Class 3 Mathematics: The Mathematician's Garden

Materials Needed:

- A large piece of cardboard or poster board (the "garden plot")
- Several smaller pieces of coloured paper or cardboard (for "garden beds")
- A ruler and pencil
- Scissors
- String or yarn (for "fencing")
- Glue or tape
- Graph paper (optional, for planning)
- Natural items like small pebbles, twigs, and seeds (for decoration and "plants")
- "Garden Design Brief" (see below)

Lesson Plan & Activities

1. Introduction: The Story of the Empty Plot (10 minutes)

Goal: To introduce the concepts of perimeter and area in a meaningful, story-based context.

Begin by telling a story. It can be simple and tailored to H's interests.

> "Once, in a small village, there was a community that was given a beautiful, empty plot of land. The sun shone on it, the soil was rich, but it was empty. The village elder said, 'This land is for a garden that will feed us all! But first, we must be wise. We need to build a fence to keep the cheeky rabbits out, and we must figure out exactly how much space we have inside for our precious seeds to grow.' The villagers had a puzzle on their hands: How do you measure the outside edge for a fence, and how do you measure the flat space inside for planting? Today, you are the village's master planner, and this puzzle is yours to solve."

Discuss the two different kinds of measurement needed: one for the "edge" (perimeter) and one for the "space inside" (area). Introduce the formal terms if they haven't been used before, connecting them directly to the story: **Perimeter** is the rabbit fence, and **Area** is the growing space.

2. Main Activity: Designing the Garden (30-40 minutes)

Goal: To apply the concepts of perimeter and area by designing and building a model garden. This is a hands-on, creative task.

Step 1: The Design Brief

Present H with the "Garden Design Brief." This makes the task feel like a real-world project.

> **Garden Design Brief for Planner H**
>
> Your task is to design the perfect community garden. You have a main plot of land that is **30cm x 40cm**.
>
> Your garden must include:

1. **At least three rectangular garden beds.** You decide their size and where they go.
2. A **pebble path** connecting the beds.
3. A fence around **each individual garden bed** to protect the special plants inside.

For each garden bed you design, you must calculate:

- The **Perimeter** (how much string "fence" you will need).
- The **Area** (how much "growing space" it has in square cm).

Step 2: Planning & Calculating

Using a pencil and ruler (and graph paper for extra support), H should plan the sizes of the three garden beds. For example, they might design:

- A carrot patch: 10cm x 5cm
- A lettuce patch: 8cm x 8cm
- A tomato patch: 15cm x 6cm

Guide H to calculate the perimeter and area for each bed before cutting them out. Encourage talking through the process:

- **For Perimeter:** "To find the fence length, we need to add up all the sides. So for the carrot patch, that's 10cm + 5cm + 10cm + 5cm."
- **For Area:** "To find the growing space, we multiply the length by the width. So for the carrot patch, that's 10cm times 5cm."

Step 3: Building the Model

Once the calculations are done, the creative part begins!

1. Cut out the garden beds from the coloured paper to the exact dimensions planned.
2. Arrange and glue them onto the large cardboard "garden plot."
3. Measure and cut lengths of string to create the "fence" for the perimeter of each bed and glue it around the edges.
4. Use pebbles to create a path and place seeds or small twigs inside the beds to represent the plants.

3. Reflection & Extension (10 minutes)

Goal: To solidify learning and connect the mathematical activity to a sense of purpose and beauty.

Admire the finished garden model together. Ask reflective questions:

- "Which garden bed has the largest area (growing space)? Was it the one with the longest perimeter?" *(This can lead to interesting discoveries about shapes).*
- "If one packet of carrot seeds can cover 20 square cm, how many packets would you need for your carrot patch?"
- "What was the most challenging part of being the garden planner? What was the most fun?"

As a final step, H can draw a picture of the finished garden in their main lesson book, labelling one bed with its perimeter and area calculations. This serves as a beautiful record of their practical, mathematical work.

Differentiation & Support

- **For extra support:** Use graph paper where each square represents 1cm. This makes it easier to visualize area and count the perimeter. You can also provide pre-cut paper rectangles to start.
- **For an extension or challenge:** Introduce a budget. For example, "Fencing costs $2 per cm, and soil costs $1 per square cm. What is the total cost to build your garden?" Or, challenge H to design an L-shaped garden bed and figure out how to calculate its area and perimeter.