrite the numbers in ascending order using the above number line.

When moving from left to right of a horizontal number line, the values of numbers on the line increase gradually.

(iii) Mark the numbers 4, -2, 0, 3, -4 and -1 on the horizontal number line given below.



(iv) Rewrite the numbers in ascending order using the above number line.

2. On the number line below, mark 0 at any of the points between ***a*** and ***d,*** and mark the possible values of ***a, b, c*** and ***d*** accordingly on the number line.

What can you say about the answers you and your friend obtained? are they similar or different? Discuss it with you teacher.

3. The following numbers have been written from the smallest to the largest in order. Use your knowledge about the number line to fill in the blanks.

-6, -5, __ , -3, -2, -1, __ , 1, 2, __ , 4, __ , __ , 6

4. The famous TITANIC ship hit the submerged part of an iceberg and sank in the Atlantic ocean with more than 1 500 people on board.

This picture shows such an iceberg photographed using advanced technological equipment. A small section of the iceberg is visible above the sea level, but a bigger section submerged and hidden. Let us use the number line to get an idea of the vertical position of the iceberg.

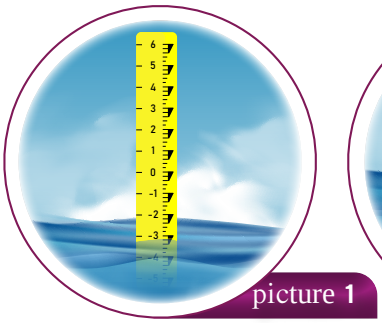
(i) Mark 0 in the most suitable position on the number line.

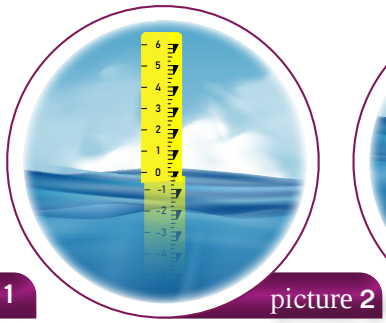
(ii) What is the highest position of the iceberg that can be marked above 0 on the number line? Mark that point as A on the picture.

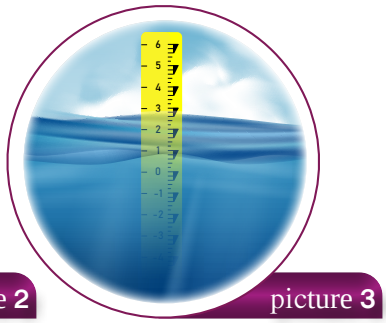
(iii) What is the lowest position of the iceberg that can be marked below 0 on the number line? Mark that point as B on the picture.

(iv) Using radar technology it has been found that the highest point on the iceberg is 100 m above sea level, and the lowest point is 200 m below sea level. Use integers to mark the peak of the iceberg, sea level and the bottom of the iceberg on the number line.

5. The following pictures are taken on a certain day at three instances of water levels on a water level indicator of a spillway while the sluice gate was opened.







(i) Explain what is represented by 0 on the water level indicator.

(ii) What can you say about the water level of the lake by looking at the numbers marked above and below zero on the water level indicator.

(iii) According to picture 1, what is the level of water in the lake? Explain what it indicates.

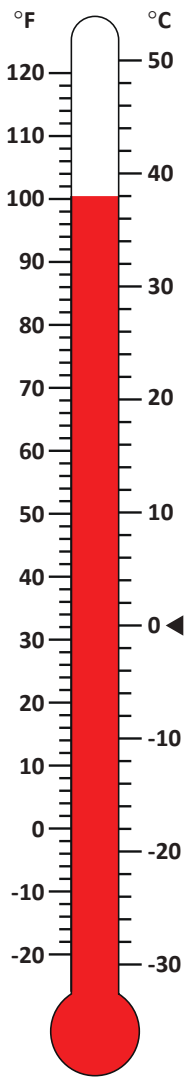
(iv) What is the level of water as shown in picture 2 ? Explain what it indicates?

(v) At the instance when the reading shown in picture 3 was obtained, to what value was the water level in the spillway approaching?

(vi) After obtaining the reading shown in picture 3, an announcement was made by the Ministry of Irrigation to those who live on the low lands to take necessary safety measures as the sluice gates are opened for the next 24 hours. On the following day, what type of reading would you expect to see on the water level indicator ? Explain your answer logically.

6. Observe the thermometer in the laboratory of your school carefully.

Thermometer has both Fahrenheit and the Celsius scales marked on it representing two number lines. It is a good real life example of how numbers can be represented on a number line. Answer the following questions based on the thermometer shown in the figure.



(i) The freezing point of water is 0 degrees Celsius (0 ^{o}C). Can this temperature be measured using the given thermometer ? Mark that value on the relevant number line.

(ii) Explain the values marked in negative (-) and positive (+) on this thermometer.

(iii) Write the temperature marked in red on the given thermometer in both Fahrenheit and Celsius units.

(iv) What is the maximum temperature that can be measured by this thermometer in Celsius.

(v) The temperature at which water boils is 100 degrees Celsius (100 °C). Can you measure that temperature using this thermometer?

(vi) The normal body temperature of a man is 98.6^{0}. Which scale has been used to measure this temperature? How do you verify that?

Activity 5

Let us compare integers

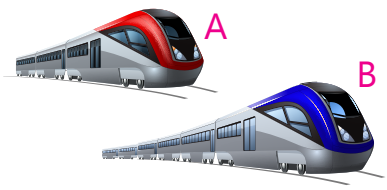
Fill in the cage related to each picture using the signs >, < and = to represent the following situations.

The size of the football is greater than the size of the tennis ball

size of the football ☐ size of the tennis ball

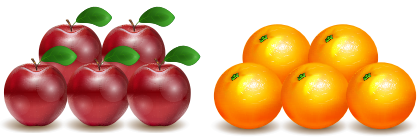
The boy is taller than the girl

height of the boy ☐ height of the girl



The length of train A is less than the length of train B

length of train A ☐ length of train B



The number of apples is equal to the number of oranges

number of apples ☐ number of oranges

4 5

4 is smaller than 5

4 ☐ 5

-1 1

1 is greater than -1

1 ☐ -1

So, when comparing two integers we use those signs as given below.

The signs " >" ," <" are called inequality signs. The pointed end of the sign should always face towards the smaller number.

Larger integer > Smaller integer

Smaller integer < Larger integer

What I learnt

Use <, =, > signs to compare integers.

1. Fill in the blanks by matching the numbers 7, 15 and 21 for the following questions.

   (i) 15 < ..... (ii) 15 > ..... (iii) 15 = ...

2. Fill in the blanks using the numbers -5, -10 and -15 according to the inequality given in the questions below.

   (i) -10 < ..... (ii) -10 > ..... (iii) -10 = ...

3. **Explain the following inequalities in words.**

Number	Inequality	In words
(i)	$5 < 9$	**Five is smaller than nine**
(ii)	$13 < 20$	
(iii)	$11 > 4$	
(iv)	$-1 > -3$	
(v)	$0 > -4$	
(vi)	$-4 < 2$	

4. **Mark right (✓) or wrong (×) in the cage in front of each inequality.**

	Inequality	Right / Wrong
(i)	$-5 > -8$	
(ii)	$-3 < -3$	
(iii)	$-13 < -3$	
(iv)	$-10 > 0$	
(v)	$11 < -15$	
(vi)	$7 = -7$	

5. The lowest temperatures recorded in few cities around the world on a certain day are as follows.

Moscow in Russia
-12^0C

Tokyo in Japan
5^0C

London in England
-3^0C

Jaffna in Sri Lanka
27^0C

(i) Draw a number line and mark the above temperatures on it.

(ii) Write 5 different inequalities using the values marked on the number line.

(iii) Which city recorded the lowest temperature?

(iv) Which city recorded the highest temperature?

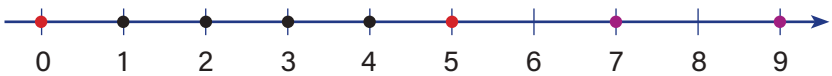
(v) By how many units the temperature in Moscow was less than the temperature in Tokyo?

(vi) When comparing the temperatures of Tokyo and Moscow and the temperatures of Tokyo and Jaffna, which two cities have a higher difference in temperature?

Integers between two non consecutive integers

Any two integers located next to each other on the number line are called consecutive integers. If there is more than 1 integer between any two integers, the two integers are called as non-consecutive integers.

Let us consider the integers between 0 and 5 on the following number line.



The integers between 0 and 5 are 1 ,2 , 3 and 4.

When we consider two non-consecutive integers 7 and 9, there is only one integer between them. It is 8.

Activity 6

Let us find integers between two non-consecutive integers.

In the following number line, A, B, C, D, E, F, G, H and I represent integers that are located next to each other. Compare the statements below with the number line and mark true '✓' or false '×' in the given box.

Statement	Mark
Only B is located between A and C.	
E is located between A and D.	
All 4 values of D, E, F, and G are located between C and H.	
Only B and C are located between A and E.	

What I learnt

Let us solve problems related to integers between two non-consecutive integers.

1. The marks given to 10 students of grade 6 for their articles written for the mathematics wallpaper are represented in the following number line.

(i) Write the marks of all 10 students in ascending order.

(ii) What is the highest mark obtained?

(iii) What is the lowest mark obtained?

(iv) How many students have scored marks between 10 and 15. Write their marks in descending order.

(v) If a prize is offered to the students who got marks between 15 and 20, how many students will receive prizes? Write their marks in ascending order.

(vi) Students who obtained marks between 0 and 5 were advised to rewrite the article. How many students received that advice?

2. **Answer the questions according to the number line given below.**

(i) Write all the integers between 1 and 5.

(ii) Write all the integers between -4 and 0.

(iii) If -3 is the only integer that lies between two particular integers, what are those two integers?

(iv) What are the positive integers lying in between 4 and 6 ?

(v) Rewrite the question (iv) in two different ways such that the answer is same as in part (iv).

What I learnt

1. At a school health clinic, Public Health Inspectors (PHI) measured the weight and height of 40 students of Grade 6 and calculated their Body Mass Index (BMI). A letter was sent to the school by the health officials giving details of 8 students who had a BMI above or below the standard value. The following details were mentioned in the letter and each of those students were advised to follow instructions.

> Values greater than the standard value are indicated by the + while the values less than the standard value are indicated by the - . For the ease of doing the exercise, the names of students are denoted by capital letters of the English alphabet.

Name of the Student	A	B	C	D	E	F	G	H
Value provided	+2	+3	-1	-3	+6	+8	-3	+1

(i) Taking 0 on the number line as the standard value of the BMI, represent the above information on the following number line.

(ii) According to the information given, what do the + and – values explain?

(iii) Which student has the highest BMI when compared with the standard BMI value?

(iv) Which student has the lowest BMI when compared to the standard BMI value?

(v) From the given values above, students who had values between +5 and +10 were advised to control their diets as they have a risk of exposing to non-communicable diseases. How many students received that advice?

(vi) If it was advised that students with values between 0 and -5 could expose to malnutrition and were recommended to be given an additional meal at school. Who are the students eligible to receive such a meal?

(vii) If the details of the other 32 students were also to be included in this number line, where should their details be included on the number line?

Based on your answers, mark '✓' in the relevant box.

All 7 answers are correct	5 or 6 answers are correct	3 or 4 answers are correct
		

1 or 2 answer(s) are correct	All 7 answers are incorrect
	

For further study watch the video related to the lesson through this QR code

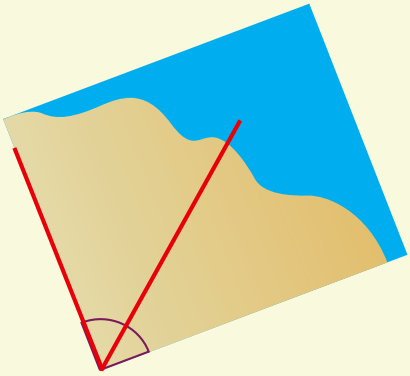
Sinhala Medium | Tamil Medium

Mathematics

Grade 6

First Term - Module 2

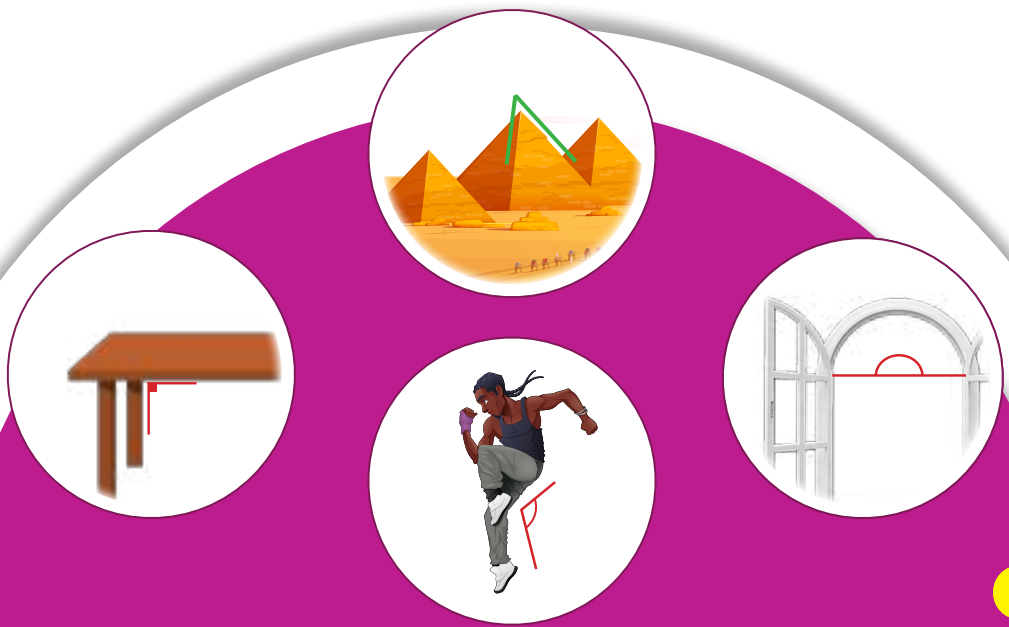
Geometry & Measurements



Chapter 1

Angles

Observe the environment clearly when you are inside the house, school and outside, walking along the river banks, roads and in mountains. You will be able to identify different types of angles on the ground, in trees and buildings as well as in any object around you. Some of those are created by nature and they are known as natural objects. Angles can be seen in artificial objects which are created by man himself as engineers, architects, road designers and carpenters. Let us study this module to learn more of these things related to angles.



Let us enjoy the beauty of the environment with angles

After studying this lesson you will be able to,

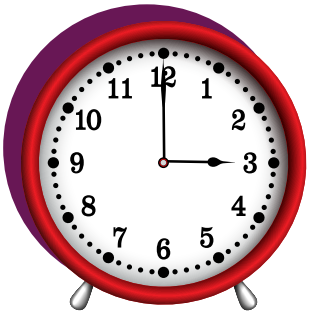
- identify the concept of angle through simple examples found in the environment
- identify the arms and vertex of an angle
- identify the static and dynamic concept of an angle based on the objects found in the environment
- identify the right angle from the locations seen in the environment
- identify acute angle, obtuse angle, straight angle and reflex angle in relation to a right angle
- identify and take photographs of right angles, acute angles, obtuse angles, straight angles and reflex angles from the surrounding environment
- name the angles
- study arts and crafts created with angles and to make new creations
- build hp a desire to be a designer, architect, artist or a photographer who will be able to experience the uniqueness of the environment with a mathematical way and present it creatively.

An angle is ...

Activity 1

- Observe the minute hand, and hour hand of the wall clock in your house.
- Observe whether the minute hand and the hour hand always rotate in the right - handed direction.
- Observe the place of the minute hand and the hour hand time to time.

You have observed how the minute hand and the hour hand are placed in your wall clock at 3.00 p.m. as shown below. The figure in front of the clock shows the position of the minute hand and the hour hand for the time shown in the clock.



Taking the clock face given above as an example draw hours the hour hand and the minute hand point at the times given below.

2.00 pm

4.00 pm

8.00 am

6.00 am

Activity 2

- Select a door at any place in your school. Close the door completely and then open it slowly. Observe the positions of the upper edge of the door and the upper edge of the door frame

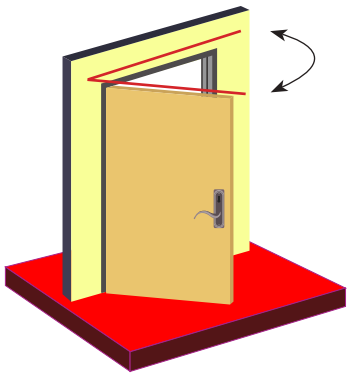


Figure I

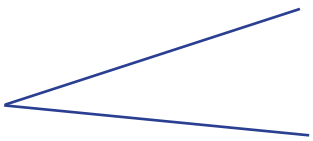


Figure II

Draw figures as in figure II, in the following boxes for the three instances given above the boxes.

When the door is slightly opened	When the door is completely opened	Any other position of the door is opened

Activity 3

Find the following places in your home and surrounding and draw the Positions of the edges of them.

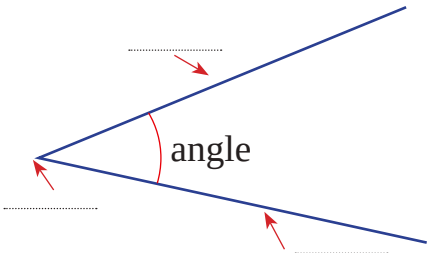
An edge of the table	Top of the main wall	Two spokes of a wheel of a cart

Complete the following sentences according to the figures you drew above.

- There are ..... straight lines in each figure.
- Above straight lines ..... at one point.

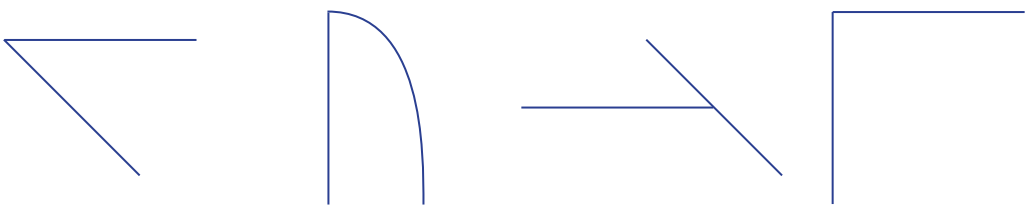
An angle is formed when two straight lines meet each other. The straight lines are called arms of the angle and the point which the two straight lines meet is called the vertex of the angle.

Identify the specific features of an angle and write them in the following blanks.

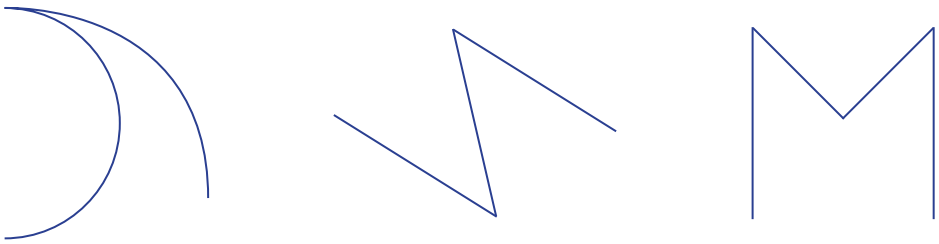


Select and underline the angles from the following figures.

(i) (ii) (iii) (iv)



(v) (vi) (vii)



Dynamic nature and static nature of an angle

In the above activities 1 and 2 (related to the hands of the clock and the door), you might have observed that the magnitude of the angles formed by the same pair of arms changes due to rotation of one arm or both arms.

If the magnitude of an angle is changed due to rotation of one or both hands of an angle, then it is called the dynamic nature of an angle.

If a rotation has taken place to the direction of moving of hands of a clock then it is called a clockwise rotation and if it happens to the opposite direction, then it is known as anti-clockwise rotation.

Complete the following sentences by considering the formation of arms of the angles in the activity 3 (related to wall, table, cart wheel).

- Position of the arms of the angle formed is ..... (changing/ not changing).
- Therefore, magnitude of the angle in each instance is ..... (changing/ not changing).

If the magnitude of an angle is a constant (not changing) then it is called the static nature of an angle.

In your classroom, home and environment,

(1) write four instances where dynamic nature of angles can be seen.

.....

.....

.....

.....

.....

(2) write four instances where static nature of angles can be seen.

.....

.....

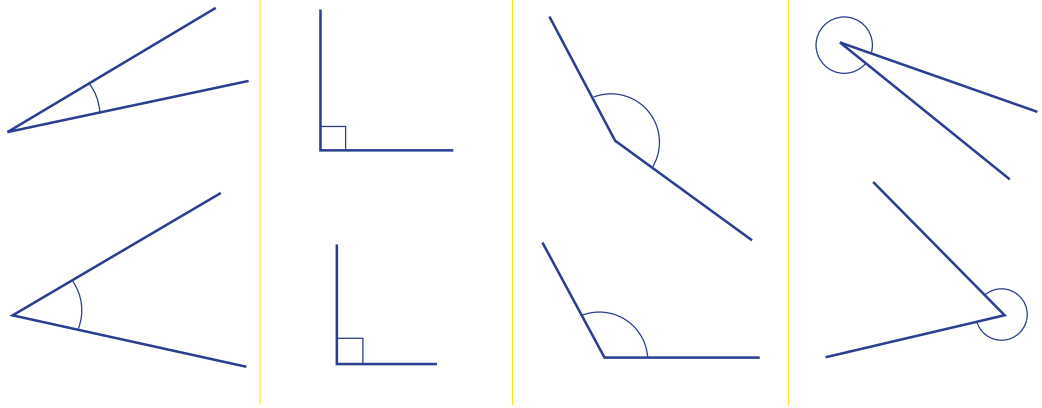
.....

.....

.....

What I learnt

Circle the larger angle out of the two angles in each instance given below. If there are equal angles draw a line below the letter of the instance.



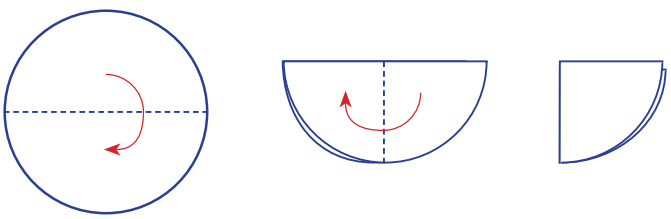
(i) (ii) (iii) (iv)

Right angle

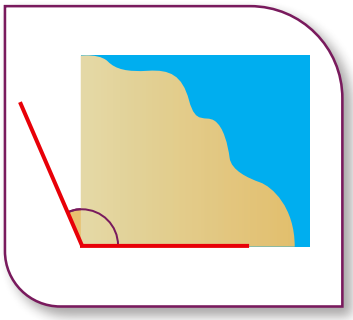
Angles can be divided into several categories according to the magnitude of them. Let's use a right angle as a reference measurement.

Look at the following instances that are seen in the nature.

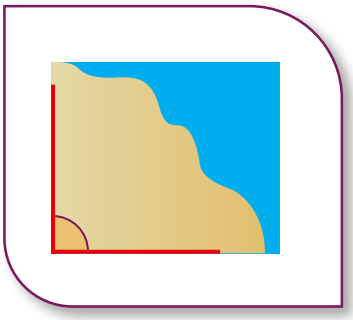
Let us make a right angled corner



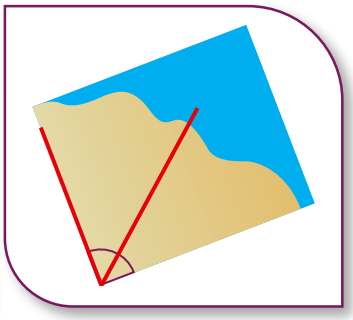
Using the folded right angled corner we can identify, whether each angle is lesser than or greater than or equal to the right angle.



Greater than the right angle

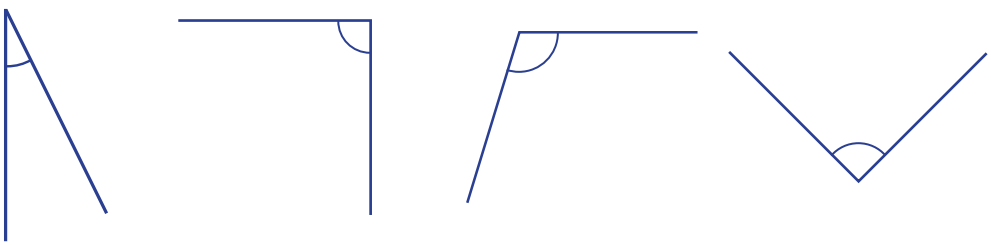


A right angle



Lesser than the right angle

(1) Underline the angles which are right angles (Use the folded right angled corner).



(2) Write 6 other places where right angled shapes can be seen in the environment.

....

....

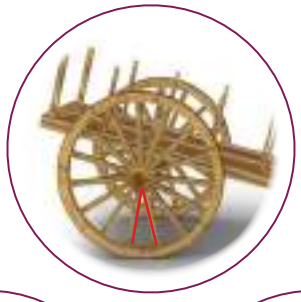
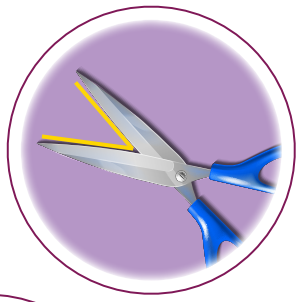
....

(3) As you observed, right angles in the environment are mostly seen in

..... (man-made objects/natural objects)

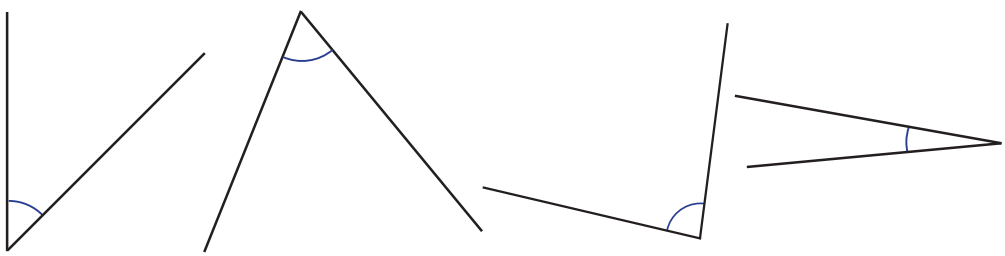
Angles which are lesser in magnitude than a right angle

Look at the following instances that you see in the environment.

Activity 4

Using your right angled corner, check whether the following angles are greater than, equal or lesser than the right angle.

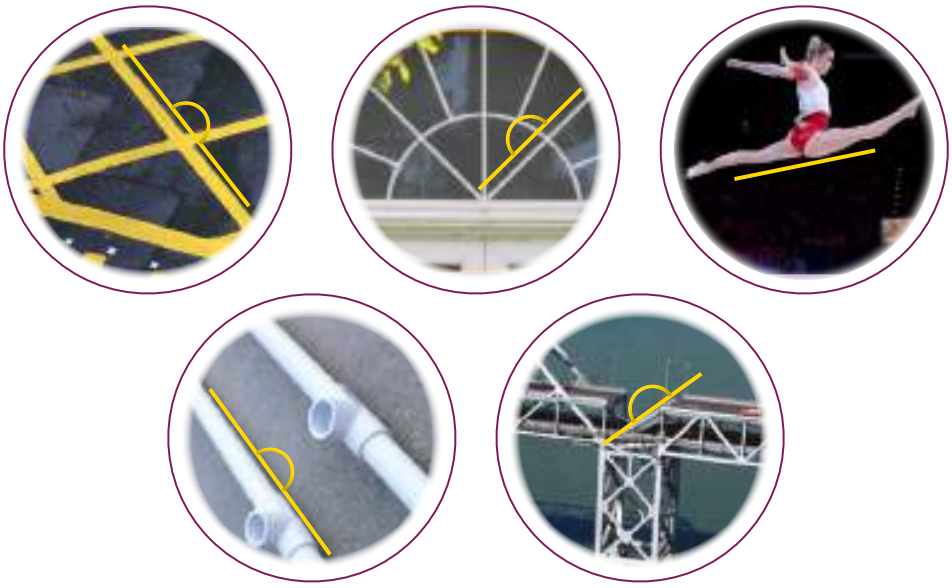


Accordingly, all the above angles are …….. (lesser/ greater) in magnitude than a right angle.

Angle which is lesser in magnitude than a right angle is called an acute angle.

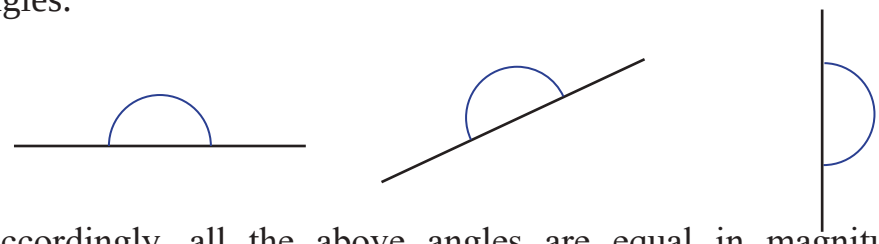
Angles which are equal in magnitude to two right angles

Look at the following instances.



Activity 5

Use two right angled corners and check whether each of the following angles are lesser than, greater than or equal to two right angles.



Accordingly, all the above angles are equal in magnitude to ..... (3/2) right angles.

Angle which is equal in magnitude to two right angles is called a straight angle.

(1) Write 4 other instances where acute angles can be seen in nature.

....

....

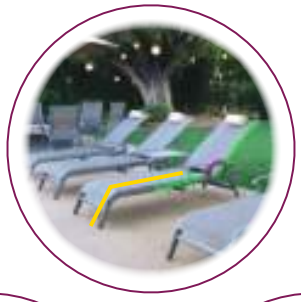
(2) Write 4 instances where straight angles can be seen in the environment.

....

....

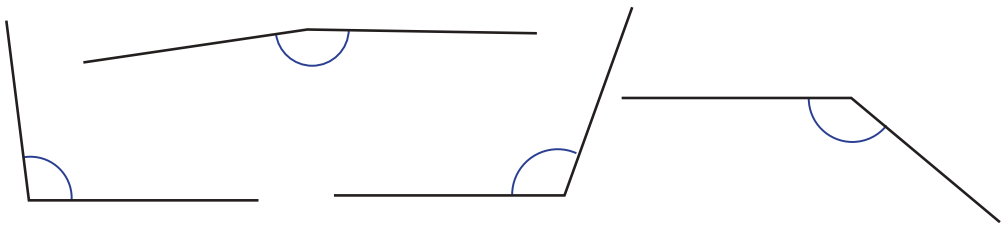
Angles which are greater in magnitude than the right angle but lesser in magnitude than a straight angle

Look at the following instances.


Activity 6

Use two right angled corners and check whether each of the following angles is lesser than, greater than or equal to a right angle.



Accordingly, all the above angles are …… (lesser than/ greater than) one right angle but ……. (lesser than/greater than) two right angles in magnitude.

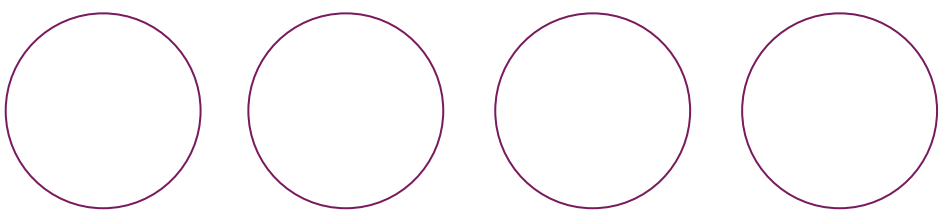
Angle which is greater in magnitude than a right angle but lesser in magnitude than a straight angle is called an obtuse angle.

(1) Write 4 other instances where obtuse angles can be seen in nature.

....

....

(2) Draw the above instances and mark the obtuse angle in it.

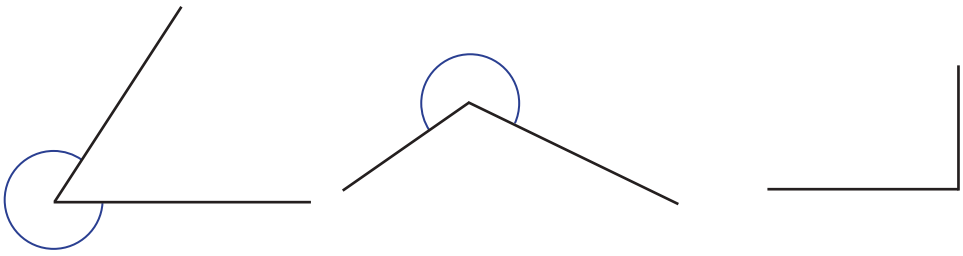


Angles which are greater in magnitude than the straight angle but lesser in magnitude than four right angles

Look at the following instances.

Activity 7

Use two right angled corners and check whether each of the following angles are lesser than, greater than or equal to a straight angle.



Accordingly, all the above angles are ..... (lesser/greater) than the straight angle but ..... (lesser/greater) than four right angles in magnitude.

Angle which is greater than the magnitude of a straight angle (two right angles) but lesser than four right angles is called a reflex angle.

(1) Write 4 other instances where reflex angles can be seen in nature.

....

....

(2) Draw the above instances and mark the reflex angle in it.

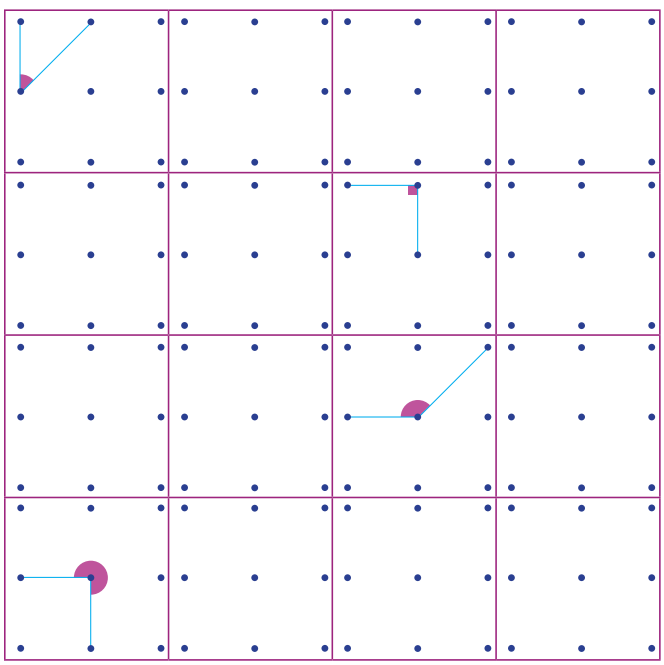
(3) Draw three different angles for each of the following types of angles by joining the dots.

Acute angle

Right angle

Obtuse angle

Reflex angle



Activity 8

Try to do the following game accurately within a minimum time period. Maximum time you will be given is 10 minutes.

Guidelines :

- Choose an average size table. Fix a box board to the whole table and paste it on the table tightly. (as we can remove it later)
- As shown in the figure, paste masking tapes on the box board such that they lie across each other by keeping empty spaces too. (Maximum of 10 tapes).
- Identify the angles given below and mark or shade them according to the given colour (at least 20 angles).
  - Acute angles - Blue colour
  - Right angles - Red colour
  - Obtuse angles - Green colour
  - Straight angles - Black colour
  - Reflex angles - Purple colour
- Present your creative activity to the class at the end of 10 minutes.

Craft with angles

In some countries, snowflakes can be studied during winter or in bad weather.

Here are some magnified snowflakes.

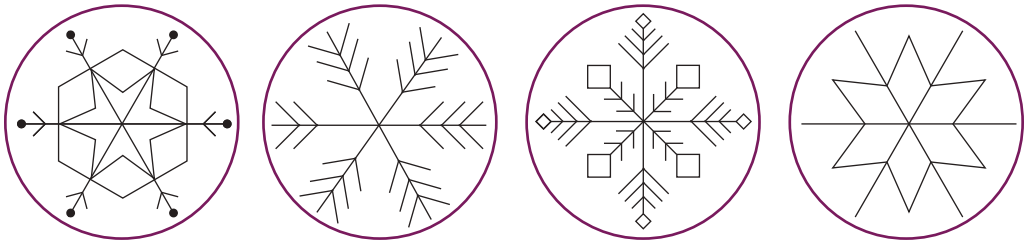
Snowflakes move so quickly and it is difficult to observe and remember their pattern in mind. Though you catch the falling snowflakes, they dissolve instantly.

Creating models of snowflakes using different types of angles

Activity 9

For this activity you will need clean ekels, glue for pasting them and white papers.

Some models seen in the snowflakes are given below. Try to create them using pieces of ekels. You can create designs for greeting cards, sarees, fabrics etc., Using the above patterns of snowflakes and with relevant raw materials. Make many creations and present them in the term end exhibition. Be a talented creative designer.



Use of angels in Art

Above are some paintings by Wassily Kandinsky that has been drawn using angular shapes.

Following is a painting by Pablo Picasso that has been drawn using angular shapes.

Create your own piece of art using different angle shapes and present it in the class exhibition at the end of the module.

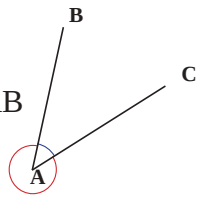
Let us name an angle...

Vertex of the angle - A

Arms of the angle - AB, AC

Blue colour angle - BAC angle or BÂC, CAB angle or CÂB

Red colour angle ;- BÂC reflex or CÂB reflex

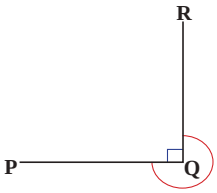


Vertex of the angle - .....

Arms of the angle - ..... and .....

Blue colour angle - Angle..... or .....

Red colour angle -.....(reflex) or.....(reflex)

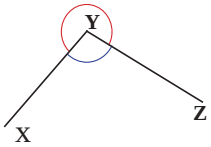


Vertex of the angle - .....

Arms of the angle - ..... and.....

Blue colour angle - Angle ..... or .....

Red colour angle - ..... (reflex) or ..... (reflex)

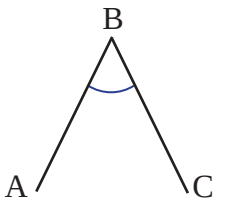
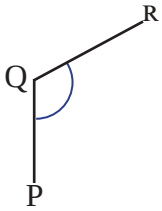
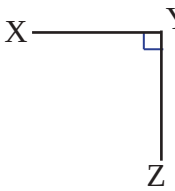
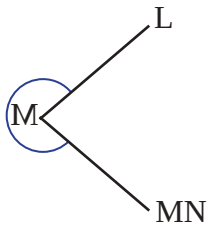


Fill the following blanks by studying the above diagrams of angles.

- To name any angle, …….. (2/3/4) capital letters of the…….. (English/ Sinhala) alphabet are used.
- Of the three letters, the mid letter indicates the ……(vertex/arm).
- When the letters on either sides of the vertex are interchanged (as BÂC, CÂB) the angle will be…….. (same/changed).

What I learnt

Name the arms and vertex of each of the following angles.

Angle				
Vertex				
Arms				
Angle				

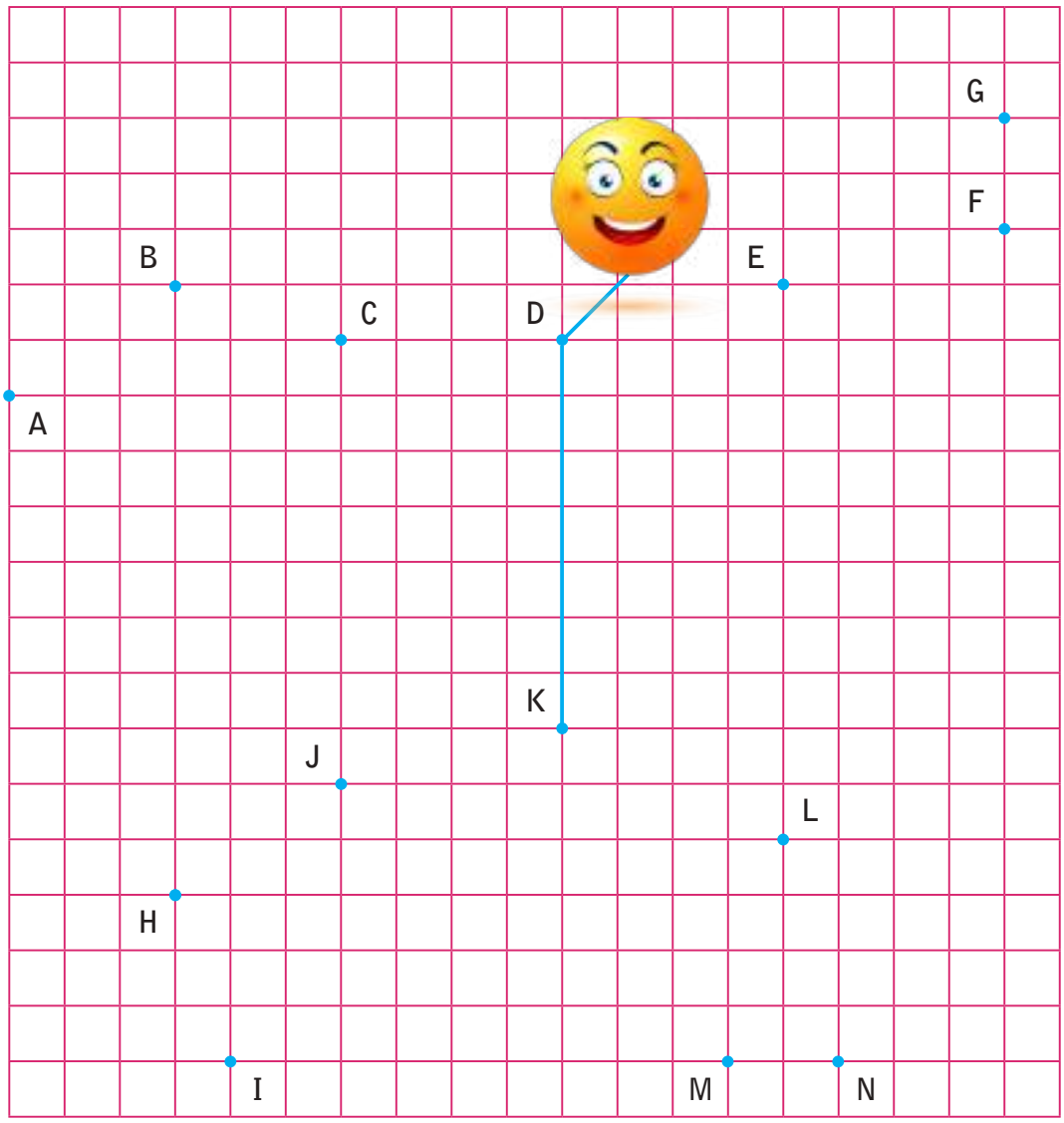
Activity 10

(1) Join the points of the following figure named by the letters A, B, C,... respectively hp to G.

(2) Similarly join the points H,I,J, ... respectively hp to N.

(3) Did you get any funny figure? Give a name for it and write it in the given box.

Name : .....



By marking only one angle at a vertex, write the different types of angles represented in the above figure, in the relevant column of the following table. (Use capital letters of the English alphabet.)

Acute angles	Right angles	Obtuse angles	Straight angles	Reflex angles
		$A\hat{B}C$		

Activity 11

Let us go on a field trip ...

- Do you like to be a photographer. It is better to accompany an adult too.
- You have to find a smartphone or a camera. Then you walk around the environment and take photographs of the places where you observed different types of angles.
- Photographs should be printed on paper. Try to highlight the angles in the photo. Create a very beautiful photo view. Below the figure, write down the type of angle found in each figure.

- If you are unable to find a camera or a smartphone to take photographs, you can draw them nicely. Or else you can take pictures from newspapers or magazines.
- Invite your principal, teachers and students of the other classes observe your photographic exhibition. Enjoy the beauty of the nature with an intelligent mathematical way and hence be a wonderful person full of humanity who can inherit productive things to the country, society and nature.

For further study watch the video related to the lesson through this QR code.

Sinhala Medium | Tamil Medium

"

Getting ready for the next chapter...

Dear students, you have to make a clock in the next chapter 'Time'. For that you can use any relevant materials. Not only that, but also you can make it working. You will get further information from your teacher. Therefore, you can work together in groups and decide which materials to bring to the class next day to make a clock

"

Chapter 2

Time

By studying this chapter you will be able to,

- express the units of measuring the time accurately
- build up the relationship between the units of measuring time
- calculate the elapsed time for a task
- do calculations relating to addition of time
- do calculations relating to subtraction of time
- organize and implement daily activities according to a timetable
- realize the importance of time management for a successful life style

Let us live with a sense of time

We all engage in different tasks from our birth to death. Similarly many phenomena happen in the nature too. Time elapses in all those instances. The time we consume for any task cannot be regained. Therefore we have to train ourselves to use the time effectively and meaningfully. You are the owners of the future world. So it is important to manage your time for a better life. This module will be a very good backing for it.

Do you remember?

Recite the following poem to a rhythm and make the occasion more attractive by combining it with a suitable dance.

Twelve men stand around a	circle
Tik Tik Tik, pendulum	swings
One hand is long and the other is	short
These two men walk just like old	men
The thin man is very	mischievous
He knocks on all twelve	heads

What is described by the above poem?

.....

.....

Draw a figure of it here.

Time in the past

Activity 1

Our ancestors in ancient times did not have clocks to keep track of time. They used a variety of tactics. Various tools were used. The environment also helped. Find information on those methods and tools with the help of adults and/ or use the Internet and write them down below.

Strategies used to know the time	Instruments used to measure time

Activity 2

Clock...

Below are some pictures of different types of clocks used from the ancient time to the present where we use modern technology.

Shall we make a clock…

Before starting this chapter your teacher informed you to bring raw materials to make a clock. You can get together and work in groups.

Further you can make the clock working.

Activity 3

Think a moment...

Always we are engaged in a task. If we can engage in them with mindfulness, then it will be meaningful. Therefore dear students, engage in following activities meaningfully and write down the time taken for each of them with relevant units.

Activity	Time taken including the units
Time you need to exhale and inhale once	
Time allocated for the interval in your school	
Time you spend per day in the school	
Time you spend to read a story book	
Duration of a school term	
Time period you study in one grade of the school	

What are the units you used in writing the answers for the above?

Now you know that, seconds, minutes, hours, days, weeks and years are the units of measuring time.

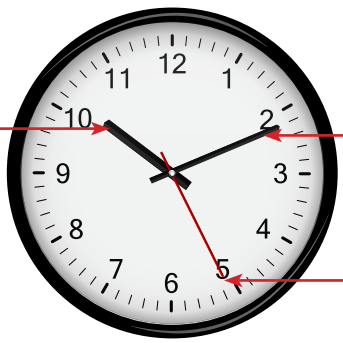
Units of measuring time and the relationship among them

Activity 4

Hands of the clock

The fastest hand in a clock is the .....hand

This is the ..... hand



This is the ..... hand

This is the ..... hand

Write the time represented in each of the following clocks by means of hours, minutes and seconds.

hours ..... minutes .....
seconds .....

(i)

hours ..... minutes .....
seconds .....

(ii)

hours..... minutes .....
seconds .....

(iii)

hours .....minutes .....
seconds .....

(iv)

Fill in the following blanks in order to find out the relationships among seconds, minutes, hours and days using a wall clock.

- Outer circle of the clock is divided into ..... equal parts using short lines.
- Numbers from 1 to 12 are marked such that ..... equal parts are placed in between two consecutive numbers.
- Time taken by the second hand to move from one small short line to the next short line is ..... second.
- Time taken by the minute hand to move when the second hand rotates one whole round is ..... minute.
- Time taken by the hour hand to move when the minute hand rotates one whole round is ..... hour.
- Time taken by the hour hand to move when the hour hand rotates ..... whole rounds is ..... day.

Let us now examine the unit conversions related to the time relevant to each of the above relationships and how to solve the related problems.

Relationship between minutes and seconds

1 minute = 60 seconds

Representing time given in minutes, in terms of seconds

Let us express 2 minutes in seconds

1 minute = ... seconds
2 minutes = 2×60 seconds
2 minutes = ... seconds

Let us express 15 minutes in seconds

1 minute = ... seconds
15 minutes = ... × ..... seconds
15 minutes = ... seconds

Therefore, to express a time given in minutes in terms of seconds, the time given in minutes should be multiplied by .....

What I learnt

(1) Express each of the following times in seconds.

(i) 5 minutes (ii) 9 minutes
(iii) 45 minutes (iv) 60 minutes

(2) You have 20 minutes break during school time. Express that time in seconds.

(3) Tharusha spends 30 minutes per day for physical exercises. Express that time in seconds?

Representing time given in seconds, in terms of minutes

Let us express 240 seconds in minutes

60 seconds = ... minute
240 seconds = 240 ÷ 60 minutes
240 seconds = ... minutes

Let us express 420 seconds in minutes

..... seconds = 1 minute
420 seconds = ...÷ ..... minutes
420 seconds = ... minutes

Therefore, to express a time given in seconds, in terms of minutes, the given time should be divided by .....

What I learnt

(1) Express each of the following times given in seconds, in terms of minutes.

(i) 120 seconds (ii) 300 seconds

(iii) 300 seconds (iv) 4800 seconds

Representing time given in seconds, in terms of minutes and seconds

Let us express 90 seconds in minutes and seconds.

Multiple of 60

90 seconds = 60 seconds + ... seconds

Since, 60 seconds = ... minute

90 seconds = ... minutes and 30 .....

Let us express 375 seconds in minutes and seconds.

Multiple of 60

375 seconds = 360 seconds + ... seconds

Since, 360 seconds = ... minutes

375 seconds = ... minutes and ..... seconds

What I learnt

(1) Express each of the following times given in seconds, in terms of minutes and seconds.

(i) 85 seconds (ii) 140 seconds

(iii) 305 seconds (iv) 500 seconds

Representing time given in minutes and seconds, in terms of seconds

Let us express 2 minutes and 30 seconds in seconds

2 minutes and 30 seconds = (2×60) seconds + 30 seconds

2 minutes and 30 seconds = ... seconds + 30 seconds

2 minutes and 30 seconds = ... seconds

Let us express 10 minutes and 8 seconds in seconds.

10 minutes and 8 seconds = (..... × .....) seconds + ... seconds

10 minutes and 8 seconds = ... seconds + ... seconds

10 minutes and 8 seconds = ... seconds

What I learnt

(1) Express each of the following times given in minutes and seconds in terms of seconds.

(i) 5 minutes and 20 seconds

(ii) 11 minutes and 14 seconds

(iii) 25 minutes 5 seconds

(iv) 55 minutes and 50 seconds

(2) The music of the drill display of an inter house sports meet was played 20 minutes and 30 seconds. Express that time in seconds.

Calculations related to relationship between hours and minute

1 hour = 60 minutes

Representing time given in hours, in terms of minutes

Let us express 4 hours in minutes

1 hour = ... minutes

4 hours = ... × 60 minutes

4 hours = minutes .....

Let us express 13 hours in minutes

1 hour = ... minutes

13 hour = ... × ..... minutes

13 hour = ... minutes

Therefore, when expressing a time given in hours, in terms of minutes, the given time should be multiplied by .....

What I learnt

(1) Express each of the following times given in hours, in terms of minutes.

(i) 6 hours (ii) 12 hours

(iii) 30 hours (iv) 72 hours

(2) How many hours you spend in your school? Express that time in,

(i) minutes

(ii) seconds

(3) Kipchoge who won the gold medal for men's marathon in 2020 Tokyo Olympic took 2 hours 8 minutes and 38 seconds to complete his race. Express the time taken by Kipchoge in seconds.

Representing time given in minutes, in terms of hours

Let us express 120 minutes in hours

60 minutes = ... hour
120 minutes = (..... ÷ 60) hours
120 minutes = ... hours

Let us express 300 minutes in hours

..... minutes = 1 hour
300 minutes = (..... ÷ 60) hours
300 minutes = ... hours

Therefore, when expressing a time given in minutes, in terms of hours the given time should be ..... by .....

What I learnt

(1) Express each of the following times in hours.

(i) 180 minutes (ii) 360 minutes

(iii) 480 minutes (iv) 600 minutes

(2) Binara who is studying in grade 6 spends 120 minutes to complete his school homeworks. Express this time in hours.

Representing time given in minutes, in terms of hours and minutes

Let us express 100 minutes in hours and minutes

60 minutes = ...
100 minutes = 60 minutes + ... minutes
60 minutes = 1 hour and ..... minutes

Let us express 345 minutes in hours and minutes

60 minutes = ... hour
345 minutes = ... minutes + ... minutes
345 minutes = ... hours and ..... minutes

What I learnt

(1) Express each of the following times given in minutes in terms of hours and minutes

(i) 150 minutes (ii) 245 minutes
(iii) 400 minutes (iv) 666 minutes

(2) Teacher gave students a task to complete within 75 minutes. Express that time in hours and minutes.

Representing time given in hours and minutes, in terms of minutes

Let us express 2 hours and 40 minutes in minutes

2 hours and 40 minutes = (2 × 60) minutes + 40 minutes
2 hours and 40 minutes = ... minutes + 40 minutes
2 hours and 40 minutes = ... minutes

Let us express 11 hours and 5 minutes in minutes

11 hours and 5 minutes = (..... × .....) minutes + ... minutes
11 hours and 5 minutes = ... minutes + ... minutes
11 hours and 5 minutes = ... minutes

What I learnt

(1) Express each of the following times in minutes.

(i) 5 hours and 15 minutes (ii) 10 hours and 8 minutes

(iii) 18 hours and 20 minutes (iv) 24 hours and 5 minutes

Calculations based on the relationship between hours and days

1 day = 24 hours

Representing time given in days, in terms of hours

Let us express 4 days in hours

1 day = ... hours

4 days = ... × 24 hours

4 days = ... hours

Let us express 11 days in hours

1 day = ...

11 days = ... × ..... hours

11 days = ... hours

Therefore, when expressing a time given in days, in terms of hours; the given time should be multiplied by ..... hours.

What I learnt

(1) Express each of the following times in hours.

(i) 5 days (ii) 7 days

(iii) 14 days (iv) 30 days

(2) Express the number of days in this year in hours.

Representing time given in hours, in terms of days

Let us express 72 hours in days

hours 24= days .....

hours 72 = days 72 ÷ 24

hours 72 = days .....

Let us express 120 hours in days

hours 24 = days .....

hours 120 = days 120 ÷ 24

hours 120 = days .....

Therefore, when expressing a time given in hours, in terms of days; the given time should be divided by ……

What I learnt

(1) Express each of the following times in days.

(i) 48 hours (ii) 96 hours

(iii) 240 hours (iv) 576 hours

Representing time given in hours, in terms of days and hours

Let us express 50 hours in days and hours

24 hours = 1 day
50 hours = 48 hours + ... hours
50 hours = ... days ..... hours

Let us express 85 hours in days

24 hours = ... day
85 hours = ... hours + ... hours
85 hours = ... days ..... hours

What I learnt

(1) Express each of the following times given in hours in terms of days and hours.

(i) 60 hours (ii) 99 hours

(iii) 245 hours (iv) 360 hours

Representing time given in days and hours, in terms of hours

Let us express 1 day and 3 hours, in hours.

1 day and 3 hours = (24 ×1) hours + ... hours
1 day and 3 hours = ... hours + ... hours
1 day and 3 hours = ... hours

Let us express 7 days and 12 hours in hours.

7 days and 12 hours = (..... × .....) hours + ... hours
7 days and 12 hours = ... hours + ... hours
7 days and 12 hours = ... hours

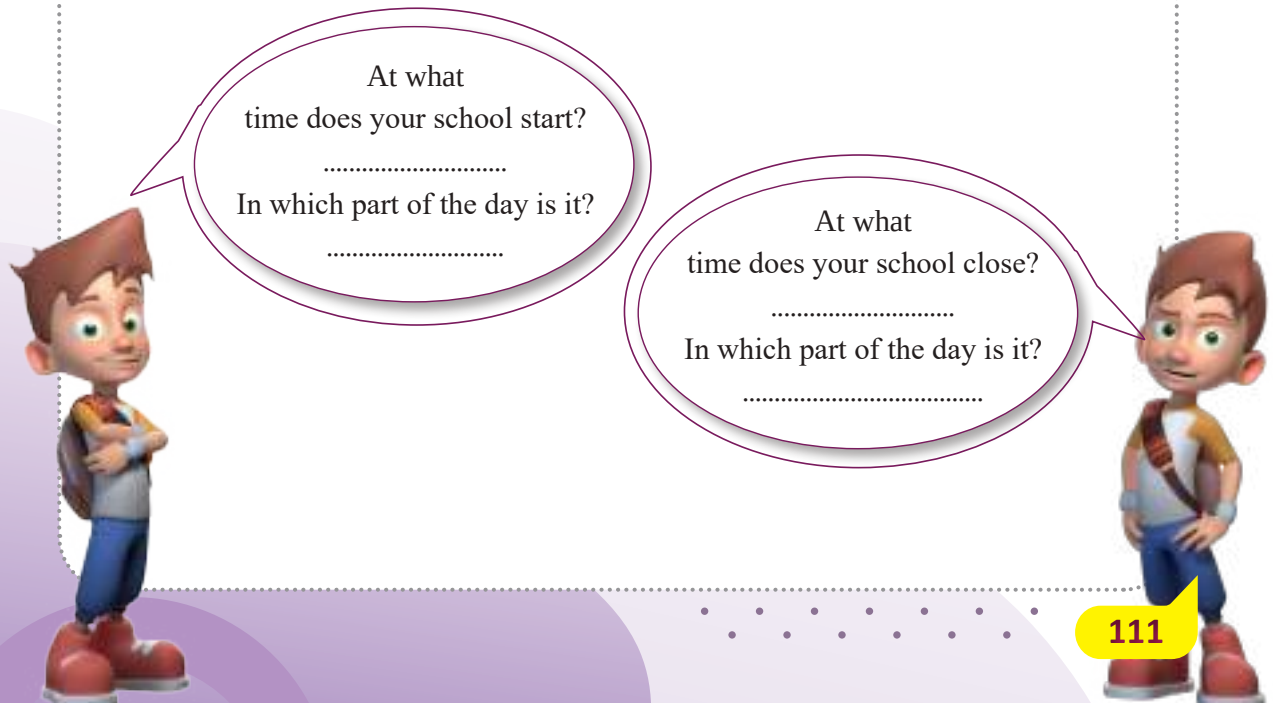
What I learnt

(1) Express each of the following times in hours.

(i) 2 days and 8 hours
(ii) 5 days and 10 hours
(iii) 10 days and 21 hours
(iv) 30 days and 15 hours

Let us express time

Write the answers to the following questions related to your school in the given blanks.



Write 5 tasks you do in the morning and 5 events taking place in the environment in the morning.

Tasks done by you	Events taking place in the environment
1.	
2.	
3.	
4.	
5.	

Similarly, write 5 tasks you do in the evening and 5 events taking place in the environment in the evening.

Tasks done by you	Events taking place in the environment
1.	
2.	
3.	
4.	
5.	

Accordingly, we can divide the time of a day into two parts as forenoon and afternoon.

Then how can we separate the forenoon and afternoon accurately?

We all know...

Number of hours in a day = ...

When these hours are divided into two equal parts,

hours belonging to one part = ...

So, we call the forenoon the morning period and afternoon the evening period.

1 day = 2 periods = 24 hours

Let us now examine how to separate the time of the day into ante meridiem and post meridiem.

The sun rises at 6.38 ante meridiem	The sunset is at 6.38 post meridiem
	

Write down in the blanks below the other names that are used for the morning period and evening period after studying the above pictures and other information.

Morning period = ...

Evening period = ...

We usually use ante meridiem for morning period; written in short as a.m. and for evening period, post meridiem; written in short as p.m.

Let us now look at the time that belongs to each period.

At what time does the day start? .....

At what time does the sun rise to the top on a sunny day? .....

At what time does the day end? .....

Then, the time of the day can be divided into two periods as follows.

The 12 hours from 12 midnight to 12 noon is called ante meridiem (a.m.) or the morning period.

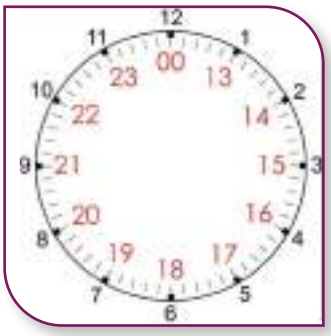
The 12 hours from 12 noon to 12 midnight is called post meridiem (p.m.) or the evening period.

Now list the ten tasks of your daily routine in the table below, showing the time in the ante meridiem and post meridiem.

Time	Task
……. a.m.	Wake hp

24 hour clock

Check out the clocks below.



Have you ever seen clocks like this? .....

What is the specialty of these clocks? .....

Let us now look at how 24 - hour clock shows the time shown in ante meridiem and post meridiem in 12 - hour clock. To do this, study the examples in the table below.

Time in 12 - hour clock	Time in 24 - hour clock
12.20 a.m.	00 : 20
7.45 a.m.	07 : 45
10.30 a.m.	10 : 30
11.55 a.m.	11 : 55
12.42 p.m.	12 : 42
2.15 p.m.	14 : 15
9.10 p.m.	21 : 10

The time shows in 24 – hour clock is also called the

"International Standard Form of the Time"

Indicate the start or end time of each task as shown in the table below in 12 - hour clock and 24 - hour clock.

Task	Time in 12 - hour clock	Time in 24 - hour clock (Standard form)
1. Your breakfast time		
2. Starting time of the school		
3. Religious observation time		
4. The end of the second period of the school		
5. Time to come home after school		
6. Time to finish playing		
7. Starting time of bathing or washing		
8. Starting time of school home works		
9. Dinner time with family		
10. Bed time		

What are the locations that show the time in standard form?

(1) Airport

(2) .....

(3) .....

(4) .....

(5) .....

The time is written in international standard form as follows,

hours : minutes : seconds

hh:mm:ss

e.g.:- 05:15:08

Note : In this form, the hours, minutes and seconds should be expressed using two digits.

Write down the current time you are studying this module in 12 - hour clock including hours, minutes, seconds below.

.....

Write that time in 24 - hour clock in international standard form.

.....

What I learnt

(1) Express the times given in the following table in terms of the 12 hour clock.

(i) 02:05	(ii) 07:45	(iii) 11:59	(iv) 16:16
(v) 05:10:30	(vi) 10:30:48	(vii) 18:55:05	(viii) 23:20:45

Representing the date in standard form

Use the calendar to get the relationships between the following units

..... days = 1 week	12 months = ... year

When writing the date in standard form,

2024-12-01

first the year, then the month and finally the date should be written. A short dash is used between them.

(1) Write down the following dates in standard form.

1. Your birthday .....
2. The founding date of your school .....
3. The independence day of Sri Lanka .....
4. Today's date .....
5. The day you expect to start your own business or job .....

(2) The foundation stone was laid for the construction of the new house at the auspicious time of 21 minutes and 30 seconds after 6 a.m. on Thursday, March 8, 2021.

1. Write the date mentioned in the above statement in the standard form. .....
2. Write the time mentioned in the above statement in the standard form. .....

Challenge 1

By now you know how to write the time and date in standard form correctly. Then join all the students in your class as one group. Now create a digital timetable for each task, from school start time to end time. There, indicate the date in standard form and the time in 24 hour clock. Strongly believe that by giving each student in the class, a special responsibility and acting accordingly, they can collectively overcome the challenge.

Let us find the elapsed time

How long will
I stay at school each day ?

.....

Complete the following blanks with 24 hour clock time.

Time, when I attend the school = ...

Time, when I leave school = ...

The time I stay in school = The difference between the time I attend school and the time I leave schools

= The time I leave school - The time I attend school

= ..... - .....

= .....

So, the elapsed time of a task or event is the difference between the time it started and the time it ended.

Elapsed time = Task ended time - Task started time

Inter school chess - tournament was started at 10.30 a.m. and finished at 1.30.p.m.

How long was the chess tournament held?

Thus, how to find the elapsed time when time is given by the 12 - hour clock related to two periods of the day?

In such a case, the elapsed time can be easily found by indicating the time given in 12 - hour clock by 24 - hour clock.

Find the elapsed time by filling in the following blanks by recording the time using the 24 - hour clock.

The time when the chess tournament started = ...

The time when the chess tournament ended = ...

The time when the chess tournament was held = ... - .....

= .....

Note

- If the time for a task that takes place in relation to two periods of the day, is given in the 12-hour clock, it is easy to find the elapsed time by taking the time in the 24 hour clock.
- When the time related to a task that takes place in the same period of the day is given by the 12 hour clock, the elapsed time can be found by -taking the difference between the time; in the same way the elapsed time can be found by taking the difference of the time given in the 24 hour clock.
- Calculations as above can be done for the work done within one day.

Activity 5

Let us walk… Let us run….

Now you are ready for the following activity.

Now we are getting ready to test the time it takes for you and your team to walk and run the same distance.

You can use a stopwatch, wrist watch or any other timer for this.

Instructions:

- Choose a place where you can walk or run.
- Collaborate with members of your team.
- Practice using your time measuring divice chosen. Complete the table below for each member of your team using that device correctly.
- Also, pay close attention to the change in your heart beat each time.

Some distance (e.g. : 100 m) Name : .....

Action	Time started (hh : mm : ss)	Time it ended (hh : mm : ss)	Time elapsed
1. Walking at a normal walking speed			
2. Running at normal speed			
3. Running at maximum speed			

Briefly describe the change in your heart beat in the above three situations.

.....

.....

.....

Now find the time elapsed on each of the following occasions below.

Occasion	Time started	Time ended	Time elapsed
Playing			
Planting a seedling			
Reading a newspaper			
Watching your favorite TV program			
Studying			

How many hours do you sleep per day ?

.....

Do you know that too much sleep as well as too less sleep is bad for your health?

Doctors believe that the number of hours of sleep a person needs per day varies according to the age in order to maintain good health.

Find out

Complete the table below with the recommended number of hours of sleep for each age group by searching information through Internet.

Stage	Range of the age	Recommended hours for sleep
Newborn Infant Toddler Preschool	From months 0 to 3	From 14 upto 17 hours

For further study watch the video related to the lesson through this QR code

So far we have learned many things about time. With that, you face the following challenge individually or as a group.

Challenge 2

Imagine that you are asked to plan your school's grade 6 annual field trip. Include all the elements that should be included in a field trip, come hp with a creative plan by managing time for a more meaningful and productive field trip.

Solving problems related to time

Addition related to time

The time it takes to travel from home to your religious place =

The time you spend there by doing religious observations =

Time taken to return home =

The total time you spend for going from home to place of worship to attending religious observation and return } =

	hours	minutes
	2	30
+	1	25
	3	55

	hours	minutes
	1 3	50
+	1	45
	5	35

First, let's add the minutes in the minutes column

50 minutes+ 45 minutes= 95 minutes

95 minutes =1 hour and 35 minutes

Let's write 35 minutes in the minutes column.

Let us carry the 1 hour to the hours' column and add the hours in that column.

What I learnt

(1) Add

(i)

	hours	minute
	4	15
+	1	25

(ii)

	hours	minutes
	12	35
+	3	45

(iii)

	minutes	seconds
	15	05
+	10	50

	minute	seconds
	28	12
+	21	55

	days	hours
	5	05
+	10	08

	days	hours
	15	12
+	11	18

(2) Vinudi's father travels 1 hour and 15 minutes by train and another 20 minutes on foot to return home after working. How much time does it take for Vinudi's father to return home after working?

Put a tick in the appropriate box according to the answers given by you.

All 7 answers are correct

6 or 5 answers are correct

4 or 3 answers are correct

2 or 1 answer(s) are correct

All answers are incorrect

Subtractions related to time

For this we use information obtained from the Activity 5.

The time it took you to run ..... m fast = ...

The time it took you to walk the same distance at normal speed = ...

Accordingly, how much more time does it take you to walk than run the same distance } = ...

	hours	minutes
	4	40
-	1	25
	3	15

	hours	minutes
	6	25
-	2	45
	3	40

First, let us subtract the minutes in the minutes' column But, 45 minutes cannot be subtracted from 25 minutes.

Therefore, let us carry one hour from the 6 hours in the hour column, that is 60 minutes to the minutes' column.

Then, 25 minutes + 60 minutes = 85 minutes

Now, 85 minutes - 45 minutes = 40 minutes

Let us write 40 minutes in the minutes' column.

When 2 hours are subtracted from the remaining 5 hours in the hours' column, we obtain 3 hours.

What I learnt

(1) Subtract

(i)

	hours	minutes
	4	35
-	1	25

(ii)

	hours	minutes
	12	35
-	3	40

(iii)

	minutes	seconds
	58	21
-	21	54

(iv)

	minutes	seconds
	38	55
-	11	30

(v)

	days	hours
	5	07
-	1	02

(vi)

	days	hours
	30	15
-	15	18

(2) It took 8 minutes and 45 seconds to telecast a breaking news during an educational programme on the television that is telecasted from 7.00 a.m. to 8.00 a.m. Find out the time that the TV educational programme telecasted.

Put a tick in the appropriate box according to the answers given by you.

All 7 answers are correct	6 or 5 answers are correct	4 or 3 answers are correct
		

2 or 1 answer(s) are correct	All answers are incorrect
	

Challenge 3

1. (i) Express your age in years.
   (ii) Express your age in terms of days.
2. Make a timetable to, manage your valuable time. Present it to the class. Make successful achievements by working according to the time table.
3. Get everyone in the class together and create some games related to time. Design those games related to mathematics. Organize a math camp with the help of your teachers in charge of mathematics, sports and other teachers, and engage in the games created by you.

For further study watch the video related to the lesson through this QR code

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Mathematics

Grade 6

First Term : Module - **3**

Numbers II

Chapter

1

Estimation and Rounding off

By studying this lesson, you will be able to;

- describe how to estimate the number of elements in a countable set.
- estimate the number of elements in a countable set.
- identify the rules used when rounding off numbers less than 1 000 to the nearest multiple of ten.
- round off numbers less than 1 000 to the nearest multiple of ten.
- identify the rules used when rounding off numbers less than 1 000 to the nearest multiple of hundred.
- round off numbers less than 1 000 to the nearest multiple of hundred.
- use estimation in day-to-day life as a life skill.

Estimation

A teak plantation cultivated for timber is shown below. It is needed to calculate the number of teak trees in an acre to estimate the value of this plantation. Can you calculate the number of teak trees in this cultivation?

You will feel that this calculation is too difficult. Counting trees one by one is difficult because it takes more time, effort, and additional resources to count the number of trees. In such cases, instead of counting one by one and getting the most correct answer, it is often possible to get an approximated value easily in daily activities.

Activity 1

Discuss with your friends and write how to get an approximated value for the number of trees.

.....

.....

.....

.....

Most of the farmers, no matter how small or large their field is, have the ability to express an estimated value for the

- number of seeds or plants they need,
- required amount of fertilizer,
- amount of yield they can gain.

It can be seen that the farmers face various difficulties when such approximated value or amounts cannot be calculated.

Taking more seeds than required will incur unnecessary expenses due to excess plants or seeds.

Taking insufficient seeds than required will cause troubles due to shortage of plants or seeds.

Activity 2

Make a list of such difficulties that farmers have to face when unable to calculate the quantity to a nearest value.

.....

.....

.....

.....

Activity 3

The agronomy unit has planned to distribute vegetable seeds to all the students in the school with the objective of promoting home gardening among school children. Accordingly, it is scheduled to follow hp the progress in the cultivation after distributing 10 seeds of three varieties of vegetables to every student. A quantity of beans seeds, pumpkin seeds, and ladies' fingers seeds has been received as a donation in support of this program. It is required to calculate the number of seeds to find whether these seeds are sufficient to distribute to all the students in the school. That task is assigned to grade 6 students.

1. Form groups appropriately with your classmates according to the teacher's instructions.
2. Plan a suitable methodology to count the number of seeds by taking one type of seeds for each group.
3. Accordingly, estimate the number of seeds in the bag.

Use the following materials and instruments for the above activity. Choose the equipment you need from the equipment provided.

Answer the following questions using the activity.

1. What kind of seeds did you estimate?

   .....

2. What instruments did you use for that?

   .....

3. Write how you estimated the number of seeds in the bag step by step.

.....

.....

4. Accordingly, estimate the approximate number of seeds in the bag.

.....

5. Get the information from the other groups and fill the following table according to the number of seeds received by each group.

Grohp	Type of seeds	Estimated quantity of seeds

6. What are the problems you faced when estimating the quantity of seeds?

.....

.....

For extra knowledge

Kasun says, even if sufficient quantity of seeds are used, the number of seedlings may be decreased depending on the percentage of germination.

What are the causes for that?

Find the actions that can be taken to avoid this problem and write an article for the wall newspaper.

Expressing the number of elements in a collection of elements to a nearest value using an appropriate method without a calculation is called estimation.

The mostly used method for estimation is, obtaining an approximate value for the number of elements in a selected section from the given collection of elements. In this method, the selected section is considered a unit and the total number of elements is estimated according to the number of elements in the unit.

Estimation is often used in day-to-day activities for easy calculations without counting one by one.

What I learnt

1. Write three instances where estimation is used in day-to-day activities.

2. The figure shows the remaining amount of oil after four equal size cans were fully filled. Accordingly estimate the number of cans needed to fill the barrel completely.

Number of oil cans filled completely = ...

Number of oil cans that can be filled using the remaining oil = ...

Number of cans that can be filled using the oil in the whole tank = ...

3. Ravindu used paving blocks for a part of the yard of the house and the remaining part with grass. If the area which is paved with grass also should be paved with paving blocks, estimate the amount of paving blocks that should be bought.

4. Nisam who generates the required units of electricity from the solar panels installed on the roof of the house, expects to gain an extra income by providing the electricity generated to the electricity board. Estimate the number of solar panels that can be installed on the double pitch roof.

5. Ravi uses red and green tissue papers to paste four identical lanterns made by him and white tissue papers to put the frills. He expects to buy tissue papers to paste the rest after pasting the triangles with red tissue paper and the squares with green tissue paper. Estimate separately, the number of red colour and green colour tissue papers he should buy.

6. Following is an aerial image of a coconut estate. If there are 20 number of trees in the section denoted by the square in the coconut cultivation, estimate the number of trees in the whole cultivation.

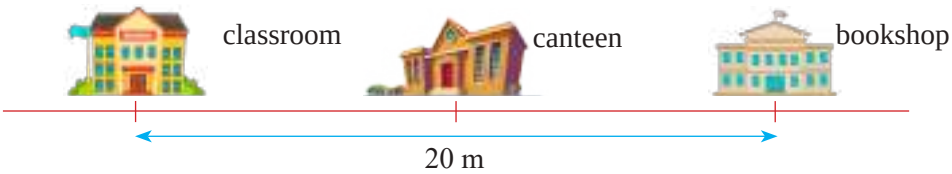
Rounding off

Rounding off to the nearest 10

Activity 4

Do the following activity with your friend.

- Imagine that the canteen is 10 m away from your classroom and the bookshop is 10 m away from the canteen along a direct path.
-



- Accordingly, note down the answers given by your friend and you separately.

1. After walking 12 m towards the bookshop from the classroom, it started to rain. You had nothing to protect yourself from rain. If you run to the nearest building to protect yourself from rain, which of the above places would you run to?

   Your answer : .....

   Your friend's answer : .....

2. If the rain started after walking 17 m towards the bookshop from the classroom, which of the above places would you run to protect yourself from rain?

   Your answer : .....

   Your friend's answer : .....

3. If the rain started after walking 15 m towards the bookshop from the classroom, which of the above places would you run to protect yourself from the rain?

   Your answer : .....

   Your friend's answer : .....

4. If the rain started after walking 3 m towards the canteen from the classroom, which of the above places would you run to protect yourself from the rain?

   Your answer : .....

   Your friend's answer : .....

- Are the answers of two of you the same or different under cases 1,2,3 and 4? .....

  If they are different, discuss and write the most suitable answer.

  1. ..... 2. ..... 3. ..... 4. .....

- What is the reason for choosing those places to run when it rains?

  .....

- Write down the distance you walked towards the bookshop and the distance from the classroom to the place where you ran seeking cover from the rain in each instance in the following table.

The distance walked towards the bookshop from the classroom	Distance to the place where you ran seeking cover from the rain from the classroom
12 m	
17 m	
15 m	
3 m	

Answer the following questions using the information obtained from the above activity.

- What is the multiple of 10 nearest to 17?

  .....

- What is the multiple of 10 nearest to 32?

  .....

- What is the multiple of 10 nearest to 45?

  .....

Indicating a certain number to its nearest multiple of ten is called rounding off to the nearest ten.

Rules of rounding off a number to the nearest 10

- When rounding off a number to the nearest 10 first, zero the unit place digit of the number.

Then,

- Keep the tens - place digit unchanged if the unit place digit is less than 5.
- Add one to the tens - place digit if the unit place digit is 5 or more than 5. Accordingly, the other digits can be changed.

Let us round of the following numbers approximately to 10. Let's fill the blanks.

1

34

The digit at the unit place is ……

It is …….. (less than/greater than/equal to) 5.

Thus, when 34 is rounded off to the nearest 10,
the value is .....

2

76

The digit at the unit place is ……

It is …….. (less than/greater than/equal to) 5.

Thus, when 76 is rounded off to the nearest 10, the value is .....

3

95

The digit at the unit place is ……

It is …….. (less than/greater than/equal to) 5.

Thus, when 95 is rounded off to the nearest 10, the value is .....

4

231

The digit at the unit place is ……

It is …….. (less than/greater than/equal to) 5.

Thus, when 231 is rounded off to the nearest 10, the value is .....

5

529

The digit at the unit place is ……

It is …….. (less than/greater than/equal to) 5.

Thus,when 529 is rounded off to the nearest 10, the value is .....

6

695

The digit at the unit place is ……'

It is …….. (less than/greater than/equal to) 5.

Thus,when 695 is rounded off to the nearest 10, the value is .....

7

765

The digit at the unit place is ……

It is …….. (less than/greater than/equal to) 5.

Thus, when 765 is rounded off to the nearest 10, the value is .....

What I learnt

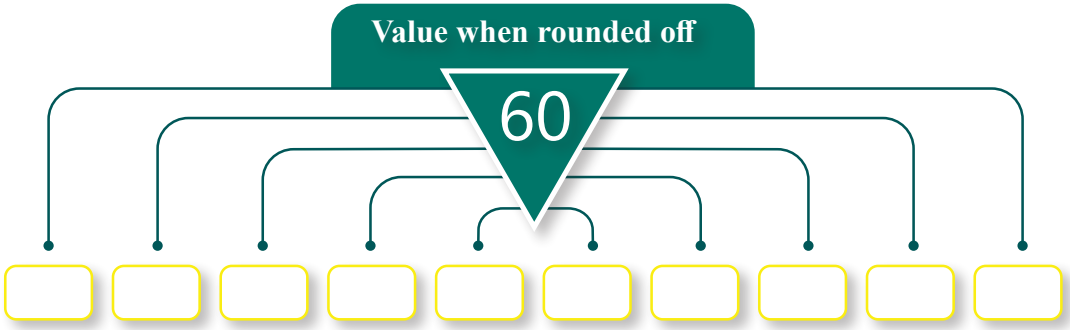
1. Round off the given numbers to the nearest 10 and complete the table.

Number	When rounded off to the nearest 10
62	
37	
83	
25	
116	
239	
268	
451	
645	
995	

2. Round off the following numbers to the nearest 10.

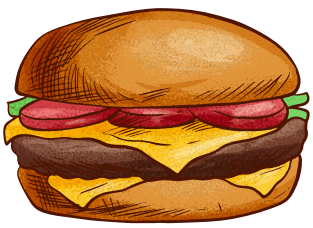
(i) 236 (ii) 898 (iii) 151 (iv) 722

3. If 60 is the value when a certain number is rounded off to the nearest 10, write the possible values of that number in the blank boxes.



4. Supun says the amount of money he has is Rs.70 when rounded off to the nearest 10 and after buying a toffee for Rs.2, the remaining amount of money is Rs.60, when rounded off to the nearest 10. What are the possible values for the amount of money he can have?

5. The price of a burger bun when rounded off to the nearest 10 is Rs. 230. The price of a burger bun increased by one rupee. Now the price, when rounded off to the nearest 10 is Rs. 240. What is the price of a burger bun now?



6. Sithika has 12 marbles and Lithika has 16 marbles. Round off and write the total number of marbles both have, to the nearest 10.

For further study watch the video related to the lesson through this QR code

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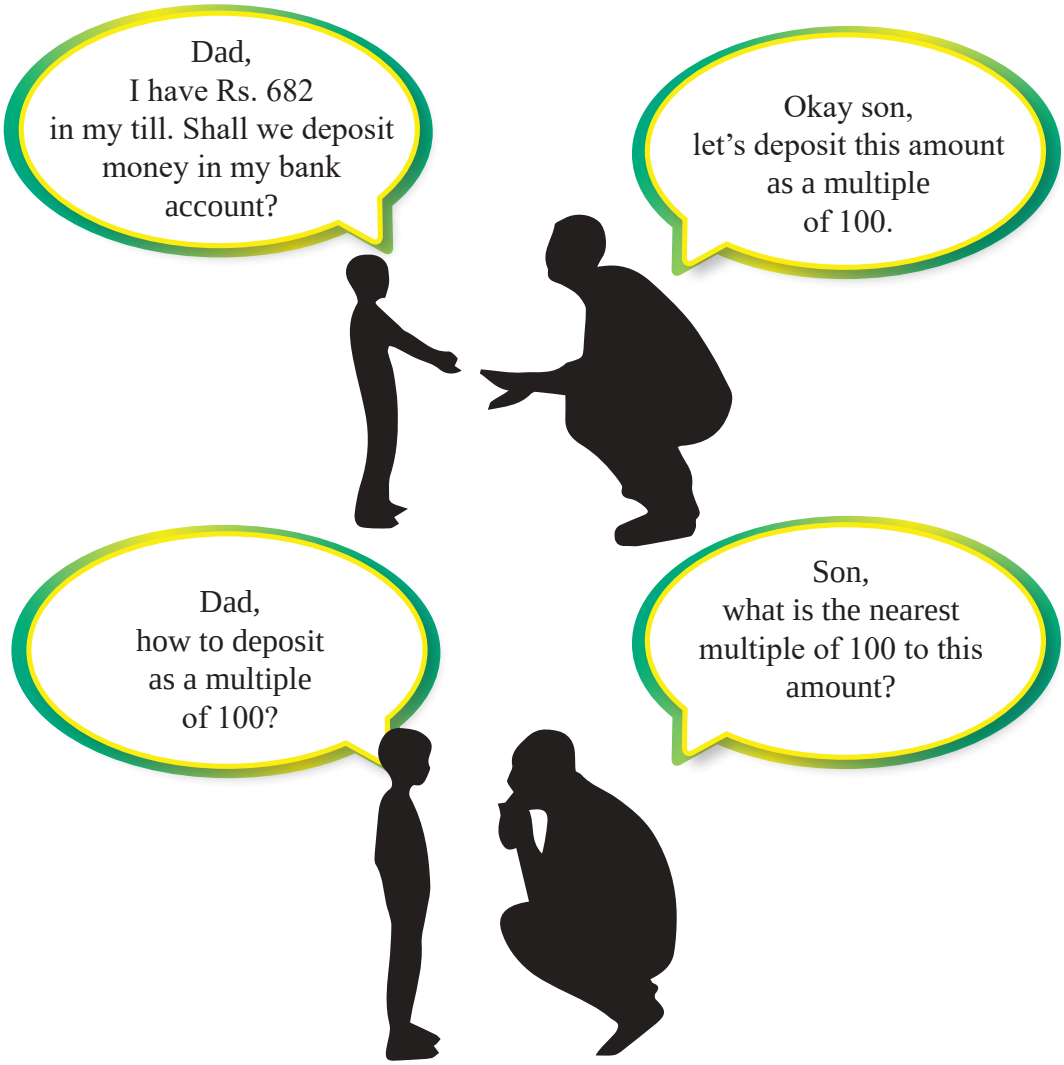
Rounding off to the nearest 100



Can you help this friend? How can he express the amount of Rs. 682 money that he has to the nearest multiple of 100?

Activity 5

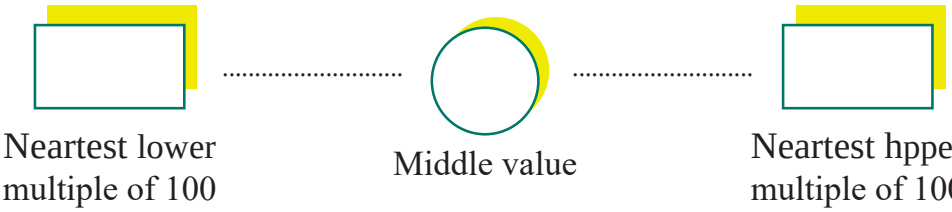
1. Find out between which two multiples of 100 the number 682 lies.

   Number : 682

   Neartest hpper multiple of 100 : .....

   Neartest lower multiple of 100 : .....

2. Write the above two multiples of 100 in the two boxes given below. Write the middle value of them in the given circle.



3. Write 682 in appropriate blank.

4. Accordingly, write 682 to the nearest multiple of 100.

Expressing a number by the nearest multiple of 100 is known as rounding off a number to the nearest 100.

Rules of rounding off a number to the nearest 100

- When rounding off a number to the nearest multiple of 100, first zero the digits in the ones and tens places.

Then,

- Keep the hundreds-place digit unchanged if the tens place digit is less than 5.
- Add one to the hundreds-place digit if the tens place digit is 5 or more than 5. Accordingly, the other digits can be changed.

Activity 6

Play a teacher guided game with your teacher to verify further about rounding off a number to the nearest multiple of ten or the nearest multiple of hundred.

Let us fill the blanks to round off the following numbers to the nearest 100.

1

349

The digit at the tens place is ……

It is …….. (less than/greater than/equal to) 5.

Thus, when 349 is rounded off to the nearest 100 the value is .....

2

652

The digit at the tens place is ……

It is …….. (less than/greater than/equal to) 5.

Thus, when 652 is rounded off to the nearest 100 the value is .....

3

995

The digit at the tens place is ……

It is …….. (less than/greater than/equal to) 5.

Thus, when 995 is rounded off to the nearest 100 the value is .....

4

400

The digit at the tens place is ……

It is …….. (less than/greater than/equal to) 5.

Thus, when 400 is rounded off to the nearest 100 the value is .....

What I learnt

1. Fill the table by rounding off following numbers to the nearest 100.

Number	When rounded off to the nearest 100
467	
236	
350	
959	
641	

2. Round off the following numbers to the nearest 100.

   (i) 148 (ii) 367 (iii) 550 (iv) 839 (iv) 989

3. The length of the Mahaweli river is 335 km. Round off that length to the nearest 100.

4. The marked price of a pair of shoes is Rs.999. Round off its price to the nearest 100.

5. The number of limes in a sack of limes, when rounded off to the nearest 100 is 400. Find the minimum and maximum number of limes that can be in the sack.

Put (√) in the table according to the numbers you rounded off correctly.

All the answers are correct	9 - 13 answers are correct	5 - 8 answers are correct
		

1 - 4 answer(s) are correct	All the answers are wrong
	

What I learnt

1. The diagram shows a small box containing an ornament and a large cardboard box used to pack the small boxes when sending them to the market. Estimate the number of small boxes that can be packed in a large cardboard box.

2. When a number is rounded off to the nearest 10, the value is 40. What are the possible values of that number?

3. (i) Estimate the maximum number of vehicles that can be parked in this six-storied car park.

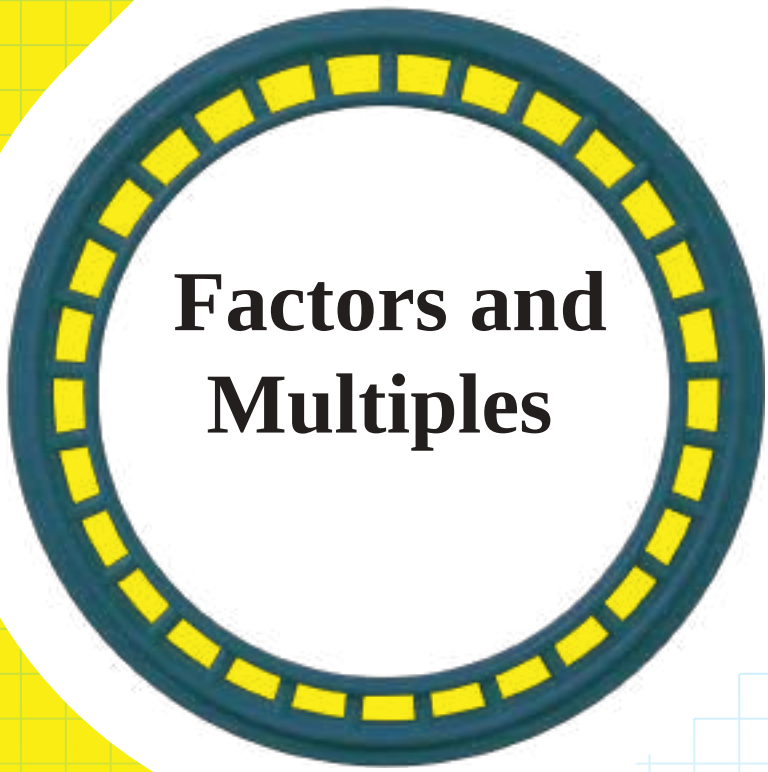
   (ii) Round off that number to the nearest 10.

   (iii) Round off that number to the nearest 100.

4. When rounded off to the nearest 10, the number of coconuts plucked from a coconut tree is 30. But three of them were thrown away due to poor ripening. The number of remaining coconuts, when rounded off to the nearest 10 is 20. Write down three possible values for the total number of coconuts plucked.

Chapter

2



Factors and Multiples

By studying this lesson, you will be able to ;

- find the factors and multiples of whole numbers hp to 100.
- solve problems related to factors and multiples.
- identify the applications of factors and multiples related to practical situations.
- determine easily whether a number is divisible by 2, 5, or 10 without a remainder.
- determine easily whether a number is divisible by 3, 4, 6, or 9 without a remainder.

Let us identify factors

Activity 1

The following types of pot trays are used in agriculture to increase the productivity in crop cultivation. Several small pots are combined to form a pot tray.

A

B

C

D

E

Answer the following questions relevant to the above nursery trays.

(i) Write the way of finding total number of pots in a nursery tray using the number of pots in a row and the number of pots in a column of the nursery tray.

(ii) Find the total number of pots in the nursery trays A,B,C,D and E using the number of pots in a row and the number of pots in a column of each of those nursery trays.

Tray A .....

Tray B .....

Tray C .....

Tray D .....

Tray E .....

(iii) Is there a relationship between the number of pots in the nursery trays C and E? If so, what is the relationship?

.....

(iv) Are there different ways to arrange 12 pots except the two ways C and E above? If so, draw all those ways in the box below.

Accordingly, write down all possible ways of writing 12 as a product of two numbers.

When a whole number is written as a product of two other whole numbers, each of them are called as the factors of the first number.

Fill in the blanks by considering the facts you learnt.

When we write the factors in order, by considering the products related to 12, ... hence, there are ..... factors to 12.

Let us find factors

Activity 2

Required materials : 50 bottle caps of equal size or
50 seeds (such as madatiya) the same size or
50 squares similar in size cut out from papers.

(i) Use the above materials and find out all the possible ways of arranging the following numbers in rectangular shape and note them down in the boxes below.

5 (**five**)

8 (**eight**)

7 (**seven**)

15 (**fifteen**)

(ii) Using the diagrams you drew, write each of the numbers as a product of two whole numbers in the boxes below.

5	8	7	15

(iii) Using those products, write down all the factors of each number. At the end write the number of factors in the circle.

5 - ..... ◯

8 - ..... ◯

7 - ..... ◯

15 - ..... ◯

(iv) Can 0 be considered a factor of any number mentioned above?

.....

(v) Can 1 be considered a factor of all the numbers mentioned above?

.....

Note

- "0" is not considered a factor of any whole number.
- "1" is a factor of any whole number.
- Any whole number is a factor of itself.

What I learnt

1. Write all the different ways of expressing 20 as a product to find the factors of 20.

   20 = 1 × ..... 20 = 2 × ..... 20 = ... × .....

   (i) The factors of 20 are .....

   (ii) Is 3 a factor of 20 or not? .....

   (iii) Give reasons for your answer to question number (ii) above.

   .....

   .....

2. Write all the different ways of expressing 36 as a product of two numbers to find the factors of 36.

   36 = 1 × ..... 36 = ... × ..... 36 = ... × .....

   36 = 2 × ..... 36 = ... × .....

   (i) Accordingly, the factors of 36 are,.....

   (ii) Therefore, there are ..... number of factors for 36.

3. Write all the factors of the following numbers on the dotted line.

   Write the number of factors for each number in the box in front.

   (i) 3 → .....

   (ii) 9 → .....

   (iii) 11 → .....

   (iv) 18 → .....

   (v) 75 → .....

(vi) 96 ⟶ .....

(vii) 27 ⟶ .....

(viii) 43 ⟶ .....

3. Separate all the above numbers for which factors were found, according to the given instructions.

The numbers that have only two distinct factors	The numbers which have more than two distinct factors

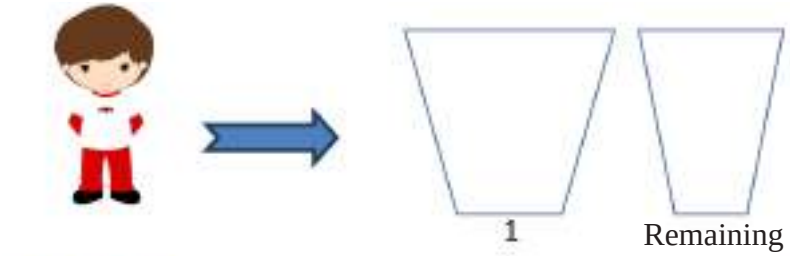
Finding the factors using the method of division

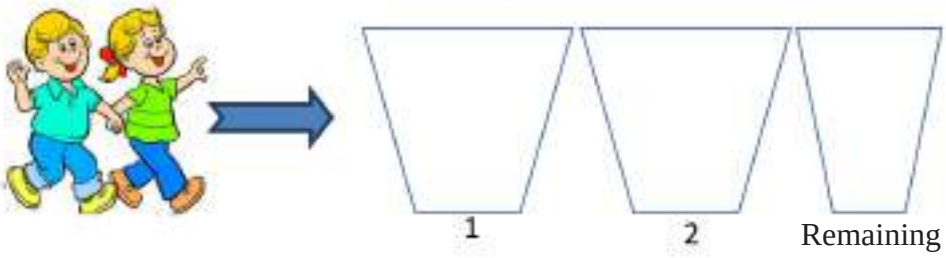
Activity 3

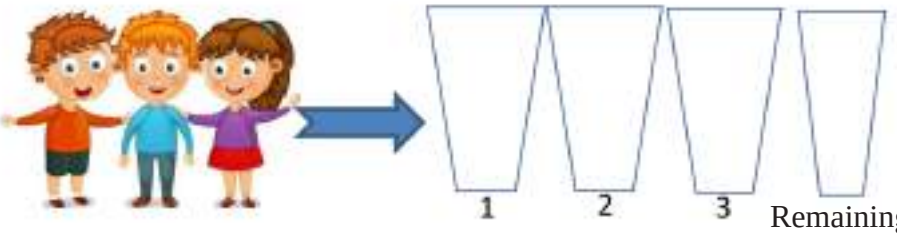
Each of 15 veralu fruits were distributed among five groups including 1, 2, 3, 4 and 5 members in each group, so that each member receives equal number of veralu.

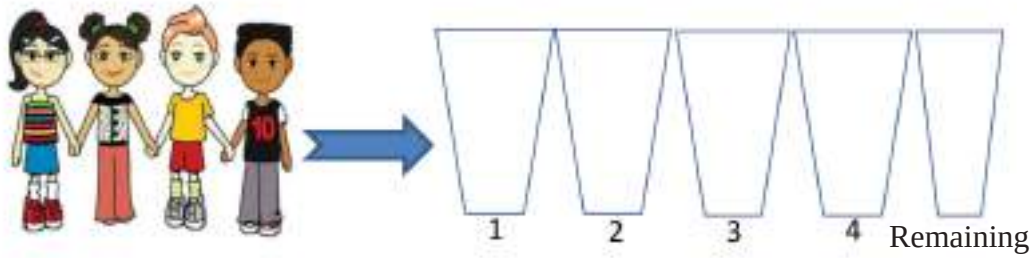
There were 5 containers equal to the number of members in the group numbered 1, 2, 3, 4 and 5 and one more container labeled "remaining" in order to put any extras.

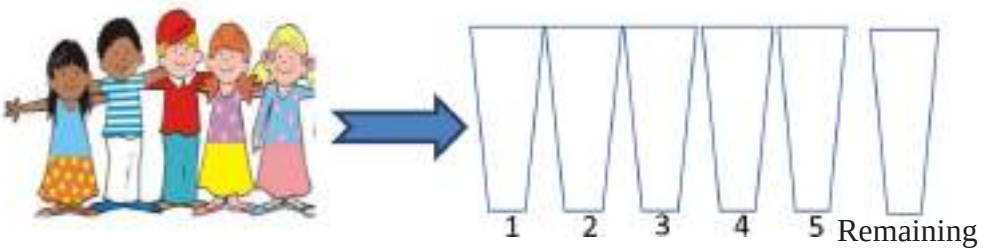
Illustrate the number of veralu fruits in each of the container such that every member receives equal and maximum number of veralu. Observe the process.


1
Remaining


1
2
Remaining


1
2
3
Remaining


1
2
3
4
Remaining


1
2
3
4
5
Remaining

Complete the following table relevant to the number of members 1,2,3,4, and 5 using the above activity. Hence, complete the rest of the table relevant to the number of members 6,10, and 15.

Number of members in the team	Number of veralu received by a member when distributing equally	Number of veralu remaining
1		
2		
3		
4		
5		
6		
10		
15		

(i) Write down the number of members in the groups respectively in which 15 veralu were distributed equally without a remainder.

.....

(ii) Besides the number of members given in the table, are there any other ways of numbering the members of the group into which the 15 veralu can be equally divided? ..... (yes/no)

(iii) Write down the number of members in the groups respectively in which some numbers of veralu are remaining after distributing the 15 veralu equally.

.....

(iv) Accordingly, write all the factors of 15.

.....

If a whole number can be divided by another whole number without a remainder, that number is a factor of the previous number. Any whole number is divisible by one and number itself, therefore one and that number are factors of the given number.

Let us find all the factors of 30 by completing the following blanks.

	30		15		.....		....		.....		....
1	30	2	30	3	30	6	30	5	30	.....	30
	30		30		30		.....		.....		.....
	30		0		0		0		....		.....

30 is divisible by the numbers 1, 2, 3, 5, 6, 10, 15 and 30. Therefore, …….. ……are the factors of 30.

What I learnt

Find 4 factors of each number below using the method of division.

(i) 18 (ii) 54 (iii) 96

What I learnt

1. Is 15 a factor of 95 or not? Explain the reason.
2. The following is a list of medicines and the doses prescribed by a physician for a patient who came for treatments.

Take
one white pill twice
a day after the
meal

Take
one red pill
4 times a day

Take
one yellow pill
thrice a day after
the meal

Take
one blue pill in the
morning after the
meal

Yellow pills
thrice a day 3 × ..... = 24
Every ..... hours

white pills
twice a day ..... × ..... = 24
Every ..... hours

Blue pills once
a day ..... × ..... = 24
Every ..... hours

red pills 4 times
a day..... × ..... = 24
Every ..... hours

(i) According to the above study you have done, the factors of 24 are,
.....

(ii) If the four pills were taken at once in the morning at 8 a.m. today, when and at what time will the four pills have to be taken again together? Find your answer by marking the time in the schedule for each pill.

Time / Type of pills	From 8 a.m. today ...																							
	08 : 00	09 : 00	10 : 00	11 : 00	12 : 00	13 : 00	14 : 00	15 : 00	16 : 00	17 : 00	18 : 00	19 : 00	20 : 00	21 : 00	22 : 00	23 : 00	24 : 00	01 : 00	02 : 00	03 : 00	04 : 00	05 : 00	06 : 00	07 : 00	08 : 00
Red colour																								
Yellow colour																								
White colour																								
Blue colour																								

3. The tanks with the following capacities are used to store 1000 *l* of water required for 4 houses for daily usage.

(i) Find separately the number of times that the owners should fill the tanks every day to fulfill the daily requirement of water.

1000 *l* tank ..... number of times

500 *l* tank ..... number of times

250 *l* tank ..... number of times

125 *l* tank ..... number of times

(ii) Each house uses an electric motor to fill water to the tank from the well. Therefore which tank of the above will be more suitable and profitable to be bought for the use at home. Give reasons for your answer.

4. Find all the factors of the following numbers.

(i) 9 → .....

(ii) 21 → .....

(iii) 45 → .....

(iv) 83 → .....

Multiples

Activity 4

Nimali's birthday is on 4th January. Nimali likes to save money and she uses the saved money to help poor people. This time she received two tills as presents for her birthday. She thought of saving money this time in a different way and this is the way she saved money in the two tills.

Nimali

She started to put Rs.2/= into the pink colour till and Rs.5/= into blue colour till every day. Thus, the amount left in the till was noted in a book at the end of the day.

According to the two tills prepared and the note she made, answer the following questions related to the amount collected in a week.

(i) Write down the way the collection is noted in the pink till, at the end of each day.

.....

(ii) Write down the way the collection is noted in the blue till, at the end of each day.

.....

(iii) Following is the way that Nimali has noted in the book. Study the note and complete until the 10th day.

.....

Pink colour till		
Amount	No.of day	Savings in the till
2	1	2 × 1 = 2
2	2	2 × 2 = 4
2	3	2 × 3 = 6

Blue colour till		
Amount	No.of day	Savings in the till
5	1	5 × 1 = 5
5	2	5 × 2 = 10
5	3	5 × 3 = 15

(i) If she continues to save money like this, at the end of 20th day,

(a) how much money will be left in the pink colour till? .....

(b) how much money will be left in the blue colour till? .....

(ii) How many days will it take to save Rs.100/= in the blue colour till? .....

(iii) How many days will it take to save Rs.100/= in the pink colour till?

.....

The multiples of a number can be obtained by multiplying a number by any number.

5 X 12 = 60. That is

- 60 is obtained by multiplying 5 by 12. Hence 60 is a multiple of 5.
- 60 is obtained by multiplying 12 by 5. Hence 60 is a multiple of 12.
- 60 is a multiple of 5 as well as 12.
- Also, 60 is divisible by 5 as well as by 12 without a remainder.

That is, a multiple of a number is divisible by that number without a remainder.

What I learnt

1. (i) Write five multiples of 3.

(ii) What is the largest multiple of 3 less than 100?

(iii) Is 80, a multiple of 3 or not? Give reasons for your answer.

(iv) Write down all multiple pairs that form 48.

2. The following is a list of school equipment provided by a social service organization to be distributed among 25 school children displaced due to flood.

375 exercise books **50 colour boxes** **100 pencils**

150 pens **25 boxes of instruments**

(i) If the principal asked you to distribute the instruments equally among 25 children, explain how you would plan to distribute those.

(ii) Write separately the number of equipment from each type received by a child.

(iii) Consider the above answer and write 5 multiples of 25.

3. Observe the following multiplication table.

x	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

According to the above table,

(i) Write the multiples of 2 from 1 hp to 100.

(ii) Write the multiples of 3 from 1 hp to 100.

(iii) Write the multiples of 4 from 1 hp to 100.

(iv) Write down the numbers that are multiples of both 2 and 3.

(v) Multiples of which number are the multiples of both 2 and 3?

(vi) Write down the numbers that are multiples of both 2 and 4.

(vii) Multiples of which number are the multiples of both 2 and 4?

(viii) Write down the numbers which are multiples of all 2, 3 and 4 according to (iv) and (vi) .

(ix) Multiples of which number are the multiples of all 2, 3 and 4?

4. A grade 6 student designed a series of bulbs using 4 colours of LED bulbs for a decoration. The bulbs of each colour in the string are arranged to glow according to a specific time pattern as shown below.

Red	(R)	- 2 times per second
Blue	(B)	- 3 times per second
Yellow	(Y)	- 4 times per second
Green	(G)	- 6 times per second

The rough arrangement of the pattern of the bulbs to be adjusted in the circuit is given below. The start of lighting red and blue bulbs are marked to make it easy for you to understand.

Colour	Seconds														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
R		R													
B			B												
Y															
G															

(i) Complete the table according to the lighting pattern of the bulbs.

(ii) Multiple of which number is the pattern of the lighting of the red bulbs? Write that pattern.

(iii) Multiple of which number is the pattern of the lighting of the blue bulbs? Write that pattern.

(iv) Multiple of which number is the pattern of the lighting of the yellow bulbs? Write that pattern.

(v) Multiple of which number is the pattern of the lighting of the green bulbs? Write that pattern.

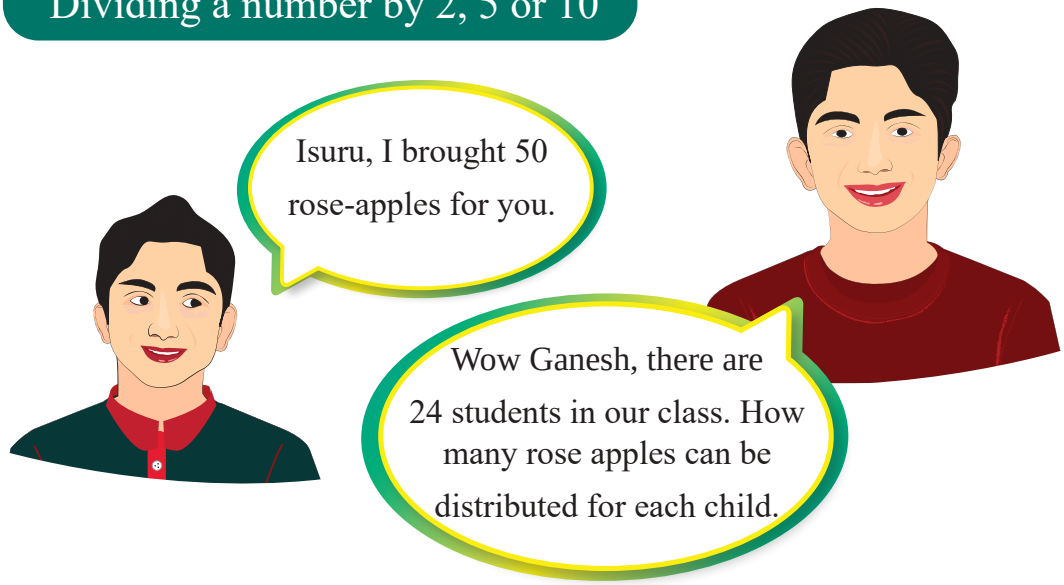
(vi) If the bulbs are lit in the above pattern from the time of power supply, in which second do all 4 bulbs light hp at the same time?

For further study watch the video related to the lesson through this QR code

Sinhala Medium | Tamil Medium

Divisibility

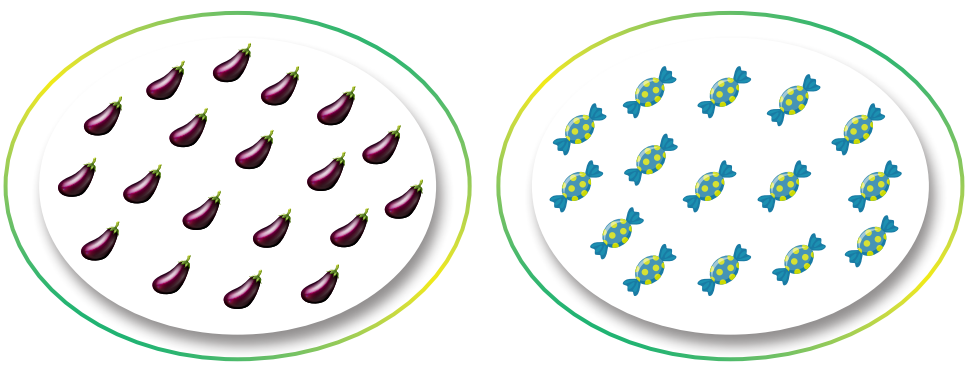
Dividing a number by 2, 5 or 10

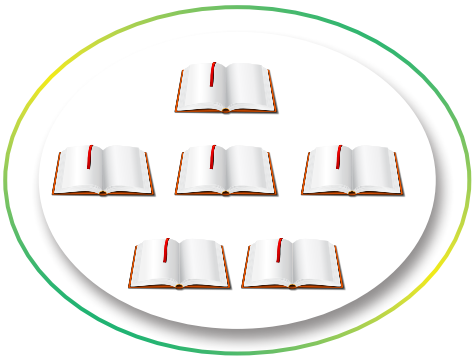
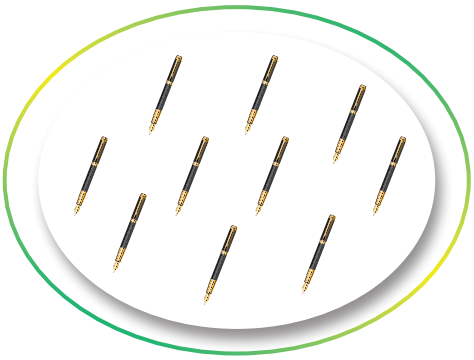
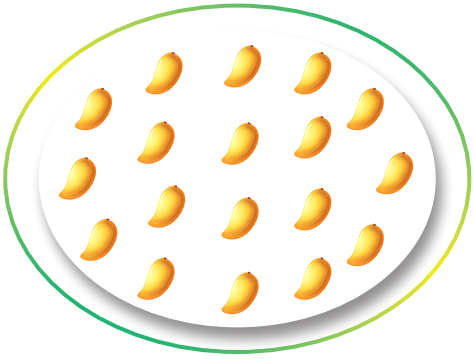


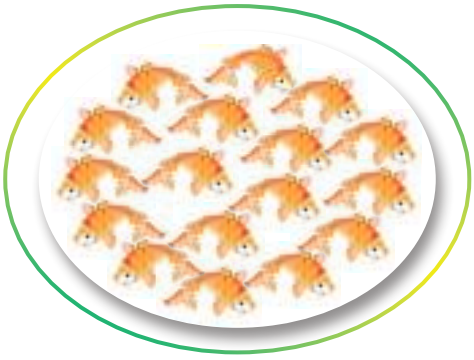
We experience such situations in our home, class or elsewhere. We need to know quickly whether a number can be divided by another number. By studying this section, you will be able to fulfill that need easily.

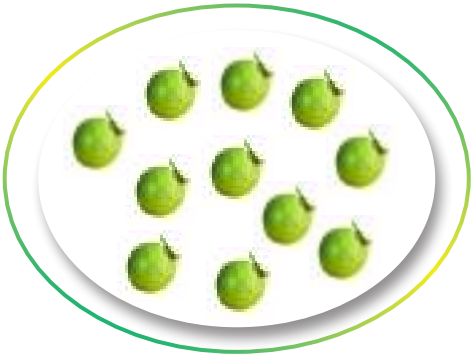
Activity 5

Separate the following materials into groups of two.





Fill the following table according to the quantities of material given above.

Material	Number	Divisible by 2 without a remainder	Digit in the one's place

- What are the last digits in the ones place of the numbers divisible by 2?

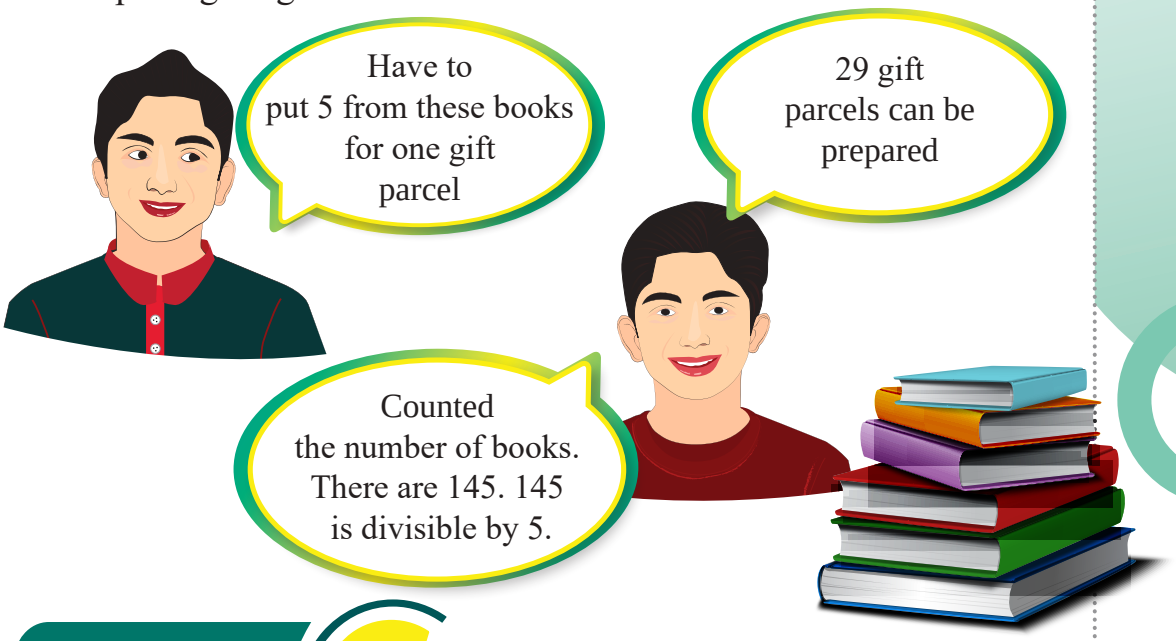
  .....

- What are the last digits of the numbers that are not divisible by 2?

  .....

Accordingly, the digits in the ones place of numbers which are divisible by 2 are .....

Ganesh and Isuru are included in the team of preparing the gift parcels for the prize giving of the school.



Activity 6

Complete the following table by dividing the following numbers by 5.

Number	Is it divisible by 5?	Digit at the ones place
20		
35		
85		
90		
42		
54		
87		

What are the digits at ones place of the numbers which are divisible by 5? .....

What are the digits at ones place of the numbers that are not divisible by 5? .....

Accordingly, the ones place digits of the numbers divisible by 5 are .....

Activity 7

Write down all the multiples of 10 using the multiplication table of 10 × 10.

.....

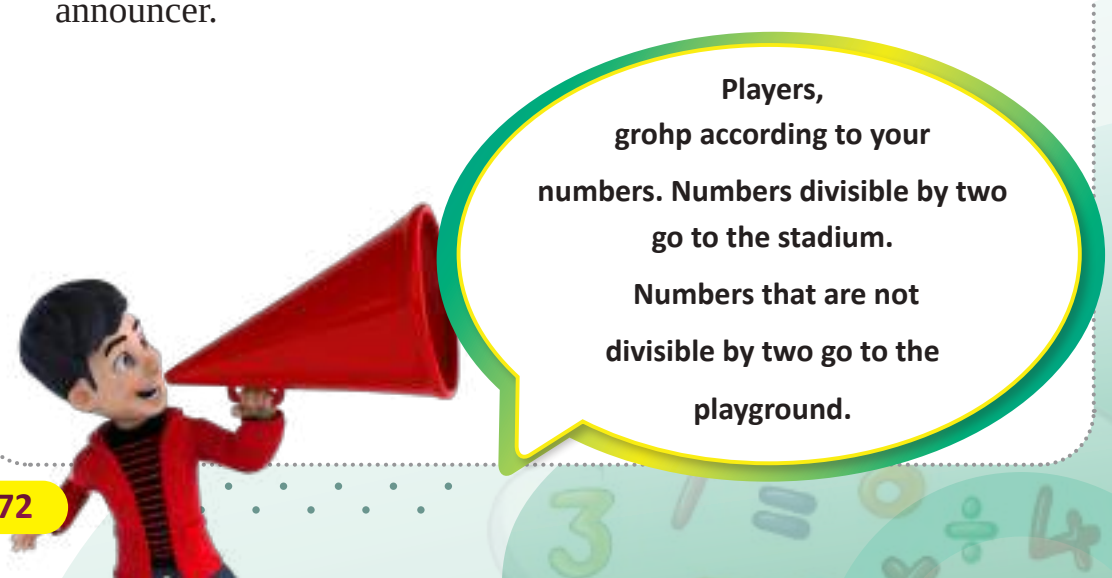
What is the digit at ones place of all those numbers?

.....

Accordingly, the digit at ones place of the numbers divisible by 10 is .....

What I learnt

1. Observe the numbers given to the players participated in a sports event. Help them to position according to the announcement of the announcer.



1253 1000 1179 7514 125

348 912 777 1176

Numbers of the players moving towards the stadium	Numbers of the players moving towards the playground

2. Membership numbers for girls and boys in a student society are given as numbers divisible by 2 for girls and numbers which are not divisible by 2 for boys. Accordingly, divide the following membership numbers into two groups as girls and boys.

25248 32585 12973 14951 72506 32624

10272 12926 30500 17163 20007 13254

Girls group	Boys group

3. Namal is a father of two. One day he won the first prize of a lottery. It was decided to set aside Rs.8 900 000 from that amount and distribute the remaining amount equally to the accounts of the two children. Can the remaining amount be shared equally between the two children? Give reasons.

4. Check whether the following numbers are divisible by 5 and write.

(i) 95 (ii) 107 (iii) 540 (iv) 1 224 (v) 3 030

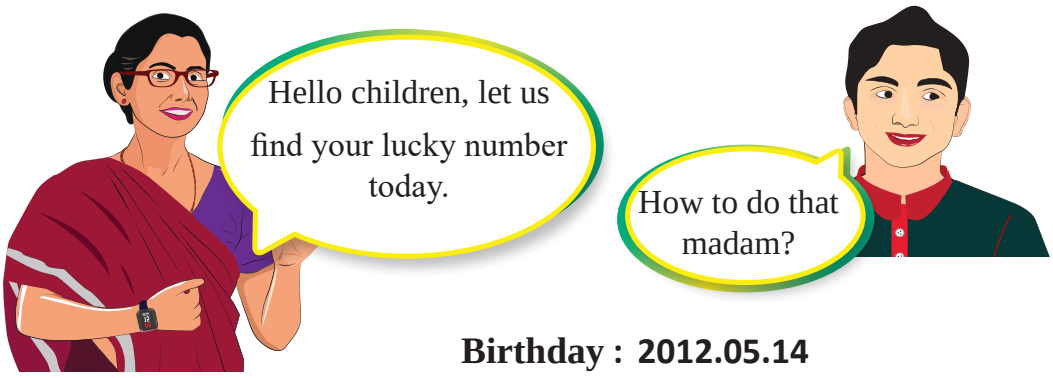
5. A grade 6 student, Gayan's till was full. Gayan who got ready to deposit this money in the bank account, checked the till and it was found that Rs.525 had been collected. If the same type of coins were collected in the till, what could be that coin type? How many such coins were there?

6. Check the ones place digit and fill the following table by identifying whether the number is divisible by 2, 5, and 10.

The Number	Digit at the one's place	Number		
		divisible by 2	divisible by 5	divisible by 10
425				
3 010				
15 267				
28 244				
2 343 123				

7. The numbers divisible by 10 are also divisible by ..... and .....

Divisibility of a number by 3 or 9



Birthday : 2012.05.14

When all the digits on your birthday are added hpto a single digit, you get the lucky number.

- Add all the digits.

  2 + 0 + 1 + 2 + 0 + 5 + 1 + 4 = 15

- If the number obtained is greater than ten, repeat until one digit is obtained.

  1 + 5 = 6

The digits obtained by adding the digits of a given number until a single digit is obtained is called the digital index of that number.

Activity 8

Fill the following table to identify whether a number is divisible by 3.

Number	Divisibility of 3 (✓)	The digital index
21		
25		
132		
753		
2033		

What is the digital index of the numbers that are divisible by 3? .....

Fill the following table to identify whether a number is divisible by 9.

Number	Divisibility of 9 (✓)	The digital index
27		
34		
149		
243		
7218		

What is the digital index of the numbers that are divisible by 9? .....

Accordingly,

- The digital index of the numbers that are divisible by 3 are, ……., ……. or ……..
- The digital index of the numbers that are divisible by 9 is,.....

What I learnt

1. Nipun has 156 rambutans. Can this amount be divided equally among 3 people?
2. A donation of Rs. 752 400 is received for 9 primary schools in the Ambakolawewa educational zone. Can this amount be equally divided among 9 schools?
3. Complete the following table by marking √ in the corresponding column if the number is divisible by 3 or 9.

Number	The digital index	Divisible by 3	Divisible by 9
2 526			
17 500			
19 188			
72 242			
151 608			

5. Separate the multiples of 3 and multiples of 9 out of the following numbers.

256 **132** **4 805** **1 916** **25 245**
1 260 **2 034**

Multiples of 3 .....

Multiples of 9 .....

5. Put "✓" or "✗" in front of the following sentences.

(i) Any number with 3, 6, or 9 in the one's place is divisible by 3. (.....)

(ii) A number with the digital root 9 is a multiple of 9. (.....)

(iii) All the numbers that are divisible by 9 are divisible by 3. (.....)

(iv) All the numbers that are divisible by 3 are divisible by 9 (.....)

(v) If the one's place digit of a number is 9, then that number is divisible by 9. (.....)

Divisibility of a number by 4

Activity 9

Complete the following table by marking ✓ if each number is divisible by 4 and ✗ if it is not. Also, mark ✓if the last two digits of the number are divisible by 4 and if it is not.

The number	Divisibility of 4	The pair of last two digits	The last two digits are divisible/not divisible by 4
204			
2 312			
39 201			
24 100			
18 900			
432 109			
1 309 418			

According to the above table,

1. what are the numbers you got for the last two digits of the numbers that are divisible by 4?

   .....

2. are the numbers with the above mentioned two digits divisible by 4?

   .....

Accordingly, in the numbers which are divisible by 4,

- the numbers formed by the last two digits are divisible by.....
- the numbers with 00 as last two digits are also divisible by.....

Divisibility of a number by 6

Activity 10

Complete the following table and answer the questions.

- Divide each number in the table by 6. If it is divisible by 6 without a remainder put ✓ mark and if it is not divisible by 6 without a remainder put ✗ mark.
- If it is divisible by 2 and 3 without a remainder put ✓ mark and if it is divisible by 2 and 3 without a remainder put ✗ mark.

The number	Divisible / Not divisible by 6	Digit at the ones place	The number is divisible / not divisible by 2	Digital index of the number	The number is divisible / not divisible by 3
154					
263					
201					
1 032					
351					

The number	Divisible / Not divisible by 6	Digit at the ones place	The number is divisible / not divisible by 2	Digital index of the number	The number is divisible / not divisible by 3
2 502					
14 202					
3 120					
720					
4 246					

1. What are the digits at the ones place of the numbers that are divisible by 6? .....

2. What is the digital index of the numbers that are divisible by 6?

   .....

3. Are the numbers that are divisible by 6 also divisible by 2 and 3?

   .....

Accordingly,

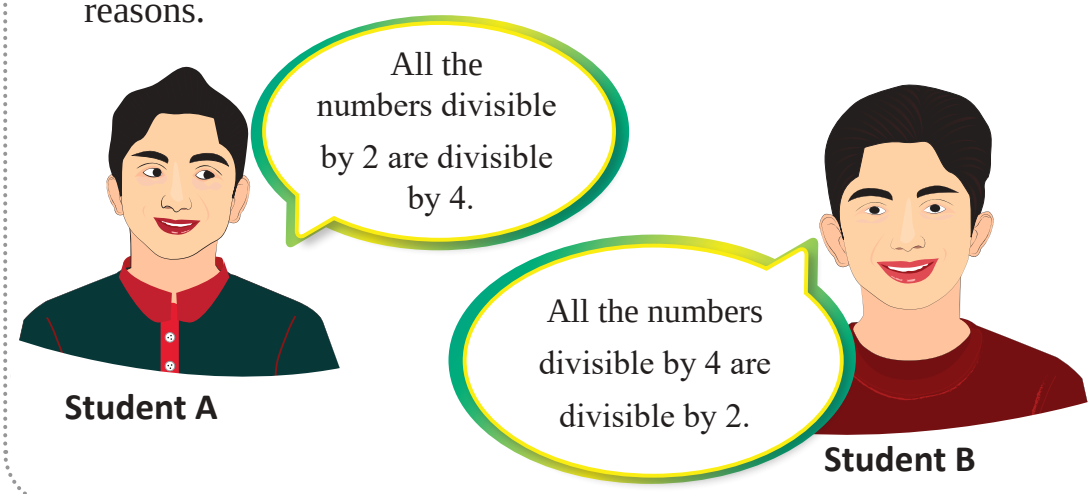
- The digital index of the numbers that are divisible by 6 is …, … or ….and the last digit is …….or ……or ….. or……or ….
- The numbers that are divisible by 2 and 3 are also divisible by ……..

What I learnt

1. Check the last two digits of the following numbers and put ✓ if it is divisible by 4 and put ✗ if it is not divisible by 4.

Number	Divisible or not divisible by 4?
132	
450	
200	
383	
1 524	
3 444	
9 996	
71 032	
150 002	

2. Which of the two students below makes the correct statement? Give reasons.



3. 2 46 __ This number is divisible by 4. Write all the suitable digits that can be filled in the blank.

4. Use the numbers 3, 4, 5, 6 once and write a 4 - digit number that is divisible by 6.

5. Write 5 numbers that are divisible by 4 and 5 both. Write a special characteristic in these numbers.

6. The following is a circuit system with bulbs.

⊗	⊗	⊗	⊗	⊗	⊗
45	**310**	**222**	**42**	**131**	**47**
⊗	⊗	⊗	⊗	⊗	⊗
83	**525**	**215**	**603**	**918**	**125**
⊗	⊗	⊗	⊗	⊗	⊗
410	**612**	**75**	**980**	**444**	**710**
⊗	⊗	⊗	⊗	⊗	⊗
44	**555**	**36**	**108**	**663**	**200**

(i) At one point, the bulbs of the numbers divisible by 6 are lit in this circuit. Select the bulbs according to the numbers on those bulbs.

(ii) Form a plane figure according to the lighting pattern.

For further study watch the video related to the lesson through this QR code

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What I learnt

1. Circle the numbers that are multiples of 20 from the following numbers.

   100 5 20 150 160 10 70 80

2. Circle the numbers that are multiples of 32 from the following numbers.

   1 12 8 2 96 16 64 32

3. Write all the factors of 32.

4. I am a multiple of 3. Also, I am a factor of 60 and an odd number. Who am I?

5. Students in a class were divided into groups of three for an environmental activity. On the same day the class was divided into groups of seven for a game related to mathematics. In each case, none of the students were left out when groping the class. If the total number of students in the class is less than 40, what is the total number of students in the class?

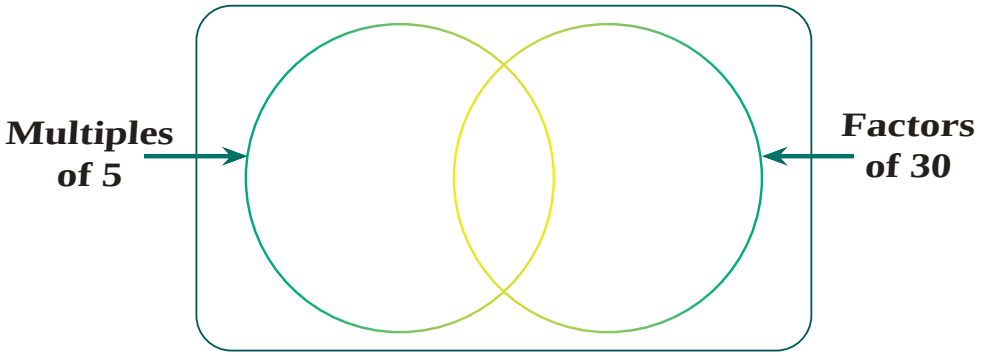
6. 91 guests attended a wedding. They were seated as the same number of guests were seated at each table. If there are more than eight tables, how many people are seated in one table? How many tables were there?

7. Our father bought a bag of 105 milk toffees. He shared it equally among me and my brothers and each received between 20 and 30 pieces of milk toffees. How many children are there in our family including me?

8. Nishan tried to share a basket of 100 mangoes among friends. After everyone received equal number of mangoes, she discovered that there were only two mangoes left. If the number of friends in the group is less than 12, how many friends are there in the group?

9. Mark the following numbers in the correct place of the diagram.

1	10	30	35	12	2	15	3	60	5	6



According to the diagram you completed above, write a number that is a multiple of 5 as well as a factor of 30.

Chapter

3

Types of Numbers and Number Patterns

By studying this lesson, you will be able to,

- represent odd and even numbers using objects.
- categorize whole numbers as odd and even numbers.
- present the instances in which odd and even numbers are used practically.
- identify the prime and composite numbers logically.
- describe the instances where composite numbers are used practically.
- categorize the prime numbers and the composite numbers from a set of numbers.
- identify the square and triangular numbers logically.
- represent the square numbers and the triangular numbers using the objects.

- present the instances in which the square numbers and the triangular numbers are used practically.
- group the square numbers and the triangular numbers from a given set of whole numbers.
- identify the number patterns that include odd and even numbers.
- identify the number patterns that include square numbers and triangular numbers.
- do creative designs using odd, even, triangular and square numbers.
- know that there are economic benefits by making decorative designs using the number patterns.

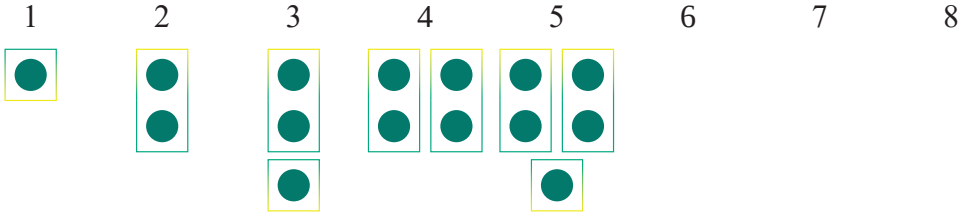
Types of Numbers

Odd Numbers and Even Numbers

Activity 1

Sachith is a grade 6 student. He is curious to find about number patterns. Following is a pattern he made using the dots.

Complete his pattern for instances 6, 7, and 8.



According to the above pattern, fill in the following blanks by considering the numbers from 1 to 8.

- Write down the numbers that can be represented as a pair.
- Are those numbers divisible by 2? .....
- What are the numbers that left one when representing as a pair?

  .....
- What is the remainder when those numbers are divided by 2?

  .....

If a whole number is divisible by 2, then that whole number is called an even number.

2, 4, 6, 8 are some examples for even numbers.

When a whole number is divided by 2 and if the remainder is one, that whole number is called an odd number.

1, 3, 5, 7 are some examples for odd numbers.

Challenge

Is "0" an even number? Present your logic.

When Sachith was on his way to Colombo with his father one day, he saw two road signs on several roads. He asked about this from his father. He explained Sachith, the meaning of the road signs.

Parking on odd days prohibited

Parking on even days prohibited

Activity 2

If Sachith is going back to Colombo in March this year, write down the dates on which their vehicle cannot be parked in front of the above boards.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

Complete the blanks using the above note.

- What are the digits of ones place of odd numbers?

.....

- What are the digits of ones place of even numbers?

.....

If the ones place digit is 1, 3, 5, 7, 9, of a number; then that number is an ……number

If the ones place digit is 0, 2, 4, 6, 8 of a number; then that number is an ……number.

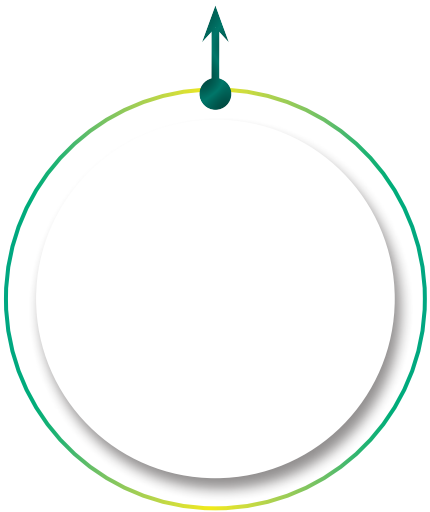
What I learnt

1. write the following numbers in the suitable circle.

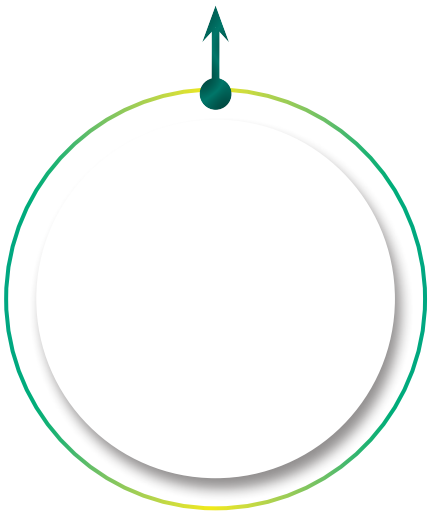
64 1 100 27 332

99 448 56 7035

Odd numbers



Even numbers



2. Fill in the blanks.

5	+	3	=	
23	+	7	=	
1	+	67	=	

When two odd numbers are added a ..... number is obtained.

3. Madhuri says that when subtracting an odd number by another odd number, the relationship obtained in 2 above is also obtained. Explain with examples whether her statement is true or false.

4. Get the answers for the following relationships as in 2 above.

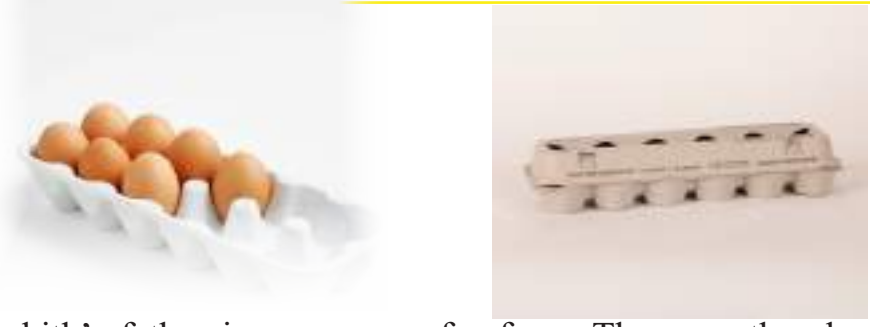
Even number	+	Even number	→	
Even number	-	Even number	→	
Even number	+	Odd number	→	
Even number	-	Odd number	→	
Odd number	+	Even number	→	
Odd number	-	Even number	→	

5. 35 ☐ 7

The number in the box above is deleted. Find that number using the following hints.

- It is between 3530 and 3570.
- The deleted digit is an even number.
- It is a multiple of two but not a multiple of 3.

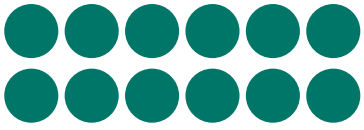
Prime Numbers and Composite Numbers



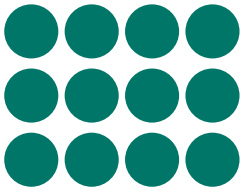
Sachith's father is an owner of a farm. They use the above type of packagings to transport their eggs. Sachith explored the ways of creating a package to pack 12 eggs.

These are the solutions he got.

$1 \times 12 = 12$



$2 \times 6 = 12$



$3 \times 4 = 12$

Accordingly, he understood that the rows and columns are the factors of those numbers. He observed that there are many ways of expressing a number as a product of two factors.

He prepared the table showing activity 3 accordingly.

Activity 3

Number	As a product of two factors	Factors	Number of factors
1	1×1	1	1
2	1×2	1, 2	2
3	1×3	1, 3	2
4	1×4 2×2	1, 2, 4	3
5			
6			
7			
8			
9			
10			
11			
12	1×12 2×6 3×4	1, 2, 3, 4, 6, 12	6

Answer using the above table.

(i) Write down the numbers that have two distinct factors only.

.....

(ii) Write down the numbers that have more than two distinct factors.

.....

The numbers with exactly two distinct factors are called prime numbers. 2, 3, 5, 7, 11, ...

The numbers 1 with more than two distinct factors are called composite numbers. 4, 6, 8, 9, 10, ...

What I learnt

1. Put (✓) if the following statements are correct and put (✗) if the following statements are incorrect.

   - 1 is a prime number. ( )
   - A prime number has only two distinct factors ( )
   - The only even prime number is 2. ( )
   - The smallest prime number is 2. ( )

- "2" is the smallest prime number ( )
- Prime numbers are only odd numbers. ( )
- 9 is a prime number. ( )
- 1 has only one factor. ( )
- 1 is neither a prime number nor a composite number. ( )

2. (i) Write down all the prime numbers smaller than 20.

   (ii) How many composite numbers are there between 20 and 30?

   (iii) What is the largest prime number less than 100?

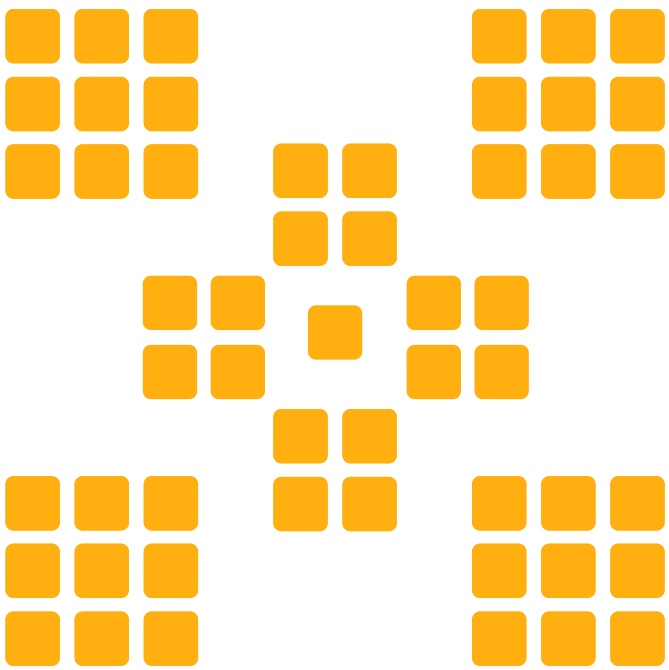
3. Circle the prime numbers shown in the table and draw a triangle around composite numbers.

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

The above are some garden decorations made using the paving blocks.

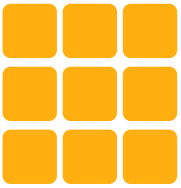
Activity 4

Sachith plans to lay the paving blocks in his garden as follows.



set hp  → 1 × 1 = 1

set hp  → 2 × 2 = 4

set hp  → 3 × 3 = 9

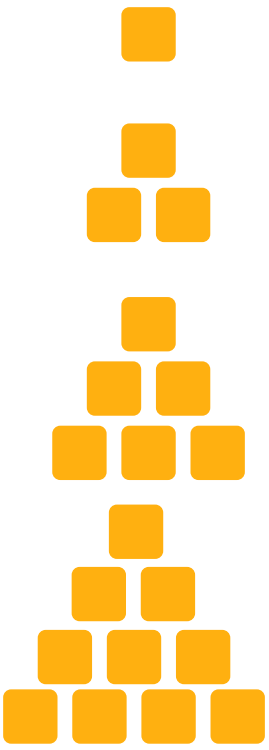
Extend this pattern for two more instances.

set hp → ____

set hp → ____

Numbers that can be represented as square shapes are called square numbers.
1, 4, 9, 16, ... are examples for square numbers.

Below is how Sachith planned to decorate the alley of his house with paving blocks. Four instances are given below.



1st set hp → 1

2nd set hp → 3 =1 + 2

3rd set hp → 6 =1 + 2 + 3

4th set hp → 10 =1 + 2 + 3 + 4

Sachith thinks to present two more instances. Check if you can draw that. Find separately the number of paving blocks he needs for that.

5th set hp → 1 + 2 + ... + ... + ... = ...

6th set hp → 1 + 2 + ... + ... + ... + ... = ...

Numbers that can be represented as triangular shapes are called triangular numbers.

1, 3, 6, 10, 15, 21, ... are examples for triangular numbers.

For further study watch the video related to the lesson through this QR code

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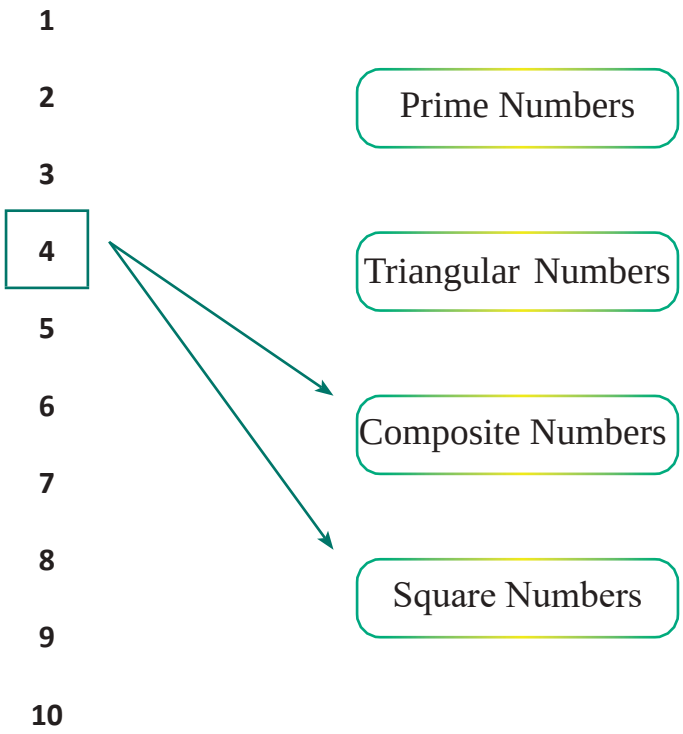
What I learnt

1. Match the following numbers given in the column with suitable boxes.



2. (i) Write the square numbers from 1 to 100.

   (ii) Write the value of the third and fourth square numbers. Obtain the sum of those.

   (iii) What type of numbers does that belong to?

Number Patterns

The numbers we use in mathematics create beautiful patterns. Those patterns are related to our daily activities. This will give you the ability of enjoying these types of numbers and their related patterns. Also you will be able to make various creations based on it.

Below are some number patterns.

1, 2, 3, 4, 5, ...

3, 5, 7, ...

10, 20, 30, 40, ...

10, 20, 30, 40, 50 are the terms of the number pattern 10, 20, 30, 40, 50.... 10 is the first term, 20 is the second term and 30 is the third term.

Thus, by writing the numbers in a certain order, a number pattern is obtained.

The even numbers, odd numbers, square numbers and triangular number that you learn above can be expressed as number patterns in the following way,

Even number pattern 2, 4, 6, 8, ...

Odd number pattern 1, 3, 5, 7, ...

Square number pattern 1, 4, 9, 16, ...

Triangular number pattern 1, 3, 6, 10, ...

Activity 5

Salitha collected the coins she received to the till as follows.

On the first day Rs. 2, on the second day it was Rs. 4 and on the third day it was Rs. 6.

1. Write down the pattern showing the value of the coins Salitha collected to the till each day. What is that number pattern?

2. Write the amount of money collected by Salitha to the till on fourth and fifth day respectively.

3. On which day did Salitha put Rs.14 to the till?

4. What is the total amount collected in the till at the end of the first week?

5. Salitha expect to collect Rs. 110 to buy a hair pin. For that how many days she should collect money to the till?

   Salitha's friend collected money to the till she received in such a way that , on the first day it was Rs. 1, on the second day Rs. 3 and on the third day Rs.5.

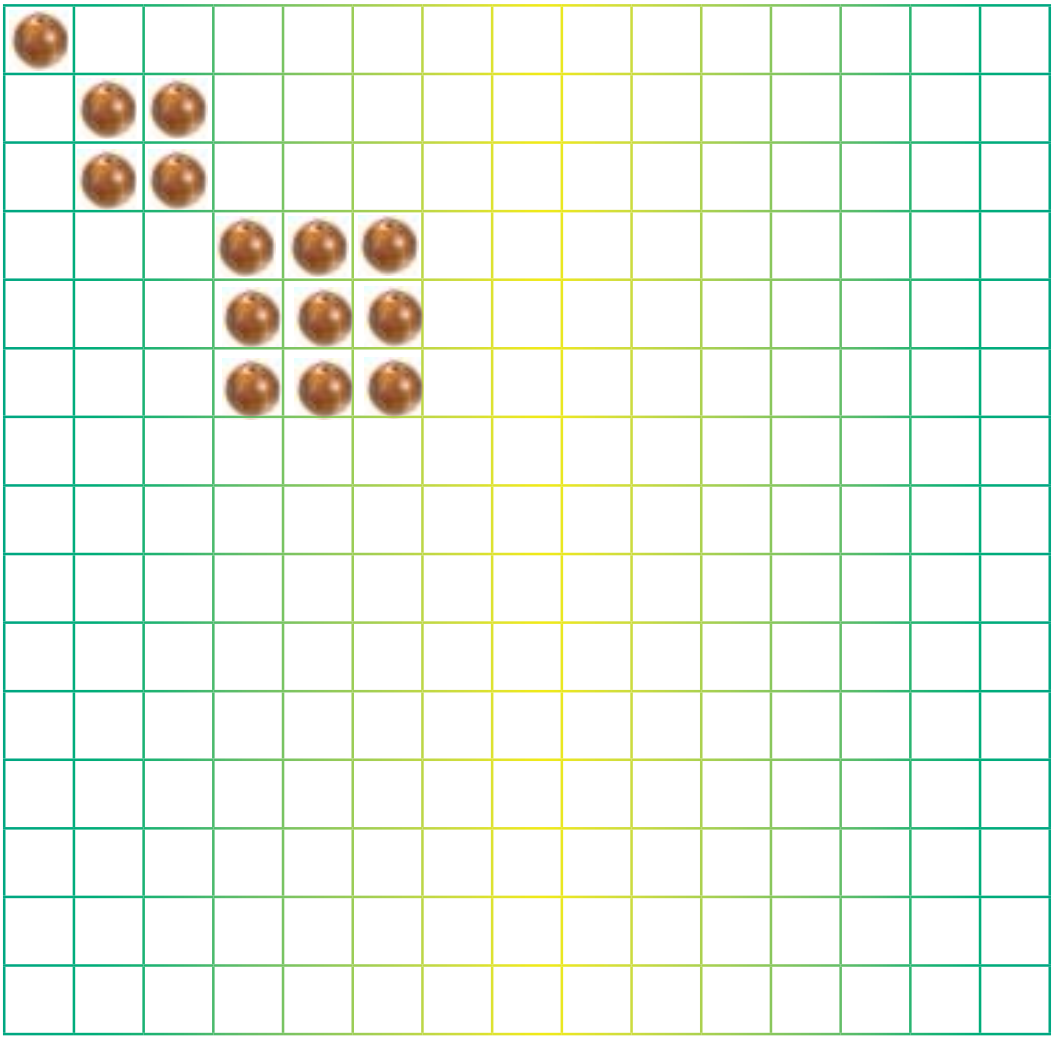
6. In the number of days Salitha spent to collect Rs 110 to buy the hair pin, how much money was her friend able to collect?

Activity 6

This is a part of a saree. The design of that is created according to a triangular number pattern.

1. Write the first three terms of that pattern .....
   .....
2. What is the value of the 6th term of the above triangular number pattern .....
3. If there were 12 beads in the last row of a term in that pattern,
   (i) which triangular number is represented by that? .....
   (ii) what is the value of that triangular number? .....

A cushion cover is designed with beads using the square number pattern.



1. Represent the next two square numbers as above in the above grid.
2. It was observed that the number of beads related to the arrangements of two consecutive triangular numbers are enough to represent the fifth triangular number (last pattern). Write those two triangular numbers.
3. Find the number of beads needed for one piece of cover above.

Activity 7

Let us create a wall decoration

What you need

- A4 sheet (any colour)
- Suitable materials for the decoration such as sequins/decorative stones/ beads/ decorative seeds/ buttons
- Glue
- Binding tape
- A thick board that is a bit larger than an A4 paper such as a hard board/chip board

Make a creative well finished wall decoration using the triangular and square number patterns with the use of above materials and display it to the class.

- Find the market opportunities for other creations that can be made using the triangular and square number patterns.
- Present to the class the way that the number patterns can be used as an entrepreneur.

What I learnt

1. 2, 4, 6, 8, 10, ... In this pattern starting with two,

   (i) write the next two terms.

   (ii) what is the name of this pattern?

   (iii) find the value of the 9th term of this pattern.

   (iv) which term is 26?

2. 1, 3, 5, 7, ... In this pattern starting with one,

   (i) write the next two terms.

   (ii) what is the name of this pattern?

   (iii) find the value of the 12th term of this pattern.

   (iv) which term is 31?

3. 

   1st set hp 2nd set hp 3rd set hp

   (i) Write the number of triangles in the above pattern in order.

   (ii) Suggest a suitable name for that pattern.

   (iii) Find the fourth and fifth terms of the pattern. Find the sum of those two values.

   (iv) Sarathi says that the sum of any two consecutive terms of this pattern is a square number. Do you agree with her? Give reasons for your answer.

4. In a shop, the PVC pipes are packed from bottom to top in such a way that one pipe is less than the number of pipes in the bottom row. There were 11 pipes in the bottom row and one pipe on the top.

   (i) What is the total number of pipes packed?

   (ii) Which triangular number is represented by that?

5. Select the letters that correspond to the number given to you according to the tips given under i, ii and iii, in the help table and write them in order on the dotted line. Then read the English word formed at the end.

i. ▶ 7^{th} even number from 1 in order

   ▶ 6^{th} triangular number

   ▶ The nearest prime number to 14

   ▶ The smallest prime number

   ▶ Obtained when 2 is added to the second triangular number

   ▶ Obtained when 2 is added to the fourth square number

   ....

ii. ▶ The prime number greater than and nearest to 18

   ▶ The second triangular number

   ▶ The number one less than the third square number

   ▶ Fifth triangular number

   ▶ 8^{th} odd number from 1 in order

   ▶ Obtained by adding 2 to the fourth triangular number

   ....

iii. ▶ The fifth square number

▶ The sum of first two prime numbers

▶ This number is neither a prime number nor a composite number.

▶ Obtained by multiplying the third square number by 2.

....

Help Table

A	B	C	D	E	F	G	H	I
1	2	3	4	5	6	7	8	9

J	K	L	M	N	O	P	Q	R
10	11	12	13	14	15	16	17	18

S	T	U	V	W	X	Y	Z
19	20	21	22	23	24	25	26