Vision Empower & XRCVC

Teacher Instruction KIT

Numbers

Syllabus: Karnataka state board
Subject: Math
Grade: 4
Textbook Name: Mathematics Text cum Workbook
Chapter Number & Name: 2. Numbers

1. OVERVIEW

OBJECTIVE AND PREREQUISITE CONCEPT

Objective

Students will be able to:

- Read and write numbers up to 9999 in an order.
- Write preceding and succeeding numbers for a given number.
- Write four-digit numbers in expanded form.
- Write the expanded number in its general form.
- Identify the place value and face value of digits of a number.
- Identify the largest and smallest 4-digit number.
- Arrange the numbers in ascending and descending order.

Prerequisite Concept

- Place value, numbers up to 999.

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Activity 2: To write the expanded number in its general form.

PLACE VALUE & FACE VALUE

Activity 1: Place value and the face value of numbers.

Activity 2: Finding the common difference between numbers.

LARGEST AND SMALLEST 4-DIGIT NUMBERS

Activity 1: To identify the largest and smallest 4-digit number.

ASCENDING AND DESCENDING ORDER

Activity 1: Introducing the concept of ascending and descending order of numbers.

Activity 2: Tower of Hanoi

Activity 3: Ascending and descending order

3.3 LET'S DISCUSS: RELATE TO DAILY LIFE*

4. EXERCISES & REINFORCEMENT

REINFORCEMENT EXERCISES

PRACTICE EXERCISES

Activity 1: Practice and Recall

Activity 2: Practice

4.1 IMPORTANT GUIDELINES*

Exercise Reading

Perform Textbook Activity

Provide Homework

2. LEARN

2.1 KEY POINTS

- 4 digit number - A number in the thousands place, hundreds place, tens place and units place.
- Succeeding and preceding number - Succeeding means the next number preceding means the previous number for the given number.
- Place value and face value - place value states the position of a digit in a given number, whereas face value describes the value of the digit.
- Expanded form - When we expand a number to show the value of each digit, we're writing that number in expanded form.

3. ENGAGE

3.1 INTEREST GENERATION ACTIVITY

Activity 1: Introduction

Materials Required: None
Prerequisites: Place value and numbers

Activity Flow

- *Give the cost of real objects such as cloth, table, toys, fruits, vegetables that they are familiar with.*
- *Ask the following questions*
    - *Which one is costlier? And why?*
    - *What are the things you can buy for 100 rupees?*
- *To buy 1 rupee chocolate 10, how much do we need?*
- *Tell them the cost of a t-shirt is 99 rupees, what if we increase 1 rupee to it? And how much it becomes.*
- *How many digits are there in 100? Is it a two-digit number or a three-digit number?*

3.2 CONCEPT INTRODUCTION ACTIVITIES

FOUR DIGIT NUMBERS

Activity 1: Introduction to four-digit numbers.

Materials Required: Taylor frame.
Prerequisites: Place value.

Activity Flow

- *Give the cost of real objects such as cloth; table, toys that they are familiar with and which will be around 3 to 4 digit numbers. They will come across many examples for 3 and 4 digit numbers in their daily life.*
- *Recall that the 3 digit number has units, tens place and hundreds place.*
- *Likewise, 4 digit numbers have a thousand's place followed by hundreds, tens, and units.*
- *Ask the students for the largest and smallest 3 digit numbers.*
    - *Hint: Start with the largest and smallest single digit.*
    - *The largest 3 digit number is 999 and the smallest number is 100.*
- *Ask the following questions to the students.*
    1. *What is the area of the square when one of its sides is 6cm?*
    2. *What is the next number of 138?*
    3. *What is the present year?*
    4. *If Raju has 1050 rupees to buy cloth but the actual price is 1000 rupees, then what is the remaining amount?*
    5. *What is the largest and smallest 4 digit number?*
- *Similarly, ask them to write the largest and smallest 4 digit number on a Taylor frame.*

    - *Since 9 is the largest single-digit number, and if they write 9 in all the four-place values then they get the largest 4 digit number is 9999.*
    - *Likewise, place 0 in all the place values except in the highest place value which is thousands place value.*
- *Ask them why not zero? If not zero, which number has to be placed in the highest place value?*
- *Explain, if we put number zero in the thousands place and one in other places then it will only be 3 or 2 or 1 digit numbers. So, to get the smallest 4 digit number, we have to consider the next greater number to zero, which is one and place it in the thousands place.*
- *Explain, if zero is written to the left side of any number then the number remains itself but when zero is written next to the number then the value of the number changes.*

Activity 2: To read and write four-digit numbers.
Materials Required: Box of braille cards from 0 to 9, Taylor frame.
Prerequisites: Numbers and place value.

Activity Flow

Braille cards from 0 to 9 would help in generating numbers of any number of digits. Here the cards will be used specifically for 4 digit numbers. Taylor frame is used to write 4 digit numbers and read.

- *Give the braille cards from 0 to 9 and ask the students to arrange a 4 digit number on the Taylor frame.*
- *Repeat it for 5 sets of 4 digit numbers.*
  Meanwhile, ask them, what are the first 4 numbers after 1007 and ask them to show it by arranging the numbers using braille cards. Or writing numbers on a Taylor frame.
    - *The first 4 numbers after 1007 are 1008, 1009, 1010, and 1011.*

OR

- *Make two groups. Let teachers create their own 4 digit Braille number cards. And shuffle the cards and spread it over the table or desk.*
- *Ask one of them from group 1 to come and pick any Braille number card and read it aloud, meanwhile ask one of them from group 2 to write the same number on a Taylor frame and check it with the teacher.*
- *Also, do it with the other children.*

PRECEDING & SUCCEEDING NUMBERS

Activity 1: The preceding and succeeding number for given numbers.
Materials Required: Braille cards from 0 to 9, Taylor frame.

Prerequisites: Place value and numbers.

Activity Flow
Note: Using the Braille cards, students are supposed to create 4 digit numbers, for which they should write the preceding and succeeding numbers. Taylor frame to write four-digit numbers.

- *Ask the students the following questions.*
  1. What is the next number of 21?
  2. What is the previous number of 56?
  3. What is the middle number of 97 and 99?
- *Ask them how they do it?*
- *Explain, adding number 1 to the present number gives the next number, which is also called the succeeding number. Similarly subtracting 1 from the present number gives the previous number, which is called the preceding number.*
- *Make two groups. If group 1 arranges 4 digit numbers using Braille cards then group 2 should give the preceding and succeeding number for the numbers given by group 1.*

OR

- *They can use the Taylor frame to write the succeeding and preceding number for the given number.*

EXPANDED FORM

Activity 1: The expanded form of numbers.
Materials Required: Braille cards of 1, 10, 100, 1000 minimum of 9 cards each.
Prerequisites: Numbers and place value.

Activity Flow

- *Give an example of a four digit number.*
- *Ask the students to observe the similarity between reading a number and its expansion. They both sound similar.*
  Example - Three hundred and forty five, so it has 3 hundreds, 4 tens and 5 ones.
- *Make a group of 3 or 4 children depending on the number of students in the class, give them braille cards of 1, 10, 100 and 1000, minimum 9 cards each to each group.*
- *Explain to them with an example, for a given 4 digit number 4789, they have to pick 9 unit cards, 8 ten cards, 7 hundred cards and 4 thousand cards and also ask them to write in words.*
- *Let each group give any 4 digit number and ask the other group to write its expanded form using Braille cards.*
- *Also, ask them to write expanded form on a Taylor frame.*

Activity 2: To write the expanded number in its general form.
Materials Required: Braille cards of 1, 10, 100, 1000 minimum of 9 cards each, Taylor frame.
Prerequisites: Place value

Activity Flow

Discuss the previous activity, in which they learnt to write the expanded form of a given 4-digit number using Braille cards for place value. Ask them how that will be if they just reverse this activity. That is, they will be asked to write the general form of a number when its expanded form is given.

- *Make two groups, if group 1 gives a number in its expanded form using Braille cards of 1, 10, 100, 1000 and group 2 should give its general form.*
  Example: If group 1 arranges a 4 digit number using Braille number cards, like 9 thousand cards, 4 hundred cards, 6 tens cards and 1 unit card. Which is 9 times 1000 + 4 times 100 + 6 times 10 + 1 times 1. Group 2 has to write its simplest form or general form on the Taylor frame as 9461.
- *Similarly, the general form for 7 times 1000 + 3 times 100 + 8 times 10 + 0 times 1 is 7380.*
- *Repeat this activity 2 to 3 times.*

PLACE VALUE & FACE VALUE

Activity 1: Place value and the face value of numbers.
Materials Required: 4 sets of Braille cards from 0 to 9 and Taylor frame.
Prerequisites: Place value

Activity Flow

- *Consider the following 4 digit numbers 1234, 5167, 8916, and 2891 and ask them to read and write an expanded form for each number on a Taylor frame. Also, ask them to find the common digit among all 4 numbers and its place value.*
  - *The common digit among all 4 numbers is 1.*
- *The expanded form of number 1234 is 1 times 1000 + 2 times 100 + 3 times 10 + 4 times 1. Place value of 1 is a thousand.*
- *The expanded form of number 5167 is 5 times 1000 + 1 times 100 + 6 times 10 + 7 times 1. Place value of 1 is one hundred.*
- *The expanded form of number 8916 is 8 times 1000 + 9 times 100 + 1 times 10 + 6 times 1. Place value of 1 is ten.*

- *The expanded form of number 2891 is 2 times 1000 + 8 times 100 + 9 times 10 + 1 times 1. Place value of 1 is one.*
- *Explain, in the above example the place value of 1 change with respect to the position in a number.*
- *Also ask them, what could be the face value of 1?*
- *Face value of 1 is 1 itself. In general, the face value of a number is the number itself.*

Activity 2: Finding the common difference between numbers.
Materials Required: Tactile ruler, Tactile Diagram of common difference numbers.
Prerequisites: Place value, subtraction and addition

Activity Flow

Note: Tactile ruler is a good example to show that it has a common difference of one between every successive number.

- *Succeeding and preceding number sequence is one of the examples for sequences of numbers having a common difference of 1.*
- *Give the following examples to the students. Example: 123, 124, 125, 126.*
- *Similarly, ask the students to give examples for number sequences having a common difference of 1.*
- *Read a story that tells about the concept of common difference in the class and ask the following questions.*
- *Give them a sequence of 3 digit numbers with a common difference of 4.*
    - *100, 104, 108, 112, ___? Ask them to find the next number.*
- *Later, ask them to write a sequence of the first 5 numbers and the first number is 222, having a difference of 6.*
    - *The next 4 numbers are 228, 234, 240, and 246.*
- *Also, make use of a calliper having a common difference of 1 between each number to explain the concept of common difference.*
- *Then tell them a story given below and ask the following questions and discuss.*

Story: A story that involves covering distance with an equal number of steps.

A girl was staying with her grandma in her village. One day, the girl dreamt she was in search of divine flowers. Her grandmother encouraged her to pursue her wish and she further gave few clues to reach the desired destination. The clues given were as follows:

1. *Starting from home, for every 30 steps there will be big mango trees at 3 places.*
2. *From the 3rd mango tree, take a left turn and walk for 30 steps to arrive at a house.*

3. *A man from that house will give the last clue.*

The girl follows her grandma's clues and meets the man in his house. The last clue he gave was to walk 50 steps further from his house and reach a temple. Thereafter take a right turn from the temple and walk 50 more steps after which she would hear the sound of a river flowing nearby. By the river, she would finally come across the divine flowers.

The girl follows the instructions as provided by the man and finally she picks up the divine flowers and happily returns home.

Her grandmother asks the following questions:

1. *What is the total distance covered by the girl from her home to the river?*
   Total no. of steps = No. of steps from (home to 1st mango tree)+(1st mango tree to 2nd mango tree)+(2nd mango tree to 3rd mango tree)+(3rd mango tree to 1st house)+(1st house to temple)+(temple to the river). The answer is 220 steps.
2. *What is the total number of steps covered to reach the 1st, 2nd and 3rd mango tree from home? The answer is 90 steps*
3. *What is the following number in the space provided below,*
   2 ,4, ,6, 8, 10, ___, ___? Answer: 12 and 14.
   1, 3, 5, 7, 9, ___ , ___? Answer: 11 and 13.

Note: For the 3rd question they should find the common difference by adding an appropriate number to the present number so that it follows the sequence. Or it can be done by finding the difference between 2 consecutive numbers ($9-7=2$ *or* $10-8=2$ *)*

OR

- *Teachers can give sequences having common differences by leaving those many holes on a Taylor frame and ask the children to observe the sequence and tell the common difference just by counting the holes on the Taylor frame between each number. By which they can understand the difference between each number.*

OR

- *Ask all the children to keep a distance of 5 steps between each of them and make a single line. And name each child with the numbers. So, to make it interesting the last person should have the treasure so that the child who is not part of the line will not know the steps that they have taken to form a line has to find the treasure.*

Hence, the child first has to find the number of steps from child 1 to child 2 and so on. Then ask them to count and observe that there is a distance of 5 steps which are common from one child to the other child.

LARGEST AND SMALLEST 4-DIGIT NUMBERS

Activity 1: To identify the largest and smallest 4-digit number.

Materials Required: Taylor frame.
Prerequisites: Place value

Activity Flow

- *Ask the following questions to the students.*
- *Which is the greatest and smallest among 12, 24 and 45? Also ask them, on what basis they are deciding which is greater.*
    - *It is number 45 because we are comparing the numbers in the units place and tens place between all 3 numbers. Since in the number 45, 4 is in the tens place and 5 is in units place it greater than the numbers 12 and 24. Hence 45 is greater or the largest number.*
    - *Likewise, 12 is the smallest number.*
- *Verbally explain the concept using other examples such as bag costs 1560 rupees, Taylor frame costs 590 rupees, textbook costs 300, and slate and stylus costs 459. Which are the objects that cost more and cost less?*
    - *The bag, which costs Rs. 1560, is more and the textbook, which is Rs. 300, is less.*
- *Ask the students to discuss themselves and answer the following questions.*

1. *Identify the largest and smallest number for the following.*
   8692, 8940, 8629, 8490, 8094.
2. *3247, 3280, 3228, 2267*
   3280 is the largest number and 2267 is the smallest number.
3. *5694, 5384, 5820, 5973*
   5973 is the largest number and 5384 is the smallest number.
   Hint: Compare the face value of each place value for each number.

ASCENDING AND DESCENDING ORDER

Activity 1: Introducing the concept of ascending and descending order of numbers.
Materials Required: Braille cards from 0 to 9, tower of Hanoi and different sizes of sticks.
Prerequisites: Numbers and place value.

Activity Flow

- *Ask the students, how do you pluck a fruit from the tree?*
    - *They might say "we need to climb up".*
- *Ask them, which tool is used to climb up or down?*
    - *For example, ladder.*
- *What is the purpose of the staircase?*
    - *To climb up and down.*

Ascending the stairs is to climb up the stairs and descending the stairs in climbing down the stairs. These are the few examples, by which we can convey the concept of increasing and decreasing.

- *Ask one of the students to form the greatest and smallest 4 digit number using the first 4 digits 1, 2, 3, 4 using braille cards.*
    - *The greatest 4 digit number is 4321 and the smallest 4 digit number is 1234.*
- *Ask the students to observe the arrangement of numbers and what is the difference in arranging the numbers to get the smallest and greatest number?*
- *Explain, In order to get the greatest number, the numbers are arranged in such a way that the digit in the thousands place is greater than the digit in the hundreds place, the digit in the hundreds place greater than the digit in the tens place and the digit in the tens place is greater than the digit in the units place.*
- *To get the smallest number the numbers are arranged in such a way that the digit in the thousands place is smaller than the digit in the hundreds place, the digit in the hundreds place smaller than the digit in the tens place and the digit in the tens place is smaller than the digit in the units place. Which is nothing but the digits are in ascending order.*
- *Similarly, do it for the next 4 digits 5,6,7,8 using braille cards. Play with braille cards with different combinations of numbers.*

Activity 2: Tower of Hanoi

Materials Required: Tower of Hanoi
Prerequisites: None

Activity Flow

The Tower of Hanoi consists of rings arranged in order according to their sizes.

- *Consider Tower of Hanoi with 4 rings, where all the 4 rings are named with braille numbers 3, 5, 7 and 9 respectively according to its sizes.*
  If they go from bottom to top they can see the sizes of rings are decreasing, which is an example for descending order (from higher to lower). But if they go from top to bottom they increase the size of rings, which is in ascending order (from lower to higher).

  Example: The greatest number is 9753 which is in descending order. The smallest number is 3579 which is in ascending order.

Activity 3: Ascending and descending order

Materials Required: Different sizes of Sticks.
Prerequisites: None

Activity Flow

- *Ask the students to arrange the sticks from increasing size to decreasing size and get a feel of descending order and vice versa.*
- *Also, ask students to sit according to their heights and observe the increasing and decreasing order.*
- *Ask them to write ascending and descending orders on a Taylor frame.*

3.3 LET'S DISCUSS: RELATE TO DAILY LIFE*
Give the following examples to the students.
Example:

1. If we go to the supermarket or any store, we would not be able to know the total amount we spent and our change if we don't learn numbers. Without learning numbers, we can't handle money.
2. Numbers are used to calculating years, months, weeks, days, hours, and seconds.

Now, ask the children to give some examples of why they need to learn numbers.

4. EXERCISES & REINFORCEMENT

4.1 REINFORCEMENT EXERCISES

PRACTICE EXERCISES

Activity 1: Practice and Recall
Materials Required: Different types of seeds and a tray.
Prerequisites: Counting and place value.

Activity Flow

Note: Each grain will represent a different place value. Green peas represent thousands place, Corn represents hundreds place, pepper represents tens place and toor dal represents one's place

- *Make two groups and give 4 different types of grains to the students in a tray or a bowl.*
- *Ask group 1 to give number 6543 to group 2 and group 2 should pick those many grains according to the number on each place value. 6543 - 6 green peas, 5 corns, 4 pepper and 3 toor dal.*
- *Similarly, let group 2 give numbers to group 1 and group 1 has to pick those many grains according to the number on each place value.*

Activity 2: Practice

Materials Required: None

Prerequisites: Place value, counting numbers, ascending order and descending order.

Activity Flow

1. *Write the following numbers in words*
    a. *5004*
    b. *7305*
    c. *9000*
    d. *5876*
2. *Write the following in numbers*
    a. *Six thousand four hundred seventy-one.*
    b. *Three thousand nine.*
    c. *Nine thousand eight hundred ninety nine.*
    d. *Two thousand four hundred twenty.*
3. *Write the succeeding numbers for the following*
    a. *7999*
    b. *8407*
    c. *9000*
4. *Write the preceding numbers for the following*
    a. *4567*
    b. *7659*
    c. *8000*
5. *Write the middle number*
    a. *2799, ___ , 2771*
    b. *5490, ___ , 5492*
    c. *3999, ___ , 4001*
    d. *5888, ___ , 5890*
6. *Write the following numbers in the expanded form*
    a. *6487*
    b. *2069*
    c. *5004*
    d. *9678*
7. *Write the following numbers in general form*
    a. $3 * 1000 + 4 * 100 + 9 * 10 + 2 * 1$
    b. $1 * 1000 + 3 * 100 + 6 * 10 + 5 * 1$
    c. $4 * 1000 + 0 * 100 + 7 * 10 + 9 * 1$
    d. $8 * 1000 + 1 * 100 + 5 * 10 + 5 * 1$

8. *Fill in the blanks with suitable numbers*
    a. *6974*
        i. *The place value of 9 is ___ and its face value is ___*
        ii. *The place value of 7 is ___ and its face value is ____*
9. *Choose the correct answer.*
    1. *In 4267, the difference between the place value and face the value of 6 is ___.*
        a. *0*
        b. *1*
        c. *9*
        d. *24*
    2. *In 3498 the difference of the place value and face value of 4 is ___*
        a. *496*
        b. *409*
        c. *396*
        d. *90*
    3. *In 5435, the difference of the place values of 5 is ___*
        a. *999*
        b. *4005*
        c. *4995*
        d. *5005*
    4. *In 1694 the digit whose place value and face value are equal is ___*
        a. *0*
        b. *1*
        c. *4*
        d. *6*
10. *Write the missing numbers in the following series.*
    a. *2326, 2330, 2334, ___ , ___ , ___*
    b. *1540, 1550, 1560___ , ___ , ___*
    c. *1850, 1900, 1950___ , ___ , ___*
    d. *3650, 3950, ___ , 4550, ___ , ___*
    e. *4107, ___ , 6107, ___ , 8107, ___*
11. *Write the numbers in ascending order.*
    a. *679, 368, 796, 697*
    b. *5839, 5093, 5872, 5829*
    c. *2167, 1679, 3847, 5000*
    d. *6493, 6394, 4693, 3625*
12. *Write these numbers in descending order.*
    a. *2765, 3847, 1629, 4867*
    b. *3926, 3967, 3908, 3937*
    c. *4798, 4792, 4087, 4800*

d. *8620, 8629, 8630, 8624*

13. Fill in the blanks

a. *The greatest number that can be formed using the digits 4, 8, 5 is ___.*
b. *3,046 is ____ digit number.*
c. *0,734 is ___ digit number.*
d. *The smallest four digit number that can be formed using the digits 3, 1, 0 and 9 is ___.*

13. Write as directed.

a. *5, 8, 7 and 2. By using these digits,*
   The greatest four digit number that can be formed is ___.
   The smallest four digit number that can be formed is___.
b. *2, 8, 9 and 0. By using these digits,*
   The greatest four digit number that can be formed is ___.
   The smallest four digit number that can be formed is ___.
c. *3, 5, 2 and 9. By using these digits,*
   The greatest four digit number that can be formed is ___.
   The smallest four digit number that can be formed is ___.

4.1 IMPORTANT GUIDELINES*

Exercise Reading

It is very important that the children practice their learnings as well as their reading. Hence have the children read out the newly learned concepts from their textbooks or other available resources.

Perform Textbook Activity

It is good practice to have the children perform the textbook activities. Your textbook activities might not be accessible hence go through this resource to learn how to make textbook content accessible

Provide Homework

To evaluate their understanding and to help the student revise and implement the new learnt concept ensure to provide them with homework. Students should perform one or two of the questions mentioned above or from the textbook exercises with the teacher in Class and the remaining may be given for homework. Also, ensure that the student knows their special skills linked to independently using their accessible books as it will be critical to doing homework independently.

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