Meldreth Primary Early Years Progression in Maths - Pattern, Shape, Space & Measure

Pattern	Shape and Space	Measures
Continue an AB pattern continue a pattern. **Copy an AB pattern** copy a pattern which contains several repeats, to ensure that the pattern unit is evident	**Developing spatial awareness: experiencing different viewpoints** visualise how things will appear when turned around and imagining how things might fit together.	**Recognise attributes** recognise the specific attributes of (for example) length – that a stick is long; adults are tall.
Make their own AB pattern repeat the unit at least three times (big bear, small bear; big bear, small bear; big bear, small bear) to ensure the child can sustain the pattern make a specified pattern, e.g. 'Can you do a green, yellow pattern?' This is to ensure the child can apply their pattern understanding choose their own rule, to ensure the child can identify pattern features/rules/criteria **Spot an error in an AB pattern** spot and correct errors in patterns	**Developing spatial vocabulary** describe position using: 'in', 'on', 'under' describe direction: 'up', 'down', 'across'. Children use terms which are relative to the viewpoint: 'in front of', 'behind', 'forwards', 'backwards'.	**Compare amounts of continuous quantities** find something that is longer/shorter or heavier/lighter than a given reference item. Children may utilise strategies such as direct comparison
Identify the unit of repeat show the pattern unit which repeats, e.g. show two blocks, a red and a blue **Continue an ABC pattern** Create more complex pattern structures: **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…	**Shape awareness: developing shape awareness through construction** explore shapes, the attributes of particular shapes, and select shapes to fulfil a particular need.	**Show awareness of comparison in estimating and predicting** after children have had lots of practical experiences of comparing attributes, they can begin to estimate and to predict. **Compare indirectly** move onto using one thing to compare with two others, if, for example, asked to put things in order of height, weight or capacity. This may involve using a 'go between', for instance pouring a jugful of water into two bottles to see which holds more.

Make their own ABB, ABBC patterns repeat the unit at least three times (big bear, small bear, medium bear; big bear, small bear, medium bear; big bear, small bear, medium bear). This is to ensure the pattern can be sustained over a longer duration make a specified pattern, e.g. 'Can you do a green, yellow, blue pattern?' This is to ensure the child can apply their pattern understanding choose their own rule, e.g. 'I am going to make a big, small, small pattern.' This is to ensure the child can identify pattern features/rules/criteria **Spot an error in an ABB pattern** spot an extra item, then a missing item, then items swapped around.	**Representing spatial relationships** describe things being 'in front of', 'behind', 'on top of' **Identify similarities between shapes** notice shape properties of the object that they want to represent	**Recognise the relationship between the size and number of units** before children use standard units of measure, they begin to compare units of different sizes in practical contexts. **Use units to compare things children use units** 'measure' and compare
Symbolise the unit structure symbolise their patterns in a range of ways, and to use these symbols to continue the pattern to demonstrate their understanding of the pattern **Generalise structures to another context or mode** describe the pattern, what comes next, what the rule is for their pattern **Make a pattern which repeats around a circle** investigate whether patterns can continue indefinitely in a circle **Make a pattern around a border with a fixed number of spaces** recognise if their pattern can 'work' – fit into the given space **Pattern-spotting around us**spot and study patterns in the environment. Patterns could be in construction, fabric, wrapping paper, wallpaper, etc. Look for opportunities to identify the unit of repeat and explain how it repeats	**Show awareness of properties of shape** Describe specific properties by using specific language in everyday situations. Properties may include: • curvedness • numbers of sides and corners (2D) or edges, faces and vertices (3D) • equal sides • parallel sides • angle size, including right angles • 2D shapes as faces of 3D shapes. **Describe properties of shape** use comparisons such as 'ball-shaped' or 'house-shaped', or start to discriminate between shapes, e.g. a 'fat' triangle and a 'pointy' triangle, using informal language. **Developing an awareness of relationships between shapes** spot shapes within shapes.	**Use time to sequence events** sequence activities, important times in their day, and some sequences of time that are significant to them. **Experience specific time durations** experience specific time spans in order to start to develop an overall sense of time

Children who have met the above expectations, will consolidate their understanding of the concepts previously taught through working in a variety of contexts and with different numbers.

Common errors

Pattern

Common errors in this area may include:

- not recognising a pattern such as ABBA (e.g. stating that patterns cannot have two of the same colour together)
- when copying or extending a pattern, changing it before making three repeats
- spotting that there is an error but not being able to describe it
- identifying an error but not being able to correct it
- correcting an error by making a 'local correction', which just moves the problem along (e.g. by adding an extra item when colours have been swapped)
- describing the whole pattern instead of identifying the part which repeats, or the unit of repeat.

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?

Shape and Space

Common errors in this area may include:

- children thinking that only regular triangles are triangles, only brick-like rectangles are rectangles (i.e. shapes are defined by their image, not by their properties)
- children thinking that squares are only squares when the bottom is horizontal (i.e. shapes are defined by their orientation).

What to look for

Can a child:

- select and rotate shapes to fit into a given space?
- use positional vocabulary, including relative terms, to describe where things are in small-world play?
- show intentionality in selecting shapes for a purpose, such as cylinders to roll?
- make a range of constructions, including enclosures, and talk about the decisions they have made?
- see shapes in different orientations and recognise that they are still that shape?
- recognise a range of triangles and say how they know what they are?
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Measures

Common errors in this area may include:

- keeping track of events, e.g. 'Have I had my lunch yet?'
- positional language associated with time; muddling the relative terms 'yesterday' and 'tomorrow'
- using 'long' to describe the shape of something (e.g. a block that is much longer than it is wide) rather than to compare lengths
- not taking into account both ends as the starting and stopping point
- not being able to say 'than' in the phrase, 'this is longer than that'
- not understanding that units must cover a complete length, with no gaps or overlaps, demonstrated by thinking that measuring is about counting units placed along something, or putting a ruler alongside and saying a number
- not understanding that units must be equal.
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What to look for

Can a child:

- find something that is longer, shorter, heavier, lighter (etc.) than a reference item?
- find an appropriate container for a specific item?
- describe the location of something using positional language?
- accurately use the relative terms 'yesterday' and 'tomorrow'?
- order a short sequence of events?