Step-by-Step Presentation Script

Forming Quadratic Expressions in Real-Life

Pre-Class Preparation

- Chart paper and markers for each pair
- Calculators
- Prepared examples on board or chart
- Area model diagrams or algebra tiles (optional)
- Anchor activity handouts

Minutes 0-2: Introduction

[SAY] Good morning! Today we're learning how to form quadratic expressions from real-life situations.

[DO] Draw a simple rectangle on the board.

[ASK] If this rectangle has length 5 and width 3, what's the area? [15]

[SAY] But what if we don't know the exact measurements? What if they involve a variable like x? That's where quadratic expressions come in!

Minutes 2-17: Anchor Activity

[DO] Divide class into pairs. Distribute anchor activity handouts.

[SAY] Work with your partner on these three situations. For each one, form an expression and expand it.

Situation 1: School Garden (5 minutes)

[WRITE] On board: Width = x, Length = x + 4

[DO] Circulate. Ask: How do we find area? What does $(x)(x + 4)$ give us?

Situation 2: Number Puzzle (4 minutes)

[ASK] If one number is x, what's the next consecutive integer? [x + 1]

[DO] Guide pairs to write $x(x + 1)$ and expand

Situation 3: Square Courtyard (4 minutes)

[ASK] How do we find the area of a square? [Side × Side]

Pair Sharing (2 minutes)

[DO] Call on 2-3 pairs to share one situation and their expanded expression.

[WRITE] Record student answers on board: $x^2 + 4x$, $x^2 + x$, $x^2 + 10x + 25$

Minutes 17-27: Structured Instruction

[SAY] Excellent work! Notice that all your answers have x^2. That's what makes them quadratic expressions.

[WRITE] On board: When Do We Get Quadratic Expressions?

- 1. Multiplying two linear expressions
- 2. Calculating areas with variable dimensions
- 3. Products of consecutive numbers

[SAY] Let me show you the 5-step process for forming quadratic expressions.

[WRITE] On board: 5-Step Process

- Step 1: Identify the variable
- Step 2: Write expressions for quantities
- Step 3: Multiply the expressions
- Step 4: Expand and combine like terms
- Step 5: Write in standard form: $ax^2 + bx + c$

[SAY] Standard form means we write it as $ax^2 + bx + c$, where $a \neq 0$.

Minutes 27-37: Worked Examples

Example 1: Rectangular Garden (5 minutes)

[WRITE] Problem: Length = $(x + 4)$ m, Width = $(x + 1)$ m. Find area.

[SAY] Step 1: Variable is x. Step 2: We have our expressions. Step 3: Multiply.

[WRITE] Area = $(x + 4)(x + 1)$

[DO] Expand together: $x^2 + x + 4x + 4 = x^2 + 5x + 4$

[ASK] Is this in standard form? [Yes! a=1, b=5, c=4]

Example 2: Consecutive Integers (5 minutes)

[WRITE] Problem: Product of two consecutive integers

[ASK] If first integer is x, what's the next? [x + 1]

[WRITE] Product = $x(x + 1) = x^2 + x$

[SAY] Notice: a=1, b=1, c=0. We can still have c=0 in a quadratic!

Individual Practice (5 minutes)

[DO] Students work on 2-3 similar problems independently

Minutes 37-40: Exit Ticket
[DO] Distribute exit ticket with 5 problems

[SAY] Complete individually. Show all steps. Write answers in standard form.

[DO] Collect exit tickets. Quick review if time permits.

Teaching Tips
- Use area models or algebra tiles for visual learners
- Emphasize the connection between multiplication and area
- Stress that x^2 comes from multiplying x by x
- Connect to real Kenyan contexts (shamba sizes, building plots)
- Allow calculators for verification with specific values
- Remind students: $a \neq 0$ for quadratics

Common Student Errors
- Forgetting to multiply all terms (missing middle terms)
- Not combining like terms correctly
- Confusing expressions with equations (no = sign in expressions)
- Writing $(x + 3)(x + 2) = x^2 + 6$ (forgetting middle term)
- Not writing in standard form (terms out of order)
- Thinking all quadratics must have all three terms (c can be 0)