

Wildground Federation YR Maths LTP

Pattern – looking for and finding patterns helps children notice and understand mathematical relationships

Continuing an AB pattern	<p>Children need the opportunity to see a pattern, to talk about what they can see, and to continue a pattern. At first, they will do this one item at a time, e.g. red cube, blue cube, red cube...verbalising the pattern helps. Children may then be asked to say what they would add next to continue it.</p>	<ul style="list-style-type: none">•building towers or trains of different-coloured cubes (continuing patterns horizontally and vertically)•extending patterns using a wide range of identical objects in different colours, e.g. beads; small plastic toys such as bears, dinosaurs, vehicles. Try to avoid interlocking cubes or bead-threading so children can focus on the pattern rather than their coordination skills.
Copying an AB pattern	<p>Copying a pattern can be difficult for children if they have to keep comparing item by item. AB patterns are easiest – when presented to children, these should contain several repeats, to ensure that the pattern unit is evident. Discuss the nature of the pattern: how has the pattern been made? Patterns can have a range of features such as varying objects, size or orientation.</p>	<ul style="list-style-type: none">•accessing a range of patterns to copy. For example, using the plastic bears: big, small, big, small, big... footwear: shoe, welly, shoe, welly..., actions and sounds: jump, twirl, jump, twirl, jump... or clap, stamp, clap, stamp...•collecting things in the outdoors environment: leaf, stick, leaf, stick...

<p>Make their own AB pattern</p>	<p>As children progress from continuing to copying patterns, they can be challenged to change the sample pattern or to create their own. A range of objects can be provided for children to decide what the features of the pattern are going to be. Children may find it easier to make a pattern with the same colours as the original but with different objects. For example, copying a red–blue cube pattern with red and blue dinosaurs is easier than with yellow and green cubes. Patterns can involve different aspects and modes such as sounds, words or actions: some children will need suggestions, while others will think of their own.</p>	<ul style="list-style-type: none"> •challenging the child to change one element of the pattern they have created, e.g. ‘Can you change the red bear to a blue bear? What is the pattern now?’ •ensuring that there are numerous opportunities to create patterns – e.g. in the outdoors, using natural materials such as sticks, leaves, stones, pine cones; in craft activities, using stamping, sticking, printing; with musical instruments, using sounds such as drums, shakers, triangles, etc. •working collaboratively with a friend to take turns to create a pattern, e.g. one claps, one stamps, or one gets the red bear, one gets the yellow bear, etc. •challenging a friend to continue or copy their pattern.
<p>Spotting an error in an AB pattern</p>	<p>When working with AB patterns, children also need the opportunities to spot and correct errors. It is easiest to spot an extra item, then a missing item, then items swapped around. When presented with an AB pattern, children can be encouraged to describe it to make sure it is right. Then, to detect an error, they can track the pattern from the start. To begin with, children may know there is something wrong, but might not be able to say what the error is. They then might take several attempts to correct it, before being able to repair the error in one move.</p>	<ul style="list-style-type: none"> •presenting patterns with deliberate errors, including extra, missing and swapped items, e.g. red cube, blue cube, red cube, blue cube, red cube, red cube, blue cube – identifying there is an extra item and fixing it by removing the extra red cube, putting in an extra blue cube, or swapping the final cubes •asking the children to make a pattern with a deliberate mistake and challenging a friend to spot it.

<p>Identifying the unit of repeat</p>	<p>The key aspect of understanding patterns is identifying the smallest part of the pattern, or the 'unit of repeat' You can draw children's attention to this when building patterns by picking up a unit at a time, e.g. a blue block and a red block together, and describing this as a 'red blue pattern', rather than a red, blue, red, blue, red, blue pattern. Children can also be asked to show the pattern unit which repeats, e.g. show two blocks, a red and a blue</p>	<ul style="list-style-type: none"> •highlight within a pattern what the unit of repeat is and ask the children to describe it. At this point for pattern novices (children who aren't as experienced as others), it would be good to do this with physical objects so that the unit of repeat can be moved to show how it repeats. Patterns that are printed, stamped or stuck down, and therefore cannot be corrected, are more appropriate for more confident pattern makers.
<p>Continuing an ABC pattern</p>	<p>Once children are secure with alternating patterns, they can tackle more complex pattern structures:</p> <ul style="list-style-type: none"> ○ ABC has more items in the unit of repeat, but all different, e.g. red, blue, yellow; red, blue, yellow... ○ ABB is more challenging because they have two items within the same unit of repeat, e.g. red, blue, blue; red, blue, blue... ○ ABBC is more complex because it is longer, with three items, but also includes items which are the same, e.g. red, blue, blue, yellow; red, blue, blue, yellow... ○ AABB may be simpler as there are just two items, both repeated, e.g. red, red, blue, blue; red, red, blue, blue... 	<ul style="list-style-type: none"> •building towers or trains of different-coloured cubes (continuing patterns horizontally and vertically) •extending patterns using a wide range of identical objects in different colours, e.g. beads; small plastic toys such as bears, dinosaurs and vehicles.
<p>Continuing a pattern which ends mid-unit</p>	<p>As children work on patterns involving more elements, they can be challenged to continue patterns which do not end after a whole unit of repeat. Provide experiences where the given pattern stops mid-unit.</p>	<ul style="list-style-type: none"> •providing a range of patterns – physical and on cards – that children can continue •ensuring that the patterns offered have different structures and end after a complete or a partial unit.

<p>Make their own ABB, ABBC patterns</p>	<p>As with the first stages of making an AB pattern, the same range of experiences needs to be provided when the unit of repeat extends. A range of objects can be provided for children to decide what the features of the pattern are going to be. Patterns may include varied items and modes, such as sounds and actions</p>	<ul style="list-style-type: none"> ●utilising a range of items in the environment to create patterns such as interlocking cubes and toys, e.g. links, elephants, camels ●exploring and creating patterns on peg boards, with fruit (e.g. fruit kebabs), musical instruments, movements and dance sequences.
<p>Spotting an error in an ABB pattern</p>	<p>When working with ABB patterns, children also need the opportunities to spot and correct errors. It is easiest to spot an extra item, then a missing item, then items swapped around. When presented with an ABB pattern, children can be encouraged to describe it to make sure it is right. Then, to detect an error, they can track the pattern from the start. To begin with, children may know there is something wrong, but might not be able to say what the error is. They then might take several attempts to correct it, before being able to repair the error in one move.</p>	<ul style="list-style-type: none"> ●presenting patterns with deliberate errors ●once children have fixed the pattern, encouraging them to check the ‘fix’ by tracking the pattern ●asking the children to make a pattern with a deliberate mistake and challenging a friend to spot it.
<p>Making a pattern which repeats around a circle</p>	<p>As children become more experienced with the structures of patterns, they can investigate whether patterns can continue indefinitely in a circle. Linking elephants, camels or making a necklace can provoke discussion about this. You then might lead discussions about whether the pattern works and how you can tell. If it doesn't work, can children explain why, and correct it so it does? Circles allow children to adjust the circle size, so they can add or take out items.</p>	<ul style="list-style-type: none"> ●making circular patterns such as necklaces, circles of linking elephants or camels ●using pre-given circles to create a border, such as on or around a paper plate ●exploring which patterns work, which don't, and why ●offering a unit of the pattern and asking the child if they can include it in their pattern ●making patterns around rectangular or other shaped frames.
<p>Making a pattern around a border with a fixed number of spaces</p>	<p>This is where the children explore creating a pattern around a given space. In these sorts of activities, children have the additional challenge of recognising if their pattern can ‘work’ – fit into the given space. It is useful to include indoor and outdoor spaces, e.g. creating an outdoor reading area and defining it with a border of carpet tiles. Children can create a pattern on the carpet tiles with cubes to see if their pattern works, e.g. one coloured cube per tile.</p>	<ul style="list-style-type: none"> ●creating borders around defined spaces in the learning environment, i.e. a garden for the teddy bears, an outdoor reading area, etc. ●encouraging children to predict if the pattern could ‘keep going’, voting on this and discussing their thoughts and reasons with a partner.

Pattern-spotting around us

As children become pattern experts, look for opportunities to spot and study patterns in the environment. These patterns could be in construction, fabric, wrapping paper, wallpaper, etc. Look for opportunities to identify the unit of repeat and explain how it repeats. Consider other patterns, such as growing patterns, extending a cross shape, or spotting 'staircase' patterns of numbers going up in ones or twos. Children may make and spot spatial patterns, for example reflecting shapes or reversing an image.

Stories and rhymes present a good opportunity to explore a growing pattern, e.g. 'There was an Old Lady who Swallowed a Fly', or 'A Squash and a Squeeze'. Explore representing these diagrammatically – to see a staircase pattern, for example.

- exploring patterns in stories, songs and rhymes
- where possible, representing these diagrammatically to support pattern-spotting, and predicting what will happen next, and why
- inviting children to spot patterns in the home environment, or bring in examples from home
- looking at fabric patterns from different cultural traditions: discussing the patterns in terms of what stays the same and what is different
- designing wrapping paper for a specific event that involves creating a pattern which the children can describe.

**What to look for...
Can a child ...?**

- continue, copy and create an AB pattern?
- identify the pattern rule (unit of repeat) in an AB pattern?
- continue, copy and create ABB, ABBC (etc.) patterns?
- identify the pattern rule (unit of repeat) in ABB, ABBC (etc.) patterns?
- spot an error and 'correct' a pattern?
- explain whether a circular pattern is continuous or not?

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<ul style="list-style-type: none"> Identify a simple AB pattern and talk about the pattern they can see i.e pink block, blue block, pink block, blue block Continue a simple AB pattern independently 	<ul style="list-style-type: none"> Create their own simple AB patterns Discuss what the AB pattern is that they have made Begin to spot errors in an AB pattern Have an understanding of how patterns can be formed using anything not just Maths resources 	<ul style="list-style-type: none"> Recognise a simple ABC pattern and discuss what the pattern is i.e. twig, leaf, flower, twig, leaf, flower Continue a ABC pattern Begin to spot patterns in the environment Continuing spotting errors in simple patterns and correcting these errors 	<ul style="list-style-type: none"> Create their own ABC pattern Talking about patterns as a unit for example pink square, blue circle pattern rather than pink square, blue circle, pink square, blue circle... Identify patterns in the environment around us 	<ul style="list-style-type: none"> To be able to identify a more complex pattern such as AAB,AABB To continue a more complex pattern Begin to spot errors in more complex patterns 	<ul style="list-style-type: none"> Creating more complex pattern (AAB, AABB, ABBC) Talking about the patterns they have created Create repeated patterns in different ways such as a circle Continue to spot errors in more complex patterns and amend these errors

Storybooks	Vocabulary	Songs & Rhymes
<ul style="list-style-type: none"> ❖ The Very Hungry Caterpillar ❖ Anno's Magic Seeds 	<ul style="list-style-type: none"> ❖ pattern ❖ next ❖ after ❖ repeat ❖ same ❖ different 	<ul style="list-style-type: none"> ❖