



Cymru
National Day Nurseries Association

Factsheet



Supporting Schemas

Wales

Supporting Schemas

Schemas can lay the foundation for children's learning and their importance is recognised by their inclusion in the curriculum for funded non-maintained settings. Schemas can be described as patterns of repeated behaviour which allow children to explore, process and understand information enabling them to make sense of the world around them and connect their experiences.

"The relationship between play, development and schemas is not by any means incidental, and schemas are central to young children's learning. The way in which babies and young children are driven by their schemas in play is too powerful and purposeful for practitioners to ignore."

Louis et al, 2008

What are schemas?

The term 'schema' was introduced by Piaget in 1923. He called schemas (cognitive structures used to process and understand information) the basic building blocks of intelligent behaviour.

Piaget believed that newborn babies have some innate schemas that are genetically programmed into us that underlie these innate reflexes. For example, babies have sucking and grasping reflexes triggered by something touching the baby's lips or hands and according to Piaget the babies have sucking and grasping schemas.

Babies and young children learn more in the first few years of life than at any other time and with each new experience, Piaget claimed, they use that new information to modify, add to, or change their existing schemas. For example, imagine a child meeting a dog for the very first time, it is a small dog with short legs and pointy ears and the parent names it as a dog, this experience of the small dog makes up the child's schema (understanding) of dogs. Now imagine the same child meeting another dog, a really big dog with long legs and tail and floppy ears and again the parent identifies it as a dog. The child now processes this information and adapts and modifies their schema (understanding) of dogs to include this new information. As the child is introduced to a range of different breeds they will continue to adapt and modify their schema about dogs.

Professor Tina Bruce provides the following summary on schemas:

"They are part of human development, from birth to death, but they are not in a constant state. They are always adjusting and changing in the light of experience. This is why they are such a powerful learning mechanism." (Bruce, 2011).

Schemas operate at four distinct levels in children's development:

- **Sensory-motor: Children use their senses, actions and movements to learn and absorb information from what they see, taste, touch, hear and smell**
- **Symbolic representation: Children use an object/word to represent something else, for example, a child in a cardboard box imagining they are sitting in a race car**

- **Functional dependency: Cause and effect – ‘if I do this then that will happen.’**
Children draw on their previous knowledge to support their learning
- **Abstract thought: When children describe events, objects or experiences without concrete cues, sometimes repeating information that has been given to them**
- **Children demonstrate that they have assimilated the knowledge and used it later to reproduce their own new ideas and thoughts**

Children may have one schema that they are focused on but often they work with a ‘cluster’ of schemas, interchanging alongside their interests and curiosity. We are going to be looking at the most common schemas that you may observe and it is important to remember that all children are individual and behaviours may differ.

Common schemas

The most common schemas include:

- Trajectory
- Rotation
- Connection and Disconnection
- Enclosing
- Transporting
- Positioning
- Transforming
- Enveloping and containing.

We are going to explore each of these common schemas and look at the repeated behaviours you may see in practice and the resources you can provide to support the individual schemas.

Trajectory schema (wanting to see things move):

Repeated behaviours you may observe:

- Dropping items or food from cots, high chairs etc.
- Playing with running water from the tap
- Building and knocking down towers
- Climbing and jumping off furniture
- Throwing, bouncing or kicking balls.

Resources you can provide:

- Throwing balls, rolling hoops and throwing bean bags
- Squirting water from a hose, water pistol, squirty bottle
- Splatting paint
- Flying paper planes
- Throwing water-filled sponges against a wall
- Rolling toy cars down ramps

- Knocking down a tower of blocks
- Sliding down a slide
- Running, crawling, hopping and jumping – using obstacles
- Climbing frames, apparatus, trees
- Blowing bubbles
- Playing on swings and slides
- Water play with funnels and pouring containers, water wheels, water flow directors etc.
- Riding bikes
- Feathers, ribbons, scarves etc.

Connection and disconnection schema (connecting things together and wanting to take things apart/undo things)

Repeated behaviours you may observe:

- Playing with puzzles
- Using sticky tape, glue etc. to join things together
- Building train tracks, connecting carriages together
- Holding hands or grasping your finger
- Connecting blocks e.g. Lego, mobile
- Pulling things apart
- Dismantling things
- Knocking things down.

Resources you can provide:

- Threading beads
- Junk Modelling
- Train tracks
- Magnets and metal objects (including magnetic trains and carriages)
- Jigsaw Puzzles
- Paper chains, daisy chains
- Making a human train by holding hands
- Playdough
- Tubes, pipes, guttering
- Lego, Duplo, Mobilo, Meccano etc.
- Weaving
- Sandcastles (Sand/buckets and spades)
- Magnetic toys
- Playdough
- Clay
- Tubes and guttering.

Enclosing schema (enclosing, covering, wrapping)

Repeated behaviours you may observe:

- Building fences around objects
- Climbing into boxes or small spaces
- Storing items in a boxes
- Covering their painting with paint
- Hiding or storing items inside other objects
- Drawing borders when mark making or drawing shapes and filling them.

Resources you can provide:

- Blankets
- Boxes and containers
- Wrapping paper and items to wrap up
- Construction material for building and enclosing
- Sand, gloop, water and containers
- Skipping ropes, hoops (boundary building)
- Large or small boxes tents for climbing in and hiding
- Den making equipment
- Paper and paints
- Role play
- Mark-making equipment (with rulers to draw lines and borders)
- Frames to place around their mark-making or painting
- Jack in the box, pop-up toys.

Transporting schema (moving themselves and objects around)

Repeated behaviours you may observe:

- Children filling bags, containers, pockets, buckets with objects and taking them with them wherever they go
- Creating piles of toys or objects
- Children riding around on bikes, sitting on toys with a pile of objects in the back
- Children moving objects around e.g. a child carrying a bucket of sand over to the home corner.

Resources you can provide:

- Bikes or vehicles that can carry objects
- Buggies, pushchairs, trolleys, wheelbarrows
- Loose parts
- Small world toys

- Bags or purses
- Buckets and spades
- Containers, bottles, buckets, tubs, boxes (for transporting water)
- Construction blocks
- Den making materials.

Positioning schema (an interest in how objects look and feel in different positions)

Repeated behaviours may include:

- Lining up objects
- Ordering and sorting objects (by size, colour etc.)
- Sorting and stacking
- Asking to sit in a specific place
- Asking for food to be laid out in a specific order

Resources you can provide:

- Stacking and sorting objects (natural resources, compare bears, coloured beads etc.)
- Threading
- Stacking blocks
- Construction blocks
- Loose parts and tubs
- Puzzles, Russian dolls
- Pegboards
- Shapes, mosaic art
- Cars, trucks, garages, lines outdoors
- A secure space for positioning items (without being destroyed or disturbed by others).

Transforming Schema (wanting to see what happens or how materials change)

Repeated behaviours may include:

- Pouring water in and out of containers
- Pouring water onto sand
- Mixing liquids and adding items to the mix
- Mixing paints (rather than painting a picture).

Resources you can provide:

- Potion station
- Playdough
- Baking activities
- Selection of paints for mixing
- Ice cubes, water
- Blowing

- Planting seeds
- Sand (wet and dry)
- Gloop (cornflour and water mixture)
- Washing baby clothes in soapy water (dry to wet properties)
- Science experiments that involve change e.g. white flowers in jars of coloured water (each flower will turn the colour of the water it is placed in).

Enveloping and containing schema (wanting to wrap things up, place things inside other things/covering selves or toys)

Repeated behaviours may include:

- Wrapping objects (or themselves) or covering them with blankets
- Hiding (themselves and/or objects)
- Wanting to be covered up
- Playing peek-a-boo or 'hide and seek.'

Resources you can provide:

- Scarves and materials to wrap objects up
- Build structures to climb into, for example, tents, pretend castles, tunnels
- Parachute play
- Gloop
- Envelopes and letters and cards
- Burying treasure (sand or mud kitchen)
- Peek-a-boo games
- Hide and seek games
- Containers, including bags and boxes
- Wrapping paper or newspaper, objects to wrap
- Dressing up clothes
- String, ribbons.

Schematic play enables children to act out experiences, take risks, test out theories, demonstrate and talk about what they already know and can do. The repetitive actions of schematic play allow children to construct meaning in what they are doing. Observing children's schemas can inform responsive planning of the learning environment; allowing you to extend and enrich children's interests, and develop their thinking skills.

Further information and support

- Let's look at Schemas – NDNA online training <https://bit.ly/3NhkXC1>

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National Day Nurseries Association

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Factsheet

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We are the voice of the 21,000-strong nursery sector, an integral part of the lives of more than a million young children and their families. We provide information, training and advice to support nurseries and the 250,000 people who work in them to deliver world-class early learning and childcare.

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