

DEPARTMENT OF SCHOOL EDUCATION

# **CBA PRACTICE MATERIAL**





STATE COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING (SCERT)



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## **Objective of the material:**



To enhance mathematical understanding and address low-performing skills and misconceptions identified through 2023-24's classroom-based assessments (CBA) scores.

The intervention will utilize a structured "CBA Practice Material" following a targeted three-stage approach: LEARN, PRACTICE, ASSESS.

## What is a misconception?

A misconception is a misunderstanding of a mathematical concept, often due to **incorrect or missing knowledge**. Example: Students misunderstand the concept of grouping hundreds, tens, and ones leading to issues in solving place value problems.

## Why do misconceptions happen?

Students tend to develop misconceptions due to several factors. Some of these factors include:

- Concrete to Abstract Transition: When students move from hands-on objects (e.g., counting blocks) to abstract (e.g., numbers, algorithms) without appropriate support, they can form gaps in their understanding, leading to misconceptions.
- Cognitive Development Stages: At different developmental stages, children may not be ready to grasp certain abstract concepts fully, leading to misconceptions.
- Lack of Real-world Application: Difficulty in connecting math concepts to everyday life can lead to misconceptions.
- Lack of Practice and Reinforcement: Repetition and practice of the concept are crucial for building understanding, and without them, misconceptions can become ingrained.

## What is the difference between misconceptions and mistakes in Mathematics?

Misconception	Mistake		
A misconception is a misunderstanding of a mathematical concept, often due to <b>incorrect or missing knowledge</b> .	A mistake is an <b>error in calculation or</b> <b>judgment</b> that happens <b>accidentally</b> despite having the correct knowledge.		
A misconception often stems from <b>incorrect prior knowledge</b> .	A mistake might result from a <b>lapse in</b> attention or calculation.		
A misconception requires <b>re-teaching, and</b> <b>re-learning of the conceptual understanding</b> to fix it.	A mistake is <b>temporary</b> and can be <b>corrected immediately</b> .		
For example: Students think that a fraction with a bigger denominator is always bigger. Therefore, they say $\frac{1}{5}$ is greater than $\frac{1}{2}$ because 5 is bigger than 2.	For example: A student wrote that the equivalent fraction of $\frac{3}{4}$ is $\frac{6}{7}$ . Here the student did 3x3 instead of 4x2 in the denominator by mistake.		

## How to use this material?



This material contains identified misconception based on the students' CBA scores 2023-24. The misconception can be resolved through three carefully designed components—videos, practice activities, and MCQ-based assessment.

#### **Teacher preparation:**

- Read the sample question and understand the misconception well. It is for you to understand the misconception and is not intended for the student.
- After that, watch the video, and read the activity and MCQ questions to familiarize yourself with the sequence and flow of the content. This will help you utilise the material with the students effectively.

#### **Teacher action:**

- Assign 2 periods in one week to complete this weekly practice material.
- Each component of the material should be completed in the below sequence.



Step 1 (LEARN) Video: 6-7 minutes (followed by 5-7 minutes of discussion)

- Show the YouTube video provided to introduce the concept. The video will provide conceptual understanding, ensuring students can grasp the concept effectively.
  Discuss the questions provided to concelidate learnings from the video.
- Discuss the questions provided to consolidate learnings from the video.



#### Step 2 (PRACTICE) Activity: 30-35 minutes

Conduct the activity provided to address the misconception and allow students to practice the concept.

#### Step 3 (ASSESS) Question Bank: 15 minutes



- Write the questions from the question bank on the board and ask the students to solve the same in their notebooks.
- □ In case of the availability of a smart TV, the questions can also be displayed.

## Teacher week-wise action plan

- To address multiple misconceptions in grade 4, you will **receive teaching material every** week that must be **completed within the same week**.
- Here is the schedule of the material that you will receive-

18 - 21,	24 - 28,	03 - 07,	10 - 14,	17 - 21,	24 - 28,
February	February	March	March	March	March
CBA	CBA	CBA	CBA	CBA	CBA
Practice	Practice	Practice	Practice	Practice	Practice
Material	Material	Material	Material	Material	Material
1	2	3	4	5	6



Chapter Name : Large numbers Chapter Number : 2 Number of periods : 2

## Understanding students' misconceptions

Let's analyze the misconception that led students to choose the wrong answer.

#### **QUESTION:**

• Look at the digits given below.



Use the digits given above to form the smallest 4-digit number. (Use each digit only once.)

A. 3850 B. 3508 C. 0358 D. 3058

#### **ANSWER ANALYSIS:**

- Correct option: Option D
  - **Reason:** The smallest digit 0 cannot be in the first place since the number will no longer be a 4-digit number, so the next smallest digit 3 comes first, followed by 0, 5, and 8 in ascending order.
- Common incorrect answer: Option C www.apteachers.in
  - **Incorrect Option Reason:** Students may also choose option C because they feel we have to start with the smallest digit to make the smallest number.

#### **MISCONCEPTION DESCRIPTION:**

We can conclude that **students often misunderstand that zero cannot be placed at the beginning of a number when forming the smallest possible value**, leading to the incorrect assumption that zero can be used as the leading digit.



1. The videos can be accessed either by scanning the following QR code or by clicking on the link.



(Note: Start the video from 2:13) https://youtu.be/ar4TtrFC6bl?si=xoBdnK2JIdW336Ek&t=131

- 2. After watching the video, ask the following questions to summarise the student's understanding of the video content. Some sample questions that you could ask are-
  - What did you watch in the video?
  - □ What examples were used in the video to explain the topic?
  - □ Can you give a different example of what you saw in the video?



#### **Objective:**

Students will be able to:

- Explain why zero cannot be the leading digit when forming the smallest number from given digits.
- Apply the rule by arranging digits to create the smallest number with zero.



- Flashcards with single-digit numbers (including zero).
- A whiteboard or chart paper.

#### **Activity Instructions:**

#### 1. Introduction:

- $\Box$  Write a few examples on the board, such as "0, 3, 5" and ask:
  - "If you have these digits, what is the smallest number you can form?"
- □ Note down all responses, including the accepted ones like "035."

#### 2. Hands-On Activity:

- Divide students into small groups and give each group a set of flashcards with digits (e.g., 0, 2, 4, 6).
- □ Ask each group to arrange the cards to create the smallest number.
- □ Monitor their responses and check if they use zero as the leading digit.
- Provide more digit sets and have students practice forming the smallest numbers. Examples:
  - $\succ$  Digits: 0, 1, 8  $\rightarrow$  Smallest number: 108.
  - > Digits: 0, 3, 9  $\rightarrow$  Smallest number: 309.
- □ Encourage peer correction for reinforcement.
- □ Use a more complex set of digits, e.g., 0, 2, 5, 8. Ask students to form the smallest number and discuss their thought process.

#### 3. Discussion and Reflection:

Explain:

"A number cannot start with zero because it wouldn't make sense as a whole number. For example, 035 is the same as 35."

Demonstrate by removing the leading zero in their incorrect answers and showing how the number changes.

## **D** QUESTION BANK

- Using the digits 7, 3, 0, and 5, what is the greatest 4-digit number?
  - a) 7530
  - b) 7053
  - c) 0753
  - d) 5730
- 2. Using the digits 7, 3, 0, and 5, what is the smallest 4-digit number?
  - a) 3057
  - b) 0573
  - c) 5037
  - d) 3075
- 3. Using the digits 2, 1, 4, and 0, what is the greatest 4-digit number?
  - a) 0412 www.apteachers.ln
  - b) 4210
  - c) 4201
  - d) 4120
- 4. Using the digits 2, 1, 4, and 0, what is the smallest 4-digit number?
  - a) 1024
  - b) 1240
  - c) 0124
  - d) 1042
- 5. Using the digits 9, 0, 8, and 6, what is the greatest 4-digit number?
  - a) 9860
  - b) 9608
  - c) 0986
  - d) 9680



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## **Correct Answers:**

a) 7530
 a) 3057
 b) 4210
 a) 1024
 a) 9860

