

Mission 1: Growing Patterns

Role: Pattern Tracker **Duration:** 50 minutes

Learning Intentions & Success Criteria

We are learning to:

- See that a growing pattern has a part that stays the same (constant) and a part that grows each step.
- Turn a growing pattern into a table of values.
- Write a simple rule for the pattern and use it to make a prediction.

Success criteria — I can:

- I can point out what stays the same and what grows in a pattern.
- I can fill in a table showing how a pattern grows day by day.
- I can write a rule for my pattern and use it to predict a future day.

Curriculum focus: Number & Algebra — growing patterns, tables of values, and an introduction to linear rules

Materials

- Pencil
- Coloured pencils (optional)
- Counters or dot stickers (optional)
- 5 large sheets of paper (optional, for the floor version below)

Lesson Flow & Scripted Questions

Use these prompts rather than explaining the maths yourself — let students reason first.

Stage	Ask students
Context	"Can you think of anything that grows a little bigger every day, every year, or every round?" "What always stays the same about it, even as it grows?"
Student Exploration (floor version, optional but powerful)	"Lay 5 sheets of paper on the floor for Day 0 to Day 4. Draw the pattern growing, live, as you tell a story about it. Ask: what do you notice growing? What's staying the same?"
Naming the Structure	"Which part of the pattern never changes?" "Which part is added on each day?" "How many new dots appear each day?"
Discussion	"If we know the constant and how much it grows by, could we work out any day without drawing it?"
Introduce the Maths	"We can write this as a short rule: $\text{Total} = (\text{growing amount} \times \text{day}) + \text{constant}$. What is our growing amount? What is our constant?"
Reflection	"Why is a rule more useful than drawing the pattern out every time?" "What did you learn about your own pattern in the Extension Challenge?"

Do Not Default To

- Starting with the rule (e.g. $S = 4 \times d + 1$) before students have seen the pattern grow and named the constant/growing parts themselves.
- Using 'x' and 'y' by default — 'd' for day and 'S' for size (or letters students choose themselves) keep the meaning attached to the maths.
- Drawing an example pattern for students in the Extension Challenge — the point is for them to invent their own, even if it's simple.

**Differentiation****Extra support:**

- Build the pattern physically with counters or dot stickers before filling in the table.
- Use a simpler rule for a first attempt, e.g. $\text{Total} = (2 \times \text{day}) + 1$.

Extension / mentor track:

- Give students a table of values only (no picture) and ask them to find the rule without being shown the pattern.
- Ask: which day does the pattern first pass 100? Can they work it out without building every day up to it?

**Adapting This Mission To Your Community**

- This mission is adapted from Chris Matthews' "Growing Patterns" exemplar in Teaching Mathematics from a Cultural Perspective (State of Victoria, Department of Education and Training, 2020), used under CC BY 4.0, and from the Goompi Model.
- Local Aboriginal and/or Torres Strait Islander art and design traditions often feature bold, repeating pattern work — if a local artist or Elder is willing, invite them to share how a pattern or design grows or repeats, rather than assuming or prescribing a design yourself.
- Let students' own answers to "what does this remind you of" guide any personal or cultural connection — don't assign one for them.

This mission uses a placeholder context. Please localise names, places, and any cultural knowledge in consultation with local Traditional Owners, Elders, or community members, and only include specific cultural knowledge that has been given permission to share.