The Pattern Detectives: Place Value Power & Skip Counting Secrets

Lesson Overview

Target Audience: 3rd Grade (9-year-olds) / Small Group Intervention

Duration: 30 Minutes

Learning Objectives:

- Students will identify and describe horizontal and vertical patterns in a choral counting grid.
- Students will explain the role of zero as a placeholder when skip counting moves across place value columns (e.g., from tens to hundreds).
- Students will represent skip counting patterns using multiplication notation (e.g., 4 groups of 20 = 4 × 20).

Materials Needed

- Large chart paper or a dry-erase board
- Markers in at least three different colors (to highlight patterns)
- Individual "Pattern Detective" grids (blank 5x5 tables)
- Sticky notes for "Prediction Stations"
- Number line (0–500) displayed horizontally

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1. Introduction: The Hook & The Circle (5 Minutes)

The Hook: "Detectives, today we aren't just counting; we are code-breakers. Numbers follow strict laws, and if we find the patterns, we can predict the future without even doing the math!"

Routine: Counting Around the Circle (Inspired by Jessica Shumway)

- **I Do:** "We are going to count by 20s around our circle. I'll start at 0. If there are 8 of us, I wonder what the last person will say?"
- **We Do:** Count around the circle. 0, 20, 40, 60... When you hit 100, pause.
  - *Prompt:* "We just hit 100. What happened to our digits? Why did we suddenly need three columns instead of two?" (Focus on the placeholder zero).
- **Rigorous Twist:** "If we went around the circle a second time, would the last person say double their first number? Why or why not?"

2. Body: Choral Counting & Pattern Mapping (15 Minutes)

The Routine: Choral Counting

- **Step 1 (I Do):** "Let's record our count by 25s on this grid. We will write 4 numbers per row."
  Write: 25, 50, 75, 100.

- **Step 2 (We Do):** Continue the count: 125, 150, 175, 200.
  - **Look Horizontally:** "What do you notice about the ones place in this row? (5, 0, 5, 0). Why does it do that?"
  - **Look Vertically:** "Look at the first column (25, 125, 225). What is changing? What is staying the same?"
- **Step 3 (The Multiplier Connection):**
  - Point to the 4th number (100). "This is our 4th jump. In math language, we call this 4 groups of 25. We write it as **4 × 25 = 100**."
  - Point to the 8th number (200). "This is 8 groups of 25. **8 × 25 = 200**."
  - *Challenge:* "If 4 groups of 25 is 100, what would 40 groups of 25 be? How does the zero placeholder help us write that giant number?"

3. Guided Practice: The "Zero" Investigation (5 Minutes)

Activity: Placeholder Hunt

- Ask the students to look at the number 200 on the grid.
- "If I take away these two zeros, I just have 2. Is 8 groups of 25 equal to 2? No! So, what are those zeros actually doing?"
- **Goal:** Guide students to say that the zeros are 'holding the place' for the tens and ones so the 2 can stay in the hundreds place. This connects skip counting directly to place value growth.

4. Conclusion: Recap & Exit Ticket (5 Minutes)

Recap:

- "Today we saw that skip counting is just multiplication in slow motion."
- "We learned that patterns move in two directions: across rows and down columns."

Summative Assessment (Exit Ticket): "On your sticky note, look at this pattern: 50, 100, 150, ____. 1. What is the next number? 2. Write it as a multiplication problem (e.g., 4 jumps of 50). 3. Circle the placeholder zero that shows we have no 'extra' ones."

Differentiation Strategies

- **Scaffolding (Struggling Learners):** Use a pre-marked number line to visualize the jumps before writing them in the grid. Focus on counting by 10s instead of 25s to see the placeholder change more frequently.
- **Extension (Advanced Learners):** Ask them to predict the 12th number in a sequence without writing the middle steps. Have them explain the relationship between the 4th column and the 8th column (doubling).

Success Criteria

- Learner can successfully predict the next number in a skip-counting sequence involving hundreds.
- Learner can point to a zero in a number like 300 and explain that it means there are "zero tens" or "zero ones."

- Learner can translate "6 jumps of 20" into the notation "6 × 20."