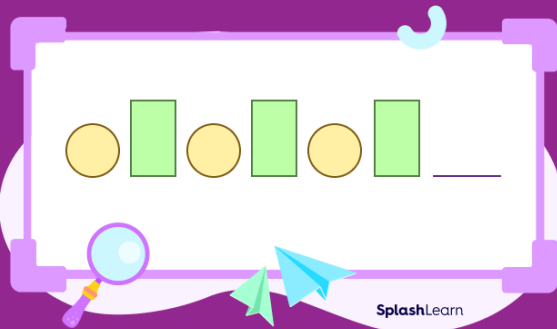


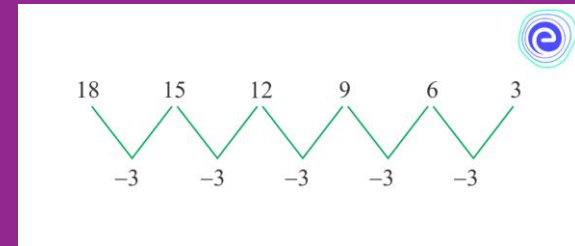
# The Importance of Patterns



RECOGNIZING MATHEMATICAL PATTERNS

|                 |                 |                 |                 |
|-----------------|-----------------|-----------------|-----------------|
|                 |                 |                 |                 |
| <b>square 1</b> | <b>square 2</b> | <b>square 3</b> | <b>square 4</b> |
| <b>1 dot</b>    | <b>4 dots</b>   | <b>9 dots</b>   | <b>16 dots</b>  |
| 1               | + 3 = 4         | + 5 = 9         | + 7 = 16        |

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## Aims of the session

- To understand why patterns are important to understand key mathematical concepts.
- To know how patterns are taught to your children.
- To show you how to support your children at home.

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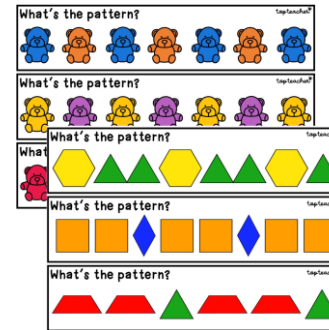
Why are  
patterns  
important?

**‘Recent research suggests that young children’s  
patterning, rather than their number understanding,  
predicts their later maths learning (Rittle-Johnson, Fyfe,  
Hofer and Farran, 2017).’**

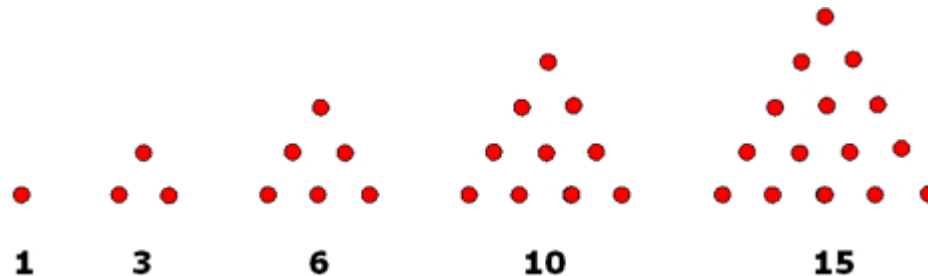
# What is pattern awareness and what types of pattern?

A pattern is anything that can be repeated involving numerical, spatial or logical relationships. In EYFS there are three main types of patterns that are used.

- Repeating patterns – sequences of things, images or actions.



- Spatial patterns – shapes with equal sides or angles and regular arrangements of items, spaced equally or according to a rule.
- Growing patterns – patterns such as a staircase with equal steps or tiles squares.



# Early Learning Goals - ELGs

- **Development Matters – this document sets out 17 ELGs.**
- **Maths is set out into two sections.**
- **Previously the Maths ELG was split into Numbers and Shape, Space and Measure.**
- **Now the Maths ELG is Number and Numerical Patterns.**

## Why change the ELGs?

- To make them more specific.
- Strengthen outcomes – ensuring a good grasp of skills for their transition to Year 1.
- Numerical Patterns ELG – to add greater clarity to counting and comparing quantities.
- Number and Numerical Patterns – stronger predictors of later maths outcomes.

What does the  
ELG look like?

## Mathematics

### Number

- Have a deep understanding of number to 10, including the composition of each number.
- Subitise (recognise quantities without counting) up to 5.
- Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.

### Numerical Patterns

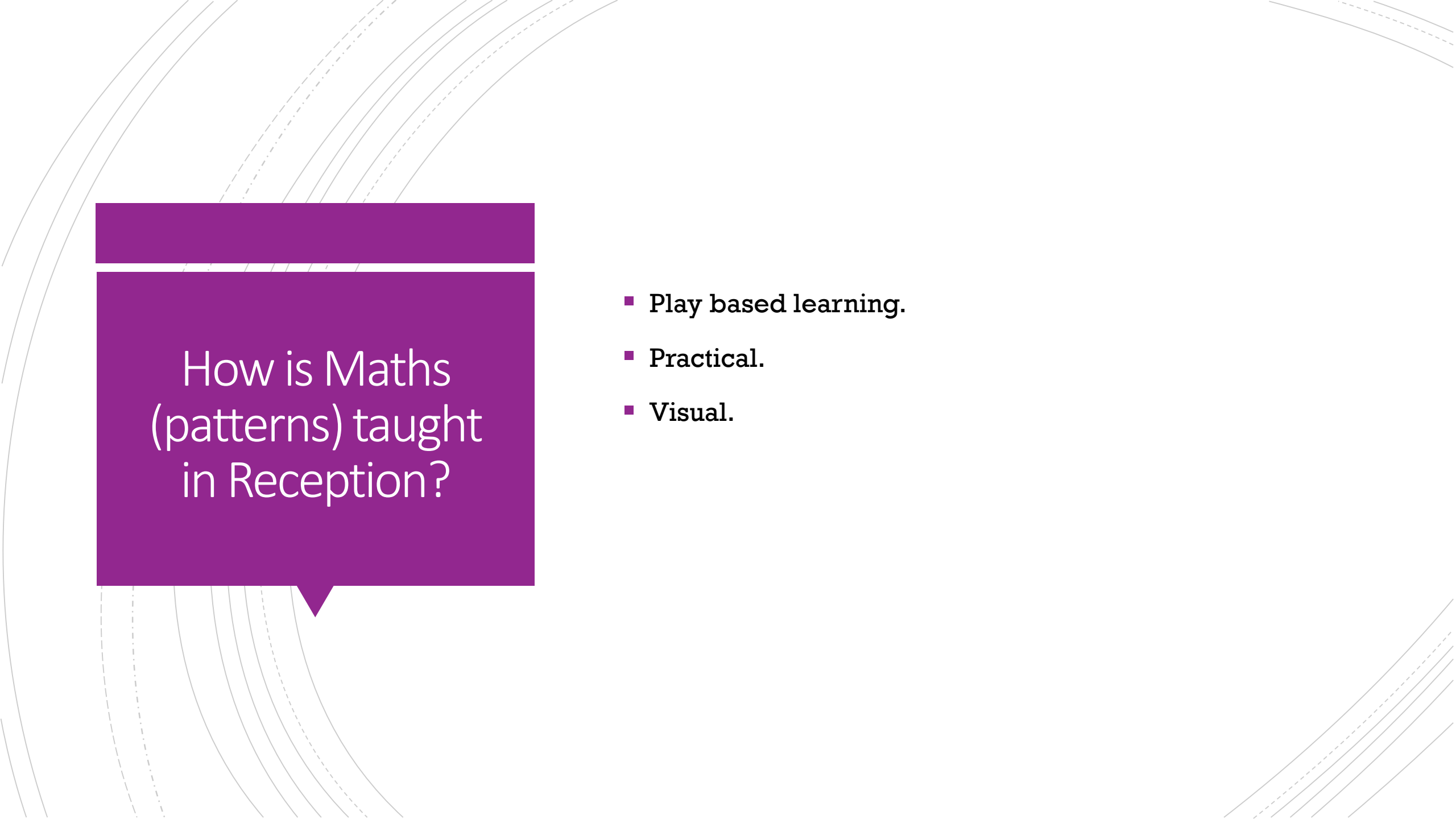
- Verbally count beyond 20, recognising the pattern of the counting system.
- Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.
- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

## Importance of patterns

- Patterns underpin all Mathematical thinking.
- Children can spot patterns before they spot the patterns in numbers.
- Timetables.

$$\begin{array}{l} 1 \times 9 = 9 \\ 2 \times 9 = 18 \\ 3 \times 9 = 27 \\ 4 \times 9 = 36 \\ 5 \times 9 = 45 \\ 6 \times 9 = 54 \\ 7 \times 9 = 63 \\ 8 \times 9 = 72 \\ 9 \times 9 = 81 \\ 10 \times 9 = 90 \end{array}$$



The background features several sets of curved lines in the top-left and bottom-right corners. Each set consists of multiple parallel lines, with the innermost being solid and the outer ones being dashed. The lines are light gray and curve towards the center of the page.

## How is Maths (patterns) taught in Reception?

- Play based learning.
- Practical.
- Visual.

Your child's work - displays



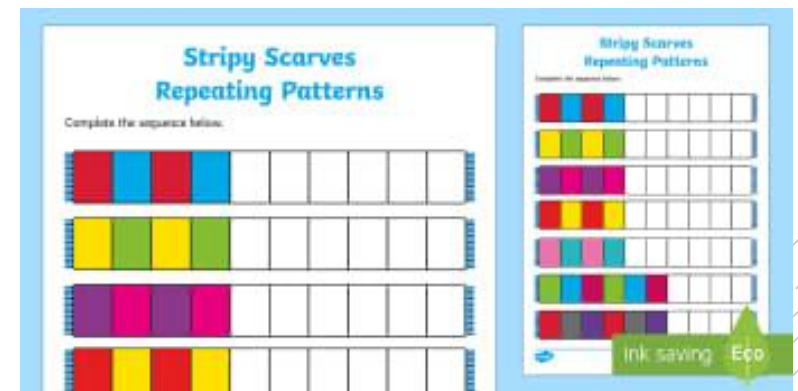
ICT and physical  
resources





# Repeating patterns

- Repeating patterns are considered the most common type. They are usually linear patterns.
- These are the first type of patterns your children will begin to learn.
- We usually would refer to a repeating pattern by the item that is being repeated such as red, blue, red blue. However, using AB as a way of describing the pattern, it will help support your children understanding of pattern structure.





## Make your own patterns!

- When you make a pattern, think about the unit that repeats.
- As you make your pattern, consider how you could make your pattern harder. Think about the shape that you are doing the pattern in and how many units are repeated.
- Allowing children to see patterns, give the children the opportunity to develop generalisation and abstract thinking.
- This is early algebraic thinking and helps children observe irregularities.

## Challenging thinking

- Children that find AB patterns easy, may find using different object so the same colour harder to use. (Red, blue pom poms and red, blue bears.)
- Extend by adding new colours, the children can 'edit' their patterns.
- Ask children to identify the pattern they have created verbally instead physically repeating the patterns.
- Creating their own patterns with a variety of resources and generalising by using any items in the classroom.
- Spotting errors in patterns and correcting the mistake.

# Border patterns

- Support fine motor skills.
- Turning corners – using border patterns, children have to keep the pattern structure in mind. They need to be able to further challenge their own thinking by being able to continue the pattern but may have to use both hands to do this.
- Continuity – did their pattern work?
- Developing reasoning skills.



*Does your pattern work?*



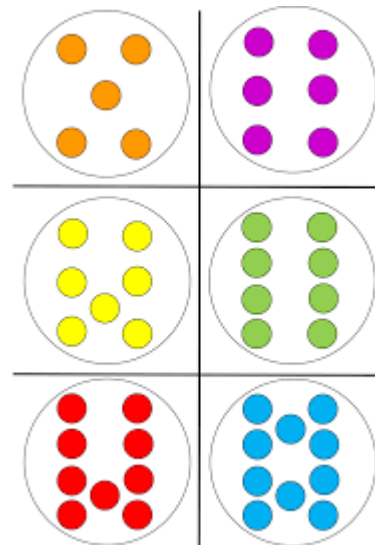
# Spatial patterns

- Spatial patterns are patterns that are evenly spaced using objects of which some are the same.
- These patterns are made with natural objects and drawings.
- Often seen in construction play and nature due to its reflective and rotational symmetry.



# Spatial patterns

- One kind of spatial patterns focusses on the arrangements of dots, for example on a dice or dominoes.
- Children will see the arrangement of dots and spot the shape and structure of the pattern. Most children will copy spaces between them accurately.
- Arranging dots in different ways will support the next step for learning.



Triangular dot pattern

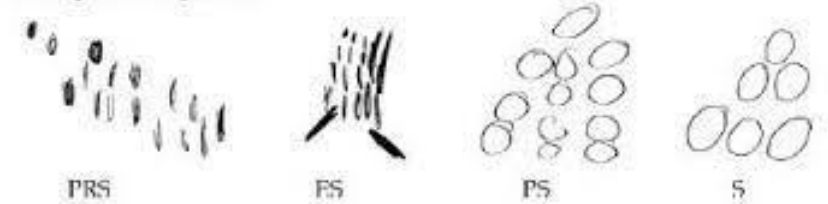


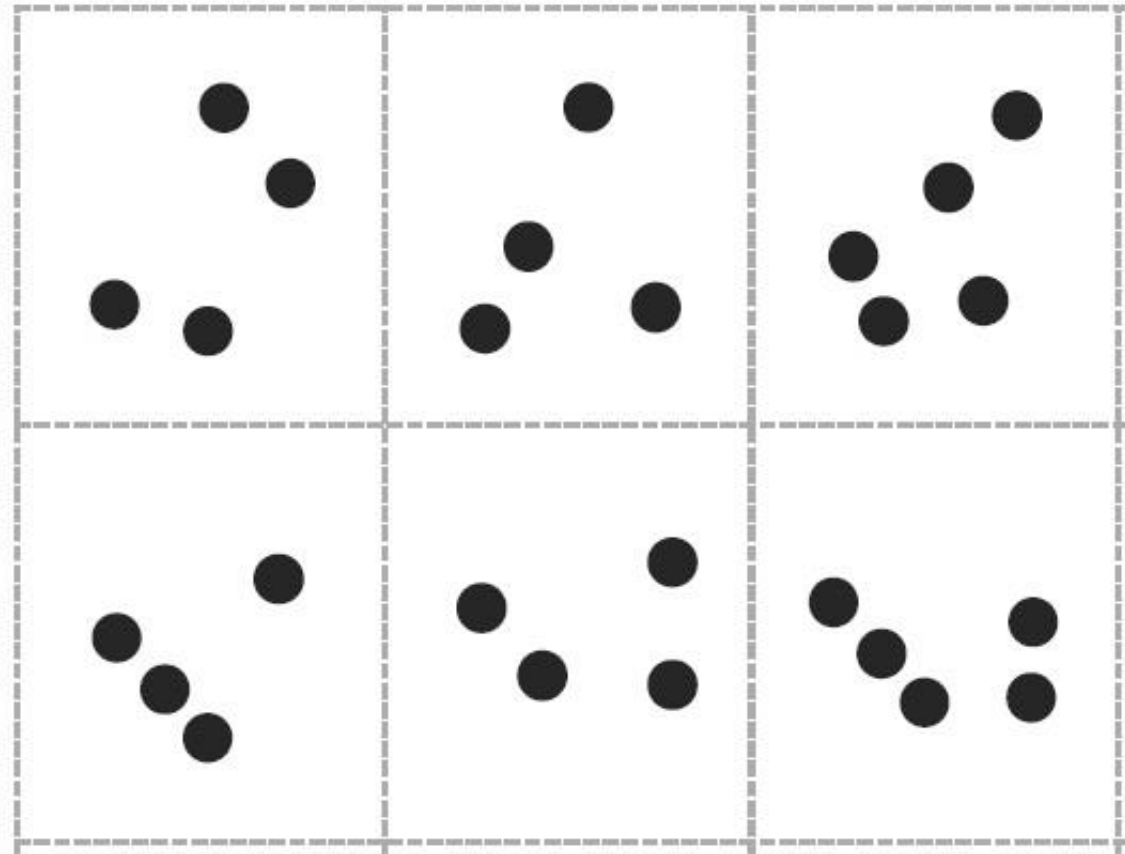
Figure 2. Typical Grade 1 students' responses at four structural stages.

# Subitising

- Subitising is an important skill.
- Subitising is when children can look at an arrangement of objects and instantly know how many there are.
- This skill is easy with objects that are arranged in regular ways such as spatial patterns.
- Most adults can subitise up to the number for in any arrangement but due to the arrangements on a dice, we are able to identify five and six. this is know as perceptual subitising. The ability to recognise numbers.
- Conceptual subitising is the ability to break larger groups into smaller groups that can be perceptually subitised and adding together. (This step is more used in Year 1 onwards.)

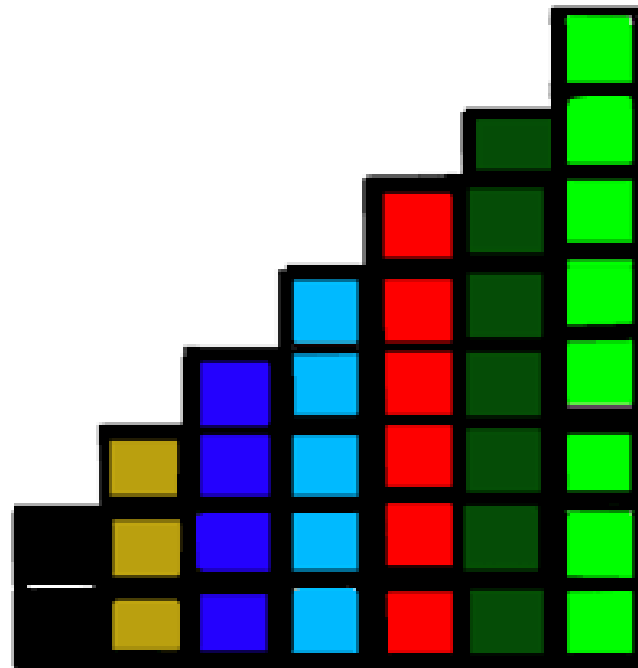
## Making number to 5

- Draw numbers to 5 in different ways.
- Irregular arrangements are important.
- This support children to be able to conceptually subitise.



## Growing patterns

- Patterns that are seen in a staircase or a pyramid.
- They can be started with small shapes and begin to get larger.
- These patterns open up more discussion and understanding of how the patterns develop as they can explore 'one more'.



How can you do  
patterns at  
home?

- Socks and clothing.
- Shopping – cans in the cupboard.
- Toys.
- Nature – walking to school or a park. This can be good for subitising too!
- Pasta, peas or bananas.
- Rhyme and songs.
- Fingers.

The background features several sets of concentric, curved lines in the top-left and bottom-right corners. These lines are a light gray color and include both solid and dashed styles, creating a sense of motion or a stylized globe.

Thank you!

- Do you have any questions?