



Topic: Patterns and algebra

Identifying change in growing patterns (2)

Lesson concepts

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

Today students will:

- ▶ continue growing patterns.

Resources

Digital

Learning object — More growing patterns

Find and prepare

Attribute shapes (or cardboard templates of circles, triangles or stars)

Coloured paper

Pipe cleaners

Paper plates

Digital camera

Scrapbook

Key terms

growing pattern, repeating pattern, sequence

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

Lesson

Introduce the lesson

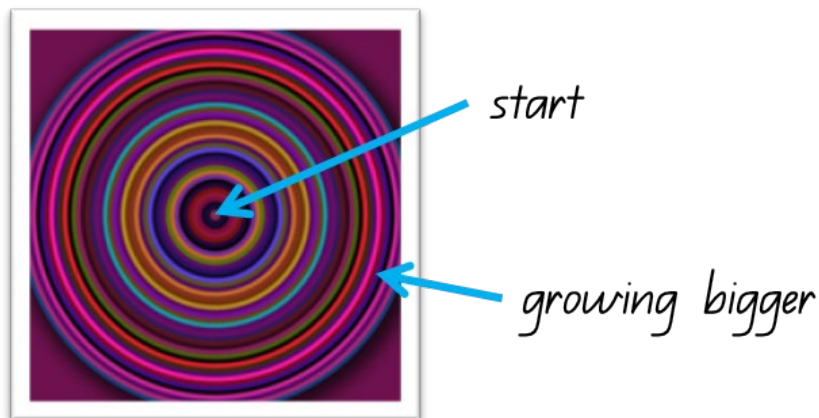
Note

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

after, before, bigger, change, colour, continue, copy, decreasing, describe, direction, expanding, explain, growing, growing pattern, increasing, larger, longer, more, next, part, repeating pattern, same, sequence, shape, size, smaller, start

Describing growing patterns

- Ask students to explore indoor or outdoor areas (with adult supervision) to find examples of visual growing patterns where the parts increase in size (length, area or volume).
- Tell students to take a digital photo (or draw a picture) of the growing patterns they find.
- Print the photos and paste them into students' scrapbooks.
- Ask students to describe the growing pattern and write the words they use to describe a growing pattern (for example: start, sequence, next, before, after, bigger, growing, larger, smaller, longer, expanding, increasing). For example:



<http://pixabay.com/en/circle-about-rings-colorful-209415/>

Focus questions

Q: *Why are these growing patterns?*

A: The circle on the plate repeats and grows bigger each time.

Q: *How would you describe this growing pattern?*

A: Small circle, bigger circle, bigger circle.

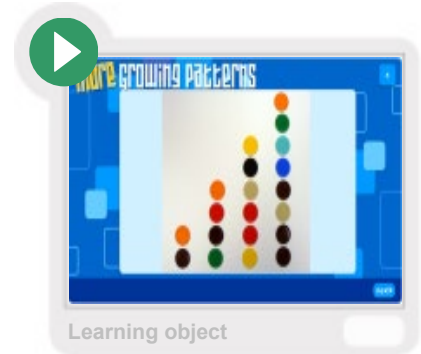
Q: *What will be next in the pattern?*

A: A circle bigger than the last one.

Patterning, using size and number

- Open the **Learning object — More growing patterns.**

In this learning object, students will see more growing patterns in different arrangements.



- Have students look at Slide 2 of the learning object:



- Discuss how growing patterns can go in all directions.

Focus questions

Q: *Why do you think that this is a growing pattern?*

A: Each arm on the cross grows by one block.

Q: *What might come next in the pattern?*

A: A cross with four blocks on each arm.

Q: *Can you describe the pattern using numbers? How?*

A: For example: The pattern grows to show one block on each arm, two blocks on each arm, three blocks on each arm, etc.

Q: *What real life things could look like that?*

A: For example: A flower or a plant.

Q: *In which directions are these patterns growing?*

A: For example: In all directions.

- Look at one of the photos or drawings in the students' scrapbooks from earlier in this lesson, for example:



<http://pixabay.com/en/background-bloom-blossom-bright-2424/>

This flower shows a growing pattern. The petals get bigger and the number of petals increases on each round. We find this type of pattern quite often in nature: the pattern grows in all directions.

- Show students some real flowers or pictures of flowers.
- Ask students to say which flowers show an example of a growing pattern.
- Ask students to describe the patterns, using size and number.

Represent growing patterns

- Explain to students that they will use what they have learned about growing patterns to make flowers that represent growing patterns.
- Help students to draw circles, triangles or star shapes, using attribute blocks or cardboard templates.
- Tell students to draw shapes of different sizes and construct flowers, using a different number of shapes for each part of the pattern.
- Show students different ways that they could construct paper flowers, using shapes that increase in size and number.

Note: Students may use cut-out shapes, pipe cleaners or paper plates.



- Allow students time to experiment with different ways of showing growing patterns. Students should:
 - display their flowers
 - check if they represent growing patterns
 - describe the patterns.

Note

When gluing flowers, it is sometimes easier to start with the largest and attach the smaller layers in sequence.

- Challenge students to draw a flower that has a growing pattern (for example: draw a flower that has three petals, then five, then seven).

