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Based on the Singapore Bar Model Method

Teacher’s Manual

REVISED EDITION

PRACTICE APP
**WOW MATHS** based on the Singapore Model offers complete Maths solutions for grade 1 to 8 in the form of text books, workbooks, lesson plans and more.

The lesson plans follow a learner centric approach and aim at experiential learning. They have been designed to ensure that whereby the learning objectives they aim to achieve are measurable and capable of analysis conductive to the understanding of children.

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- **The objective the lesson plan aims to achieve.**
- **The hands on experience to learn the concept.**
- **The new words related to the concepts which the child is to learn through the activity.**
- **The implied concepts that if the child is able to gather from the activity, help the teacher quantify that the child has understood the concept clearly.**
- **Questions to practice the concept taught.**
- **Higher order thinking questions to enhance the critical thinking skills of the child.**
- **Indirect questions, aimed at further probing and better understanding of the concepts.**
- **The concepts that have not been explicitly taught in the lesson, but can be associated with the activity or the concept learned through the lesson.**
- **The things parents can do or questions parents can ask their child to strengthen the understanding of the concept taught.**

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Lesson Plan - 1

Grade - 3

Chapter 1

NUMBERS

Learning Objective
To identify and write numbers beyond thousand.

Material Required
Base ten blocks

Activity
- Place base ten blocks on a table. (For example; 4 thousand blocks, 3 hundred blocks, 5 tens blocks and 2 unit cubes)
- Ask four students to sort and put similar blocks together.
- Arrange them and count the number of blocks of each type.
- Associate with representation.

- Reiterate that the number on the extreme right is ones, then tens, hundreds (H) and thousands (Th).
- Conclude using students’ response that the above number has 4 thousands, 3 hundreds, 5 tens and 2 ones.
- Share with them that the number is written as 4352 and read as four thousand three hundred fifty-two.
- Ask the students to say aloud the number formed.
- Extend the activity by calling more students to form four digit numbers using base ten blocks.
- Encourage them to identify and say aloud the numbers so formed.
- Ask them to write these numbers in their notebooks.
- Practice with more numbers till time permits.

Understanding expected
- 4 digit numbers are called thousands. Word ‘thousand’ and not ‘thousands’ is written when writing number names.
- If a block is missing at any place, that value is represented by a zero.
- While writing the number in words, ‘and’ is not used; e.g. "Four thousand and three hundred and fifty-two" is incorrect.
- While writing tens and ones in words, hyphen is used; e.g. fifty-two, twenty-four, and so on.
Thinking Skills

What number is obtained when 1 is added to the greatest 4-digit number? Can you identify and write its number name?

Real Life Connect

- Ask your child to observe and read the last four digits of the cars on the road.
- Make your child circle four digit numbers in figures or words in the newspaper. Encourage them to read them aloud.
- Let your child locate house numbers that begin with thousand.

Application

- Write the number names for the following: 5067, 9125, 7304 and 4500.
- Write the numeral for the following number names: Three thousand nine hundred thirty-six, two thousand two hundred eight, six thousand ninety-nine.

Analysis

- Which is the smallest 4 digit number?
- Which is the greatest 4 digit number?
Learning Objective
- To identify the place value of digits in 4-digit numbers.
- To express 4-digit numbers in expanded form and standard form.

Material Required
Base ten blocks

Stress Words
Expanded form, Standard form

Activity
- Call any one student from the class and ask him/her to form any four digit number using base ten blocks.
- Ask the students to say aloud the number so formed, say, 3528.
- Inform them that 3528 or in words, three thousand five hundred twenty-eight is called the standard form of a number.
- Reiterate that in a four digit number there are four places.
- Write the following on the board:

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>5</td>
<td>2</td>
<td>8</td>
</tr>
</tbody>
</table>

- Explain that:
  » the place value of 8 is 8 ones or \( 8 \times 1 = 8 \)
  » the place value of 2 is 2 tens or \( 2 \times 10 = 20 \)
  » the place value of 5 is 5 hundreds or \( 5 \times 100 = 500 \)
  » the place value of 3 is 3 thousands or \( 3 \times 1000 = 3000 \)
- Show that 3528 can also be written as:

\[
3528 = 3 \text{ thousands} + 5 \text{ hundreds} + 2 \text{ tens} + 8 \text{ ones}
\]

or

\[
3528 = 3000 + 500 + 20 + 8
\]

- Inform them that expressing a number with the place value of each of its digits is called the expanded form.
- Recall that the face value of the digits in a number is the digit itself.
- Ask the students to say aloud the face value of each digit in 3528.
- Ask the students to form different 4-digit numbers using base ten blocks in the class.
- Encourage all the students to say aloud the place value and the face value of the number so formed.
- Ask them to express the number formed in its expanded form.

Understanding Expected
- Numbers can be expressed in either standard form or expanded form. Both of them have the same meaning.
- The face value of a number is same irrespective of its place value.
Application

- Write the numbers in standard form.
  - 3000 + 50 + 4, 5000 + 100 + 3, 8 thousands + 6 hundreds + 4 tens
- Express the following numbers in expanded form.
  - 1072, 5743

Analysis

What is the face value of the digit at the hundred’s place in 9016?
- What is the face value of the digit 6 in the above number?
- What is the place value of the digit 6?

Thinking Skills

- How many hundreds are there in 2400?
- When will the face value of a digit be same as its place value?

Real life Connect

- Show your child currency notes of various denominations. Make them count the money and tell you the total amount.
- Help your child to read the last four digits of the number plates of vehicles and express them in expanded form. Also ask him/her to say aloud the face value and place value of each digit.
### Learning Objective
- To compare the given 4-digit numbers.
- To arrange the given 4-digit numbers in ascending and descending order.

### Stress Words
Ascending, Descending

### Group Activity
- Divide the class into two groups; team A and team B.
- Ask four students from each team to say aloud one digit each between 0 and 9.
- Write these digits on the board to form two 4-digit numbers; one each for each team.
- Let the number formed by team A be 4623 and that formed by team B be 6153.
- Ask them: Which is a greater number; 4623 or 6153?
- Inform them that to compare any two numbers; we first start to compare the digit at the greatest place.
- Here, 4Th < 6Th, so 4623 < 6153
- Reiterate symbols with crocodile’s mouth, that crocodile opens his big mouth to eat ‘More things’.
- Write two numbers, 5907 and 5213 on the board.
- Bring their attention to the digits at the thousands place.
- Explain that if the digits at the thousands place are same, then we compare the digits at the hundreds place and so on.
- Here, 5Th = 5Th.
- Compare the digits at the next smaller place value, i.e. hundreds.
- Here, 9H > 2H. So, 5409 > 5213
- Write any four 4 digit numbers on the board.
- Ask team A to compare the numbers and arrange them from greatest to smallest in descending order.
- Ask team B to compare the numbers and arrange them from smallest to greatest in ascending order.
- Extend the activity where one team forms the numbers and the other team arranges them in ascending and descending order, as time permits.

### Understanding expected
- When numbers are arranged from smallest to greatest, it is called ascending order or increasing order.
- When numbers are arranged from greatest to smallest, it is called descending order or decreasing order.
• While comparing two numbers having same number of digits, we need not compare digits of smaller place values once the larger digit at a greater place value is identified.

Application

• Fill in the blanks using >, < or =
  » 3995 __ 5995, 2814 __ 1280, 4507 ___ 4507

• Arrange the numbers in ascending order.
  » 3280, 456, 6752, 9081
  » 7825, 8405, 7804, 8450

• Arrange the numbers in descending order:
  » 1220, 2201, 3201, 1001
  » 9887, 7789, 978, 7871

Analysis

• How will you compare numbers with unequal number of digits?
• Which is more 765 or 7650?

Thinking Skills

• Is 5605 = 05605? Justify your answer.
• Which is the greatest number; 4988, 8964, 498, 8064?

Real life Connect

• Ask your child to note down the year of birth of any two family members and compare them. Find who is elder or younger of the two.
• Make your child note the last four digits of number plates of any 4 autos/two wheelers/cars. Ask him/her to arrange them in ascending and descending order. Also encourage your child to identify the smallest and the greatest number among them.
**Learning Objective**
- To form the smallest and the greatest 4-digit number using the given digits.
- To identify the number just before and just after a 4-digit number.

**Stress Words**
Successor, Predecessor

**Activity**
- Ask four students to come and stand in front of the class.
- Instruct each one of them to represent a digit from 0 to 9 using their fingers.
- Encourage all the students to form four digit numbers using these digits.
- Write their answers on the board.
- Ask them to compare all the above numbers and identify the smallest and the greatest four digit number as done in the previous class.
- Bring their attention to the digits of the smallest number so formed.
- Tell them that to form the smallest four digit number, the digits are arranged in the ascending order.
- Similarly tell them that greatest number can be formed by arranging the digits in descending order.
- Ask them to say aloud the number that comes just after and just before 8532.
- Inform them that the number just after a given number is called its successor and the number just before a given number is called its predecessor.
- Extend the activity and write any four digits on the board. Ask the students to form the smallest and the greatest four digit number and write their successors and predecessors.

**Understanding expected**
- When forming the smallest four digit number with zero as one of the digits; zero always comes after the first digit otherwise the number will become a three digit number.
- Successor of a number is obtained when 1 is added to it.
- Predecessor of a number is obtained when 1 is subtracted from it.

**Application**
- Form the smallest 4-digit number using the given digits:
  9, 0, 8, 2
  6, 3, 1, 4
- Form the greatest 4-digit number using the given digits:
  7, 2, 0, 5
  8, 9, 2, 6
- Write the successor and predecessor of the following numbers:
  6301
  7899
- Form the greatest and the smallest 4-digit number using 4, 7 and 0 by repeating one digit twice?
Can a four digit number be formed with just three digits?

- Form the greatest and the smallest 4-digit number using digits 4, 7 and 0 by repeating only one digit twice?
- Write the predecessors of the following letters and read the message: J / B N / B / N B U I T / H F O J V T
- Make your child count the number of books, notebooks, pencils and erasers in her/his school bag. Ask her/him to form the smallest and the greatest four digit number using those digits.
- Take your child for a walk in your locality and make him/her choose any house number, then encourage your child to identify its successor and predecessor. Verify with the actual house numbers, if possible.
Learning Objective
- To recognise the given 4-digit number as odd or even.
- To skip count 4-digit numbers by a given number.

Material Required
Connecting cubes (2 colours), Base ten blocks

Stress Words
Odd, Even

Activity
- Place connecting cubes on a table. (say, 5 blue and 6 red)
- Ask two students to sort the cubes on the basis of colour.
- Instruct them to join the cubes to make pairs of each colour separately.
- Bring their attention to red colour cubes where all the cubes are arranged in pairs where as in case of blue cubes, one is left after forming pairs.
- Tell them that numbers which can be arranged to form complete pairs or are divisible by 2 exactly are called even numbers and the numbers which cannot be arranged to form complete pairs or are not divisible by 2 exactly are called odd numbers.
- Reiterate that 2, 4, 6, 8, 10… are all even numbers whereas 1, 3, 5, 7, 9… are all odd numbers.
- Elucidate that in a four digit number, to identify if the number is even or odd; check the digit at the one’s place.
- Write on the board 3567 and 8751 and explain that the one’s place digits 7 and 1 are odd so 3567 and 8751 are odd numbers.
- Help students to recognise that numbers like 5690 and 9826 are even.
- Next, ask a student to form any four digit number using base ten blocks (say 6574). Instruct him/her to place one more tens block with seven tens blocks and say aloud the number so formed.
- Repeat by adding one more tens block.
- Show on the board that numbers 6574, 6584, 6594… follow a pattern where in each time we count by 10 to complete the pattern.
- Extend the above activity for a four digit number counting by 100 and 1000.
- Draw the pattern on a number line and explain the counting back also.
- Practice with more numbers by forming a new 4-digit number with base ten blocks and ask the students to count by 10, 100 and 1000.

Understanding expected
- 0 is neither an even nor an odd number by itself. If however, it is placed at the ones place of a number, the number is considered to be even.
- To skip a number by 10, increase the digit in tens place by 1.
- To skip a number by 100, increase the digit in hundreds place by 1.
- To skip a number by 1000, increase the digit in thousands place by 1.
Application

- Write the missing numbers in each case:
  - 3275, 3285, 3295, ____, ____.
  - 7568, 7668, ____, 7868, ____.
  - 2980, 3980, ____, ____, ____.
  - 8256, 8246, ____.

- Underline odd numbers and encircle even numbers in the following:
  - 3891, 6580, 5682, 7555, 8759, 6218, 9003

Analysis

- What is the sum of 2 odd numbers?
- What is the sum of an even and an odd number?

Thinking Skills

- If a car with an odd number plate can be driven only on odd dates and an even number car can be driven only on even dates, mention the dates from 15 to 30 of a month when a person with number plate DL 7C 4893 can drive the car.
- Which is the smallest number when added to an even number will make it odd?

Real life Connect

- Let your child identify and recognise odd and even numbers in the last four digits of the number plates of cars/autos/two wheelers.
- Make your child write his/her year of birth and form patterns counting by 10, 100 and 1000.
Learning Objective
To round off the numbers to nearest tens, hundreds and thousands.

Activity
- Narrate a situation to the students.
- Shalini goes to a book store. She has about ₹100 in her bag. Can she buy a book that costs ₹98?
- Allow the students to discuss their answer.
- Tell the students that ₹100 is a rounded amount—the actual amount can be little less or little more than ₹100.
- Draw a folded number line on the board as shown.
- Ask the students to think and tell that if a coin is placed at 18; which number will it slide to?
- Bring their attention to number 14; will the coin slide to 10 or move up?
- Draw the number line again.

Understanding expected
- Help them conclude that number 18 is close to 20 whereas 14 is close to 10.
- Share that to round off a number to nearest tens, look at the digit at the one’s place. If the digit at the ones place is less than 5, round down the number to the previous tens. When the digit at the ones place is equal to or greater than 5, round up the number to the next tens.
- Elucidate that number 18 will be rounded up to 20 and 14 will be rounded down to 10.
- Explain with examples that for rounding off to nearest hundreds observe the digit at the tens place. If it is less than 5, round down the number to the previous hundreds. If the digit at the tens place is greater than or equal to 5, round up the number to the next hundreds.
- Extend the concept of rounding off to nearest thousands.
- Write few numbers such as 5674, 7540, 6083 and 2198 on the board and ask the students to round off to nearest 10s, 100s and 1000s.
- Practice with more numbers till time permits.
- To round off a number to a certain place value, observe at the digit on its immediate right at one lower place.
- In real life, in numbers where the word ‘about’ is written, are generally rounded off numbers.
Application

- Round off the following numbers to nearest ten.
  2456, 6872, 4325
- Round off the following numbers to nearest hundred.
  4521, 9856, 1328
- Round off the following numbers to nearest thousand.
  8647, 3217, 6582

Analysis

- What is the use of rounding off numbers in day to day life?
- Is it advisable to always round off figures related to time and date?
- What will happen if you round off and tell the train timings?

Thinking Skills

Is it justified if a shopkeeper asks for ₹5000 for a total bill amount of ₹4962? Justify your answer.

Real life Connect

- Show bills of commodities like electricity bill, grocery bill, restaurant bill, etc. to your child and help him/her estimate the amount paid by rounding off.
- Let your child encircle figures from newspapers that have been rounded off. Also encourage your child to identify the greatest and the smallest number that the rounded number may actually be.
Learning Objective
- To read and write Roman numerals from 1 to 50.
- To convert Hindu-Arabic numerals to Roman numerals and vice-versa.

Material Required
Clock with numbers in Roman numerals

Stress Words
Roman numerals

Activity
- Ask one student to share the digits we use in our daily life. (0 to 9)
- Share with them that these numbers were developed by Indians and Arabs and hence called the Hindu Arabic numbers.
- Ask the students to recall and answer how classes in their school are numbered. (Class III, Class IV, Class V, etc.)
- Show them the clock with markings with Roman numerals.
- Inform them that the number system of the classes and the markings in the clock are called Roman numerals which were developed by ancient Romans. Share with them that they used 7 basic symbols.
- Draw the following table on the board and explain the rules for writing Roman Numerals.

<table>
<thead>
<tr>
<th>Roman Numerals</th>
<th>I</th>
<th>V</th>
<th>X</th>
<th>L</th>
<th>C</th>
<th>D</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hindu Arabic Numerals</td>
<td>1</td>
<td>5</td>
<td>10</td>
<td>50</td>
<td>100</td>
<td>500</td>
<td>1000</td>
</tr>
</tbody>
</table>

- Repetition of the numerals means addition; but no numeral can be repeated more than 3 times.

| III = (1+1+1) = 3, XX = (10 + 10) = 20 |

- Symbols V, L and D cannot be repeated; hence VV or LL is meaningless.
- When a smaller numeral is written to the left of a greater numeral, this means subtract the value of the smaller one from the greater one.

| IV = 5 – 1 = 4, IX = 10 – 1 = 9, XL = 50 – 10 = 40 |

- When a smaller numeral is written to the right of a greater numeral, this means add the value of the smaller one to the greater one.

| VI = 5 + 1 = 6, XI = 10 + 1 = 11, XIX = 10 + 10 + 5 + 1 = 26 |

- When a smaller numeral is placed between two numerals of greater value, it is subtracted from the numeral placed after it.

| XXIV = 10 + 10 + (5 – 1) = 24, XIX = 10 + (10 – 1) = 19 |

- I can be subtracted from V and X only and X can be subtracted from L and C only.
- V is never subtracted from any numbers.
- Show the clock once again to the students.
Application

Write the Roman numerals for the following Hindu-Arabic numerals:
39, 24, 11, 21, 18
Write the Hindu-Arabic numerals for the following Roman numerals:
46, 14, 37, 26, 13
What is the symbol for zero in Roman Numerals?
Fill in the blanks with the correct sign (<, > or =).
XXIX ___ 31, XLII ___ 42, XXVI ___ 24

Analysis

Write the Roman numerals for the following Hindu-Arabic numerals:
39, 24, 11, 21, 18
Write the Hindu-Arabic numerals for the following Roman numerals:
46, 14, 37, 26, 13
What is the symbol for zero in Roman Numerals?
Fill in the blanks with the correct sign (<, > or =).
XXIX ___ 31, XLII ___ 42, XXVI ___ 24

Thinking Skills

Which of the following are meaningless numerals?
XXXX, XXII, VV, XXX, XV, IIX, IVI, VL, XLV, VIII
Write each of the following in Roman numerals and find the answer in Roman numerals:
34 + 29, 14 × 7, 27 ÷ 3, 40 − 20

Real life Connect

Help them recognize Roman numerals from 1 to 9.
Tell them to write them in their notebook.
Write few Hindu Arabic numerals such as 35, 24, 12, 9, etc. on the board.
Guide them to write the corresponding Roman numerals.
Next, write Roman numerals such as XXVII, XIII, VI, XIX, etc. on the board and encourage the students to write their corresponding Hindu-Arabic numbers.

Understanding

Expected

Roman Numerals are obtained by addition and subtraction.
Roman Numerals do not use place value system.

Associated Concepts

Roman Numerals beyond 50.
The largest number that can be represented in Roman numeral.

Real life Connect

Make your child recognize and read aloud Roman numerals marked in the watch/clock in the house.
Help your child find out how Olympic Games are numbered.
Share with your child that Monarchs and Popes are usually numbered in Roman numerals.
Learning Objective: To add 4-digit numbers without regrouping.

Material Required: Thousands, hundreds, tens and ones cubes

Activity:
- Divide the class into groups of four.
- Write 1234 and 4444 on board and ask the children to represent both the numbers using cubes.
- Draw the bar model to represent both members. Guide the students to make the bar model according to the size of the numbers.
  
  \[
  \begin{array}{c}
  \text{1234} \\
  + \text{4444}
  \end{array}
  \]
  \[
  \text{?}
  \]

- Next, ask the children to add both the numbers. Remind children to start from the ones place.
- Guide children to combine the cubes each place value. Say, for example, 4 ones cubes of number 1234 and 4 ones cubes of 4444 when combined form 8 units cubes.
  \[
  \begin{array}{c}
  \text{□□□□} \\
  + \text{□□□□}
  \end{array}
  \]
  \[
  \text{□□□□}
  \]

- Show each step on the board. Make students observe that at each step, the number of combined cubes is less than ten.
- Students of each group take turns to combine the cubes, count and add them; and write them in the notebook.
- Practice with more numbers

Application:
- Find the sum of given numbers 5432 and 2015.
- Add 4213, 145 and 3640.

Analysis:
- What is the sum of 3000?
- Find the total of 751, 1001 and 1013.

Thinking Skills:
In a number 8431, what is the sum of place value of 4 and 3?

Parent Connect:
Ask your child to add 1000 to the last 4 digits of the number plate of any vehicle they see.

Content Book Reference: Page 33-35
Guided Practice: Page 20, 21
Learning Objective
To add 4-digit numbers with regrouping.

Material Required
Thousands, hundreds, tens and ones cubes

Activity
- Write $2046 + 1295$ vertically on the board along with their place values and ask children to add the numbers.
- Remind them of the addition of three digit numbers to carry out the addition.
- Draw the bar diagram and associate representation with addition as:
  ![Bar Diagram]
- Call out a student to represent both the numbers through cubes. Next, ask the child to add these numbers by combining and adding the cubes at each place value.
- At the ones place, the number of cubes is 11. Guide the child to replace 10 ones cubes with 1 tens cube. Next, place it on top of tens cubes in the tens place value column.
- Instruct the child to add the tens. Remind them of add the 1 tens they had carried from the ones place value.
- Guide the child to exchange 10 tens for 1 hundred and put 4 tens in the tens column.
- Write each step on the board to explain.
- Similarly, explain the steps for hundreds and thousands. Remember to keep the number cube exchanged at the top of the other numbers and associate with ‘carry over’ digit in vertical subtraction.
- Practice with other numbers.

Understanding Expected
Ten units of any place value when joined make the succeeding place value.

Application
- Find the sum of the given numbers 8946 and 3548.
- Add 6024, 1543 and 3148

Analysis
- What is the sum of 7001 and 1999?
- Which digit can be passed on the next place value at the most?

Thinking Skills
Find the sum of largest four digit number and smallest three digit number.

Parent Connect
- Ask the child to roll a dice 8 times, form two 4-digit number and add them.
- Ask you child to add up the last 4-digits of registration number of cars parked near your house.

Content Book Reference: Page 36-37
Guided Practice: Page 22-23
Learning Objective
To find different ways to add two numbers.

Material Required
Two sets of number counter from 0 to 9.

Activity
- Write any two number to be added on board, say, 2439 and 10.
- Ask each pair to represent these numbers through the counters. For example, to represent number 2439, students place four counters for hundred digit next to each other with 2 counters for the thousands digit at the left most position and so on. Similarly, represent 10.
- Question the students on the easier way to add two numbers. Bring them to understand that splitting the number such that the digits at ones and tens place become zero makes calculations easier.
- Guide the students to split 2439 as 2430 and 9. Change the counter representation for the new numbers formed.
- Place the counters of 10 below 2430 and get 2440 as the sum. Next, add 9 to get 2449. Associate with representation.

\[
\begin{array}{c}
2439 \\
\downarrow \\
2430 \\
\uparrow \\
10 \\
9
\end{array}
\]

- Explain by splitting the numbers and showing each step on board.
- Carry on the activity for a 4 digit and a 1-digit number. Guide students to split the digit at unit place of each number to 5 if possible and form a tens. Else add the numbers through count forward.
- Practice with more numbers.

Understanding
There are more than one ways of splitting the number and adding them.

Application
Add 8439 and 9 by making 10.

Find the sum of:
- 6762 and 39
- 3124 and 200

Thinking Skills
Complete the following:

\[
\begin{array}{c}
8535 \\
\downarrow \\
15
\end{array}
\]

= ____________

Parent Connect
Make your child explore various ways to add 2 numbers using various combinations of money and exchanging it for higher or lower denominations.
Learning Objective: To subtract 4-digit numbers without regrouping.

Material Required: Base ten blocks (Thousands, hundreds, tens and ones)

Activity:
- Write two 4-digit numbers say, 7862 and 5431 vertically on the board.
- Ask them to subtract 5431 from 7862.
- Remind them subtraction of two and three digit numbers.
- Recall that the smaller number is always subtracted from the greater number and we begin subtraction from the ones place.
- Ask one student to represent the number 7862 using the cubes. Guide them to remove/take away 1 ones cube from 2 ones cubes.
- Next, remove 3 tens cubes from 6 tens cubes.
- Encourage them to continue for hundreds and thousands also.
- Ask the students to say aloud the two numbers formed after removing the cubes, i.e. after subtraction.
- Show that 7862 – 5431 = 2431.

Activity:
- Elucidate that the sum of the difference and the smaller number is equal to the greater number i.e. the sum of 2431 and 5431 will be equal to 7862.
- Place back the cubes representing 2431 with those of 5431 to show this.
- Practice with more numbers as time permits.

Associated Concepts:
- Subtraction of two numbers can be verified if the sum of the difference and the smaller number gives the greater number.
- Smaller number is always subtracted from the bigger number.

Understanding
- There are more ways of subtracting numbers like regrouping of numbers and breaking a number into tens for easy calculations.

Application:
- Subtract:
  » 8573 – 4317  » 9862 – 5000  » 4870 – 2360
- Find the difference in each of the following and also check your answer:
  » 7863 and 5621  » 3024 and 8367  » 9942 and 3510
Analysis

- Can the difference of two numbers be more than both the numbers?
- What is the difference if zero is subtracted from a number?
- How can predecessor of a number be obtained?

Thinking Skills

The difference between two numbers is 1023. If the greater number is 8357, find the smaller number.

Parents Connect

- While shopping, encourage your child to calculate the amount of money the shopkeeper will return during transactions.
- Help your child find the difference in the age of the family members.
Lesson Plan - 2
Grade - 3

Learning Objective
To subtract 4-digit numbers with regrouping.

Material Required
Thousands, hundreds, tens and ones cubes

Stress Words
Regroup, borrow

Class Activity

Activity

- Write two 4-digit numbers say, 7364 and 5481 vertically on the board.
- Ask one student to form the number 7364 using the cubes.
- Ask them to subtract 5481 from 7364.
- Reiterate that we begin subtraction from the ones place.
- Subtract 1 ones from 4 ones; $4 - 1 = 3$ ones

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- Bring their attention to the digits at the tens and hundreds place; show that they are greater in 5481 than 7364 respectively.
- Share with them that in such cases, we regroup or borrow from the next higher place value.
- Help them recall that 10 ones make 1 tens, 10 tens make 1 hundred and 10 hundreds make 1 thousand.
- Write on the board: $300 = 200 + 100$
- Elucidate using cubes; remove 1 hundreds cube from 3 hundreds cubes and add 10 tens cubes to 6 tens cubes in the number 7364 formed before. Make children observe that now there are 16 tens at the tens place value.
- Now subtract 8 tens from 16 tens; $16 - 8 = 8$ tens
- Similarly, explain that 4 hundreds cannot be subtracted from 2 hundreds, so regrouping is done; $7000 = 6000 + 1000$
- Add these 10 hundreds to 2 hundreds to make 12 hundreds.
- Elucidate using cubes; remove 1 thousands cube and add 10 hundreds cubes.
- Write on the board: $1200 = 400 + 800$
- Subtract digits at the thousands place; $6000 - 5000 = 1000$
Hence; $7364 - 5481 = 1883$
- Practice with more numbers as time permits.
- Encourage them to check their answers by adding the difference obtained to the smaller number.
Borrowing 1 from the higher place value means borrowing 10 units of the smaller place value.

- Subtract:
  » 8573 – 4631
  » 8000 – 3500
  » 4372 – 2645

- Find the difference in each of the following and also check your answer:
  » 5762 and 5261
  » 3086 and 8363
  » 9042 and 3514

- How will you borrow if the digit at the next higher place is zero?
- The teacher asked Monika, Ritu and Reena to solve 8602 – 4734. The answers given are: Monika (4132), Ritu (3868) and Reena (3878). Who gave the correct answer?

How many tens are there in one thousand?

- Ask your child to roll a dice 8 times and form two 4-digit numbers. Encourage them to find their difference.
- Encourage your child to find the difference of the last 4-digits of the number plates of the cars/autos/two wheelers parked near your house.
Lesson Plan - 3

Grade - 3

Learning Objective
To explore and apply the properties of subtraction.

Material Required
Dice

Pair Activity

Activity

- Form pairs of students sitting next to each other and distribute one dice to each pair.
- Instruct each student in the pair to roll the dice four times to form two 4-digit numbers, say, 5463 and 3072.
- Ask them to find the difference of the two numbers; reiterate that smaller number is subtracted from the greater number.
- Tell them to now change the order; write the smaller number first and subtract the greater number from it.
- Ask if they were able to subtract the greater number from the smaller number. Seek answers.
- Elucidate that in subtraction, the order of the numbers cannot be changed unlike addition, as greater number cannot be subtracted from the smaller number.
- Instruct each student in a pair to subtract zero from the number they had obtained and share their observation. (5463 – 0 and 3072 – 0),
  » Conclude that subtracting zero from a number gives the number itself as the difference.
- Ask them to now subtract the number they had formed from itself. Share their result. (5463 – 5463 and 3072 – 3072)
- Bring their attention to the fact that in this case the answer of each student is zero even when their numbers were different.
- Help and guide the students to summarise the properties of subtraction.
- Instruct the students in each pair to add the two numbers they had formed, say 5463 + 3072 = 8535.
- Ask each student in a pair to separately subtract the number they had formed from the sum. (8535 – 5463 = 3072, 8535 – 3072 = 5463)
- Help them conclude that the difference between one number and the sum of two numbers is the second number.
- Share with them that these are called ‘addition facts’. Each addition fact can be written as two ‘subtraction facts’/sentences.
- Extend the activity by encouraging the students to form more numbers and verify the subtraction facts for other numbers.
Application

- Solve:
  » 5631 – 0
  » 9432 – 9432
  » 7204 – 0
- Write subtraction facts in each of the following:
  » 1762 + 5261 = 7083
  » 8052 + 1775 = 9827

Analysis

- If 1 is subtracted from a number, what is the number obtained called?
- If 6835 + 3091 = 9926, what is 9926 – 6835?

Thinking Skills

- What must be added to 2657 to get 8734?
- Solve 1245 + 6392 – 4752.

Parents Connect

- Make your child verify the properties of subtraction using the year of birth of the family members.
- Tell them to add the year of birth of any two family members and form the subtraction facts.
Lesson Plan - 4

Grade - 3

Learning Objective
To estimate the difference of the two numbers and to verify the result by actual subtraction.

Material Required
Dice

Stress Words
Estimate, About, Rounding off

Activity
- Recall rounding off of numbers.
- Write any 4 digit number say, 7543 on the board and ask the students to say aloud numbers formed after rounding off to nearest 10, 100 and 1000.
- Recall that to round off a number to a certain place value, observe at the digit on its immediate right at one lower place.
- Reiterate that to round off to nearest 10s, if the digit at the ones place is less than 5, round down the number to the previous tens. When the digit at the ones place is equal to or greater than 5, round up the number to the next tens.
- Similarly, reiterate for rounding off to nearest 100 and nearest 1000, if required.
- Summarise students’ response and write on the board: 7543 is rounded to 7540 (nearest 10), 7500 (nearest 100) and 8000 (nearest 1000)
- Form groups of 4 students each and distribute one dice to each group.
- Ask two students in each group to roll the dice six times to form two 3-digit numbers say, 451 and 362.
- Instruct these students to find the difference between these numbers and the other two students to first round off each number to nearest 100 and then calculate the difference.
- Elucidate that the actual difference is 451 – 362 = 89. Also, 451 rounded to nearest 100 is 500 and 362 will round up to 400. So estimated difference is 500 – 400 = 100.
- Inform them that the difference obtained after rounding off the numbers is called the estimated difference.
- Ask them to say aloud the actual difference and the estimated difference.
- Elucidate on the board with any two 4-digit numbers. Extend the activity for each group in such a way that the two students, who had calculated the estimated difference in the previous activity, roll the dice and the other two students find the estimated difference.
- Encourage them to round off the numbers to nearest 10, 100 and 1000 and compare the actual difference and the estimated difference.
- Practice with more numbers till time permits.
The rules of estimation remain the same in all operations.

Application

Find the actual difference and the estimated difference in each of the following:

» Nearest 1000: 5862 and 4521
» Nearest 100: 8302 and 3967
» Nearest 100: 6942 and 3510

Analysis

If you estimate the difference of two 4-digit numbers to nearest 10, nearest 100 and nearest 1000; in which case will the actual difference be closest to the estimated difference?

Thinking Skills

Will give at the end of the chapter.

Parents Connect

Help your child count money in your purse, say, ₹2564. Encourage him/her to estimate the amount by rounding off to nearest 1000. Take away ₹1250 from it. Now ask your child to calculate the estimated money left in the purse and verify it by actual subtraction.
# Lesson Plan - 5

## Grade - 3

### Learning Objective
To solve word problems on addition step-by-step

### Material Required
- 4-step cut-outs (Understanding, Planning, Doing, Checking), situation cards

### Activity
- Call a volunteer and ask him/her to take out a situation card.
- Ask the student to read aloud the situation in the class. Say, the card reads, ‘Riya and Tina collected ₹4579 and ₹3259 for a charity. How much money did they collect in all?’
- Show the step cut-outs to the students.
- For the first step ‘Understanding’, make students listen to the problem again to gather what is to be found out.
- Make students observe what numbers are given and what needs to be found out. Stress on words and numbers Riya, Tina, ₹4579, ₹3259, money collected in all.
- Next show the ‘Planning’ cut-out. Bring students attention to the fact that they need to ‘add’ to find the money collected in all. Call a volunteer to draw a bar model for the same.
- Next, encourage the students to solve the questions. Explain them that the third step is ‘Doing’.
- Share ‘Checking’ as the concluding step. Guide students to ‘check’ that their answer is more than both the number being added. Alternatively, the order properly can also be used to check the answer.
- Practice with more numbers.

### Application
- After paying the hotel bill for ₹5540. Suman had 684 left. How much money did she have at first?
- The sale of a bangle shop was ₹3048 on Monday, ₹1150 on Tuesday and ₹1854 on Wednesday. What was the total sale of the shop on the three days?

### Analysis
Draw the bar model for the given situation; shop A sold 2349 flowers and shop B sold 2594 flower. How many flower did both sell in all?

### Thinking Skills
These 9 numbers can be used to make 3 addition sentences, including their answers. Can you work out what the calculations are?

| 3468 | 295  | 4905 | 379  | 3748 | 2987 | 4043 | 481  | 4526 |

### Parent Connect
Ask your child to add the last 4-digit of two mobile numbers in your home.

### Class Activity

- `Call a volunteer and ask him/her to take out a situation card.`
- `Ask the student to read aloud the situation in the class. Say, the card reads, ‘Riya and Tina collected ₹4579 and ₹3259 for a charity. How much money did they collect in all?’`
- `Show the step cut-outs to the students.`
- `For the first step ‘Understanding’, make students listen to the problem again to gather what is to be found out.`
- `Make students observe what numbers are given and what needs to be found out. Stress on words and numbers Riya, Tina, ₹4579, ₹3259, money collected in all.`
- `Next show the ‘Planning’ cut-out. Bring students attention to the fact that they need to ‘add’ to find the money collected in all. Call a volunteer to draw a bar model for the same.`
- `Next, encourage the students to solve the questions. Explain them that the third step is ‘Doing’.`
- `Share ‘Checking’ as the concluding step. Guide students to ‘check’ that their answer is more than both the number being added. Alternatively, the order properly can also be used to check the answer.`
- `Practice with more numbers.`

### Content Book Reference: Page 58-64

**Guided Practice: Page 36-38**
Learning Objective: To solve word problems on subtraction by framing statements.

Stress Words: Understanding, Planning, Doing, Checking

Activity:

- Narrate a word problem to the students. In a seminar on Global warming, 5431 people who attended were females and the rest were all males. If 9853 people attended the seminar, find the number of males.
- Share with them that to solve such problems they have to follow a 4-step approach as under:
  - **Understanding:** This involves to understand what all is given and what they need to find. Here, the total number of people who attended the seminar and the number of females are given. They have to find the number of males.
  - **Planning:** Analysis is done in this step, which means, they are given the whole and a part. Represent it using a model:
    \[
    \begin{array}{c|c}
    \text{Females} & \text{Males} \\
    \hline
    5431 & ?
    \end{array}
    \]
  - **Doing:** This step involves the actual calculation by subtracting the smaller number from the greater number. \(9853 - 5431 = 4422\)
  - **Checking:** This is the last step done to verify the answer. \(4422 + 5431 = 9853\)
- Recall and guide that they can add the number of females and the number of males to verify if the total number of people match with that given in the problem.
- Summarise the word problem by writing the statements on the board as under:
  - Total number of people = 9853
  - Number of females = 5431
  - Number of males = Total number of people – Number of females
    \[= 9853 - 5431 = 4422\]
- Encourage the students to find out how many more females are there than males.
- Narrate a situation to the students: A factory produced 5432 bulbs. Of these 3679 bulbs were sold out. How many bulbs remained unsold?
- Ask them to solve the word problem by framing sentences.
- Provide them with more word problems as time permits.
Application

- Solve the following word problems:
  - Anita pays ₹7865 for a dress and Reena pays ₹2128 less for a similar dress. What is the cost of Reena’s dress?
  - A bag contains 3256 chocolates and toffees. Out of these, 1810 are toffees. How many chocolate are there in the bag?

Analysis

- Calculate the number of hours in February 2016. Hint: Is 2016 a leap year?
- Frame a word problem using the clues: buttons, 2350, bags, 3, total.

Thinking Skills

- Rahul orders for an ice cream, pizza and potato fries. The costs of these items mentioned in the menu card are ₹65, ₹225 and ₹50. If he gives a ₹1000 note to pay the bill, calculate the amount of money he will get back.
- Frame a word problem using the clues: exhibition, people, 8650, 5342, left.

Parents Connect

Present word stories to your child like:

- Your father deposited ₹9500 in his bank account and then withdrew ₹5600 the next week. How much money is left in his account?
- If your grandmother was born in 1962 and your father was born in 1995, calculate the difference in their age?
Learning Objective
To understand and learn the multiplication tables from 11-20.

Class Activity

Activity
- Recall multiplication as repeated addition by the following activity.
- Ask the students to form 5 groups of four students each.
- Help them recall that the total number of students are $5 \times 4 = 20$
- Ask the students to stand in two groups of 11 students each.
- Pose questions: How many groups are there? How many students are there in each group?
- Help them conclude that there are 2 groups of 11 students each. So the total number of students are $2 \times 11 = 22$
- Instruct the students to form three groups of 13 students.
- Bring their attention to the number of groups; it is 3 and each group has 13 students, so the total number of students are $3 \times 13 = 39$
- Elucidate that in this way if the number of groups are increased keeping the number in each group to be the same, we obtain the multiplication table of that number.
- Extend the activity by increasing the number of students in each group as 12, 13 and so on, till time permits.
- Instruct the students to write the multiplication tables of 11 to 20 in their notebooks and memorise them. Explain that this makes calculations easier.

Understanding
- Multiply the number of groups and the number of objects in each group to calculate the total number of objects.

Expected
- Multiplication by 10, 20, 50, ... and 100.

Associated Concepts

Application
- Find the product of:
  » $20 \times 5$
  » $15 \times 7$
  » $18 \times 2$
  » $17 \times 3$
  » $13 \times 9$
- Fill in the blanks:
  » $12 \times \underline{_____} = 24$
  » $17 \times 6 = \underline{_____}$
  » $16 \times \underline{_____} = 96$
  » $\underline{_____} \times 8 = 112$
Analysis

- Why is it important to learn the multiplication tables?
- 5 dozen bananas = ____ bananas?

Thinking Skills

15 students were sitting in 6 rows each. The teacher instructed them to rearrange and sit in 5 rows such that each row has the same number of students. How many students will be there in each row?

Parents Connect

- Take your child for a walk in the colony, help him/her identify the number of rows of the houses and the number of houses in each row and encourage him/her to calculate the total number of houses in the colony.
- Let your child count the number of cars parked near your house and ask him/her to calculate the total number of tyres in those cars by multiplication.
### Lesson Plan - 2

#### Grade - 3

<table>
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<th>Learning Objective</th>
<th>Material Required</th>
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<tr>
<td>To understand and apply the properties of multiplication.</td>
<td>Plastic /metal bangles small marbles</td>
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<tr>
<td>To multiply a number by 10, 20, ..., 50, ..., 100.</td>
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#### Group Activity

- Divide the class into groups of 4 students each.
- Distribute 4 bangles and 15 marbles to each group.
- Ask the students in each group to place 3 marbles each in four bangles.
- Ask them; How many marbles are there in each bangle? What is the number of bangles? What are the total numbers of marbles?
- Help them conclude that there are $3 \times 4 = 12$ marbles
- Instruct them to now place 4 marbles each in 3 bangles.
- Pose them the same questions again.
- Bring their attention to the total number of marbles $4 \times 3 = 12$ marbles
- Share with them that if two numbers are multiplied in any order, their product remains the same.
- Ask the students to place all the 15 marbles in one bangle.
- Reiterate that this represents 1 group of 15 bangles; so $1 \times 15 = 15$.
- Extend this by putting 10 marbles or 6 marbles or 12 marbles in one bangle.
- Elucidate that $1 \times 10 = 10$, $1 \times 6 = 6$, $1 \times 12 = 12$
- Help them conclude that when a number is multiplied by 1, the product is always the number itself.
- Ask the students to place different number of marbles in 3 bangles.
  (4 in 1st, 5 in 2nd and 6 in 3rd bangle)
- Instruct them to multiply the three numbers; 4, 5 and 6.
- Ask them to first solve $(4 \times 5) \times 6$ and record their answer.
- Now, ask them to solve $4 \times (5 \times 6)$ and record their answer.
- Help them conclude that the product of three or more numbers remains the same, even if they are grouped and multiplied in any order.
- Ask students in each group to place any number of marbles in just one bangle, say, 5 or 7 or 8 or 12, etc.
- Tell them to multiply the number of marbles by 10 and record their answer.
- Next, tell them to multiply the number of marbles by 100 and record their answer. Bring their attention to the number of marbles they had and the product obtained while multiplying by 10 and 100.
- Emphasise on the number of zero in each case.
• Practice with more numbers as time permits. Elucidate that, when a number is multiplied by 10, 20, 30,...90; we multiply the number by 1, 2, 3, ... 9 respectively and put a zero to the right of the product obtained.
• Write on the board: $6 \times 10 = 6 \times 1 \text{ Ten} = 6 \text{ Tens} = 60$
• $7 \times 30 = 7 \times 3 \text{ Tens} = (7 \times 3) \times 1 \text{ Ten} = 21 \times 10 = 210$
• Similarly, show that when a number is multiplied by 100, 200, 300, ... 900; we multiply the number by 1, 2, 3, ... 9 respectively and put two zeros to the right of the product obtained.

To multiply a number by a multiple of 10, just write the number and add the number of zeros to the write of the number.

• Fill in the blanks:
  » $12 \times ____ = 0$  
  » $75 \times 20 = ____$  
  » $375 \times 1 = ____$
  » $45 \times 8 = 8 \times ____$  
  » ____ $\times 4506 = 4506$
  » $(76 \times 75) \times 20 = ____ \times (75 \times 20)$  
  » $(32 \times 27) \times 5 = 32 \times ( ____ \times ____)$

• What is the product of a number multiplied by zero?
• Find the product: $4563 \times (37 \times 0)$
• What is $6 \times 1000$?

• Find the product: $345 \times 2000$.
• Find the product: $28 \times 5 \times 100$.

• Help your child in multiplying the age of any three family members, (father and mother first and then the child’s age) and then verify the product by changing the order; (father and child’s age first and then mother’s age). Encourage them to multiply by taking numbers in different orders and verify that the product remains the same in all cases.
• Let your child note down 2-digit and 3-digit numbers from a newspaper or a magazine and encourage him/her to multiply each one of them by 100.
Lesson Plan - 3

Grade - 3

Learning Objective
- To multiply a 4-digit number by a 1-digit number without regrouping.
- To multiply a 4-digit number by a 1-digit number with regrouping.

Material Required
Thousands, hundreds, tens and ones cubes

Activity

- Ask one student to use the cubes and form a 4-digit number; say, 2341.
- Ask all the students to multiply 2341 with 2.
- Recall multiplication of 2 or 3-digit numbers with one digit number, if required.
- Reiterate that first we multiply the ones, then the tens and then the hundreds.
- Write $2341 \times 2$ on the board in vertical columns.


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- Elucidate the steps of multiplication;
  » multiply the ones, $1 \times 2 = 2$ ones
  » multiply the tens, $4 \times 2 = 8$ tens
  » multiply the hundreds, $3 \times 2 = 6$ hundreds
  » multiply the thousands, $2 \times 2 = 4$ thousands
  » So, $2341 \times 2 = 4682$
- Ask a student to form another 4-digit number using cubes, say, 2824.
- Ask all the students to multiply 2824 with 3.
- Multiply the ones; $4 \times 3 = 12$ ones
- Help them recall that 10 ones make 1 ten, 10 tens make 1 hundred and 10 hundreds make 1 thousand.
  » $12$ ones $= 1$ ten $+ 2$ ones, so we carry over 10 ones to the tens place.
- Replace 10 ones cube with 1 ten cube and place it on top of the 2 tens cube of the number 2824.
- Multiply the tens and add, $2 \times 3 = 6$ tens
- Remind them to add 1 tens of the previous step; $6 + 1 = 7$ tens.
- Multiply the hundreds and add, $8 \times 3 = 24$ hundreds
  » $24$ hundreds $= 2$ thousands $+ 4$ hundreds
- Guide them to replace two 10 hundreds cube with 2 thousands cube and place them on top of the 2 thousands cube of the number 2824.
• Multiply the thousands and add, 2 thousands \( \times 3 = 6 \) thousands.
• Remind them to add 2 thousands from the previous step; 6 thousands + 2 thousands = 8 thousands.
  So, \( 2824 \times 3 = 8472 \)
• Explain each step on the board.
• Extend the activity where students form other 4-digit numbers.
• Encourage them to say aloud the numbers while multiplying.

Understanding

Expected

Application

• Multiply:
  » \( 3040 \times 2 \quad \rightarrow \quad 1246 \times 5 \)
  » \( 2860 \times 3 \quad \rightarrow \quad 1600 \times 4 \)

Analysis

• 2400 cars will have _____ wheels.
• 1250 hands will have _____ fingers.
• When 4321 is multiplied by 2, which two numbers are actually getting multiplied at each place value?

Thinking Skills

• How many seconds are there in 2 hours?
• How much money will be collected if each of the 8 employees contribute equal amount of ₹1225 for a charity?

Parents Connect

• Tell your child to form the greatest 4-digit number with 1, 0, 3 and 2 and find the product of the number formed with the greatest digit in the given digits.
• Ask your child to roll a dice 5 times. Tell him to form the smallest 4-digit number with these 5 digits and multiply it by the fifth digit.
Lesson Plan - 4
Grade - 3

Learning Objective
- To multiply a 2-digit by a 2-digit number.
- To multiply a 3-digit number by a 2-digit number.

Material Required
Dice

Activity
- Write $45 \times 23$ on the board in vertical columns.
- Recall that $23 = 20 + 3$
- Share with them that to multiply a number by a 2-digit multiplier, first multiply by the digit at the ones place and then by the tens place digit.
- Help and encourage the students to find the product of $45 \times 3 = 135$
- Tell them that to multiply with the tens place digit; here 2, put a zero in the ones place as now they have to multiply by 2 tens or 20.
- Write on the board: $45 \times 20 = 900$
- Add both the products obtained: $135 + 900 = 1035$; $45 \times 23 = 1035$
- Similarly, elucidate multiplication of a 3-digit number by a 2-digit number.
- Reinstate that they should multiply the numbers as per their place values.
- Form pairs of students sitting next to each other.
- Distribute one dice to each pair.
- Ask one student of each pair to roll the dice four times to form two 2-digit numbers.
- Ask them to write these numbers in columns and find their product.
- Extend the activity in which the other student in a pair rolls the dice five times to form one 3-digit number and one 2-digit number and find their product.
- Instruct them to exchange their work with the pair sitting next to them.
- Tell them to verify each other’s answers.
- Practice with more numbers till time permits.

Understanding Expected
Multiply the numbers as per their place values. In a 2-digit multiplier, first multiply by ones and then by tens.
**Application**

- Find the product of:
  - $87 \times 45$
  - $76 \times 23$
  - $53 \times 37$
  - $49 \times 18$

- Multiply the following:
  - $309 \times 29$
  - $480 \times 14$
  - $612 \times 16$
  - $561 \times 17$

- Can you find the product of $45 \times 308$?
- Find the product of the smallest 3-digit numbers with the greatest 2-digit numbers.

**Thinking Skills**

- Without actual multiplication, determine the digit at the ones place of the product of $43 \times 37 \times 52$.
- How many minutes are there in the month of March?

**Parents' Connect**

- Whenever you buy grocery, fruits or vegetables, encourage your child to calculate the cost by telling him the rate and the quantity purchased.
- Ask your child to calculate the number of hours in one year by multiplication.
Lesson Plan - 1
Grade - 3

## CH 5
DIVISION

### Learning Objective
To divide a number by grouping.

### Material Required
Plastic /metal bangles, small marbles/ buttons

### Stress Words
Dividend, Divisor, Quotient, Remainder

### Activity
- Make groups of 4 students.
- Distribute 4 bangles and 20 marbles to each group.
- Ask students in each group to put these 20 marbles in four bangles such that each bangle has equal number of marbles.
- Ask them: What is the total number of marbles? What is the number of bangles? How many marbles are there in each bangle?
- Help them conclude that they have distributed 20 marbles into 4 equal groups such that each group contains 5 marbles.
- Show the equal distribution of marbles on the board as under.

![Marbles Distribution](image)

- Reiterate that division is done when equal groups are formed or equal sharing is done.
- Write on the board: $20 \div 4 = 5$

<table>
<thead>
<tr>
<th>Divisor → [4]</th>
<th>2 0</th>
<th>← Dividend</th>
</tr>
</thead>
<tbody>
<tr>
<td>- 2 0</td>
<td>← Quotient</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>← Remainder</td>
<td></td>
</tr>
</tbody>
</table>

- Instruct them to divide 20 marbles equally in 3 bangles now.
- Ask: Are you able to distribute all the marbles equally in 3 bangles or are any extra marbles left?
- Bring their attention to 2 marbles that were left after equal distribution.
- Write on the board: $20 \div 3 = 6, \text{ Remainder} = 2$
- Help the students to recall and write on the board;
  Dividend = 20, Divisor = 3, Quotient = 6, Remainder = 3
- Reiterate that the number being divided is called the dividend (here 20 marbles), the number by which the dividend is divided is called the divisor (here, 3 bangles), the numbers obtained after the division is the quotient (here, 6) and the number that is left undivided is called the remainder (here, 2).
• Extend the activity till time permits, where the students in each group divide these 20 marbles in 2, 5, or 6 groups and show the division in each case.
• Encourage them to also mention the dividend, divisor, quotient and remainder in each case.

The equal distribution of things is called division.

**Application**

Make equal groups in each of the following and write their division sentence.

- 24 flowers into 4 flower pots.
- 40 pen in 5 pen holders.
- 36 chocolates in 6 bags.
- 18 books in 2 rows.

• If the remainder is zero, what can you say about the divisor and the dividend?
• How many toffees will each of the 5 boys get if the teacher distributes 35 toffees equally? Will any toffee be left with the teacher?

• How many months are there in each quarter of a year? (Hint: 1 quarter = 4)
• How many pairs can be formed from two dozen pencils?

• Ask your child to count the fruits in the refrigerator and divide them equally among all the family members.
• Give few beads to your child and ask him/her to make 2 necklaces with equal number of beads. Ask him to do so using division.
Lesson Plan - 2

Learning Objective
- To explore and apply the properties of division.
- To be able to divide a number by 10.

Material Required
Pencils (can be collected from the students)

Activity
- Collect a few pencils from the students of the class, say 7.
- Invite 7 students randomly to come forward and stand in one row.
- Ask another student to distribute these collected pencils to the students standing in the row. Enquire: How many pencils did each student get?
- Help them conclude that 7 pencils were distributed among 7 students, so each student got 1 pencil.
- Write on the board: $7 \div 7 = 1$
- Extend the activity by changing the number of pencils and the number of students to 5.
- Help them observe that $5 \div 5 = 1$
- Summarise; when a number is divided by itself, the quotient is always 1.
- Instruct one student to give all the 7 pencils to one student only.
- Bring their attention to the fact that 7 pencils were given to 1 student, so the student got 7 pencils.
- Write on the board: $7 \div 1 = 7$
- Summarise; when a number is divided by 1, the quotient is the number itself.
- Take back all the pencils from the student.
- Pose: If there are no pencils, can you distribute them among the students?
- Encourage them to write it in the form of a division sentence.
- Elucidate and write on the board: $0 \div 7 = 0$
- Conclude; when 0 is divided by a number, it always gives 0 as the quotient.
- Invite 10 students this time to stand in one row.
- Collect 15 pencils from the students.
- Ask one student to distribute these 15 pencils among 10 students.
- Pose: How many pencils did each of the 15 students get? Are there any pencils remaining?
- Conclude using students’ response and write on the board:
  $15 \div 10 = 1$, Remainder = 5
- Extend the activity with 24 pencils; help them conclude that $24 \div 10 = 2$, Remainder = 4
- Bring their attention to the quotient and the remainder when the number is divided by 10.
• Share with them that when a number is divided by 10, the quotient is obtained by removing the ones digit from the number. The digit at ones place is the remainder.
• Give 3-digit and 4-digit numbers to the students and encourage them to say aloud the quotient and the remainder in each case.

**Division of a number by 100 or 1000.**

**Application**

• Fill in the blanks:
  » 14 ÷ 1 = ____,
  » 245 ÷ ____ = 245,
  » 5432 ÷ 1 = ____,
  » 632 ÷ 632 = ____,
  » ____ ÷ 50 = 0,
  » 4560 ÷ 0 = ____

• Find the quotient and remainder:
  » 56 ÷ 10,
  » 8567 ÷ 10,
  » 500 ÷ 10,
  » 6785 ÷ 10

• Can you divide a number by zero?
• What is the quotient and remainder: 4365 ÷ 100?

**Thinking Skills**

• How many ₹100 notes can a person get from ₹9000?
• Without actual division, find the quotient and remainder of 7835 ÷ 1000.

• Help your child to calculate the total number of ₹10 notes in ₹320, ₹150, etc.
• Encourage your child to identify the quotient and remainder in the 4-digit numbers of the number plates of vehicles when divided by 10.
Grade - 3

Lesson Plan - 3

Learning Objective
- To divide a 3-digit number by a 1-digit number with and without remainder.
- To divide a 4-digit number by a 1-digit number with and without remainder.

Material Required
Thousands, hundreds, tens and ones cubes

Class Activity

Activity
- Ask one student to form a 3-digit number using cubes say, 842.
- Ask all the students to divide 842 by 2.
- Recall the division of 2-digit numbers by one digit number, if required.
- Reiterate that first we divide the hundreds, then the tens and then the ones.
- Elucidate the division with the help of cubes; recall that they have to make 2 equal groups of the number 842.
- Help the students to divide 8 hundreds cubes into 2, so that each group has 4 hundreds cubes.
- Next, divide 4 tens cubes by 2 such that each group has 2 tens cubes.
- Finally, divide 2 ones cubes by 2; each has 1 ones cube.
- Make the students identify and say aloud the numbers formed.
- Write and explain $842 \div 2 = 421$ on the board.

Dividing the hundreds, tens and ones.

```
  4 2 1
8 4 2
 2 | 8 4 2
  2 \ 0 4
```

- $2 \times 4 \text{ Hundreds} = 8 \text{ Hundreds}$
- $2 \times 2 \text{ Tens} = 4 \text{ Tens}$
- $2 \times 1 \text{ One} = 2 \text{ Ones}$

```
  4 2 1
8 4 2
 2 \ 
 0 4
  - \ 0 2
  - \ 2
```

$842 \div 2 = 421$

- Ask one student to form an odd 4-digit number using the cubes say, 4523.
- Encourage them to divide 4523 by 6 as explained above.
- Share with them that if a digit is not divisible by the divisor i.e. it is smaller than the divisor, we bring down the next digit by placing 0 (zero) in the quotient.
- Explain that 4 thousands < 6, so we bring down hundreds digit, and then divide so, $45 \div 6$.
- Emphasise that they should always write the quotient as per the place value; here $45 \div 6 = 7$, remainder 3, so quotient 7 should be written above the hundreds digit and not above the thousands digit.
Help them recall that the number that is left called the remainder.

Explain each step on the board.

4523 ÷ 6 = 753, Remainder = 5

Provide more division questions to the students and tell them to find the quotient and remainder in each one of them.

If a digit is not divisible by the divisor i.e. it is smaller than the divisor, bring down the next digit by placing 0 (zero) in the quotient.

In division, quotient should be written as per the place value of the dividend.

Division of 2 and 3 digit numbers with and without remainder.

Solve:

» 408 ÷ 4
» 5435 ÷ 5
» 924 ÷ 3
» 3768 ÷ 8

Divide and mention the quotient and remainder in each of the following:

» 6718 by 8
» 273 by 6
» 7452 by 7
» 9310 by 9

Can the remainder be more than or equal to the divisor?

How can you verify quotient in division?

How many weeks are there in a year?

A shopkeeper purchases 7 cartons of apple juices. Each carton contains 350 cans of apple juice. If he wants to repack them in 5 cartons, how many will he pack in each carton?

Make your child calculate the rate of grocery items while shopping by telling him/her the total amount paid and the quantity purchased.

Show your child a ₹500 or a ₹1000 note. Ask him/her to find out the money each family member will get if distributed equally among all.

Content Book Reference: Page 95, 98

Guided Practice: Page 62-65
Lesson Plan - 4

Grade - 3

Learning Objective
- To divide a given number by a 2-digit number with remainder.
- To verify the result obtained.

Material Required
- Dice

Activity
- Write $205 \div 15$ on the board and ask the students to solve it.
- Recall division of a number by 1-digit number, if required.
- Share with them that here the divisor is a 2-digit number but the steps of division remains the same.
- Seek students’ response to obtain: $205 \div 15 = 13$, Remainder $= 10$
  \[
  \begin{array}{c|c}
  \text{Divisor} & 15 \\ \hline
  \text{Dividend} & 205 \\ \hline
  \text{Quotient} & 13 \\ \hline
  \text{Remainder} & 10 \\
  \end{array}
  \]
- Elucidate each step on the board.
- Reiterate that they should always write the quotient as per the place value, as done in division of a 4-digit number by 1-digit number.
- Ask them: how can you verify if the quotient and the remainder obtained are correct? Seek responses.
- Conclude using students’ response that to verify the answer, multiply the quotient by the divisor and then add the remainder to it. If the dividend is obtained, the answer is correct.
- Write on the board:
  \[
  \text{Dividend} = \text{Divisor} \times \text{Quotient} + \text{Remainder}
  \]
- Elucidate and verify on the board: $\text{Divisor} \times \text{Quotient} + \text{Remainder} = 15 \times 13 + 10 = 195 + 10 = 205 = \text{dividend}$.
- Form pairs of students sitting next to each other.
- Distribute one dice to each pair.
- Ask one student of each pair to roll the dice four times to form two 2-digit numbers.
- Ask them to divide the greater number by the smaller number.
- Encourage and guide them to verify their answers too.
- Extend the activity in which the other student in the pair, rolls the dice five times to form one 3-digit number and one 2-digit number.
- Tell them to divide and verify their answers.
- Extend the activity where students form different numbers by rolling the dice, till time permits.
**Associated Concepts**
- Division of large numbers by 3-digit and more digit numbers.
- Short division method.

**Application**
- Divide and verify your answer in each of the following:
  - $82 \div 14$
  - $435 \div 11$
  - $864 \div 12$
  - $3768 \div 13$

**Analysis**
- Write division facts for $15 \times 17 = 255$.
- How many dozens make 144?

**Thinking Skills**
- A man walks 13 km per day. In how many days will he cover a distance of 585 km?
- How many days are equal to 2520 hours? (Hint: 1 day = 24 hours)

**Parents Connect**
- Let your child divide his/her grandparents' age by his/her parents' age. Also, encourage him/her to verify the result obtained.
- Tell your child to form the greatest 3-digit number and a 2-digit number using digits 3, 6, 9, 1, and 5. Ask him/her to divide and find the quotient and the remainder.

Content Book Reference: Page 99, 100
Guided Practice: Page 66-68
Learning Objective

To solve word problems by framing statements involving multiplication.

Class/Pair Activity

Narrate a word problem to the students.

An NGO decided to distribute packets of biscuits to each student in the rural schools. They identified 25 such schools. Each school had 235 students. How many packets of biscuits will they distribute in all?

Bring their attention to the word ‘such’ in the question; it implies that the number of packets to be distributed in each school is the same; 235.

Pose: How will you calculate the total number of packets? Is it possible for you to add 235, 25 times to find the answer?

Discuss that in such situations, where there are large numbers, multiplication is used to calculate the total quantity.

Share with them that to solve such problems they have to follow a 4-step approach as under:

**Understanding:** This involves to understand what all is given and what they need to find. Here, we know that each school has 235 students. There are 25 such schools. We have to find the total number of packets of biscuits.

**Planning:** Analysis is done in this step. One part is given; 235 and we have to find the whole. Associate with representation:

\[
\begin{array}{c}
235 \\
\hline
\end{array}
\]

25 schools

**Doing:** This step involves the actual multiplication in columns. Recall the steps of multiplication.

\[235 \times 25 = 5875\]

**Checking:** This is the last step done to verify the answer. It can be done by adding as: \(235 + 235 + 235 + 235 + \ldots \) 25 times = 5875

Share that it is not possible to check the answer by addition in case of large number of times.

Summarise the word problem by writing the statements on the board as under:

Number of students in 1 school = 235
Number of schools = 25
Total number of students = \(25 \times 235 = 5875\) packets of biscuits are required.
Solve the following word problems:

» 160 cars can be parked in one parking lot. How many cars can be parked in 58 such parking lots?

» How many oranges will Beena have if she buys 45 dozen oranges for a puja in her house?

» Calculate the number of hours in February 2016. Hint: Is 2016 a leap year?

» Frame a word problem using the clues: buttons, 2350, bags, 3, total.

» In a cricket match, Sachin hits 12 fours and 5 sixes and took 21 singles. What is his score at the end of the match?

» Frame a word problem using the clues: basket, 150, apples, 36, in all.

» Tell your child: There are (for example) 2 notes of 1000 rupees each, 5 notes of 500 rupees and 10 notes of 100 rupees each in your purse. Calculate the money in the purse. Encourage and guide him/her to use multiplication.

» Ask your child: In an Indian tricolor there are 24 spokes. Calculate the number of spokes in 45 such flags.
Grade - 3

Learning Objective
To solve word problems by framing statements using division.

Activity

- Narrate a word problem to the students: There are 657 flowers in a basket. Ankush wants to make 9 equal garlands with these flowers. How many flowers will he use to make one garland?
- Seek responses..
- Recall the 4-step problem solving approach. Explain each step as under:
  - **Understanding:** Need to understand what all is given and what we have to find. Here, there are 657 flowers. There are 9 garlands. We have to find the number of flowers in each garland.
  - **Planning:** Analysis is done in this step. This means the whole is 657 and it is to be divided into 9 parts. Represent it using a model.
    
    ![Model of 657 flowers divided into 9 garlands]
    
    - **Doing:** This step involves the actual division; $657 \div 9 = 73$
      
      \[
      \begin{array}{c|c|c|c|c|c|c|c|c|c}
      & & & & & & & & & \\
      657 & \div & 9 & = & 73 \\
      \hline
      9 & \downarrow & 6 & 5 & 7 & \downarrow & 2 & 7 & \downarrow & 0 \\
      \hline
      \end{array}
      \]
      
      One garland will have 73 flowers.
  - **Checking:** This is the last step done to verify the answer. It can be done as: Dividend = Divisor × Quotient + Remainder
    
    $9 \times 73 = 675 = \text{Dividend}$, so the answer is correct.
- Summarise the word problem by writing the statements on the board as under:
  
  Total number of flowers = 675  
  Number of garlands = 9  
  Number of flowers in each garland = $657 \div 9 = 73$
- Make pairs of students sitting next to each other.
- Narrate another word problem to the students.
- The total amount paid to the shopkeeper for a dozen toys is ₹528. What is the cost of each toy?
- Ask them to solve the word problem in pairs by framing sentences and also verify their answers.
Solve the following word problems:

- There are 74 toffees to be distributed equally among the students of a class. If each student got 2 toffees, calculate the number of students in the class.
- Ritu has 120 stickers. She wants to paste 6 stickers on one page. In how many pages will Ritu be able to paste the stickers if she pastes them equally on all the pages?

If the product of two numbers is 750 and one of the numbers is 5, what is the other number?

Frame a division word problem from the given clues: biscuits, 299, bag, each, 13, packets.

Frame a division word problem from the given clues: sugar, ₹480, 15 kg, cost, each.

If the product of two numbers is 9750 and one of the numbers is 25, what is the other number?

- Involve your child while buying vegetables or fruits. Show him/her the total amount of money you pay and the cost of a vegetable/fruit per kg. Ask him/her to calculate the quantity that can be purchased with the given money.
- Take your child for a walk in your colony. Tell him/her that the total number of houses in the colony is 315 and the number of rows is 15. Ask him to calculate the number of houses in each row and also verify the answer.
Lesson Plan - 1

Grade - 3

WHOLE AND PARTS : FRACTIONS

Learning Objective

- To read and write a fraction and identify its numerator and denominator.

Stress Words

Numerator, denominator

Class, Pair Activity

Activity

- Pose questions: If you have one chocolate and you have to share it equally with 2 more friends, what will you do? If a pizza is to be divided equally among 4 friends, how much will each person get? Seek responses.
- Recall using student’s response that an undivided object is called a whole and if it is divided into equal parts, then each part is called a fraction of the whole.
- Ask: What fraction of the chocolate and pizza will each person get?
- Discuss that the chocolate will have to be divided into 3 equal portions and the pizza will be cut into 4 equal parts so that each of them gets an equal portion of the chocolate and the pizza.
- Write on the board:

| Parts into which the whole, here, chocolate, is divided | 3 |
| Part of the whole being taken away by each person | 1 |
| Fraction of each part | 1/3 or each part is 1/3 of the whole |

- Represent and show on the board:

\[
\begin{align*}
\frac{1}{3} & \quad \frac{1}{3} & \quad \frac{1}{3} \\
\frac{1}{4} & \quad \frac{1}{4} & \quad \frac{1}{4} \\
\end{align*}
\]

- Share with them that 1/3 is read as one by three or one-third.
- Encourage the students to identify and say aloud the fraction of pizza each person will get.
- Appreciate if they mention 1/4 and read it as one by four or one-fourth.
- Make them observe that a fraction is made up of two parts; the top part; here 1 as in 1/3 and 1/4, and the bottom part, here 3 and 4 respectively as in 1/3 and 1/4.
Share with them that the top part of a fraction is called the numerator and the bottom part of a fraction is called the denominator. So a fraction is written as:

\[
\text{Fraction} = \frac{\text{Numerator}}{\text{Denominator}}
\]

Each equal part of a whole is called a fraction.

Fractions equivalent to a given fraction.

- Write the fractions for the following:
  Numerator = 2  Denominator = 7, Numerator = 5  Denominator = 6  
  Numerator = 3  Denominator = 4, (Ans: \(\frac{2}{7}, \frac{5}{6}, \frac{3}{4}\))

- Write the fraction \(\frac{4}{6}\) of in words. (Ans: four sixth)
- What fraction of the cake is left if 2 out of 7 equal pieces are eaten? (Ans: \(\frac{5}{7}\))

Can you represent one finger of your hand as \(\frac{1}{5}\). Give reasons for your answer.

If you gave one third of a dozen mangoes to your friend, how many mangoes did you give? (1 dozen = 12)

Help your child draw a circle on an A4 size sheet. Divide it into 10 equal parts. Let him/her colour 3 parts blue, 2 parts yellow and 4 parts with red colour. Encourage him/her to write the fraction of each colour and also the fraction of unshaded portion, if any.

Show fruits/vegetables cut in 2, 3 or 4 equal parts and ask him/her to find the fraction of each part.
Learning Objective
To identify fraction as a part of collection.

Material Required
5 chart papers of 2 different colours (2 pink and 3 blue); rolled and kept in a vase/beaker.

Activity
- Show the folded chart paper one by one as you keep them in the vase. Ask the students to observe the total number of charts and charts of each colour.
- Ask a student to come forward and take the pink chart papers.
- Pose questions like:
  » How many charts were there in all? (5)
  » How many pink chart were there in all? (2)
  » What fraction of the charts out the total in pink? \(\frac{2}{5}\)
  » Say 2 charts out of 5 is pink. So, \(\frac{2}{5}\) of chart are pink.
- Make students understand that the denominator represents the total number of objects in the collection and numerator represents the objects under consideration or the number of objects taken away (without using the terms ‘numerator’ and ‘denominator’).

Understanding
Expected
Pink chart represents \(\frac{2}{5}\) of the collection and not \(\frac{2}{3}\).

Application
What fraction of the circles are shaded?

Analysis
How is \(\frac{2}{3}\) different from \(\frac{2}{5}\)?

Parents Connect
- Ask your child to pick up a number of socks from a collection and identify the fraction of the socks picked.
- Place 2-3 types of glasses and ask the child to separate one of a type, then ask them to identify the fractional part of the glass collection separated from the whole collection.

Content Book Reference: Page 114, 115
Guided Practice: Page 82-83
Activity

- Tell the students that a fraction can also be represented on a number line just like a whole number.
- Recall and draw a number line on the board.
- Explain the steps to represent a fraction on a number line, say, $\frac{2}{3}$.
  » Draw a number line and mark 0 and 1 on it. The line segment between the two numbers represents the whole.
  » Divide the number line between 0 and 1 into as many equal parts as the number in the denominator, here 3 equal parts.
  » Label each of the equal parts. Here, the first mark is $\frac{1}{3}$. Then the second mark will represent $\frac{2}{3}$.
- Elucidate on the board and clarify doubts, if any.

- Make pairs of students sitting next to each other.
- Distribute one dice and one crayon to each pair.
- Tell them to draw a rectangle in their notebook and divide it into 8 equal parts.
- Draw and show it on the board as represented here.

- Ask one student in each pair to roll the dice and the other student to note the number obtained.
- Ask him/her to form and write the fraction; also shade the portion of the rectangle to represent the fraction.
- Reiterate that the denominator here is 8 as the figure is divided into 8 equal parts. So, the number obtained on the dice will represent the numerator.
- Repeat the above, now the other student in the pair rolls the dice and the first student forms the fraction and colour the rectangle to represent the fraction.
- Guide and help them to represent the fraction obtained on a number line.
- Extend the activity where students form more fractions, if time permits.
• Fractions can be represented on a number line.

• Represent the following fractions on a number line: \( \frac{3}{7} \) and \( \frac{4}{6} \).

• Complete the following number line.

\[ \begin{array}{cccccccc}
0 & 1 & 2 & 3 & 4 & 5 & 6 \\
\end{array} \]

• A number line is divided into 12 equal parts between 0 and 1. Name the fraction which is halfway between 0 and 1.

• Help your child to make a number line using clothespin and hanger. Place the clothespins at equal distances on the hanger and label the first and last one as 0 and 1 respectively. Ask your child to label the remaining clothespins.

Content Book Reference: Page 116

Guided Practice: Page 84
Lesson Plan - 4

Grade - 3

Learning Objective
To identify and differentiate between like fractions and unlike fractions.

Material Required
Strips of paper, crayons

Stress Words
Like fractions, unlike fractions

Activity

- **Note:** Teacher to prepare a bunch of 4 strips of paper, say 2 cm wide but of various lengths, say 10 cm, 8 cm, 12 cm and 6 cm, respectively for each group of 4 students. Prepare such bundles for each group in the class.
  - Divide the class into groups of four students each.
  - Distribute one bunch of paper strips and crayons to each group.
  - Ask all the students to fold the strip so that the strip is divided into 6 equal parts.
  - Demonstrate and show it in the class. Guide and help the students, if required.
  - Instruct each student in a group to colour some parts out of the 6 parts formed; all 4 students in each group to colour different number of parts, say, 1, 4, 3 and 5 parts.
  - Ask them to write the fraction of the shaded part of their strip.
  - Elucidate on the board as represented here.

    \[
    \begin{array}{cccc}
    & & & \frac{1}{6} \\
    & & & \\
    & & & \\
    \hline
    \end{array} \quad \begin{array}{cccc}
    & & & \frac{4}{6} \\
    & & & \\
    \hline
    \end{array}
    \quad \begin{array}{cccc}
    & & & \frac{5}{6} \\
    & & & \\
    \hline
    \end{array} \quad \begin{array}{cccc}
    & & & \frac{3}{6} \\
    & & & \\
    \hline
    \end{array}
    \]

  - Bring their attention to the denominators of the fractions formed by all the students; here it is 6 as the strip, though of different sizes, is divided into 6 equal parts.
  - Share with the students that fractions with the same denominator are called like fractions, here \( \frac{1}{6}, \frac{4}{6}, \frac{3}{6} \) and \( \frac{5}{6} \) are like fractions.
  - Next, provide strips of paper of the same length to each student.
  - Ask students of each group to fold it into different parts say 8 parts, 5 parts, 4 parts and 6 parts and colour some parts of it, say 2, 4, 3 and 1 part respectively.
  - Ask them to write the fraction of the shaded part of their strip.
  - Elucidate on the board and show that though the strips are of the same size, they are divided into different number of parts.
Convert unlike fractions into like fractions.

- Group the following fractions as like and unlike fractions:
  \[
  \frac{2}{5}, \frac{1}{3}, \frac{3}{7}, \frac{5}{9}, \frac{1}{11}, \frac{2}{7}, \frac{5}{11}, \frac{6}{9}, \frac{4}{5}, \frac{1}{3}, \frac{3}{8}
  \]
  (Ans: Like: \(\frac{2}{5}\) and \(\frac{1}{3}\); \(\frac{3}{7}\) and \(\frac{5}{9}\); \(\frac{4}{5}\) and \(\frac{1}{3}\); \(\frac{6}{9}\); \(\frac{1}{5}\); \(\frac{3}{8}\))
  Unlikely: \(\frac{5}{13}\), \(\frac{3}{8}\), \(\frac{1}{3}\)
- Identify the pairs of fractions as like and unlike fractions:
  \[
  \frac{1}{5}, \frac{4}{5}; \frac{2}{9}, \frac{1}{3}; \frac{7}{11}, \frac{2}{5}; \frac{2}{7}
  \]
  (Ans: like, unlike, like, unlike)

- Are \(\frac{2}{7}, \frac{3}{9}, \frac{2}{5}\) like fractions? (Ans: No)
- Do the fraction of the shaded portion in the following figures represent like fractions or unlike fractions?
  (Ans: like fractions, \(\frac{2}{4}\); as they all are divided into 4 equal parts)
Thinking Skills

- Express \( \frac{2}{5} \) and \( \frac{3}{10} \) as like fractions.

Parent Connect

- Let your child form fractions with the denominator as the age of the father and numerators as the age of various family members in the house. Ask him/her to identify and justify if the fractions formed are like or unlike.
- Make your child count the total number of cars parked in your colony. Let him/her write the fraction of each colour of the car, say red, white, silver, black car, etc. Encourage him/her to arrange the fractions obtained as like and unlike fractions.

Content Book Reference: Page 117, 118
Guided Practice: Page 85
Learning Objective: To compare fractions and arrange them in ascending and descending order.

Material Required: Strips of paper, crayons

Activity:
- Divide the class into groups of four students each.
- Narrate: Suppose that each student in a group has the same chocolate which has 6 equal pieces. But each student eats a different portion of it, say, 2, 3, 1 and 5 pieces respectively.
- Distribute one paper strip (of same size) to each student and crayons to each group and tell them to assume that the strip of paper is the chocolate.
- Ask them to fold the strip to divide it into 6 equal parts and shade the strip to represent the portion of the chocolate they ate.
- Demonstrate if required and elucidate on the board as represented here.

\[
\begin{align*}
\text{\includegraphics[width=\textwidth]{chocolate.png}}
\end{align*}
\]

- Pose: Who ate the most and who ate the least? Are these fractions like or unlike? Which among them is the greatest? Which is the smallest fraction?
- Summarise using students’ response that since \(3 > 2\) and \(3 < 5\), so \(\frac{3}{6}\) is greater than \(\frac{2}{6}\) but is smaller than \(\frac{5}{6}\); here, \(\frac{3}{6} > \frac{2}{6}\), and \(\frac{3}{6} < \frac{5}{6}\).
- Write on the board, \(\frac{5}{6} > \frac{3}{6} > \frac{2}{6} > \frac{1}{6}\) is the descending order of fractions.
- Ask the students to arrange the fractions in the ascending order.
- Invite one student to write the ascending order on the board and all the others to verify their answers; \(\frac{1}{6} < \frac{2}{6} < \frac{3}{6} < \frac{5}{6}\).
- Bring their attention to the numerators in the like fractions mentioned above.
- Generalise that in like fractions, fraction with a greater numerator is the greater fraction and vice-versa.
Write few like fractions on the board: \( \frac{3}{7}, \frac{6}{7}, \frac{1}{7}; \frac{4}{9}, \frac{2}{9}, \frac{5}{9} \).

Tell them to arrange the fractions in ascending and descending order.

Discuss the answers and ask the students to verify them.

Provide more questions, till time permits.

While comparing like fractions, fraction with the greater numerator is the greater fraction.

Fill in the blanks by putting ‘>’, ‘<’ or ‘=’.

\[
\frac{24}{30} \quad \frac{25}{30}, \quad \frac{8}{11} \quad \frac{5}{11}, \quad \frac{3}{7} \quad \frac{3}{7}, \quad \frac{3}{9} \quad \frac{7}{9}, \quad \frac{4}{5} \quad \frac{1}{5}
\]

(Ans: <, >, =, <, >)

State whether true or false? \( \frac{3}{4} > \frac{2}{4}; \frac{5}{9} > \frac{10}{9} \) (Ans: T, F)

Is \( \frac{3}{4} < \frac{12}{16} \)? Justify your answer.

Make your child form fractions with the number of marks obtained to the total number of marks in various subjects, say, English, Maths and Science. Ask him/her to compare and arrange them in ascending order.

Content Book Reference: Page 119, 120 Guided Practice: Page 86
Learning Objective
- To add two or more fractions.
- To subtract two or more fractions.

Material Required
Sheets of paper, crayons (2 different colours)

Activity

- **Note:** Teacher to make circular cut outs of a suitable radius, say 6cm, one for each pair of students.
- Narrate: Your mother made a circular cake and divided it into 8 equal pieces. You ate 2 pieces while your friend ate 3 pieces. What fraction of the cake did you both eat altogether? Seek responses.
- Discuss that in such a situation, we have to first identify the fraction of cake that each person ate and then add both the fractions to obtain the fraction of cake they ate altogether.
- Make pairs of students sitting next to each other.
- Distribute one circular sheet and crayons of any two colours to each pair.
- Inform them that the circular sheet represents the cake.
- Tell them to fold the circle in such a way so as to divide it into 8 equal parts.
- Ask both the students in each pair to shade the circle to represent the portion of the cake he/she ate, using different colours; here 2 and 3 parts respectively.
- Tell them to write the fraction of the shaded part of the circle that represents the portion of cake they ate; here $\frac{2}{8}$ and $\frac{3}{8}$ respectively as shown.
- Encourage them to add both the fractions and calculate the fraction of cake they ate altogether.
- Remind them that fractions $\frac{2}{8}$ and $\frac{3}{8}$ are like fractions.
- Elucidate on the board that $\frac{2}{8} + \frac{3}{8} = \frac{5}{8}$ as represented here.
- Conclude that when we add like fractions, we add only the numerators to get the sum. The denominator remains the same.
- Ask the students to add the fractions using a number line.
- Remind them to represent a fraction on a number line.
- Show on the board:
To add like fractions, add only the numerators to get the sum and to subtract like fractions, subtract only the numerators to get the difference. The denominator remains the same.

- Similarly, elucidate that when we subtract like fractions, we subtract only the numerators to get the difference. The denominator remains the same.
- Show on the board: $\frac{6}{7} - \frac{4}{7} = \frac{2}{7}$.
- Write few questions on the board and ask them to solve them individually. $\frac{2}{5} + \frac{1}{5} = \_\_\_; \frac{3}{11} + \frac{7}{11} = \_\_\_; \frac{5}{9} - \frac{4}{9} = \_\_\_; \frac{4}{6} - \frac{1}{6} = \_\_\_.$
- Reiterate that in addition and subtraction of like fractions, the denominators remain the same; only the numerators are added or subtracted, respectively.
- Ask them to represent them on the number line also.
- Move around in the class to help and guide the students, if required.
- Instruct the students to exchange their notebook with their partners.
- Discuss the solutions and ask the students to verify; here, $\frac{3}{5}$, $\frac{10}{11}$, $\frac{1}{9}$ and $\frac{3}{6}$.
- Provide more questions, till time permits.

To add like fractions, add only the numerators to get the sum and to subtract like fractions, subtract only the numerators to get the difference. The denominator remains the same.

**Addition and subtraction of unlike fractions.**

- Add $\frac{3}{5}$ and $\frac{1}{5}$; $\frac{4}{7}$ and $\frac{2}{7}$. Also show using a number line. (Ans: $\frac{4}{5}$, $\frac{6}{7}$)
- Subtract: $\frac{7}{11}$ from $\frac{9}{11}$; $\frac{15}{31}$ from $\frac{25}{31}$. (Ans: $\frac{2}{11}$, $\frac{10}{31}$)
- What is: $\frac{3}{10} + \frac{1}{10} + \frac{2}{10}$? (Ans: $\frac{6}{10}$)
- Find: $\frac{5}{9} - 0$; $\frac{3}{4} + 0$. (Ans: $\frac{5}{9}$, $\frac{3}{4}$)
- Subtract the sum of $\frac{2}{15}$ and $\frac{1}{15}$ from the sum of $\frac{5}{15}$ and $\frac{4}{15}$.
- What is $1 - \frac{6}{7}$? (Hint: 1 whole = $\frac{7}{7}$)

- Make your child count the number of books and the number of copies in his/her school bag. Tell him/her to form two fractions with these numbers as numerators. Take the total number of books and copies as the denominator. Tell them to find the difference between the two fractions.
- Show a fruit basket to your child. Let him/her form fractions with the total number of fruits as the denominator. Let him/her form fractions representing any 2 fruits in the basket. Encourage him/her to calculate the fraction that these two fruits make altogether.

**Content Book Reference:** Page 120-123  
**Guided Practice:** Page 87-90
Learning Objective
To solve word problems by framing statements related to daily life involving addition and subtraction of fractions.

Material Required
White sheet, scale, pencil

Activity
- Narrate a word problem to the students: Reena ate \( \frac{2}{5} \) of a chocolate and Sheetal ate \( \frac{1}{5} \) of the same chocolate. What fraction of the chocolate did they eat altogether? How much chocolate was left?
- Seek responses.
- Recall the 4-step problem solving approach. Explain each step as under:
  - **Understanding:** Need to understand what fractions are given and what we have to find. Here, \( \frac{2}{5} \) and \( \frac{1}{5} \) are given. We have to find the fraction of the chocolate they ate altogether.
  - **Planning:** Analysis is done in this step. Here, we have to divide the whole into 5 equal parts as the denominator is 5. Represent it using a model.

![Model of chocolate division](image)

- **Doing:** This step involves the actual addition; \( \frac{2}{5} + \frac{1}{5} = \frac{3}{5} \)
- Hence both of them ate \( \frac{3}{5} \) of the chocolate.
- Ask: How much chocolate is left? Seek responses.
- Elucidate once again using the above approach that they had a whole chocolate out of which \( \frac{3}{5} \) is eaten. So they have to find the portion of chocolate that is left.

![Model of remaining chocolate](image)

- Remind them that 1 whole can be written as \( 1 = \frac{5}{5} \); So the fraction of chocolate left is \( 1 - \frac{3}{5} = \frac{5}{5} - \frac{3}{5} = \frac{2}{5} \)
- **Checking:** This is the last step done to verify the answer. \( \frac{2}{5} \) and \( \frac{1}{5} \) chocolate is eaten and \( \frac{2}{5} \) is left. All the three fractions should add to give a whole. \( \frac{2}{5} + \frac{1}{5} + \frac{2}{5} = \frac{5}{5} = 1 \), so the answer is correct.
- Summarise the word problem by writing the statements on the board as under:
Thinking Skills

Amit has 8 beads in a string. One half of them are red. One is blue and the rest are green. What fraction of the beads is green?

Rina spent $\frac{1}{5}$ of her pocket money on pencils and $\frac{2}{5}$ on books. If she had ₹100, how much money is left with her?

Parent Connect

Make your child write his/her marks in fractions; marks obtained by the total number of marks in any three subjects. Ask him/her to calculate the fraction of marks obtained in all.

Also encourage him/her to find the difference in the marks obtained in various subjects.

Analysis

If $\frac{1}{3}$ of a figure is coloured, what part of it is not coloured? (Ans: $\frac{1}{3}$)

Subtract the sum of $\frac{2}{7}$ and $\frac{1}{7}$ from $\frac{6}{7}$. (Ans: $\frac{3}{7}$)

Application

Solve the following word problems:

- Akshay does $\frac{4}{9}$ of a work, Amit does $\frac{2}{9}$ and Riya does $\frac{1}{9}$ of the same work. How much work do they complete altogether? (Ans: $\frac{7}{9}$)

- $\frac{4}{7}$ of the walls are painted and the rest are not painted. What fraction of the walls is not painted? (Ans: $\frac{3}{7}$)

- Make pairs of students sitting next to each other.

- Narrate another word problem to the students: A man travels $\frac{5}{13}$ km by train and $\frac{3}{13}$ km by bus everyday to reach his office. How much does he travel everyday in all?

- Ask them to solve the word problem in pairs by framing sentences.

- Tell them to exchange their notebooks and verify their answers.

- Provide more word problems to the students to solve till time permits.

Content Book Reference: Page 126

Guided Practice: Page 91-95
Lesson Plan - 1
Grade - 3

MEASUREMENT

Learning Objective
• To list different units of measuring length.
• To convert a bigger unit of measuring length to smaller unit and vice versa.

Material Required
Scale/ruler, measuring tape

Stress Words
Centimetre, Metre, Kilometre

Activity
• Ask the students: How do you measure the length of a line if you draw it in your notebook? Which instrument will you use? What is the unit in which you will measure? Seek responses.
• Remind them that a scale is used to measure the length of a line and we use centimetre, written as cm.
• Make students observe carefully small markings between any two numbers on the scale.
• Tell them to count the number of markings between, say, 2 and 3.
• Share with them that each 10 small markings give measurement in millimetres (mm). It is a very small unit of length, commonly used to measure the length of small objects.
• Write on the board: 10 mm = 1 cm.
• Instruct them to draw and measure the length of a line in cm and mm.
• Pose: Can you measure the length of your class with the help of a scale? Have you seen a cloth merchant measuring the length of the cloth? What is that instrument called? Can distance between two places in a city be measured in cm or mm? Have you noticed boards/milestones that mention the distance to a place while travelling by road from one place to another? Seek responses.
• Show a measuring tape to the students and conclude that a measuring tape or a metre scale is used to measure the length of the cloth in metres (m). So bigger lengths are measured in metres.
• Write on the board: 100 cm = 1 m
• Share with them that to measure large/long distances a larger unit such as kilometre (km) is used.
• Write on the board: 1000 m = 1 km
• Inform them that one unit of measurement can be converted into another unit; multiply a bigger unit 10 times, 100 times or 1000 times to change it into a smaller unit and divide to change a smaller unit into bigger unit.
• Write on the board few questions such as: Convert 3 km 75 m into m and 652 cm into m and cm.
Elucidate each step on the board.

» 3 km 75 m = 3 \times 1000 \, m + 75 \, m; \text{ since } 1 \, km = 1000 \, m
   \quad = 3000 \, m + 75 \, m = 3075 \, m

» 612 \, cm = 600 \, cm + 12 \, cm
   \quad = 6 \, m + 12 \, cm = 6 \, m 12 \, cm; \text{ since } 100 \, cm = 1 \, m

Provide questions and ask them to convert: 5 m 20 cm into m, 10 km 340 m into m, 753 m into m and cm, 5425 m into km, etc.

Remind them the factors with which they have to multiply or divide to obtain the desired unit.

Instruct them to work individually without discussing with their partners.

Move around in the class to help and guide them, if required.

Ask the students to exchange their notebooks with their partners.

Discuss the answers and ask them to verify their solutions.

Provide more questions till time permits.

1 \, cm = 10 \, mm; 1 \, m = 100 \, cm; 1 \, km = 1000 \, m

Convert the following:

» 2154 \, m into km and m; 936 \, cm into m and cm; 10 \, m 37 \, cm into cm; 4 \, km 86 \, m into m.

Ajay’s school is 2076 \, m away from his house. How far is it in km and m?

The height of a building is 10 \, m 65 \, cm. What is its height in cm?

Which unit will be used to measure:

Length of a book, distance between Jaipur and Udaipur, length of your nail, length of the sharpened portion of a pencil, length of a bed sheet. (Ans: cm, km, cm and mm, mm, m)

How many metres make 400 \, cm? (Ans: 4 \, m)

_____ \, m = 9 \, km; _____ \, cm = 7 \, m. (Ans: 9000, 700)

Convert 5 \, m 8 \, cm into mm.

Reeta, Meena and Amisha purchased ribbons of length 5 \, m, 450 \, cm and 4 \, m 65 \, cm respectively. Who had the greatest length of the ribbon? Arrange them in ascending order of their lengths.

Make your child measure the length of a duppata, towel, pencil, length of a book, etc, in appropriate units.

Next time you travel by a car/taxi etc, make your child observe the sign boards that mention the distance from where you travel to the destination. Encourage him/her to observe more on the way.

Show your child an odometer in a vehicle, an instrument used to measure the distance.

Content Book Reference: Page 131-134

Guided Practice: Page 96-99
Lesson Plan - 2

Grade - 3

Learning Objective
- To add two or more measures of length.
- To subtract measures of length.

Material Required
Measuring tape, ribbons of 2 colours

Activity
- Demonstrate using the measuring tape how to measure the length of an object, say, length of a table, board, window grill, etc.
- Place ribbons of both the colours, say, red and blue on a table.
- Invite one student to measure the length of the red ribbon, say 3 m 55 cm.
- Invite another student to measure the length of the blue ribbon, say 1 m 75 cm.
- Ask the students to calculate the length of both the ribbons put together.
- Recall that to add numbers, we write them in vertical columns.
- Remind addition of three and four digit numbers with and without regrouping.
- Elucidate each step on the board.
  » First add cm; 55 cm + 75 cm = 130 cm.
  » Recall: 100 cm = 1 m; regroup: 130 cm = 100 cm + 30 cm = 1 m + 30 cm
  » Carry over 1 m to the column of m and add.
  » Add m: 3 m + 1 m + 1 m = 5 m
  » So, 3 m 55 cm + 1 m 75 cm = 5 m 30 cm
- Pose: Which ribbon has more length and by how much? Seek responses.
- Conclude that they will find the difference between the lengths of both the ribbons.
- Encourage the students to write the numbers in vertical columns and subtract.
- Remind them to borrow from the next higher place value if the number to be subtracted is greater than the number from which it is to be subtracted.
- Explain each step on the board.
  » Subtract cm first and then m; 55 cm – 75 cm
  » Since 55 < 75, borrow 1m from the metre column.
  » Recall 1 m = 100 cm; 155 cm – 75 cm = 80 cm
  » Subtract metres; 3 m – 1 m = 2 m (when borrowed); 2 m – 1 m = 1 m
  » So, 3 m 55 cm – 1 m 75 cm = 1 m 80 cm.
Solving word problems based on addition and subtraction of units of length.

Associated Concepts

**Application**

- Find the sum of:
  - 13 m 16 cm, 34 m 82 cm and 2 m 40 cm
  - 42 km 306 m, 24 km 800 m and 5 km 78 m.
    (Ans: 50 m 38 cm, 72 km 184 m)
- Find the difference of:
  - 90 km 432 m and 46 km 769 m
  - 35 m 97 cm and 63 m 12 cm.
    (Ans: 43 km 663 m, 27 m 15 cm)

**Analysis**

- What is the sum of 5 cm 3 mm and 3 cm 8 mm? (Ans: 9 cm 1 mm)
- 4 km + 3 km = ____ cm? (Ans: 70000 cm)

**Thinking Skills**

- Express the sum of 5 km 352 m, 64 m 28 cm and 14 cm in cm.
- Subtract the sum of 43 km 562 m and 7 km 28 m from the sum of 12 km 854 m and 69 km 302 m.

**Parent Connect**

- Help your child measure the length and breadth of a room with the help of a measuring tape. Ask him/her add the two readings obtained in m and cm. Let your child measure the length of other objects, say, a table top, length of table cloth, etc and ask him/her to find their sum.
- Next time you travel by a vehicle, make your child note down the readings of the odometer at the beginning of the journey and at the end of the journey in km and metre. Encourage him/her to find the distance between the two places you travelled.

Add together or subtract from the same units of length. Borrow from the higher unit of length in case the number to be subtracted is greater than the number from which it is to be subtracted; taking care of the conversion of different units.

Content Book Reference: Page 135-137
Guided Practice: Page 100-104
Lesson Plan - 3

Grade - 3

Learning Objective
- To list different units of measuring weight.
- To convert a bigger unit of measuring weight to smaller unit and vice versa.

Material Required
Empty packets of chips, biscuits, chocolate, sugar, etc.

Stress Words
Gram, kilogram

Activity
- Ask the students: How does a shopkeeper measure the weight of the vegetables or fruits you purchase? How will you measure your weight? What are the units in which weight can be measured? Seek responses.
- Summarise responses and inform them that a weighing scale is used to measure the weight of any object. Weighing scales are of many varieties like beam balance, spring balance, weighing machine, digital machine, etc. There are various units for measuring weight.
- Invite one student to observe and say aloud the weight mentioned on an empty packet of biscuit, say 100 g.
- Show and help the students to read the weight on the wrapper.
- Next, invite 2-3 more students to say aloud the weight mentioned on empty packets of chips, chocolate, sugar, etc.
- Write them on the board, say, 100 g, 50 g, 30 g, 1 kg, etc.
- Share with them that small weights are measured in grams (g) and large weights are measured in kilogram (kg).
- Write on the board: 1 kg = 1000 g.
- Recall that one unit of measurement can be converted into another unit, as done in the measurement of length; here kg can be converted into g and g can be expressed in kg.
- Write on the board: Convert 4 kg 175 g into g and 3752 g into kg and g.
- Elucidate each step on the board.
  » 4 kg 175 g = 4 × 1000 g + 175 g; since 1 kg = 1000 g
  = 4000 g + 175 g = 4175 g
  » 3752 g = 3000 g + 752 g
  = 3 kg + 752 g = 3 kg 752 g; since 1000 g = 1 kg
- Provide few questions and ask them to convert: 2 kg 48 g into g, 11 kg 120g into g, 5608 g into kg and g, 9003 g into kg and g.
- Remind them the factors with which they have to multiply or divide to obtain the desired unit.
- Instruct them to work individually without discussing with their partners.
- Move around in the class to help and guide them, if required.
- Discuss the answers and ask them to verify their solutions.
- Provide more questions till time permits.
Weighing scale is used to measure weight. Gram is a smaller unit used to measure weight; kilogram is used to measure large weights. 1 kg = 1000 g. We do not use gm for gram or kgs for kilogram; instead we use g and kg.

Small unit of measuring very small weight is milligram (mg). 1 g = 1000 mg. Large weights are measured in units like tonne. 1 tonne = 1000 kg

**Application**

- Convert the following:
  - 3156 g into kg and g; 5914 g into kg and g.
  - 9 kg 307 g into g; 4 kg 28 g into g.

- Reeta’s school bag weighs 2 kg 75 g. What is its weight in grams?

- Anita purchased 20750 g of rice from the market. Express this weight in kg and g.
  (Ans: 3 kg 156 g, 5 kg 914 g, 9307 g, 4028 g, 2075 g, 20 kg 750 g)

- Which is more: 3 kg 560 g or 4560 g? (Ans: 4560 g)

- Arrange the weight in ascending order: small chocolate, school bag with books and copies, pack of toothpaste, double bed. (Ans: small chocolate, pack of toothpaste, school bag with books and copies, double bed)

- ____ g = 11 kg; 6 kg = ____ g. (Ans: 11000, 6000)

- How many mg are there in 4 kg 654 g?

- What has more weight: 5650 g of cotton or 3 kg of iron?

- Provide a weighing scale to your child. Make your child measure and note down weight of objects like school bag, bag full of potatoes, can of talcum powder, 5 notebooks, etc. in proper units.

- Take your child to a grocery shop or a vegetable/fruit seller next time you go for shopping. Make him/her note down weight of the commodities you buy and encourage him/her to convert them into grams/kilogram.
Learning Objective
- To add two or more measures of weight.
- To subtract measures of weight.

Material Required
Digital weighing machine

Activity
- Remind the students that value of two or more weights can be added just as different lengths were added.
- Divide the class into groups of three students each.
- Place a digital weighing machine in the class.
- Ask each student in a group to quickly measure and note down his/her weight using the weighing machine.
- Explain and show once how to read the scale of the weighing machine.
- Choose three students from the group whose weights are in kg and g.
- Ask students in each group to add all the 3 weights obtained in kg and g.
- Recall that to add numbers they should write them in vertical columns.
- Remind addition of three and four digit numbers with and without regrouping.
- Write the weight of 3 students of any one group on the board, say, 25 kg 234 g, 22 kg 563 g and 24 kg 864 g.
- Elucidate each step on the board.
  » First add g: 234 g + 563 g + 864 g = 1661 g
  » Recall: 1000 g = 1 kg; regroup: 1661 g = 1000g + 661g = 1kg + 661g
  » Carry over 1 kg to the column of kg and add.
  » Add kg: 25 kg + 22 kg + 24 kg + 1 kg (carryover) = 72 kg
  » So, 25 kg 234 g + 22 kg 563 g + 24 kg 864 g = 72 kg 661 g
- Ask the students in each group to identify the greatest weight and the least weight.
- Tell them to find the difference between the greatest and the least weight.
- Encourage them to write the numbers in vertical columns and subtract.
- Remind them to borrow from the next higher place value if the number to be subtracted is greater than the number from which it is to be subtracted.
- Write on the board from the example above: greatest weight is 25 kg 234 g and the least weight is 22 kg 563 g.
• Explain each step on the board.
  » Subtract g first and then kg; 234 g – 563 g 
  » Since 234 < 563, borrow 1 kg from the kg column.
  » Recall 1 kg = 1000 g; 1234 g – 563 g = 671 g
  » Subtract kg; 25 kg – 1 kg = 24 kg; 24 kg – 22 kg = 2 kg
  » So, 25 kg 234 g – 22 kg 563 g = 2 kg 671 g.

• Write few questions on the board: Add 12 kg 710 g and 3 kg 624 g; 34 kg 351 g, 10 kg 32g and 18 kg 528 g; subtract 13 kg 258 g from 35 kg 132 g.

• Ask all the students to solve the questions individually.
• Move around in the class to help and guide the students, if required.
• Discuss the answers and ask them to verify their answers.
• Provide more questions, till time permits.

Add together or subtract from the same units of length. Borrow from the higher unit of weight in case the number to be subtracted is greater than the number from which it is to be subtracted; taking care of the conversion of different units.

Solving word problems based on addition and subtraction of units of weight.

• Find the sum of:
  » 23 kg 400 g, 14 kg 75 g and 7 kg 845 g
  » 6 kg, 10 kg 506 g and 30 kg 623 g (Ans: 45 kg 320 g, 47 kg 129 g)

• Find the difference of:
  » 84 kg 56 g and 57 kg 832 g
  » 31 kg 674 g and 74 kg 894 g. (Ans: 26 kg 224 g, 43 kg 220 g)

• What is the weight of a bag if it contains 5 kg 250 g of apples and 2 kg 500 g of oranges? (Ans: 7 kg 750 g)

• How much is the difference in their weight? (Ans: 2 kg 750 g)

• Express the sum of 12 kg 135g and 5 kg 754 g in mg.

• From a bottle containing 90 g 650 mg of honey, 950 mg was taken out. How much honey is left in the bottle?

• Provide a bill to your child that mentions the weight in kg and g of few commodities. Encourage your child to add the weight of at least three commodities.

• Provide a weighing machine to your child. Help him/her to measure the weight of all the members of the family. Ask him/her to find the difference between the weights of the eldest member and the youngest member of the family.
**Learning Objective**
- To list different units of measuring capacity/volume.
- To convert a bigger unit of measuring capacity to smaller unit and vice versa.

**Material Required**
Jug, measuring cylinders/beakers of 1 L, 500 mL and 100 mL capacity

**Stress Words**
Litre, Millilitre

**Activity**
- Take a jug and fill half of it with water.
- Ask the students: Can this jug hold more water? Seek answers.
- Pour more water till the jug is full.
- Repeat the question again: Can the jug hold more water? Seek answers.
- Share with them that the amount of liquid a vessel can hold when it is full is called the capacity of the vessel. It is also known as the volume of the vessel.
- Tell them that capacity/volume is measured in a unit called litres (L); millilitre (mL) is a smaller unit used to measure volume.
- Inform them that the volume of a vessel can be measured with the help of graduated beakers or cylinders; marked in L and mL.
- Show the measuring cylinders of various capacities to the students and make them observe the capacity of each, say 1 L, 500 mL and 100 mL.
- Pour some water in the 1 L measuring cylinder.
- Guide and encourage the students to read the volume of the water in it, say 750 mL.
- Pour more water to increase the volume till 1 L; pour some water in 500 mL measuring cylinder also.
- Ask the students to say aloud the volume of water in both the cylinders; say 1 L 300 mL.
- Repeat the above activity by changing the volume of water in the small measuring cylinders, keeping the volume of 1 L same, till time permits.
- Ask the students to say aloud the volume of water in each case.
- Recall that one unit can be converted into another unit, here L can be converted into mL and mL can be expressed in L and mL.
- Write on the board: 1L = 1000 mL
- Instruct the students to convert 8 L 375 mL into mL and 6725 mL into L and mL, as done in the measurement of length and weight.
- Elucidate each step on the board.
The amount of liquid a vessel can hold when it is full is called the capacity of the vessel. It is measured in a litres (L) and millilitre (mL).

1 L = 1000 mL

**Understanding**

**Expected**

- Express 5 kilolitre 540 L of a liquid in mL.
- Arrange the following in the descending order of their capacities; 5L 670 mL, 8000 mL, 3L 900 mL, 15000 mL.

**Application**

- Convert the following:
  - 7150 mL into L and mL; 6592 mL into L and mL.
  - 9 L 300 mL into mL; 14 L 30 mL into mL.
- The capacity of a bottle is 3800 mL. What is its capacity in L and mL?
- Ritika noted the capacity of oil can to be 20L 350mL. Express this capacity in mL.
  (Ans: 7L 150 mL, 6L 592 mL, 9300 mL, 14030 mL, 3L 800 mL, 20350 mL)

**Analysis**

- Express 5L in mL. (Ans: 5000 mL)
- Fill in the blanks: ___mL = 13 L; 4550 mL = ___L ___mL (Ans: 13000, 4L 550 mL)

**Thinking Skills**

- Express 5 kilolitre 540 L of a liquid in mL.
- Arrange the following in the descending order of their capacities; 5L 670 mL, 8000 mL, 3L 900 mL, 15000 mL.

**Parent Connect**

- Make your child observe and note down capacities of various containers mentioned on their pack, say, milk pouch, cold drink bottle, juice pack, water bottle, etc.
- Encourage him/her to convert the above observations into mL or L and mL.

Content Book Reference: Page 142-145
Guided Practice: Page 108, 109
Learning Objective
- To add two or more measures of capacity.
- To subtract measures of capacity.

Material Required
Water, measuring cylinder, plastic container

Activity
- Place the measuring cylinder on a table.
- Invite one student and ask him/her to pour some water in it with the help of a plastic container.
- Ask one student to observe and say aloud the capacity of water in the measuring cylinder, say, 3L.
- Invite 2 more students and repeat the above so that there are three different capacities, say, 1L 350mL and 2L 755mL.
- Help and guide them to observe and note the capacity, if required.
- Divide the class into groups of three students each.
- Ask students in each group to add all the 3 capacities obtained in L and mL.
- Reiterate that the value of two or more capacities can be added just as different lengths and weights were added.
- Recall that to add numbers they should write them in vertical columns.
- Write the capacities of any three items of a group; say, 3 L, 1L 350 mL and 2 L 755 mL on the board.
- Elucidate each step:
  » First add mL: 350 mL + 755 mL = 1105 mL
  » Recall: 1000 mL = 1L; regroup: 1105 mL = 1000 mL + 105 mL
  » Carry over 1 L to the column of L and add.
  » Add L: 3 L + 1 L + 2 L + 1 L = 7 L
  » So, 3 L + 1 L 350 mL + 2 L 755 mL = 7 L 105 mL
- Ask the students in each group to identify the item that has the greatest capacity and the least capacity.
- Tell them to find the difference between the greatest and the least capacity.
- Encourage them to write the numbers in vertical columns and subtract.
- Remind them to borrow from the next higher place value if the number to be subtracted is greater than the number from which it is to be subtracted.
- Write on the board from the example above: greatest capacity is 3 L and the least capacity is 1 L 350 mL.
You have only a 7 L and a 5 L bottle and access to plenty of water. Using only these 2 bottles, how can you measure and pour exactly 4 L of water in a bucket?

If 3 L of milk is consumed every day, what is the consumption of milk in the month of February 2016?

Help your child note down the capacity of a bucket full of water and the capacity of an oil can available at home. Ask him/her to find the difference in their capacities. Which one has more capacity?

Tell your child the quantity of milk used per day for three consecutive days of a week, at your home. Let your child determine the capacity/quantity of milk used in three days altogether.

**Solving word problems based on addition and subtraction of units of capacity.**

**Application**

- Find the sum of:
  - 3 L 450 mL, 10 L 55 mL and 7 L 365 mL
  - 18 L 900 mL, 30 L and 12 L 520 mL (Ans: 20 L 870 mL, 61 L 440 mL)

- Subtract:
  - 24 L 156 mL from 52 L 800 mL
  - 15 L 65 mL from 20 L 250 mL (Ans: 28 L 644 mL, 5 L 185 mL)

**Analysis**

- Ask: 9 L = ____ mL, 6520 mL = ___ L ____ mL
  (Ans: 9000 mL, 6 L 520 mL)

- Is there a bigger unit of measuring capacity? How is it related to litre?
  (Ans: kilolitre, 1 kL = 1000 L)

- You have only a 7 L and a 5 L bottle and access to plenty of water. Using only these 2 bottles, how can you measure and pour exactly 4 L of water in a bucket?

- If 3 L of milk is consumed every day, what is the consumption of milk in the month of February 2016?

**Associated Concepts**

- Explain each step on the board.
  - Subtract mL first and then L; 0 L – 350 L
  - Since 0 < 350, borrow 1 L from the L column.
  - Recall 1 L = 1000 mL; 1000 mL – 350 mL = 650 mL
  - Subtract L; 3 L – 1 L = 2 L (when borrowed); 2 L – 1 L = 1 L
  - So, 3 L – 1 L 350 mL = 1 L 650 mL.

- Write few questions on the board: Add 15 L 170 mL and 3 L 500 mL; 4 L 350 mL, 10 L 30 mL and 8 L 520 mL; subtract 12 L 258 mL from 35 kg 130 mL.

- Ask all the students to solve the questions individually.

- Move around in the class to help and guide the students, if required.

- Discuss the answers and ask them to verify their answers.

- Provide more questions, till time permits.

Content Book Reference: Page 146, 147
Guided Practice: Page 110, 111
Learning Objective

To apply the concept of addition and subtraction of length, weight and capacity in daily life and solve word problems.

Activity

- Narrate a situation to the students: Ritesh started from his village and travelled 52 km 726 m by train, 3 km 142 m by taxi and 650 m on foot to reach his uncle’s village. How much distance did he cover altogether?
- Seek students’ response and discuss the steps and statements to solve the word problem.
- Remind the students to follow the 4-step approach of understanding, planning, doing and checking while solving word problems, as done earlier.
- Represent it using a model as shown here.

```
52 km 726 m
3 km 142 m
650 m
```

- Reiterate that to add numbers they should write them in vertical columns.
- Remind them to first add m and then km and to regroup as 1 km = 1000 m.
- Write each statement on the board:
  
  Distance travelled by train = 52 km 726 m
  Distance travelled by taxi = 3 km 142 m
  Distance travelled on foot = 650 m
  Total distance covered = 52 km 726 m + 3 km 142 m + 650 m = 56 km 518 m

- Make pairs of students sitting next to each other.
- Narrate more situations to the students:
  
  » A family consumed 85 L 500 mL of milk in the month of January and 78 L 750 mL of milk in the month of February. In which month was the consumption of milk more and by how much?
  
  » Nita purchased 2 kg 400 g of apples, 5 kg 150 g oranges and 3 kg guava. What is the total weight of all the fruits?

- Encourage students to form statements for the word problems and solve them in pairs.
- Recall that to subtract a number greater than the number from which it is to be subtracted, they must borrow from the next higher place value.
- Remind them to check their answers by adding the difference obtained to the lesser quantity to obtain the greater quantity in question 1.
Thinking Skills

A shopkeeper had 50 L of oil with him. On Monday he sold 18 L 200 mL of oil and on Tuesday he sold 24 L 850 mL of oil. How much oil is left with him after two days?

The capacity of a tank is 9 L. It contains 4 L 760 mL of water. How much more water is needed to fill up the tank completely?

Parent Connect

Present word stories to your child like:

- Help the child to measure his/her height and the height of the father in cm. Encourage him/her to frame sentences and find the difference in the height.
- Show 2 bottles of different colours, say, red and blue to your child and let him/her note the capacities of both. If the capacity of the red water bottle is 2 L 500 mL and that of the blue water bottle is 3 L 150 mL. What should be the capacity of a container that can hold water from both the bottles? Ask your child to frame sentences and find the solution.

Analysis

- Find the difference between 5 L and 4600 mL. (Ans: 400 mL)
- How much is 840 m more than 3 km 450 m? (Ans: 4 km 290 m)
- A shopkeeper had 50 L of oil with him. On Monday he sold 18 L 200 mL of oil and on Tuesday he sold 24 L 850 mL of oil. How much oil is left with him after two days?
- The capacity of a tank is 9 L. It contains 4 L 760 mL of water. How much more water is needed to fill up the tank completely?

Application

Solve the following word problems:

- Meena had a red ribbon 4 m 245 cm long. She cut a piece of 1 m 730 cm and gave it to her friend. What length of ribbon is left with Meena?
- Rekha, Meeta and Sheena purchased 12 L 500 mL, 5 L and 10 L 350 mL of juice respectively. What is the quantity of all the three juices put together?
- A shopkeeper sold 25 kg 650 g of rice in the first week and 39 kg 350 g of rice in the second week. What quantity of rice did he sell in these two weeks?
  (Ans: 2 m 515 cm, 27 L 850 mL, 65 kg)

- Instruct the students to exchange their notebooks with their partners.
- Ask the students to verify the answers as follows; Consumption of milk is more in the month of January by 6 L 750 mL and the total weight of all the fruits is 10 kg 550 g.
- Clear doubts, if any.
- Provide them with more word problems till time permits.

Content Book Reference: Page 148-150
Guided Practice: Page 112-114
# Lesson Plan - 1

## Grade - 3

### Learning Objective
- To identify and represent a point as a fundamental of geometry.
- To identify, draw and distinguish between different kinds of lines.

### Material Required
- Thread, string

### Stress Words
- Straight line, curved line, vertical line, horizontal line, slant or oblique line, parallel lines and intersecting lines

### Activity
- Ask: What is the shape of the stars as seen from the earth? Seek answers.
- Summarise students’ response that stars appear like tiny dots in the sky.
- Tell them to make a dot on a paper with the tip of a sharpened pencil or a pen.
- Share with them that a dot is called a point in geometry.
- Encourage the students to observe the size of the dot they have made.
- Represent a dot on the board. Share with them that:
  - A point is represented by a dot.
  - It has no length or breadth but it represents a definite position.
  - It is represented by capital letters such as P, Q or A.
- Make pairs of students sitting next to each other.
- Distribute one thread to each pair of students.
- Instruct them to draw 20 points close to each other, one after the other in succession, in their notebook.
- Ask them to join these points with the help of the thread.
- Enquire: What do you observe? What do these points join together look like? Seek response.
- Help students observe that when an infinite number of points are joined, a line is formed.
- Ask them to draw few more points on the left and on the right of the line of the points they have formed already.
- Pose: Can you add more points on both the sides? What will happen to the length of the line then? Seek answers.
- Explain on the board that a line can be extended indefinitely on both the sides.
- Discuss; it is not possible to draw a whole line on a sheet of paper, so a line is represented by putting arrow heads on both the sides which indicates that a line can be extended on both the sides.
• Share with them: a line is denoted by a small letter; here, \( \text{\( m \)} \) represents a line.
• Discuss about a line that can be formed on a straight road and on a curved road at a turn.
• Establish that a line can be straight or curved.
• Instruct all the students to draw a straight line, in any direction, in their copy.
• Ask them to share with the class, the type of line they have drawn; a sleeping line, standing line or a slant line.
• Elucidate on the board as represented; here line \( l \) is a vertical line, line \( m \) is a horizontal line and line \( n \) is an oblique or slant line.
• Encourage the students to identify vertical, horizontal and oblique lines around them in the class.
• Bring their attention to the lines formed by the iron or wooden grills of the windows, opposite sides of the board or opposite sides of a chart paper on the display board.
• Distribute one string of approximately 1m length to each pair of students, same pairs made earlier for the previous activity.
• Demonstrate how to measure the distance between grills of the window with the help of a string; use a marker/pencil or pen to make a mark on the string.
• Help and guide them to measure the distance between opposite sides of a chart paper, window grills, opposite sides of the table top, (if they are parallel), at various positions, with the help of the string.
• Ask all the students to share their observation.
• Share with them that lines in which the distance between them is always the same are called parallel lines; here line \( a \) and line \( b \) are parallel lines.
• Pose: When and where will these parallel lines intersect?
• Elucidate on the board that parallel lines can be extended forever; still they will never cross each other.
• Ask the students to make a plus (+) sign and a multiplication (\( \times \)) sign.
• Make them observe that in both the signs, two straight lines intersect or cross each other at a point.
• Share with them that such lines are called intersecting lines; here line \( a \) and line \( b \) are intersecting lines.
• Draw few lines on the board; say, vertical lines, horizontal lines, oblique lines, parallel lines and intersecting lines as.
Thinking Skills

- How many lines can be drawn from a given point?
- How many lines can be drawn passing through two given points?

Parents Connect

- Encourage your child to locate 5 cities of his/her choice on a political map of India with the help of an atlas. Make him observe that a point gives an exact location of a place.
- Make your child observe and identify various types of lines whenever you go out with your child like, boundary of buildings, zebra crossing on the roads, road intersections, advertisement boards or sign boards, railway track, etc.

Content Book Reference: Page 155, 156
Guided Practice: Page 115-117
Learning Objective

- To identify a line segment and measure its length.
- To identify and draw a ray and distinguish between a line, line segment and a ray.
- To identify and distinguish between an open and a closed figure.

Material Required

Ribbons, ruler/scale

Stress Words

Line segment, ray, open figure, closed figure

Activity

- Make pairs of students sitting next to each other.
- Distribute three ribbons to each pair of students.
- Demonstrate to join the ribbons by tying knots, ask the students to do the same.
- Ask them to identify and say aloud what they have obtained.
- Appreciate if they mention a line.
- Bring their attention to one part of the ribbon and share with them that a part of it is called a segment.
- Ask the students to draw a line, say line \( m \).
- Tell them to mark any two points on the line, say A and B.
- Elucidate on the board that AB is a part of a line \( m \) and is known as the line segment. It is represented as \( \overline{AB} \).
- Ask: Does a line segment have end points? Can the length of a line segment be measured?
- Help them conclude that the length of a line segment can be measured as it has two end points; a ruler can be used to measure its length.
- Make them observe that in a centimetre scale/ruler each ‘cm’ is divided into 10 equal parts.
- Demonstrate and explain to the students, steps involved in measuring the length of a line segment:
  » Place a ruler alongside with the line segment, here \( \overline{AB} \).
  » Make the first point, here A, coincide with zero mark of the ruler.
  » Read the mark on the ruler of the end point, here B, of the line segment.
  » This is the length of line segment \( \overline{AB} \).
- Make pairs of students sitting next to each other.
- Ask each student in a pair to do 2 things: draw a line segment of any length and mention a length in cm.
- Instruct both the students in a pair to exchange their notebooks.
• Ask them to measure the length of the line segment that has been drawn and also draw a line segment equal to the length mentioned by their partners.

• Move around in the class to help and guide the students.

• Enquire: How do you draw sun rays coming from the sun? Where do they originate from? Is the position of the sun fixed?

• Discuss that the sunrays start from the sun and move on and on in any direction.

• State and show on the board that a geometrical ray has one fixed point and can be extended endlessly in one direction.

• Share with the students that a ray is denoted by a symbol (→) using capital letter. Here \( \overrightarrow{AB} \) is a ray with one starting point, O.

• Divide the class into groups of 4 students each.

• Ask all the students in a group to draw a figure; each one drawing a different figure, say, triangle, circle, oval, square, etc.

• Pose: What are the starting point and the end point of the figure you have drawn? Are these two points same or different? Seek responses.

• Establish using students’ response that figures that we draw from one point and end at the same point are called closed figures.

• Instruct them to draw the same figures again, but tell them not to draw the complete figure.

• Represent such incomplete figures on the board.

• Pose: Do these figures have the same starting and ending point? Seek answers.

• Share with them that figures that we start drawing from one point and end at another point are called open figures.

• Extend the activity where each student in a class draws two more open and closed figures of their choice.

• A line segment is a part of a line and its length can be measured.

• A ray has only one end point so it can be extended in only one direction whereas, a line has no end points and it can be extended in both the directions.

Understanding expected
Application

- Differentiate between a line, a line segment and a ray. Draw diagrams also.
- Draw line segments of length 5cm and 6.5 cm.

Analysis

- How many line segments are there in an octagon?
- How many points are required to draw a ray?

Thinking Skills

- How many rays can be drawn with one point?
- How many line segments can be drawn using two points?

Parents Connect

- Tell your child to write his/her name in capital letters. Encourage him to count the total number of the line segments in his/her name. Also make him identify the various types of lines in the name.
- Make your child measure the lengths of various objects in the house, say, sides of a cubical chocolate box, pencil box, colour box, etc.

Content Book Reference: Page 157-159
Guided Practice: Page 115-117
Grade - 3

Lesson Plan - 3

Learning Objective
- To explore and recognise plane shapes obtained by tracing solid shapes.
- To identify and describe plane figures.

Material Required
Dice, soft drink can or a cell, prism, empty matchbox

Stress Words
Square, rectangle, triangle, circle

Activity
- Show the solid shapes in the class, dice, can, chalk, etc.
- Ask the students: Is a solid object 3D or 2D? What will you obtain if you trace the outline of a solid object? Is the figure obtained 2D or 3D?
- Conclude using students’ responses that tracing the base of a solid shape gives a plane shape.
- Divide the class into groups of 4 students each.
- Distribute one object each of all the shapes to each group; here, dice, cell/can, empty matchbox and prism.
- Tell each student in a group to choose one shape each.
- Instruct them to place the base of the solid shape on a sheet of paper and hold it tight with a hand. Then, draw the outline of the object with a pencil.
- Demonstrate with any one solid shape on the board.
- Help and guide the students, if required.
- Make them observe the shapes obtained on tracing the solid shapes.
- Establish that when we trace a solid shape, we get a flat or plane shape.
- State that figures that can be drawn on a flat surface are known as plane figures.
- Pose: Do these plane figures have thickness? Do all the solid shapes used today have thickness?
- Conclude using students’ response that a solid shape has thickness but a flat or a plane shape does not have thickness.
- Draw all the plane figures on the board: square, rectangle, triangle and circle.
- Encourage the students to identify the figure obtained by tracing a dice.
- Establish that it is a square with four equal sides, here \( AB = BC = CD = DA \)
- Elucidate that the corners formed when two sides meet is called a vertex, here A, B, C and D are 4 vertices.
- Discuss the shape, number of sides and vertices of the plane figure formed by tracing a matchbox.
• Share that this plane figure with four sides is a rectangle.
• Encourage them to observe the sides of the rectangle.
• Establish that the opposite sides of a rectangle are equal and parallel, here \( AB = DC \) and \( BC = AD \), \( AB \) is parallel to \( DC \) and \( BC \) is parallel to \( AD \).
• Inform them that the longer side of the rectangle is called the length and the shorter side is called its breadth.
• Ask them to identify the length, breadth and vertices of the rectangle \( ABCD \).
• Discuss and establish that the plane figure formed by a prism is a 3-sided figure called a triangle; here \( ABC \) is a triangle.
• Encourage the students to speak aloud its sides and vertices; here sides are \( AB, BC \) and \( AC \) and 3 vertices are \( A, B \) and \( C \).
• Next, ask the students to identify the figure formed by the base of a cell/can.
• Appreciate if they mention it as a circle.
• Pose: Can you identify its sides and vertices?
• Seek students’ response to conclude that a circle has no side and no vertex.
• Tell them that the point \( O \) inside the circle is called its centre.
• Extend the activity where students trace the base of objects like bottle cap, eraser, pencil box, etc, till time permits.
• Encourage them to identify the plane figure so obtained and also to identify its sides and vertices.
• Summarise the characteristics of plane figures done in the class:
  » A solid shape has thickness but a plane shape does not have thickness.
  » All the four sides of a square are equal and it has 4 vertices.
  » The opposite sides of a rectangle are equal and parallel and it has 4 vertices.
  » A 3-sided figure formed by straight lines is called a triangle and it has 3 vertices.
  » A circle has no side and no vertex.
• Ask them to observe and identify the plane figures around them in the class.
• The length and the breadth of a square are equal.
• The opposite sides of a rectangle are equal and parallel.
• A circle has no vertex.
• What are polygons?
• What is boundary of closed figures called?
Who am I:
» I look like the face of a sugar cube
» I am a shape with no corners
» The ruler has my shape
» I am a shape with all its four sides equal.
» I am a shape with three corners

Draw a square of sides 4 cm. Mention its sides and vertices.

How many pairs of parallel lines do a square have?
Which shape will be formed if the base of a conical birthday cap is traced?

How many vertices will a pentagon and hexagon have?
If two sides of a rectangle measure 10 cm and 8 cm respectively, what will be the measure of the other two sides?

Provide few plastic straws to your child. Ask him/her to form plane figures using the straws. Encourage him/her to identify the sides and vertices of the figures formed.
Help your child create a scenery by paper cutting, using only plane figures, like circles, triangles, squares and rectangles.
| Learning Objective | • To identify and differentiate between a plane figure and a solid figure.  
• To identify the surfaces of solid figures as a plane surface or a curved surface. |
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<tbody>
<tr>
<td>Material Required</td>
<td>Matchbox, duster, ball, balloon, chalk, soft drink can</td>
</tr>
<tr>
<td>Stress Words</td>
<td>Plane surface, curved surface</td>
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</tbody>
</table>

**Activity**

- Take any book from a student and show it to the students.
- Make them observe the shape of a page of the book and tell them to identify its shape.
- Summarise students’ response to conclude that it is a rectangle; a plane shape.
- Recall that a flat or a plane figure does not have thickness.
- Discuss that by adding pages; the thickness of the book has increased, giving it a solid shape.
- Establish that solid shapes are plane shapes with a thickness or height.
- Place matchbox, duster, ball, balloon, chalk, soft drink can on a table.
- Invite two students and ask them to hold a matchbox and a duster respectively and show them to all the students.
- Instruct them to observe and identify the shape of the surfaces of the matchbox and the duster. Make them observe that these 3D shapes have been formed from plane shapes. Seek responses.
- Conclude that they are solid figures made of plane surfaces.
- Next, invite two more students and ask them to hold a ball and an inflated balloon.
- Establish that the ball and the balloon have curved surfaces and no plane surface.
- Invite two more students to hold and show a chalk and a can.
- Bring their attention to the surface of the base and the top of the chalk and the can.
- Help them identify that these are two plane surfaces. Also, the rest is a curved surface.
- Elucidate that some solid shapes have both plane and curved surfaces.
- Encourage all the students to identify and say aloud objects around them that have only plane surfaces, only curved surfaces and those that have both plane and curved surfaces.
- Appreciate them for their observation and responses.
- Create a slope on a table with the help of books.
• Discuss with the students’ what they think will happen when a ball, an orange, matchbox, duster, water bottle and a can are placed on top of the slope and pushed gently. Seek responses.

• Demonstrate by placing each one of the item on the slope one by one.

• Help them conclude that:
  » Solid objects with curved surfaces can roll down a slope; here, a ball and an orange.
  » Solid objects with flat or plane surfaces cannot roll down a slope, but they can slide; here, a matchbox and a duster.
  » Solid objects that have both plane and curved surfaces can roll as well as slide; here, a can and a water bottle.

• Extend the activity where students can use other objects like a book, pencil box, chalk, pencil, etc. to check if it rolls or slides and identify its surface.

Solids shapes may be formed from plane surface or/and curved surface only.

Recognise the given solid shape and identify its faces, edges and vertices

• Mention the surfaces of each of the following solid figures:
  Egg, unsharpened pencil, eraser, dice, globe and drum.

• Draw two objects that will roll and two objects that will slide.

• Do conical birthday caps have a plane or a curved surface or both the surfaces?

• Will a dholak slide or roll on a slope? Give reasons.

• Invention of wheel has made our tasks easy. Discuss with suitable examples.

• Can you think of a method of unloading heavy loads from a truck to minimize the effort of the workers?

Parents Connect

Make your child observe various objects in and around your house and identify its surfaces.
Learning Objective
- To identify and describe solid figures; cube, cuboid, cone, cylinder and sphere.
- To identify face, edge and vertex of a given solid figure.

Material Required
Dice, soft drink can or a cell, empty matchbox, conical birthday cap, ball

Stress Words
Cube, cuboid, cone, cylinder, sphere

Activity
- Borrow a rectangular pencil box from a student.
- Hold it in your hand so that all the students are able to observe it.
- Turn it and show all its surfaces to the students.
- Inform them that the surface of a solid shape is called its face.
- Invite a student to identify all the faces of the pencil box.
  - Ask: Are the surfaces of the pencil box plane or curved? Seek responses; here surfaces are plane.
- Move your finger to the place where two faces of the pencil box meet.
- Tell them that two faces meet to form an edge; it can be curved or straight.
- Invite a student to identify all the edges of the pencil box.
  - Make them observe the corners formed where two edges meet.
  - Share that the corners formed are known as vertices; singular, vertex.
- Invite a student to identify all the vertices of the pencil box.
- Appreciate students’ responses.
- Divide the class into groups of 5 students each.
- Distribute one each; dice, cell/can, empty matchbox, ball and a conical birthday cap, to each group.
  - Encourage the students to recall the shapes of the given solid figures.
  - Appreciate if they mention, dice as a cube, cell/can as a cylinder, matchbox as a cuboid, ball as a sphere and conical birthday cap as a cone.
- Tell them to observe the faces of the dice.
  - Pose: How many faces does a dice have? Are the faces, plane or curved? What is the shape of the faces? Seek responses.
- Encourage them to identify the edges and the vertices of the dice.
  - Establish that a cube has 6 plane faces, each of which is a square, 12 edges and 8 vertices.
  - Next, ask them to observe and identify the faces, edges and vertices of the matchbox; a cuboid.
• Conclude that a cuboid has 6 plane faces, 12 edges and 8 vertices.
• Help and guide the students, if required.
• Tell them to observe the shape of the faces of the matchbox.
• Ask: Are all the faces of the matchbox same? Seek responses.
• Establish that the opposite faces of a cuboid are equal; it may have some square or/and some rectangular faces.
• Make them observe the vertices, faces and edges of a conical birthday cap.
• Conclude that a cone has two faces, one curved and one plane. It has one vertex and one edge.
• Encourage them to observe the can or a cell, and identify its faces, vertices and edges.
• Elucidate that a cylinder, here a can, has one curved face and two plane faces, two edges but no vertex.
• Ask them to point at the edges and vertices of a ball; a sphere.
• Help them conclude that a sphere has only one curved face. It has no edges and no vertices.
• Encourage the students to observe and identify solid figures around them in the class as cube, cuboid, cylinder, cone or sphere.

The surface of a solid shape is called its face. Two faces of a solid shape meet to form an edge and a vertex is formed when two edges meet.

Write the number of faces, edges and vertices in each of the following: Ice cream cone, orange, chalk box, unsharpened pencil, drum.

• Are the top and the bottom of a cylinder circular plane surfaces or curved surfaces?
• How many edges, vertices and faces will a duster have?
• What is the shape of the sun, circle or sphere?
• How many faces and edges will an open soft drink can have?

• Make your child observe objects around him/her in and around the house and identify solid shapes.
• Encourage and help your child to make a wind chime using only geometrical solid shapes. Tell him/her to use waste materials available at home like used cans, toothpaste box, bangles, etc.
Lesson Plan - 1

Learning Objective
- To create patterns with shapes and/or numbers.
- To identify and insert the missing part in an existing pattern.

Material Required
- Connecting cubes (three colours)

Activity
- Enquire: Have you seen rangoli in the houses during festivals? What makes them attractive? Is there something particular in their designs?
- Summarise students’ response that rangoli has a series of designs and colours that are arranged in a particular order that is generally repeated.
- Share with them that a series of figures or numbers that are arranged in some order or repeat themselves based on some rule, forms a pattern.
- Bring their attention to the arrangement of table and chairs in their class room; one row then space for walking, another row and then space and so on.
- Encourage them to identify patterns around them in the class.
- Appreciate if they mention design on the notice board, class room flooring, grills of the windows, etc.
- Place the connecting cubes on a table, say, green, yellow and red.
- Invite two students to join the cubes of any two colours to form a pattern, say green and yellow.
- Write few number series on the board.
  - 2, 4, 6, 8, 10
  - 1, 3, 5, 7, 9
  - 10, 20, 30, 40, 50
- Ask the students to study the number series and observe the pattern in each.
• Discuss that the first series is of multiple of 2 or even numbers, the second series is of odd numbers and the third one is skip counting by 10.
• Encourage them to say aloud the next number in each of the number series; here, 12, 11 and 60 respectively.
• Make pairs of students sitting next to each other.
• Write few questions on the board.
• Ask each student in a pair to find the missing number/figure in the given patterns.

| 5000, 500, 50, 5000, _______ | 4, 8, ___ , 16, 20 |
| 55, 50, 45, 40, ___ | ☹ ☹ ☹ ☹ |

• Instruct the students in each pair to exchange their notebooks.
• Discuss and ask the students' to verify their answers; here, 500, 12, 35, ☹ and ☹.
• Extend the activity in which students form patterns and their partners identify and insert the missing figure/number.
• A pattern is formed when a series of figures or numbers are arranged in some order or they repeat themselves based on some rule.
• Patterns can be obtained by rotation of shapes.
• Complete the pattern:
  » 3, 7, 11, 15, 19, _____  » 76, 66, 56, 46, _____
  » 100, 105, 110, 115, _____  » A, 2, C, 4, E, 6, _____
  » ☐ ☐ ☐ ☐ ☐ ☐ ☐  » ↑ ↔ ↓ ↔ ↑

• What shape will come next in the pattern?

• Can you identify the incorrect member of the pattern:
  A, 2, B, 4, C, 6, D, 10

• What will be next number in the series: 4, 9, 16, 25, ____?
• Mention any two phenomenon in nature that follows a pattern.
  (Hint: heavenly bodies)

• Make your child observe patterns in the shapes, colours and designs of tiles, bed sheets, saris, etc. Encourage him/her to analyse and extend the pattern.
• Provide coloured buttons, ribbons or any other decorative materials to your child and help and guide him/her to frame a pattern with the given material.

Content Book Reference: Page 168-170
Guided Practice: Page 127, 128
Lesson Plan - 2

Grade - 3

Learning Objective
- To understand symmetry and identify if an object is symmetric or non-symmetric.
- To find the line of symmetry for different shapes.

Material Required
Sheets of paper, scissors

Stress Words
Symmetry, line of symmetry

Activity
- Make the students observe their partners body; all have two eyes, two ears, two hands, two legs and one nose in the centre of the face.
- Ask them to think of an imaginary straight line that runs from the head to toe at the centre of the face passing through the nose.
- Pose questions: Has this line divided the body into two parts? Is the right part of your body identical/similar to the left part of the body? Seek responses.
- Help them conclude that the line has divided the body into two identical parts.
- Share with the students that figures that can be divided into two similar halves by a line are known as symmetrical figures or shapes, and the line is called the line of symmetry of that figure/shape.
- Make pairs of students sitting next to each other.
- Distribute one sheet of paper to each student and a pair of scissors to each pair.
- Instruct the students to fold the paper into half.
- Ask them to draw the following pattern on the folded paper and then cut the folded paper along the design.
- Demonstrate and help the students to perform the activity.
- Tell them to open the folded sheet of paper after cutting it.
- Ask: Is the shape formed a symmetrical figure?
- Tell them to identify the line of symmetry.
- Ask them to fold the picture again along the crease.
- Elucidate that when the shapes are folded along the line of symmetry, one part will fit exactly over the other part.
- Extend the activity where the students draw other shapes like a flower, tree, star, etc. on a folded sheet of paper and observe the symmetrical figure obtained after cutting it, as time permits.
- Draw geometrical shapes like a square, rectangle, triangle, etc. on the board.
- Ask the students in each pair to cut one paper in a square shape and another in a rectangular shape.
• Tell them to fold each of the shape to find the lines of symmetry of a square and a rectangle. Seek response.

• Explain on the board that a figure may have more than one line of symmetry as in a square, and a rectangle.

• Write few alphabets on the board, say, A, I, C, F, etc.

• Ask the students to identify and draw the lines of symmetry in each of the above alphabets in their notebook.

• Instruct the students to exchange the notebook with their partners.

• Discuss the answers and ask them to verify the answers.

• Reiterate that shapes figures, letters, etc. that have no lines of symmetry are known as non-symmetrical shapes.

• Extend the activity where students write their own names and find the lines of symmetry of each alphabet in their name.

• Figures that can be divided into two similar halves are known as symmetrical figures.

• A figure may have more than one line of symmetry.

• Identify the following alphabets that have vertical and horizontal line of symmetry.

  » H, V, B, M, E

• How many line of symmetry do the following figures have?

  △ □ □

• How many lines of symmetry does the class board have?

• Identify two objects in the class that have horizontal line of symmetry.

• How many lines of symmetry does a circle have?

• How many lines of symmetry will a cylindrical shape have?

• Help your child perform the following activity. Take a square or rectangular sheet of paper and fold it into half. Put drops of paint, say, green, red and yellow separately on one side of the folded sheet. Press and then open the sheet. You will get a symmetrical design. Create your own designs like this.

• Ask your child to write the names of the family members in capital letters. Tell him/her to find the alphabets in the name that have no symmetry, one line of symmetry and more than one line of symmetry.
Lesson Plan - 1

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| • To observe and study the different hands of a clock.  
  • To read and write the time of a clock in hours and five minute intervals. | Clock | Minutes, seconds |

**Activity**

- Recall previous knowledge of the students by asking questions such as:
  - How many big divisions/markings are there on a clock?
  - How many hands are there in a clock?
  - Are these hands of the same size?
  - What does the small/short hand indicate?
  - What is the long hand for?
- Seek responses.
- Summarise students’ response as:
  - There are 12 numbers/big markings on a clock’s face.
  - A clock has three hands.
  - The short hand is called the hour hand and the long hand is the minute hand.
  - A very thin long hand moving fast is called the seconds hand.
- Display a clock in the class and explain each part.
- Make students observe the equal number of markings between any two neighbouring numbers.
- Share with them that each small marking stands for 1 minute; the minute hand takes 1 minute to move from one small marking to the next small marking.
- Ask: How many small divisions are there between two numbers? How many minutes will the minute hand cover from one number to the next number? How many minutes are there in an hour? How many seconds make one minute? Seek responses.
- Elucidate using students’ response:
  - There are 5 small divisions between any two consecutive numbers on the clock’s face, so the minute hand covers 5 minutes from one number to the next number.
  - There are 12 big divisions on a clock; so there are \((12 \times 5) = 60\) minutes in an hour.
- Write on the board: 1 hour = 60 minutes; 1 minute = 60 seconds
### Thinking Skills

- **How many minutes are there in 5 hours?**
- **The hour hand of a clock is between 6 and 7 and the minute hand is at 4. Nitin reads the time as 20 minutes past 6 but Sneha reads it as 40 minutes to 7. Who is correct and why?**

### Parent Connect

- **Make your child prepare a time table at home of his/her daily routine.**
- **Encourage him/her to read the time on his/her own for each activity.**
- **Help your child design a clock using waste materials at home, like old plastic plate, paint brush, toothpicks, etc.**

### Content Book Reference

- Page 179, 180

### Guided Practice

- Page 134
### Lesson Plan - 2

#### Learning Objective
- To recognise quarter past an hour, half past an hour and quarter to an hour.
- To read and write time in three different ways.

#### Material Required
Clock

#### Stress Words
Quarter past an hour, half past an hour and quarter to an hour.

#### Activity
- Take a clock and set the minute hand at 6 and the hour hand between 4 and 5.
- Ask the students to recall and mention the time shown by the clock.
- Share with them that when the minute hand is at 6, the time is half past the hour; here the time can also be read as half past 4.
- Write on the board: half past 4 or 4:30; here 4 stands for hours and 30 represents minutes.
- Inform them that while writing time, we separate hours and minutes using ‘:’.
- Set the minute hand at 3 while keeping the hour hand at the same position.
- Encourage the students to read aloud the time; 15 minutes past 4.
- Tell that when the minute hand is at 3, the time can also be read as quarter past the hour.
- Write on the board: quarter past 4 or 4:15.
- Next, set the minute hand at 9 and ask the time; 45 minutes past 4.
- Share with the students that when the minute hand is at 9 the time is read as quarter to the next hour.
- Write on the board: 4:45 or quarter to 5.
- Write few time of a clock such as 6:15, 9:45, 7:30, 3:15, 5:45, etc, on the board.
- Instruct the students to express the time in quarter past, half past and quarter to an hour form.
- Help and guide them, if required.
- Draw a clock on the board without hands and also show 5 small divisions between 4 and 5.
- Invite one student to draw the hands to show the time 5:24 on the clock.
- Encourage other students to help and guide him/her; appreciate the students.
- Elucidate that the time 5:24 can be written and read in three different ways; all represent the same time:
  - 5:24 is read as five twenty four.
  - 24 minutes past 5 or 24 minutes after 5.
  - 36 minutes to 6 or 36 minutes before 6.
The word ‘to’ is used to show that it is before a certain time.
The word ‘past’ is used to show that it is after a certain time.

**Understanding**

- Mehak started playing game at 3:00 p.m. she stopped playing at 5:00 p.m.
  - For how long did she play?

**Expected**

**Application**

- Make your child observe the hands on the clock and read the time when he/she wakes up, reaches back home from school and the time of going to bed.
  - Encourage him/her to express this time in three different ways.

**Analysis**

- Draw the hands on the clock according to the given time: 7 minutes to 9, 38 minutes past 3 and 25 to 10.
- What is the time if the hour hand is between 6 and 7 and the minute hand is at 9?
- How can the above time be read in three other ways?

**Thinking Skills**

- Dr. draw the hands on the clock to show the time: 6:42, 7:15 and 4:17.
- Also, write the above time in three different ways.
- Draw the hands on the clock according to the given time: 7 minutes to 9, 38 minutes past 3 and 25 to 10.

**Parent Connect**

- The word ‘to’ is used to show that it is before a certain time.
- The word ‘past’ is used to show that it is after a certain time.
- Write 7:35, 8:12 and 3:50 on the board.
- Ask the students to write the time in three different ways.
- Reiterate:
  - When the minute hand is in the right-side half, we say minutes past the hour.
  - When the minute hand is in the left-side half, we say minutes to the next hour.
- Move around in the class to help and guide them, if required.
- Discuss the answers and ask them to verify.
- Provide more questions till time permits.

**Content Book Reference:** Page 181, 182

**Guided Practice:** Page 135, 136
Lesson Plan - 3

Grade - 3

Learning Objective
To find the time few hours after the given time.

Class, Pair Activity

Activity

- Narrate a situation to the students: Rita reached her aunt’s house at 10:15 a.m. She stayed there for 4 hours. What time did Rita leave her aunt’s house?
- Pose questions such as: What time will it be 1 hour after Rita reached her aunt’s place? What will be the time 1 hour after that?
- Seek response.
- Invite one student to draw a clock on the board and show the time 10:15 on it.
- Invite another student to show the time 1 hour later; 11:15 on the clock.
- Continue by inviting more students randomly till time 4 hours after 10:15 is represented on the clock; here 2:15.
- Ask: Is this time 2:15 a.m. or p.m.? Seek responses.
- Recall that for time between 12 Midnight and 12 Noon, we use a.m. and for time between 12 Noon and 12 Midnight, we use p.m.
- Conclude that Rita left her aunt’s house at 2:15 p.m.
- Reiterate that to calculate the time few hours after the given time:
  » They just have to add the number of hours to the existing time without changing the minutes in the clock.
  » They must remember to write a.m. or p.m. based on what part of the day it is.
- Write few questions on the board such as:
  » What time will it be: 2 hours after 10:50 p.m. and 5 hours after 9:20 a.m.?
- Make pairs of students sitting next to each other.
- Instruct that for one question, one student in a pair will show the present time on the clock and the other student will show the time after the given time and vice versa.
- Move around in the class to help and guide them, if required.
- Discuss the answers and ask them to verify; here, 12:50 a.m. and 2:20 p.m.
- Provide more questions till time permits such as:
  » Rita’s father leaves home for his office at 8:10 a.m. and it takes him 1 hour to reach the office. At what time will he reach the office?
  » Himani’s mother leaves home for the market at 11:30 a.m. and came back after 3 hours. At what time did she reach home?
- Clarify doubts, if any.
The time at 12 O’clock in the afternoon and 12 O’clock in the midnight is written as 12 Noon and 12 Midnight; we do not use a.m. or p.m.

For time between 12 Midnight and 12 Noon, use a.m. and for time between 12 Noon and 12 Midnight, use p.m.

Time interval between any two given times.

Find time few minutes before and after a given time.

A bus leaves Delhi for Chandigarh at 6:20 a.m. It took 6 hours to reach Chandigarh. At what time did it reach Chandigarh?

A cricket match began at 10 a.m. and lasted for 5 hours. At what time did the cricket match got over?

3 hours after 12 noon is _____.

5 hours after 12 midnight is _____.

What is the number of hours between 6 p.m. and 10 p.m.?

Kriti started studying at 5:00 p.m. She stopped studying at 7:15 p.m. For how long did she study?

If Manish reached his office at 10 a.m. and it took him 2 hours to reach his office, what time did he leave his house?

Make your child note the time when he/she starts watching TV. Tell your child to watch TV only for 1 hour. Encourage him/her to calculate the time when he/she should stop watching TV and follow it.

Let your child record the time when he/she leaves for school in the morning and the time he/she comes back from the school. Encourage him/her to calculate the time spend in the school.
Learning Objective

To convert years into months and days, months into days, week into days, days into hours, hours into minutes and minutes into seconds.

Activity

- Randomly ask the age of a student in years and months; say, 7 years 10 months.
- Ask: Can this age of 7 years and 10 months be expressed in months? How many months are there in a year? Seek response.
- Share with the students that just as in measurement of length, weight and capacity, we converted one unit of measurement into another; similarly time may be converted and expressed into other forms.
- Elucidate on the board:
  
  \[1 \text{ year} = 12 \text{ months}\]
  
  \[7 \text{ years} + 10 \text{ months} = (7 \times 12 \text{ months}) + 10 \text{ months}\]
  
  \[= 84 \text{ months} + 10 \text{ months} = 94 \text{ months}\]
  
- Recall previous knowledge of the students by asking questions such as:
  
  » How many days are there in a year?
  » How many days are there in a month?
  » How many days form a week?
  » How many minutes make one hour?
  » How many seconds does a minute have?
- Discuss that though the number of days in a month vary, but for calculations we take the number of days in a month as 30, if the month is not mentioned.
- Narrate: Neeta spent 2 hours 15 minutes in the library. How many minutes did she spend in the library?
- Encourage the students to convert hours into minutes.
- Invite one student to solve it on the board; others may guide him/her.
- Appreciate if the student is able to do as:
  
  \[1 \text{ hour} = 60 \text{ minutes}\]
  
  \[2 \text{ hours} + 15 \text{ minutes} = (2 \times 60 \text{ minutes}) + 15 \text{ minutes}\]
  
  \[= 120 \text{ minutes} + 15 \text{ months} = 135 \text{ minutes}\]
  
- Write on the board:
  
  » Convert 6 weeks into days.
  » Convert 8 days into hours.
  » Convert 5 hours into minutes.
  » Convert 40 minutes into seconds.
- Instruct all the students to convert the above time as per the question independently without discussing with their partners.
• Move around in the class to help and guide them, if required.
• Instruct the students to exchange their notebooks with their partners.
• Discuss the answers and ask them to verify; (42 days, 192 hours, 300 minutes and 2400 seconds)
• Provide more questions till time permits.

Understanding

1 year = 365 days; 1 year = 12 months
1 month = 30 days; 1 day = 24 hours

Application

• Convert into days: 4 years, 9 months and 6 weeks.
• Convert: 3 days into hours, 8 hours into minutes and 15 minutes into seconds.
• Ajay worked for 3 hours 25 minutes. How many minutes did he work?

Analysis

• 5 minutes = ____ seconds.
• 4 days = ____ hours.
• 7 weeks = ____ days.
• 2 hours = ____ minutes.

Thinking Skills

• Change 2 hours 20 minutes 30 seconds to seconds.
• Rani’s grandma’s age is 65 years 3 months 12 days. How many days old is her grandma?

Parent Connect

• Make your child note down his/her age in years and months and then ask him/her to calculate the age in months.
• Let your child note down the number of hours he/she sleeps at night. Encourage him/her to calculate the time in minutes.
Lesson Plan - 1

Grade - 3

Chapter 11

MONEY

Learning Objective
To convert rupees into paisa and paisa into rupees.

Material Required
Indian currency notes and coins of various denominations

Class, Individual Activity

Activity

- Show 2 currency notes to the students; say ₹100 and ₹50.
- Encourage the students to recognize the denomination of the notes and say aloud the total money.
- Recall that the symbol for rupees is ₹ and for paisa ‘p’.
- Ask one student to write the amount of money on the board; here ₹150.
- Next, show a 50 paisa coin.
- Encourage the students to say aloud the total money in rupees and paisa.
- Ask one student to write the amount of money on the board.
- Appreciate if the student is able to write ₹150.50.
- Recall that ₹150.50 is read as one hundred fifty rupees and fifty paise.
- Reiterate that the rupees are written on the left side of the dot (.) and paisa on the right side of the dot.
- Narrate a situation to the students: Ankita’s mother helped her count the money in her money bank which was 5425 paise in the form of coins of various denominations. Her mother said she has ₹54 and 25 paise. Ankita was confused.
- Pose questions such as: Is 5425 paise same as ₹54 and 25 paise? What is the relation between rupees and paisa? Seek response
- Write on the board: 1 rupee = 100 paisa; ₹1 = 100 p
- Share with them that we can convert and express rupees into paisa and paisa into rupees just as they had converted m into cm and vice versa.
- Write on the board few questions such as: Convert ₹15.65 into paisa and 7625 paisa into rupees.
- Elucidate each step on the board.
  » **Convert rupees into paisa:**
    » ₹15.65 can be written as 15 rupees and 65 paisa.
    » First, convert 15 rupees into paisa and then add 65 paisa to it.
    » ₹15 = 15 × 100 p = 1500 p; since ₹1 = 100 p
    » Add 65 p to 1500 p; 1500 p + 65p = 1565 p.
    » ₹15.65 = 1565 p
  » **Convert paisa into rupees:**
    » 100 p = ₹1; 200 p = (200 ÷ 100) = ₹2
    » To convert paisa into rupees, we divide the number by 100 (100 p = ₹1).
Three friends, Ramesh, Sneha and Deepa had 2350p, `25 and 2465p respectively. Which friend had more money than the other two and who had the least?

Arrange the following amount of money in ascending order:

- 45.85
- 4530p
- 45
- 458p

Show notes and coins of any denomination to your child. Ask him/her to write the amount. Encourage him/her to convert the amount into paise.

Help your child to make a list of 10 of his/her items along with their price; say chips, chocolate, ice-cream, pizza, juice, dress, etc.

Which is the correct form of writing 5 rupees 5 paise, ₹5.5 or ₹5.05?

635 p = ____ rupees.

₹80.70 = ____ p.

Three friends, Ramesh, Sneha and Deepa had 2350p, ₹25 and 2465p respectively. Which friend had more money than the other two and who had the least?

Arrange the following amount of money in ascending order: ₹45.85, 4530p, ₹45 and 458p.
Learning Objective
To add any two given amount of money.

Material Required
Empty wrappers of items; say any namkeen, biscuit, chocolate, etc.

Activity
- Place any two wrappers of the items on the table.
- Invite 2 students to observe and read aloud the cost of the items.
- Write both the costs on the board, say, ₹20 and ₹15.
- Pose: How will you find the total cost of both these items? Seek response.
- Share with them that addition in money is done just like addition in numbers.
- Write on the board in vertical columns: ₹20 + ₹15 = ₹35.

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- Invite 2 more students and show them items whose cost is mentioned in rupees and paise.
- Ask them to say aloud their costs.
- Write them on the board, say, ₹40.50 and ₹25.75.
- Pose: How will you add rupees and paise to get the total cost of the two items? Seek response.
- Discuss; first we add both paise together, then regrouping just as that done in numbers and then add rupees.
- Recall that to add numbers, we write them in vertical columns.
- Elucidate each step on the board.
  » First add paise; 50p + 75p = 125p
  » Recall: 100p = ₹1; regroup: 125p = 100p + 25p = ₹1 + 25p = ₹1.25
  » Carry over ₹1 to the column of rupees and add.
  » Add ₹: ₹40 + ₹25 + ₹1 = ₹66
  » So, ₹40.50 + ₹25.75 = ₹66.25

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- Make pairs of students sitting next to each other.
- Instruct each student in a pair to write one amount each, separately.
Addition of money is similar to addition of numbers; add paise together, regroup and then add rupees to get the sum.

Solving word problems based on addition of money.

Add the following amount of money:
- ₹30.00 and ₹28.75
- ₹13.45 and ₹48.65
- ₹53, ₹26.65 and ₹8.50

- How much paise are 695p + 340p? Express in rupees also.
- Rita purchased an ice-cream for ₹55 and a chocolate for ₹25.50. How much money did she spend in all?

- Find the currency of countries like Australia, Japan, China, Europe and USA and their value in Indian rupees. If you have one US dollar and one Australian dollar, how much money do you have in Indian currency.
- Anita spent ₹67.25, 730p and ₹38 to buy a book, a chocolate and a copy respectively. Calculate the total amount spent by Anita.

- Provide a grocery bill to your child. Ask him/her to find the cost of any two of his/her favourite items mentioned in the bill.
- Take your child for shopping next time you go to the market. Encourage him/her to note the cost of the items purchased and then calculate the total money spent in shopping.
Lesson Plan - 3

Grade - 3

Learning Objective
To subtract and find the difference between any two amount of money.

Material Required
Notes and coins of various denominations

Class, Individual Activity

Activity
- Give a twenty and a ten rupee to a student.
- Ask him/her to calculate and say aloud the total money he/she has.
- Write the amount on the board; here, ₹30.
- Next, give a ten and a five rupee note to another student.
- Ask him/her to calculate and say aloud the total money he/she has.
- Write the amount on the board; here, ₹15.
- Pose: Which student has more money? How will you calculate the difference in the amount of money? Seek response.
- Inform them that subtraction in money is done just like subtraction in numbers.
- Recall that to subtract numbers, we write them in vertical columns.
- Write on the board in vertical columns: ₹30 – ₹15 = ₹15.

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- Give a fifty paise coin to the student who had ₹30.
- Ask him/her to calculate and say aloud the total money he/she has.
- Write the amount on the board; here, ₹30.50.
- Next, give a fifty and a twenty five paise coin to the student who had ₹15.
- Ask him/her to calculate and say aloud the total money he/she has.
- Write the amount on the board; here, ₹15.75.
- Pose: How will you subtract rupees and paise? Seek response.
- Conclude using students’ response that first we subtract paise and then subtract rupees.
- Remind them to borrow from the rupee column if the paise to be subtracted are greater than the paise from which it is to be subtracted.
- Explain each step on the board: ₹30.50 – ₹15.75
  » First subtract paise; 50 p – 75 p
  » Since 50 < 75, borrow ₹1 from the rupee column.
  » Recall ₹1 = 100 p; 100 p + 50 p = 150 p; 150 p – 75 p = 75 p
Subtract rupees: \( \text{₹}30 - \text{₹}1 = \text{₹}29 \) (when borrowed); \( \text{₹}29 - \text{₹}15 = \text{₹}14 \)

So, \( \text{₹}30.50 - \text{₹}15.75 = \text{₹}14.75 \)

- Write few questions on the board: Subtract \( \text{₹}17.50 \) from \( \text{₹}29.75 \), \( \text{₹}35.45 \) from \( \text{₹}50 \) and \( \text{₹}15.05 \) from \( \text{₹}85.50 \).
- Encourage student to solve the questions individually without discussing with their partners.
- Move around in the class to help and guide the students, if required.
- Instruct the students to exchange their notebook with their partners.
- Discuss the answers and ask them to verify their answers; Provide more questions, till time permits.

Subtraction of money is similar to the subtraction of numbers; subtract paise first, borrow from the rupee column, if required, and then subtract rupees.

Use addition and subtraction of money to solve daily life situations.

- Subtract the following amount of money:
  - \( \text{₹}39 \) and \( \text{₹}18.75 \)
  - \( \text{₹}21.45 \) and \( \text{₹}54.60 \)
  - \( \text{₹}43.05 \) and \( \text{₹}8.50 \)
  - \( \text{₹}104.60 \) and \( \text{₹}78.90 \)
- What is \( 725\text{p} - 340\text{p} \)? Express in rupees also.
- If you have \( \text{₹}25.50 \) with you, how much more money will you require to make it \( \text{₹}50 \)?
- How much is \( \text{₹}25.50 \) less than \( \text{₹}105 \)?
- Subtract the sum of \( \text{₹}15 \) and \( \text{₹}23.75 \) from the sum of \( \text{₹}45.65 \) and \( \text{₹}8.40 \).
- Take your child for shopping next time you go to the market. Ask him/her to note the money you gave to the shopkeeper and the total bill of the items you purchased. Encourage him/her to calculate the money the shopkeeper would return.
- Play games like monopoly and business with your child to reiterate addition and subtraction in money. Encourage him to do the transactions in the game by himself/herself.
Lesson Plan - 4

Grade - 3

Learning Objective
To perform multiplication while dealing with money.

Class, Group Activity

Activity

- Narrate a daily life situation to the students: There are 4 members in your family. You went to the market to buy the same ice cream for each of the member. The cost of one ice cream is ₹20.75, how much will 4 ice creams cost?
- Seek response from the students to calculate the total cost.
- Bring their attention to the fact that since the cost is same for all the 4 ice creams; the amount of money, here ₹20.75, is repeated four times.
- Share with them that multiplication in money is similar to that in numbers.
- Recall multiplication of 2 or 3-digit numbers with one digit number, if required.
- Write on the board: ₹ 20.75 \times 4
- Inform them that we first multiply paise with the given number, then regroup paise into rupees and paise and then multiply rupees.
- Remind them to add the rupees obtained from regrouping.
- Elucidate the steps of multiplication;
  » first multiply paise, 75 p \times 4 = 300 p
  » Recall: 100p = ₹1; regroup: 300p = ₹(300 \div 100)= ₹3.00
  » Carry over ₹3 to the column of rupee.
  » multiply rupees, ₹20 \times 4 = ₹80
  » Add ₹: ₹80 + ₹3 = ₹83
  » So, ₹20.75 \times 4 = ₹83
  » So the cost of 4 ice creams is ₹83.

<table>
<thead>
<tr>
<th>₹</th>
<th>P.</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>75</td>
</tr>
<tr>
<td>83</td>
<td>00</td>
</tr>
</tbody>
</table>

- Divide the class into groups of 4 students each.
- Give instructions as follows:
  » Each student in a group will choose any one item, say, pencil box, chocolate, pen, etc.
  » Let them fix the price of the item, say ₹15, ₹22.45, ₹8.50, etc.
  » Choose the quantity of the item, say, 2, 3, 5, etc.
Multiplication in money is similar to multiplication in numbers. Regroup paisa into rupees to get the final answer.

**Understanding**

Expected

**Associated Concepts**

Use of all the operations; addition, subtraction and multiplication of money to solve daily life situations.

**Application**

Multiply the following:

- ₹63 by 5
- ₹33.85 by 6
- ₹82.50 by 4
- ₹24.75 by 7

- The cost of one book is ₹45. What will be the cost of 3 such books?
- How much will two notes of ₹100 and three notes of ₹20 amount to?

**Analysis**

Thinking Skills

- Tina had two ₹500 notes, three ₹100 notes and two ₹50 notes. How much money does she have?
- Rohan’s father gives him ₹20 each day. He spends ₹5 out of ₹20 daily and puts the remaining money in his money bank. How much money will he save in a week?

**Parent Connect**

- Provide the cost of 1 kg of the items that you purchase to your child. Help him/her calculate the total cost of each item when you purchase grocery, say, 5 kg of rice, 2 kg potatoes, 3 kg mangoes, etc. Encourage him/her to also calculate the total amount spent.
- Discuss the use of credit card, debit card and ATM with your child.

Content Book Reference: Page 196, 197
Guided Practice: Page 149
Learning Objective
To apply the concept of addition, subtraction and multiplication of money in daily life and solve word problems.

Activity

- Narrate a situation to the students: Your mother bought mangoes for ₹105 and bananas for ₹25.65. How much money did she spend in all? Is she had ₹200 in her purse, how much money is left in her purse?
- Seek students’ response and discuss the steps and statements to solve the word problem.
- Remind them that to solve such problems they have to follow a 4-step approach as under:
  - **Understanding:** This involves to understand what all is given and what they need to find. Here, money spent on mangoes is ₹105 and money spent on bananas is ₹25.65. We have to find the total money spent.
  - **Planning:** Analysis is done in this step. One part is ₹105 and the other is ₹25.65. Represent it using a model.
    
    | ₹105 | ₹25.65 |
    |-------|-------|
    | Mangoes | Bananas |
    |       |       |
    | ?     |       |

- Doing: This step involves the actual addition in columns.
  
  ₹105 + ₹25.65 = ₹130.65

- Checking: This is the last step done to verify the answer. It can be done by subtraction of any part from the total; say, ₹130.65 – ₹25.65 = ₹105.

- Encourage the students to solve the second part of the word problem. Seek response.
- Elucidate that the total amount of money is ₹200 and the money spent is ₹130.65. Money left = total money – money spent; ₹200 – ₹135.65 = ₹64.35

- Encourage the students to write the statements for the above word problem.
- Write each statement on the board:
  
  Monet spent on mangoes = ₹105
  Money spent on bananas = ₹25.65
  Total money spent = ₹105 + ₹25.65 = ₹130.65
  Money she had = ₹200
  Money left = ₹200 – ₹135.65 = ₹64.35

- Make pairs of students sitting next to each other.
- Narrate more situations to the students:
Perform division while dealing with money.

Associated Concepts

Application

Solve the following word problems:

- How much money will be collected if each of the 8 employees contribute equal amount of Rs 225.50 for a charity?
- The cost of one pizza is Rs 125.50. Shweta had Rs 98 with her. How much more money does she need to buy the pizza?
- Riya spent Rs 56 on hair bands, Rs 25.50 on chocolate and Rs 123.85 on books. How much money did she spend in all?
- What is the cost of 6 books if the cost of 1 book is Rs 25?
- How much is Rs 43.50 more than Rs 239.65?
- Hetal had Rs 1000 with her. She went to the market to buy few cosmetics. She is left with Rs 467.80. How much money did she spend?
- Monali earns Rs 12000 a month. She spends Rs 965 every month and saves the rest of the amount. How much money will she save in a year?
- Share information on expenditure with your child like: school fees, monthly kitchen bills, money spent in restaurants or outings. Help your child prepare a bill of the monthly expense and calculate the total expense of the month. This help him/her realize how to spend and save wisely.

Content Book Reference: Page 198-200

Guided Practice: Page 150-154
**Grade - 3**

**Chapter 12**

**DATA HANDLING**

**Lesson Plan - 1**

**Learning Objective**
To collect data and represent it through a pictograph with a scale.

**Stress Words**
Pictograph

**Activity**
- Ask the students: Which is your favourite sport? Seek responses.
- Write on the board the names of the sport’s, cricket, badminton, football, tennis and carom.
- Draw a table on the board and count the number of students for each sport.

<table>
<thead>
<tr>
<th>Sport</th>
<th>Number of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cricket</td>
<td>15</td>
</tr>
<tr>
<td>Badminton</td>
<td>10</td>
</tr>
<tr>
<td>Tennis</td>
<td>5</td>
</tr>
<tr>
<td>Football</td>
<td>10</td>
</tr>
<tr>
<td>Carom</td>
<td>5</td>
</tr>
</tbody>
</table>

- Pose: How many students like football? How many students like cricket the most?
- Instruct the students to raise their hand for their favourite sport.
- Count and write the number of students for each sport; say 15 for cricket, 10 for badminton, 5 for tennis, 10 for football and 5 for carom.
- Discuss that the above information can be represented using pictures; such a representation of data is called pictograph or pictogram.
- Share with them that any symbol may be used to represent the object in the pictograph.
- Illustrate that if the data is large, a proper scale may be used as done below.
- Draw a table on the board:

<table>
<thead>
<tr>
<th>Sport</th>
<th>Number of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cricket</td>
<td>☺☺☺</td>
</tr>
<tr>
<td>Badminton</td>
<td>☺☺</td>
</tr>
<tr>
<td>Tennis</td>
<td>☺</td>
</tr>
<tr>
<td>Football</td>
<td>☺☺</td>
</tr>
<tr>
<td>Carom</td>
<td>☺</td>
</tr>
</tbody>
</table>

- Tell that in the above collected data, each ☺ represents 5 students.
- Elucidate that for cricket, $15 \div 5 = 3$ ☺; 2 ☺ for badminton and so on.
- Discuss with the students that a pictogram helps to compare and give information at a glance.
- Make pairs of students sitting next to each other.
- Provide data to the students such as: In a survey done for all the students of class III for their favourite fruit, it was found that 11 students like mango, 10 students like grapes, 8 students like watermelon, 9 students like apples and 4 like bananas. Represent the collected data as a pictograph.
- Instruct the students to choose a suitable symbol and scale for the pictograph.
- Guide and help them to use ○ for 2 students and □ for 1 student.
- Instruct them to work in pairs; one student prepares the data table and the other a pictograph; vice versa for the next question.
- Move around in the class to help and guide them, if required.
- Discuss the answers and ask them to verify.

<table>
<thead>
<tr>
<th>Fruits</th>
<th>Number of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mango</td>
<td>○○○○○○□</td>
</tr>
<tr>
<td>Grapes</td>
<td>○○○○○</td>
</tr>
<tr>
<td>Watermelon</td>
<td>○○○○</td>
</tr>
<tr>
<td>Apples</td>
<td>○○○○□</td>
</tr>
<tr>
<td>Bananas</td>
<td>○○</td>
</tr>
</tbody>
</table>

Each ○ stands for 2 students; □ stands for 1 student.

- Provide more questions till time permits.
- A representation of data using pictures is called a pictograph or pictogram.
- Any suitable symbol and scale can be used to represent a pictograph.

Interpretation of data using a pictograph.

- The table below shows the sale of mobiles for a week. Prepare a pictograph for the given table.

<table>
<thead>
<tr>
<th>Day</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sale of mobiles</td>
<td>10</td>
<td>16</td>
<td>12</td>
<td>8</td>
<td>10</td>
</tr>
</tbody>
</table>

- Rekha asked 25 students about their favourite subject. Below is their response. Represent the information collected through a pictograph.


Ask questions based on the pictograph for the favourite sport such as:
- Which sport is liked by most students?
- Which sport is the least favourite?
- How many students are there in all?
Thinking Skills

- How is a pictograph useful to interpret data?
- Mention any other way to interpret data?

Parent Connect

- Help your child conduct a survey to find out the favourite drink of their friends; orange, cola, lemon, mango and chocolate. Tell them to prepare a pictograph for the data collected.
- Let your child make a list of at least 15 relatives with their date of birth. Ask him/her to prepare a pictograph to represent the number of birthdays in each month. Encourage him/her to interpret the pictograph by asking questions such as: In which month is the number of birthdays minimum? In which month is the number the birthdays maximum?
Learning Objective
- To represent the given data using tally marks.
- To read and interpret data in a tally marks table/pictograph.

Stress Words
  Tally marks

Activity
- Draw a table on the board with two columns as shown below.
- Randomly ask 20 students to mention their favourite colour.

<table>
<thead>
<tr>
<th>Student’s name</th>
<th>Favourite colour</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Fill in the name of the student and his/her favourite colour in the table.
- Make them observe the table and ask questions such as: Which colour is liked by most of the students? Which colour is liked the least?
- Seek responses.
- Probe: Was it easy to answer the questions by looking at the table? Is there a more useful and easy way to present the data? Seek responses.
- Share with the students that if the data is arranged in a tally marks table; it makes counting and interpretation really easy.
- Write the following data on the board:
- Below is the response of 25 children about their favourite ice cream flavour. Represent the information collected through a tally marks table.

  chocolate, vanilla, mango, chocolate, strawberry, chocolate, orange, mango, strawberry, strawberry, mango, vanilla, chocolate, orange, mango, orange, strawberry, vanilla, chocolate, vanilla, strawberry, chocolate, strawberry, chocolate, vanilla

- Share with the students that in tally marks, we represent 1 by I, 2 by II, 3 by III, 4 by IIII, 5 by IIII, 6 by IIII and so on.
- Draw a table on the board and represent the above data using tally marks in a tally marks table.

<table>
<thead>
<tr>
<th>Ice cream flavour</th>
<th>Tally marks</th>
<th>Number of ice creams</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chocolate</td>
<td>IIII</td>
<td>7</td>
</tr>
<tr>
<td>Vanilla</td>
<td>III</td>
<td>5</td>
</tr>
<tr>
<td>Mango</td>
<td>IIII</td>
<td>4</td>
</tr>
<tr>
<td>Strawberry</td>
<td>IIII</td>
<td>6</td>
</tr>
<tr>
<td>orange</td>
<td>III</td>
<td>3</td>
</tr>
</tbody>
</table>
For a larger data, tally marks are a very quick way to represent data in an organised manner.

Understanding

Instruct the students to study the table and answer questions such as:

» Which is the favourite ice cream of the students?
» How many children like orange?
» What is the number of children put together who like mango and strawberry ice creams?

Conclude that tally marks are a very quick way to represent data in an organised manner.

Provide data to the students such as: The favourite cartoon character of 30 students of class II is given below. Represent it in a tally marks table.

| Bheem, Mickey, Popeye, Pokémon, Spiderman, Bheem, Pokémon, Bheem, Mickey, Popeye, Pokémon, Spiderman, Mickey, Bheem, Mickey, Popeye, Pokémon, Spiderman, Bheem, Pokémon, Bheem, Mickey, Mickey, Pokémon, Spiderman, Bheem, Pokémon, Pokémon, Bheem |

Instruct them to work individually without discussing with their partners.

Move around in the class to help and guide them, if required.

Discuss the answers and ask them to verify.

Provide more questions till time permits.

For a larger data, tally marks are a very quick way to represent data in an organised manner.

Application

Below is a table that shows the favourite colour of all the girls of class 3. Represent the information collected through a tally marks table.

| Pink, Green, White, Black, Red, Pink, Green, Pink, White, Red, Black, Red, White, Pink, Green, White, Pink, Black, Blue, Red, Pink, Pink, Green, Red, Pink, White, Blue, Pink, Red, Pink |

Answer the following questions based on the tally marks table above:

» How many girls like pink colour?
» How many girls like white colour?
» How many girls like black colour?
» Which colour is the most favourite?
» Which colour is the least favourite?
» How many girls are there in all?

Ask questions based on the tally marks table for the favourite cartoon such as:

» Which cartoon character is liked by most students?
» Which cartoon character is the least favourite?
» How many students like Spiderman?
Which representation of data is more useful, according to you- pictograph or tally marks? Give reasons to support your answer.

- Help your child conduct a survey among relatives and friends (at least 20) to find out their favourite car. Tell them to prepare a tally marks table for the data collected.

- Let your child make a list of at least 15 of his friends and the mode of transport used by them to go to school; school bus, private car, walking, etc. Ask him/her to prepare a tally marks table to represent data collected. Encourage him/her to interpret the table by asking questions such as: How do most students travel to school? How many students go to school walking?