Philip Steadman

Boy (and girl) architects and their toy buildings

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Boy architects and their toy buildings, Part 1

A child playing with Froebel's Gift 4, on a gridded tabletop. Image from Wikipedia

Plato said that “if a boy is to be... a good builder, he should play at building toy houses... and be provided by his tutor with miniature tools modelled on real ones.” From the late 18th century we can follow this

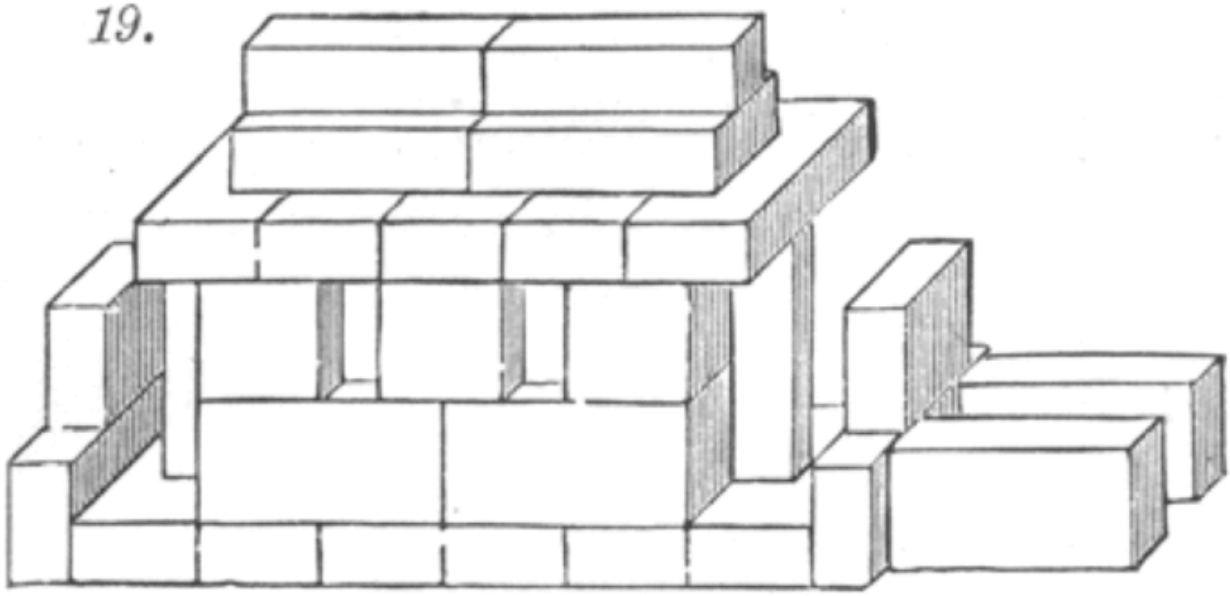
learning process in action. Richard Lovell Edgeworth and Maria Edgeworth in their book *Practical Education* of 1798 recommended that the nursery be equipped with "pieces of wood of various shapes and sizes, which [infants] may build up and pull down", and that older children might make 'models of architecture' from cardboard and glue. In the 1830s the German pedagogue Friedrich Fröbel developed these kinds of ideas into a complete teaching system for the 'kindergarten' (Fröbel's term) in which educational toys known as 'gifts' played a central role.

The gifts are numbered in order. Numbers 3 to 6 are sets of wooden blocks of increasing variety of form, from cubes only in Gift 3, to cubes, slabs and triangular prisms in Gift 6. Fröbel specified that when working/playing, the child should sit at a table with a gridded top on which to place the blocks. Fröbel had previously worked in Berlin with Christian Samuel Weiss, one of the pioneers of modern crystallography. The laws of symmetry and the spatial packing of elementary forms, which play a central part in that subject, find their clear expression in the patterns made with the kindergarten blocks. Other exercises involve weaving paper strips, arranging flat tiles, and making framework structures out of toothpicks with semi-dried peas for the joints.

In 1876 Frank Lloyd Wright's mother Anna, herself a teacher, bought her nine-year-old son a set of Fröbel gifts at the Centennial Exposition in Philadelphia. Much has been written about young Frank's fascination with these blocks and their influence on his later design work, not least by Wright himself. As he says in his *Autobiography*: "For several years I sat at the little kindergarten table-top ruled by lines about four inches apart each way making four-inch squares; and, among other things, played upon these 'unit-lines' with the square (cube), the circle (sphere) and the triangle (tetrahedron or tripod) – these were smooth maple-wood blocks. All are in my fingers to this day."

Wright writes about his mission to 'destroy the box' of traditional

architecture, with its separate rooms packed inside the rectangular envelope of the external walls. Instead he conceives of buildings in terms of solid blocky elements – large chimney stacks, piers, parapets, oversailing flat roofs – and the spaces created between them. Rooms flow one into another, and the boundary between outside and inside is less sharply defined. We can see the sculptural affinities between a model house made with the sixth Fröbel gift and Wright's Unity Temple in Chicago of 1908.



House built from Fröbel blocks; from Maria Kraus-Boche and John Drauss, *The Kindergarten Guide*, New York 1877

Frank Lloyd Wright, Unity Temple, Oak Park Illinois 1908. Photo from Wikimedia Commons

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The plans of other Wright buildings have the symmetries, especially the cyclic or pinwheel symmetries, of patterns made with the various gifts. The British architect Richard MacCormac, whose own work owes something to Wright and who wrote about Wright and Fröbel, emphasises that the relationship is not just one of formal similarities. It depends as much on the 'essentially abstract organisational discipline' that Wright acquired in the kindergarten.

Wright is the architect in whose work this discipline is expressed most strongly. But Le Corbusier also had a Fröbel education, as did the visionary American engineer Buckminster Fuller, famous for his domes and 'tensegrity structures' built from jointed rods. Fuller says that these

had their genesis in the Fröbel gift with sticks and dried peas.

Gustav Lilienthal was a German artist and architect who worked in the 1870s on the design of instructional wooden bricks for the educator Jan Georgens, a friend of Fröbel. Gustav and his brother Otto had the idea that the blocks might be better made of cast stone, and devised a recipe that combined sand, powdered chalk, and colouring, with linseed oil as the binder. (Otto is more famous as one of the pioneers of manned flight: the bat-like gliders in which he travelled hundreds of metres owed much to Leonardo da Vinci.)

The brothers had little commercial success with their invention and sold the rights to an industrialist Friedrich Adolph Richter, who marketed them under the name Anker [Anchor] blocks. They were sold internationally and are still manufactured today by the Goki company. They were the most successful construction toy ever produced, until Lego conquered the playroom after World War II. George F Hardy, historian of the Anker company, reckons that between 3 and 5 billion stones have been sold since the 1880s.

Richter sold boxed sets of blocks, the designs of which were simple at the outset but became much more complex. They were conceived less as instruments for kindergarten exercises, more for constructing ever more realistic models of historic German buildings. At first there were just three colours of block: brick red, slate blue and limestone white. Other colours were added later. Blueprints and illustrated instruction books were provided. Hundreds of different specially-shaped blocks were introduced, including for example parts with which to build an authentically detailed Doric temple. The Anker art department designed castles and cathedrals, requiring thousands of stones, that were exhibited at trade fairs. A series of bridge designs used the stone blocks

for the supporting towers and piers, and a system of metal bars and plates – like the British toy Meccano – for the roadways.

A Greek temple built from Anker blocks; from George F Hardy, *Richters Anker-Steinbaukasten* p.101

A bridge built from Anker blocks and metal pieces; from George F Hardy, *Richters Anker-Steinbaukasten* p.42

Later in his career Gustav Lilienthal became involved in housing reform, and devised a system of prefabrication for low-cost houses. The system was called Terrast and used pre-cast concrete slabs that resembled much-enlarged Anker blocks. Indeed, one of the patents for Terrast cited an earlier patent for the Lilienthals' original toy. Terrast was not a success. But in the 1920s Anker blocks were to provide the inspiration for another programme of experiment with prefabricated buildings at the Bauhaus in Dessau.

There was a shortage of housing in Germany after World War I, and the director of the Bauhaus, Walter Gropius, came to believe that this crisis could be solved through a combination of prefabrication and mass production. Gropius had played with Anker blocks as a child. He imagined "a house made up of variable set pieces, that are produced in stock and can be put together in a combinatorial way, say, in the manner of an Anker-Steinkasten [Anchor stone box], but on a larger scale." The architectural historian Atli Magnus Seelow describes how Gropius saw in Anker blocks several of the characteristics required in (full-scale) systems of prefabrication: standardised components made in a factory,

with modular dimensions, so that the parts fit together and are interchangeable.

Gropius and his partner Adolf Meyer exhibited two designs at the Bauhaus in 1923: the Honeycomb system, and the significantly named Big Construction Kit (*Baukasten im Großen*). The latter comprised six large modular components with which to build 'house-machines'. Unfortunately, like Lilienthal's Terrast, these projects also proved to be premature and failed to achieve the reductions in cost and time on site that they seemed to promise.

So the teachings of Fröbel rippled through the architecture of the first half of the 20th century. In 2008 the Lego company launched its 'Landmark Architect' series: specialised kits for building models of great monuments of the modern movement, including Frank Lloyd Wright's house Fallingwater. The wheel comes full circle: full-size buildings with debts to Fröbel are translated back into toy blocks.

The Lego 'Architecture' kit 21005 for Frank Lloyd Wright's Fallingwater, no longer manufactured

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Richard MacCormac, 'Froebel's kindergarten gifts and the early work of Frank Lloyd Wright', *Environment and Planning B*, Vol.1, 1974, pp.29-50

George F Hardy, *Richter's Anker (Anchor) Stone Building Sets*, 2013, online at ▶ **www.ankerstein.ch**

Atli Magnus Seelow, 'The construction kit and the assembly line – Walter Gropius' concepts for rationalizing architecture', *Arts*, Vol.7 2018, ▶ **https://doi.org/10.3390/arts7040095**

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learning process in action. Richard Lovell Edgeworth and Maria Edgeworth in their book *Practical Education* of 1798 recommended that the nursery be equipped with "pieces of wood of various shapes and sizes, which [infants] may build up and pull down", and that older children might make 'models of architecture' from cardboard and glue. In the 1830s the German pedagogue Friedrich Fröbel developed these kinds of ideas into a complete teaching system for the 'kindergarten' (Fröbel's term) in which educational toys known as 'gifts' played a central role.

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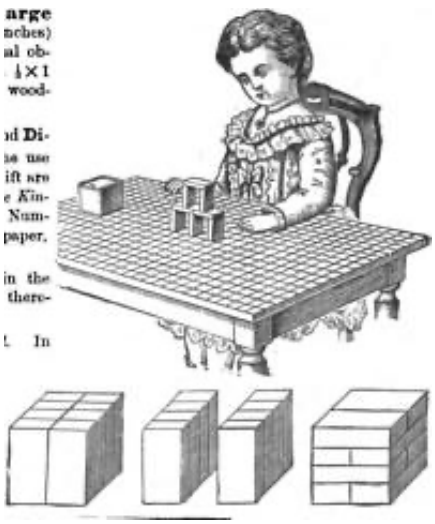
Froebel gifts

The **Froebel gifts** (German: *Fröbelgaben*) are educational play materials for young children, originally designed by Friedrich Fröbel for the first kindergarten at Bad Blankenburg. Playing with Froebel gifts, singing, dancing, and growing plants were each important aspects of this child-centered approach to education. The series was later extended from the original six to at least ten sets of gifts.[1][2]

A reproduction set of Froebel gifts

Description

The *Sunday Papers* (*Sonntagsblatt*) published by Fröbel between 1838 and 1840 explained the meaning and described the use of each of his six initial "play gifts" (*Spielgabe*): "The active and creative, living and life producing being of each person, reveals itself in the creative instinct of the child. All human education is bound up in the quiet and conscientious nurture of this instinct of activity; and in the ability of the child, true to this instinct, to be active."[3]



Fröbel's Gift 4, on a special gridded tabletop he also specified

Between May 1837 and 1850, the Froebel gifts were made in Bad Blankenburg in the principality of Schwarzburg Rudolstadt, by master carpenter Löhn, assisted by artisans and women of the village.[4] In 1850, production was moved to the Erzgebirge region of the Kingdom of Saxony in a factory established for this purpose by S F Fischer.[5]

Fröbel also developed a series of activities ("occupations") such as sewing, weaving, and modeling with clay,[1] for children to extend their experiences through play. Ottilie de Liagre in a letter to Fröbel in 1844 observed that playing with the Froebel gifts empowers children to be lively and free, but people can degrade it into a mechanical routine.

Each of the first five gifts was assigned a number by Fröbel in the *Sunday Papers*, which indicated the sequence in which each gift was to be given to the child.

Gift 1 (infant)

The first gift is a soft ball or yarn ball in solid color, which is the right size for the hand of a small child. When attached to a matching string, the ball can be moved by a mother in various ways as she sings to the child. Although Fröbel sold single balls, they are now usually supplied in sets of six balls consisting of the primary colors: red, yellow, and blue; as well as the secondary colors: purple, green, and orange. These soft balls can be squashed in the hand, and they revert to their original shapes.

The first gift was intended by Fröbel to be given to very young children. His intention was that, through holding, dropping, rolling, swinging, hiding, and revealing the balls, the child may acquire knowledge of objects and spatial relationships, movement, speed and time, color and contrast, and weights and gravity.[6]:42

Gift 2 (1–2 years)

The second gift originally consisted of two wooden objects, a sphere and a cube. Fröbel called this gift "the child's delight", since he observed the joy of each child discovering the differences between the sphere and cube.

The child is already familiar with the shape of the wooden sphere, which is the same as the ball of the first gift. The wooden sphere always looks the same when viewed from any direction. Like the child, the wooden sphere is always on the move. When rolled on a hard surface, the wooden sphere produces sounds. In contrast, the wooden cube is the surprise of the second gift. It remains where it is placed, and from each direction presents a different appearance.

The second gift was developed to enable a child to explore and enjoy the differences between shapes. By attaching a string or inserting a rod in a hole drilled through these wooden geometric shapes, they can be spun by a child. Although the sphere always appears the same, the spinning cube reveals many shapes when spun in different ways. This led Fröbel to later include a wooden cylinder in the second gift, which may also be spun in many different ways.

Gift 3 (2–3 years)

The familiar shape of the cube is now divided into eight identical beechwood cubes, about one inch along each edge, which is a convenient size for the hand of a small child. A child delights in pulling apart this gift, rearranging the eight cubes in many ways, and then reassembling them in the form of a cube. This is the first building gift.

Gift 4 (2–3 years)

This second building gift at first appears the same as in Gift 3. But a surprise awaits the child when the pieces are pulled apart. Each of these eight identical beechwood blocks is a rectangular plank, twice as long and half the width of the cubes of the previous gift.[1] Many new possibilities for play and construction arise due to these differences.

Gift 5 (3–4 years)

This building gift consists of more cubes, some of which are divided in halves or quarters.

Gift 6 (4–5 years)

A set of more complex wooden blocks that includes cubes, planks, and triangular prisms.[1]

Influence

Froebel's gifts were adapted by Caroline Pratt for the school, which she founded in 1913 in the Greenwich Village district of New York City. This school embodied a child-centered approach to education. Children worked together to reconstruct their experiences through play. Based on the ideas of Friedrich Fröbel, the curriculum was drawn from the environment of the child; observations about the neighborhood inspired each child to reflect on their world directly so that they could make sense of their experiences.[7]

Joachim Liebschner commented in his book, *A Child's Work: Freedom and Guidance in Froebel's Educational Theory and Practice* "Realising how the Gifts were eventually misused by Kindergarten teachers who followed after Fröbel, it is important to consider what Fröbel expected the gifts to achieve. He envisaged that the Gifts will teach the child to use his (or her) environment as an educational aid; secondly, that they will give the child an indication of the connection between human life and life in nature; and finally, that they will create a bond between the adult and the child who play with them".[8]

Fröbel's building forms and movement games were forerunners of abstract art as well as a source of inspiration to the Bauhaus movement.[9][10] Many modernist architects were exposed as children to Fröbel's ideas about geometry, including Frank Lloyd Wright, Le Corbusier, and Buckminster Fuller.[10] Wright was given a set of the Froebel blocks at about age nine, and in his autobiography he cited them indirectly in explaining that he learned the geometry of architecture in kindergarten play:

> For several years I sat at the little kindergarten table-top ruled by lines about four inches apart each way making four-inch squares; and, among other things, played upon these 'unit-lines' with the square (cube), the circle (sphere) and the triangle (tetrahedron or tripod)—these were smooth maple-wood blocks. All are in my fingers to this day.[11]: 359

Wright later wrote, "The virtue of all this lay in the awakening of the child-mind to rhythmic structures in Nature... I soon became susceptible to constructive pattern evolving in everything I saw."[12]: 25 [13]: 205

Current availability

Froebel gifts continue to be used in early childhood education in Korea and Japan, where they are made from local timber.

Reproduction sets can be ordered via the Internet.[2]

See also

- Alphabet blocks (ABC blocks)
- Montessori sensorial materials
- Unit block
- Waldorf doll

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External links

- Play is the work of children (http://www.ozpod.com/150/play/) Archived (https://web.archive.org/web/20090325234500/http://www.ozpod.com/150/play/) 2009-03-25 at the Wayback Machine
- Friedrich Froebel website (http://www.friedrichfroebel.com/)

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"From objects to pictures, from pictures to symbols, from symbols to ideas, leads the ladder of knowledge."

~ Friedrich Froebel

The Froebel Gifts are perhaps the world's first educational toys ... they certainly were the first materials designed for child development, as Kindergarten was the original preschool method. Developed in the early 1800's by Friedrich Froebel, inventor of Kindergarten, the Gifts appear deceptively simple but represent a sophisticated approach to child development. Over the last 180 years these intricately conceived playthings had a widespread impact, becoming interwoven with the history of art/design, education and popular culture.

Garden of Children documentary series

Much has been written about the Gifts since Froebel's death in 1852, but a lack of published material and modern translations has increasingly led to a misunderstanding of the meaning and purpose of these materials. As a result, the awareness of Froebel's method declined sharply in the 20th century. This site is intended to demystify the materials and more fully explain their intended use. Want to learn more? Subscribe to the Path to Learning podcast, or visit the Garden of Children documentary series website.

To understand of Froebel's original concept of his Gifts (how they are intended to be used) we must look at the history of the Kindergarten, the Froebel philosophy, and the specific attributes of the Froebel Gifts. This site is intended as an introduction and more information can be found through other resources and among the Froebel community. Learn more about annual conferences on the Froebel method.