

**Kenneth Martin & Mary Martin:  
Constructed Works**

**Notes for Teachers**

**Exhibition Dates:**

**Camden Arts Centre, 13 July – 16 September 2007**

**Tate St Ives, 6 October 2007 – 13 January 2008**

**De La Warr Pavilion, 26 January – 20 April 2008**

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## How to use this pack and structure your visit

The aim of this pack is to provide information about the artists whose work is exhibited, an exploration of key themes and suggested activities. Also included are information on resources and key art terms. The pack should help you create an introductory discussion about some of the issues raised by the current displays. It can be used to help focus work in small groups in the exhibition, and to allow follow-up within the classroom.

**For information on arranging a visit to the De La Warr Pavilion see our website, [www.dlwp.com/education/schools](http://www.dlwp.com/education/schools)**

## ***Kenneth Martin and Mary Martin: Constructed Works***

This exhibition shows the work of two of Britain's key post-war abstract artists, Kenneth Martin and Mary Martin. Part of a generation of British artists, who 'rediscovered' abstraction in the 1940s, the exhibition highlights the correspondences and differences between their working practices. The exhibition includes nearly 50 works and focuses on Kenneth Martin's mobiles and his later *Chance and Order* series of abstract paintings, alongside Mary Martin's relief sculptures.

This exhibition is the first joint public exhibition of their work in Britain since 1971. Living and working together, they were constantly exchanging ideas, although they rarely made direct collaborations. They had their first joint exhibition in 1954 and on only two other occasions did they collaborate - *Environment* produced with the architect John Weeks for the exhibition 'This is Tomorrow' at the Whitechapel Art Gallery, 1956 and on the joint exhibition 'Essays in Movement' at the Institute for Contemporary Arts in 1960.

**Mary Martin** (1907 – 69) was born in Folkestone. She studied painting at Goldsmiths College and at the Royal College of Art where she met Kenneth. In the 1930s she focused on still-life and landscape and also worked as a textile designer teaching at Chelmsford School of Art 1941-4. She painted her first abstract picture in 1950 and made her first relief in 1951. Mary made numerous public commissions and collaborations with architects including a Wall Screen for Musgrave Hospital Belfast (1957) and Wall Construction for the University of Stirling.

**Kenneth Martin** (1905-84) was born in Sheffield. He studied painting at Sheffield School of Art and worked as a graphic artist in the 1920s before studying fine art at the Royal College of Art where he met Mary in 1929. Kenneth made his first abstract paintings in the late 1940s and his first three-dimensional construction in 1951. He worked primarily in three-dimensions making kinetic mobiles, constructions and public commissions until the late 1960s. He also taught at Camberwell School of Art and Goldsmiths College. In 1969 he began a group of paintings known as the *Chance and Order* series, which he worked on until his death in 1984.

## Key works

### Mary Martin

#### ***Columbarium 1951*** (Gallery 1)

Plaster

Estate of Mary Martin. Courtesy of Annely Juda Fine Art.

This was Mary's first experiment with relief. Encouraged by the sculptor Eduardo Paolozzi, Mary used a baking tin to cast a plaster relief. She then cut triangular, rectangular and square shapes into the plaster creating niches and areas of empty space. This was her first real experiment with positive and negative areas within composition and she quickly realised that plaster was an unreliable and unsuitable material for her interests. All subsequent works were constructed reliefs in the true sense of being built up from the flat picture plane (see, for example, *Spiral* 1951).

In *Columbarium* you can see Mary experimenting with her characteristic 'tilt', which receives light in a very particular way and which encourages one to feel a sense of movement 'up and over'. This is the last time Mary gave her work a title suggestive of something else. Later works have titles that provide only an objective description of the process and materials used.

#### ***First Maquette for Wall Screen, Musgrave Park Hospital, Belfast 1957*** (Gallery 1)

Wood, aluminium and paint

Private collection

This is one of two maquettes on display here made in relation to her first public commission to design a Wall Screen for Musgrave Park Hospital (note the first is very much a sculptor's maquette, whereas the second is for the architects). This was a collaboration with the architect John Weeks and, as the maquettes demonstrate, Mary was keen to create a work completely embedded with the building's construction. She chose to use the same materials as those used to construct the building (brick, cement and stainless steel) and the piece was actually fabricated by the site builders. The screen was therefore linked to the plan and design of the overall building but also served to direct the flow of visitors, perhaps one reason why she chose to include holes to provide views through from one side to the other. Mary said 'This is intended to be a symbol, on the personal scale, of the building, its architecture and function, and the lives of the people who work in it'.

Mary's design creates a serpentine composition and she also called it *The Waterfall* describing it as a symbol of life. The pattern of apertures and metal surfaces encourages the idea of movement or of water falling down. Despite being an example of a successful architectural collaboration, in more recent years the screen has been removed and placed as a free-standing work in the hospital grounds.

#### ***Inversion 1966*** (Gallery 2)

Metal, oil and wood

Tate

This work, which is 6 foot high by 24 foot long, is made of aluminium plates mounted on hardboard on baseboards of black painted plywood. There are 96 plates in four rows of 24 and Mary has permuted the planes, which are placed in four different directions in vertical columns of four.

For the first time in her work Mary used open half cubes (only the diagonal side is used) and the play of light and reflections across the surface creates an extraordinary sense of movement and surprising partial images. She described her device as a 'moving format of cubism combined with a system of

positive and negative spaces'. The 'moving format' was a geometrical device identified by J.W. Power in his book *Elements of Pictorial Construction* (1933) in which he describes the movement of a unit across a plane through a motion of sliding and rotating, with each stage determining the location of other related elements within a composition.

The grand scale of this work reflects Mary's ambition to create architectural works that interact with their environment and must be linked to her later commission to create a *Wall Construction* at the University of Stirling. Rarely shown in complete form, this work has recently been restored with the help of the Tate St Ives Members.

### **Kenneth Martin**

#### **Mobile Reflector 1953** (Gallery 1)

Painted and anodised aluminium and wood

For this mobile Kenneth Martin has suspended metal rods with circular coloured discs. If you stand directly below it you can see the play of colour reflections (red, blue and green) in the polished aluminium surfaces. It is an example of Kenneth's earliest mobiles, which he describes as 'lessons in balance' where he constructs using commercial materials and suspends with nylon (a new material, strong but invisible).

This mobile moves according to air temperature and movement in the room. Kenneth saw movement as a way of linking space with time. He maintained his mobiles were resolutely abstract composed of what he called 'primitive forms' such as lines, circles and ellipses. In contrast to the mobiles of Alexander Calder, who undoubtedly inspired Kenneth (they were exhibited in London in 1951), these mobiles do not directly reference nature.

#### **Construction for the Nuffield Foundation 1967-8** (Gallery 2)

Brass

Zoological Society of London

This brass screw mobile, which is powered by a motor, creates different shapes and patterns as it slowly turns. A cage, a spiral staircase, butterfly wings are all suggested as it moves. This mobile was commissioned for the Nuffield Institute of Comparative Medicine at London Zoo. It is Kenneth's largest mobile and it took six years to complete.

Kenneth's screw mobiles were a development of his earlier reflector mobiles. He used three basic elements – the parabola, the circle and the vertical line and constructed them from mass produced brass bars, rings and rods. They were made through the ordering of fundamental movements such as rotations and twists and by using bars of various sizes he was able to programme their positions on the vertical rod. He also introduced a whole range of further permutations by having, for example, parabolas or rings related to the Fibonacci sequence.

As can be seen with this work, the position and lighting of these mobiles is important. The unpredictable play of light on the surface of the mobiles, casting dramatic shadows on the wall behind introduces an element of chance into these 'constructed' objects.

***Chance and Order 23 (Yellow) 1978*** (Gallery 1)

Oil on canvas

Estate of Kenneth Martin. Courtesy of Annely Juda Fine Art.

In the late 1960s Kenneth returned to using oil paint on canvas producing a series of over 40 paintings based on variations of a particular working process. Each canvas was carefully 'gridded-up' and then pairs of numbers chosen by chance were used to determine the sequence of orientation of lines corresponding to the coordinates of the grid. This process enabled Kenneth to work in a very structured way, but also a way where he could not determine or foresee the final outcome.

Here you can see how Kenneth has built up his composition using a sequence of yellow lines based on this system. The bold pure yellow pigment contrasts with the sensuous heavily worked white paint surface. The stark geometry of the lines creates a sense of space and energy within the painting; at the same time the intensely worked physical surface suggests a feeling of contained or muffled stillness.

## For discussion

- How good are you at describing Kenneth's mobiles or Mary's reliefs? Explore the exhibition and find a work that catches your eye – look at it closely. Trace its shape in the air with your finger. Can you find words to describe it?
- Now glance around the whole exhibition again. What sorts of things are these artists interested in? Make a list.
- Mary and Kenneth often used sequences and permutations for the basis of their work. Can you find a work where you can see the exact permutation used? Can you 'break the code'?
- Mary often used a half cube form, which she called a 'tilt'. Can you think why?
- What colours do Mary and Kenneth prefer? Why?
- What materials and processes did they use to make their work?
- Why do you think they like reflective surfaces?
- The exhibition creates some striking 'conversations' between two and three-dimensional works. Choose two works that you feel speak to each other in some way (they might share characteristics or they might be strongly contrasting) and explain to the group why.

## Key themes

### Constructions

The idea of 'construction', of building forms using individual elements through the application of mathematical rules, was central to the work of both artists. Kenneth and Mary developed their constructions through relationships of simple, repeated formal forms using mathematical progression, sequences and permutations and rules of proportion.

### Abstraction

Kenneth Martin and Mary Martin looked to a particular type of abstract art – they looked to the earlier proponents of pure geometric abstraction for both formal and philosophical foundations and in particular to the earlier Constructivists such as Vladimir Tatlin and Alexander Rodchenko. They formed a group, which included Victor Pasmore, Anthony Hill and Adrian Heath that were concerned with establishing a new wave of constructed abstract art in Britain. They used geometric forms according to proportional systems and numerical mathematical sequences, with the intention of giving a visual form to the laws and systems on which nature is founded (note: this is different to abstracting from nature).

### Materials

They rejected traditional artists' materials as being too closely associated with traditional values. They turned to readily available materials such as sheet metals, hardboard, plywood, formica and perspex. They loved to experiment with the contrasting qualities of materials such as smooth versus textured, matt versus shiny and absorbing versus glowing. Their use of modern industrial materials also distanced their art from the traditional, private, unique work of art and imbued their work with a sense of optimism for the future.

### Movement and stillness

In each gallery you will find works that convey an extraordinary sense of both movement and stillness – of both change and constancy. Kenneth Martin's mobiles use what he described as 'primary kinds of movement' – some sort of rhythmic sequence which may be reliant simply on air current but sometimes an actual motor. Mary Martin does not use actual movement in her relief work but it is invoked in the play of light over the projecting and reflective surfaces. You could say that the energy of the spiral was developed in planar composition by Mary but in linear composition by Kenneth.

## **Shadow**

Consider what role shadows and reflections play in their work. The dramatic shadows cast by a spotlight in Kenneth's mobiles add another dimension and place the work in the environment around it. Shadow was the 'fifth element' according to Mary and the 'tilts' and angles of her cubes, half cubes and planes create new spaces and complexities of colour.

## **Chance and order, sequence and pattern**

It is important to understand the role of both chance and order in their work. This is perhaps best understood in relation to Kenneth's *Chance and Order* paintings where lines were painted according to numbers that corresponded to coordinates on a grid chosen by chance. Mary described her own working method as 'nuclear building' and a logical process of growth, starting from a unit and subjecting it to a logic or sequence and accepting the result without any interference by the artist and without foreknowledge of the final outcome.

## **Colour**

The predominance of black and white and occasionally red is noticeable in the early reliefs and constructions. It was only in the late 1950s that Mary began to add painted colours to the side surfaces of some of the reliefs, eventually experimenting with bold coloured Perspex. Kenneth Martin tended to use pure unmixed colours pitched against a deeply textured white in his later paintings.

## **The active line**

Kenneth Martin was influenced by Paul Klee's idea of the 'active line' and the idea of 'taking a line for a walk' to describe the combination of rules and chance that underpin his drawing. For Kenneth everything began with line. His constructions and mobiles are drawings in space – their lines embody both dynamism and controlled energy.

## **Art of the environment**

Both artists were interested in the relationship between art and architecture. They wanted their work to be fully integrated within the environment and both were involved in architectural commissions. Mary, who collaborated with the architect John Weeks on a number of occasions, argued that working in an exhibition context was only a 'makeshift for reality'. In 1958 she wrote 'is the artist to remain the 'chamber architect', a 'backroom boy' or is there a real place for the constructive artist in architecture?'

## **Social role of art**

Mary and Kenneth's ideas about art and architecture reflect their optimism and genuine belief in a social role for art. They believed art could and should be part of the fabric of life. Such a belief was inextricably linked to a particular movement advocating for a politicised abstract art in post-war Britain and contrasts sharply with the interest in pop and commercial art that also emerged in this period. They believed their pure abstraction, based on a rigorous scientific, mathematical and systemic approach, had a moral and intellectual authority that could play a real role in the public realm. Such views must be seen in the context of a Post-War Utopianism. This after all, was the period that saw the founding of the Welfare State and the establishment of the Arts Council.

## **A human dimension**

Despite formal systems and industrial materials Kenneth and Mary Martin's work always remains human both in terms of scale and character (note: this contrasts strongly to, for example, American Minimalism, see Glossary of art terms). They never forgot the importance of the hand-made – of making rather than simply realising a design. Within their rigorous systems is the belief that human beings live a pattern of constantly repeating sequences. Mary Martin wrote, 'the artist, a part of nature, seeks to discover and use forming principles in order that he may in his turn manifest nature. It is a forming principle that I see the idea of polarity, constancy and change'.

## Abstract art and the environment today

Today a younger generation of artists such as Tomma Abts, Peter Peri and Toby Paterson are looking with fresh eyes at abstract art from the 1950s and 1960s. There has also been a revival of interest in the social utopian ideals of the immediate post war period and the debates about art and architecture in the public realm continue. Toby Patterson argues that a study of the work of Mary Martin can sharpen the way we look at both the rhythms and eccentricities of cities.

## Ideas and influences

Outlined below are some of the key influences on the work of Kenneth Martin and Mary Martin.

1. **Science and mathematical models.** Kenneth Martin was known to have studied such models at the Science Museum.
2. Kenneth Martin was influenced by the work of **Paul Klee** – he saw an exhibition of his paintings at the National Gallery in 1945/6 and Klee's *Pedagogical Sketchbook* was republished in UK in 1953.
3. Both Mary and Kenneth were acquainted with the Swiss artist/ designer **Max Bill** a former Bauhaus student who wrote *The mathematical Approach to Contemporary Art* (1949). They also knew **Theo van Doesburg**, leader of the Dutch De Stijl movement.
4. Both artists were influenced by the American artist and theorist **Charles Biederman** who advocated abstract art made from industrial materials. The source of the term Kenneth Martin used to describe their work, 'Constructionist', actually came from Charles Biederman whose ideas were set out in *Art as the Evolution of Visual Knowledge* 1948 and *Letters on New Art* 1952.
5. The **Golden Section and Fibonacci Series** was often used in their constructions. The Golden Section (See Glossary of art terms) is defined as a line divided so that the smaller part is to the larger part as the larger part is to the whole. It works out at roughly 8:13 or a bit over one third to two thirds.

The Fibonacci Series is a sequence of numbers named after the Italian mathematician Leonardo Fibonacci (1175-1250). In a Fibonacci sequence each number is the sum of the two before it (0,1,1,2,3,5,8,13,21,34...). The Fibonacci numbers are evident in nature, for example, the number of spirals found in a sunflower seed head.

For help explaining the golden section and Fibonacci series to children see the following websites,  
[http://www.coolmath.com/reference/math-dictionary-G.html#Golden\\_Ratio](http://www.coolmath.com/reference/math-dictionary-G.html#Golden_Ratio)  
<http://www.amathsdictionaryforkids.com/>

6. Scientific forms such as the **Möbius strip** and the **double helix** may have had an impact on the design of Kenneth's mobiles. The Möbius is a surface with only one side and only one boundary. It has the fascinating mathematical property of being non-orientable. It was discovered independently by the German mathematicians August Ferdinand Möbius and Johann Benedict Listing in 1858. The double helix, which is a very strong shape, is most closely associated with the structure of DNA molecules that was first published by James D. Watson and Francis Crick in 1953, based on work by Rosalind Franklin.
7. Mary's preoccupation with systems of scale and proportions was influenced by **Le Corbusier's** *Le Modular* (1948) and *Le Modular 2* (1954). This was a measuring tool based on the proportions of the body. Le Corbusier claimed it could be used on an international scale and for the production of mass-produced manufactured articles.

# Ways of Looking

## Questions to ask of any work

### Personal responses – what do you bring to the artwork?

- What are your first reactions to the work?
- What is the first word that came into your head when you saw it?
- What do you notice first?
- Does it remind you of anything?
- What do you think the artist wants to communicate?

### Looking at the artwork – what can you see?

- What materials and processes has the artist used to make the artwork?
- What is it? (Is it a film, photograph, drawing, sculpture, installation, performance etc?)
- Where is it? Describe the space. Does it link with other artworks in the exhibition?
- How big is the artwork? What effect does scale have on the artwork and our relationship to it?
- Is it time-based? If so, describe what happened and how long it took. Is it repeated?

### Subject and meaning – what is it about?

- Is the artwork about a subject, issue or theme?
- Is it about real life?
- Could the work have a symbolic, moral or political meaning?
- Is there a story or narrative within the work?
- How does the work make you think about time?
- Does it make you consider aspects of life or art in a new way?
- Does the work have a title? Does this affect the way you see it?
- What information is available in the gallery (e.g. wall text or caption)? Does this information affect or change the way you see the work?

### Art in Context – influences which shape the creation and reading of a work

- Who is the artist? Do you think the background of the artist can inform us about why or how it was created, or what it might be about?
- Was the artwork made for a particular location or event?
- Does the artwork link to other works made by the artist?
- How does the artwork link to work by other contemporary artists?
- Does it connect to any art of the past?
- What does the artwork tell us about the ideas and values of today's world?
- How does it link or comment on contemporary social, cultural and political issues such as consumerism, globalisation and multi-culturalism?
- Does the work make use of modern materials and technology or perhaps it re-invents age-old processes?

## Suggested activities

Listed below are some suggested activities. Some can be done during a gallery visit, and other are for the classroom. Please note that as some of the work is very fragile, only pencils and paper are allowed in the gallery, and groups must be supervised.

### Quick/ simple activities

**Grids, patterns and systems.** Use simple geometric forms such as wooden blocks or card to explore systems and sequences to create patterns. Use graph paper and plot coordinates chosen by chance to understand how Kenneth Martin created his Chance and Order paintings. Experiment with bright/primary colours and use sticky pads and/or blue tac to create a raised surface that reflects the underside colours.

**Möbius strips.** Take a strip of paper and turn it once before joining the ends. Cut the loop that it makes into two, making two loops, one will be inside the other. You can then repeat the process on one of the remaining loops. This activity is full of surprise and encourages curiosity – it shows how we categorised two and three-dimensional objects before we have any real experience of them.

**Parabolas.** A parabola can be defined as the set of all points in the plane equidistant from a given line and a given point. Use graph paper to plot parabolas to demonstrate how Kenneth Martin created his mobiles.

**Colour and/or numerical sequencing.** Encourage children to experiment with colour and number sequences. Use graph paper and coloured pencils or experiment with coloured card, paper or three-dimensional shapes such as cubes and play blocks with different coloured faces. Challenge each other to 'break the code' and discover the sequence used. Children could also experiment with Fibonacci numbers to understand the Fibonacci spiral.

**Magic mobiles.** Ideas about balance, pivot points, light and shadow can be explored simply using your finger and a pencil. 'Magic' mobiles can be created using easily available materials such as painted paper shapes, nylon thread, straws, a hole-puncher and a torch.

**Take a line for a walk.** This is a good sketchbook activity. Encourage students to look around the gallery or classroom and then draw what they see without taking their pencil from the paper. They can go over the line they draw as many times as they like but the challenge is not to take their pencil off the paper.

### Extended activities and projects

**Systems, grids and chance environments.** Explore Kenneth Martin and Mary Martin's use of systems and grids within their two and three-dimensional work. Students could explore a landscape or building using a system or grid as the starting point. For example, students could grid up a plan of the school and then select coordinates by chance within the grid. The points selected could then be recorded, perhaps through photography or painting. This activity could extend to outdoor landscapes/ environments beyond the school.

**Pathway through a landscape.** Similar to the activity above, students could take a geometric shape such as a cube or half cube and sequence it in some way (by rotation, flipping, numerical series etc.) to create a path or pattern through the landscape. This would work well on a large scale and as a group activity.

**Computer patterns and sequencing.** What happens when a coloured shape is flipped, rotated and layered? What would happen if a relief by Mary Martin is translated into a computer design? This is an opportunity to create both hand-made and computer generated design – perhaps as a diptych or combined piece of work in some way to contrast the qualities of each.

**Reliefs.** Use found or recycled materials and glue to develop relief collages. Encourage students to experiment with shapes that have a relationship with each other. For example, they could use the golden section or number sequences or experiment with rotating and ‘tilting’ half cubes. Alternatively, contrast geometric shapes with more natural shapes. Combine sharp lines (perhaps use string and pins) and pure colours with curved shapes and mixed colours.

**Materials.** Kenneth Martin and Mary Martin chose to use modern, often industrial, materials in ways that had not previously been associated with art works. What materials are considered ‘modern’ today? Experiment with new materials (such as recycled plastics and papers) available today and find unusual or different ways to use them.

**Mobiles & kinetic sculpture.** Use wire, cotton, fishing line, nylon and/or withies to create more elaborate mobiles. Use a range of materials (including miscellaneous objects), colours and reflective surfaces to experiment with balance, colour, shape, light and shadow. Think about weight and position and how high or low to hang the mobile. Could the mobile be re-made in a slightly different shape or form? Shine a torch or direct light onto the mobile to create dramatic shadows. Depending on resources, extend to kinetic sculpture through the use of heat convectors and even simple motors.

**Structured versus natural compositions.** Start by preparing a textured coloured ground on canvas, card or paper. Develop a composition on this ground, by first creating a strong geometric structure using intersecting lines, geometric shapes such as triangles, ellipses and curves, perhaps based on a grid system or the golden section. Add to this a series of more organic or natural forms that seem to fit the structure – this could be done by simply taking a line for a walk (see Quick and Simple activities above) across the composition. Finally add small touches of bright colour.

**Insignificant objects.** Look at the objects around you in the classroom/ your home or here at the gallery. Compare your thoughts as to which objects are more important than others and why. Can a collection of everyday objects tell us something about a person? Younger children could create a box/bag/table with objects relating to a person and then guess who they might be. Older students could explore the idea of transforming ordinary or ‘poor’ objects.

## Key art terms

(from Tate glossary [www.tate.org.uk/collection](http://www.tate.org.uk/collection))

### Abstract art

The word abstract strictly speaking means to separate or withdraw something from something else. In that sense it applies to art in which the artist has started with some visible object and abstracted elements from it to arrive at a more or less simplified or schematised form. Term also applied to art using forms that have no source at all in external reality. These forms are often, but not necessarily, geometric. Some artists of this tendency have preferred terms such as Concrete art or non-objective art, but in practice the word abstract is used across the board and the distinction between the two is anyway not always obvious. A cluster of theoretical ideas lies behind abstract art. The idea of art for art's sake - that art should be purely about the creation of beautiful effects. The idea that art can or should be like music - that just as music is patterns of sound, art's effects should be created by pure patterns of form, colour and line. The idea, derived from the ancient Greek philosopher Plato, that the highest form of beauty lies not in the forms of the real world but in geometry. The idea that abstract art, to the extent that it does not represent the material world, can be seen to represent the spiritual. In general abstract art is seen as carrying a moral dimension, in that it can be seen to stand for virtues such as order, purity, simplicity and spirituality. Pioneers of abstract painting were Kandinsky, Malevich and Mondrian from about 1910-20. A pioneer of abstract sculpture was the Russian Constructivist Naum Gabo. Since then abstract art has formed a central stream of modern art.

### Constructivism

Particularly austere branch of abstract art founded by Vladimir Tatlin and Alexander Rodchenko in Russia around 1915. The constructivists believed art should directly reflect the modern industrial world. Tatlin was crucially influenced by Picasso's Cubist constructions (Construction 1914) which he saw in Picasso's studio in Paris in 1913. These were three-dimensional still lifes made of scrap materials. Tatlin began to make his own but they were completely abstract and made of industrial materials. By 1921 Russian artists who followed Tatlin's ideas were calling themselves Constructivists and in 1923 a manifesto was published in their magazine Lef: 'The material formation of the object is to be substituted for its aesthetic combination. The object is to be treated as a whole and thus will be of no discernible 'style' but simply a product of an industrial order like a car, an aeroplane and such like. Constructivism is a purely technical mastery and organisation of materials.' Constructivism was suppressed in Russia in the 1920s but was brought to the West by Naum Gabo and his brother Antoine Pevsner and has been a major influence on modern sculpture.

### Constructionism

An extension of Constructivism in Britain from about 1950 in the work of Victor Pasmore, Kenneth Martin, Mary Martin and Anthony Hill. Naturally occurring proportional systems and rhythms underpinned their geometrical art. They were inspired by the theories of the American artist Charles Biederman and explored the legacy of the 'Constructive art' made in the 1930s by Ben Nicholson, Barbara Hepworth and Naum Gabo, whose contribution to the Russian Constructivism was exemplary. Hill insisted on using the term Constructionism for the British phenomenon, but Constructivism is more commonly found.

### Cubism

Cubism was a new way of representing reality in art invented by Picasso and Braque from 1907-8. A third core Cubist was Juan Gris. The generally agreed beginning of Cubism was Picasso's celebrated *Les Femmes d'Alger (O.J. Version O)* of 1907. The name seems to have derived from the comment of the critic Louis Vauxcelles that some of Braque's paintings exhibited in Paris in 1908 showed everything reduced to 'geometric outlines, to cubes'. Cubism was partly influenced by the late work of Cézanne in which he can be seen to be painting things from slightly different points of view. Picasso was also influenced by African tribal masks which are highly stylised, or non-naturalistic, but nevertheless

present a vivid human image. In their Cubist paintings Braque and Picasso began to bring different views of the object together on the picture surface. 'A head', said Picasso, 'is a matter of eyes, nose, mouth, which can be distributed in any way you like. The head remains a head.' In practice however, the object became increasingly fragmented and the paintings became increasingly abstract. They countered this by incorporating words, and then real elements, such as newspapers, to represent themselves. This was Cubist collage, soon extended into three dimensions in Cubist constructions. This was the start of one of the most important ideas in modern art, that you can use real things directly in art. Cubism was the starting point for much abstract art including Constructivism and Neo-Plasticism. It also however, opened up almost infinite new possibilities for the treatment of reality in art.

### **Minimalism**

Minimalism or Minimal art is an extreme form of abstract art that developed in the USA in the second half of the 1960s. It can be seen as extending the abstract idea that art should have its own reality and not be an imitation of some other thing. It picked up too on the Constructivist idea that art should be made of modern, industrial materials. Minimal artists typically made works in very simple geometric shapes based on the square and the rectangle. Many Minimal works explore the properties of their materials. Minimal art was mostly three-dimensional but the painter Frank Stella was an important Minimalist. The other principal artists were Andre, Flavin, Judd, Lewitt, Morris, and Serra. There are strong links between Minimal and Conceptual art. Aesthetically, Minimal art offers a highly purified form of beauty. It can also be seen as representing such qualities as truth (because it does not pretend to be anything other than what it is), order, simplicity, harmony.

### **Proportion**

Proportion is the relationship of one part of a whole to other parts. In art it has usually meant a preoccupation of artists with finding a mathematical formula for the perfect human body. At the time of the Renaissance, Leonardo da Vinci and Albrecht Dürer attempted to find a formula that would enable the body to be exactly inscribed in a square or a circle. Their system seems to have been to first make the height the same as the full width of the outstretched arms, and then to add to the height so that the total height was equal to eight heads. Renaissance researches into proportion were inspired by the ancient Roman writer of a treatise on architecture, Vitruvius. A more general formula for perfect proportion is the **Golden Section** or Golden Mean. This is defined as a line divided so that the smaller part is to the larger part as the larger part is to the whole. It works out at roughly 8:13 or a bit over one third to two thirds. In one way or another the Golden Section can be detected in most works of art. It so named because it was considered to have some special aesthetic virtue in itself.

### **Kinetic art**

The word kinetic means relating to motion. Kinetic art is art that depends on motion for its effects. Since the early twentieth century artists have been incorporating movement into art. This has been partly to explore the possibilities of movement, partly to introduce the element of time, partly to reflect the importance of the machine and technology in the modern world, partly to explore the nature of vision. Movement has either been produced mechanically by motors or by exploiting the natural movement of air in a space. Works of this latter kind are called mobiles. A pioneer of Kinetic art was Naum Gabo with his motorised Standing Wave of 1919-20. Mobiles were pioneered by Alexander Calder from about 1930. Kinetic art became a major phenomenon of the late 1950s and the 1960s.

### **Relief**

A relief is a wall mounted sculpture in which the three dimensional elements are raised from a flat base. Any three dimensional element attached to a basically flat wall mounted work of art is said to be in relief or a relief element.