

# PLAY AND STEM

## ***Workshop 4: Bringing maths to life in the home: exploring patterning and symmetry***

*Parenting in a pandemic: Supporting parents every step of the way*



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# Bringing patterning and symmetry to life in the home

To get the most out of this workshop please collect some materials available in the home with your child and place in a “loose parts box” (container). We are going to use these loose parts to explore patterning and symmetry. Some examples are:

- Pegs
- Buttons
- Lego and blocks if you have them
- Small pebbles and sticks
- Coloured pencils, crayons or markers
- Shapes
- Cutlery
- Popsicle sticks or matchsticks
- Coloured beads
- marbles

## Patterning

Patterning is fundamental to mathematics and in particular, understanding patterning is essential for the development of mathematical concepts. It involves the **repetition of a sequence of items or events**. In particular, from a mathematical perspective, a pattern can be defined as **a sequence of two or more items that begin to repeat themselves**. This element of recognition is key to a sequence being recognised as a pattern.

### Patterning activities:

- Looking for and recognizing patterns
- Copying patterns
- Extending patterns
- Identifying missing pieces in a pattern
- Creating patterns
- Abstracting patterns ( making sane type of pattern using different items)

Types: ABABAB, ABBABBA, ABCABC, etc.

**Patterning in nature:** search for patterns in nature with your child.



## Let's make a pattern!

1. Using your loose parts box create an ABABAB pattern.
2. Have your child copy your pattern with the same items
3. Have your child extend the pattern. Ask you child: What do you think comes next?
4. Play a guessing game with your child – have your child close their eyes. Take a part of the pattern away. Tell your child to open their eyes and identify the missing piece of the pattern. Repeat and remove from different parts of the pattern.
5. Abstract a pattern: Have your child create the same pattern as your pattern using different items.
6. Now try a different type of pattern. (ABBABBA, AABBAABB, ABCABC, ABCDABCD)
7. Have your child create their own pattern and describe it.



# Exploring symmetry in the home

## Symmetry

The concept of symmetry has a special role to play in problem solving. The spatial concept of symmetry builds on understandings of reflection and rotation, which children often begin to develop through early engagements with patterning.

Research also suggests that symmetry plays an important role in later mathematical understandings in algebra, probability and calculus. Symmetric construction is an important component of a child's spatial cognitive development. Symmetry is both prevalent in nature and man-made architectural structures and examples of it are all around us. From a simple leaf, seashell, pine cone or butterfly, to the intricate man-made constructions of the Eiffel Tower or Taj Mahal!

**Reflective symmetry:** For many children, early understandings about reflection are developed as they explore mirrors as most young children are fascinated with their reflection. In reflective symmetry a line (in 2 dimensional) and a plane (in 3 dimensional) can be drawn through an object such that the two halves are mirror images of the other.

**Rotational symmetry:** Radial or rotational symmetry repeats a pattern of equal elements or spaces around a central point. Rotational symmetry is a more challenging concept to grasp and some useful examples of real-world objects with rotational symmetry include things like a propellor, a windmill or mag wheels.

- [Making symmetry at home](#). 10 hands on ideas
- [Making mandala patterns](#) with Discovery at Home
- [Symmetry for kids](#). 20 activities for the home.

## Let's make a symmetrical pattern!

1. Using your loose parts box create a **reflective symmetrical** pattern with your child. You make one side and have your child make the **reflection**.
2. Now have your child make one side and you make the reflection.
3. Repeat with different objects from your loose parts box.
4. Have your child represent the symmetrical pattern by drawing it.
5. Now try a **rotational symmetrical** pattern with your child. Choose an item as your central point to rotate around.
6. Try making different symmetrical patterns with different items from your loose parts box.
7. Have your child draw it. Use the mathematical language of **symmetry, reflection, rotation**.
8. Go on a **symmetry hunt** outside – look for symmetry in nature.

## Weblinks and further ideas:

- [Fun ways to teach kids about patterns](#).
- [Pattern activities for preschool](#). Simple activities to engage children in patterning.
- [Preschool Math: Exploring patterns](#)
- [Simple ways to teach patterning to preschoolers](#)
- [The importance of patterning](#)
- [Exploring STEM in the home](#) This is a fabulous resource with many practical ideas.
- [Making patterns with lego](#)