

## Patterns and Relationships Activity Pack – Patterning Aims and Overview

### Note to Educator

Thank you for your continued participation in and commitment to the ELSA program! It has been a difficult time as we, as a community, have had to deal with COVID-19. We are here to support you! To help, we will be sending you an ‘activity pack’ that follows the E-R-A model of learning for each skill focused in the ELSA apps. Please feel free to use these activity ideas in any way to best support your ongoing quality program. We recognise that some of you might be working across face-to-face and online modes, so please use these activities in ways that suit your own context.

Each activity is described so that you can use the information to make your own videos OR copy/paste directly to the families to give them ideas for adult-led and independent play within the home. **Please note:** the last section within each activity idea (‘Tips for remote play’) is intended for just you (the educator) if using activity for an online, educator-based video.

### Skill: Patterning

Patterns can be found in ideas, words, symbols, numbers and images. Pattern recognition is the ability to recognise repeated sequences. In mathematical patterning, for example, the repetition of a ‘unit’ could be observed. In the patterning activities described below, we use letters to represent units of repeat – so a **square, circle | square, circle** pattern is described as an **AB pattern** and a **high, low, high | high, low, high** is described as an **ABA pattern**.

*Copying* a pattern helps children understand the repetitive structure of patterns. Sometimes patterns will also include elements of ordering. For example, a pattern of even numbers (0, 2, 4, 6) involves the pattern of adding two elements to the previous unit each time. This knowledge is an important patterning milestone.

Pattern *creation* involves the repetition of a specific sequence in order. Children can create visual, auditory and movement patterns. For example, shape patterns (circle, circle, triangle | circle, circle, triangle) or dance patterns (turn left, turn right, spin around | turn left, turn right, spin around). Here the children have to imagine, and then create, the repeating set of elements. Initially, children will likely apply their knowledge of simple patterns, learned via copying, as they create their own simple AB patterns.

### Spatial reasoning

Patterning is an essential skill in early learning, particularly in the development of spatial awareness, sequencing and ordering, comparison and classification. Spatial language provides children with essential tools to describe their environments and helps identify the patterns in their world. Specifically, identifying the spatial features or properties of objects within a pattern (such as tall, short, curve, line, corner, etc.), as well as spatial transformations between pattern terms (such as flip, slide, turn, etc.), are important elements of developing spatial awareness within a range of pattern contexts. Gesturing can also help children abstract the pattern. For example, using one hand to represent one element and the other hand to represent the other element.

## Overview of activities

Experience	Represent	Apply
<a href="#">Read a book</a> <a href="#">Sequence and patterns with objects</a>	<a href="#">Let's dance</a> <a href="#">Celebrating patterns</a>	<a href="#">Beads on a string</a>

## Additional SERC Resources:

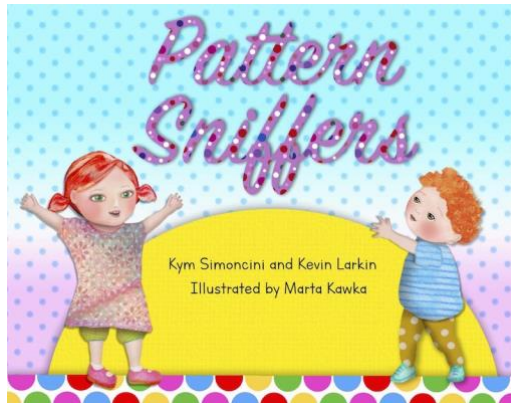
This section contains links to other resources that support thinking about patterning. Please feel free to share these resources directly with families or for ideas to make your own materials.

Activities for the home	Videos	Materials
N/A	N/A	N/A

## Patterns and Relationships Activity Pack – Patterning Experience Ideas

### Read a book (about patterning)

*What you need:* A picture book on patterns, such as *Pattern Sniffers* by Kym Simoncini and Kevin Larkin (ELSA Book). *Pattern Sniffers* is story about two children and their mother who discover mathematical and non-mathematical patterns as they go about their day.



*How to play:* Engage the child(ren) in identifying and thinking about patterns as you read. Mathematical patterns are patterns that have repeating units. For example, AB, ABC, ABA.

Consider these question prompts:

- Can you find a pattern on this page?
- Do you see any other patterns (sometimes there are other patterns in the background)?
- What makes this a mathematical pattern and not a non-mathematical pattern or design?

After reading the book, encourage the child(ren) to recreate their favourite patterns from the book. They can use common objects or even their own movements.

*Tips for remote play:* Create a video of yourself reading this book to your children who are learning remotely or at home. Ask the children to identify the patterns in the story and leave ample time for them to answer so they feel engaged and connected to you. Alternatively, you can ask parents and children to access YouTube readings of books about patterns.

For example:

- *Pattern Bugs* by Trudy Harris
- *A-B-A-B-A – A Book of Pattern Play* by Brian P. Clearly
- *Beep Beep Vroom Vroom* by Stuart J. Murphy

Children can take photos of the patterns they create with toys and household objects (found at home) to share their learning with you.

## Patterns and Relationships Activity Pack – Patterning Experience Ideas

### Sequence and patterns with objects

*What you need:* A range of concrete materials, such as blocks, shapes, loose parts (both natural and man-made) and craft materials.



*How to play:* Start by having the child(ren) *copy* your pattern. Using simple patterns with objects that are the same colour, size, and shape will help emphasise the pattern. For example, an AB pattern using red square block, red triangle block | red square block, red triangle block.

To increase the difficulty, try changing one attribute at a time. For example, use different kinds of trapezoids to emphasise that the repeating pattern is ‘number of sides’ not ‘specific shapes’. This might be: square, triangle | rectangle, triangle | trapezium, triangle – or using different types of triangles.

You can also ask the child(ren) to *finish* or *extend* your pattern by making 1 and a  $\frac{1}{2}$  repeating units and asking them to complete the pattern. For example, square, triangle | square, triangle | square, \_\_\_\_\_.

Ask the child(ren) to recreate the same pattern using different objects (this helps *abstract* the repeating unit).

Finally, encourage the child(ren) to *create* their own patterns.

Here are some examples of patterns:

- AB = clap, jump | clap, jump| etc.
- ABC = truck, doll, ball | truck, doll, ball| etc.
- AAB = turn right (1/4 turn), turn right (1/4 turn), turn left (1/2 turn) | turn right (1/4 turn), turn right (1/4 turn), turn left (1/2 turn) |etc.
- ABB = click, spin, spin | click, spin, spin| etc.
- ABCD = triangle, square, circle, star | triangle, square, circle, star| etc.

In these activities, it is important that children emphasise the language of ‘over and over’ or ‘again and again’ to help them recognise and emphasise the unit of repeat.

It is important to emphasise the spatial properties and spatial transformations occurring within the pattern units. Prepositional language that further emphasises the spatial elements of their created patterns is also important. Some spatial words to emphasise are:

Prepositional language	Spatial features or properties	Spatial transformations
over inside up above in front on top through	under outside down below behind beneath between	long short tall fat curve
	edge corner line base face	flip slide turn reflection rotation cut it in half
		slide it over face it this way put the pieces together take the pieces apart place on top of turn it around

Children can exchange patterns and *copy* or *extend* their friends' patterns (in person, and virtually by sending photos).

*Tips for remote play:* Create a range of patterns from materials in your preschool, and photograph them to send home to children. Be explicit in your representation so that children can easily identify the unit of repetition.

Ask children to use some common objects they may find at home – such as blocks, leaves, cans, stones, etc. – and copy the units in your pattern.

For example, you may use flowers for an ABC pattern: orange flower, white flower, purple flower | orange flower, white flower, purple flower. The child learning remotely may copy this pattern, this time using stones: small stone, medium stone, large stone | small stone, medium stone, large stone. The emphasis is on copying the structure of the pattern. Children can copy the range of different pattern structures you have modelled and take photos or draw to share their learning with you.

## Patterns and Relationships Activity Pack – Patterning Represent Ideas

### Let's dance!

*What you need:* Music and picture cards and/or symbols of possible dance moves, pencil and paper.

*How to play:* Each picture and/or dance symbol card represents a dance move. You can decide these ahead of time, or engage the child(ren) in deciding. Place three cards so the child(ren) can see them, and demonstrate the corresponding dance sequence. Then, encourage the child(ren) to perform the sequence repeatedly until the music stops.

The first few times the child(ren) may need you to demonstrate the repeating unit a few times. As they get the hang of it, increase the difficulty by only showing the repeating unit 1 and a ½ times, and then ask the child(ren) to finish the pattern. For example, an ABC pattern may be: jump, clap, slap knees | jump, clap, slap knees. You may demonstrate – jump, clap, slap knees | jump, clap...and then ask the child to fill in the next movement.

Increase the difficulty by using more complex patterns. For example, ABCD, AAB, and so on. Children can also determine the repeating unit themselves!

Try patterning in the opposite direction! Have the child(ren) create a movement pattern and then represent it with objects or symbols. For example, 'spin, jump, ½ turn | spin, jump, ½ turn' is represented by 'spinning top, kangaroo, clock face | spinning top, kangaroo, clock face'. This demonstrates that they have understood the structure of the pattern.

After the children have danced several patterns, ask them to represent these with their own drawings, or selecting a range of picture cards you have prepared to sequence their patterns.

Example of an 'ABC' pattern using 'spin, jump ½ turn':



Prepositions play an important role in children developing their spatial awareness when creating and representing patterns in embodied form. That is, using prepositions such as 'under', 'over' and 'through', while representing with hand or bodily gestures (such as placing a hand over your head to represent 'under'). Ensure children are exploring and extending their prepositional vocabulary as they create their movements, and connect them to appropriate symbolic representations for their dance patterns.

*Tips for remote play:* Provide a range of symbols like those suggested above, and ask children to create a series of different dance patterns based on their interpretation of these symbols. Encourage families to extend one another's patterns, and record it with a digital device to share with you.

Educators might like to create a video such as this for families to copy and extend:  
<https://www.youtube.com/watch?v=hoFhVdYsmPg>

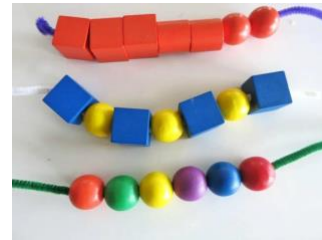
## Patterns and Relationships Activity Pack – Patterning Represent Ideas

### Celebrating patterns

*What you need:* A range of craft materials such as coloured paper, coloured beads, string, buttons, pop sticks, natural loose parts, glue and paper.

*How to play:* Children can make their own pattern displays to decorate the room. Using a range of different materials, encourage the child(ren) to create a pattern. They can *copy* another pattern by switching with the adult or their friends (in person, or virtually by sending photos). Try using the same materials to *copy* exactly, as well as different materials to identify the *abstract* attributes of the unit of repeat.

Examples of children’s decorative patterns for display:



These representations are an important opportunity to develop language associated with the spatial properties and spatial transformations occurring within the pattern units. Make patterns based on geometrical features (shape, number of sides and corners, size) or numerical features.

Prepositional language	Spatial features or properties	Spatial transformations
over	long	flip
under	edge	slide it over
inside	short	slide
outside	corner	face it this way
up	tall	turn
down	line	put the pieces together
above	fat	reflection
below	base	take the pieces apart
in front	curve	rotation
behind	face	place on top of
on top		cut it in half
beneath		turn it around
through		
between		

*Tips for remote play:* Take photographs of the patterns you have created in your preschool, or have demonstrated for children to view at home. Natural loose parts or recyclable materials in and around the home can be used for children to create their own pattern poster, to photograph and share with you virtually.



## Patterns and Relationships Activity Pack – Patterning Apply Ideas

### Beads on a string

*What you need:* A range of objects that can be threaded onto string, such as beads, pasta, and buttons.

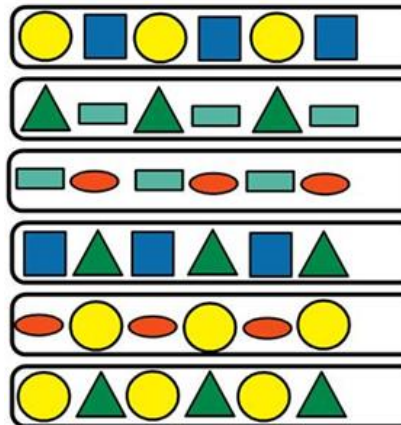
*How to play:* Children can make a pattern necklace or decoration by threading objects onto a string. The child(ren) can use any pattern, such as AB, ABC, ABA.

They can then *extend* another pattern by switching with an adult or their friends (in person, or virtually by sending photos).

To increase the difficulty, have the child(ren) extend the pattern using different objects. That is, they can substitute different objects to keep the structure going. For example, a child may have created an ABC pattern that was a piece of pasta, a blue button, and a long yellow bead. Encourage the child to extend the ABC pattern by using different items to represent the pattern unit, such as red small bead, paper chain, playdough ball.

Encourage children to discuss the geometrical properties (“I used round beads”; “I used an object with six sides”) or numerical properties (“I used two beads and then one piece of pasta”), as well as the spatial properties and dimensions (I used short, fat, long beads, etc.).

A modification of this activity is for children to continue part-patterns as shown on picture cards, such as the one below: *Can you extend each pattern?*



This can be done with the same objects shown on the cards, or with different objects where the focus is on the structure of the pattern that is extended.

*Tips for remote play:* Prepare several different patterns with classroom items. Then photograph them and ask the children learning remotely to continue the pattern with items they can find at home. The focus again is on repeating the unit (AB, ABC, AAB, etc.) rather than on the materials used in the initial pattern.