PATTERNS IN NUMBERS

- To help children to see numbers in spatial arrays
- To help children to look for and describe number patterns
- To help children to thin for themselves in solving number problems and to be systematic in investigations and their recording.

Introducing the topic

- Have 4 chairs, 2 on each side of you. Ask 2 children to come and choose a chair to sit on. Record the result. Ask another 2 children to come and choose a different pair of chairs to sit on. Keep going until the children are satisfied that you have got all the possibilities covered, making a record of the results.

Questions during activities

- What do you think will happen for the next one?
- Could you organize what you have done so far to make it easier to see all the possible patterns?
- Can you think of any way to simplify the problem first?
- How do you know you have found all ways?

Things to think about

- What are square numbers?
- What are triangular numbers?
- Could you invent a series of numbers based on diamond shapes?
- What other shapes might lend themselves to a series of numbers?
- What series of numbers would these double lines give?

Experiences to build on

- Looking at numbers

- Pegboard patterns
- Growing numbers

Organizational Points

- Activities lend themselves well to children working in pairs
- As far as possible children will need to work with practical materials in order to get the most out of the activities.

Assessment Observations

- Can the children describe spatial arrays of things in terms of numbers?
- Can children use sequences and series of patterns to identify a number sequence and predict further models?
- Can children organize their work systematically in searching for different ways to arrange things?
- Can children work independently of you in solving problems and exploring investigations?

Before showing children the video clip

- Have a look at a piano keyboard. What numbers can you see in the patterns of black and white keys? What number patterns can you see with just the black keys? Just the white keys?

What you may need

- Cubes, Multilink, Hexagonal paper, hexagon shapes, squared paper, counters

Things to do

- When a cube is made twice as big along each edge: how many times bigger is its surface area and its volume? Investigate for cubes three times as big and more. Try to find patterns in the numbers you discover.
- Milk Bottles. Use some counters on a grid to help you work out a way to place 18 milk bottles in a crate (6x4) so that every row and column has an even number of bottles in it.
- Polyhex. How many different ways can you fit 4 hexagons together edge to edge? Find some hexagonal paper or plastic hexagons to help you record your patterns. Try it with 3 hexagons, or 5 hexagons. Look for the patterns with different numbers of hexagons.

- How many different ways to put 4 eggs in an egg box?

More activities

- Braille. Braille is a system of writing and reading for blind people. It is based upon patterns of raised dots in a 2x3 rectangle. (Show some examples if you can). How many different patterns can be made with this system?
- Squares/Rectangles, Cubes/Cuboids. Pick any number between 1 – 50. How many different cuboids, including cubes, can you make with that number of cubes? Try it again with a greater number?

Ideas for the whole class

- **Looking at Tiling Patterns<**
Collect examples of tiling patterns based on different numbers and shapes of tiles. Arrange the talbe and chairs in the classroom according to the pattern. Children should first plan their ideas and designs onpatper. Then let them vote on which furniture to use for a day.
- **Pattern Scrapbook<**
Make a scrapbook of cut-outs from magazines etc which depict patterns in numbers eg Red Arrow Planes, snooker, skittles …

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