



MATHEMATICS

First term - Further Learning Module

Let us play with numbers

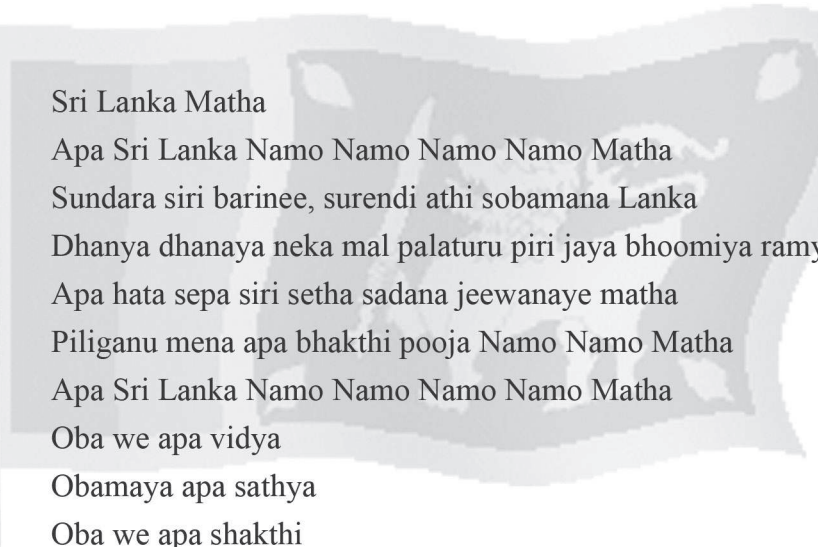


Grade
6

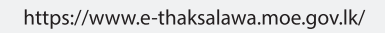
Department of Mathematics
Faculty of Science and Technology
National Institute of Education
Sri Lanka
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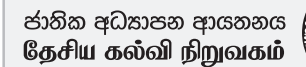
The National Anthem of Sri Lanka



Sri Lanka Matha
Apa Sri Lanka Namō Namō Namō Namō Matha
Sundara siri barinee, surendi athi sobamana Lanka
Dhanya dhanaya neka mal palaturu piri jaya bhoomiya ramya
Apa hata sepa siri setha sadana jeewanaye matha
Piliganu mena apa bhakthi pooja Namō Namō Matha
Apa Sri Lanka Namō Namō Namō Namō Matha
Oba we apa vidya
Obamaya apa sathya
Oba we apa shakthi
Apa hada thula bhakthi
Oba apa aloke
Apage anuprane
Oba apa jeevana we
Apa mukthiya oba we
Nava jeevana demine, nithina apa pubudukaran matha
Gnana veerya vadawamina regena yanu mana jaya bhoomi kara
Eka mavakage daru kela bevina
Yamu yamu vee nopama
Prema vada sema bheda durerada
Namō, Namō Matha
Apa Sri Lanka Namō Namō Namō Namō Matha



National Institute of Education
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School:.....

	Name of the Student	Grade	Class Teacher's Signature
2026			
2027			
2028			
2029			

MATHEMATICS

Grade 6

First Term - Further Learning Module

Let us play with numbers



Department of Mathematics
Faculty of Science and Technology
National Institute of Education
Sri Lanka
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Mathematics – Grade 6

First Term – Further Learning Module

Magic squares, Palindromic numbers, Let us practice subtracting numbers, Different methods of multiplying numbers, Divisibility

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Message from the Director General

The General Education Transformative Reform Effort in Sri Lanka aims to create a decisive pathway to meet the needs of every learner. The foundation of this reform lies in the modernization of curricula, teaching–learning methodologies, and assessment systems, with a strong emphasis on competency-based learning, critical thinking, creativity, 21st-century skills, technological orientation, and ethical citizenship.

The contribution of the Hon. Prime Minister; the Secretary to the Ministry of Education; Additional Secretaries; Subject Directors; the Commissioner General of Examinations and the staff; and the Commissioner General of the Educational Publications Department and the staff, who worked with exceptional dedication, has been immense in ensuring the quality of the curricula and related learning materials proposed for implementation from the year 2026 for Grades 1 and 6. These materials have been developed by the National Institute of Education through a collaborative dialogue with educationists, interdisciplinary experts, teachers, and various stakeholders.

I also gratefully acknowledge the exceptional commitment of the Council and the Academic Affairs Board of the National Institute of Education during this initiative. The entire staff of the National Institute of Education, who have contributed immensely in accomplishing this task, deserve the respect of the nation.

Prof. Manjula Vithanapathirana

Director General

National Institute of Education

11.08.2025

Message from the Commissioner General of Educational Publications

The world today is progressing at an exceptional pace, driven by innovation and transformation. In parallel, it is the paramount responsibility of everyone involved in the field of education to equip schoolchildren with the skills necessary to face the challenges of the modern world. Accordingly, it must be noted with pride that the opportunity to introduce the module-based learning approach aligned with the new curriculum to be implemented from the year 2026 is a significant achievement.

These specially designed learning aids for each subject aim to strengthen essential skills such as critical thinking, creative problem-solving for complex issues, analyzing information from multiple perspectives, and making logical decisions. I believe these resources will serve as a strong foundation for each subject.

I kindly request all of you to use these learning aids as a guiding light to help realize the noble dreams of a generation of students enriched with wisdom and virtue. I also extend my heartfelt gratitude to everyone who contributed immensely to the excellent task of compiling the modules and activity books.

D. A. Subhashini Dematagoda

Commissioner General of Educational Publications

Educational Publications Department

11.08.2025

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 2026, grades 2 and 7 in 2027, grades 3 and 8 in 2028, 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 learner. 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 also wish to remind that the service rendered 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.

K. Ranjith Pathmasiri

Deputy Director General

Faculty of Science and Technology

National Institute of Education

08.08.2025

- Consultancy** : Prof. Manjula Vithanapathirana (PhD)
Director General
National Institute of Education
Ranjith Pathmasiri
Deputy Director General, Faculty of Science and Technology
- Supervision** : G. P. H. Jagath Kumara
Director, Department of Mathematics
- Coordination** : K.K. Vajeema S. Kankanamge
Lecturer, Department of Mathematics
C. Sutheson
Lecturer, Department of Mathematics
- Panel of writers** : T. D. Mahesh Dhanushka Nandhasiri
Teacher Service, Wp/ Ma/ Anandha Shasthralaya
National School, Mathugama.

Panel of writers :

- | | |
|-------------------------------------|---|
| G. P. H. Jagath Kumara | Director, Department of Mathematics |
| Nilmini P. Peiris | Senior Lecturer, Department of Mathematics |
| M. Rajendram | Senior Lecturer, Department of Mathematics |
| C. Sutheson | Lecturer, Department of Mathematics |
| K. K. Vajeema S. Kankanamge | Lecturer, Department of Mathematics |
| Dr. Nalin Ganegoda | Senior Lecturer, University of Sri Jayawardenepura |
| P. P. Niroshi | Deputy Director of Education, Ministry of Education |
| Shrima Dasanayaka | Deputy Director of Education, Ministry of Education |
| H. Chandima K. De Zoysa | Assistant Commissioner of Education Publications |
| Educational Publications Department | |
| Thanuja Maithree Witharana | Deputy Director of Education, Ministry of Education |
| D.H. Weerakoon | Lecturer, Pasdunrata National College of Education |

- Language Editing** : G. Y. A. Neranja K. Jayananda
Assistant Principal, President's College, Maharagama.
M. M. B. Dabarera
Teacher, WP/Neg/ Katana Vidiyaloka M.V., Katana.

Other Assistance

- | | |
|------------------|--|
| N. Thushanthan | Printing and Technical management
Department of Mathematics |
| M.G. Mayomi | Printing and Technical management
Department of Mathematics |
| S.R. Dedugala | Management Assistant, Department of Mathematics |
| K.N. Senani | Technical Assistant I, Department of Mathematics |
| R. M. Rupasinghe | Office Aid I, Department of Mathematics |

Introduction

This is an elective module. The student has the option of selecting this on his / her preference and it consists of five topics: magic squares, palindromic numbers, puzzles related to subtraction of numbers, Chinese and Japanese multiplication methods and divisibility in relation to the theme numbers. This module has been planned, developed and reviewed collaboratively by the officers of the Department of Mathematics of the National Institute of Education, officers of the Mathematics Branch and the Education Publication Department of the Ministry. of Education, Lecturers of the Universities and the National Colleges of Education and Mathematics subject Directors and teachers with expertise in the subject. This module has been designed in such a way that it eases the task of the facilitator and offers opportunities to develop students' abilities and skills. It also paves way to experience and study the beauty of mathematics and various methods of simplifying numbers which the students are supposed to know in addition to the main subject content which should necessarily be mastered by the students when achieving the expected learning outcomes at the end of grades 6-9.

The presentations and examples given here have been prepared to consolidate the students' understanding. The module consists of a number of solution strategies inserted to guide the students for learning enabling them to identify each concept and significant features. It also comprises self-learning activities in which the students can engage according to their own time and pace as well as activities to be done under the guidance of the teacher. A specialty of this module is that the student can use it to learn cooperatively with peers with patience and perseverance for achieving required learning outcomes.

The module also aims to help students acquire the 21st century skills taking their needs and situations into consideration.

G. P. H. Jagath Kumara

Director, Department of Mathematics

Contents

Topics	Time	Page
The magic squares	02 hours	1 - 6
Palindromic numbers	01 hour	7 - 12
Let us practice subtracting numbers	02 hours	13 - 17
Different methods of multiplying numbers	02 hours	18 - 26
Divisibility		27
Divisibility of a number by 7 without a remainder	45 minutes	28 - 30
Divisibility of a number by 8 without a remainder	45 minutes	31 - 32
Divisibility of a number by 11 without a remainder	45 minutes	33 - 35
Divisibility of a number by 13 without a remainder	45 minutes	36 - 39



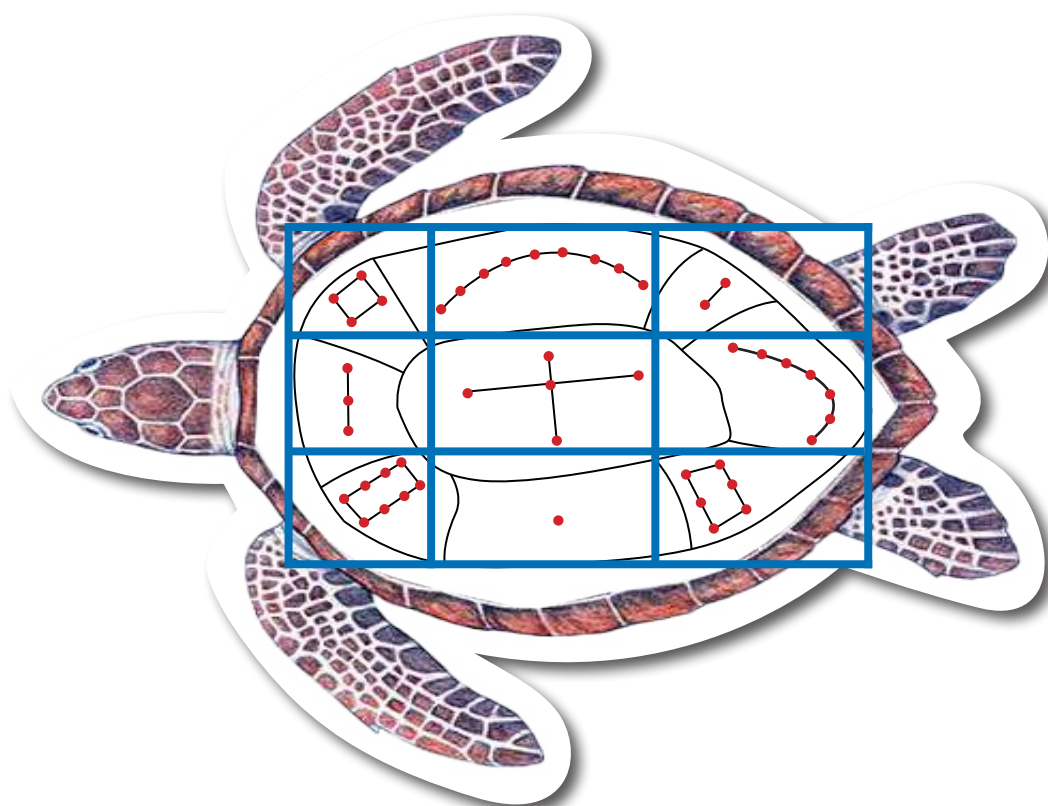
Magic Squares

By studying this lesson you will be able to

- understand more about additive bonds,
- improve the skill of addition and subtraction,
- to identify mathematical relations,
- to build up mathematical relations logically,
- develop the skill of solving problems.



The Turtle Who Created Patterns of Mathematics



According to Chinese myths, there was a huge flood around 650 B.C. in China. King Yu, who was the ruler, planned to move the excess water to the ocean. While the king was travelling along Yellow river, he saw a turtle with a unique pattern of dots on its shell.

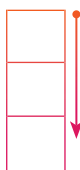
The pattern consisted of three cages arranged horizontally and vertically as a grid of 9 cages. The dots could be seen within these cages. When adding the number of dots vertically, horizontally or diagonally, the sum was always 15.

This pattern was introduced as Lo-Shu by him and later this had been the base for the mathematical puzzles called as magic squares.

Activity

1

- i. Following is a magic square with nine squares. Fill in the blanks according to the pattern and check whether the sum is 15 when added along horizontally, vertically and diagonally.



Sum of the numbers in the three squares along each horizontal row should be 15.

Sum of the numbers in the three squares along each vertical column should be 15.



Sum of the numbers in the three squares along each diagonal should be 15.

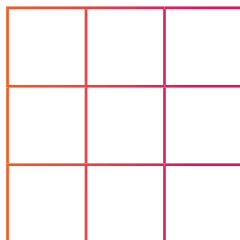
- ii. Write all the additive bonds you used in completing the magic square above.

Activity

2

- i. Write the following numbers only once inside the magic square to obtain the sum of 42, when added along horizontally, vertically and diagonally.

10, 11, 12, 13, 14, 15, 16, 17 and 18



- ii. Create a magic square like the above and present it to your class asking your friends to solve.

Activity

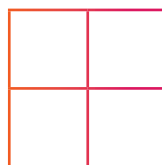
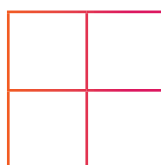
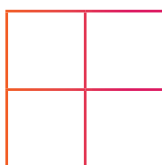
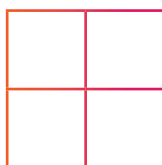
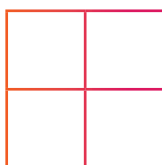
3

7	12	1	14
2	13	8	11
16	3	10	5
9	6	15	4

This magic box has 16 squares. Numbers from 1 to 16 are included only once in each cage to obtain the sum of 34 horizontally, vertically and diagonally.

Further, you can see four small squares indicated by four different colours. The sum of the numbers in them also gives 34.

In addition to the coloured squares, five more squares can be identified which the sum of the numbers included in four squares being 34. Identify the squares and write the numbers in the squares below.



Activity

4

Given below are six incomplete magic squares consist of four small squares in each. Complete them to obtain the sum 34 vertically, horizontally and diagonally as well as the sum in each small square by using the numbers from 1 to 16 only once.

13			12
2			7
		4	
		15	1

	3		5
15	6	9	
		2	

3	16		10
	9		
12		14	
	2		

10	3		
15			
	12		14
	13		

2		9	
		15	
	14	4	5

			12
8	11		13
15		9	

Activity

5

A magic square with 25 cages is given below. Enter the numbers from 1 to 25 only once to get the sum 65, along horizontally, vertically and diagonally.



Palindromic Numbers

By studying this lesson you will be able to

- identify palindromic numbers,
- to understand further about additive bonds,
- improve the skill of addition,
- take decisions by analyzing numbers comparatively.



Amazing answer

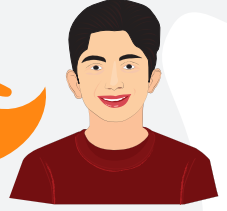
விகடகவி
ஒருவரை பார்த்து
வருவோமா?

நடன,
லால் கொல்லா
கொலை டீ சீயே?

வா தாத்தா வா
விகடகவி பார்க்க
போய்வருவோம்.



லால்
கொல்லா
நாஸைடி ஸைனா
ஓடினா சீயா.

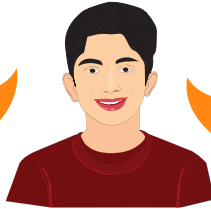


பாப்பா, திறன்பேசியை
இயக்க கைரேகை
தேவையா?

ரஹ் கஹ்
கொலைடி
நடன?



ரஹ் கஹ்
வட்டி மட்டி
ஊடு மெய்யை
ஈடி.



ஆம் தாத்தா,
கைரேகை கொண்டு
திறன்பேசியை
இயக்கலாம்

Pay your attention to the dialogue between father and Nayana. Study the Sinhala words written in black.

Activity

1

- i. What is the special feature you noticed in the words in the above dialogue?
- ii. Write more meaningful words with similar features used in Sinhala language.

Look at the words in the dialogue given in black. They spell same when read from the front and back. We can identify many such words, not only in sinhala language but also in other languages.

Both such words and sentences can be seen in English. When spell it backwards, we do not consider about the punctuation marks and the gap between words.

Followings are some similar words and sentences given in English language.

- ◆ Level, redder, noon
- ◆ Rise to vote sir.
- ◆ No devil lived on

Activity

2

- i. Write similar meaningful words and sentences used in English language as much as possible.

This feature which is seen in different languages can be seen in mathematics also which is a universal language. There are instances which we read the same number from the front and back according to the arrangement of digits.

Activity

3

- i. Write 5 numbers, which is read same to the front and back.
(You can use any number of digits for the number you write.)

You are free to write any amount of numbers which is read same when the digits are reversed. These numbers are called as Palindromic numbers.

Activity

4

i.

Write a number of two digits which is not a palindromic number.

Rewrite the digits of the number in reverse.

Add this to the number written earlier.

The answer obtained is

a palindromic number

not a palindromic number

Write the answer and restart from it.

- ii. Write five numbers of three digits that are not palindromic numbers. Get the corresponding palindromic numbers as in the above.

Activity

5

- i. Obtain palindromic numbers for the following numbers.
168 , 762 , 366 , 465 , 960
- ii. What can you say about the palindromic numbers obtained?
- iii. Write three special features of the numbers used to obtain palindromic numbers.
- iv. Write all the possible numbers with the above features mentioned in (iii) above to verify the answer in (ii).

Activity

6

- i. Obtain palindromic numbers for the following numbers.
880 , 286 , 781 , 583 , 484
- ii. What can you say about the palindromic numbers obtained?
- iii. Write four special features of the numbers, used to obtain the above palindromic numbers.
- iv. Write all the possible numbers with the above features mentioned in (iii) above to verify the answer in (ii).



Let us Practice Subtracting Numbers

By studying this lesson you will be able to

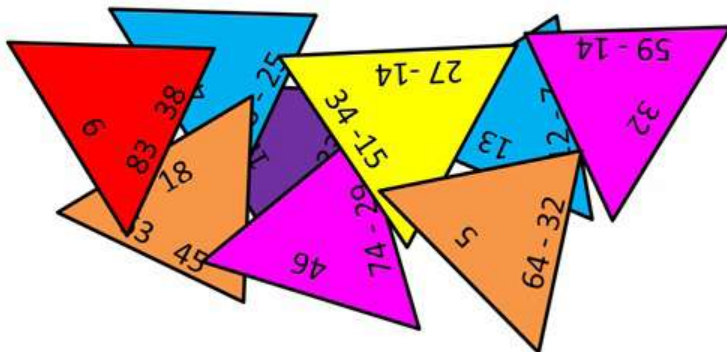
- understand further about subtraction bonds,
- use tarsia puzzles to improve the skill of subtracting,
- develop the ability of identifying mathematical relationships,
- develop the ability to build up relationships logically,
- gain the skill of solving problems.



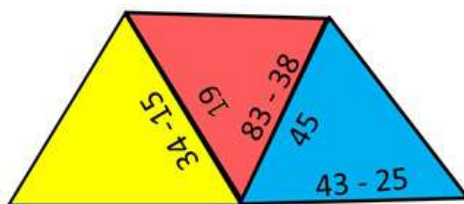
Activity

1

- i. Study the triangular laminae provided by your teacher. Each side of them contains mathematical expressions and answers relevant to the such other expressions.



- ii. Keep the triangular laminae in such a way that the expressions and the answers match as shown below.



- iii. Construct a figure by keeping all the triangular laminae you got.
- iv. Write down as much as possible subtraction bonds you used to find the answers for the mathematical expressions.

An arrangement of a figure with mathematical expressions and the relevant answers is known as a Tarsia puzzle.

Activity

2

1. Study the given instructions properly.

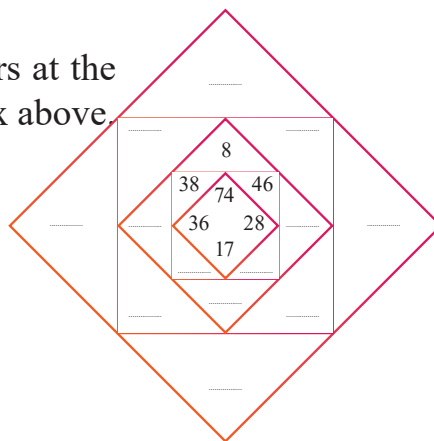
The figure given below consists of squares. There are four numbers in the vertices of the smallest square.

- Write the difference of the numbers at the adjoining vertices within the vertex above.

Ex: $74 - 28 = 46$

$74 - 36 = 38$

$46 - 38 = 8$



- Repeat the above process for the remaining vertices.
- i. Fill in all the blanks in the above figure.
 - ii. What are the values obtained for the vertices of the largest square?
2. Draw another figure as in the above. Insert the numbers 95, 12, 87 and 19 for the vertices of the smallest square. Complete the figure by obtaining 0 as the final answers.

Activity

3

1. Consider the numbers given below. Draw diagrams as shown in the activity 2 above for each set of numbers. Write the numbers at the vertices of the smallest square and get the final answers to 0.

(i) 57, 75, 30, 12 (ii) 27, 35, 83, 64 (iii) 35, 52, 89, 18

(iv) 97, 12, 85, 35 (v) 75, 57, 30, 12
2. i. Imagine four numbers less than 100. Put the four numbers to the vertices of the smallest square. Draw a diagram as given in the activity 2 above and complete it by getting the final answers as 0. Select the numbers as you have to draw more than 5 squares.

ii. How many squares did you draw?

Activity

4

Study the following diagram well.

53	9	10	17
20	1	20	18
13	15	19	6
7	7	20	1
			2

You can see the first circled number at the top of this diagram. Move down along the coloured path subtracting the values written in the cages. The final answer is seen at the last circle.

$$53 - 9 - 1 - 15 - 19 - 6 - 1 = 2$$

- The starting and ending numbers are circled. Colour the correct path to obtain the answer in the last circle from the first circle, using the above method.

17	8	11	14
5	1	17	10
3	14	19	6
84	13	20	17
			15

87	19	17	20
9	16	4	11
17	17	8	12
19	10	1	10
			5

17	16	1	12
114	10	15	5
18	16	3	16
2	17	12	8
			18

4	20	6	4
9	15	19	16
116	7	17	5
12	10	17	6
			13

12	26	29	13	54
83	43	23	14	46
365	18	32	27	37
64	52	46	11	25
43	67	39	28	5
				83

38	46	13	22	63
16	29	34	38	17
7	35	16	23	29
257	14	19	22	17
52	11	37	46	4
				93



Different Methods of Multiplying Numbers

By studying this lesson you will be able to

- understand the Japanese method of multiplying numbers,
- understand the Chinese method of multiplying numbers,
- improve the ability in logical thinking.

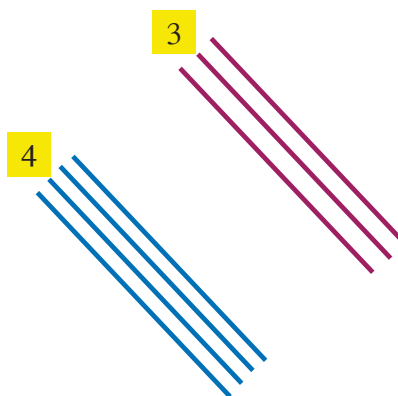


Japanese method of multiplying numbers

According to this method, each number is represented by straight lines.

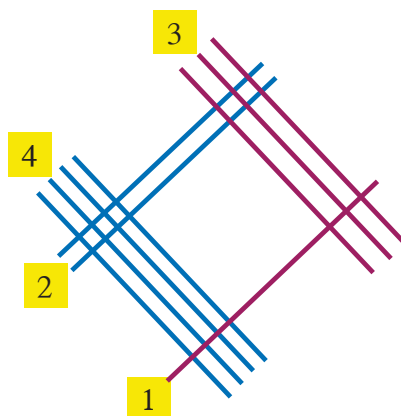
Look at the straight lines given below. They represent the product of 43×21 .

When representing 43 by straight lines, number four in the tens place are represented by four straight lines and the number three in the ones place is represented by three straight lines.



Similarly, 21 can also be represented by straight lines.

Since we need to get the product of 43×21 , 21 is represented by straight lines as shown below.



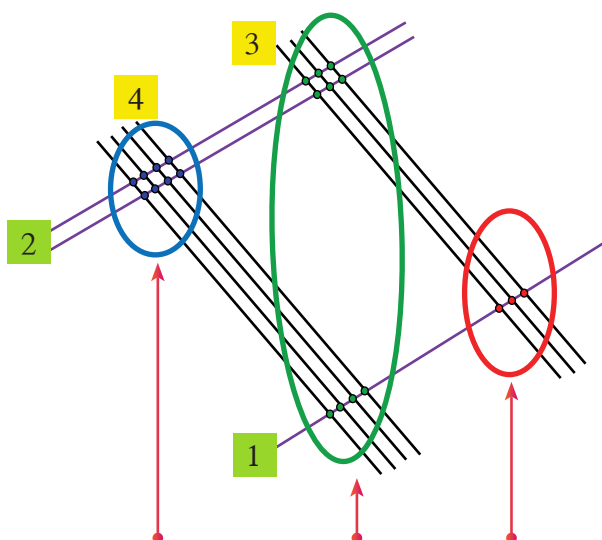
The number of points of intersection of the straight lines in the above diagram is used to get the answer.

Complete Activity 1 to find the value of 43×21 using the Japanese method of multiplication.

Activity

1

Study the diagram drawn below to find the value of 43×21 using straight lines. Find the value of the product by filling in the blanks.



Find the answer of
 43×21 using the
general method.

$$\begin{array}{r} 43 \\ \times 21 \\ \hline \end{array}$$

Hundreds place

Tens place

Ones place

.....

.....

.....

← Number of intersecting
points relevant to each
place

.....

.....

.....

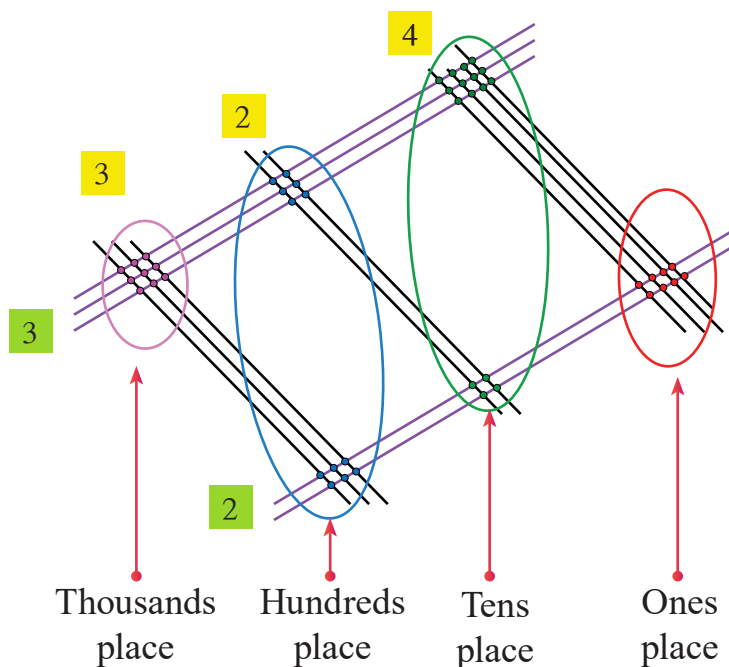
← Value represented by the
points

Hence $43 \times 21 = \dots + \dots + \dots$
 $= \dots$

Activity

2

Study the diagram drawn below to find the value of 324×32 using straight lines. Find the value of the product by filling in the blanks.



Find the answer of 324×32 using the general method.

$$\begin{array}{r} 324 \\ \times 32 \\ \hline \end{array}$$

Thousands
place

Hundreds
place

Tens
place

Ones
place

.....

.....

.....

.....



Number of
intersecting
points relevant
to each place

.....

.....

.....

.....



Value
represented by
the points

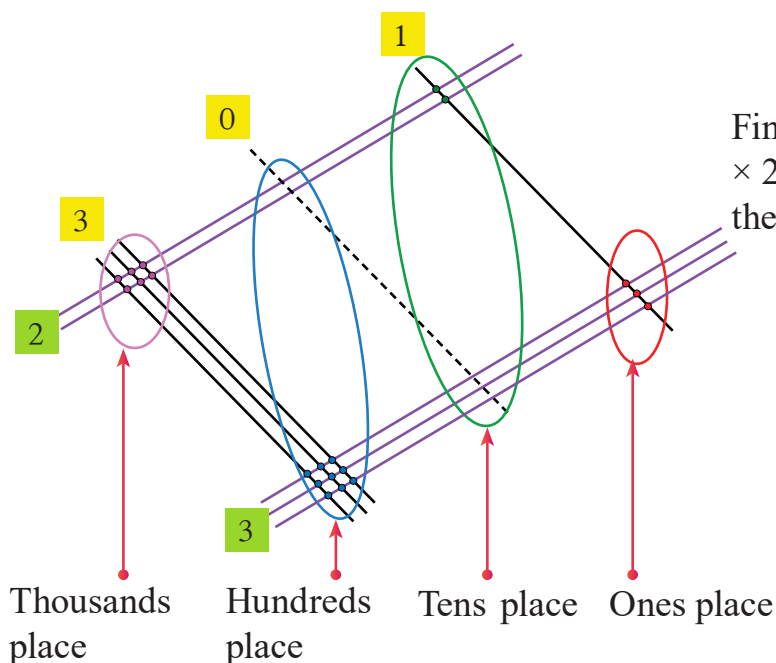
$$\begin{aligned} \text{Hence } 324 \times 32 &= \dots + \dots + \dots + \dots \\ &= \dots \end{aligned}$$

The above method used by the Japanese to multiply numbers is known as the Japanese method of multiplication.

Activity

3

Study the diagram drawn below to get the value of 301×23 . A dotted line is used to represent zero (0) here. Points of intersection with dotted lines are not counted in calculating intersection points for each location. Write the values in the blanks.



Find the value of 301×23 by multiplying the numbers.

$$\begin{array}{r} 301 \\ \times 23 \\ \hline \end{array}$$

Thousands place	Hundreds place	Tens place	Ones place	
.....				← Number of intersecting points relevant to each place
.....				← Value represented by the intersecting points

Hence, $301 \times 23 = \dots + \dots + \dots + \dots$
 $= \dots$

Explore the internet and learn more about Japanese method of multiplication. Use the following web address or QR code if required.

<https://www.youtube.com/watch?v=gQcEeMjI6DM>



Activity

4

Multiply the following numbers using the Japanese method of multiplication.

(a) 34×23

(b) 42×35

(c) 54×42

(d) 43×34

(e) 543×23

(f) 352×64

(g) 523×14

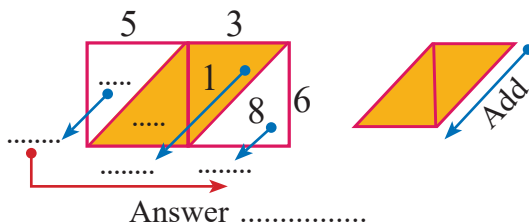
(h) 432×36

Chinese method of multiplying numbers

Activity

5

Study the sketch drawn to obtain the value of 53×6 .



Find the value of
 53×6 by multiplying

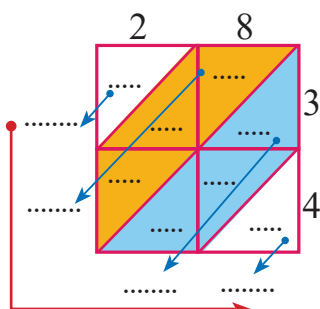
$$\begin{array}{r} 53 \\ \times 6 \\ \hline \end{array}$$

- First, get the product of 5 and 6. The answer is a 2 digit number. Write the digit at the tens place above the diagonal and the digit at the ones place below the diagonal of the cage below 5.
- Add the values in the triangles indicated along the arrowheads and write the answer in the blank below. If the value obtained has two digits, the digit at the ones place is written in the relevant blank and the digit at the tens place is added to the upper place and write in the relevant blank.
- The answer can be obtained by writing the digits in the value from left to right.

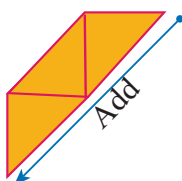
Activity

6

Complete the following diagram to get the product of 28×34 . Use the instructions given below.



Answer



Find the value of 28×34 by multiplying the numbers.

$$\begin{array}{r} 28 \\ \times 34 \\ \hline \end{array}$$

- Follow the method of the activity 5 and write the answers you obtain in the relevant cages. Multiply 8 by 3 and write the answer in the box in the first row below 8. Multiply 2 by 3 and write the answer in the box in the first row below 2. Multiply 8 by 4 and write the answer in the box in the second row below 8. Multiply 2 by 4 and write the answer in the box in the second row below 2.
- Add the numbers in the triangles along the arrowheads and write in the blank below. If the value obtained has two digits, the digit at the ones place is written in the relevant blank and the digit at the tens place is added to the upper place and write in the relevant blank. Obtain the answer by arranging the digits from left to right.

The above method used by the Chinese to multiply numbers is known as the Chinese method of multiplication.

Activity

7

Multiply the following numbers using the Chinese method of multiplication.

(a) 63×18

(b) 36×43

(c) 29×52

(d) 47×26

(e) 128×34

(f) 347×39

(g) 256×18

(h) 638×52



Divisibility

By studying this lesson you will be able to

- check whether a certain number is divisible by 7, 8, 11 and 13 without any remainder.



Activity

1

1. The prefects' guild of your school is planning for the annual student welfare program "Lending hands of brotherhood". They have selected 4 girls and 5 boys from your class to offer prizes. Assume that you have to help them as the class monitor.

The selected students are to be given similar gift packs with maximum number of exercise books. You are given the responsibility of arranging the parcels from the below items, such that the girls are given a maximum number of blue pens and the boys are given a maximum number of black pens.

Exercise books - 75

Blue pens - 27

Black pens - 27

As the gift parcels should be arranged for the other classes as well, the remaining items should be handed over to them at the same moment. Hence find the quantities remaining from each item.

Number of exercise books remaining -

Number of blue pens remaining -

Number of black pens remaining -

2. Kaveesha says that when the number of mangoes in a stock is divided by 2, 3, and 6 respectively there are no remainders and the heap contains more than 250 mangoes. Hence, calculate the minimum number of mangoes that can be in the heap.

Finding whether a number is divisible by 7 without a remainder

We know that multiples of 7 such as 7, 14, 21, 35, 42 ...are divisible by 7. When it is a larger number, it will be easier if we can find whether it is divisible by 7 without dividing.

Activity

2

- i. Let us follow the steps below to verify that 252 is divisible by 7 without any remainder.

Number
252

Double the digit in ones place.
(the digit at ones place of 252 is 2)
 $2 \times 2 = 4$

Find the difference between the
above product (4) and the first two
digits of 252
 $25 - 4 = \dots\dots\dots$

Restart with the value
received.

The answer obtained is

a single digit

not a
single digit

The digit obtained is

To obtain the difference of two numbers, subtract the smaller number from the larger number.

- ii. Is the above number obtained is divisible by 7, without a remainder?
- iii. Follow the above method for the following numbers and check whether the numbers are divisible by 7 without a remainder.

394 973 831 986

- iv. Values obtained for numbers divisible by 7 without a remainder.
.....
- v. Divide the numbers in (i) and (iii) above by 7 by long division and verify that each number is divisible by 7 without a remainder.
- vi. Write a way to identify numbers divisible by 7 using the above method.

If the difference between the product of the digit in ones place by two and the number obtained from the remaining digits is zero (0) or 7, then the initial number is divisible by 7 without a remainder.

Activity

3

Check whether the following numbers are divisible by 7 without a remainder or not and write down the numbers that are divisible by 7.

- | | | | |
|------------|------------|-------------|-------------|
| (a) 1 068 | (b) 2 351 | (c) 7 457 | (d) 5 768 |
| (e) 12 569 | (f) 38 731 | (g) 144 989 | (h) 165 578 |

Finding whether a number is divisible by 8 without a remainder

Activity

4

i

Number
1 632

The number obtained from the last three digits
(the last three digits of 1 632 is 632)

The number obtained from the last three digits is divided by 8
 $632 \div 8 = \dots\dots\dots$

Is the number obtained from the last three digits divisible by 8?

Yes

No

- ii. Is the number obtained from the last three digits of the above number divisible by 8 without a remainder or not?
- iii. Follow the above method and check whether the last three digits of each number given below are divisible by 8 without a remainder.
 520 1 544 6 163 11 784 24 000
- iv. Divide the numbers in (i) and (iii) above by 8 using long division and check whether each number is divisible by 8.
- v. Write down a way of identifying numbers that are divisible by 8 without a remainder using the above method.

If the last three digits are 000 or the number obtained from the last three digits is divisible by 8 without a remainder, the initial number is divisible by 8.

Activity

5

Check whether the following numbers are divisible by 8 or not without remainder and write down the numbers that are divisible by 8.

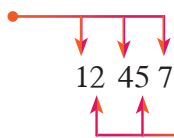
- (a) 322 (b) 484 (c) 768 (d) 1 612
 (e) 7 942 (f) 5 492 (g) 17 640

Finding whether a number is divisible by 11 without a remainder

The digits located in even places and the digits located in odd places in a number.

The location of the digits of any number can be named first, second, third and fourth by taking the ones place as the first place and continuing to the left. Then the even places and odd places of a number can be identified as follows.

1, 4 and 7 are located
in odd places



2 and 5 are located in
even places

Sum of digits in odd places = $1 + 4 + 7 = 12$

Sum of digits in even places = $2 + 5 = 7$

Difference between the sum of the digits in the odd places and that of the even places = $12 - 7 = 5$

Activity

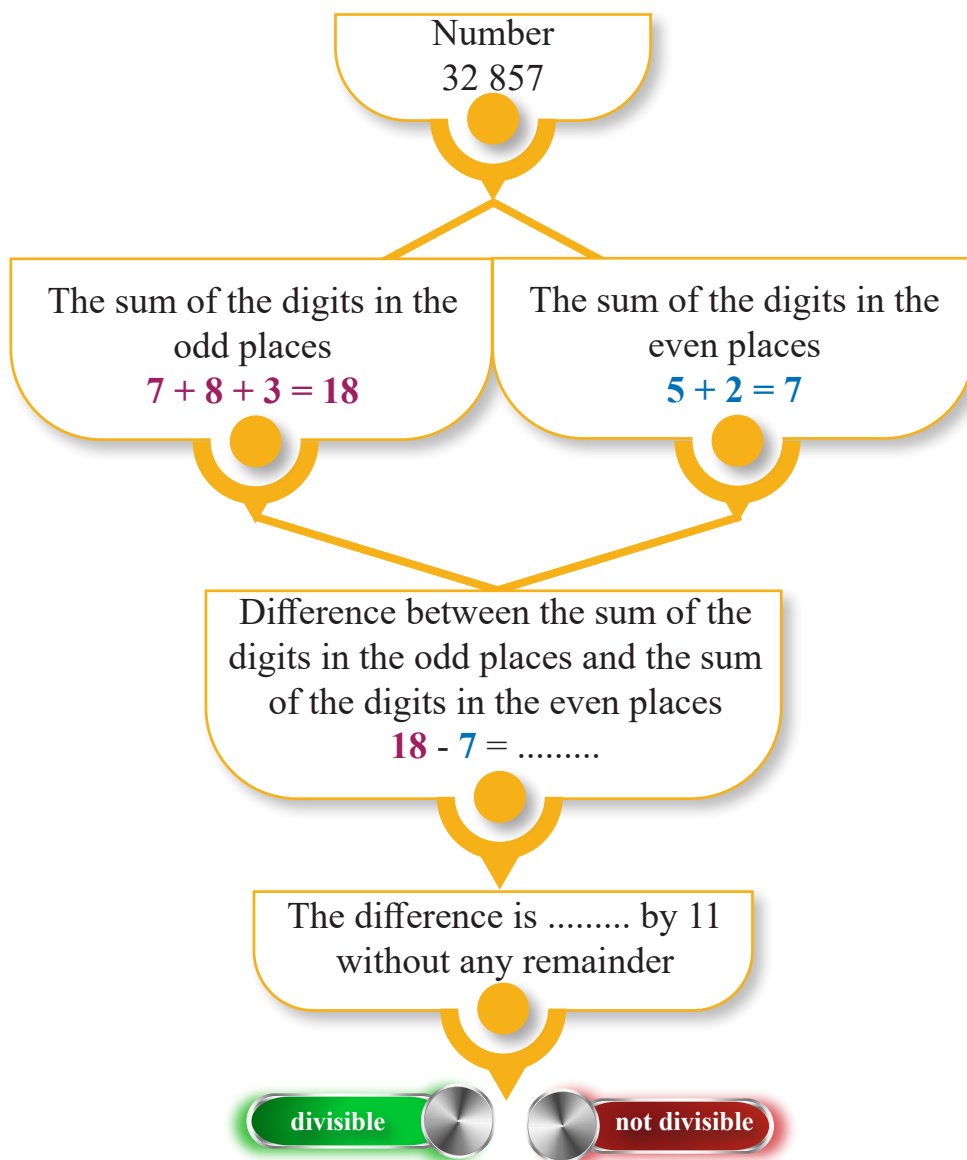
6

- i. In the number 32 857;
 - (a) What is the sum of digits in the odd places?
 - (b) What is the sum of digits in the even places?
 - (c) What is the difference of the sums of the digits at even and odd places?

Activity

7

- i. Let us follow the steps below to check whether 32 857 is divisible by 11 without a remainder.



- ii. Is the above number divisible by 11 without a remainder or not?
.....
- iii. Follow the above method to check whether the final value is divisible by 11 in the following numbers.

(a) 451	(b) 896	(c) 532	(d) 308
(e) 1 276	(f) 4 029	(g) 32 857	(h) 86 570
- iv. Values obtained for numbers divisible by 11 without any remainder
- v. Divide the numbers in (i) and (iii) above by 11 using the method of long division. Check whether each number is divisible by 11 without a remainder.
- vi. Write down a way of identifying numbers that are divisible by 11 without a remainder using the above method.

Get the sum of the digits at odd places and even places of a given number separately. If their difference is 0 or divisible by 11 without any remainder, then the initial number is divisible by 11.

Activity

8

Check whether the following numbers are divisible by 11 or not without a remainder.

- | | | | |
|------------|------------|-------------|-------------|
| (a) 594 | (b) 787 | (c) 1 265 | (d) 3 080 |
| (e) 3 278 | (f) 6 485 | (g) 137 852 | (h) 246 968 |
| (i) 12 736 | (j) 42 460 | (k) 37 158 | (l) 78 539 |

Checking the divisibility of a number by 13 without a remainder

Activity

9

- i. Let us follow the steps given below to check whether 3 458 is divisible by 13 without a remainder.

Number
3 458

Multiply the digit at ones place by 9 and get the value. (The digit at the ones place in 3 458 is 8)
 $8 \times 9 = 72$

Find the difference between the answer obtained (72) and the number obtained from the remaining digits of the initial number (345)
 $345 - 72 = \dots\dots\dots$

Is the answer zero (0) or a two-digit number?

yes

no

Restart with the answer obtained above

The number obtained is ...

ii. Is the value obtained above divisible by 13 without a remainder or not?

iii. Use the above method to obtain the final value of each number given below. Verify whether the final value zero or two digit number are divisible by 13 without a remainder

468

893

1 638

7 254

iv. Divide the numbers in (i) and (iii) above by 13 using the method of long division. Identify the numbers that are divisible by 13 without any remainder.

v. What is the relationship between the method in (iv) and the method used in activity 6?

vi. Write down how you can identify numbers that are divisible by 13 without a remainder using the method you identified above.

Multiply the digit at ones place by 9 and obtain the answer. Calculate the difference between the above answer and the number obtained from the remaining digits. If the difference is zero or divisible by 13, then the initial number is divisible by 13.

Activity

10

Using the method given above, check whether the numbers given below are divisible by 13 without a remainder or not and write down the numbers that are divisible by 13.

(a) 559

(b) 693

(c) 1 467

(d) 3 094

(e) 4 526

(f) 7 527

(g) 26 174

(h) 44 928

Activity

11

Find the other ways of checking the divisibility of a number by 7, 8, 11 and 13. Prepare a booklet and present it to the class.

You can explore the information through the following web addresses or QR codes.



<https://byjus.com/maths/divisibility-rules/>
<https://www.youtube.com/watch?v=E4yzE5NumV8>

Activity

12

An unknown number with 9 digits is written by the digits one to nine, using each digit once. That number has following properties.

- ◆ The number formed by the first 2 digits is divisible by 2.
- ◆ The number formed by the first 3 digits is divisible by 3.
- ◆ The number formed by the first 4 digits is divisible by 4.
- ◆ The number formed by the first 5 digits is divisible by 5.
- ◆ The number formed by the first 6 digits is divisible by 6.
- ◆ The number formed by the first 7 digits is divisible by 7.
- ◆ The number formed by the first 8 digits is divisible by 8.
- ◆ The 9-digit number is divisible by 9.

Find the number.

Activity

13

Let us identify the prime numbers between 1 and 100 according to the instructions given.

