# Vision Empower & XRCVC Teacher Instruction KIT ADDITION

Syllabus: Karnataka State Board Subject: Mathematics Grade: III Textbook Name: Mathematics Textbook cum Chapter Number & Name: 3, Addition

# **1. OVERVIEW**

# 1.1 OBJECTIVE AND PREREQUISITES **Objective**

Students will be able to:

- solve addition problems expressed in different situations presented through stories.
- use place value in the standard algorithm of addition.
- add three-digit numbers without borrowing and with borrowing.
- solve problems in addition shown through stories for various situations.
- construct/frame addition problems.
- estimate the sum of 2 given numbers not exceeding 99.

#### **Prerequisite Concept**

• Addition of two-digit numbers, the concept of place value. *TIK\_MATH\_G2\_CH3\_Addition* 

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Kindly Note: Activities marked with \* are mandatory

#### **OVERVIEW**

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# 2. LEARN

# 2.1 KEY POINTS

- 1. Number added is 'addend' Ex: 825 addend
- 2. The number to be added is 'addendum + 112 addendum
- 3. Answer after adding is 'sum'
- 4. When estimating to tens place, observe the number in unit place.
- 5. If the number in units place is less than 5, estimate it to the previous tens place.
- 6. When the number in units place is 5 or more than 5, estimate it to its next tens place

## 2.2 LEARN MORE

- 1. Addition can be done in two ways: the expanded form and the short method.
- 2. In the expanded form, the addends are broken down into the value of each digit before performing addition.
- 3. In the short method, the addends have to be written in column form before addition can be done. The ones are added first followed by the tens for 2-digit addends and then the hundreds for 3-digit addends.

# **3. ENGAGE**

**3.1 INTEREST GENERATION ACTIVITY** 

## Addition of two-digit numbers

#### Activity 1: Addition of two-digit numbers

*Materials Required*: Braille- place value cards( units (1 to 9), tens ( 10 to 100)). *Prerequisites:* Place value

### Activity Flow

- Tell the following story to the students. Story: Nitish and Manish went to a fruit shop along with their mother. Nitish: Mother, I like orange. Manish: Mather, I like watermelon. Mother brought orange for 45 rupees and watermelon for 52 rupees. How much do they need to pay to the shopkeeper?
- 2. Get the replies from the students and ask how did they add the numbers?
- *3. If the child cannot explain, prompt them to partition and recombine using place value cards.* 
  - Example: 45 means 40 tens and 5 ones 52 means 50 tens and 2 ones
- 4. Ask the child to organise the two-digit numbers shown on the place value cards into a vertical format:
  - 40 5
  - 50 2
- 5. Now ask them to add the ones together and tens together and to write the answer using the place value card in the vertical format.
  - 40 5
  - 50 2
  - 90 7

*Recombine* 90 + 7 = 97.

- 6. Now give three two-digits numbers and ask them to follow the same process to find the answer. Add 23+42+19
- 7. Encourage the child to show their total using place value cards, talking through the process of partitioning each number into a multiple of ten and a unit's part, totaling the tens and units parts and recombining.

# Activity 2: Addition of two-digit numbers (Alternative method)

*Materials Required*: Place value blocks *Prerequisites:* None

# Activity Flow

- 1. Encourage the student to use the place value blocks for the above story which is in Activity 1.
- 2. Recall the ones, tens and hundreds to the children.
- 3. Ask the students, in 45 how many ones and tens are there? Answer: 4 tens and 5 ones. Ask them to keep 4 tens (4 towers) and 9 ones (9 units).
- 4. Similarly, for 52, 5 ten's (5 towers) and 2 ones.
- 5. Ask them to add the one's cube (5 + 2 = 7) then ask them to add the towers (4 + 5 = 9). Totally 9 towers and 7 cubes so, the answer is 97 (9 tens and 7 ones).

# **3.2 CONCEPT INTRODUCTION ACTIVITIES**

# Place value board

# Activity 1 - Place Value board

*Materials Required:* Cardboard, textured paper ( 3 different types) *Prerequisites:* None

# Activity Flow

1. Place a large piece of cardboard. Place three varying textured papers on top of cardboard to create a tactile place value board. Each textured space represents a place value.

OR

2. Place value board - Take the A4 size cardboard sheet, divide the sheet into 3 cells (mark the dividing line in Fevicol), at the bottom draw a horizontal line to place the answer in the respective cell. Tell them the rightmost cell is unit, the middle one is 10's place and the leftmost cell is hundreds place.

Note: Students can use this place value board for all the activities.

# Addition of three-digit numbers

# Activity 1 - Addition without carrying

*Materials Required:* Number cards and place value board or place value block. *Prerequisites:* Addition of 2 three-digit numbers.

#### Activity Flow

- 1. In order to construct a treehouse, Charlie and his father need more wood planks. Charlie collected 102 wood planks from the nearby forest and his father collected 232 wood planks. Totally how many wood planks they have?
- To find the answer, ask the students to write 102 on the place value board using number cards/ place value blocks.
   109 Ask how many hundred, tens and ones it has? It has 1 hundred, 0 tens and 2 ones. Ask them to place respective cards in its respective places on the place value board.
- 3. Similarly, ask them to write 232 below the first-row number (102) on the place value board in its respective places.

(Orient them which stands for ones, tens and hundreds)

- Н Т О
- 1 0 2
- + 2 3 2

Things to remember:

- a. Place the numbers according to their place value vertically.
- 4. Ask them to do the following steps one by one.

Step 1: add the numbers in units place (2+2=4). Place 4 in the units place.

Step 2: add the numbers in tens place (0+3=3). Place 3 tens in ten's place.

Step 3: add the numbers in hundreds place (1+2=3). Place 3 in hundreds place. Therefore, the sum of 102 and 232 = 334.

H T O 1 0 2 + 2 3 2 3 hundred 3 tens 4 ones

5. After practicing a few problems using the place value board, ask them to write the numbers according to place value and practice addition without using the place-value board.

Note: Tell them, first they have to add the ones, then the tens and then the hundred's. (moving from rightmost to the leftmost).

Using the same steps, ask the children to solve the same type of problems in the braille book.

## Activity 2: Addition - Story

*Materials Required:* Place value board, Braille or tactile number cards. *Prerequisites:* Concept of place value.

## Activity Flow

1. Tell the following story to the students. Story:

Once upon a time, a snake had arranged a party for all the animals to whom it was giving trouble. It invited all the families of rats, frogs and hens. When the animals came to know the decision of the snake, they did not believe as many were troubled by him so they together refused the snake's invitation. The snake was disappointed "It requested all the animals again and again and said while coming, count your numbers while going back and count your numbers again. I do not trouble you anymore. I am telling you the truth, believe me, please fulfil my ambition". All of them agreed with the words of the snake. A big green frog took responsibility to take all the rats, frogs and hens. It also promised to bring 200 members back. Before going to the snake, the big green frog counted the members. After coming back it again counted them. Rats-46, hens-37, frogs-109.

- 2. Now, tell the children, let us see the total number of frogs and rats who came back from the snake's house.
- Ask the students to write the number of frogs and rats in the place value board.
   For example, 109 frogs, it has 1 hundred, 0 tens and 9 ones. Ask the students to place 1 in the hundred cell, 0 in the ten's cell, 9 in the one's cell. Similarly, for 46- rats.
   Now ask them to add the one's together, tens together and hundred's together

	1 hundred	4 tens	16 ones
+	0	4	6
	1	0	9
	Н	Т	0

- 4. Since in one's place, we can have only a single-digit number. If we add 9 and 7, we get 16 which is a two-digit number. In 16 we have one ten and 6 one's so, move one ten to the tens place. Therefore we get 1 hundred 5 tens and 6 ones. Therefore the total number of frogs and rats = 156
- 5. Now ask them to add the total of frogs and rats to the number of hens. Ask them to think that Green frog has told the snake that they were 200 members coming to its house. Are they 200 now?

#### Activity 3: Addition- with carryover

*Materials Required*: Number cards and place value board or place value block. *Prerequisites:* Addition of 2 three-digit numbers.

Activity Flow

- 1. Ask the following questions and discuss the answers with the students.
  - a. What is addition?
  - b. What is sum?
  - *c.* How will you add 34 + 32? Expected answer: adding one's together and ten's together.
  - d. When I say add, what comes to your mind? Will my total go up or come down.
  - e. What are the rules that I need to follow when I add any two numbers?
- 2. Ask the students to add 466 and 176? Tell them to add the one's, ten's and hundred's separately using a place value board.

step 1: ask them to write the numbers on the place value board.

- Н Т О
- 4 6 6
- <u>1 7 6</u>

step 2: add the ones, add the tens and then add the hundred's

	5 hundred	13 tens	12 ones
+	1	7	7
	4	6	6
	Н	Т	0

- 3. Since in one's place, we can have only a single-digit number. If we add 6 and 6, we get 12 which is a two-digit number. In 12 we have one ten and 2 ones so move the ten to its respective place and keep the 2 in one's place.
- 4. In ten's place, we already have 13 (tens) now there is 1 more ten so the total number of tens = 14.

	5 hundred	13 + 1 = 14 tens	2 ones
+	1	7	7
	4	6	6
	Н	Т	0

5. In the tens place, again we have a two-digit number which is 14 (10 + 4 = 14). 10 ten's make 1 hundred so in 14, we have 1 hundred and 4 tens. Move 1 hundred to its respective place and keep the 4 ten's in ten's place.

	Η	Т	Ο
	4	6	6
+	1	7	7

5+1=6 hundred 4 tens 2 ones

- 6. Add the hundreds together (4 + 1 + 1 = 6)
- 7. Therefore we get 6 hundred 4 tens and 2 ones. Therefore the total = 6 4 2.

### Activity 4: Addition- with carryover (Alternative Method)

*Materials Required*: Number cards/ place value blocks and place value board. *Prerequisites:* Addition of 2 three-digit numbers.

Activity Flow

Recall: Tower is ten.

Flat denotes hundred.

- 1. Encourage the children to form the number using place value blocks and ask them to add the one's, while doing so, ask them the total number of ones.
- 2. Adding 6 and 6 gives 10. Since 10 ten is a two-digit number so, move it to the tens place. Move all the ones and take one ten tower and add it in the tens tower.
- 3. What are the two numbers in your tens place? Ask them to add 6, 7 and 1. When they add these three numbers they will get 14 (10 + 4). 10 towers make 1 flat 1 hundred) so ask them to remove 10 towers and replace it with a flat (1 hundred). Now ask them to add the hundreds (4 + 1 + 1 = 5 hundred). Therefore total = 6 hundred 4 tens and 2 ones that is 6 hundred forty-two.

## Estimations

#### Activity 1: Addition - Estimation

*Materials Required:* Number cards and place value board. *Prerequisites:* Addition of 3 three-digit numbers.

## Activity Flow

1. Ask the following questions to the children, whoever gives the answers first give a point or clap for them as a reward.

Questions:

- a. Meena bought 5 pens and her sister brought 10 pens. What is the total number of pens? is it more than 20 or less than 20?
- b. In a basket, there are 53 mangoes and 32 in another basket. How many mangoes are there in these two baskets? Is it more than 100 or less than 100?
- c. In a moving train. These are 116 passengers in coach-numbers C-1 and 130 passengers in coach C-3. What is the total number of passengers travelling in two coaches? Is it more than 200 or less than 200?
- 2. Ask the students, is estimation important if yes, why it is important?

Estimation: Estimation is finding a number that is close enough to the right answer. We are not trying to get the exact right answer. Estimation helps us understand what range the expected answer should be.

3. Play a simple estimation game with the students.

Game:

- a. How many times you can clap your hands in 30 seconds. Ask the estimated count. Tell the children that they are going to find the actual count. Start the stopwatch; give the go command to start claps and the stop command to end the claps. And ask the actual count of the number of claps.
- b. How many times can you stand and sit in 30 seconds? Ask the estimated count and do the same process as mentioned above.
- c. Discuss the nearest estimated values with the students.

# Activity 2: Round off

Materials Required: Tactile number line from 10 to 20. Prerequisites: None

## Activity Flow

1. When we buy things from a local shop and if we don't have the exact change then the shopkeeper will round off the values to its nearest ten. (Give the following example or share any of your experiences).

For example, yesterday I brought vegetables for 103 rupees; I had only 100 rupee notes so the shopkeeper asked me to pay 100 only.

Ask the children, what did the shopkeeper do? He rounded off the values to the nearest ten. Even if we buy anything for 99 rupees, we give 100 rupee notes instead of giving the exact 99 amount to the shopkeeper. In both the scenarios, the amount was rounded off to its nearest ten.

- 2. Estimate means rounding off the number to the nearest 10. There are a few things we always need to remember while doing estimation.
- 3. When estimating to tens place, observe the number in unit place. If the number in units place is less than 5, estimate it to the previous tens place. When the number in units place is 5 or more than 5, estimate it to its next ten places.
- 4. Give a tactile number line from 10 to 20 or tactile number card from 10 to 20 (ask them to arrange in a straight line in ascending order. Ask them to mark the middle number; the digit 5 in the unit place is the middle number between any two tens.
- 5. The number 11,12,13 and 14 which are towards the left side of 15 and near to 10. Therefore the nearest ten and estimated value for 11, 12, 13 and 14 is 10. Similarly, for 21, 22, 23, 24 the nearest ten is 20.

- 6. The numbers 16,17,18,19 are towards the right side of 20 and nearer to 20. Therefore the estimated value of 16,17,18,19 is 20.
- 7. Discuss the following problems with the students.
  a. What is the ten's estimated value of 43?
  The number in units place is less than 5 therefore, the nearest ten is 40.
  (if the number in units place is less than 5 then write the number in tens place as it is then write '(Zero)' '0' in the units place. When '0' is written in units place after 4, it becomes 40.
  b. What is the ten's estimated value of 47?

The number in units place is more than 5. Therefore, the nearest ten is 50. (Add 1 to the number in tens place = 4+1=5 and write '0' in unit place. After 5, if '0' is

written in units place it becomes 50. Therefore the tens estimated value of 47 is 50.

### **Activity 3: Estimation - Sums**

*Materials Required:* None *Prerequisites:* Place value and the concept of round off

### Activity Flow

- 1. Discuss the nearest ten of the following numbers with the students.
  - a. For 46, the nearest ten is 50.
  - b. For 23, the nearest ten is 20
  - c. For 65, the nearest ten is 70.
- 2. Ask the students to estimate the sum of 46 and 23. Explain, they already know the nearest ten for 46 and 23 which is 50 and 20. Now ask them to add estimated numbers as usual. Therefore the estimated sum of 46 and 23 is 70.
- *3. Discuss the following example:*

Example: A farmer has grown 264 bunches of bananas in the plantation last year and this year 123 bunches of bananas. What is the total number of bunches of bananas grown by the farmer?

In 123, we have 1 hundred and in 264, we have 2 hundred so, totally the answer will be more than 3 hundreds.

Ask them to round off to the nearest ten and ask them to solve the problem. 264 - in unit place, the number is less than 5 so the nearest ten is 60. 123 - in unit place, the number is less than 5 so the nearest ten is 20.

Hundreds	Tens	ones
2	6	0
1	2	0

3	8	0
0	0	v

The estimated sum is 380.

#### Game

#### Activity 1 - Smallest possible number

*Materials Required:* Number cards *Prerequisites:* Addition of 3 three-digit numbers.

#### Activity Flow

- 1. Divide the students into pairs. Make groups, two pairs in a group.
- 2. Place the number cards face down in a pile.
- 3. The first pair must take three cards, look at them carefully and make the smallest three-digit number that they can. Then the other pair takes three cards and makes the smallest number that they can.
- 4. When each pair has made three three-digit numbers, each pair adds up their numbers as fast as they can.
- 5. When they are sure their calculation is right, they should write down their answer. The one who tells the right answer first will get a point. The one who scores the first 5 points will be the winner.
- 6. Encourage the children to remember to estimate first and check at the end.

#### 3.3 LET'S DISCUSS: RELATE TO DAILY LIFE\*

We all use addition in everyday applications whether we are aware of it or not. For example: To count objects, we use addition.

Adults use addition while buying vegetables while handling money while paying bills. Similarly, you will all use addition in many places. For example, while counting biscuits and chocolates. During birthdays, we all distribute sweets to our friends, If you have 20. Think about your birthday, your birthday consists of numbers and every year you add one.

#### 4. EXERCISES & REINFORCEMENT

4.1 PRACTICE AND EXERCISES

#### **Activity 1: Addition**

Materials Required: Place value table Prerequisites: None

1. Write the following number in place value table and add:

- a. 500 + 301
- b. 372 + 345
- *c.* 411 + 299
- d. 362 + 428
- 2. Find the estimated sum for the following:
  - a. 62 and 23
  - b. 29 and 47

# **References:**

- 1. National Stem Center Primary. *Addition and Subtraction.* Retrieved from <u>https://www.stem.org.uk/elibrary/resource/29225</u>.
- PATHS TO LITERACY. Teaching place value using a tactile graphical organizer. Retrieved from <u>https://www.pathstoliteracy.org/strategies/teaching-place-value-using-tactile-grap</u> <u>hical-organizer</u>

## 4.2 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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