

#### Topic: Patterns and algebra

#### Describing growing patterns

##### Lesson concepts

-  **Patterns** — Pattern/non pattern
-  **Patterns** — Describing patterns
-  **Patterns** — Spatial (nonlinear)
-  **Patterns** — Growing

Today students will:

- ▶ describe change in growing patterns
- ▶ create growing patterns.

#### Resources

##### Find and prepare

Sheet — Jumping kangaroo

Paper or plastic cups (or blocks)

Threading materials (for example: string, beads, pasta, cupcake papers, fruit or playdough balls to thread onto kebab sticks)

#### Key terms

growing pattern,  
repeating pattern

For definitions and explanations of terms, please see the [Glossary](#).

## Lesson

### Introduce the lesson

#### Note

It is important to highlight and develop the following vocabulary throughout this lesson.

bigger, change, colour, direction, expanding, growing pattern, increasing, more, number, repeating pattern, same, shape, size, start

### Describe growing patterns



- Show students the **Sheet** — [Jumping kangaroo](#).
- Explain that the kangaroo's movement has created a pattern.
- Ask students to look at and describe the pattern in the kangaroo's movement.

#### Focus questions

Q: *What did you notice about the kangaroo's jumps?*

A: They make a growing pattern.

Q: *How do you know that it is a growing pattern?*

A: The jumps get bigger each time.

Q: *What might the next jump look like?*

A: It would be bigger than the last one.

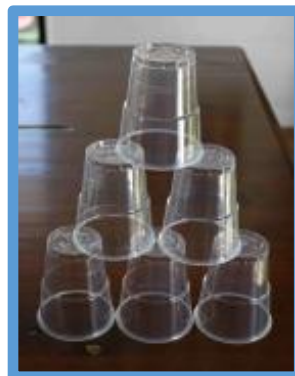
Q: *How could you use numbers to describe this pattern?*

A: For example: The first jump was very small, the second jump was a bit bigger and the third jump was a bit bigger again.

- Ask students to:
  - jump in the same pattern
  - represent the pattern by making a toy jump in the same way.

### Create growing patterns

- Assist students to construct a tower out of plastic cups or blocks.
- Ask questions to help students to describe what changes they can see at each level of the tower.



### Focus questions

Q: *What do you notice about the cup tower?*

A: It makes a growing pattern.

Q: *How can you tell if it is a growing pattern?*

A: One cup is added to the tower on each row.

Q: *Where would you have to place a new layer, if you were to continue the growing pattern?*

A: On the bottom.

Q: *How could you use numbers to describe the pattern?*

A: For example: 3, 2, 1.

Q: *How could you represent that pattern in a different way?*

- Ask students to represent the growing pattern in a drawing and label the pattern with numbers. For example:



### Focus questions

Q: *How did the total change from the top of the tower to the bottom?*

A: There is one more on each layer.

Q: *If you made another row of cups at the bottom, how many cups would you need to continue the pattern? How did you work that out?*

A: Four, because one more than three is four.

### Evaluate patterns

- Explain to students that they are going to make a growing pattern of their own for another person to copy and represent.
- Students may make and represent growing patterns, using:
  - fruit or playdough-ball kebabs
  - sound growing patterns
  - towers that grow upwards and sideways
  - jewellery, using beads, macaroni or cupcake papers
  - exercise movements, such as star jumps, hops, frog jumps, push-ups.

- Direct students to:
  - select a start number
  - describe their growing pattern, using numbers
  - make or perform their growing pattern
  - represent the pattern
  - check it to see if the change matches their plan.

### Focus question

Q: *Is this a growing pattern? How do you know?*

Q: *How can you describe the change, using numbers?*

Q: *How would this pattern look if you had a different starting number?*