Step by step guide_Median

Pre-Class Preparation

- Prepare group assignments (4-5 students per group).
- Have chart paper and markers ready.
- Prepare number cards (1-100) for physical arrangement activities.
- Have calculators available.
- Write anchor activity data on the board or prepare handouts.
- Prepare worked examples on cards or slides.

Phase 1: Problem-Solving and Discovery (15 minutes)

[0-2 minutes] Introduction

[SAY] "Good morning! Today we learn about the MEDIAN - the middle value of a dataset."

[SAY] "You already know the MEAN (average). Today's measure is different!"

[ASK] "If I line up all students by height, who would be in the middle? That person represents the MEDIAN height!"

[2-3 minutes] Group Formation

[DO] Divide students into groups of 4-5.

[DO] Distribute chart paper and markers.

[3-5 minutes] Explain the Activity

[SAY] "Here are marks from 15 students in a math test."

[WRITE on board] "45, 78, 56, 90, 67, 82, 54, 88, 73, 60, 95, 80, 70, 85, 68"

[SAY] "Your task: (a) Arrange in order, (b) Find the median, (c) Explain what it means. You have 10 minutes."

[5-13 minutes] Group Work

[DO] Circulate among groups, observing their strategies.

[LISTEN] to how they arrange the data.

[ASK] "Why are you arranging the numbers?"

[ASK] "How will you find the middle value when there are 15 numbers?"

[DO] Guide groups struggling with counting positions.

[ASK] "What does this middle value tell us about the class performance?"

[13-15 minutes] Group Sharing

[SAY] "Group 1, what order did you arrange the marks?"

[LISTEN] Students say: 45, 54, 56, 60, 67, 68, 70, 73, 78, 80, 82, 85, 88, 90, 95

[WRITE] the ordered list on the board.

[SAY] "Group 2, what is the median?"

[LISTEN] Students say: 73

[ASK] "How did you find 73?"

[LISTEN] Students explain: It's the 8th value, the middle one.

[SAY] "Excellent! The median is 73. Half the students scored below 73, half scored above."

Phase 2: Structured Instruction (10 minutes)

[15-17 minutes] Define Median

[SAY] "The median is the MIDDLE VALUE of a dataset."

[WRITE] "Median = Middle Value"

[SAY] "Critical rule: Data must be arranged in order FIRST!"

[17-20 minutes] Case 1: Odd Number

[SAY] "When you have an ODD number of values, the median is easy - it's the middle one!"

[WRITE] "Odd number → Middle position = (n + 1) / 2"

[EXAMPLE] "For 15 students: Position = (15 + 1) / 2 = 8th value"

[SAY] "Count to the 8th position: 45, 54, 56, 60, 67, 68, 70, 73. The median is 73!"

[20-23 minutes] Case 2: Even Number

[SAY] "When you have an EVEN number of values, there are TWO middle values!"

[SAY] "We take the AVERAGE of those two middle values."

[WRITE] "Even number → Median = (Middle 1 + Middle 2) / 2"

[EXAMPLE] "For 6 values: 12, 13, 14, 15, 15, 16"

[SAY] "The two middle values are 14 and 15 (positions 3 and 4)."

[WRITE] "Median = (14 + 15) / 2 = 14.5"

[23-25 minutes] What Median Tells Us

[SAY] "The median shows the TYPICAL or MIDDLE value."

[SAY] "Half the data is below the median, half is above."

[SAY] "Unlike the mean, the median is NOT affected by extreme values!"

Phase 3: Practice and Application (15 minutes)

[25-32 minutes] Worked Example 3.1.27 (Student Ages)

[SAY] "Example: Ages of 6 students are 12, 15, 14, 13, 16, 15. Find the median."

[DO] Work through together:

[WRITE] "Step 1: Arrange in order: 12, 13, 14, 15, 15, 16"

[WRITE] "Step 2: Count = 6 (even number)"

[WRITE] "Step 3: Two middle values = 14 and 15 (positions 3 and 4)"

[WRITE] "Step 4: Median = (14 + 15) / 2 = 14.5"

[ASK] "Why do we average the two middle values?"

[LISTEN] Students explain: Because there's no single middle value.

[SAY] "Correct! When there are two middle values, we find their average."

[32-37 minutes] Worked Example 3.1.28 (Goals Scored)

[SAY] "Example: Goals scored in 20 matches: 2, 3, 1, 4, 2, 5, 3, 2, 4, 1, 3, 2, 4, 5, 3, 2, 1, 4, 3, 2"

[DO] Guide students:

[WRITE] "Step 1: Arrange: 1, 1, 1, 2, 2, 2, 2, 2, 2, 3, 3, 3, 3, 3, 4, 4, 4, 4, 5, 5"

[WRITE] "Step 2: Count = 20 (even)"

[WRITE] "Step 3: Middle positions = 10th and 11th"

[DO] Count together to find 10th value = 3, 11th value = 3

[WRITE] "Step 4: Median = (3 + 3) / 2 = 3"

[ASK] "What does median = 3 tell us?"

[LISTEN] Students say: Typical number of goals is 3.

Phase 4: Assessment (5 minutes)

[37-40 minutes] Exit Ticket Review

[SAY] "Question 1: Find median of 50, 30, 10, 40, 20"

[DO] Quick check: Arrange → 10, 20, 30, 40, 50 → Median = 30

[SAY] "Question 2: Goals in 6 matches: 2, 3, 1, 4, 2, 5"

[DO] Arrange → 1, 2, 2, 3, 4, 5 → Median = (2 + 3) / 2 = 2.5

[SAY] "Remember: Always arrange first, then find the middle!"

[DO] Collect exit tickets.

Teaching Tips

- Emphasize "arrange first" - this is the most common error.
- Use physical objects (cards, students) to demonstrate ordering.
- Connect to real life: "If we line up by height, who's in the middle?"
- Stress the difference: Mean is affected by outliers, median is not.
- Use Kenyan contexts: exam scores, pocket money, goals scored.
- Always verify: Count positions carefully to avoid errors.

Common Student Errors to Watch For

- Not arranging data in order before finding median.
- Confusing median with mean (average).
- For even numbers: taking only one middle value instead of averaging two.
- Miscounting positions when finding the middle.
- Thinking median must be a value in the dataset (not true for even numbers).
- Not understanding that median represents the "typical" middle value.