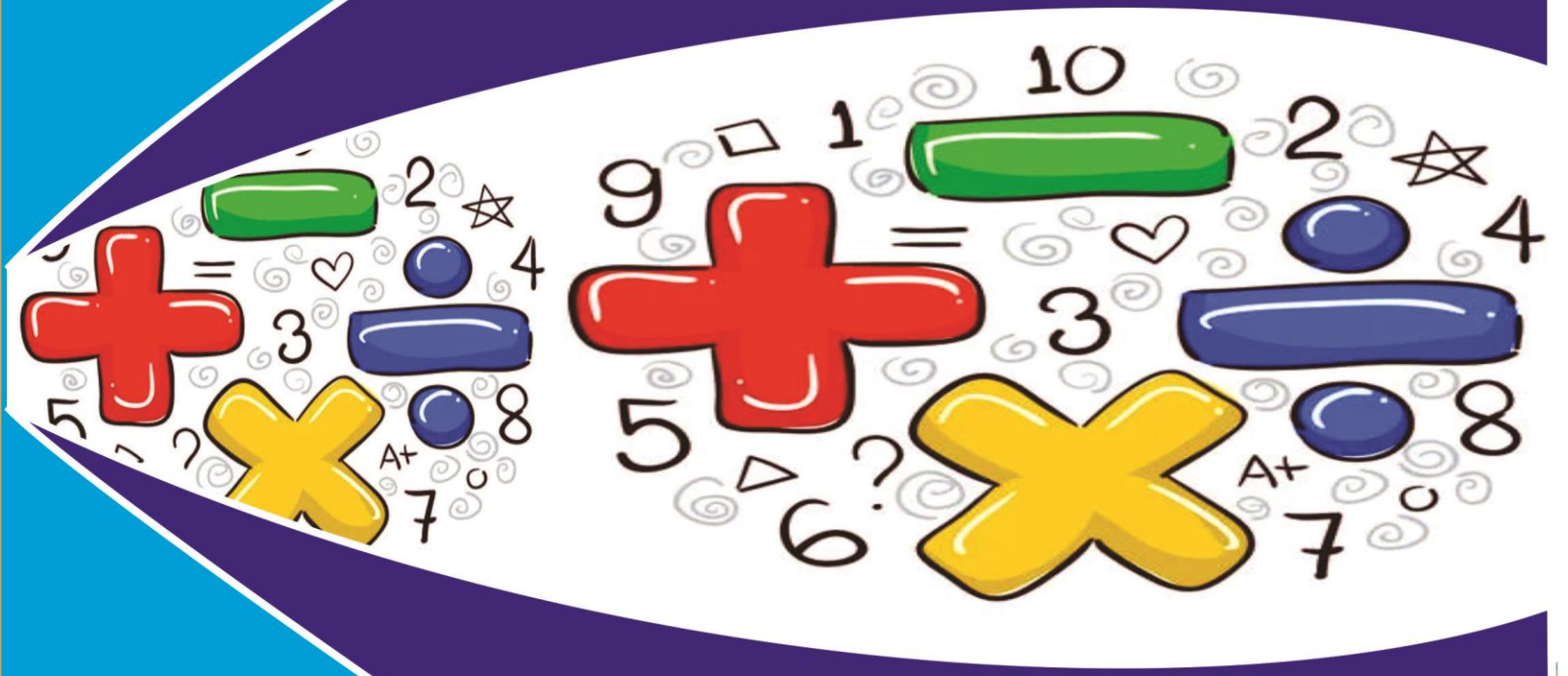
PROFESSIONAL DEVELOPMENT FOR QUALITY EDUCATION

Mathematics
Teachers' Guide
Lesson Plans

Grade 3



Quaid-e-Azam Academy for Educational Development, Punjab
Wahdat Road, Lahore

PREFACE

The Quaid-e-Azam Academy for Education Development (QAED), Government of Punjab, was tasked with developing teacher guides on the Single National Curriculum (SNC) 2020. For this purpose, a team of education experts and teachers from government and non-government institutions was engaged. The subject specialists from Material Development Wing supervised this task. The teams not only critically reviewed the entire guide but also ensured the incorporation of its recommendations.

While developing this guide, the team recognized that instructional settings and availability of resources vary significantly in the province of Punjab. Therefore, considering the important aspects of SNC and active learning, a contextually relevant teaching process has been devised to ensure student learning outcomes.

On behalf of Quaid-e-Azam Academy for Education Development, Government of Punjab, I am deeply grateful to all involved in creating this guide. I hope that this book will be helpful for teachers to teach effectively and enable them to perform their duties properly.

Thank you,
The Director General
Quaid-e-Azam Academy for Educational Development,
Government of Punjab

Mathematics – Teacher Guide

Introduction

The Government of Punjab School Education Department notified Single National Curriculum (SNC) in 2021. To ensure its effective execution, Quaid-e-Azam Academy for Educational Development has taken the following initiatives:
Organized a professional development program for teachers to enhance their understanding of SNC
Develop teacher guides to improve instructions at the school level.

Through these initiatives, the teachers will be able to:
Observe the alignment between SNC, Academic Calendar & Textbooks.
Ensure the achievement of student learning outcomes given in SNC
Equip themselves with new teaching techniques.
Create an interactive learning environment.

Active Learning promotes students to learn by doing through collaborative activities such as problem-solving, role-playing, watching others, arguing, and many more.

Students will not passively acquire material owing to engaging activities and several types of evaluation. The objective is to improve students' capacity to think critically and creatively via the application of innovative instructional strategies and flexible evaluation techniques. Using this form of instruction, students' knowledge will develop, their social skills will blossom, and their feeling of community will grow.
The course material is designed to have students thinking critically and solving mathematics problems that they'll encounter in the real world. For students to be able to defend their mathematical reasoning and understand the interconnectedness of mathematical ideas, we will arm them with the skills they need to do so.
We hope that they'll learn to apply mathematics not just to their coursework, but also to other areas of life.
To encourage the independence and self-confidence of students as learners, a range of instructional strategies are deployed to create an environment conducive to attaining the desired results.

SNC recommends that teachers utilize a range of materials, not simply the prescribed textbooks and teacher's guides.

About SNC

SNC emphasizes developing analytical, critical, and creative thinking through a more activities-based approach rather than static teacher-centric learning. Furthermore, it focuses on equipping learners with principles and attributes such as truthfulness, honesty, tolerance, respect, peaceful coexistence, environmental awareness & care, democracy, human rights, sustainable development, global citizenship, personal care, and safety (SNC 2020).

- The SNC is standards, benchmarks, and outcomes-based across all subjects.

The components of the curriculum are given below:

- Competency: A key learning area involving applied skills and knowledge enabling learners to perform successfully in educational, professional, and other life contexts.
- Standard: It defines competency by broadly specifying the knowledge, skills, and attitudes to be acquired by students in a particular key learning area during the first five years of schooling.
- Benchmarks: Further elaborate the expectations about what learners know under each standard, indicating what the students will accomplish at each developmental level to meet the standards.
- Student Learning Outcomes (SLOs): These are built upon the descriptions of the benchmarks and describe (in key points) what students will accomplish at the end of each unit.

Along with standards and benchmarks, the curriculum also provides a progression matrix containing SLOs grade-wise. For further detail, please refer to the SNC 2020 for the specific subject. In addition, this guide includes lesson plans based on student learning outcomes and textbook content developed by Punjab Textbook Board.

Key Components of Lesson Plan:

TEMPLATE FOR LESSON PLAN

Topic

Lesson plan No.	
Grade:	**Time:**

SLO:

Material / Resources required:

Information for Teachers:

- New concepts
- New ideas
- Teaching tips

Introduction:

- Warm up
- Brainstorming
- Elicitation
- Mind map etc.

Development:

Activity1

Activity2 (Minimum two activities)

Conclusion / Sum up / Wrap up:

Assessment: Focus will be on formative assessment

Follow up:

- home work
- written work
- project
- oral assignment etc.

List of Selected Students Learning Outcomes (SLOs)	
Mathematics-III	
Sr. No	**Students' Learning Outcomes**
Unit 1: Whole Numbers	
1.	• Read Roman numbers up to 20. • Write Roman numbers up to 20. • Recognize even and odd numbers up to 99 within a given sequence. • Differentiate between even and odd numbers within a given sequence. • Read and write given numbers up to 10,000 (ten thousand) in numerals and words. • Identify the place values of numbers up to 5 - digit. • Represent a given number on number line up to 2 - digit numbers. • Compare two numbers up to 3- digits using symbols "<", ">", or "=". • Write the given set of numbers in ascending and descending order (numbers up to 3 - digit). • Round off a whole number to the nearest 10 and 100.
Unit 2: Number Operations	
2.	• Add numbers up to 4 - digit with and without carrying. • Add numbers up to 100 using mental calculations. • Solve real life number stories up to 4 - digit with and without carrying involving addition. • Subtract numbers up to 4 - digit with and without borrowing. • Subtract numbers up to 100 using mental calculations. • Solve real life number stories. up to 4 - digit with and without borrowing involving subtraction. • Develop multiplication tables for 6, 7, 8, and 9. • Multiply 2-digit number by 1 - digit number. • Apply mental mathematical strategies to multiply 1 - digit numbers to 1 - digit numbers. • Solve real life situations involving multiplication of 2 - digit numbers by 1 - digit numbers. • Divide 2 - digit number by a 1 - digit number (with zero remainder). • Apply mental mathematical strategies to divide 1-digit number by a 1 - digit number. • Solve real life situations involving division of 2 - digit number by a 1 - digit number.
Unit 3: Fractions	
3.	• Express the fractions in figures and vice versa. • Match the fractions with related figures. • Identify equivalent fractions from the given figures. • Write three equivalent fractions for a given fraction. • Compare fractions with same denominators using symbols "<", ">", or "=".

	• Add two fractions with same denominators. • Represent addition of fractions through figures. • Subtract fractions with same denominators. • Represent subtraction of fractions through figures.
Unit 4: Measurement	
4.	• Use standard metric units of length (kilometer, meter, and centimeter) including abbreviations. • Add measures of length in same units without carrying • Solve real life situations involving same units of length for addition without carrying. • Subtract measures of length in same units without borrowing. • Solve real life situations involving same units of length for subtraction without borrowing. • Solve real life situations involving same units of capacity for addition without carrying • Solve real life situations involving same units of mass for subtraction without borrowing.
Unit 5: Time	
5.	• Use a.m. and p.m. to record the time from 12-hour clock. • Read and write time from analog and digital clocks. • Add measures of time in hours • Solve real life situations involving measures of time for addition of hours. • Subtract measures of time in hours. • Solve real life situations involving subtraction of measures of time in hours.
Unit 6: Geometry	
6.	• Classify figures according to number of sides as quadrilaterals (rectangles, squares and triangles). • Calculate perimeter of square, rectangle, and triangle. • Identify center, radius and diameter of a circle. • Describe 3-D objects (cubes, cuboids, and pyramids) with respect to the number of edges and faces.
Unit 7: Data Handling	
7.	• Read and interpret a Carroll diagram and Tally chart. • Read and interpret Picture Graph.

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ROMAN NUMBERS UP TO 20

Duration: 40 Minutes

Students Learning Outcome:

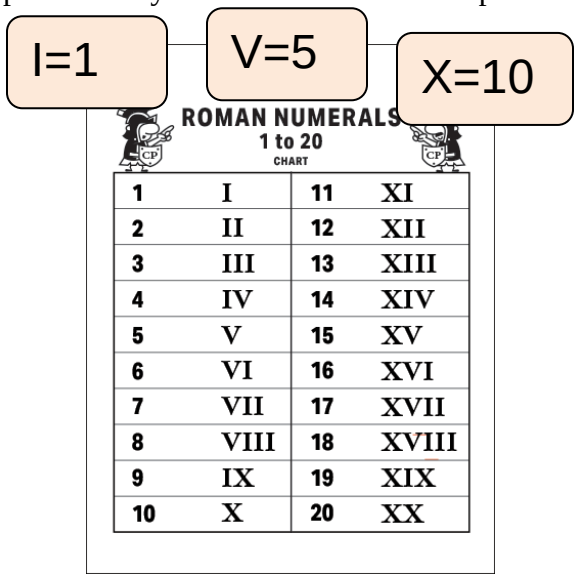
- Read &Write Roman numbers up to 20.

Materials:

Board, marker/chalk, chart paper, matchsticks/popsicles and Mathematics Textbook Grade 3 (PCTB), Notebook

Information for Teacher:

Roman numbers are represented by a few letters from the alphabet.
For example:



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

Introduction:

- Roman numbers are the counting symbols used by the ancient Romans.
- They used only a few letters from the Latin alphabet and we know these letters as I, V and X.
- Each letter stands for a certain number or value. Let us see what numbers these letters stand for:

Roman Numeral	Number
I	1
V	5
X	10

a) 1 in Roman Numerals is I
b) 5 in Roman Numerals is V
c) 10 in Roman Numerals is X

All other roman numbers are formed by using these letters.

Development:

Activity 1:

Let's learn the rules for reading and writing roman numerals.

Rule 1

You can put the same symbol together up to three times. You can't have four of the same symbols all together. The limit is three.

For example: I=1, II=2 and III=3, where 4 is not written as IIII.

Rule 2

If a smaller value is written before a larger value, then subtract the values.

For example: Write IV in number.

Where I=1 and V=5. We subtract these values 5-1=4. So IV=4

4 is written as IV(one before five)

Similarly, IX=10-1=9

So, IX=9

Rule 3

If a larger value is written before a smaller value, then add the values.

For example: Write VI in number.

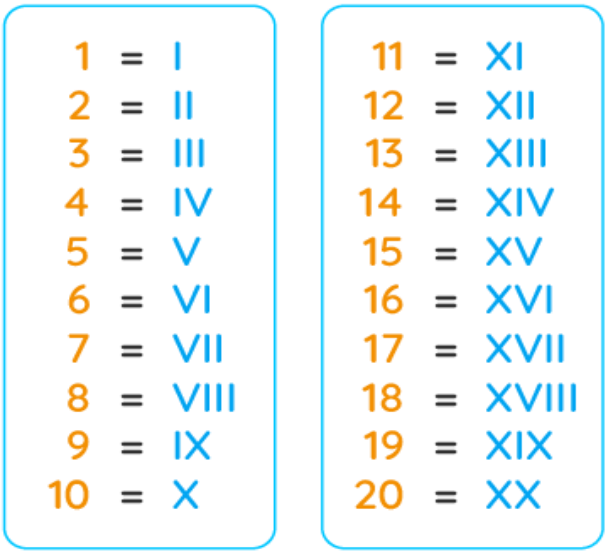
Where V=5 and I=1.

We add these values 5+1=6.

So VI=6 and it would be written as VI(one after five).

Similarly, XI=10+1=11

So, XI=11



Activity 2:

Let's find out the value of roman numbers VIII and XI in numbers.

1) VIII=V+I+I+I (here I is repeated no more than 3 times)
   =5+1+1+1
   =8
2) XI=X+I
   =10+1
   =11

Activity 3:

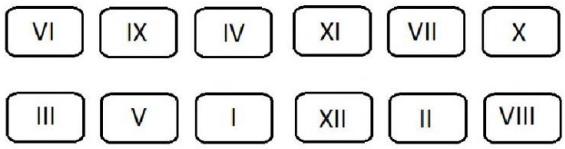
Write the following roman numbers on the board and ask the students to read.

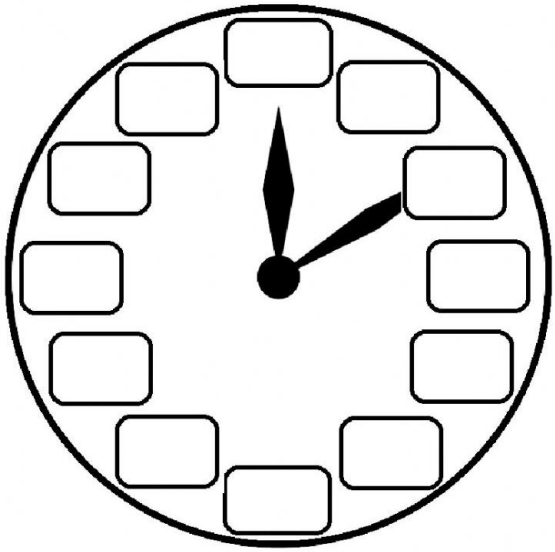
ii ii iii iv vi vii viii

Involve maximum students in this activity by writing more roman numbers on the board.

Activity 4:

Provide worksheet and ask the students to cut and paste the roman numerals to make a roman clock or draw it on a board and ask the students to copy in their notebooks.





Conclusion:

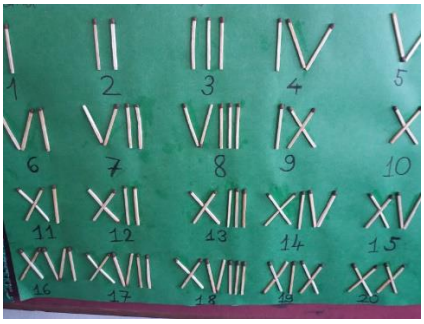
- Roman numerals are a system for representing numbers with letters of the Latin, or Roman alphabet.
- These numbers are used for ranking as I, II, III, etc., in writing classroom numbers or expressing the school classes as VI, VII, VIII, IX, X, XI, XII, etc.
- Often, they are used for writing the numbers on clock dials.

Things to remember:

- There is no symbol or digit for "0" means digit "0" is not there in roman numbers.
- Numerals of the same value are added. E.g., III=1+1+1=3 and VIII=5+1+1+1=8
- You cannot have the same letter more than three times in a row. e.g., 4=IV, 8=VIII, XIII=13, XIV=14 etc.
- If a smaller value is written before a larger value, then subtract the values. e.g., IV =5-1=4 and IX=10-1=9
- If a larger value is written before a smaller value, then add the values. For example. VI=5+1=6 and XI=10+1=11

Assessment:

- Ask the students to solve exercise 1 from Maths PCTB textbook page 5 and 6.
- Make a chart of numbers up to 20. Ask students to paste matchsticks/toothpicks to form a roman number (as shown in the picture below)



- Or write Roman numbers up to 20 on the board and ask the students to read.
- Involve all students in this activity.
- Make sure that all students are able to read and write Roman numbers up to 20.

Follow up:

Assign Q#1and 4 from Mathematics textbook PCTB to solve in notebook.

Glossary

Numeral: A numeral is a symbol or word that represents a number, such as the Arabic Numerals 1, 2, 3 and the Roman numerals I, V, X

Roman numerals: These are the symbols used in a system of numerical notation based on the ancient Roman system.

EVEN AND ODD NUMBERS

Duration: 40 Minutes

Students Learning Outcome:

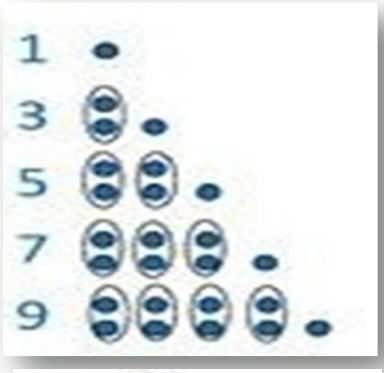
- Recognize even and odd numbers up to 99 within a given sequence.

Materials:

Board, marker/chalk, chart paper, Math's Grade 3 PCTB, notebook, candies

Information for Teacher:

An even number is a number that can be divided into two equal groups. Even numbers are 0, 2, 4, 6 and 8.
An odd number is a number that cannot be divided into two equal groups. Odd numbers are 1, 3, 5, 7 and 9.



Introduction:

- Ask the students about the even and odd numbers.
- After getting their responses, write numbers 1 to 9 on the board and tell the students that lets separate even and odd numbers.
- An odd number can be made into pairs but there is always one leftover. If a number cannot be split into two equal groups, it is odd.
- A number which is not divisible by 2. The remainder in the case of an odd number is always "1". Odd numbers are 1, 3, 5, 7 and 9.
- An even number can be made into pairs. If a number can be split into two equal groups, it is even.
- A number which is divisible in pair or pairs or divisible by 2 with remainder of 0 is called an even number. Even numbers are 0, 2, 4, 6 and 8.
- If we divide a number into two groups with an equal number of elements in each, then

the number is an even number. In the case of
odd numbers, we get a remainder of 1 whilegrouping.

Development:

Activity 1:

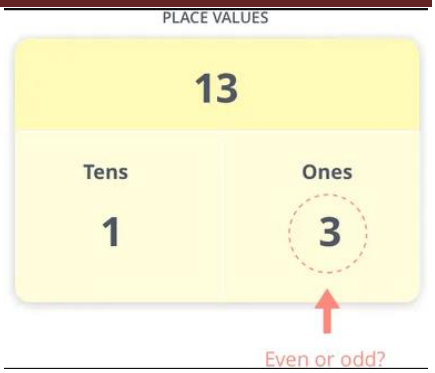
- Call one student in front of the class.
- Ask the students: how many students are there in front of the class? Note their responses on the board.
- Then ask how many pairs of students are there in front of the class?
- After taking their response explain to them that one (1) student cannot form a pair.
- Write 1 on the board tell them that 1 is an odd number.
- Now write the number 2 on the board and call two students to come in front of the class.
- Now ask the students that can we make a pair? After taking their response tell them that we can make a pair.
- Tell them that number 2 is an even number.
- Now do the same steps for the remaining numbers up to 9 to separate them as even or odd.
- At the end ask the students to write first five even and odd numbers.

Activity 2:

- Open page no 8 of Mathematics (PCTB) Grade 3 textbook and introduce the activity to the students.
- Involve them to find out the given numbers as odd or even.
- Take a round and check their work and guide.
- At the end recap this activity by involving whole class.

Activity 3:

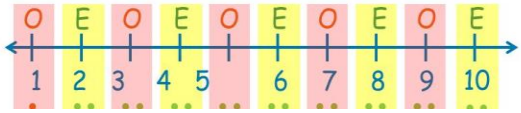
- Ask the students, how can you tell if a number over 10 is even or odd?
- Take their responses.
- Write number 13 on the board and ask them, what do you think is it even or odd?



- Tell them to identify a 2-digit number as even or odd we will look for the digit at ones place of this number that is it odd or even. As 13 is a 2-digit number and it has 3 at ones place, 3 is odd number so 13 is an odd number.
- Also tell them that a number that ends in 1, 3, 5, 7, or 9 is always an odd number e.g., 15, 63, 49, 87 and 91are odd numbers.
- And a number that ends in 0, 2, 4, 6, or 8 is always an even number e.g.,14, 26, 32, 40 and 88 are even numbers.
- Write the following numbers on the board and ask the students to identify these numbers as even or odd:
  29, 56, 33, 51, 45, 9, 34, 77
- Now open page no 9 of textbook (Mathematics PCTB) and involve the students to find out the given numbers as odd or even numbers.
- Take a quick round and check their work and guide where needed.

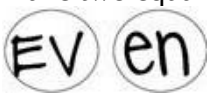
Conclusion:

- First five even numbers are 0, 2, 4, 6 and 8 and a number that ends in 0, 2, 4, 6, or 8 is always an even number.
- First five odd numbers are 1, 3, 5, 7 and 9. And a number that ends in 1, 3, 5, 7, or 9 is always an even number.
- Numbers have an alternating even-odd-even-odd pattern. If we put these numbers on the number line, it would look something like this:



- Every other number is even and every other number is odd.

Let's find the difference between even and odd number.

Even	Odd
Everyone has a partner; you can make two equal groups.  Ends in 0, 2, 4, 6 or 8	Not everyone has partner and cannot be split into equal groups.  Ends in 1, 3, 5, 7 or 9
In two digit numbers to find odd or even we see the digit at ones place and if it is odd then the number will be odd or if it is even the number will be even.	
For example: 20, 34, 98 Digit at ones place is even so the numbers are even numbers.	For example: 25,37,49 Digit at ones place is odd so the numbers are odd numbers.

Assessment:

- Write the following numbers on the board and call different students to encircle the even numbers.
  7, 21, 30, 15, 64, 82, 98, 77, 11, 66
- Write the following numbers on the board and call different students to encircle the odd numbers.
  21, 5, 63, 56, 89, 76, 55, 49, 50, 99

Follow up:

Do Exercise 2: Q#1 on the book

Glossary

Even number: Numbers that can be divided in pairs.
Odd number: Numbers that cannot be divided in pairs.
Remainder: The value left after the division.
Number line: A long straight line with markings at equal intervals to denote the numbers.

EVEN AND ODD NUMBERS

Duration: 40 Minutes

Students Learning Outcome:

- Differentiate between even and odd numbers within a given sequence.

Materials:

Board, marker/chalk, chart paper, Math's Grade 3 PCTB, notebook

Information for Teacher:

- Students have already learnt about even and odd numbers.
- The numbers which can be divided completely into pairs are called even numbers. E.g., 0, 2, 4, 6, 8 are first five even numbers.
- The numbers which cannot be divided completely into pairs are called odd numbers. E.g., 1, 3, 5, 7, 9 are first five odd numbers.
- Any number whose last digit or the digit at ones place is 0, 2, 4, 6, and 8 is an even number.
- Any number whose last digit or the digit at ones place is 1, 3, 5, 7, and 9 is an odd number.
- While teaching the lesson also consult textbook where and when applicable.

Introduction:

- Involve the students to recall the concept of pairs by giving examples on the board.
- Write the numbers and draw the corresponding number of objects with the numbers on the board.
- Ask the students to make pairs and find the numbers as odd or even.
- Show the chart of even and odd numbers in front of the students or write the even or odd numbers in sequence on the board.

- Tell them that we can write even and odd numbers in sequence.
- Demonstrate the students to find the missing even or odd numbers in the given sequence by giving examples from the chart or by writing numbers sequence on the board.
    a) 10, 12, ___, 16, 18, ____
    b) 21, ___, 25, 27, ____, 31
    c) 74, ___, 78, ____, ____, 84
    d) 63, ___, ___, 69, ____, 73

Development:

Activity 1:

- Write even numbers in sequence on the board
  For example:
    - Even numbers between 25 and 35 in sequence
        - 26, 28, 30, 32, 34
    - Even numbers between 41 and 51 in sequence
        - 42, 44, 46, 48, 50
- Ask the students to write the even numbers between the following:
    - 21 and 31
    - 79 and 89

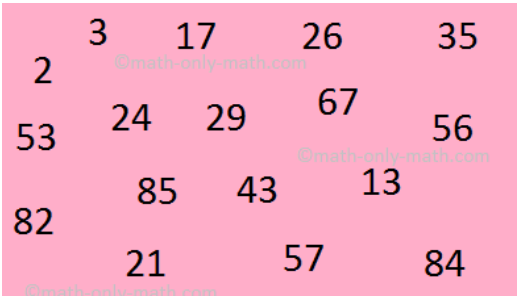
Activity 2:

- Demonstrate the writing of odd numbers in a sequence in front of the students.
  For example,
    - Odd numbers between 10 and 20 in sequence
        - 11, 13, 15, 17, 19
    - Odd numbers between 50 and 60 in sequence
        - 51, 53, 55, 57, 59
- Ask the students to write the odd numbers between
    - 22 and 32
    - 84and 94

Activity 3:

- Write different numbers up to 99 on the board.
- Make a table on the board.

Even	Odd



- Call a student and ask him/her to write even number in the even column from the above table.
- Call another student and ask him/her to write odd number in the odd column.
- Keep on calling until all numbers are separated.

Conclusion:

- First five even numbers are 0, 2, 4, 6 and 8 and any number whose last digit or the digit at ones place is 0, 2, 4, 6 or 8 is an even number.
- First five odd numbers are 1, 3, 5, 7 and 9and any number whose last digit or the digit at ones place is 1, 3, 5, 7 or9 is an odd number.
- To differentiate whether a number is odd or even: divide it by 2.
- If the number is not divisible by 2 entirely, it'll leave a remainder 1, which indicates that the number is an odd number and can't be divided into 2 parts evenly.
- If the number is divisible by 2 entirely, it'll leave a remainder 0, which indicates that it is an even number and it can be divided into 2 parts evenly.
- Odd numbers always have 1, 3, 5, 7, or 9 in their ones place.
- Even numbers always have 0, 2, 4, 6, or 8 in their ones place.

Assessment:

Ask the students to:

- Write even numbers between 79 and 89.
- Write odd numbers between 50 and 70.
- Take a quick round and check their work.

Follow up:

Assign Q#2 to 5 from the Exercise # 2 on notebook.

Glossary

Even number: Numbers that can be shown as pairs.
Odd number: Numbers that cannot be shown as pairs.
Remainder: The value left after the division.

NUMBERS UP TO 10,000

Duration: 40 Minutes

Students Learning Outcome:

- Read and write given numbers up to 10,000 (ten thousand) in numerals and words.

Materials:

Information for Teacher:

5-digit numbers are the integers on the number line that start from 10,000 and go up to 99,999. These numbers contain a total of 5 digits in their numeric form.
We put comma (,) after every three digits counting from right to left, for example 10,000.
While teaching the lesson, also consult textbook where and when applicable.

Introduction:

- When we read numbers we use place value, or the value of a digit based on its position in the number, starting from left to right. For example, we will read 8,313 as eight thousand three hundred and thirteen.
- When we write numbers, first determine the place value of each digit, and then write the number.
  Let's find the place and place value of each digit in a 4-digit number.

Place	Thousands	Hundreds	Tens	Ones
Place value	1000	100	10	1
Number	8	3	1	3

(Start reading number from left to right)

- Here, 8 is in thousands place and its value is 8000.
- 3 is in hundreds place and its value is 300.
- 1 is in tens place and its value is 10.
- 3 is in ones place and its value is 3.

So, we read 8,313 as eight thousand three hundred and thirteen.

Making 10,000 the smallest 5-digit number

- The smallest 4-digit number is 1,000 and the greatest number is 9,999.
- By adding 1 in 9,999 we get 10,000. It is the first and the smallest 5-digit number.
- **A 5-digit number is a number that has 5 digits, in which the first digit should be 1 or greater than 1 and the rest of the digits can be any number between 0-9. It** starts from 10,000 (ten thousand) and goes up to 99,999(ninety-nine thousand nine hundred and ninety-nine)**.**
- 5-digit numbers contain a number of ten thousands, thousands, hundreds, tens, and ones. It can be written in a place value chart as:

Place	Ten thousands	Thousands	Hundreds	Tens	Ones
	1	0	0	0	0
Place value	10 000	1000	100	10	1

The smallest 5-digit number is 10,000 and the greatest 5-digit number is 99,999.

Let's write 68,175 in words.

Place	Ten thousands	Thousands	Hundreds	Tens	Ones
	6	8	1	7	5

(Start reading number from left to right)

- We read a 5-digit number from left to right, starting from the ten thousand place to the ones place. For example, 68,175 is read from left to right starting from 6, followed by 8, 1, 7 and then 5.
- Using a place value chart, we can see that:
  - the number 6 is in the Ten Thousands place,
  - 8 is in the Thousands place,
  - 1 is in the Hundreds place,
  - 7 is in the Tens place, and
  - 5 is in the Ones place.
- So, 68,175 in words is Sixty-eight thousand one hundred and seventy-five.

Development:

Activity 1

- Write ten thousand, thousands, hundreds, tens and ones on the board.
- Write 0-9 numbers on the flashcard.
- Call 5 students on the board and give them 5 different cards.
- Ask each student to stand under ten thousand, thousands, hundreds, tens and ones place.
- Ask the students from the class to read the number from the flash card.
  For example, make a number 23,684.
- Ask the whole class the places of each digit and write it on the board.
- Now ask them to read the number aloud.
- Shuffle the digits or take new flashcards and continue asking different questions.
- Ask the students to write these numbers in words.

a) 89,235 _____

b) 56,302_____

c) 11,956_____

Activity 2:

- Write any 5-digit number on the board, for example: 32,759
- Ask the students how would we read it?
- Tell them to read this; we make its place value chart.
- Ask the students: To make a place value chart for a 5-digit number, how many columns are needed?
- After taking their response draw five columns on the board.
- Ask what will we write in the first column on right side?(ones)
- Similarly, ask them one by one and write ten thousands, thousands, hundreds, tens and ones in the remaining columns.
- Tell the student that we start writing any 5-digit number from left side and move towards right side.

Place	Ten thousands	Thousands	Hundreds	Tens	Ones
	3	2	7	5	9

- Now ask the students to read this 5-digit number.
- At the end ask the students to put the following numbers in place value chart.
  - 9,999
  - 65, 030
- Ask the students to write these numbers in numerals.
  - Fifty four thousand eight hundred and seventeen _____
  - Ten thousand six hundred and twenty _____
  - Sixty-four thousand seven hundred and twenty _____

Activity 3:

- Ask the students to read and write the numbers given on textbook page 16 and 17.
- Assign them Q#1 and 2 from exercise 3 textbook page 17 and 18 in their notebook.
- Have a quick round and review their work and guide them where needed.

Conclusion:

- When we add one unit to the greatest 4-digit number we get the smallest 5-digit number.
  1+9999 = 10000

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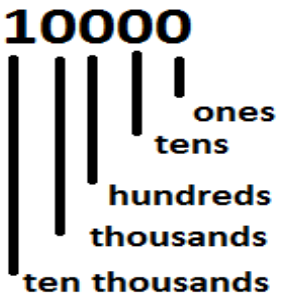


- The smallest 5-digit number is 10,000 and the greatest 5-digit number is 99,999.
- When we see a 5-digit number, the five digits will correspond to the 5 place values.

Place	Ten thousands	Thousands	Hundreds	Tens	Ones
	1	0	0	0	0
Place value	10 000	1000	100	10	1

- When reading or writing a large number, begin at the left and proceed to the right.
  For example; 27,482 is read as twenty-seven thousand four hundred and eighty-two.

Assessment:

Write the following numbers on the board

Numbers	In words
a) 53 235	
b) 64 356	
c) 87 103	
d) 99 990	
e) 36 035	
f) 80 913	
g) 55 430	
h) 11 141	
i) 10 001	
j) 71 545	

- Ask the students to copy the table in their notebooks and write these numbers in words.
- Take a quick round and check their work.

Follow up:

Assign Q#3 and Q#4 of exercise#3 as homework.

Glossary

Place value: It is the value of each digit in a number.
Number: Number is expressed with digits e.g., 4
Numeral: It is a word describing a number. E.g., four

PLACE VALUE UP TO 5-DIGIT

Duration: 40 Minutes

Students Learning Outcomes :

- Identify the place values of numbers up to 5-digits.

Materials:

Board, marker/chalk, Mathematics Grade 3 PCTB, notebook.

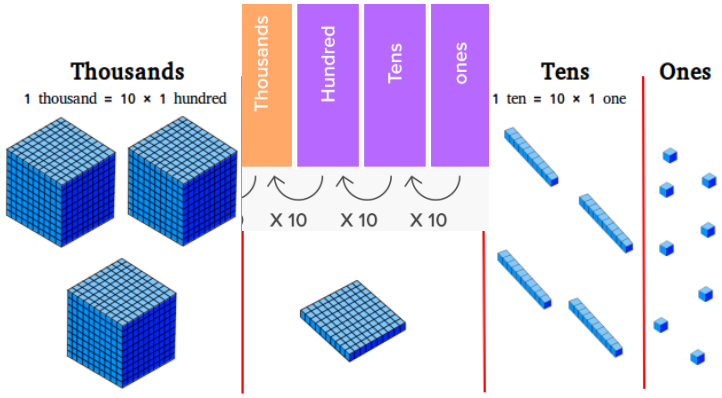
Information for Teacher:

- **Place value** describes the value of every digit in a number depending on its position. These positions start from the ones place.
- The order of the place value of digits in a 5- digit number from right to left is expressed as ones, tens, hundreds, thousands and ten thousand.
- For example: the place value of the digit 6 in 65,123 is 60000. As 6 is at the ten thousand place (6 ten thousand or 60000).
- While teaching the lesson, also consult textbook where and when applicable.

Introduction:

Place value is the value of a digit in a number based on its place or position.

- The place a digit appears in a number determines its value.
- A place value chart of 4-digit number is made up of ones, tens, hundreds and thousands.
- The place value of the digit increases by ten times as we move left on the place value chart.



Place value of the digits in 3248

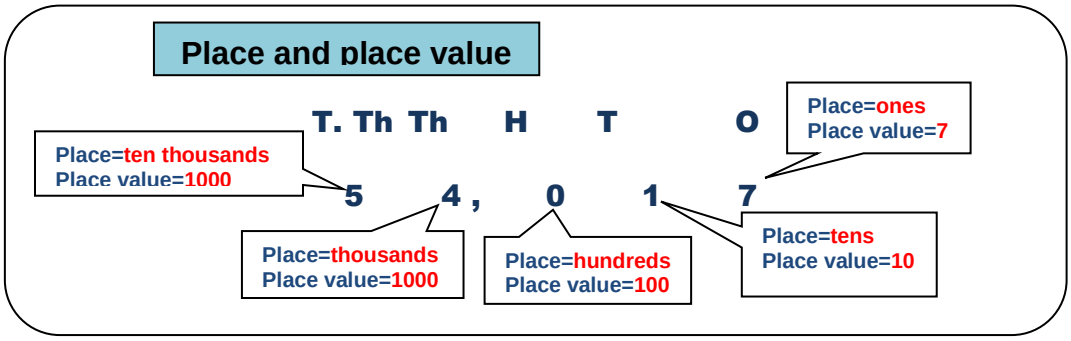
- 3 thousand, 2 hundreds, 4 tens and 8 ones
- We read it as “Three thousand two hundred and forty-eight”
- Mow ask the students, what is the greatest 4-digit number?
- After taking their responses write the greatest 4-digit number (9,999) on the board.
- Make place value chart for 9,999 on the board.
- In 9,999 there are 4 digits so there will be four place value positions.

Thousands TH	Hundreds H	Tens T	Ones O
9	9	9	9

- Explain this place value chart to the students.
- Ask them if we add 1 in 9,999, what will be the answer?
- Demonstrate to the students; that what will happened if we add 1 in 9,999.
- Construct place value chart of smallest 5 digit numbers on the board.

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

- It has 5-digits and it is called the smallest 5-digit number.
- Tell the students that from reading right to left, first place is ones, second place is tens, third place is hundreds, fourth place is thousands and fifth place is ten thousands.
- With the help of place value chart, we can find the place value of any digit in a number.
- We can find the value of each digit according to their respective places.
- For example, the number 54,017 is different from 51,047 because the digits are in different positions.



- Demonstrate the example on textbook page 15 and 16.

Development:

Activity 1:

- Write a 5-digit number on the board, for example: 29,735
- Demonstrate to the students that how they will construct place value chart of this number.

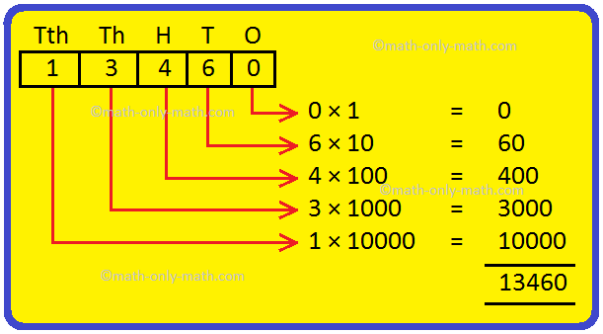
Ten thousands T.TH	Thousands TH	Hundreds H	Tens T	Ones O
2	9	7	3	5

- Demonstrate to the students that how they will read and write this number with the help of this place value chart.
- Now ask the students to construct the place value chart for the following numbers.
  a) 51,863
  b) 60,107

Activity 2:

- Demonstrate to the students how they will find the place value of a specific digit in a number.
- For example ask the students to tell the place value of 3 in the number 13,460.
- Tell them that first we have to construct the place value chart.

Ten thousands T.TH	Thousands TH	Hundreds H	Tens T	Ones O
1	3	4	6	0



- Ask the students to tell the place value of 3 from the chart.
- After taking their responses, explain to them that the place value of 3 is 3 thousands or 3000.
- Similarly, we can find the place values of the other digits in a number e.g. the place value of 1 is 1 ten thousands (10000), 4 is 4 hundreds (400), 6 is 6 tens(60) and 0 is 0 ones(0).
- Write the following numbers on the board and ask the students to identify the place value of underlined digits.
  a) 28,<u>0</u>35 _____
  b) 5<u>1</u>,635 _____
  c) 96,9<u>1</u>9 _____
  d) <u>3</u>0,783 _____
- Ask the students to solve Q#5 and 7 from textbook page 19.

Conclusion:

- The place value chart of smallest 5-digit number is:

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

- In this chart, from right to left, first place is ones, second place is tens, third place is hundreds, fourth place is thousands and fifth place is ten thousands.
- Each digit has a value depending on its place called the place value of the digit. For example in 59,354 the place value of 5 is 5 ten thousand or 50000.

Assessment:

- Write the following numbers on the board and ask the students to identify the place value of the underlined digits.
  a) 8,0̲32 _____
  b) 4̲9,240 _____
  c) 54,5̲67 _____
  d) 65,55̲6 _____
- Ask the students to solve Q#3 from textbook page 18.

Follow up:

Ask the students to make a poster of;

- Greatest 2-digit number, 3-digit number, and 4-digit numbers.
- Smallest 2-digit number, 3-digit number, and 4-digit numbers.
- Ask the students to solve the questions given in their textbook.

Glossary

Digit: All numbers are made up of digits. They are 0,1,2,3,4,5,6,7,8,9.

Place value: It is the value of the place of any digit in any number that a digit occupies in a number.

NUMBER LINE

Duration: 40 Minutes

Students Learning Outcome:

- Represent a given number on number line up to 2 - digit numbers.

Materials:

Board, marker/chalk, Mathematics Grade 3 PCTB, notebook.

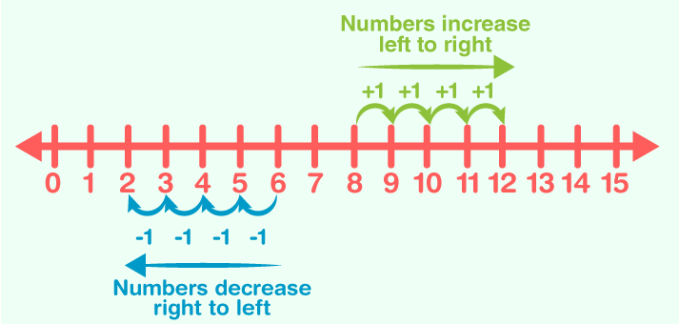
Information for Teacher:

A number line can be defined as a straight line on which numbers are marked at equal intervals. Number line can be used for comparing and ordering numbers.

Introduction

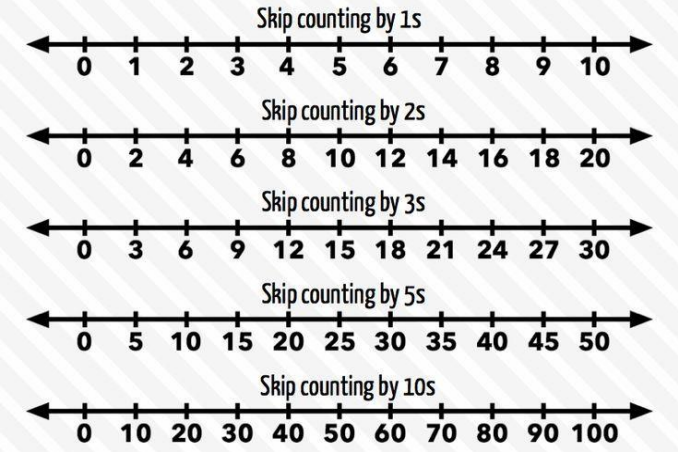
A number line is a long straight line with markings at equal intervals to denote the numbers. Below are the steps to represent whole number on number line:

- Draw a straight line.
- Mark a point at the extreme left as 0.
- Mark another points to the right of 0. Label them as 1, 2, 3… The distance between these marks must be equal. They are said to be at a units (ones) distance from one another.



- Explain the students that the number increases by 1 when we move from left to right and decreases by 1 when we move from right to left.
- On a number line, a number on the left is always less than a number on the right.
- Similarly, a number on the right is always greater than a number on the left.

- Tell the students that number line can also be used to carry out addition, subtraction and multiplication.
- We always move right to add, left to subtract and skip count to multiply.
- Demonstrate that in order to represent whole numbers on a number line, we can:
  - Change the range of number lines.
  - Create number lines that count by ones, twos, threes, fives and tens (draw these lines on the board).

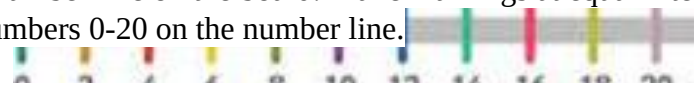


- Place a dot at a desired location.
- Find the dot marked on a number.
- With the help of examples demonstrate to the students that how to represent numbers on the number lines from textbook page 23.

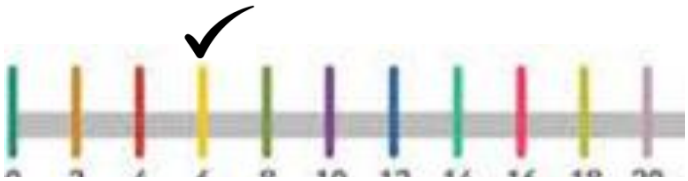
Development:

Activity 1:

- Draw a number line on the board. Make markings at equal intervals on the line.
- Write numbers 0-20 on the number line.



- Call a student and ask him/her to point the number 6 and tick mark on it.



- Call another student and ask him/her to point the number 14 and tick mark on it.
- Carry on with different numbers.
- At the end recap the whole activity to the students.

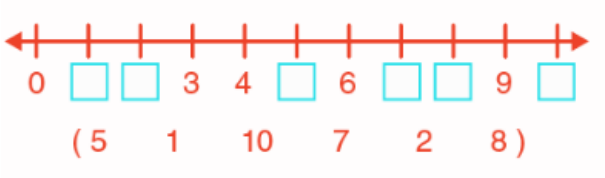
Activity 2

- Draw these number lines on the board and ask the students to write the missing numbers on correct place on the number line.

a)

b)

c)

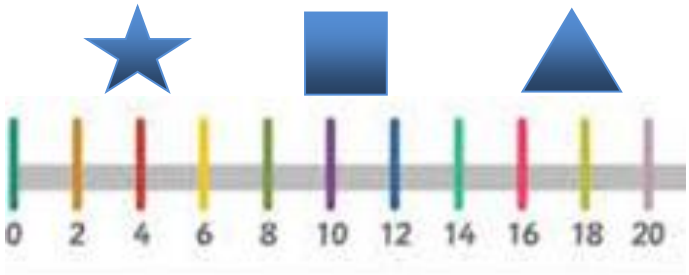


- Call different students to write missing numbers.

Activity 2:

- Draw a number line on the board.
- Mark numbers counting by twos. (2, 4, 6, … ,20)

- Make different objects (star, square, triangle, etc.) above the number line on different numbers.



- Tell them that we can find the value of objects represented on the number line.
- Ask them the value of the objects on the number line.

- Demonstrate to the students the examples given in the textbook page 24.
- Also do the activity given in the textbook page 25.

Conclusion / Sum up:

Number line is a straight line that is divided into equal parts and can be divided into many ways. It can be defined as a straight line with numbers placed at equal intervals or segments along its length.

The numbers on the number line increase as one moves from left to right and decrease on moving from right to left.

Assessment:

Draw a number line on the board and ask the students to:

- Represent the following numbers on the number line.
  - a) 8 and 10
  - b) 5, 15 and 20

c) 6, 9, 12, and 15

Follow up:

Ask the students to solve the questions given in the textbook.

Glossary

Number line: a straight line that shows numbers as a series of points.
Line: A straight path that goes on in both directions.
Skip counting: counting forward or backward by a number other than 1.

COMPARING AND ORDERING NUMBERS

Duration: 40 Minutes

Students Learning Outcome:

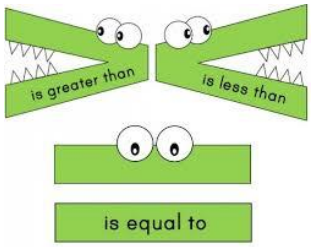
- Compare two numbers up to 3- digits using symbols "<", ">", or "=".

Materials:

Board, marker/chalk, Math's Grade 3 PCTB, notebook.

Information for Teacher:

- To show a number less than the other, we use symbol "<" means "less than".
- To show the number greater than the other, we use symbol ">" means "greater than".
- To show a number equal to the other, we use symbol "=" means equal to.

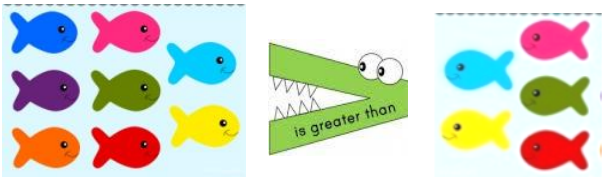


- While teaching the lesson, also consult textbook where and when applicable.

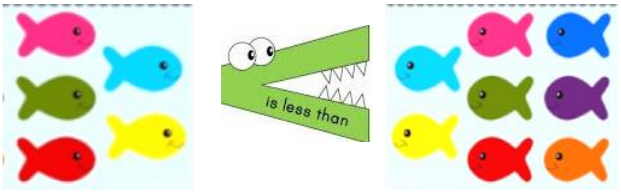
Introduction:

- "Compare" means to check if the number is greater, smaller or equal to another number.
- Draw an alligator mouth on the board.
- Say that the alligator is hungry.
- Ask the students; have you noticed anything that shows the alligator is hungry?
- Students may respond: "its mouth is open".
- Encourage the students and reinforce the idea of the open mouth.
- Draw fish on the board to show the two groups of food.
- Now tell the students that alligator is hungry and wants to eat from the group with more fish.
- Count the number of fish with more quantity and ask the students to point to the group they think is bigger.
- To show this, demonstrate to the students that how they can choose the alligator mouth.

- Ask the students to look carefully at the alligator's mouth and put it in the direction of the fish's group with more quantity.



- With the help of open mouth of alligator, introduce the symbols > greater than and < less than to the students.



- Tell the students that

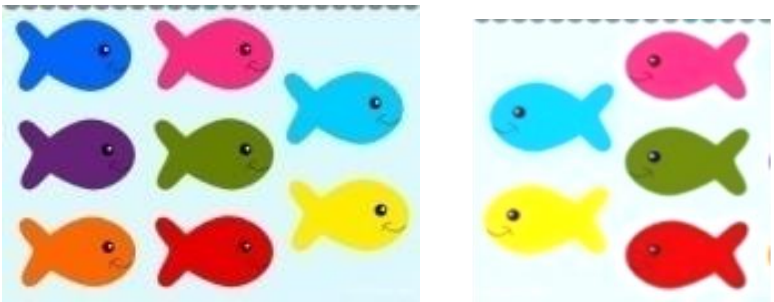
Symbol '>' is read as 'greater than'
Symbol '<' is read as 'less than'
Symbol '=' is read as 'equal to'

- Also explain textbook page 27 and 28.

Development:

Activity 1:

Demonstrate to the students with the help of example that:



When we compare the numbers first see the number having more digits is always greater than the number having less digits. e.g., 395 is greater than 26. Because there are 3-digits in 395 and only 2-digits in 26.

- For example:
  a) 152 > 35
  b) 54 < 654
  c) 799 > 99
  d) 73 < 103

- Write the following numbers on the board and ask the students to compare the numbers by putting > or <.
  a) 456 ____ 62
  b) 94 ____ 310
  c) 568 ____ 10
  d) 444 ____ 44
- Give chance to maximum students.
- At the end recap the activity for the whole class.

Activity 2:

Demonstrate with the help of example that:

- If the numbers have the same number of digits, then first we compare the digits at the greatest place or the first digit from left to right to find greater or smaller number.
- Explain to them that while comparing two 3-digit numbers, we always look for the place values of the given numbers starting from the hundreds place using place value chart.
- Write 142 and 865 on the board.
- Explain to them that both numbers have the same number of digits. So; we will find the greater or smaller number by comparing hundreds place or the first digit from left to right.

Hundreds	Tens	Ones
1	4	2
8	6	5

8 hundreds > 1 hundred

865 > 142

- Comparing the digits at hundreds place. i.e. 8 > 1
- So, 865 is greater than 142. i.e. 865 >142 or

142 < 865

- Also explain the concept from textbook page 29.
- Write the following examples on the board and solve with the help of students to find smaller and greater number.
  a) 530 > 150
  b) 315 > 213
  c) 824 < 936
  d) 765 < 857
- Now writer some more examples on the board and ask the students to compare the following numbers by putting > or <.
  a) 110 ____ 267
  b) 230 ____ 640
  c) 803 ____ 903
  d) 649 ____ 794
  e) 555 ____ 450

Activity 3:

Demonstrate with the help of following examples that:

- If the digits at the extreme left in both numbers are same then compare the next place to find greater or smaller number, if they are also same then we will compare the next place and so on.
- Explain to them if hundreds place has same digits, then we will compare the tens.
- Compare the digits in tens place, the number which has a bigger digit is greater.
- Write 691 and 654 on the board

Hundreds	Tens	Ones
6	9	1
6	5	4

6 hundreds=6 hundreds
9 tens > 5 tens
691 > 654

- Comparing the digits at hundreds place i.e. 6=6
- Now, we will compare the digits at tens place. i.e. 9>5
- So, 691 is greater than 654. i.e., 691> 654 or
  654<691
- Also explain the concept from textbook page 29 and 30.
- Write the following examples on the board and solve with the help of students to find smaller and greater number.
  a) 256 > 236
  b) 798 > 789
  c) 501 < 510
  d) 989 < 990
- Now write some more examples on the board and ask the students to compare the following numbers by putting > or <.
  a) 132 _____ 165
  b) 946 _____ 935
  c) 762 _____ 790
  d) 326 _____ 362
  e) 950 _____ 905
- If the tens place also have the same digits then we will compare the ones. The number which has a bigger digit in ones place is greater.
  For example:
  a) 156 > 154
  b) 263 > 260
  c) 638 < 639
  d) 976 < 977
- Ask the students to compare the following numbers by putting > or <.
  a) 654 ____ 658
  b) 364 ____ 360
  c) 986 ____ 989
  d) 556 ____ 555
  e) 710 ____ 719

Conclusion / Sum up:

- To show a number smaller than the other we use symbol '<' means smaller than.
- To show a number greater than the other number we use symbol '>' means greater than.
- To show a number equal to the other number we use symbol '=' means equal to.
- To check which of the two numbers is greater, first we check the number of digits. The number with more digits is always greater.
- While comparing two 3-digit numbers, we compare the digits at the hundreds place, then tens place and lastly the ones place.

Assessment:

- Ask the students to compare the following numbers by putting >, < or =

a) 156 _____ 963
b) 895 _____ 859
c) 365 _____ 653
d) 298 _____ 298

Follow up:

- Ask the students to compare the following using symbol >,< or =

a) Five hundred twenty-three ☐ fifty two
b) Seven hundred seventy ☐ two hundred and thirteen
c) Eight hundred forty-nine ☐ nine
d) Two hundred twenty-seven ☐ three hundred thirty
e) Nine hundred ninety-nine ☐ undred ninety-nine

Glossary

Compare: to find which is smaller or greater.

COMPARING AND ORDERING NUMBERS

Duration: 40 Minutes

Students Learning Outcome:

- Write the given set of numbers in ascending and descending order (numbers up to 3-digit).

Materials:

Information for Teacher:

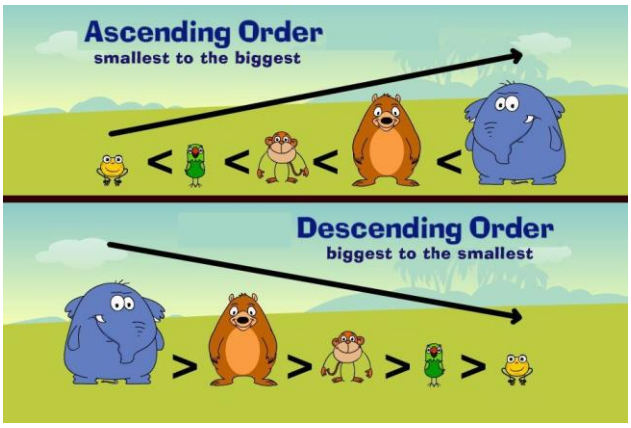
- In ascending order, numbers are arranged from the smallest to the greatest.
  For example: 10, 29, 36 are arranged in ascending order.
- In descending order, numbers are arranged from the greatest to the smallest.
  For example: 36, 29, 10 are arranged in descending order.
- To arrange the numbers in ascending or descending order we compare place values of the given numbers.

Introduction:

Explain by giving examples that:

- To arrange numbers in any order, first we need to compare them.
- Write 27, 51 and 19 on the board.
- Call a student to identify the greatest number.
- Again, ask any other student to come forward and identify the smallest number.
- Ask them to arrange these numbers in two ways:
  Smallest to greatest
  Greatest to smallest
- Take a quick review of their work and encourage them.
- Guide the students that how we arrange the numbers.
- Demonstrate that we arrange the numbers from smallest to greatest as:
  19, 27, 51, tell them this order is called “ascending order.
- We arrange the numbers from greatest to smallest as:
  51, 27, 19, tell them this order is called “descending order”.
- Also, explain textbook page no. 30 and 31.

The arrangement of smallest to greatest number is called ascending order and greatest to smallest is called descending order.



Similarly, you can arrange large numbers from smallestto greatest and greatest to smallest by comparing its place values.

- The number which has more digits is always greater and the number which has less number of digits is always smaller.
- If numbers have the same number of digits, start by comparing the digit on the left (in the hundreds, tens or ones column).
- Then, keep moving across the number from left to right to compare the digits. Keep writing them down from smallest to biggest.
- Continue until no numbers are left and they have all been ordered.
  For example, write 324, 187 and 828 on the board.

1 hundred<
187< 324<{

H	T	O
3	2	4
1	8	7
8	2	8

- Ascending order: 187,324,828
- Descending order: 828,324,187

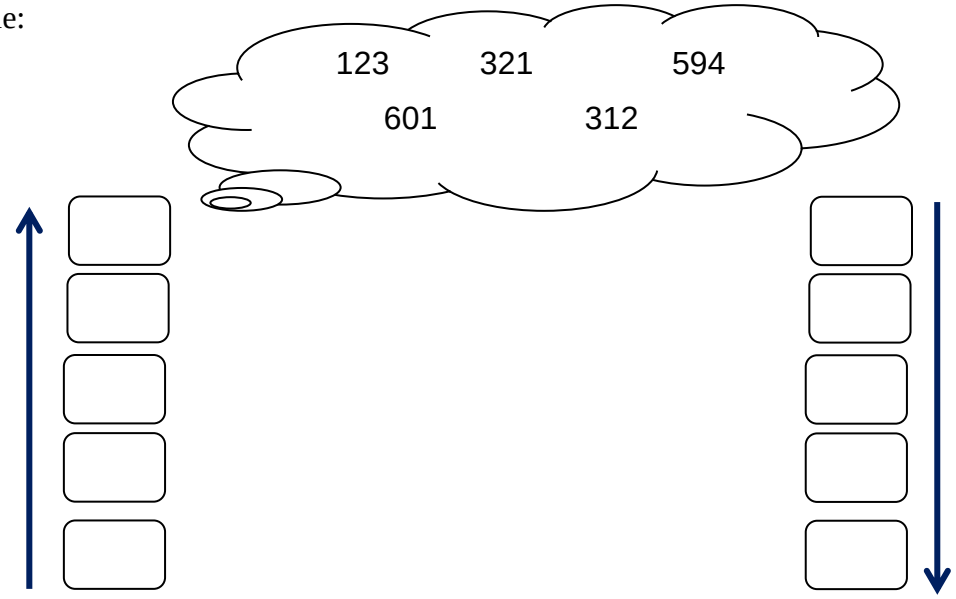
Development:

Activity 1:

- Demonstrate the method of comparing the following numbers in front of the students in the classroom:
- Write the following numbers on the board.
  585 956 264 575
- Involve the students to identify the greatest number and the smallest number.
- Ask the students to copy and encircle the greatest number and tick the smallest number in each of the following:
  a) 645 478 532 802
  b) 910 123 846 321
  c) 222 756 229 779 856
  d) 613 291 389 791 560
- Check their work and guide where necessary.

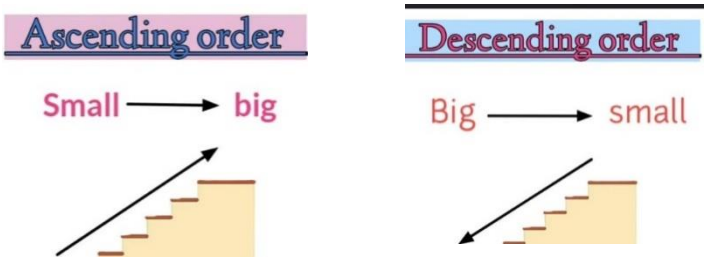
Activity 2:

- Explain how to write numbers in ascending and descending order from textbook page no. 31.
- Demonstrate the ordering of numbers in ascending and descending order to the students, for example:



Conclusion / Sum up:

- In ascending order, we arrange the numbers from smallest to greatest. Ascending means increasing (small to big).
- In descending order, we arrange the number from greatest to smallest. Descending means decreasing (big to small).



- To put the numbers in ascending or descending order we compare all the given numbers.

Assessment:

For quick assessment use textbook material for this activity that is easy to use

- Ask the students to arrange the following numbers in ascending order:
  a) 165 38 59 132
  b) 265 90 568 567
  c) 100 530 900 201
- Ask the students to arrange the following numbers in descending order:
  a) 956 587 796 120
  b) 555 55 650 65
  c) 890 109 999 989

Follow up:

Do exercise 5, Q#1 to 4 from textbook page no. 32-33 in notebook.

Glossary

Ordering numbers: Arrangement of numbers either from smallest to greatest or greatest to smallest.

Comparing numbers: To find which number is smaller or greater.

Ascending order: Arrangement of numbers from smallest to greatest e.g., 0 to 9

Descending order: Arrangement of numbers from greatest to smallest e.g., 9 to 0.

ESTIMATION

Duration: 40 Minutes

Students Learning Outcome:

- Round off a whole number to the nearest 10 and 100.

Materials:

Board, marker/chalk, Mathematics Grade 3 PCTB, notebook.

Information for Teacher:

- If the number you are rounding is followed by 5, 6, 7, 8, or 9, round the number up.
  Example: 38 rounded to the nearest ten is 40.
  276 rounded to the nearest hundred is 300.
- If the number you are rounding is followed by 0, 1, 2, 3, or 4, round the number down.
  Example: 33 rounded to the nearest ten is 30.
  634 rounded to the nearest hundred is 600.
- While teaching the lesson, also consult textbook where and when applicable.

Introduction:

Demonstrate the following that:

- When rounding a number, first need to check: what are you rounding it to?
- Numbers can be rounded to the nearest ten, the nearest hundred and so on.
- For a number in tens, we round off to tens.
- For a number in hundreds, we round off to hundreds and tens as well.
- Rounding can be done for every place-value of number. To round off a number to the nearest tens, we round off to the nearest multiple of ten. A large number may be rounded off to the nearest 10.

Rules for Rounding off to the Nearest 10:

- When rounding off a number to the nearest tens, look at the **ones digit** of the number. There are two rules of rounding off a number to the nearest 10.

Rule I: Rounding down

While rounding off to the nearest tens, if the digit in the ones place is between 0 to 4 i.e.< 5 then the ones digit is replaced by 0.

For example:

24 is 20 when rounded off to the nearest 10.

345 is 300 when rounded off to the nearest 100

- Here we moved down the numbers to the nearest ten, which is why it is called rounding down.

Rule II: Rounding Up

While rounding off to the nearest tens, if the digit in the ones place is 5 to 9 i.e., >5 or 5, then the ones place is replaced by '0' and the tens place is increased by 1.

For example:

26 is 30 when rounded off to the nearest 10.

375 is 400 when rounded off to the nearest 100.

- Here we moved up the numbers to the nearest ten, which is why it is called rounding up.
- Ask the students to solve the activity given on page 35 of Math's PCTB Textbook.
- Observe their work and recap the whole concept by giving these examples.

Development:

Activity 1:

Let's see how to round off the numbers to the nearest tens on the number line.

- Let us take a number 74.
- This number lies between 70 and 80. To round off this number, either we take it back to 70 or move it forward to 80. How do we decide where to go?
- Look at the number line below –

- The numbers that lie in the **red areas** will be rounded down to 70.
- Similarly, the numbers that lie in the green areas will be rounded up to 80.
- This is because the numbers that lie in red areas, i.e., the numbers between 71 and 74 are closer to 70 as compared to 80. Hence, they will be rounded down.
- However, the numbers that lie between 75 and 79 are closer to 80 due to which they would be rounded up to 80.
- **So, we can say that rounding off to the nearest 10 means that we wish to round off the last two digits of a number, i.e., up to the tens place of a number.**

Activity 2

Rounding off to the nearest 100:

- When rounding off a number to the nearest hundreds, look at the **tens digit** of the number.
- Rule I: Rounding down
- While rounding off to the nearest hundreds, if the digit in the tens place is between 0 to 4 i.e.< 5 then the ones and tens digit is replaced by 0.

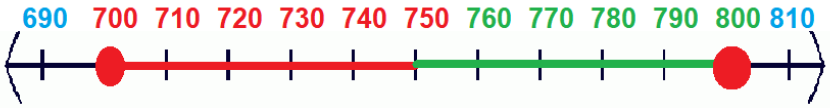
  For example:

  132 is 100 when rounded off to the nearest 100.
- Here we moved down the numbers to the nearest hundred, which is why it is called rounding down.
- Rule II: Rounding Up

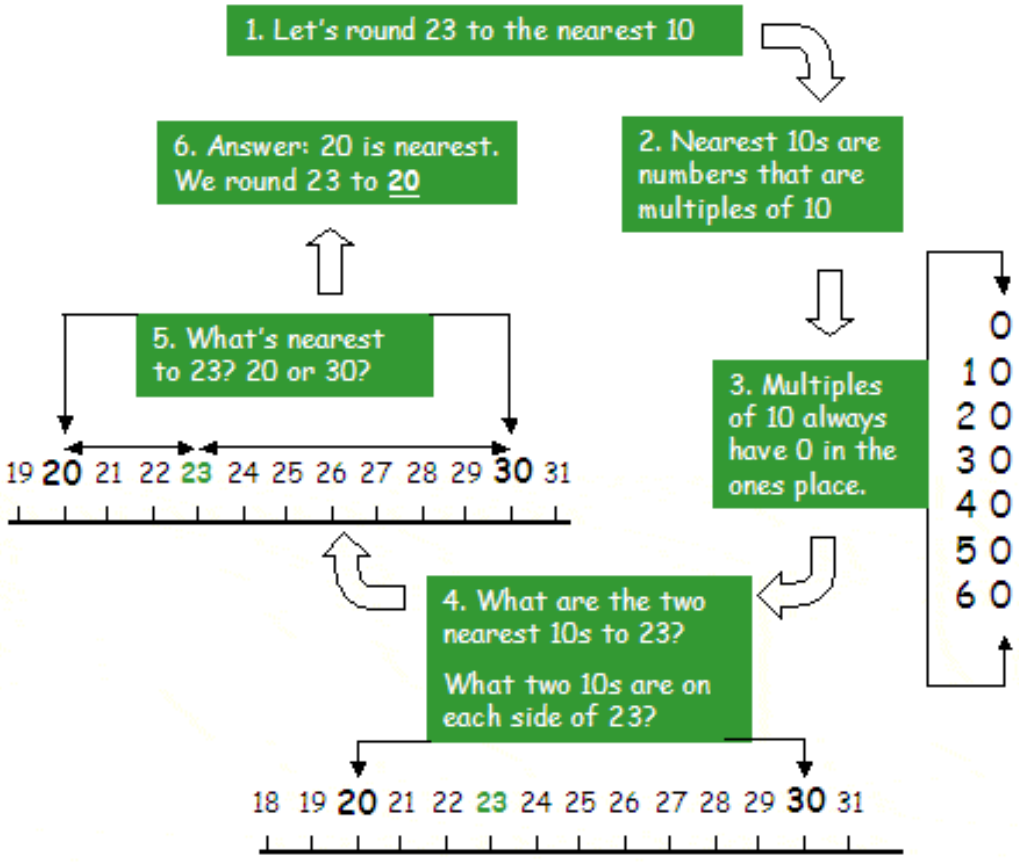
- While rounding off to the nearest hundreds, if the digit in the tens place is 5 to 9 i.e., >5 or 5, then the ones and tens place is replaced by '0' and the hundreds place is increased by 1.
  For example:
  493 is 500 when rounded off to the nearest 100.
- Here we moved up the numbers to the nearest ten, which is why it is called rounding up.

Let's see how to round off the numbers to the nearest tens on the number line.

- Let us take a number 748.
- This number lies between 700 and 800.
- To round off this number, either we take it back to 700 or move it forward to 800. How do we decide where to go?
- Look at the number line below:

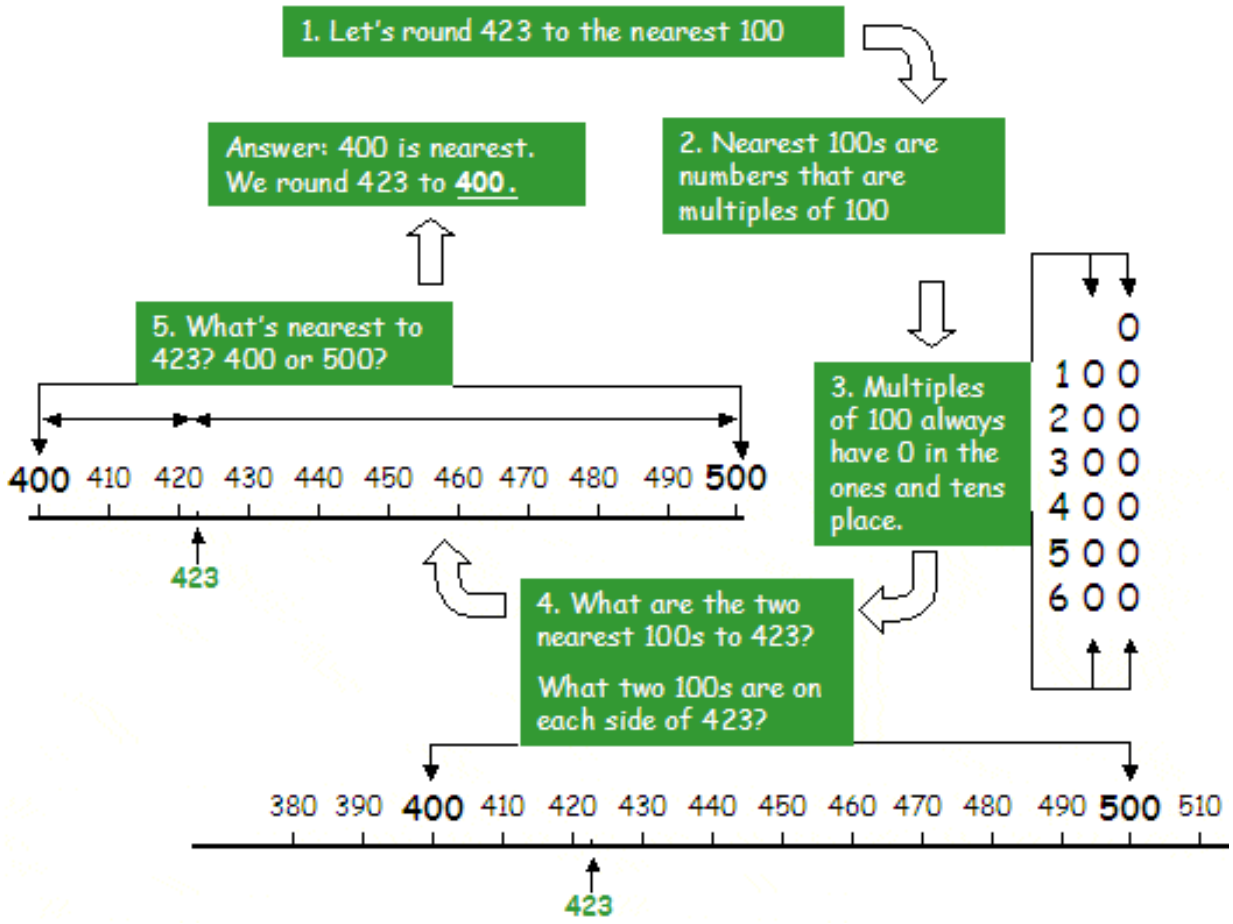


-]
- Similarly, the numbers that lie in the blue areas will be rounded up to 800.
- This is because the numbers that lie in red areas, i.e. the numbers between 701 and 749 are closer to 700 as compared to 800.
- Hence, they will be rounded down.
- However, the numbers that lie between 750 and 799 are closer to 800 due to which they would be rounded up to 800.



Activity 3:

- Demonstrate the following example on the board:



Also explain to the students the rounding off to the nearest tens and hundreds from textbook page 35-36.

Activity 4:

- Write 855 on the board.
- Ask the students, which digit we will look to round off the number to the nearest 100?
- Take their responses and tell them as we need to round off to the nearest 100 we will look for the tens digit. Here, 5 is equal to 5.
- Ask them the number will Round up or round down?
- Take their responses and tell them that we will round up855 to 900.
- Ask them; can you round off the above number to the nearest 10? (Answer will be 860)
- Correct them if needed.
- Ask the students to solve, Q#1 from textbook page 36.

Conclusion /Sum up:

- When rounding off a number to the nearest tens, look at the digit at ones place of the number. Rounding off to the nearest 10 means that we wish to round off the last two digits of a number, i.e., up to the tens place of a number.
- If that digit is 0, 1, 2, 3, or 4, you will round down to the previous tens. (Round down)

- If that digit is 5, 6, 7, 8, or 9, you will round up to the next ten. (Round Up)
- When rounding off a number to the nearest hundred, look at the tens digit of the number.
- If that digit is 0, 1, 2, 3, or 4, you will round down to the previous hundred. (Round down)
- If that digit is 5, 6, 7, 8, or 9, you will round up to the next hundred. (Round Up)

Assessment:

Ask the students to solve Q#1from textbook page 37.

Follow up:

Ask the students to solve Q#2, 3and 4 from textbook page 37.

Glossary

Rounding: making a number simpler but keeping its value close to what it was.
Round down: round to the previous lower number
Round up: round to the next higher number.

ADDITION OF 4–DIGIT NUMBERS (WITH AND WITHOUT CARRYING)

Duration: 40 Minutes

Students Learning Outcome:

- Add numbers up to 4 - digit with and without carrying.

Materials:

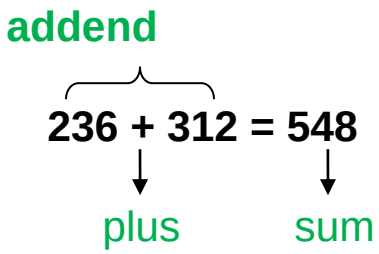
Board, marker/chalk, Math's Grade 3 PCTB, notebook.

Information for Teacher:

- Addition is the process of finding the total or sum by adding two or more numbers.
- To add the two numbers, we use the symbol "+".
- The numbers which are added are called addends and the result obtained is called sum.
- An example of addition is: 5 + 8 = 13. We read it as 5 plus 8 equals to 13.
  Here, 5 and 8 are addends and 13 is the sum.

Introduction:

- The process of addition is taking two or more numbers and adding them together, that is, it is the total sum of two or more numbers.
- Addition is shown using the '+' symbol.
- The addition formula that we use to write an addition fact is addend + addend = sum; where: Addends are the numbers that are added, i.e., on which the addition operation is performed.
- Sum is the final answer that we get after the addition.
- We use two symbols while performing addition, one is a plus sign (+) and the other is the 'equal to' sign (=)
- For example, if we add 236 and 312, (236 + 312) we get the sum as 548. Here, we performed the addition operation on two numbers 236 and 312 to get the sum, i.e., 548.



- Other names for Addition are Sum, Plus, Increase, Total,etc.
- For adding large numbers, we split the numbers into columns using their respective place values, like ones, tens, hundreds, thousands, and so on.
- We always start adding from the ones digit and move towards the digits at the highest place (right to left).
- While solving such problems we may come across some cases with carry-overs and some without carry-overs.
- Let us understand the two processes with help of examples.
- Demonstrate the concept of addition up to 4-digits without carrying from textbook page 42 and addition up to 4-digits with carrying from textbook page 42 and 43.

Development:

Activity 1:

Demonstrate with the help of following examples on the board:

- Add 1,547 and 5,231.
- Tell them that 1,547 and 5,231are addends.
- Adding these means to find the sum or total of the given numbers.
- To find the sum we will write these numbers in their respective columns using place value chart; or we write the numbers one on top of the other.

	Th	H	T	O
	1	5	4	7
+	5	2	3	1

(Start adding from right to left)

- Step I: Add the ones. 7 + 1 = 8. Write 8 in ones column.
- Step II: Add the tens. 4 + 3 = 7. Write 7 in tens column.
- Step III: Add the hundreds. 5 + 2 = 7. Write 7 in hundreds column.
- Step IV: Add the thousands. 1 + 5 = 6. Write 6 in thousands column.

	Th	H	T	O
	1	5	4	7
+	5	2	3	1
	6	7	7	8

- Tell them that in addition we simply add digits in each place value column and get the answer.
- Recap the whole concept by giving different examples:
  a) Add 1, 026 and 8,532
  b) Add 5,123 and 4,321
- Also explain to them the fun facts that:
- Adding 0 to any number gives the sum as the number itself. E.g., 5+0=5
- Adding 1 to a number repeatedly is the same as counting. E.g., 3+1=4, 4+1=5, 5+1=6 and so on.
- Ask the students to add the followings:
  a) 4,302 and 2,165
  b) 1,384 and 6,615

Activity 2:

Demonstrate with the help of following examples on the board:

Th	H	T	O
6	1	9	6
+ 3	0	2	5

- Add 6,196 and 3,025.
- Tell them to find the sum we will write these numbers in their respective columns using place value chart; or we write the numbers one on top of the other.
- Step I: Add the ones. 6 + 5 = 11 ones = 1 ten and 1 one. Write 1 in ones column and carry 1 to the tens column.
- Step II: Add the tens. 9 + 2 + 1 (carry over) = 12 tens = 1 hundreds and 2 tens. Write 2 in tens column and carry 1 to the hundreds column.
- Step III: Add the hundreds. 1 + 0 + 1 (carry over) = 2 hundreds. Write 2 in the hundreds column.
- Step IV: Add the thousands. 6 + 3 = 9 thousands. Write 9 in the thousands column.

	1	1	
Th	H	T	O
6	1	9	6
+ 3	0	2	5
9	2	2	1

- Explain to them that anytime an answer in a column is 10 or more, we will regroup.
- Recap the whole concept by giving different examples:
  a) Add 8,604 and 1,095
  b) Add 2,191 and 5,958
- Ask the students to add the followings:
  a) 7,098 and 2,892
  b) 5,346 and 9,517

Conclusion:

- The process of addition is taking two or more numbers and adding them together, i.e., it is the total sum of two or more numbers.
- Addition is shown using the '+' symbol.
- The addition formula that we use to write an addition fact is addend + addend = sum.
- Sum is the final answer that we get after the addition.
- To add, write the numbers in their respective columns using place value chart or write the numbers one on top of the other.
- We always start adding from the right side i.e.,ones place to the highest place (right to left).
- Addition without carrying is when the digits add up to a number that is 9 or less. The answer can simply be written below each place value column. There is no carrying of tens or hundreds.
- While addition with carrying is when the digits add up to a number is 10 or more then the number will be carried over to the next place value column.
- Adding 0 to any number gives the sum as the number itself. E.g., 5+0=5
- Adding 1 to a number repeatedly is the same as counting. E.g., 3+1=4, 4+1=5, 5+1=6 and so on.

Assessment:

Write the following questions on the board and ask the students to add:

a) 5 6 8 9 + 8 2 6 8	b) 8 0 1 6 + 1 9 9 5
c) 2 1 6 7 + 3 5 2 1	d) 1 9 2 7 + 7 0 1 2
e) 9,036 and 5,597	f) 3, 125 and 1,356

Follow up:

Ask the students to solve exercise 1, Q#1 and 2 from textbook page 46.

Glossary

Addition: the process of calculating the total of two or more numbers

Carry over: to transfer (an amount) to the next column

Vertical: it is an alignment in which the top is always above the bottom.

Vertical Addition: it is a method of adding numbers lined up in columns according to their place values.

ADD NUMBERS UP TO 100 USING MENTAL STRATEGIES

Duration: 40 Minutes

Students Learning Outcome:

- Add number up to 100 using mental calculations.

Materials:

Board, marker/chalk, Math's Grade 3 PCTB, notebook.

Information for Teacher:

Mental mathematics strategies are the foundations for most of the areas of mathematics that use numbers. Without efficient mental strategies, children can often struggle to quickly and fluently calculate.
Mental strategies are also the foundation of any written or formal method in mathematics.
Mental mathematics strategies are accepted ways of working mathematics out in your head that help us take shortcuts and get to the correct answer in an efficient way.

Introduction:

- Explain to the students that mental math is about performing math calculations in your head without using a pencil or paper.
- Using mental math with addition involves breaking up the numbers into its separate parts and then adding up the matching parts and then adding up the sums to find the answer.
- To add two numbers mentally, add the digits separately.
- For adding two 2-digit numbers, split the numbers into tens and ones column.
- Add the tens column and then the ones (or ones column then the tens column) separately.
- The answer ends in the same digit that the sum of the ones column ends in.
- Demonstrate the concept from textbook page 45.

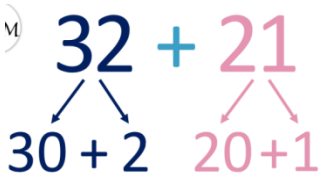
Development:

Activity 1:

Demonstrate with the help of following example:

- Add 32 and 21.
- First break the numbers as:
  32 into its tens and ones. i.e., 30+2

21 into its tens and ones. i.e., 20+1



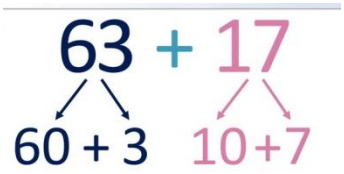
- Now add the ones place digits (2 + 1 = 3).
- Next add the tens place digits (3 + 2 = 5).
- The sum of the ones place digits is less than 10, so the answer is 53.
- Ask the students to add using mental strategies:
  a) 12 + 13 = _____
  b) 50 + 39 = _____
  c) 75 + 24 = _____
  d) 64 + 24 = _____

Activity 2:

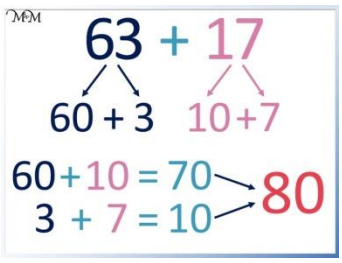
Demonstrate with the help of following example:

- Add 63 and 17.
- First break the numbers as:

63 into its tens and ones. i.e. 60+3
17 into its tens and ones. i.e. 10+7



- Now add the ones' place digits (3 + 7 = 10).
- Next add the tens' place digits (6 + 1 = 7).
- The sum of the ones' place digits is 10 i.e., 1 tens and 0 ones
- Add the 1 tens to 7 tens=70+10=80
- So, 63 + 17 = 80



- Ask the students to add using mental strategies:
  e) 59+ 13 = _____
  f) 22 + 29 = _____
  g) 75 + 15 = _____
  h) 55 + 35 = _____

Conclusion/Sum up:

- Add the digits in the tens column together and remember this result.
- Add the digits in the ones column together.
- Only hold the result of tens column in our head while we add the ones column.
- If this result is greater than 10 then add '1' to your tens column answer and the final answer will end in the remaining ones.

Assessment:

Ask the students to add the following using mental strategies:

a) 12 + 55 = _____
b) 46 + 26 = _____
c) 37 + 29 = _____
d) 71 + 19 = _____
e) 24 + 37 = _____

Follow up:

Solve exercise 1, Q#8 from textbook page 48.

Glossary

Break up: to decompose the number into its tens and ones.

Teacher Guide
Grade-3

Lesson Plan
12

ADDITION OF 4–DIGIT NUMBERS (WITH AND WITHOUT CARRYING)

Duration: 40 Minutes

Students Learning Outcome:

- Solve real life number stories up to 4-digit with and without carrying involving addition.

Materials:

Board, marker/chalk, Math's Grade 3 PCTB, notebook.

Information for Teacher:

- A word problem is a situation explained in words that can be solved using math.
- Real life problems mean the situations or problems happening in the real world.
- Through real world application, students are able to better comprehend the practical application.
- Some of the most popular key words for word problems are altogether, both, combined, total, more and additional.
- While teaching the lesson, also consult textbook where and when applicable.

Introduction:

- Open page # 42 of the Math's PCTB textbook and call any student to read the word problem in front of the class.
- Ask the students: how can we solve this question?
- Write the given and required information from the word problem like this:
- Number of mango trees= 3516
- Number of guava trees= 2322
- Tell the students that the word 'total' means to add the numbers. So, we will do addition and find the total number of trees.

Number of mango trees=	3	5	1	6	
Number of guava trees=	+	2	3	2	2
Total number of trees	=				

- Ask any student to solve the question on the board like this:

Number of mango trees=	3	5	1	6
Number of guava trees= +	2	3	2	2
Total number of trees =	5	8	3	8

- Check the work and tell the students that these types of questions are called real life problems or word problems. Also, we called them story based questions.
- Tell the students that let us practice different real life problems involving addition (with and without carrying).
- Solving real life problems, the following points will be focused(write them on the board).
- Read the question statement at least twice.
- Highlight any numbers or figures (given information).
- Write a sum from this information and work it out.
- Re-read the question statement.
- Re-check the answer.
- At the end, ask any student to repeat the points orally in front of the class.

Development:

Activity 1:

- Write the number story from textbook page 43 on the board.
- Read the question and ask the students to tell the given and required information.
- How much the grocer sold on Tuesday?
- How much the grocer sold on Wednesday?
- What we have to find?
- How can you solve this question?
- Collect their response and ask them to solve the questions in their notebooks.

Sale of vegetable on Tuesday =	2	5	4	6
Sale of vegetable on Wednesday= +	3	4	4	3
Total sale =				

- Move through the class to check the work and correct mistakes if any.
- On completion, solve the question on the board. Also introduce the words like ‘total’, ‘sum’, ‘altogether’ so that they could easily understand and solve the question.

Activity 2:

- Divide the students in groups of 3 to 4.
- Write the real life problem from textbook page 43 on the board.

Areeba has amount=	6	3	8	6
Affan has amount = +	2	4	2	4
Total amount =				

- Ask the students to solve the question in their notebooks using the guidelines explained in activity 1.
- Check the answer of any student from each group.

- Then ask those students to check the work of remaining students.
- At the end, announce the winner group having the students with more correct answers.
- Appreciate that group and ask the remaining groups to recheck their work and correct the mistakes.

Activity 3:

- Write the real life problem from textbook page 45 on the board.
- Call a student on the board and ask him/her to write the given or required information.
- Call another student on the board and ask him/her to write the given figures.
- Ask the whole class: how can you solve the question?
- Collect their response and call another student on the board to add the following numbers.
- Help him/her if needed.
- At the end, ask the whole class to re-read the question statement and recheck the answer.

Conclusion:

- Solving real life problems, the following points will be focused:
- Read the question statement at least twice.
- Highlight any numbers or figures (given information).
- Write a sum from this information and work it out.
- Re-read the question statement.
- Re-check the answer.

Assessment:

- Write the following word problem on the board and ask the students to solve it in their notebooks.
- There are 3,450 girls and 5,698 boys in a school. Find the total number of children in a school.
- Take a quick round and check their work.

Follow up:

- Ask your father about the recent utility bills (electricity, gas, water). Find out the total amount of all the bills.
- Ask the students to solve, Q#3 to 7 given in the textbook page 47-48.

Glossary

Word problem: it is a situation explained in words that can be solved using math.

ADDITION OF 4–DIGIT NUMBERS (WITH AND WITHOUT CARRYING)

Duration: 40 Minutes

Students Learning Outcome:

- Subtraction of 4–digit numbers with and without borrowing

Materials:

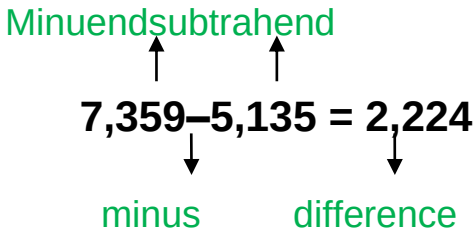
Board, marker/chalk, Math's Grade 3 PCTB, notebook.

Information for Teacher:

- Subtraction is the process of taking away a number from another.
- To subtract the two numbers, we use the symbol "-".
- A number from which another number is to be subtracted is called "minuend".
- A number to be subtracted from another is called "subtrahend".
- The result of subtraction is called "difference".
- An example of subtraction is: 9 - 5 = 4. We read it as 9 minus 5 equals to 4. Here, 9 is the minuend, 5 is the subtrahend and 4 is the difference.
- While teaching the lesson, also consult textbook where and when applicable.

Introduction:

- The process of subtraction is taking away a number from another.
- It is the method of calculating the difference between two numbers.
- To subtract the two numbers, we use the '-' symbol.
- The subtraction formula that we use to write subtraction fact is: Minuend - subtrahend = difference; where: minuend and subtrahend are the numbers that are subtracted, i.e., on which the subtraction operation is performed.
- Difference is the final answer that we get after the subtraction.
- We use two symbols while performing subtraction, one is a minus sign (-) and the other is the 'equal to' sign (=)
- Remember, that in subtraction, we always subtract the smaller number from the larger number to get the correct answer.



- Words like "minus", "less", "difference", "decrease", "take Away" shows that you need to subtract one number from another.
- Subtracting 0 from any number gives the number itself as the difference.
- When 1 is subtracted from any number, the difference equals the predecessor of the number. A predecessor is a number that comes just before a particular number. E.g., 5-1=4, 6-1=5
- For subtracting larger numbers, we split the numbers into columns using their respective place values, like Ones, Tens, Hundreds, Thousands, and so on.
- We always start subtracting from the ones digit and move towards the digits at the highest place (right to left).

Th	H	T	O
7 - 5	3 1	5 3	9 5
2	2	2	4

- While solving such problems we may encounter some cases with borrowing and some without borrowing.
- Let us understand the two processes with help of examples.

Development:

Activity 1:

Demonstrate with the help of example given in the textbook page 50 on the board

- Subtract 4,342 from 8,984.
- Tell them that 4,342 is smaller than 8,984. So, we will subtract 4,432 from 8,984.
- Here the smaller number 4,342 is subtrahend (i.e., a number to be subtracted from another number) and the greater number 8,984 is minuend (i.e., a number from which another number is to be subtracted).
- Subtracting these numbers means to find the difference of the given numbers.
- While writing the numbers in their respective columns we will always put the greater number (minuend) above the smaller number (subtrahend).
- To find the difference we will write these numbers in their respective columns using place value chart;

Th	H	T	O
8	9	8	4
-	3	4	2
4			

Minuend Subtrahend(Start subtracting from the right)

- Step 1: Subtract ones from ones. 4 – 2 = 2. Write 2 in ones columns.
- Step 2: Subtract tens from tens. 8 – 4 = 4. Write 4 in tens columns.
- Step 3: Subtract hundreds from hundreds. 9 - 3 = 6. Write 6 in hundreds column.
- Step 4: Subtract thousands from thousands. 8 - 4 = 4. Write 4 in thousands column.

Th	H	T	O
8	9	8	4
-	3	4	2
4			
4	6	4	2

Difference

- Tell them that in subtraction without borrowing, we simply subtract the digits in each place value column and get the answer.
- Recap the whole concept by giving different examples on the board:
  a) Subtract 1,216 from 8,966
  b) Subtract 5,036 from 9,547
- Also explain to them the fun facts that:
- Subtracting 0 from any number gives the number itself as the difference. E.g., 6-0=6
- When 1 is subtracted from any number, the difference equals the predecessor of the number. A predecessor is a number that comes just before a particular number. E.g., 5-1=4, 6-1=5
- Ask the students to subtract the following numbers:
  a) 4,011 from 8,235
  b) 9,010 from 9,395
- Write the answers of the above questions on the board and ask the students to match their answers and correct if needed.

Activity 2:

Demonstrate with the help of example given in textbook page 53 on the board:

- Find the difference between 7,650 and 2,586.
- Ask the students what will we do first to solve this question?
- After taking their response, tell them that to find the difference we will write these numbers in their respective columns using place value chart.
- Ask them; which number is minuend?
- Which number is subtrahend?
- Now ask: which number will be written first? (answer will be 7,650)
- Tell them that greater number is always written first.
- Explain to them that we always start subtracting from right and move to left.

Th	H	T	O
7 - 2	~~5~~ 6 5	**10** ~~4~~ 5 8	**10** 0 6
5	0	6	4

- Step 1: Start subtracting the digits at ones place. We can see that 6 is greater than 0. So, we will borrow 1 from the tens column which will make it 10. Now, 10 - 6 = 4 ones. Write 4 in ones column.
- Step 2: After giving 1 to the ones column in the previous step, 5 becomes 4. Now, let us subtract the digits at the tens place i.e. (4 - 8). Here, 8 is greater than 4, so we will borrow 1 from the hundreds column. This will make it 14. So, 14 - 8 = 6 tens. Write 6 in tens column.
- Step 3: In step 2, we had given 1 to the tens column, so we are left with 5 at the hundreds place. To subtract the digits at the hundreds place, i.e., (5 - 5). Here 5 is equal to 5. So, 5 - 5 = 0 hundreds. Write 0 in the hundreds column.
- Step 4: Lastly, subtract the thousands column i.e. 7 – 2=5. Write 5 in the thousand column.
- Therefore, the difference between the two numbers is 5,064.
- Also tell them that this process is called subtraction with borrowing
- Recap the whole concept by giving different examples:
    a) Find the difference between 9,653 and 2,966
    b) Find the difference between 4,736 and 3,879

Conclusion:

- Subtraction is taking away a number from another.
- To subtract the two numbers, we use the '-' symbol. We read it as 'minus'
- The subtraction formula that we use to write subtraction fact is:
  minuend - subtrahend = difference; where: minuend and subtrahend are the numbers that are subtracted. Minuend is always the greater number and subtrahend is the smaller number.
- Difference is the final answer that we get after the subtraction.
- In subtraction, we arrange the numbers in columns according to the place value and then subtract the digits in the same order (starting from ones place).
- If the minuend is smaller than the subtrahend, we borrow 1 number from the preceding/next column to make the minuend bigger than the subtrahend, until we reach the last column.
- Words like "minus", "less", "difference", "decrease", "take away" are used for subtraction**.**
- Subtracting 0 from any number gives the number itself as the difference.
- When 1 is subtracted from any number, the difference equals the predecessor of the number.

Assessment:

Write the following questions on the board and ask the students to solve in their notebooks:

- Subtract 4,563 from 9,789
- Find the difference between 6,045 and 4,585
- Solve 3,812 – 1,051
- Take a quick round and check their work.

Follow up:

Ask the students to solve exercise 2, Q#1 (i-xii) from textbook page 55.

Glossary

Subtraction: It is the process of taking away a number from another.
Minuend: The number from which the other number is subtracted
Subtrahend: The number which is to be subtracted from the minuend
Difference: the final result after subtracting from the minuend
Regrouping: When you make groups of ten when performing operations such as addition or subtraction
Borrow: To take amounts from one number and assign them to the next
Predecessor: A number that comes just before a particular number.

SUBTRACTION OF NUMBERS UP TO 100 USING MENTAL STRATEGIES

Duration: 40 Minutes

Students Learning Outcome:

- Subtract numbers up to 100 using mental calculations.

Materials:

Board, marker/chalk, Math's Grade 3 PCTB, notebook.

Information for Teacher:

- Mental calculation is a skill that not only helps us to become better at computation but it also enhances the development of number concepts.
- Using mental calculation, we subtract the number by some shortcut methods without solving it on paper.
- While teaching the lesson, also consult textbook where and when applicable.

Introduction:

- Explain to the students that mental math is about performing math calculations in your head without using a pencil or paper.
- Using mental math with subtraction involves breaking up the numbers into its separate parts and then subtracting up the matching parts.
- To subtract two numbers mentally, subtract the digits separately.
- For subtracting two 2-digit numbers, split the numbers into tens and ones.
- Subtract the tens and then the ones (or ones then the tens) separately.
- The answer ends in the same digit that the difference of the ones ends in.
- Let us practice some examples.

Development:

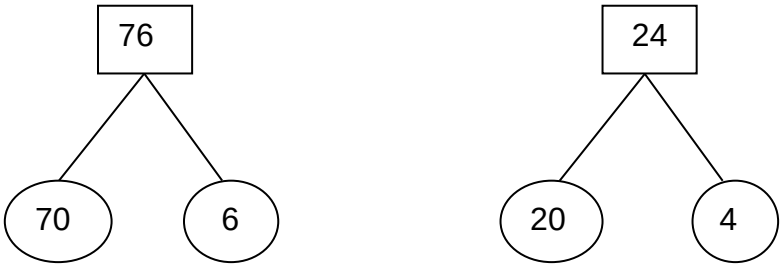
Activity 1:

Demonstrate the example given in textbook page 54 on the board

- Write 76 – 24 on the board.
- Ask the students, can you solve it mentally?

- Collect their feedback and tell them that we have a simple method to solve it mentally.
- First break up the numbers into ‘tens’ and ‘ones’.

–



- Ask any student to tell how many ‘tens’ and ‘ones’ are in 76 and 24.
- Write the strategy on the board like this.
  76 = 7 tens + 6 ones
  24 = 2 tens + 4 ones
- Tell the students to subtract ones from ones and tens from tens.
  7 tens – 2 tens = 5 tens
  6 ones – 4 ones = 2 ones
- At the end, write the two answers as:
  5 tens 2 ones = 52
  So the required answer is 52.
- Tell the students let us practice some more questions.

Activity 2:

Demonstrate the example given in textbook page 54 on the board.

- Find the difference between 48 and 27.
- Ask the whole class, which number is minuend?
- Which number is subtrahend?
- Call two students on the board one by one and ask him/her to write the strategy on the board like this.
  48 = 4 tens + 8 ones
  27 = 2 tens + 7 ones
  Subtract tens from tens i.e., 4 – 2 = 2
  Subtract ones from ones i.e., 8 – 7 = 1
  Now first write ‘tens’ and then ‘ones’ (from left to right) i.e., 21
  So, the difference between the two numbers is 21.
- Repeat this activity for some more numbers by involving maximum students.

Activity 3:

- Write the following questions on the board:
  a) 95 - 53 = _____
  b) 56 – 31 = _____
- Divide the students in pairs and ask them to solve these questions using mental calculations.
- Check their work and guide them.
- Recap the use of mental calculation method and write the correct answers on the board.

Conclusion/Sum up:

- First break up the numbers into ‘tens’ and ‘ones’.
- Then subtract tens from tens and ones from ones.

- At the end first write tens and then ones (from left to write).

Assessment:

- Write the following questions on the board and ask the students to solve in their notebooks using mental strategy.
  a) 56 - 26 = _____
  b) 29 - 15 = _____
  c) 74 – 20 = _____
- Check their work and correct them if needed.

Follow up:

Ask the students to solve exercise 2, Q#2 (i-vi) from textbook page 56.

Glossary

Break up: to decompose the number into its tens and ones.

Teacher Guide
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Lesson Plan
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SUBTRACTION OF 4–DIGIT NUMBERS (WITH AND WITHOUT BORROWING)

Duration: 40 Minutes

Students Learning Outcome:

- Solve real life number stories up to 4-digit with and without borrowing involving subtraction.

Materials:

Board, marker/chalk, Math's Grade 3 PCTB, notebook.

Information for Teacher:

- A word problem is a situation explained in words that can be solved using math.
- Real life problems mean the situations or problems happening in the real world.
- Solving word problems students are able to better comprehend the practical application of mathematics.
- Some of the most popular keywords for word problems are subtract, minus, take away, less/fewer than, difference, decrease and left etc.
- While teaching the lesson, also consult textbook where and when applicable.

Introduction:

- Ask the students, have you learnt about real life problems involving subtraction in the previous class?
- Collect their feedback and illustrate the word problem given on page # 49 of mathematics PCTB textbook.
- Call a student to read the word problem in front of the class.
- Write the given information on the board

Total amount Amount paid	9 8 9 9 7 5 4 5
Amount left	

- Ask the students; how much money Zubair had?
- How much did he pay for the household things?
- What we have to find?

- After this, call any student on the board and ask him/her to solve this question. Provide guidance if necessary.
- Explain to the students that in solving real life problems, the following points will be focused:
  - Read the question statement twice.
  - Highlight any numbers or figures.
  - Highlight the words or phrases that let you know which operation to use (required information).
- In this question we have to find out "amount left" that means "subtraction "operation.

Total amount Amount paid	9 8 9 9 - 7 5 4 5
Amount left	2 3 5 4

- Re-read the question statement.
- Re-check the answer.
- Ask the students if they have any confusion in understanding the concept.
- Collect their feedback and provide further guidance if necessary.
- Tell the students that now we will practice more real life problems involving subtraction (with and without borrowing).

Development:

Activity 1:

Demonstrate the given example from textbook page 51 on the board.

- Ask the students to read the question twice very carefully.
- After this, ask the following questions from the students:
- What is the given information?
- What is the required information?
- How can we solve it?
- Collect their feedback and solve the question on the board with the help of the students.
- Ensure that the students are paying full attention towards the board.
- At the end, repeat the procedure to have the student's strong grip on the concept.

Activity 2:

Demonstrate the given example from textbook page 51 on the board.

- Ask the students to read the question twice very carefully.
- After this, call a student on the board and ask him/her to write the given or required information like this:

  Number of coins Ali has = 2 3 5 4
  Number of coins Wali has = 1 2 6 0
  How much more coins Ali have than Wali?
- Ask the whole class: How can we solve it?
- Which operation is required to solve the sum?
- Collect their feedback and appreciate their participation.
- Now call another student on the board and ask him/her to solve the following sum like this:

2 10

Number of coins Ali has = 2 3 ~~5~~ 4
Number of coins Wali has = - 1 2 6 0
Difference = 1 0 9 4

- Provide guidance if necessary.
- Recap the whole activity with another example given in textbook page 53 on the board.

Conclusion:

- Solving real life problems, the following points will be focused:
- Read the question statement twice.
- Highlight any numbers or figures.
- Highlight the words or phrases that let you know which operation to use (required information).
- Re-read the question statement.
- Re-check the answer.

Assessment:

- Ask the students to solve Q#6 from textbook page 56 in their notebooks.
- Check the work of some students.
- Ask the students to check the work of remaining students.
- In this way, the assessment of all the students will be done and their work will be checked.

Follow up:

- Ask your father abut monthly income and ask your mother about monthly household expense. Find out how many rupees your father is saving per month.
- Ask the students to solve the questions given in textbook page 56.

Glossary

Word problem: It is a situation explained in words that can be solved using math.

TABLES OF 6, 7, 8 AND 9

Duration: 40 Minutes

Students Learning Outcome:

- Develop multiplication tables for 6, 7, 8, and 9.

Materials:

Board, marker/chalk, chart paper, Math's Grade 3 PCTB, notebook.

Information for Teacher:

- Multiplication is a process of repeated addition.
  For example, 6 + 6 + 6 = 3 × 6 = 18. We read it as, 3 times 6 is equals to 18.
- Multiplication can be interpreted as equal groups of a number.
- Ensure that students have mastered the multiplication tables of 2, 3, 4 and 5 before moving on to 6,7,8 and 9 times table.
- Tables of 6, 7, 8 and 9 shows the values we get when the number 6, 7, 8 and 9are multiplied by other whole numbers.

Table of 6	Table of 7	Table of 8	Table of 9
6 × 1 = 6	7 × 1 = 7	8 × 1 = 8	9 × 1 = 9
6 × 2 = 12	7 × 2 = 14	8 × 2 = 16	9 × 2 = 18
6 × 3 = 18	7 × 3 = 21	8 × 3 = 24	9 × 3 = 27
6 × 4 = 24	7 × 4 = 28	8 × 4 = 32	9 × 4 = 36
6 × 5 = 30	7 × 5 = 35	8 × 5 = 40	9 × 5 = 45
6 × 6 = 36	7 × 6 = 42	8 × 6 = 48	9 × 6 = 54
6 × 7 = 42	7 × 7 = 49	8 × 7 = 56	9 × 7 = 63
6 × 8 = 48	7 × 8 = 56	8 × 8 = 64	9 × 8 = 72

6 × 9 = 54	7 × 9 = 63	8 × 9 = 72	9 × 9 = 81
6 × 10 = 60	7 × 10 = 70	8 × 10 = 80	9 × 10 = 90

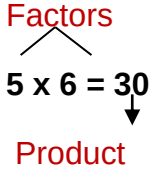
- While teaching the lesson, also consult textbook where and when applicable.

Introduction:

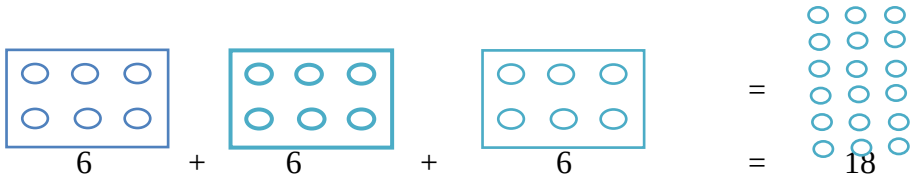
Multiplication Tables Tricks

- Any number multiplied by zero is zero e.g., 0 x 6 = 0
- Any number multiplied by 1 is itself e.g., 1 x 6 = 6
- Any number multiplied by 2 will be an even number e.g., 2 x 6 = 12
- When you multiply a number by two, you just double that numbere.g., 2 x 6 = 6 + 6 = 12 or 2 x 7 = 7 + 7 = 14.
- Any number multiplied by 5 will always end in 0 or 5 e.g., 5 x 6 = 30 or 5 x 7 = 35
- To multiply any number by 10, simply add a zero to the end e.g., 10 x 6 = 60 or 10 x 8 = 80

- Tell the students that multiplication tables will help to:
  Solve problems quickly.
- Multiplication is a process of repeated addition.
- Instead of adding the same number over and over again, an easier way to reach an answer is to use multiplication.
- We use the symbol ‘x’ for the multiplication and read it as times.
  For example: 5 x 6 = 30
  We read it as;
  Five times six equals thirty or
  Five multiplied by six equals thirty or
  Five sixes are thirty or
  If you multiply 5 by 6 you get thirty
- The numbers that are being multiplied are called factors. And the result of multiplying these factors is called product.
  For example, in 5 x 6 = 30



- If you switch the order in which you multiply two numbers, the product will not change.
  For example: 5 x 6 = 30is the same as 6 x 5 = 30. Or

- It can also be written in repeated addition as 6 + 6+ 6+ 6+ 6 = 30.
- Demonstrate the example given on textbook page 57 on the board.
- Ask the students the following questions and underline the given information:
  How many boxes do Faheem have?
  How many chocolates are there in each box? And tell them that each box means 1 box.
- Now, draw 3 boxes each having 6 chocolates on the board like this:
- 

(Repeated addition)

Or

3 x 6 = 18

(Multiplication)

- Tell the students to find the total number of chocolates, we will add them or we can also write it as 3 x 6 = 3 times 6 = 18
- Thus, there are 18 chocolates in 3 boxes.
- Display the following chart in front of the class.
- Also explain to the students that they can learn the multiplication tables using the above tricks.

Development:

Activity 1:

- Display the following chart in front of the class and ask them to read aloud after you.

6 TIMES TABLE

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

- Ask the students: have you noticed something similar about the products?
- Take their responses and tell them that the ones place of first five products ends in digits 6, 2, 8, 4 and 0. This pattern continues in the second half of the 6 times table too.
- Demonstrate that, if we keep adding 6 to the previous product, we get the 6 times table as shown on textbook page 57.
- Explain the key fact given in textbook page 57.
- Call a student on the board and ask him/her to say 6 times table from the chart.
- Help the students to learn the 6 times table.

- Write the following questions on the board and solve with the help of students:
  a) 2 x 6 = _____
  b) 5 x 6 = _____
  c) 9 x 6 = _____

Activity 2:

- Display the following chart in front of the class and ask them to read aloud after you.

7 TIMES TABLE

7 x 1 = 7
7 x 2 = 14
7 x 3 = 21
7 x 4 = 28
7 x 5 = 35
7 x 6 = 42
7 x 7 = 49
7 x 8 = 56
7 x 9 = 63
7 x 10 = 70

- Demonstrate that, if we keep adding 7 to the previous product, we get the 7 times table as shown on textbook page 58.
- Revise the 7 times table.
- Write the following questions on the board and solve with the help of students.
  a) 2 x 7 = _____
  b) 5 x 7 = _____
  c) 7 x 7 = _____

Activity 3:

- Explain the fact that the number 8 is just the number 4 doubled. So an easy way to get the products of the 8 times table is to double the products of the 4 times table.
- Let's find out with the help of the following example:
- Write 8 x 5 on the board.
- Tell the students, to find the product of 8 x 5, first find the product of 4 x 5.
- Ask the students, do you know what is the product of4 x 5?
- Collect their response and appreciate them.
- Write 4 x 5 = 20 on the board.
- Tell them that if we double the answer we will get the product of 8 x 5.
- So, 20 + 20 = 40.Therefore, 8 x 5 = 40.
- Also explain to them, if we keep adding 8 to the previous product, we get the 8 times table as shown on textbook page 59.
- Repeat the whole activity and complete the 8 times table with the help of students on textbook page 61.

Activity 4:

- Display the following chart in front of the class.

9 TIMES TABLE

9 x 1 =	9
9 x 2 =	18
9 x 3 =	27
9 x 4 =	36
9 x 5 =	45
9 x 6 =	54
9 x 7 =	63
9 x 8 =	72
9 x 9 =	81
9 x 10 =	90

- Ask the students, have you noticed something interesting in the table?
- Take their response and reveal the fun fact about it i.e., the digits which are at one's place reduce by 1 when going from top to bottom. Simultaneously, the digits in the ten's place are just increasing by 1 from top to bottom.
- Ask the students what else you can notice about the table?
- Take their responses and appreciate their participation.
- Demonstrate on the board that the sum of the digits of the products makes nine.
- Also explain to them, if we keep adding 9 to the previous product, we get the 9 times table as shown on textbook page 60.
- Ask the students to complete the 9 times table from textbook page 61.

Conclusion/Sum up:

- Multiplication is a process of repeated addition. E.g., 7 + 7 + 7 = 3 x 7 = 21
- We read 3 x 7 = 21 as 3 times 7 equals 21.
- We use ‘x’ symbol for multiplication.
- The numbers which are being multiplied are called factors.
- The result of multiplication is called the product.
- Changing the order of factors will not change the product. E.g., 7 x 6= 42 or 6 x 7= 42
- Adding 6, 7, 8 and 9 to the previous product to find the product of the next number in the 6, 7, 8 and 9 times table respectively.
- Revise the time table’s tricks chart from introduction.
- Revise the 6, 7, 8 and 9 times tables.

Assessment:

Write the following questions on the board and ask the students to solve:

a) 5 x 9 = _____
b) 4 times 6 = _____
c) 7 sevens are _____
d) 10 times 8 equals _____

Follow up:

- Ask the students to complete the 6 and 7 times table and solve Q#2 from textbook page 61.

Glossary

Multiplication: it is a process of repeated addition.

MULTIPLY 2-DIGIT NUMBER BY 1-DIGIT NUMBER

Duration: 40 Minutes

Students Learning Outcome:

- Multiply 2-digit number by 1-digit number.

Materials:

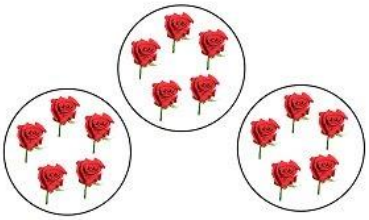
Board, marker/chalk, Math's Grade 3 PCTB, notebook.

Information for Teacher:

- In previous class students have learnt about multiplication.
- Now they will learn about multiplication of 2-digit number by 1-digit number.
- To multiply 2-digit number by 1-digit number, arrange the numbers by place value.
- Multiply the bottom number by each digit of the top number. Start with the ones. Next, multiply the tens.
- While teaching the lesson, also consult textbook where and when applicable.

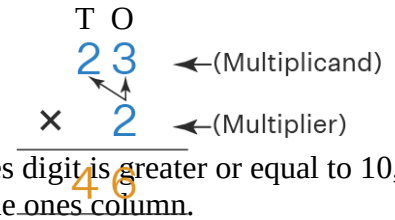
Introduction:

Multiplying means repeated addition of a number.
For example, if we have three groups of five flowers and we need to find the total number of flowers, we can either:



- add the flowers within the groups
  (5 + 5 + 5)
- or we can multiply the number of groups by the number of flowers in one group
  (3 groups x 5 flowers)
- 5 + 5 + 5 has the same meaning as 3 x 5
  (3 groups of 5)

- 2-digit multiplication is the method of multiplying 2-digit numbers arranged in two place values, i.e., ones and tens.
- The method of multiplying numbers is the same as multiplying single digits.
- However, in 2-digits, we multiply each digit one by one by the multiplier.
- Explain the following steps to multiply 2-digit numbers by 1-digit numbers:
- Step 1: Place the one-digit number below the 2-digit number. This makes the one-digit number the multiplier.
- Step 2: Multiply the one-digit number (the multiplier) with the ones digit of the multiplicand and then it is multiplied with the tens digit of the multiplicand to get the final answer



- If the product of ones digit is greater or equal to 10, then carry 1 to the preceding tens column and write 0 below the ones column.
- Multiply the multiplier with the tens digit of the multiplicand and add the number that was carried over to the tens column. And write the final answer.
- Tell the students; let's practice multiplying 2-digit numbers with 1-digit (with and without regrouping).

Development:

Activity 1:

- Write 13 x 2 on the board.
- Ask the students the following questions:
- Can you tell which number is multiplier and which number is multiplicand?
- How to write the numbers according to their places?
- Collect their response and appreciate their participation.
- Call a student on the board and ask him/her to write the numbers under their places like this:

T	O
1	3
x	2

- Now tell them that first multiply the digits at ones as: 2 x 3 = 6 and write under ones column.
- Multiply 1 at tens place with 2 at ones place as: 1 x 2 = 2 and write 2 under tens column.

T	O
1	3
x	2
2	6

- Therefore, 13 x 2 = 26
- Also explain the example given in textbook page 62.
- Write the following questions on the board and call the students to solve.
  a) 11 x 5
  b) 24 x 2
  c) 30 x 3

Activity 2:

- Write 46 x 6 on the board.
- Call a student on the board and ask him/her to write the numbers under their places.
- Ask the students, which times table we need to recall to solve the sum?
- Appreciate their participation.
- Ask the students which digits we will multiply first?
- Multiply the digits at ones place as: 6 x 6 = 36
- Ask the students, the product of ones digits is a 2-digit number, what we will do?(their response should be: write 6 under ones column and carry 3 to the tens column)
- Explain to them that we will write 6 under ones column and carry 3 to the tens column like this:

```
  T O
  4 6
x 6
-----
  6
-----
```

- Now ask the students how to multiply the remaining digits?
- Take their responses and guide if necessary.
- Tell them that first we multiply 4 at tens place with 6 at ones place i.e. 4 x 6 = 24 and then add the carry 3 to the product i.e. 24 + 3 = 27.
- So we will write 7 at tens column and 2 at hundreds column.

```
  T O
  3
  4 6
x 6
-------
2 7 6
-------
```

- Also explain the example given in textbook page 63.
- Write the following questions on the board and call the students to solve.
  d) 15 x 8
  e) 72 x 9
  f) 52 x 5

Conclusion:

- 2-digit multiplication is the method of multiplying 2-digit numbers arranged in two place values, i.e., ones and tens.
- Revise the steps to multiply 2-digit numbers by 1-digit numbers given in introduction.

Assessment:

a) Writer the following questions on the board and ask the students to solve.45 x 8
b) 19 x 2
c) 25 x 4
d) 11 x 7

Follow up:

Ask the students to solve Q#1 from textbook page 67.

APPLY MENTAL STRATEGIES TO MULTIPLY 1 DIGIT NUMBER BY 1 DIGIT NUMBER

Duration: 40 Minutes

Students Learning Outcome:

- Apply mental mathematical strategies to multiply 1-digit number to 1-digit number.

Materials:

Board, marker/chalk, Math's Grade 3 PCTB, notebook.

Information for Teacher:

- Mental mathematics strategies that allow the students to multiply numbers without pencil and paper or a calculator.
- Mental calculation is a skill that not only helps us to become better at computation but it also enhances the development of number concepts.
- While teaching the lesson, also consult textbook where and when applicable.
- Student will learn the application of mental strategies to multiply 1-digit number to a 1-digit number.

Introduction:

- Ask the students that can you solve the mathematics questions without having paper and pencil.
- After taking their response tell them that we can solve questions using mental strategies.
- Explain to them that mental math is about performing math calculations in your head without using a pencil or paper.
- To multiply a 1-digit number by a 1-digit, simply learn the multiplication tables.
- Tell the students that multiplication tables will help to solve problems quickly.
- Access to the prior knowledge by asking:
  - What is multiplication?
  - What do you know about multiplication tables?
  - How do you develop a multiplication table for a specific number?
  - Does changing the order of the number effects the product?
  - What are the numbers to be multiplied called?
- Involve the students to revise the multiplication tables.

- Let's solve some questions applying mental strategies.

Development:

Activity 1:

- With the help of students write the multiplication tables from 2 to 5 on the board.
- Call few students one by one on the board and ask them to read aloud.
- After reading, ask the students:
- Can you find some similar products in the tables?
- What are those factors that have common products?
- Underline those products one by one. E.g., 2 x 3 = 6 or 3 x 2 = 6
- Tell them whether you read 2 times table up to 3 or 3 times table up to 2, the products are same.
- Let's see some more products that are similar.
- Call a student on the board and ask him/her to underline another common product. E.g. 3 x 4 = 12 or 4 x 3 = 12
- Again tell them that reading the 3 times table up to 4 or 4 times table up to 3, the products are same. And changing their positions does not affect the product.
- Repeat the whole activity with the rest of the common products.
- Write the following on the board and call a student to solve it:
    a) 2 x 8 = _____
    b) 5 x 6 = _____
    c) 3 x 9 = _____

Activity 2:

- Write the multiplication tables from 6 to 9 on the board.
- Call few students one by one on the board and ask them to read aloud.
- Ask the students the product of different factors.
- For example: what is 6 times 5?
- What is 7 times 8 equals to?
- Which factors have common product of 63?
- 8 x 8 = ?
- Find the product of 7 and 5.
- Ask the students from 'try yourself' given in textbook page 66.
- Write the following on the board and call a student to solve it:
    a) 6 x 4 = _____
    b) 9 x 8 = _____
    c) 7 x 7 = _____

Conclusion:

- Mental math is about performing math calculations in your head without using a pencil or paper.
- To multiply a 1-digit number by a 1-digit, simply learn the multiplication tables.
- Changing the position of the factors does not change the product.
- Any number multiplied by zero is zero. E.g., 0 x 6 = 0
- Any number multiplied by 1 is itself. E.g., 1 x 6 = 6

Assessment:

Ask the students to solve Q#4 from textbook page 68.

Follow up:

- Ask the students to revise the tables from (2-9).
- Write all those factors that have common products from the tables (2-9). E.g. 7 x 3 = 21 and 3 x 7 = 21

Glossary

Common: same

MULTIPLICATION OF 2-DIGIT NUMBERS BY 1-DIGIT NUMBER

Duration: 40 Minutes

Students Learning Outcome:

- Solve real life situations involving multiplication of 2-digit numbers by 1-digit number.

Materials:

Board, marker/chalk, Math's Grade 3 PCTB, notebook.

Information for Teacher:

- A **word problem** is a situation explained in words that can be solved using math.
- Real life problems mean the situations or problems happening in the real world.
- Solving word problems students are able to better comprehend the practical application of Maths.
- Some of the most popular keywords for multiplication are total, of, product, times, in all etc.
- While teaching the lesson, also consult textbook where and when applicable.

Introduction:

- Ask the students, have you learnt about real life problems involving multiplication in the previous class?
- Collect their feedback and illustrate the word problem given on page # 64 of Maths PCTB textbook.
- Call a student to read the word problem in front of the class.
- Write the given information on the board.
  - Cost of one toy = Rs 31
  - Cost of 6 toys = ?
- Ask the students what we have to find?
- After this, call any student on the board and ask him/her to solve this question. Provide guidance if necessary.
- Explain to the students that in solving real life problems, the following points will be focused:
- Read the question statement twice.

- Highlight any numbers or figures.
- Highlight the words or phrases that let you know which operation to use (required information).
- In this question we have to find out "cost of 6 toys" that means we will multiply 31 by 6 to find the total cost.

```
  T O
  3 1
x 6
-----
-----
```

- First multiply 6 by 1 i.e., 6 x 1 = 6, write 6 under ones column.

```
  T O
  3 1
x 6
-----
  6
-----
```

- Now, multiply 6 by 3 i.e., 6 x 3 = 18, write 8 under tens column and 1 under the preceding or next column.

T O

```
  3 1
x 6
-----
1 8 6
-----
```

- Thus, the total cost of 6 toys will be Rs186.
- Re-read the question statement.
- Re-check the answer.
- Ask the students if they have any confusion in understanding the concept.
- Collect their feedback and provide further guidance if necessary.
- Tell the students that now we will practice more real life problems of multiplication.

Development:

Activity 1:

Demonstrate the Q#5 from textbook page 68 on the board.

- Ask the students to read the question twice very carefully.
- After this, ask the following questions from the students:
  - What is the given information?
  - What is the required information?
  - How can we solve it?
- Collect their feedback and solve the question on the board with the help of the students.
- Ensure that student are following multiplication steps correctly.
- Involve all students that are paying full attention towards the board.
- At the end, repeat the procedure to have the student's strong grip on the concept.

Activity 2:

Demonstrate the Q#6 from textbook page68 on the board.

- Ask the students to read the question twice very carefully.

- After this, call a student on the board and ask him/her to write the given or required information like this:
  - Number of days in a week = 7
  - Total days in 52 weeks = ?
- Ask the whole class: How can we solve it?
- Which operation is required to solve the sum?
- Collect their feedback and appreciate their participation.
- Now call another student on the board and ask him/her to solve the following sum like this:

```
  T O
  5 2
x 7
-----
3 6 4
-----
```

- Thus, there are 364 days in 52 weeks.
- Provide guidance if necessary.

Conclusion:

- Solving real life problems, the following points are focused:
  - Read the question statement twice.
  - Highlight any numbers or figures.
  - Highlight the words or phrases that let you know which operation to use (required information).
  - Re-read the question statement.
  - Re-check the answer.

Assessment:

- Write Q#7 from mathematics PCTB textbook page 69 on the board and ask the students to solve it.
- Check their work and guide if necessary.

Follow up:

Solve Q#8 from textbook page 69.

Teacher Guide
Grade-3

Lesson Plan
20

DIVIDE 2-DIGIT NUMBER BY A 1-DIGIT NUMBER

Duration: 40 Minutes

Students Learning Outcome:

- Divide 2-digit number by a 1-digit number (with zero remainder).

Materials:

Board, marker/chalk, Math's Grade 3 PCTB, notebook.

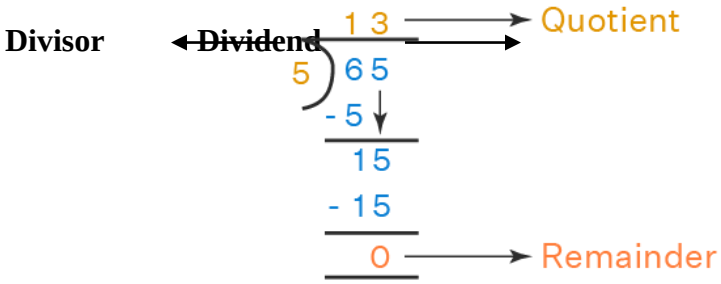
Information for Teacher:

- The division is the inverse of the multiplication operation. E.g., 4 ÷ 2 = 2 this can be written as a multiplication fact as 2 x 2 = 4.
- We use '÷' symbol for division.
- There are four parts of the division, which are dividend, divisor, quotient, and the remainder.
- While teaching the lesson, also consult textbook where and when applicable.

Introduction:

- One-digit division can be done using multiplication tables. For example, to solve 24 ÷ 6, we just need to see what we need to multiply by 6 to get 24 as the answer. Clearly, 6 × 4 = 24, therefore 24 ÷ 6 = 4.
- Demonstrate the example given on textbook page 69 on the board.
- Tell the students that division means to distribute the things equally.
- When it comes to the division of numbers with greater numbers, then we can use the long division method.
- Explain the four parts of the division, which are dividend, divisor, quotient, and remainder.
- Define that dividend is the number that is to be divided, divisor is the number by which we divide the dividend or the number of equal groups that are to be made, quotient is the answer obtained after performing the division and remainder is the remaining or left out value that is not a part of any group.
- Let us take another example to understand it.
- Write 65 divided by 5 on the board.
- Tell them that we write 65 divided by 5 as 65 ÷ 5.
- Explain the following steps to learn how to do division:
- Step 1: Draw the division symbol ⟌ and write divisor (5) on its left side and dividend (65) enclosed under this symbol like this:

- Step 2: Take the first digit of the dividend from the left (6). Check if this digit is greater than or equal to the divisor. If the first digit of the dividend is less than the divisor, then we consider the first two digits of the dividend.
- Step 3: Then divide it by the divisor and write the answer on top as the quotient. Here, the quotient of 6 ÷ 5 is 1.
- Step 4: Subtract the product of the divisor and the digit written in the quotient (5 × 1) from the first digit of the dividend and write the difference below. Here, the difference is 6 - 5 = 1.
- Step 5: Bring down the next digit of the dividend (if present). The next digit in the dividend is 5.
- Step 6: Repeat the same process until you get the remainder, less than the divisor.



- Explain to them some fun facts about division:
- When dividing a number by 1, the answer will always be the original number. It means if the divisor is 1, the quotient will always be equal to the dividend e.g., 10 ÷ 1= 10.
- Division by 0 is undefined.
- The division of the same dividend and divisor is always 1. For example: 4 ÷ 4 = 1.
- Tell them lets practice some more examples.

Development:

Activity 1:

- Write the example given in textbook page 71 on the board.
- Call a student and ask him/her to write it in division form like this: 84 ÷ 4
- Ask the students the following questions:
  - Which number is the dividend?
  - Which number is the divisor?
  - Which times table we need to recall to divide the number?
- Appreciate their participation.
- Tell them to distribute something equally we need to divide the numbers.
- Here 84 is the dividend and 4 is the divisor.
- Explain the key fact given on textbook page 71.
- Solve the sum with the help of students using the above steps mention in introduction.

Activity 2:

- Solve Q#7 from textbook page 72 on the board with the help of students.
- Write 48÷4.
- Ask the students the following questions:
  - Which is the divisor?
  - Which is the dividend?
- Call a student on the board and ask him/her to draw a division symbol.
- Ask the students which number will be enclosed in the division symbol?
- Appreciate their participation.
- Now call another student on the board and ask him/her to write the divisor and dividend like this:

$$4\overline{)\,4\ 8}$$

- Ask the students, is the first digit of the dividend is greater than or equal to the divisor?
- Tell them, it is equal to the divisor i.e. 4
- As, 4 ÷ 4 = 1
- So, we will write 1 on the top as the quotient like this:

$$\begin{array}{r} 1 \\ 4\overline{)\,4\ 8} \\ -\ 4 \\ \hline \end{array}$$

- Now ask the students, what is the next step?
- Call again another student and ask him/her to subtract and bring down the next number like this:

$$\begin{array}{r} 1\ 2 \\ 4\overline{)\,4\ 8} \\ -\ 4 \\ \hline 0\ 8 \end{array}$$

- Call again another student and ask him/her to divide and subtract like this:

$$\begin{array}{r} 1\ 2 \\ 4\overline{)\,4\ 8} \\ -\ 4 \\ \hline 0\ 8 \\ -\ 0\ 8 \\ \hline 0\ 0 \end{array}$$

- So, 48÷4 = 12 with 0 remainder.
- Guide them if necessary.

Conclusion:

- Division means to distribute the things equally.
- We use '÷' symbol for division.
- There are four parts of the division, which are dividend, divisor, quotient, and remainder.
- When 2-digit number is divided by 1-digit number, we divide the number at tens place first and then the number at ones place.
- When dividing a number by 1, the answer will always be the original number.

- Division by 0 is undefined.
- The division of the same dividend and divisor is always 1.
- Revise the method of division mention in introduction.

Assessment:

- Ask the students to solve Q#1 to 6 on textbook page 72.
- Check the answers of few students and ask the rest of the students to check their partners work. In this way, all the students work will be checked.

Follow up:

- Solve Q# 8 to 12 from textbook page 72.

Glossary

Division: to distribute something equally

Remainder: the value that is left after division.

APPLY MENTAL STRATEGIES TO DIVIDE 1-DIGIT NUMBER BY 1-DIGIT NUMBER

Duration: 40 Minutes

Students Learning Outcome:

- Apply mental mathematical strategies to divide 1-digit number by a 1-digit number.

Materials:

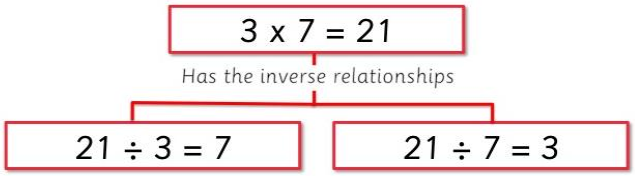
Board, marker/chalk, Math's Grade 3 PCTB, notebook.

Information for Teacher:

- Mental mathematics strategies that allow the students to divide numbers without pencil and paper or a calculator.
- Mental mathematics strategies are very useful in our daily life.
- Mental calculation is a skill that not only helps us to become better at computation but it also enhances the development of number concepts.
- While teaching the lesson, also consult textbook where and when applicable.

Introduction:

- Ask the students that can we divide numbers without having paper and pencil.
- After taking their response tell them that with the help of mental math strategies, we can divide the numbers.
- Tell them that mental maths strategies allow us to divide numbers without pencil and paper or a calculator.
- Mental calculation is a skill that not only helps us to become better at computation but it also enhances the development of number concepts.
- Explain to the students that mental math is about performing math calculations in your head without using a pencil or paper.
- To divide a 1-digit number by a 1-digit, simply use multiplication tables.
- Tell the students that learning multiplication tables will help to solve division quickly, as division is the inverse of multiplication. For example:



- Access the prior knowledge of students by asking following questions:
  - What do you know about division?
  - How can we divide a number?
  - What is divisor, dividend quotient and remainder?
- Write 6÷2 on the board from textbook page 71.
- Ask the students the following questions:
  - What is the divisor?
  - What is the dividend?
  - Which table you need to recall to solve the sum?
- Tell the students that to divide 6 by 2means you have to simply read 2 times table to reach the product of 6.
- Here, 2 x 3 = 6, by reading 2 times table till 3, we get the product of 6.
- So, 6 ÷ 2 = 3
- Tell the students that:
  - Any number divided by 1 is the number itself. E.g. 9 ÷ 1 = 9
  - Any number divided by itself is 1. E.g. 9 ÷ 9 = 1
- Let's practice some more examples.

Development:

Activity 1:

- Write 9÷3 on the board from textbook page 71.
- Ask the students the following questions:
  - Which multiplication table we need to recall to get the product of 9?
  - How many times 3 is 9?
- Call a student on the board and ask him /her to read the 3times table in front of the class, till he/she reaches the product of 9.
- Appreciate his/her participation.
- Write 3 x 3 = 9, by reading 3 times table till 3, we get the product of 9.
- So, 9 ÷ 3 = 3
- Repeat the whole activity with few more examples on the board.

Activity 2:

- Write 4 ÷ 2 on the board.
- Ask the whole class how many times 2 is 4?
- Call a student on the board and ask him her/ to solve the sum like this:
- 2 x 2 =4
  So, 4 ÷ 2 = 2
- Write Q# 14 and 15 from textbook page 72 on the board and repeat the whole activity.

Conclusion:

- Mental math is about performing math calculations in your head without using a pencil or paper.
- To divide a 1-digit number by a 1-digit, simply apply the multiplication tables.
- Any number divided by 1 is the number itself. E.g., 9 ÷ 1 = 9
- Any number divided by itself is 1. E.g., 9 ÷ 9 = 1

Assessment:

- Write some question on the board and ask the students to solve:
  - 6 divided by 6? _____
  - 9 divided by 3 is _____
  - 8 ÷ 2 = _____
- Take a quick round of their work and guide if necessary.

Follow up:

Solve the following:

a) 6 ÷ 3 = ____
b) 8 ÷ 4 = ____
c) 9 ÷ 3 = ____
d) 2 ÷ 1 = ____
e) 7 ÷ 7 = ____
f) 4 ÷ 2 = ____

SOLVE REAL LIFE PROBLEMS INVOLVING DIVISION

Duration: 40 Minutes

Students Learning Outcome:

- Solve real life situations involving division of 2-digit number by a 1 - digit number

Materials:

Board, marker/chalk, Math's Grade 3 PCTB, notebook.

Information for Teacher:

- A **word problem** is a situation explained in words that can be solved using mathematical skills.
- Real life problems mean the situations or problems happening in the real world.
- Solving word problems students are able to better comprehend the practical application of mathematics.
- Involve the students in real life situation so that they can apply the mathematical skills and knowledge to solve real life situation involving division of 2-digit number by 1-digit number.
- Some of the most popular keywords for division are how many in each, distribute, share, divide and groups of etc.
- While teaching the lesson, also consult textbook where and when applicable.

Introduction:

- Ask the students, have you learnt about real life problems involving division in the previous class?
- Collect their feedback and tell them that in our daily life we deal with the real life situations having division of 2-digit numbers by 1-digit number.
- Tell the students that keywords for division are how many in each, share, divide and groups of etc.
- Illustrate the word problem given on page # 70 of mathematics PCTB textbook.
- Call a student to read the word problem in front of the class.
- Involve the students to tell the given information and write the given information on the board.
  - Number of mango trees = 72
  - Rows of trees = 6

- Number of trees in 1 row =?

- Tell the students to find the number of trees in 1 row we have to divide.
- Write on the board like this:
  - Number of trees in 1 row = 72 ÷ 6
- Let's solve.

$$\begin{array}{r} 12 \\ 6\overline{)\,72} \\ -\,6 \\ \hline 12 \\ -\,12 \\ \hline 00 \end{array}$$

- Thus, there are 12 trees in 1 row.
- Re-check the answer.
- Let's practice some more examples.

Development:

Activity 1:

- Ask the students to open mathematics PCTB textbook page 72.
- Ask a student to read the Q#16 aloud.
- Call a student on the board and ask him/her to write the given information like this:
  - Number of students standing = 96
  - Number of rows = 6
  - Number of students in each or 1 row = ?
- Guide if needed.
- Ask the students which table you need to recall to divide 96?
- Now call another student on the board and ask him/her to solve the sum like this:

$$\begin{array}{r} 16 \\ 6\overline{)\,96} \\ -\,6 \\ \hline 36 \\ -\,36 \\ \hline 00 \end{array}$$

- Thus, number of trees in each or 1 row is 16.
- Now ask the students to check his/her work.
- Guide them if needed.
- Ask them what is the quotient in the solution?
- Write the following question on the board and ask the students to solve:
  - Distribute 65 pencils in 5 boxes equally.
- Involve the students to extract the given information.
- Take a quick round and check their work.

Activity 2:

- Ask the students to open textbook page 72.
- Ask a student to read Q#17 in front of the class.

- Call a student on the board and ask him/her to write the given information like this:
  - Distance covered = 56 km
  - Number of days = 4
  - Distance covered in 1 day = ?
- Guide if needed.
- Ask the students which table you need to recall to divide 56?
- Now call another student on the board and ask him/her to solve the sum like this:

$$
\begin{array}{r}
14 \\
4\overline{)\,56} \\
-\ 4 \\
\hline
16 \\
-\ 16 \\
\hline
00 \\
\hline
\end{array}
$$

- Thus, the distance covered in 1day is 14 km.
- Now ask the students to check his/her work.
- Guide them if needed.
- Ask them what is the quotient in the solution?
- Write the following question on the board and ask the students to solve:
  - If the price of 8 kg of salt is Rs 96, then what will be the price of one kilogram of salt?
- Take a quick round and check their work.

Conclusion:

- Some of the most popular keywords for division are how many in each, distribute, share, divide and groups of etc.
- Solving real life problems, the following points are focused:
- Read the question statement twice.
- Highlight the given information.
- Highlight the words or phrases that let you know which operation is needed.

Assessment:

- Ask the students to solve Q#18 from textbook page 73.
- Take a quick round and check the answer of few students.
- Ask the rest of the class to check their partners work. In this way, all the students work will be checked and their concept will be clear.

Follow up:

Solve Q# 19 and 20 from textbook page 73.

COMMON FRACTION

Duration: 40 Minutes

Students Learning Outcomes:

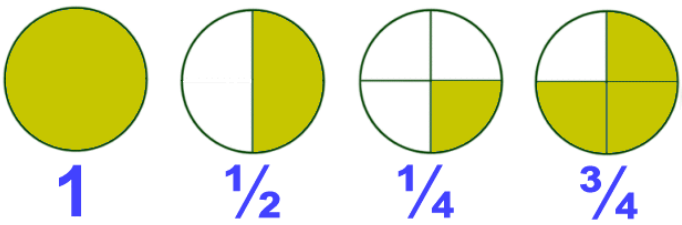
- Express the fractions in figures and vice versa.
- Match the fractions with related figures.

Materials:

Board, marker/chalk, Math's Grade 3 PCTB, notebook.

Information for Teacher:

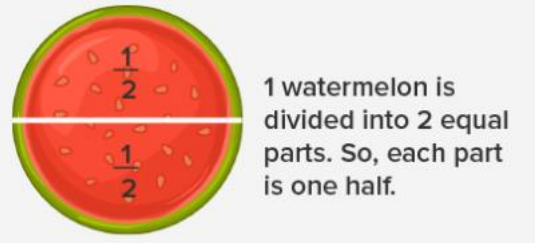
- A fraction is a way of representing division of a whole into parts.
- The bottom part of the fraction represents denominator which means total numbers of equal parts of the whole.
- Top part of fractions represents numerator which means require part of whole.
- When we divide a whole into equal parts, each part is a fraction of the whole.



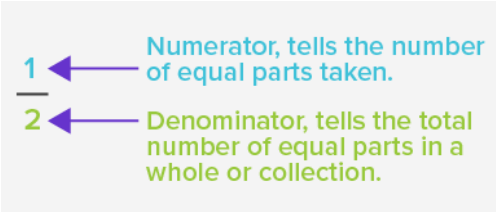
- While teaching the lesson, also consult textbook where and when applicable.

Introduction:

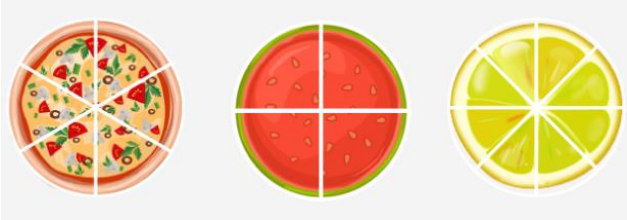
- Fractions represent **equal parts** of a whole or a collection.
- **When** we divide a whole into equal parts, each part is a fraction of the whole.



- A fraction consists of a numerator and a denominator and they are separated by a horizontal bar known as the fractional bar.
- The number on the top of the line is called the numerator. It tells how many equal parts of the whole or collection are taken.
- The number below the line is called the denominator. It shows the total number of equal parts of the whole.



- Tell the students that the most common examples of fractions from real life are equal slices of watermelon, pizza, fruit, cake, a bar of chocolate, etc.



- Ask the students to see textbook page 77.
- Let's take an example of watermelon to understand it.
- If we cut a whole watermelon into 2 equal pieces, the fraction of each part will be written as half or ½.
- And if we cut that half piece into 2 equal parts, the fraction of each part will be written as ¼. Because the watermelon has been cut into 4 equal parts. And each part has a fraction of one fourth or ¼ (as shown in the picture on textbook page 77).
- Now tell the students that there are 4 equal parts of watermelon. If you ate 3 pieces of watermelon, the fraction of eaten pieces will be written as ¾ or three-fourth i.e., 3 out of 4 equal parts has been eaten.
- Tell the students that now we will learn how to find the fraction of colored portions from the given figures.

Development:

Activity 1:

- Ask the students that open textbook page 77.
- Draw a rectangle on the board.

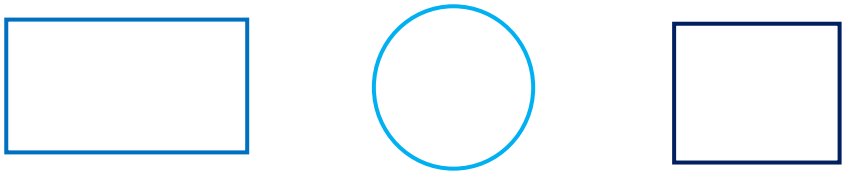
- Call a student on the board and ask him/her to divide the shape into 4 equal parts.

- Ask the students: how many total parts are there?
- What is the fraction of each part?
- Appreciate their participation.
- Now call another student on the board and ask him/her to color 3 parts of the figure.

- Ask the students how many parts are colored?
- What is the fraction of colored part?
- Take their responses and explain to them that the whole shape is divided into 4 equal parts.
- Each part has a fraction of ¼ or one-fourth.
- 3 out of 4 equal parts are colored. So, the fraction of colored part can be written as ¾ or three-fourth.
- Draw a circle on the board and repeat the whole activity.
- Ask the students to match the given colored figures with the fractions on textbook page 78.
- Also ask them to solve Q#2 of textbook page 78.

Activity 2:

- Divide the class into four groups.
- Ask each group to draw different shapes e.g. circle, rectangle and square on a chart paper.



- Tell them to divide each of the shapes into four equal parts.
- Ask them to color each shape to show the following fraction $\frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{4}{4}$
- Ask any two groups to present their work.
- Encourage them to explain their work and let other students ask questions so the concept is clear to everyone.
- Ask the students to solve Q#3 of textbook page 79.

Conclusion:

- Fractions represent **equal parts** of a whole or a collection.
- **When** we divide a whole into equal parts, each part is a fraction of the whole.
- A fraction consists of a numerator and a denominator and they are separated by a horizontal bar known as the fractional bar.
- The number on the top of the line is called the numerator. It tells how many equal parts of the whole or collection are taken.
- The number below the line is called the denominator. It shows the total number of equal parts of the whole.

Assessment:

- Draw few diagrams or shapes divided into two parts, equally and unequally. Ask the students to tick mark all those figures which are divided into two equal parts and write its fraction.
- Ask them to solve Q#5 of textbook page 80.

Follow up:

- Ask the students to draw 5 shapes on notebooks and make as many as equal number of parts for the figures.
- Solve Q#1 and 4 of textbook page 78 and 79.

Glossary

Fraction: a fraction represents a part of a whole or, more generally, any number of equal parts.
Numerator: the top number that represents the part of the whole
Denominator: the bottom number that represents the whole

Note: This lesson plan contains two SLOs

EQUIVALENT FRACTIONS

Duration: 40 Minutes

Students Learning Outcome:

- Identify equivalent fractions from the given figures.

Materials:

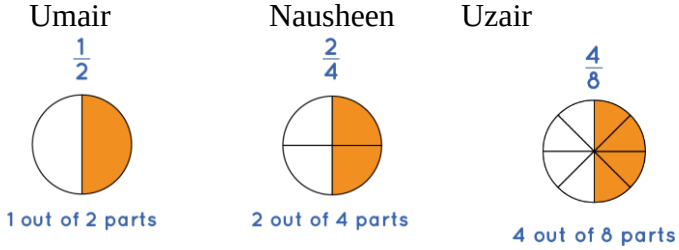
Board, marker/chalk, paper strips, Math's Grade 3 PCTB, notebook.

Information for Teacher:

- **Students have learnt about proper and improper fractions.**
- **Now they will learn about equivalent fractions**
- **Equivalent fractions** are fractions which are equal to the same value irrespective of their numerators and denominators. For example 1/2 and 2/4 are equivalent fractions.
- While teaching the lesson, also consult textbook where and when applicable.

Introduction:

- Equivalent fractions are fractions that represent the same value, even though they look different.
- For example, if you have a cake, cut it into two equal pieces, and eat one of them, you will have eaten half the cake.
- And if you cut a cake into 4 equal pieces and eat 2 of them, you will still have eaten half the cake. These are equivalent fractions.
- Open textbook page 83 and 84.
- Draw 3 circles on the board and write the names of the children above each circle like this:

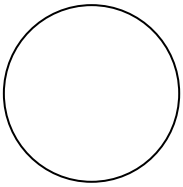


- Explain to the students that all of them have eaten same quantity of bread as you can see from the shaded portions.
- So we can say that 1/2, 2/4 and 4/8 are equivalent fractions.

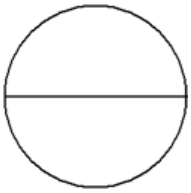
Development:

Activity 1:

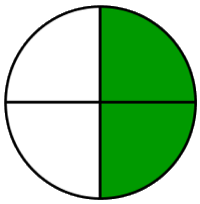
- Draw a circle on the board.



- Call one student to divide it into two half and write its fraction i.e. 1/2



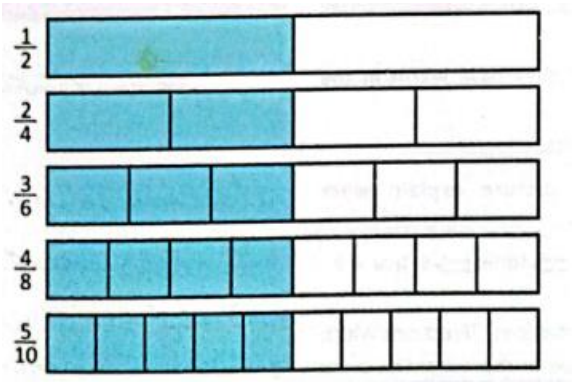
- Call another student to further divide it into four equal parts, color any two parts and write its fraction i.e. 2/4



- Repeat the same procedure by further dividing it into six, eight and ten equal parts and color half of them.
- Ask every time to write the fraction of colored part.
- Explain the procedure of writing fraction to the students.

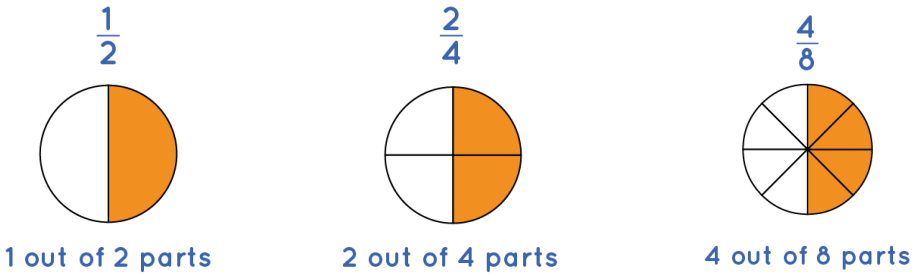
Activity 2:

- Give paper strips to students in groups.
- Ask them to represent 1/2, 2/4, 3/6, 4/8 and 5/10 fractions by folding and shading.
- Ask them to arrange all strips in a row and identify what is common in all?
- Discuss similarity in all five strips and help them to describe all strips have same shaded portion but they are different fractions.
- Highlight that the fractions may be different but they show the same amount. These are equivalent fractions.



Conclusion:

- Equivalent fractions are fractions that represent the same value, even though they look different.



- 1/2, 2/4 and 4/8 are equivalent fractions because they all are showing half.

Assessment:

- Ask the students to open mathematics textbook PCTB page no 86 and solve Q#2 in their notebooks.
- Give 5 circles to students and ask them to color some parts of each circle so that they show equivalent fractions.

Follow up:

- Assign homework that match the equivalent fractions given on page no 86 of mathematics textbook PCTB.
- Assign any one fraction to students 1/3 or 1/4.
- Ask them to make equivalent fraction of assigned fraction and draw their diagrams.

Glossary

Equivalent: same or equal.

EQUIVALENT FRACTIONS

Duration: 40 Minutes

Students Learning Outcome:

- Write three equivalent fractions for a given fraction.

Materials:

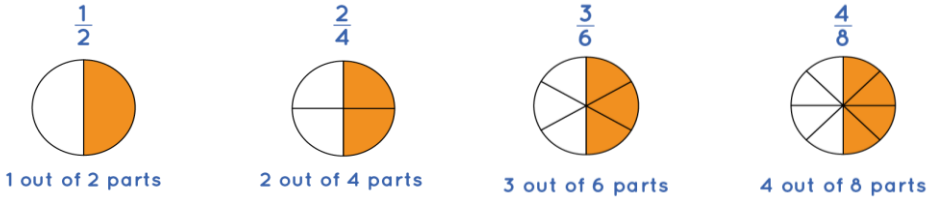
Board, marker/chalk, Math's Grade 3 PCTB, notebook.

Information for Teacher:

- The word equivalent means that the two fractions have the same value.
- Multiplying the numerator and denominator of a fraction by the same (non-zero) number, the result of the new fraction is said to be an equivalent fraction.
- For example, the equivalent fractions of 1/5 are 5/25, 6/30, and 4/20.
- While teaching the lesson, also consult textbook where and when applicable.

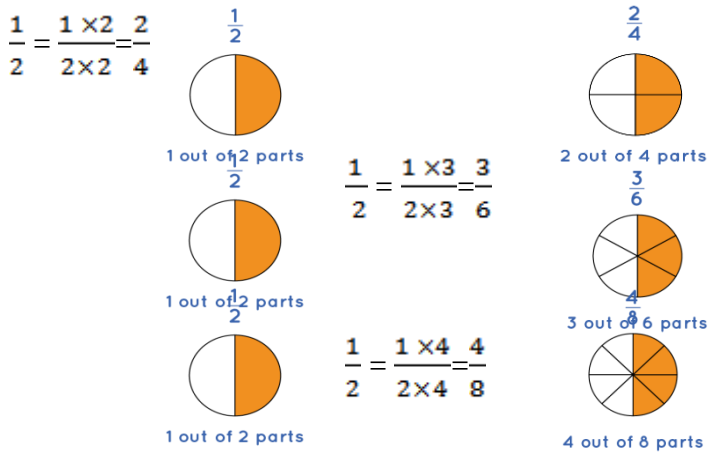
Introduction:

- **Equivalent fractions** are defined as those fractions which are equal to the same value irrespective of their numerators and denominators.
- Open textbook page 85.
- Write 1/2, 2/4, 3/6, and 4/8 are equivalent fractions on the board.
- Let us see how their values are equal.
- We will represent each of these fractions as circles with shaded parts.



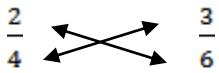
- The shaded parts in all the figures represent the same portion if seen as a whole.
- So, the amount of shaded portion is the same in all the circles. Hence, 1/2, 2/4, 3/6, and 4/8 are equivalent fractions.
- Tell the students that to find the equivalent fraction, multiply or divide the numerator and the denominator by the same non-zero number.

- We can write three equivalent fractions of ½ as:



- Thus, three equivalent fractions of ½ are 2/4, 3/6 and 4/8.
- Also tell the students that to identify whether 2/4 and 3/6 are equivalent, we cross multiply them.
- If both the products are the same, the fractions are equivalent.
- Write $\frac{2}{4}$ and $\frac{3}{6}$ on the board.

- Now, cross multiply them like this:

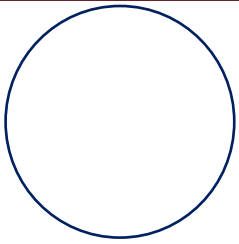


- Tell the students that the product of 2 x 6 = 12 and 4 x 3 = 12 both are equal. So they are said to be equivalent fractions.

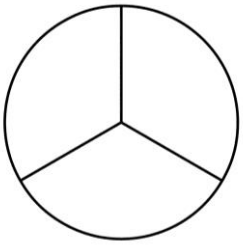
Development:

Activity 1:

- Write 2/3 on the board.
- Draw a circle on the board.



- Call a student and ask him/her to divide the circle into 3 equal parts.



- Now call another student to color its two parts to show the fraction i.e. $\frac{2}{3}$

- Help if needed.
- Ask the students what will you do to find the equivalent fractions?
- Appreciate their participation.
- Now call another student on the board and ask him/her to find the equivalent fraction $\frac{2}{3}$ like this:

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

- Call another student and ask him/her to draw the equivalent fraction $\frac{4}{6}$ on the board.
- Repeat the activity and find next two three equivalent fractions.

Activity 2:

- Write $\frac{1}{3}$ and $\frac{4}{12}$ on the board.
- Ask the students how to determine that two fractions are equivalent or not?
- Take their responses and guide them.
- Call a student on the board and ask him/her to solve like this:

$\frac{1}{3}$ $\quad\quad$ $\frac{4}{12}$

$$1 \times 12 = 3 \times 4$$
$$12 = 12$$

- Tell them that both the products are equal. So, the fractions are said to be equivalent fractions.
- Repeat this with some more examples on the board.
- Ask the students to solve Q#1 of textbook page 86.
- Take a quick round and check their work.

Conclusion:

- The word equivalent means that the two fractions have the same value.
- Multiplying the numerator and denominator of a fraction by the same number we get an equivalent fraction.
- The 'Cross multiplication method' is used to determine whether any two fractions are equivalent or not.

Assessment:

- Assign fraction $\frac{3}{4}$ to the students and ask them to find next three equivalent fractions and also draw diagrams to represent each fraction.

Follow up:

Solve Q#2 of textbook page 86.

Glossary

Equivalent: same or equal

Non-zero: not equal to zero.

COMPARISON OF FRACTIONS

Duration: 40 Minutes

Students Learning Outcome:

- Compare fractions with same denominators using symbols "<", ">", or "=".

Materials:

Board, marker/chalk, paper strips, box, Math's Grade 3 PCTB, notebook.

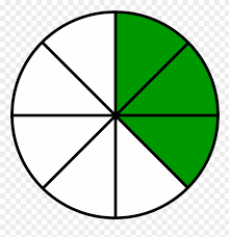
Information for Teacher:

- Students have learnt about proper and improper fractions and also learnt about equivalent fractions.
- Now they will learn about the comparison of fractions.
- Fractions that have same denominator are called like fractions e.g., 1/4, 2/4, 3/4 etc.
- Comparing fractions means to check if the fraction is smaller than, greater than or equal to the other fraction.
- To compare like fractions, look at the numerators, greater the numerator greater is the fraction.
- While teaching the lesson, also consult textbook where and when applicable.

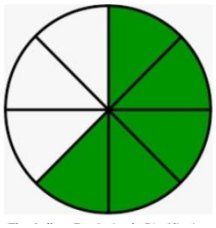
Introduction:

- **Comparing fractions** means determining the larger and the smaller fraction between any two fractions.
- For comparing fractions with the same denominators, it becomes easier to determine the greater or the smaller fraction.
- After checking if the denominators are same, we can simply look for the fraction with the bigger numerator.
- If both the numerators and the denominators are equal, the fractions are also equal.
- Open page 87 of textbook.
- Draw two circles (representing bread) naming Ali and Saba respectively, on the board as shown in textbook page 87.
- Color 3 out of 8 parts and 5 out of 8 parts to show the two fractions of the bread.

Ali ate 3 out of 8



Saba ate 5 out of 8

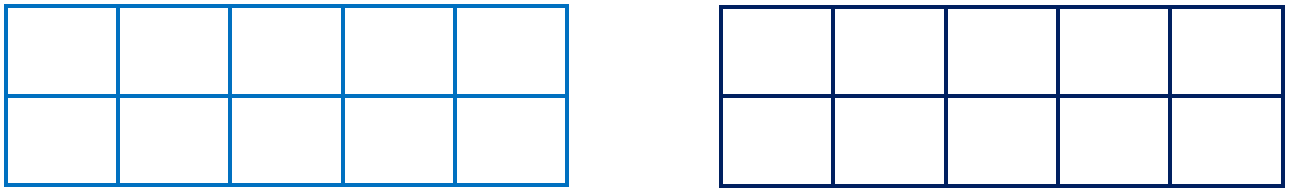


- Now, compare 3/8 and 5/8 to find who ate less bread.
- Follow the steps below to compare like fractions:
- Step 1: Observe the denominators of the given fractions: 3/8 and 5/8. The denominators are the same.
- Step 2: Now, compare the numerators. We can see that 3 <5.
- Step 3: The fraction with the smaller numerator is the smaller fraction.
- Therefore, 3/8<5/8, which shows Ali ate less bread.
- Tell the students that in two fractions with same denominators. A fraction having greater numerator than other fraction, is a greater fraction. While fractions with same numerators are equal fractions.

Development:

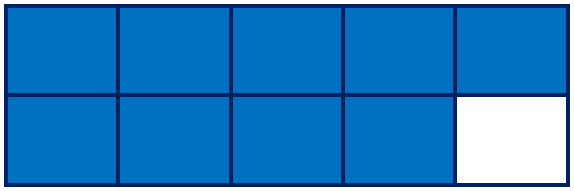
Activity 1:

- Draw two rectangles on the board.
- Ask the students can we divide the rectangle into 10 equal parts?
- Give them some time to discuss with their partners.
- Take their responses and appreciate their participation.
- Call a student and ask him/her to divide it into 10 equal parts.



- Now write 7/10 and 9/10 under each rectangle.
- Call two students one by one on the board and ask them to color the figures according to the given fractions.

7/10



9/10

- Help them if needed.
- Now ask the students can u tell which fraction is greater and how?
- Now explain to them, as we can see from the figures that 9/10 has more colored portion than 7/10.
- Also tell them that 9/10 and 7/10 have same denominators. Now we will check the numerators.
- As, 9 is greater than 7. i.e., 9 > 7
- So, 9/10 is greater than 7/10 i.e., 9/10>7/10
- Draw few shapes and write fractions on the board then ask the students to color the following figures according to fractions and then use >,< or =

Activity 2:

- Write some fractions with same denominators on paper strips (e.g., 1/6, 2/6, 5/6 etc).
- Put them in a box and ask students to draw two fractions.
- Ask them to compare those fractions and write in their notebooks.
- Now ask them to open page no 88 of Maths textbook PCTB and solve Q#1.
- Take a round and check their work.
- Appreciate the students who have done their work successfully.
- Solve the question for students who are still struggling.

Conclusion:

- **Comparing fractions** means determining the larger and the smaller fraction between any two fractions.
- For comparing fractions with the same denominators, it becomes easier to determine the greater or the smaller fraction.
- After checking if the denominators are same, we can simply look for the fraction with the bigger numerator.
- If both the numerators and the denominators are equal, the fractions are also equal.

Assessment:

- Write some fractions with same denominators to students and ask them to compare these fractions.
- Assign them to solve Q#2 from textbook page 88.

Follow up:

Read and remember “key point” given on page no 87 and write some fractions with the same denominators. Now compare these fractions.

Glossary

Comparing fractions: to check which fraction is smaller than, greater than or equal to the other.

ADDITION OF FRACTIONS

Duration: 40 Minutes

Students Learning Outcomes:

- Add two fractions with same denominators.
- Represent addition of fractions through figures.

Materials:

Board, marker/chalk, Math's Grade 3 PCTB, notebook.

Information for Teacher:

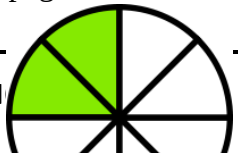
- Students previously have learnt about proper and improper fractions and equivalent fractions.
- Now they will learn about the addition of fractions.
- The addition of fractions means to add two or more fractions.
- In addition with like fractions, add the numerators of the fractions and denominators remain the same.
- We use '+' symbol to add the fractions.

$$\frac{5}{3} + \frac{2}{3} = \frac{7}{3}$$

- While teaching the lesson, also consult textbook where and when applicable.

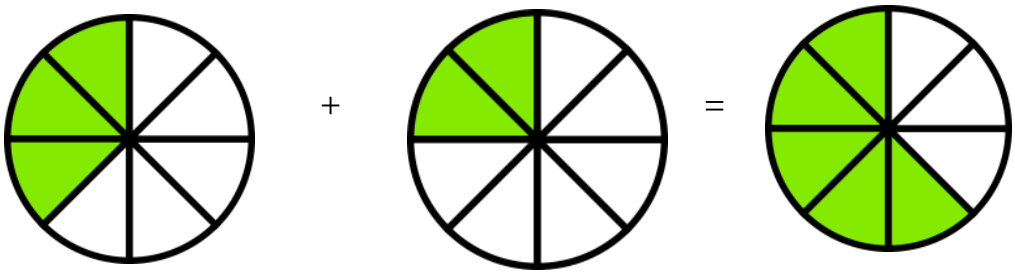
Introduction:

- Asses the prior knowledge of students about fractions.
- Involve them to recall the already learnt concepts with the help of examples on the board.
- Tell them that the addition of fractions with the same denominators is simple.
- We only need to add the numerators of the given fractions and write the sum over the denominator.
- Adding fractions with the same denominators is done by writing the sum of the numerators over the common denominator.
- Ask the students to open mathematics textbook page 89.
- Draw two circles with fractions 3/8 and 2/8 respectively on the board (representing how much pizza Zryab and Nayab ate) as shown in textbook page 89.



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

- Ask the students that how many total number of parts in both figures.
- After taking response tell them that the total number of parts are same in both fractions i.e. 8
- Zryab ate 3 out of 8 equal parts and Nayab ate 2 out of 8 equal parts.
- Now, to find the total quantity of pizza we will add the fractions. $\frac{3}{8}$ and $\frac{2}{8}$



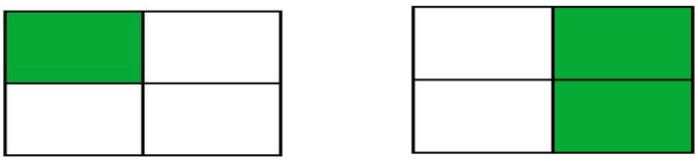
$\frac{3}{8}$ + $\frac{2}{8}$ = $\frac{3+2}{8}$ = $\frac{5}{8}$

- So, the total pizza eaten is $\frac{5}{8}$ i.e., 5 out of 8 equal parts
- Let's learn how to add fractions through figures.

Development:

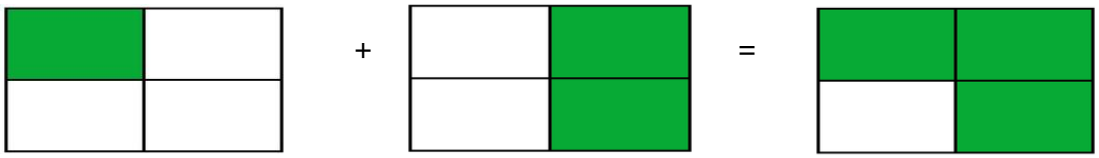
Activity 1:

- Ask the students to open textbook page 89.
- Let us add the fractions $\frac{1}{4}$ and $\frac{2}{4}$ using a rectangular model.
- Call two students one by one on the board and ask them to divide the rectangles into 4 equal parts and color according to the given fractions.



- Ask the students have you noticed something in the fractions?
- Take their responses and appreciate their participation.
- Tell the students that the denominator in the given fractions is the same. These fractions are called like fractions.
- Here, $\frac{1}{4}$ indicates that 1 out of 4 equal parts is shaded green and $\frac{2}{4}$ indicates that 2 out of 4 equal parts are shaded green.

- So, if we want to know the total number of parts that are shaded in this figure, we add the two fractions i.e., $\frac{1}{4}+\frac{2}{4}$
- Ask the students how many parts will be colored in total?
- Now call another student on the board and ask him/her to draw the resulting figure i.e.,$\frac{3}{4}$
- Ask the students the following questions:
  - Is the resulting figure correct?
  - How do we add the fractions?
- Call again another student on the board and ask him/her to add the given fractions.



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

- Guide if needed.
- Ask the students to solve Q#7 to 9 of Math PCTB textbook page 90.
- Take a quick round and check their work.

Activity 2:

- Write the following example on the board:
- Add$\frac{3}{10}$and$\frac{6}{10}$.
- Ask the students what is common in both fractions?
- How do we add the fractions?
- Which symbol do we use in addition?
- Take their responses and appreciate their participation.
- Call a student on the board and ask him to solve the sum like this:
  $\frac{3}{10}+\frac{6}{10}=\frac{3+6}{10}=\frac{9}{10}$
- Guide if needed.
- Write the following questions on the board and ask the students to solve them in their notebooks:
  a) $\frac{1}{3}+\frac{1}{3}$
  b) $\frac{2}{7}+\frac{3}{7}$
  c) $\frac{8}{18}+\frac{3}{18}$
- Take a quick round of their work and guide them if needed.

Conclusion:

- Adding fractions with the same denominators is done by writing the sum of the numerators over the common denominator.

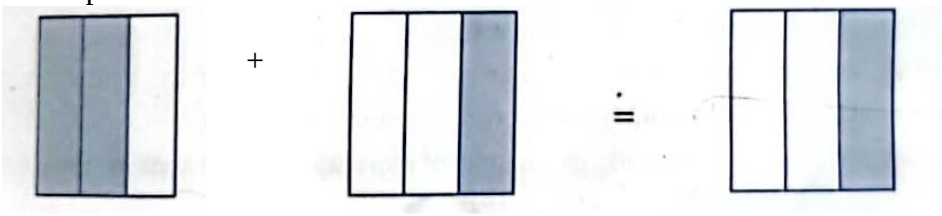
- We use the symbol '+' for addition.

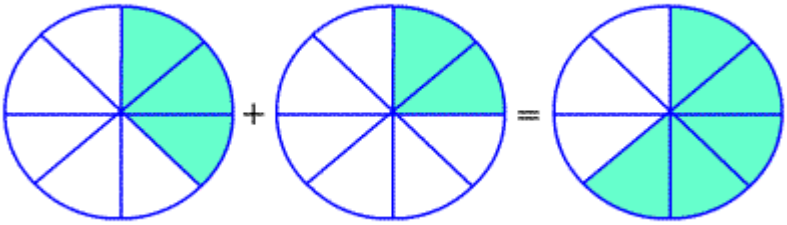
Assessment:

- Draw the following figures on the board and ask the students to write the fractions of the colored parts then solve it:

a)

b)





Follow up:

Assign homework Q#1 to 6 from textbook page 90 to solve.

Note: This lesson plan contains two SLOs.

Teacher Guide
Grade-3

Lesson Plan
29

SUBTRACTION OF FRACTIONS

Duration: 40 Minutes

Students Learning Outcomes:

- Subtract fractions with same denominators.
- Represent subtraction of fractions through figures.

Materials:

Board, marker/chalk, Math's Grade 3 PCTB, notebook.

Information for Teacher:

- Students have learnt the addition of fractions.
- Now they will learn about the subtractions of fractions.
- The subtraction of fractions means to subtract two fractions.
- In subtraction with like fractions, subtract the numerators, and denominator remain the same.
- We use '- 'symbol to subtract the fractions.

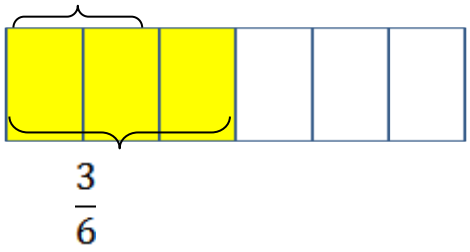
$$\frac{5}{8} - \frac{2}{8} = \frac{3}{8}$$

- While teaching the lesson, also consult textbook where and when applicable.

Introduction:

- The subtraction of fractions with the same denominators is simple.
- We only need to subtract the numerators of the given fractions and write the difference over the denominator.
- Subtracting fractions with the same denominators is done by writing the difference of the numerators over the common denominator.
- Open textbook page 91.

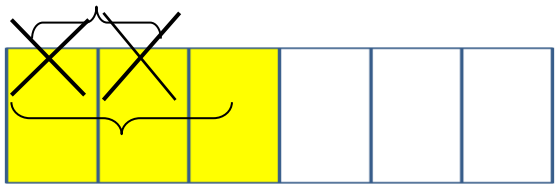
- Draw a rectangle on the board and mark $\frac{3}{6}$ and $\frac{2}{6}$ to show the fractions of chocolate eaten by
- Shahzain and Tabish respectively, like this: $\frac{2}{6}$



$\frac{3}{6}$

- To find how much more chocolate has eaten by Shahzain, we will subtract the fractions.
- Let us subtract the fractions $\frac{3}{6}$ and $\frac{2}{6}$ using rectangular figure.
- We will represent $\frac{3}{6}$ in this figure by shading 3 out of 6 parts.
- Now we will cross out 2 parts from our shaded parts of the figure to represent removing $\frac{2}{6}$.

$\frac{2}{6}$



$\frac{3}{6}$

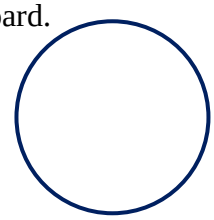
- We are now left with 1 part in the shaded parts. Thus, we subtract the fractions in the following way:
  $\frac{3}{6} - \frac{2}{6} = \frac{3-2}{6} = \frac{1}{6}$
- Thus, Shahzain ate $\frac{1}{6}$ part more of the chocolate than Tabish.
- Let's learn how to add fractions through figures.

Development:

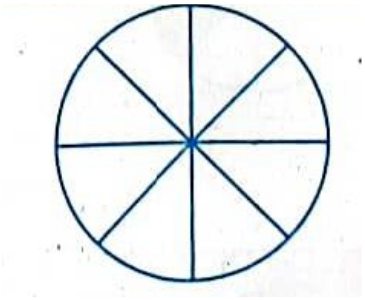
Activity 1:

Demonstrate the following example on the board from textbook page 91.

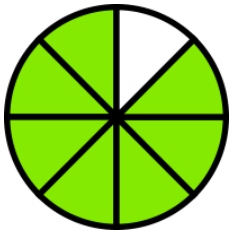
- Subtract $\frac{7}{8} - \frac{2}{8}$ through figures.
- Draw a circle on the board.



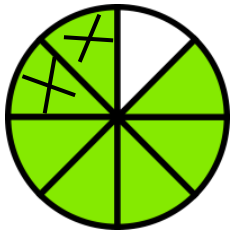
- Ask the students the following questions:
  - Can we divide a circle into equal parts?
  - Can a circle be divided into 8 equal parts?
- Give them some time to discuss with their partners.
- Take their responses and appreciate their participation.
- Now call a student on the board and ask him/her to divide the circle into 8 equal parts.
- Help if needed.



- Now ask the following questions to the students:
  - Which is the greater fraction?
  - Which is the smaller fraction?
  - How many parts of the circle you need to color to subtract the other fraction?
- Take their responses and appreciate their participation.
- Tell them that when we subtract the fractions, always subtract the smaller fraction from the greater fraction. (as in simple subtraction)
- Call a student on the board and ask him/her to color 7 out of 8 parts.



- Now ask them how many parts will be cross out from colored parts of the figure to represent $\frac{2}{8}$?
- Call again another student and ask him/her to cross out 2 parts.



- Ask them how many colored parts are left?
- Now call again another student and ask him/her to solve the sum like this:
- $\frac{7}{8} - \frac{2}{8} = \frac{7-2}{8} = \frac{5}{8}$
- Ask the students to solve Q# 10 to 12 of textbook page 92.

Activity 2:

- Write the following example on the board:
- Subtract $\frac{3}{12}$ from $\frac{10}{12}$.
- Ask the students what is common in both fractions?
  - How do we subtract the fractions?
  - Which fraction is subtrahend?
  - Which fraction is minuend?
  - Which symbol do we use in subtraction?
- Take their responses and appreciate their participation.
- Call a student on the board and ask him to solve the sum like this:
  $\frac{10}{12} - \frac{3}{12} = \frac{10-3}{12} = \frac{7}{12}$
- Guide if needed.
- Write the following questions on the board and ask the students to solve them in their notebooks:
  - d) $\frac{7}{10} - \frac{5}{10}$
  - e) $\frac{6}{7} - \frac{3}{7}$
  - f) $\frac{14}{18} - \frac{9}{18}$
- Take a quick round of their work and guide them if needed.

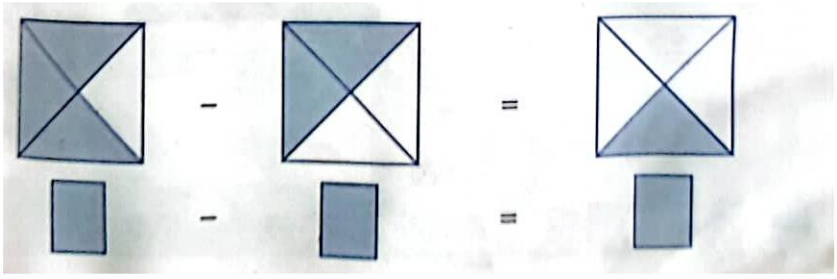
Conclusion:

- Subtracting fractions with the same denominators is done by writing the difference of the numerators over the common denominator.
- We use the symbol '-' for subtraction.

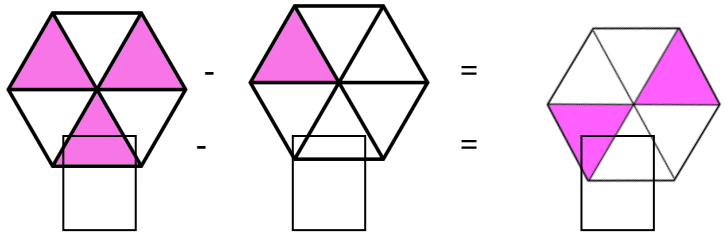
Assessment:

- Draw the following figures on the board and ask the students to write the fractions of the colored parts then solve it:

a)



b)



Follow up:

Solve Q#1 to 9 from textbook page 92.

Note: This lesson plan contains two SLOs.

LENGTH, MASS AND CAPACITY

Duration: 40 Minutes

Students Learning Outcome:

- Solve real life situations involving same units of length for addition without carrying.

Materials:

Board, marker/chalk, Math's Grade 3 PCTB, notebook.

Information for Teacher:

- Measurement of length is very important concept in daily life.
- Involve the students in hands on activities where they can apply mathematical skills.
- By solving word problems involving real life situations they are able to mathematics in their daily life.

Introduction:

- Assess student's previous knowledge and recap the concept of length and its units.
- Tell the students that we use concept of length in our daily life and it is very important concept.
- We measure distance while traveling, we measure size of clothes when we purchase cloths, etc.
- Let's take an example.
- Ahmed bought 5m cloth for himself and 6m cloth for his friend. How much total cloth Ahmed bought?
- It's a real life situation and first we have to find out the given information and the required operation.
- Ahmed bought cloth in meters i.e., 5m and 6m and "How much total cloth" refers to the addition operation.

Ahmed Cloth	05m
Ahmed friend Cloth	+ 06m
Total Cloth Bought	11 m

- This is how we apply concept of length in our daily life.
- Let's see some more examples.

Development:

Activity 1:

- Khalil and Usman are friends and working in a same office. The distance of office from Khalil's home is 9km 600m and the distance of office from Usman home is 13km 200m. Khalil wants to visit his friend's home and how much total distance Khalil has to travel to reach his friend home?

Khalil Home

Usman Home

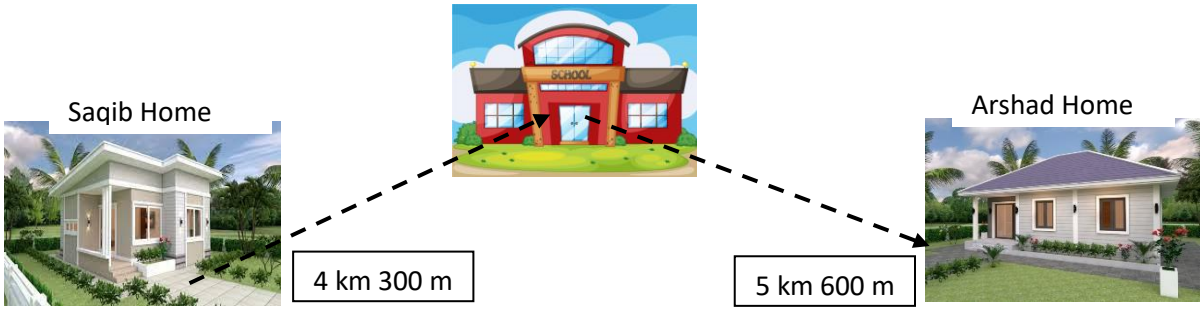
- It's a real life situation and first we have to find out the given information and the required operation.
- We can see two distances are given and "how much total" refers that addition operation is needed.
- So we will add two distances.
- Tell them that we will add metre into metre and centimetres into centimetres.

09km600m + 13km200m	
22km800m	

- Thus, Khalid will have to cover 22 km and 800 m to reach his friend home.

Activity 2:

- Paste the following charts on the board or illustrate the following real life situation.



- Saqib and Arshad are friends. Saqib wants to visit his friend's home. How much total distance Saqib has to travel to reach his friend's home?
- Call any student to read this real-life situation.
- Now ask the students that how much distance does Saqib travel from home to school? (4km 300m)
- Take their feedback and write the correct answer on the board.
- Now ask the students that how much distance Saqib travels from school to his friend Arshad's home.
- Take their feedback and write the correct answer on the board.

- Demonstrate to the students that we will write kilometers in one column and meters in one column.

Saqib's travel home to school Saqib's travel school to Arshad's home	04km300m + 05km600m
Total distance travel by Saqib	

- Add meters in meters and kilometers in kilometers.

Saqib's travel home to school Saqib's travel school to Arshad's home	04km300m + 05km600m
Total distance travel by Saqib	09km900m

- Ask the students that how much total distance Saqib will have to cover.
- Take their answer and recap the whole situation once again.

Sum up / Conclusion:

- **We use concept of length in our daily life.**
- **We add kilometers in kilometers and meters in meters.**
- **In real life situation first, we grasp the given information and then identify the required operation.**

Assessment:

Ask the students to open page # 102 of their Mathematics textbook PCTB and solve Q#7 on their notebooks.
Take a quick round and check their work.

Follow up:

Assign Q#9 of page no 102 of Maths textbook as homework.

Glossary

Carry: support and move (someone or something) from one place to another.

Teacher Guide
Grade-3

Lesson Plan
31

LENGTH, MASS AND CAPACITY

Duration: 40 Minutes

Students Learning Outcome:

- Solve real life situations involving same units of length for subtraction without borrowing.

Materials:

Board, marker/chalk, Math's Grade 3 PCTB, notebook.

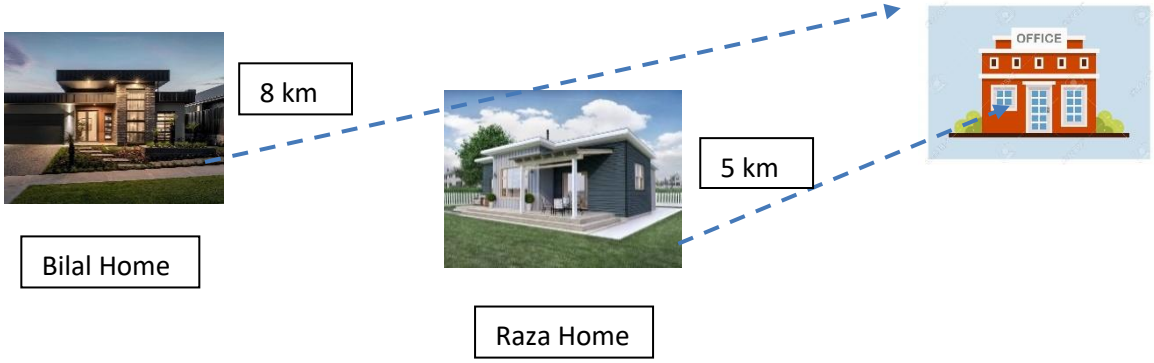
Information for Teacher:

- Students have learnt about addition of length in real life situations. Now they will learn about subtraction of length in real life situations.
- Involve the students in real life situations where they can apply mathematical skills.
- By solving word problems involving real life situations they are able to apply mathematics in their daily life.

Introduction:

Assess student's previous knowledge and recap the concept of subtraction of length.

- Ask the students that where we use concept of length in our daily life.
- After taking their responses tell them that we use concept of length in different tasks for example measuring distance, measuring length of cloth, measuring room length and width, etc. Let's see a real life situation.
- Raza covers daily 5 km distance to reach his school and his fried Bilal covers 8 km distance from his home to reach the school.
- Who is covering more distance and how much?



- First, we see the given information i.e.
  - Raza covers daily 5km to reach his school.
  - Bilal covers daily 8 km to reach his school.
  - We have to find out who is covering more distance and how much.
  - The word "more" refers to subtraction operation.

Raza covers daily distance Bilal Covers daily distance	05km 08km
Who is covering more and how much?	

- We will do subtraction operation and for subtraction we subtract smaller number from the greater number. So we will write as:

Bilal Covers daily distance Raza covers daily distance	08km - 05km
Who is covering more and how much	03 km

- Bilal is covering 3 km distance more than Raza to reach school.

Development:

Activity 1:

- Abid and Luqman are friends and one day they went for long drive and Abid covered 59 km 900 m distance and Luqman covered 46 km 500 m. Find who covered more distance and how much.

- It's a real life situation and first we have to find out the given information and the required operation.
- Ask the students that will we do addition or subtraction?
- After taking their response tell them that the word" more" refers that subtraction operation is needed.
- So we will subtract smaller distance from the greater one.
- Ask the students that who is covered more distance?
- After taking their response tell them that Abid covered more distance and we will write it at upper side.

Abid covered distance Luqman covered distance	59km900m - 46km500m
Who coverd more and how much	13 km 400 m

- We can see that Abid covered 13 km 400 m more distance to Luqman.

Activity 2:

- Let's see a real life situation.
- Rehana bought 19m 82cm lace for her shirt. She used 8m 61cm lace on her shirt. Find the length of remaining lace.

- Write this real life situation on the board and call a student to read it aloud.
- Ask the student to tell what we will do addition or subtraction?
- After taking their response tell them that word "remaining" refers to the subtraction operation.
- With the help of students write the given information on the board.
- Subtract meters from meters and centimeters from centimeters.

Rehana bought lace Rehana used lace	19m82cm + 08m61cm
Remaining lace	11 m 21 cm

- Ask the students that how much length of lace does Rehana remaining with her.
- After taking their response demonstrate the above subtraction operation step by step.
- Divide the class in pairs and assign Q#4 to solve in their notebooks from page # 106 of Maths textbook.
- Take a quick round and write the given information on board and demonstrate the step by step subtraction operation.

Sum up / Conclusion:

- Solving real life situation word problems first grasp the given information and then identify the required operation.
- Identify the keyword that refers to addition or subtraction.
- We subtract kilometers from kilometers, meters from meters and centimeters from centimeters.

Assessment:

Write the following real life situation on the board and ask the students to solve in their notebooks.

A shopkeeper sold 16m 34cm cloth from 38m 45cm cloth. How much cloth was left with him?

Take a quick round and check their work.

Follow up:

Assign Q#2 of page no 105 of Maths textbook as homework.

Glossary

Measure: a standard unit used to express the size, amount, or degree of something.

LENGTH, MASS AND CAPACITY

Duration: 40 Minutes

Students Learning Outcome:

- Solve real life situations involving same units of mass for addition without carrying.

Materials:

Board, marker/chalk, Math's Grade 3 PCTB, notebook.

Information for Teacher:

- Students have learnt about addition and subtraction of length in real life situations. Now they will learn about addition of same units of mass in real life situations.
- Involve the students in real life situations where they can apply mathematical skills to add same units of mass.
- By solving word problems involving real life situations they are able to apply mathematics in their daily life.
- While teaching the lesson, consult textbook at all steps where and when applicable.

Introduction:

- Assess student's previous knowledge of units of mass / weight.
- Ask the following questions to the students:
  - Which unit of mass is used to measure the mass of light objects like a pencil or chalk? (gram)
  - Which unit of mass is used to measure the mass of heavy objects like a chair or table? (kilogram)
- Ask the students that where we use concept of mass / weight in our daily life.
- After taking their responses tell them that we use concept of length in our different tasks for example measuring weight of household items vegetable and fruits.
- Tell them if you want to buy vegetable, you have to tell the shopkeeper that how much you need vegetable in grams or kilograms.
- While adding same units of mass we add grams in grams and kilograms in kilograms.
- Let's learn some more about it.

Development:

Activity 1:

- Rehan bought the following fruit from the market.

Apple 4 kg 500g

Mango 5 kg 400g

- Ask the students that tell how much total mass of these fruit baskets.
- Give them time to think and answer.
- After taking their response tell them that we will add mass of both baskets because we have to find "total" mass. Word total refers to addition operation.
- We will add kilogram into kilograms and grams into grams.

Apple 4 kg 500g

Mango 5 kg 400g

Apple Mango		4 kg 500 g 5 kg 400 g
Total Mass		9 kg 900 g

- Call a student to tell how much mass of apple basket?
- Call other students that how much mass of mango basket?
- Ask the students that much the total mass of both baskets?
- Take their response and demonstrate the addition steps of both baskets masses.

Activity 2:

The mass of Zahra bag is 10kg 300g and mass of Suleman's bag is 12 kg 400g. How much the total mass of both bags?

Zahra Bag

10kg 300g

Suleman Bag

12kg 400g

- Call a student to read aloud this real life situation.
- Call any student and ask him to tell the mass of Zahra's Bag.
- Call any other student and ask to tell the mass of Suleman Bag.
- Ask the students that what we have to find out and which operation is needed addition or subtraction.
- After taking their response tell them that word "total" refers to do addition operation.
-
- Make the following table on the board and demonstrate the addition operation.

Zahra's Bag Suleman's Bag	10 kg 300 g + 12 kg 400 g
Total Mass	22 kg 700 g

Activity 3:

- Divide the class in pairs.
- Write the following questions on the board and ask the students to solve these questions in their notebooks.

85 kg	245g		28 kg	325g	
+ 10 kg	134g		+ 31 kg	550g	

- Take a quick round and check their work.

Sum up / Conclusion:

- Solving real life situation word problems first grasp the given information and then identify the required operation.
- Identify the keyword that refers to addition or subtraction.
- We subtract kilograms from kilograms and grams from grams.

Assessment:

- Write the following real life situation on the board and ask the students to solve in their notebooks.
- Rizwan bought 6kg 250g sweet biscuits and 3 kg 500g salty biscuits. Find the total mass of the biscuits.
- Take a quick round and check their work.

Follow up:

Assign Q # 4 of page no 111 of mathematics textbook as homework.

Teacher Guide
Grade-3

Lesson Plan
33

LENGTH, MASS AND CAPACITY

Duration: 40 Minutes

Students Learning Outcome:

- Solve real life situations involving same units of mass for subtraction without borrowing.

Materials:

Board, marker/chalk, Math's Grade 3 PCTB, notebook.

Information for Teacher:

- Students have learnt about addition of same units of mass and now they will learn about subtraction of same units of mass in real life situations.
- Involve the students in real life situations where they can apply mathematical skills to subtract same units of mass.
- By solving word problems involving real life situations they are able to apply mathematics
- in their daily life.
- While teaching the lesson, consult textbook at all steps where and when applicable.

Introduction:

- Assess student's previous knowledge of units of mass / weight.
- Ask the following questions to the students:
  - Which unit of mass is used to measure the mass of light objects like a pencil or chalk? (gram)
  - Which unit of mass is used to measure the mass of heavy objects like a chair or table? (kilogram)
- Ask the students that where we use concept of mass / weight in our daily life.
- After taking their responses tell them that we use concept of length in our different tasks for example measuring weight of household items vegetable and fruits.
- In the market we buy fruit and vegetable in kilograms or grams.
- While subtracting same units of mass we subtract grams from the grams and kilograms from the kilograms.
- Let's learn some more about it.

Development:

Activity 1:

- The mass of Saima's bag is 8kg 675g. After taking out of some books, the mass of bag becomes 7 kg 550g. What will be the mass of books that were taken out?

- Call any student to read aloud the real life situation.
- Ask the following questions to the students:
  - What is the mass of Saima's bag? (8kg 675g
  - What is the mass of bag after taking out of some books? (7kg 550g)
  - What we have to find out? (Mass of books taken out)
- Ask the students what we have to addition or subtraction?
- Give them time to think and answer.
- After taking their response tell them that we will do subtract operation. The word "taken out" refers to do subtract operation.
- Make the following table on the board and write grams and kilograms in vertical form.

Mass of bag Mass of Bag after books taken out	8 kg 675 g - 7 kg 550 g
Mass of books taken out	

- We will subtract mass of bag after taken out books from the mass of bag with that books.
- Tell them that we will subtract grams from gram and kilograms from kilograms.
- Call a student to solve the question on board.

Mass of bag Mass of Bag after books taken out	8 kg 675 g - 7 kg 550 g
Mass of books taken out	1 kg 125 g

- Call a student to tell the mass of books taken out.

Activity 2:

A shopkeeper sold 16kg 250g chocolates from a chocolate carton of mass 27kg 350g. How much chocolates were left?

- Call a student to read aloud this real life situation.
- Call any student and ask him to tell the mass of chocolates sold.(16kg 250g)
- Ask other students that his answer is correct or not.
- Write the correct answer on the board.
- Call any other student and ask to tell the mass of chocolate carton.(27kg 350g)
- Ask the students that what we have to find out and which operation is needed addition or subtraction.
- After taking their response tell them that word "left" refers to do subtraction operation.
- Make the following table on the board and demonstrate the steps of subtraction operation.

Mass of chocolate carton Mass of chocolate sold	27 kg 250 g - 16 kg 250 g
Mass of chocolate left	11 kg 000 g

Activity 3:

- Divide the class in pairs.
- Write the following questions on the board and ask the students to solve these questions in their notebooks.

97 kg 850g - 53 kg 340g		82 kg 677g - 75 kg 500g

- Take a quick round and check their work.

Sum up / Conclusion:

- Recap the whole concept of subtraction of same units of mass in real life situations.
- Tell them that solving real life situation word problems first grasp the given information and then identify the required operation.
- Identify the keyword that refers to addition or subtraction and keywords.
- We subtract kilograms from kilograms and grams from grams.

Assessment:

- Write the following real life situation on the board and ask the students to solve in their notebooks.
- In the beginning of the year Affan weight was 34 kg 650g and at the end of year his weight is 44kg 950g. How much weight did he gain in one year?
- Take a quick round and check their work.

Follow up:

Assign Q # 1 of page no 114 of Mathematics textbook as homework.

Teacher Guide
Grade-3

Lesson Plan
34

LENGTH, MASS AND CAPACITY

Duration: 40 Minutes

Students Learning Outcome:

- Solve real life situations involving same units of capacity for addition without carrying.

Materials:

Board, marker/chalk, Math's Grade 3 PCTB, notebook.

Information for Teacher:

- Students have learnt about addition and subtraction of same units of mass and now they will learn about addition of same units of capacity in real life situations.
- Involve the students in real life situations where they can apply mathematical skills to add the same units of capacity.
- Capacity is the quantity of liquid, a container can hold. Capacity is measured in liters or milliliters. One liter is equal to 1000 milliliters.
- By solving word problems involving real life situations they are able to apply mathematics in their daily life.
- While teaching the lesson, consult textbook at all steps where and when applicable.

Introduction:

- Assess student's previous knowledge of units of capacity.
- Ask the following questions to the students:
  - Which unit of capacity is used to measure the capacity of small containers like a cup small water bottle or syringe? (milliliters)
  - Which unit of capacity is used to measure the capacity of big containers like a jug, water gallon and drum? (kilogram)
- Ask the students that where we use concept of capacity in our daily life.
- After taking their responses tell them that we use concept of capacity in our different tasks for example measuring capacity of cooking oil bottle, measuring petrol in our car or bike, etc.
- In the market we buy cooking oil and petrol in liters.
- While adding the same units of capacity we add milliliters in milliliters and liters in liters.
- Tell the students that we buy cooking oil in different containers having different capacity.

Cooking oil bottle
Capacity 5 litters

Cooking oil gallon
Capacity 10 litters

- Tell them that capacity is the quantity of liquid, a container can hold. Capacity is measured in liters or milliliters. One liter is equal to 1000 milliliters.

Development:

Activity 1:

- Rizwan bought 10 litre 500 milliliters cooking oil from a shop. His mother demonded 20 liter 300 milliliter more cooking oil. How much total cooking oil Rizwan bought?

- Call any student to read aloud the real life situation.
- Ask the students what we have to do addition or subtraction?
- Give them time to think and answer.
- After taking their response tell them that we will do addition operation. The word “total” refers to do addition operation.
- Make the following table on the board and write milliliter and liter in vertical form.

	Rizwan bought cooking oil His mother more demanded	10 L 500 ml + 20 L 300 ml
	Total amount of oil	

- Tell them that we will add liters in liters and milliliters in milliliters.
- Call a student to solve the question on board.

Rizwan bought cooking oil His mother more demanded	500 ml + 300 ml	10 20	L L
Total amount of oil	800 ml	30	L

- Call a student to tell how much total quantity of cooking oil Rizwan bought.

Activity 2:

Amir bought water bottles. One bottle has 18 liter 600 milliliter and second bottle has 5 liter 350 milliliter water. How much total water is there in both bottles?

18 liter 600 milliliter

5 liter 350 milliliter

- Call a student to read aloud this real life situation.
- Call any student and ask him to tell the quantity of water in big bottle(18 L 600 ml)
- Ask other students that his answer is correct or not.
- After taking responses write the correct answer on the board.
- Call any other student and ask to tell the quantity of water in small bottle(5 L 350 ml)
- Ask the students that what we have to find out and which operation is needed addition or subtraction?
- After taking their response tell them that word “total” refers to do addition operation.
- Make the following table on the board and demonstrate the steps of addition operation.

Water in big bottle Water in Small bottle	18 L 600 ml + 05 L 350 ml
Total quantity of water	23 kg 950 g

Sum up / Conclusion:

- Recap the whole concept of addition of same units of capacity in real life situations.
- Tell them that solving real life situation word problems first grasp the given information and then identify the required needed operation.
- Identify the keyword that refers to addition or subtraction.
- We add liter in liter and milliliter in milliliter.

Assessment:

- Write the following real life situation on the board and ask the students to solve in their notebooks.
- Farida makes an online order for 13 liter 500 milliliter milk for her children and 11 liter milk for tea. How many total quantity of milk does Farida order?
- Take a quick round and check their work.

Follow up:

Assign Q # 3 & 4 of page no 119 of Mathematics textbook as homework.

LENGTH, MASS AND CAPACITY

Duration: 40 Minutes

Students Learning Outcome:

- Solve real life situations involving same units of capacity for subtraction without borrowing.

Materials:

Board, marker/chalk, Math's Grade 3 PCTB, picture of water cooler, picture of small water bottle, notebook.

Information for Teacher:

- Students have learnt about addition of same units of capacity in real life situations and now they will learn about the subtraction of same units of capacity.
- Involve the students in real life situations where they can apply mathematical skills to subtract the same units of capacity.
- Capacity is the quantity of liquid, a container can hold. Capacity is measured in liters or milliliters. One liter is equal to 1000 milliliters.
- By solving word problems involving real life situations they are able to apply mathematics in their daily life.
- While teaching the lesson, consult textbook at all steps where and when applicable.

Introduction:

- Involve the students to recall their previous knowledge of units of capacity.
- Ask the following questions to the students:
  - Which unit of capacity is used to measure the capacity of small containers like a small water bottle or syringe? (milliliters)
  - Which unit of capacity is used to measure the capacity of big containers like a jug, water gallon and drum? (kilogram)
- Ask the students that where we use concept of capacity in our daily life.
- After taking their responses tell them that we use concept of capacity in our daily life to measure the capacity of cooking oil bottles, petrol in our car or bike and quantity of milk etc.
- We measure cooling oil, milk, petrol and water in liter or milliliter.
- Give empty packs of juices, water bottles and oil bottles to read the capacity of each.
- Tell the students that while subtracting the same units of capacity we subtract milliliters from milliliters and liters from liters.

- Let's see a few examples of real life situations.

Development:

Activity 1:

- The capacity of a water cooler is 6 liter (L) 800 milliliter (ml). Farhan has a bottle with the capacity of 1 liter (L) 500 milliliter (ml). He fills his bottle from the cooler. How much water is left in the water cooler.
- Illustrate the above real life situation in the class using pictures or draw on the board.

6 liter 800 milliliter

1 liter 500 milliliter

- Call any student to read aloud the real life situation.
- Ask the students what we have to do addition or subtraction?
- Give them time to think and answer.
- After taking their response tell them that we will do subtraction operation. The word "left" refers to do subtraction operation.
- Make the following table on the board and write milliliter and liter in vertical form.

Quantity of water in cooler Quantity of water filled by Farhan	6 L 800 ml - 1 L 500 ml
How much water is left	

- Tell them that we will subtract liters in liters and milliliters from milliliters.
- Call a student to solve the question on board.

Quantity of water in cooler Quantity of water filled by Farhan	6 L 800 ml - 1 L 500 ml
How much water is left	5 L 300 ml

- Call a student to tell how much total quantity of water is left in the cooler. (5L 300ml)

Activity 2:

- Divide the whole class different groups.
- Provide each group four 500 ml and one 1500 ml empty water botltes.

- First allow the students to fill the 1500 ml bottle with water.
- Now allow them to fill 500 ml bottles from the water of 1500 ml bottle.
- Now ask the following questions:
    - How many 500ml bottles can be filled from one bottle of 1500ml?
    - Can we filled four bottles of 500ml from 1500ml water bottle?
    - How much total water is there in three bottles of 500ml?
    - How much total water will be if we fill three 500ml bottles and one 1500ml water bottle?

Activity 3:

- Divide the class in pairs and assign them to solve Q# 2, 3 and 4 from page # 122 of their Maths textbook.
- Guide them that first read the reallife situations carefully and note down the given information.
- Identify the keyword that leads to the needed operation.
- Take a quick round and check their work.

Sum up / Conclusion:

- Recap the whole concept of subtraction of same units of capacity in real life situations.
- Tell them that solving real life situation word problems first grasp the given information and then identify the required needed operation.
- Identify the keyword that refers to addition or subtraction.
- We subtract liter from the liter and milliliter from the milliliter.

Assessment:

- Write the following real life situation on the board and ask the students to solve in their notebooks.
- Arif bought 45 liter 500 milliliter petrol and used 30 liter of petrol from it. How many liter of petrol is left in the car?
- Take a quick round and check their work.

Follow up:

Assign Q # 2, 3 & 4 of page no 122 of Maths textbook as homework.

Glossary

Capacity: the maximum amount that something can contain.

TIME

Duration: 40 Minutes

Students Learning Outcomes:

- Use a.m. and p.m. to record the time from 12-hour clock.
- Read and write time from analog and digital clocks.

Materials:

Board, marker/chalk, Math's Grade 3 PCTB, picture of analog clock, picture of digital clock, am and pm poster, notebook.

Information for Teacher:

- Student will learn the measurement of time. It's a very important concept.
- AM and PM are Latin words that are used to reference time.
- AM and PM are the abbreviated terms for Ante meridiem and Post meridiem which means before noon or midday and afternoon or midday respectively.
- The initial 12-hour period which lasts from midnight to noon is designated with AM while the next 12-hour period which lasts from noon to midnight is designated with PM.

Introduction:

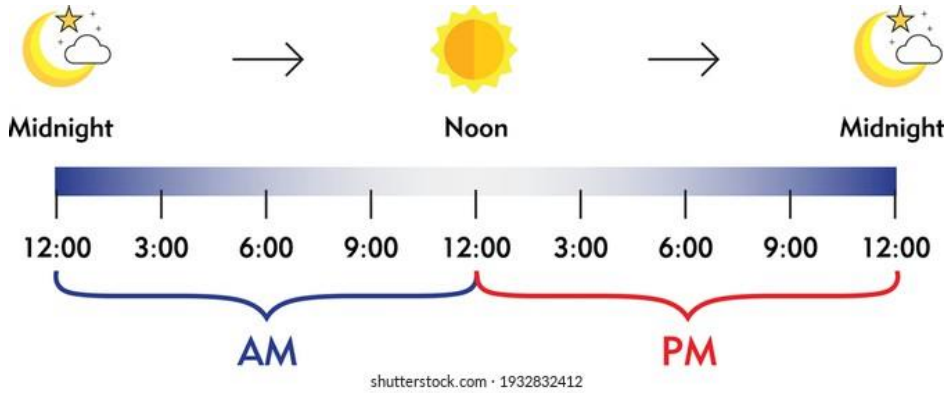
- Start your session by asking following questions:
  - What is the time?
  - To know the time what is needed?
- Display or paste the picture of analog and digital clock in front of the class.

- Call students to tell the difference between two clocks. (Analog clock has two hands i.e., hour hand and minute hand and digital clock has no hands it has digits only.
- Ask the students that what is am and pm?
- After taking their response tell them that let's learn more about it.

Development:

Activity 1:

- Draw on the baord or display the following poster in front of the class.



- With the help of above poster demonstrate the concept of "am" and "pm" to the students as:
  - Time is divided into hours, minutes, and seconds. Each day is 24 hours, each hour is 60 minutes, and each minute is 60 seconds.
  - Time is displayed in two ways. The first is through a 24-hour clock, and the other is through an AM-PM clock or 12 hours clock.
  - Show the picture of 12 hours clock.

  - The abbreviation 'AM' stands for ante meridiem (before the meridian line has crossed the Sun or the time between midnight and 11.59 in the morning). PM stands for post-meridiem (after the meridian line has crossed the Sun or the time between noon and 11.59 at night).
  - The 12-hour clock method defines all 24 hours of the day using the numbers 1 to 12, followed by am or pm. 5 AM is early in the morning and 5 PM is late in the afternoon; 1 AM is one hour after midnight, and 11 PM is one hour before midnight.
  - Ante meridiem is generally referred to as AM, am, a.m., or A.M whereas PM, pm, p.m., or P.M. are typically abbreviated post meridiem.
- Ask the students that open page # 130 of Mathematics textbook.
- Look at the clocks and write the time.

- Take a quick round and guide where needed.

Activity 2:

- Place or display picture of analog clock in front of the class.

- Call any student to read the time from the clock.
- Demonstrate to the students that there are 1 to 12 numbers written on the dial of the clock, long hand shows the minutes and short hand shows hours. In one hour there are sixty minutes.

- Now divide the class in pair and ask them to read and write the time from the clocks given on page no 131.
- Tell the students that remember the 12-hour clock method defines all 24 hours of the day using the numbers 1 to 12, followed by am or pm. 5 AM is early in the morning and 5 PM is late in the afternoon; 1 AM is one hour after midnight, and 11 PM is one hour before midnight.
- Take a quick round and check their work.
- Now show the picture of digital clock and tell the students that there are only numbers in the digital clock.

- Left side numbers shows the hours and right side number shows the minutes.

Sum up / Conclusion:

- Recap the whole concept of time using pictures of analog and digital clocks.
- Tell them that in 12-hours clock the numbers are written on the dial. Long hand shows minutes and short hand shows hours.

- We write am or pm with the time with the reference of mid night. From midnight to noon there is “am” and from midday to midnight there is “pm”.

Assessment:

- Draw or show the pictures of the following clocks and ask the students to read time.



- Ask the students to open page no 132 of their mathematics textbook and solve the Q#3 in their notebook.
- Take a quick round and check their work.

Follow up:

Make your daily routine time table and write time in am or pm.
Fajar: Salah Time_____ Breakfast Time_____School Time _____
Study Time _____ Exercise Time _____Sleeping Time _____

Glossary

AM / am: ante meridiem (before the meridian line has crossed the Sun or the time between midnight and 11.59 in the morning)
PM/pm: post-meridiem (after the meridian line has crossed the Sun or the time between noon and 11.59 at night)

Note: This lesson plan contains two SLOs.

Teacher Guide
Grade-3

Lesson Plan
37

TIME

Duration: 40 Minutes

Students Learning Outcomes:

- Add measures of time in hours.
- Solve real life situations involving measures of time for addition of hours.

Materials:

Board, marker/chalk, Math's Grade 3 PCTB, notebook.

Information for Teacher:

- Student have learnt the reading of time from analog and digital clock.
- Now they will learn to add time in hours and solving real life problems involving measures of time for addition of hours.
- Involve the students in real life situation so that they can grasp the given information correctly.
- By solving real life situations, the students are able to apply mathematics in daily life.
- While teaching the lesson, consult Maths textbook where and when applicable.

Introduction:

- Start your session with a question that "who will read the time from the classroom clock or tell the time from his own watch".
- After getting response tell the students that we have learnt reading of time from analog clock as well as digital clock.
- Now we will learn about real life situations involving measures of time.
- Tell them that units of time are used to measure the duration between the occurrences of two events.
- Ask the students that how we measure time? (In seconds, in minutes and in hours)
- After getting response tell them that we measure time in seconds, in minutes and in hours.
- If someone asks you that "how much time do you spend in studies?" your answer will be like that, 2 hours or 3 hours, etc. You will give your answer in minutes or hours.
- Let's learn some more about it.

Development:

Activity 1:

- Amna is hardworking girl. She plans her daily routine very carefully.
- Write the following time schedule on the board.

No	Task	Duration (Time)
1	Study time	4 hours
2	Helping mother in household tasks	2 hours
3	Playing with younger sister	30 minutes
4	Sitting with mother	30 minutes
5	Watching TV	1 hour
6	Recitation of the Holy Quran	30 minutes
7	Reading general books	1 hour

- Now ask the following questions from the students.
- Involve different students while asking questions.
- Give them time to think and answer.
    - How much time she is spending in her studies?
      (4 hours)
    - How much time she is spending in playing with sister and watching TV?
      (1 hour 30 minutes)
    - How much total time she is spending in studies and reading general books? (5 hours)
- Tell the students that we add minutes in minutes and hours in hours.
- Ask them to open page # 136 of Mathematics textbook and solve Q#1.
- Take a quick round and check their work.

Activity 2:

A bus takes 5 hours to reach Lahore from Rawalpindi and takes 4 hours to reach Multan from Lahore. What is the total time taken from Rawalpindi to Multan?

- Call a student to read the real life situation aloud.

- Ask the students to tell the given information.
- After taking their response tell them that we have:
  - Time taken by bus from Rawalpindi to Lahore: 5 hours
  - Time taken by bus from Lahore to Multan: 4 hours
- Now ask them to tell which operation is needed addition or subtraction?
- Give them time to think and answer.
- After taking their response tell them that the word "total" refers addition operation.
- So we will add these two times.

Time taken by bus from Rawalpindi to Lahore Time taken by bus from Lahore to Multan	5 h + 4 h
Total time taken from Rawalpindi to Multan	9 h

- We add minutes in minutes and hours in hours.
- Now divide the class in pairs and assign Q# 4 of page no 136 of Maths textbook.
- Take a quick round and check their work.
- Appreciate the students who have done successfully and solve the question on board and involve those who are still struggling.

Sum up / Conclusion:

- Recap the session by concluding that:
  - We can read time from analog clock as well as digital clock.
  - We measure time in seconds, minutes and hours.
  - While adding time we add hours in hours, minutes in minutes and seconds in seconds.
  - In real life situation word problems first we extract the given information and then find the keyword that refers to any operation.

Assessment:

- Ask the students to open page # 136 of Mathematics textbook and solve Q# 3 & 4 in their notebook.
- Check their work and guide where necessary.

Follow up:

Assign Q# 2 of page # 136 as homework.

Note: This lesson plan contains two SLOs.

TIME (PAGE 137-140)

Duration: 40 Minutes

Students Learning Outcomes:

- Subtract measures of time in hours.
- Solve real life situations involving subtraction of measures of time in hours.

Materials:

Board, marker/chalk, Math's Grade 3 PCTB, notebook.

Information for Teacher:

- Student have learnt the reading of time from analog and digital clock.
- They have also learnt addition of time in hours.
- Now they will learn to subtract time in hours and solving real life problems involving measures of time for subtraction of hours.
- Involve the students in real life situation so that they can grasp the given information correctly.
- By solving real life situations, the students are able to apply mathematics in daily life.
- While teaching the lesson, consult Maths textbook where and when applicable.

Introduction:

- Start your session with a question that "who will read time from the classroom clock or tell the time from his own watch".
- After getting response tell the students that we have learnt reading time from analog clock as well as digital clock.
- Now we will learn about real life situations involving subtraction of measures of time in hours.
- Ask the students that how we measure time? (In seconds, in minutes and in hours)
- After getting response tell them that we measure time in seconds, in minutes and in hours.
- While subtracting we subtract seconds from seconds, minutes from minutes and hours from hours.
- Let's learn some more about it.

Development:

Activity 1:

- Saira plans her daily routine very carefully. She prepared her daily schedule as following:

No	Task	Duration (Time)
1	Study time	4 hours
2	Study of Science	1 hour
3	Playing with younger sister	30 minutes
4	Household tasks	3 hours
5	Watching TV	1 hour
6	Recitation of the Holy Quran	30 minutes
7	Reading general books	1 hour

- Now ask the following questions from the students.
- Involve different students while asking questions.
- Give them time to think and answer.
    - How much more time she is spending in her studies than reading general books? (3 hours)
    - How much more time she is spending in study time than reading general books? (2 hours)
    - How much total time she is spending in studies and reading general books? (5 hours)
- Tell the students that we subtract minutes from minutes and hours from hours.

Activity 2:

- Write the following real life situation on the baord.
  Tahira spends 9 hours for studying English and 5 hours for studying mathematics. How much more time does she spend for English than mathematis?
- Call a student to read this situation alound in front of the class.
- Ask the studens to tell the given information.
- Make the following table on the board and with the help of students write the given information.

Tahira study time for English Tahira study time for Mathematics	9 h 5 h
How much more time for English	

- Ask the students to tell that what we will do addition or subtraction?
- Give them time to think and read real life situation again.
- After getting their response tell them that we will do subtraction operation.

Tahira study time for English Tahira study time for Mathematics	9 h - 5 h
How much more time for English	**4 h**

- Thira is spending 4 hours for studying for English more than Mathematics.
- Now divide the class in pairs and assign Q# 1,2 and 3 of page no 138 of Mathematics textbook.
- Take a quick round and check their work.
- Appreciate the students who have done successfully and solve the question on board and involve those who are still struggling.

Sum up / Conclusion:

- Recap the session by concluding that:
    - We can read time from analog clock as well as digital clock.
    - We measure time in seconds, minutes and hours.
    - While subtracting we subtract hours from hours, minutes from minutes and seconds from seconds.
    - In real life situation word problems first we extract the given information and then find the keyword that refers to any operation.

Assessment:

- Ask the students to open page no 140 of Mathematics textbook PCTB and solve Q# 5 in their notebooks.
- Check their work and guide where necessary.

Follow up:

Make your daily routine schedule and check how many hours you are spending for studies?
Are you spending more time on studies than playing if yes then tell how many hours more you are spending for studies than playing.

Note: This lesson plan contains two SLOs.

GEOMETRY

Duration: 40 Minutes

Students Learning Outcome:

- Classify figures according to the number of sides as quadrilaterals (rectangles, squares) and triangles.

Materials:

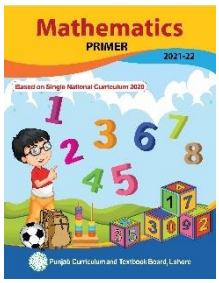
Board, chalk/marker, cutouts of triangles, cutout of square, cutout of circle textbook, sheets of paper, Mathematics Grade 3 (PCTB).

Information for Teachers:

- A triangle has three sides and three vertices.
- A quadrilateral has four sides and four vertices.
- A circle has no side and no vertex.
- While teaching the lesson, also consult textbook where and when applicable.

Introduction:

- Assess the prior knowledge of students about triangle, rectangle and a circle.
- Show the following things from the daily life and ask them to match with the shape of triangle, rectangle or circle.

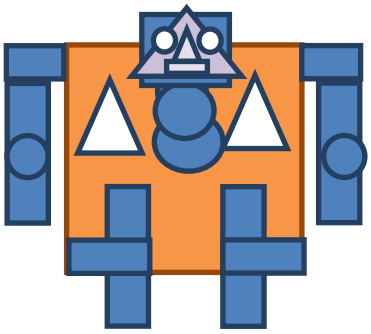


Book

Pizza

Cake box

- Now draw the following robot on the board and ask the students to identify the different shapes.

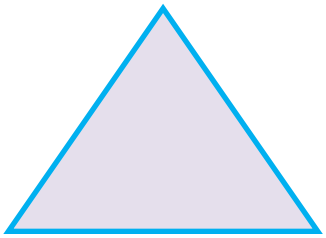


- Ask the following questions to the students:
  - How many triangles are there?
  - How many squares are there?
  - How many rectangles are there?

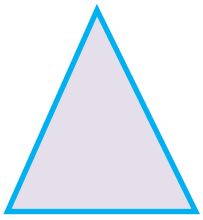
Development:

Activity 1:

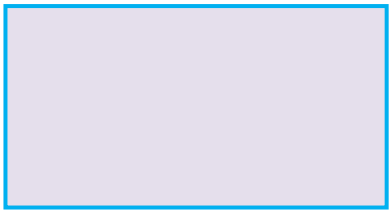
- Involve the students to recall the concept of sides and vertex.
- Show them a cutout of triangle and ask to count its sides and vertices.



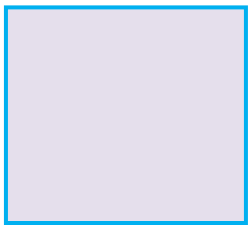
- After taking their response, show another type of triangle and ask to count its sides and vertices.



- Is there any difference in the number of sides and vertices of both triangles?
- Conclude to them that a shape with three sides and three vertices is called triangle. A triangle has three sides and three vertices.
- Now show cutout of rectangle to the students and ask them to count its sides and vertices.



- After taking their response, tell them that it has four sides and four vertices.
- Show them cutout of square and they will count the number of sides and vertices.



- Ask the students, is there any difference in the number of sides and vertices of rectangle and square.
- Conclude to them that a triangle has three sides and three vertices whereas a rectangle has four sides and four vertices.

Activity 2:

- Draw the following shapes on the board.

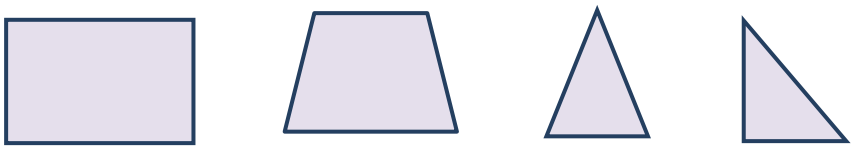
- Ask the students count the number of sides and vertices of these shapes.
- Point out one by one and get the response of students.
- After getting their responses demonstrate to them that these all shapes have four sides and four vertices.
- Identify sides and vertices of each shape with the help of students.
- Tell them that a shape with four sides and four vertices is called quadrilateral.
- Ask the students that rectangle and square are quadrilateral or not. If yes then why these are called quadrilateral.

Sum up/Conclusion:

- A triangle has three sides and three vertices.
- A quadrilateral has four sides and four vertices.
- Rectangle and square are examples of quadrilaterals.

Assessment:

Draw the following shapes on the board and ask the students to tell the sides and vertices. Ask them to identify quadrilaterals also.



Follow up:

Ask the student to find that is there any side and vertex of a circle?

Glossary

Quadrilaterals: A quadrilateral is a closed shape and a type of polygon that has four sides, four vertices and four angles.

GEOMETRY

Duration: 40 Minutes

Students Learning Outcome:

- Calculate perimeter of square, rectangle, and triangle.

Materials:

Board, marker/chalk, scale, Math's Grade 3 PCTB, notebook.

Information for Teacher:

- Students have learnt about sides and vertices of shapes.
- Now they will learn about the perimeter of square, rectangle and triangle.
- The perimeter of a shape is the total measurement of all sides of a shape e.g., a triangle has three sides, so its perimeter is the total of those three sides added together.

Introduction:

- Involve the students to recall the concept of sides and vertices of triangle, square and rectangle.
- Tell them that we are going to learn a new concept i.e., perimeter of square, rectangle and triangle.
- Let's take an example:
    - Furqan runs in a square shaped ground with the length of its one side is 40m. How much distance he covers in one round.

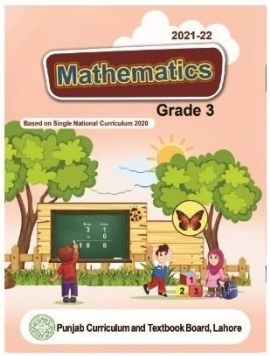
- Ask the students how many sides are there in a square?
- After taking their response tell them that there are 4 sides of a square.
- Ask the students that is it correct that all sides of a square are equal?
- Demonstrate to them that length of all sides of a square shape is equal.
- Furqan runs in a square shaped ground having length of one side is 40m. To find out what distance he covers in one round what we will do?

- After getting response tell the students that we will add length of four sides.
- So total distance will be:
  Length of side 1+ length of side 2 +length of side 3 + length of side 4
- 40 m+40m+40m+40m = 160m
- Tell the students that perimeter is sum of all sides of a square.
- So, in this case we can say that perimeter of this square shaped ground is 160m.
- Tell them that perimeter is sum of lengths of all sides of a closed shape.

Development:

Activity 1:

Divide the class in groups and assign them to find out the perimeter of their Maths textbook book.



- Ask the students that shape of Maths book is square or rectangle.
- Tell them that shape of Maths book is rectangle shape.
- Involve them to recall the attributes of a rectangle shape.
- Demonstrate to them that length of opposite sides of a rectangle are equal.
- Now allow them to measure the length of sides of Maths book and find its perimeter.
- Take a quick round and guide the students who are struggling.
- Give chance to the groups who have done their job correctly to present in front of the class.
- Applicate them and do the same activity with the help of slow learners.

Activity 2:

Asim has a triangular shape garden outside his home with the length of sides 18m, 24m and 30m. He wants to measure its perimeter.

- Ask the students how will do?
- After taking their response tell them that to measure perimeter of a triangular shape we add lengths of all three sides.
- Call a student to solve this problem on board.

- Perimeter of a triangular shape garden = sum of all three sides

  = 18m + 24m + 30m

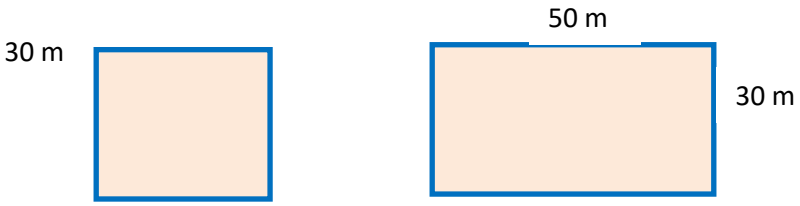
  = 72m

Sum up / Conclusion:

- **Recap the session by concluding that:**
  - Perimeter is sum of lengths of all sides of a closed shape.
  - To find perimeter of square we add lengths of four sides.
  - To find perimeter of a rectangle we add lengths of its four sides.
  - To find perimeter of triangle we add lengths of its all three sides.

Assessment:

- Make the following shapes on the board and ask the students to find the perimeter of each shape.



Follow up:

Measure the perimeter of your home main door or any window.

Glossary

Perimeter: The perimeter of a shape is the total measurement of all the edges of a shape.

GEOMETRY

Duration: 40 Minutes

Students Learning Outcome:

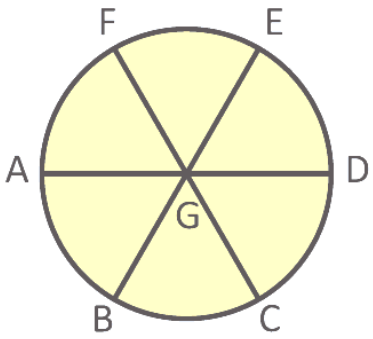
- Identify the center radius and diameter of a circle.

Materials:

Board, chalk/marker, duster, disposable glass / cup, pencil, ruler, scissors, card sheets, Maths Grade 3 (PCTB).

Information for Teachers:

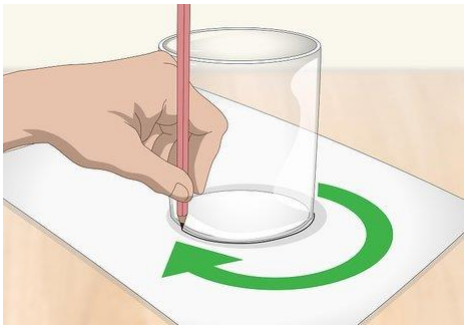
- Students have already learnt about the sides, vertices and perimeter of square, rectangle and triangle.
- Now they will learn about the radius and diameter of a circle.
- The diameter is the line segment that goes through the center of the circle and has end points at the edge of the circle.
- Diameter is the largest distance between any two points on the circle.
  AD, BE *and* FC diameters in the given circle.

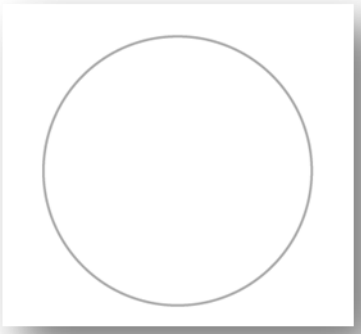


- Radius is the half of diameter, it is the distance of center of circle from any point on the boundary of the circle. GD, AG, GE, FG, and GC are the radii of circle (radii is the plural of radius).
- While teaching the lesson plan also consult textbook where and when applicable.

Introduction:

- Select a student from the class and ask him/her to draw a circle with help of glass.
- Guide him/her in placing the drinking glass with its open end one a flat sheet of a paper. Trace around the opening of the drinking glass with a pencil.





- Remove the glass from the paper, what is this shape?
- Cut the circle with the help of scissors.
- Show this cutout of circle to other students.
- Let's identify its diameter and radius.

Development:

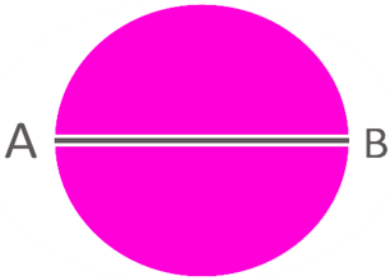
Activity 1:

- Divide the class into 3 or 4 groups. Give sheets of paper and any circular object (drinking glass, cap of water bottle, inkpot, etc.) to the students.
- Ask the students to draw the circle and make the cutout of circle.
- Take a quick round and observer their work
- Guide them to hold the glass in a proper way and draw a line around it.
- Ask each group to show their circle.
- Appreciate their work and recap the whole activity for the students who are still struggling.

Activity 2:

- Ask the students that what is semicircle?
- After taking their response, demonstrate to the students that we will get the semicircles by folding this cutout of circle into two equal halves.
- Demonstrate the students to fold their cutout of circle to make two semicircles. And then unfold it. They will see a crease on the cutout of circle.

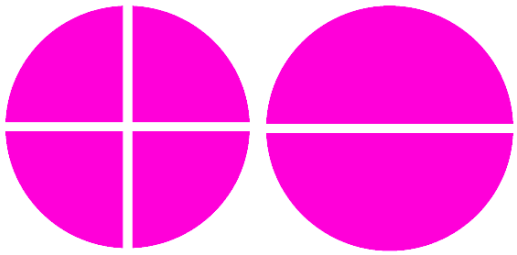
- Ask the students to draw a line segment following this crease.
- Tell them that this line segment goes through the center of the circle and has end points at the edge of the circle.
- Explain to them that this line segment is called diameter of a circle. In Fig. AB is the diameter of circle.



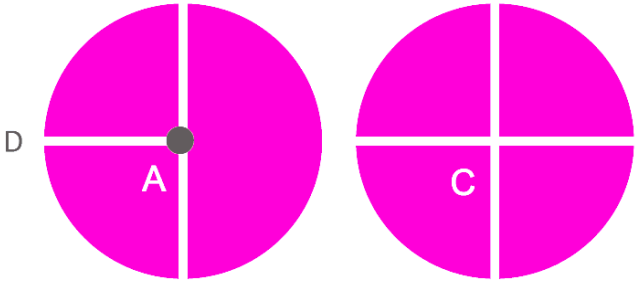
- Ask the students to draw another line segment to show the diameter of the circle. Write its name and measure its length also.

Activity 3:

- Ask the students that what is quarter circle?
- After taking their response, demonstrate to the students that we will get the quarter circle by folding the semicircle into two equal halves.



- Ask the students to fold their semicircles to make four quarter circles.
- Ask them to unfold the circle. You will see two line segments on the circle which are cutting each other at point C. The point C is called center of circle.



Ask the students to draw a line segment that starts from the center of the circle and has ends at the edge of the circle.

- Make the same drawing on the board to tell the students about center and radius of a circle.
- With the help of above figure tell the students that AD is called the radius of the circle.

Sum up/Conclusion:

Conclude by demonstrating using a diagram on the board that:

- Diameter is the line segment that goes through the center of the circle and ends at the edges of the circle.
- The length of the line segment that starts from the center of the circle and ends at the edge of a circle is called radius of the circle.

Assessment:

- Ask the students to open page no 157 of their Mathematics textbook and solve Q#6.
- Take a quick round and check their work.

Follow up:

Repeat the whole activity at home.

GEOMETRY

Duration: 40 Minutes

Students Learning Outcome:

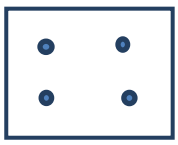
- Describe 3-D objects (cubes, cuboids, and pyramids) with respect to the number of edges and faces.

Materials:

Board, chalk/marker, any square box, pack of juice, any pyramid shape pack, textbooks, sheets of paper, Mathematics Grade-3 (PCTB).

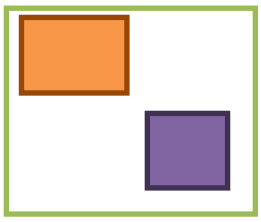
Information for Teachers:

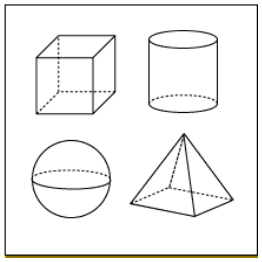
- Zero Dimensions: A point has zero dimensions. There's no length, height, width, or volume. Its only property is its location. We can have a collection of points, such as the endpoints of a line or the corners of a square, but it would still be a zero-dimensional object. For example, a square box with four dots inside.



- One Dimension: Once you connect two points, you get a one-dimensional object: a line segment. A line segment has one dimension: length a square box with a horizontal line in the middle

- Two Dimensions: A flat plane or shape is two-dimensional. Its two dimensions are length and width. Squares and rectangles, are examples of two-dimensional objects.





- Three Dimensions: The objects around us, the ones we

can pick up, touch, and move around, are three-dimensional.
These shapes have a third dimension: depth. Cubes, prisms, pyramids, spheres, cones, and cylinders are all examples of three-dimensional objects.

Introduction:

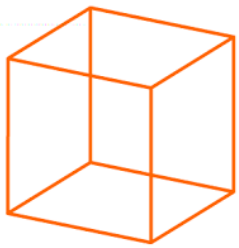
- Tell the students that now we are going to learn 3-D shapes.
- Asses the prior knowledge of students by asking following questions:
  - What are 2-D shapes?
  - What are 3-D shapes?
- Place or draw the following different 3-D shapes to the students.
- You can bring your own models from the daily life.

- Point out these shapes turn by turn and ask [illegible] students about att
- Tell the students that these all are 3-D shapes.
- Let's learn more about these shapes.

Development:

Activity 1:

- Asses the prior knowledge of students by asking following questions:
  - What is side of a shape?
  - What is vertex of a shape?
- After getting their response involve them to recall these concepts by solving examples on the board.
- First show the square box (any object is square shape). Or draw a 3-D square shape on the board.

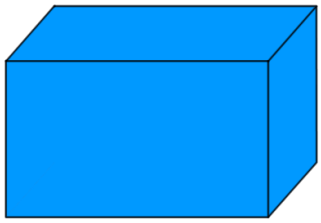
- Ask the students how many sides are there in this shape?
- Allow them to keep model of 3-D square shape in their hands. Let them to count its sides.
- Take their responses and tell them that this shape has 6 sides or faces.
- It's all sides are equal.

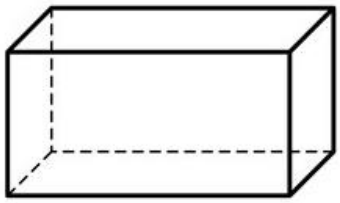
- Now ask them to tell its edges.

- After getting their response demonstrate to them that it has 12 edges.
- Now ask them that how many vertices are there in this shape?
- Let them to count and after taking their response tell them that there are 8 vertices.
- Now let's say its name. Its name is "cube".
- So, a cube is a 3-D shape. It has 6 sides, 8 vertices and 12 edges.

Activity 2:

Place or draw the model of rectangular 3-D shape on the board.

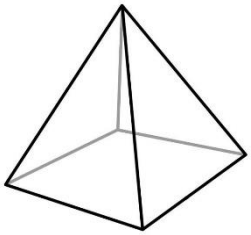




- Ask the students how many sides are there in this shape?
- Allow them to keep model of 3-D rectangular shape in their hands. Let them to count its sides.
- Take their responses and tell them that this shape has 6 sides or faces.
- Its opposite sides are equal.
- Now ask them to tell its edges.
- After getting their response demonstrate to them that it has 12 edges.
- Now ask them that how many vertices are there in this shape?
- Let them to count and after taking their response tell them that there are 8 vertices.
- Now let's say its name. Its name is "cuboid".
- So, a cuboid is a 3-D shape. It has 6 sides or faces, 8 vertices and 12 edges. Its opposite sides are equal.

Activity 3:

Place or draw the model of pyramid on the board.



- Ask the students how many sides are there in this shape?
- Take their responses and tell them that this shape has 5 sides or faces.
- Now ask them to tell its edges.
- After getting their response demonstrate to them that it has 8 edges.
- Now ask them that how many vertices are there in this shape?
- Let them to count and after taking their response tell them that there are 5 vertices.
- Now let's say its name. Its name is "pyramid".
- So a cube is a 3-D shape. It has 5 sides or faces, 5 vertices and 8 edges.

Sum up/Conclusion:

Conclude the session that:

- The objects around us, the ones we can pick up, touch, and move around, are three-dimensional. These shapes have a third dimension: depth. Cubes, prisms, pyramids, spheres, cones, and cylinders are all examples of three-dimensional objects.

Assessment:

Ask the students to open page no 163 of their Maths textbook and solve exercise 4.
Take a quick round and check their work.

Follow up:

Explore different things at your home and identify the things as cube, cuboid and pyramid.

DATA HANDLING

Duration: 40 Minutes

Students Learning Outcome:

- Read and interpret a Carroll diagram and Tally chart.

Materials:

Board, marker/chalk, Carroll Diagram on a chart paper, Math's Grade 3 PCTB, notebook.

Information for Teacher:

- Data handling is a new concept for students.
- Data handling refers to the process of gathering, recording and presenting information in a way that is helpful to others - for instance, in graphs or charts.
- A Carroll diagram is a way to sort data, such as a group of objects, shapes or numbers, based on given properties or traits in a yes/no fashion.
- Tally charts are used to collect data quickly and efficiently. The initial data is recorded using 'dashes' or tally marks, organized into groups of five. One tally mark is used for each occurrence of a value
- While teaching the lesson, consult Mathematics textbook where and when applicable.

Introduction:

- Tell the students that we are going to start a new concept i.e. data handling.
- Write "Data Handling" on the board and ask the students what does it mean?
- Tell them that data is information and we will organize this information is a useful way to get some results.
- We use Carroll diagram to sort the data.
- Show them a Carroll Diagram with the help of a chart paper and demonstrate them that it is a way of sorting objects, numbers and shapes by their traits. It looks like a table and allows people to sort data with more than two criteria into boxes in a visual way using yes/no situations.
- Let's see an example.

Development:

Activity 1:

- Draw the following Carroll Diagram on the board.

	Shirt	Not Shirt
Red Color		
Not Red Color		

- Ask the following questions:
  - How many rows are there?
  - How many column are there?
  - How many shapes are there?
- From this diagram we can see that:
  - 3 shirts and 4 caps are in red color.
  - 4 shirts and 3 caps are in blue color.

Activity 2:

Sorting following numbers with the help of Carroll Diagram:

10 18 22 25 29 30 35 37 45 43 48 52

- Ask the student that how we can sort these numbers.
- After taking their response make the following Carrol Diagram on the board.
- Set the following criteria and with the help of students sort the numbes.

	Even	Odd
Divisible by 5	**10, 30,**	**25, 35, 45,**
Not Divisible by 5	**18, 22, 48, 52**	**29, 37, 43,**

- Now ask the following questions:
  - How many even numbers are not divisible by 5? (4)
  - How many odd numbers are divisible by 5? (3)
  - How many even numbers are there? (6)
  - What is the greatest even number in this diagram,? (52)
- Ask the students to open page no 170 of their Maths textbook and answer the given questions for Carrol Diagram.
- Take a quick round and check their work and guide the students who are struggling.

Activity 3:

- Umair monthly test result is given below.
  English 12, Mathematics 8, Science 9, Urdu 7, Islamiat 10
- Let's present this result in Tally Chart.

- Draw the Tally Chart on the board and demonstrate to the students that how to draw.

Tally Chart		
Subject	Tally Marks	In Numbers
English	𝍸 𝍸 ||	12
Mathematics	𝍸 |||	8
Science	𝍸 ||||	9
Urdu	𝍸 ||	7
Islamiat	𝍸 𝍸	

- Tell the students we count 5 dashes or 5 Tally marks in group as 5 to make our counting easy and quick.
- In Tally Chart every 5 dashes are kept in a group form (Group of five dashes or tally marks).
- Demonstrate to the student that how we count the tally marks.
- Call one student to count Tally marks for one subject.
- Call others also to count Tally marks for other subjects.
- Repeat this counting practice by drawing more Tally marks groups on the board.
- Now remove the Tally marks from the chart and ask different students to draw Tally marks for each subject.

Sum up / Conclusion:

- **Recap the session by concluding that:**
  - Carroll diagram is a way to sort data, such as a group of objects, shapes or numbers, based on given properties or traits in a yes/no fashion.
  - Tally charts are used to collect data quickly and efficiently. The initial data is recorded using 'dashes' or tally marks, organized into groups of five. One tally mark is used for each occurrence of a value

Assessment:

- Ask the students to open page no 171 of Mathematics textbook PCTB and solve Q# 3.
- Check their work and guide where necessary.

Follow up:

Assign Q#5 from page no 171 of Mathematics textbook PCTB as homework.

Glossary

Carroll diagram: It is a way to sort data, such as a group of objects, shapes or numbers, based on given properties or traits in a yes/no fashion.

Teacher Guide
Grade-3

Lesson Plan
44

DATA HANDLING

Duration: 40 Minutes

Students Learning Outcome:

- Read and interpret picture graphs.

Materials:

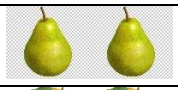
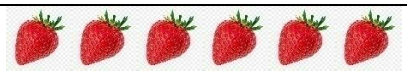
Board, chalk/marker, picture graph of fruit chart paper, picture graph of balloons on chart paper picture graph of parents, Mathematics Grade-3 textbook (PCTB).

Information for Teachers:

- Graphs are pictures that help us understand information in the form of figures. The information is called data. There are many kinds of graphs.
- A picture graph is one of the simplest type of graphs.
- Picture graph convey information by using relevant pictures as symbols to represent information.
- While teaching this lesson, the teacher should also consult textbook at all the steps where and when applicable.

Introduction:

- Tell the following story to the students.
- Ahsan bought different type of fruit from the market yesterday.
- Display the following picture chart to the students or make the same chart on the board by drawing pictures of each fruit to show the type and quantity of each fruit bought by Ahmad.

Apple	
Pear	
Orange	
Mango	
Strawberry	

- Ask them to look at the chart and tell how many apple, pear, mango, orange and strawberry did Ahsan buy?
- Tell them that this type of chart is called picture graph because it represents information using pictures.

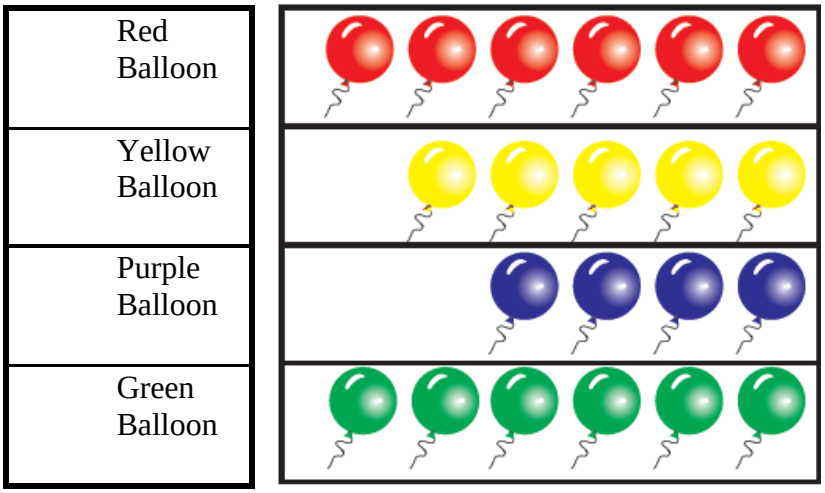
Development:

Activity 1:

- Demonstrate the students that how they will interpret a picture graph. Show the above picture graph to the students and ask the following questions.
    - How many apples are there in graph?
    - How many mangoes are there?
    - How many orange are there?

Activity 2:

- Fatima bought following balloons of different colours,
- Six red balloons.
- Four blue balloons
- Five yellow balloons
- Show the picture of graph of Fatima's balloons to the students.



- Ask the students, what this graph shows.
- After taking their response, explain the above picture graph to them and ask to complete the following.
    - Fatima has ____red balloons
    - She has _____green balloons.
    - She has _____more red balloons then blue balloons.
    - She has same number of ____ and ____ balloons.
    - She has _____balloons, together.

Activity 3:

- Ask the student to open page # 174 of their Mathematics textbook.
- Tell the students that picture graph shows the favourite sports of students.
- Demonstrate to them that one picture represent two students.
- It means we will count two students for each picture.
- Divide the whole class in pairs and ask them to answer the given questions.
- At the end solve each question with the help of students.

Sum up/Conclusion:

- The information is called data.
- Graphs are pictures that help us understand information.
- A picture graph is one of the simplest type of graphs
- Picture graphs convey information by using relevant pictures as symbols to represent information.

Assessment:

Ask the student to open page # 175 of their Mathematics textbook. Read the given picture graph and answer the questions.
Take a quick round and check their work.

Follow up:

Assign homework reading and answer the questions given on page no 176 of Math textbook grade 3.

Glossary

Graph: a graph can be defined as a pictorial representation or a diagram that represents data or values in an organized manner.

List of Contributors		
Mathematics-III		
Sr.No.	**Name**	**Organization**
	Management	
1.	Allah Rakha Anjum	Director General, Quaid-e-Azam Academy for Educational Development Punjab, Lahore
2.	Asif Majeed	Additional Director General, Quaid-e-Azam Academy for Educational Development Punjab, Lahore
	Developers	
3.	Hafiz Muhammad Habib Ullah	Elementary School Teacher, Govt. High School Kohla, Okara
4.	Hina Khan	Book Developer, AFAQ, Lahore
	Reviewer	
5.	Abdul Hamid	Director, LEARNOGATE Education, Pvt
	Quality Reviewer	
6.	Dr. Saira Hameed	Assistant Professor, University of the Punjab, Lahore
7.	Dr. Alia Sadiq	Senior Subject Specialist, Quaid-e-Azam Academy for Educational Development Punjab, Lahore
	Proofreader	
8.	Dr. Marriam Bashir	Rt. Principle, Govt College Gulshan Ravi, Lahore
	Supervision and Coordination Team	
9.	Saif ur Rehman Toor	Course Coordinator, Quaid-e-Azam Academy for Educational Development Punjab, Lahore
10.	Dr. Alia Sadiq	Senior Subject Specialist, Quaid-e-Azam Academy for Educational Development Punjab, Lahore
11.	Ms. Fozia Inam	Senior Subject Specialist, Quaid-e-Azam Academy for Educational Development Punjab, Lahore
12.	Parveen Din Muhammad	Subject Specialist, Quaid-e-Azam Academy for Educational Development Punjab, Lahore
13.	Dr. Adila Khanam	Subject Specialist, Quaid-e-Azam Academy for Educational Development Punjab, Lahore
	Designing, Composing & Layout	
14.	Asim Jacob	Assistant, Quaid-e-Azam Academy for Educational Development Punjab, Lahore
15.	Aneeq Rehman	Freelance

Mathematics
Teachers' Guide
Lesson Plans

Quaid-e-Azam Academy for Educational Development, Punjab
Wahdat Road, Lahore