



Geometry and Number

In Islamic and British Arts and Crafts

For Key Stages 2-3





Arts & Crafts Hammersmith

At the end of the nineteenth century, in an unfashionable area of West London, two remarkable men made their homes.

One was the country's most famous designer, poet and radical thinker. The other, less well known, was also a key member and huge influence on the Arts & Crafts Movement. Their names were William Morris and Emery Walker. Their work changed art and design.

Fast forward over 100 years and Arts & Crafts Hammersmith – a partnership between The William Morris Society and The Emery Walker Trust has been set up to uncover their stories and influences.

Much needed renovation work was undertaken on their former homes at Kelmscott House and Hammersmith Terrace, supported by the Heritage Lottery fund.

The contents of Emery Walker's House had to be cleared, cleaned and recorded, and now, with the help of a terrific team of volunteers, put them all back ready in place to reveal them once more to the public.

We have also refurbished and created storage space at Kelmscott House for an important collection of original Morris designs and publications.

Over 6,000 items have been catalogued and many will be available to view online. We will be adding new insights and discoveries while the project progresses, so do come back and visit the website, or, the homes themselves.

The museums have extended opening hours and offer new bespoke group and school visits and resources.

Check out the special events and exhibitions which are held in the improved facilities.

Both museums are half an hour away by public transport from central London, or just 20 minutes from the V&A.

Why not visit both houses at the same time? They are only separated by a picturesque ten minute walk along the Thames.



| | |
|-----------------------------|----|
| Arts & Crafts Hammersmith | 3 |
| Introduction to Islamic Art | 5 |
| Ceramics and Colour | 6 |
| Tiles and Symmetry | 7 |
| Spirals and Curves | 13 |
| Geometry and Number | 15 |
| Further Resources | 18 |
| Visit Us | 19 |

Islamic art is an all-encompassing term used to describe mostly historical examples of arts and artefacts related to the Islamic world. In many cases these artefacts were produced in those parts of the world where Islam was or is the dominant faith of the population. However, the art in question spanned many centuries, continues to this day in all parts of the world, and has been developed by and for non-Muslims too.

The world 'Islamic' relates to the Islamic faith, the faith of Muslims who believe in the last Prophet Muhammad (b.571 CE) whose revelations from God via Angel Gabriel were recorded as the Qur'an (the written form of the revelations).

Alongside the spread of the Islamic faith also developed a visual culture associated with the people and places it touched. The popular visual decorative elements of geometry and floral motifs were advanced by artisans across the expanding Islamic empire and soon Arabic calligraphy, used to beautify the Qur'an, also became an art form. These three visual elements were also most suited to religious spaces such as the mosques, places of communal worship and congregational gatherings.

From the smallest boxes to the largest books, from the everyday jar to the tiles used to cover a large building. It seems anything could be turned into a work of art.

The skills used to produce such artefacts and architecture became a tradition associated with the parts of the world where the most beautiful and high-quality items were made. Places such as Turkey, Spain, Morocco, Syria and India still hold wondrous examples of historical palaces and working mosques covered in beautiful patterns. These have inspired creativity to this day and are explored through this booklet where we will examine and recreate some of the wondrous patterns used in Islamic art.

This resource provides an exploration of the collections held by both the William Morris Society and the Emery Walker Trust and developed under the joint project of Arts & Crafts Hammersmith.

The Islamic Collection at Emery Walker's House
The content of this resource relates closely to the online exhibition The Walkers and Islamic Art in which the engagement with Islamic culture and artefacts is discussed in the context of British Arts and Crafts. Within this exhibition, particular focus has been given to the relationship between William Morris and Emery Walker, close friends, both residing along the embankment in Hammersmith, London.



Postcard of The Blue Mosque from Dorothy Walker's Photo Album, 1954. EWT Archive



Wooden tablet with remnants of inked Arabic scripture. Morocco, 1900. Object No. EWH/00449

Ceramics and Colour

The Walkers were great enthusiasts of ceramics, and almost every room in their home holds a display of ceramics, some purchased on their trips abroad, others bought from or gifted by local artisans.

Seeing these global styles side by side in a British arts and crafts home, it becomes clearer that influences between cultures from around the world informed and influenced each other.

One of the more unique group of ceramics bought by the Walkers was a set of multi-coloured dishes, jars, bowls and flasks from Morocco. All the pieces feature geometric line-based decorations and petal shaped borders. The bright colours of

yellow, green and blue against a soft pink or white base made for a vibrant display for a family home. Similar pieces became very popular in Britain in the late 19th century when introduced at the Annual International Exhibition of 1871.

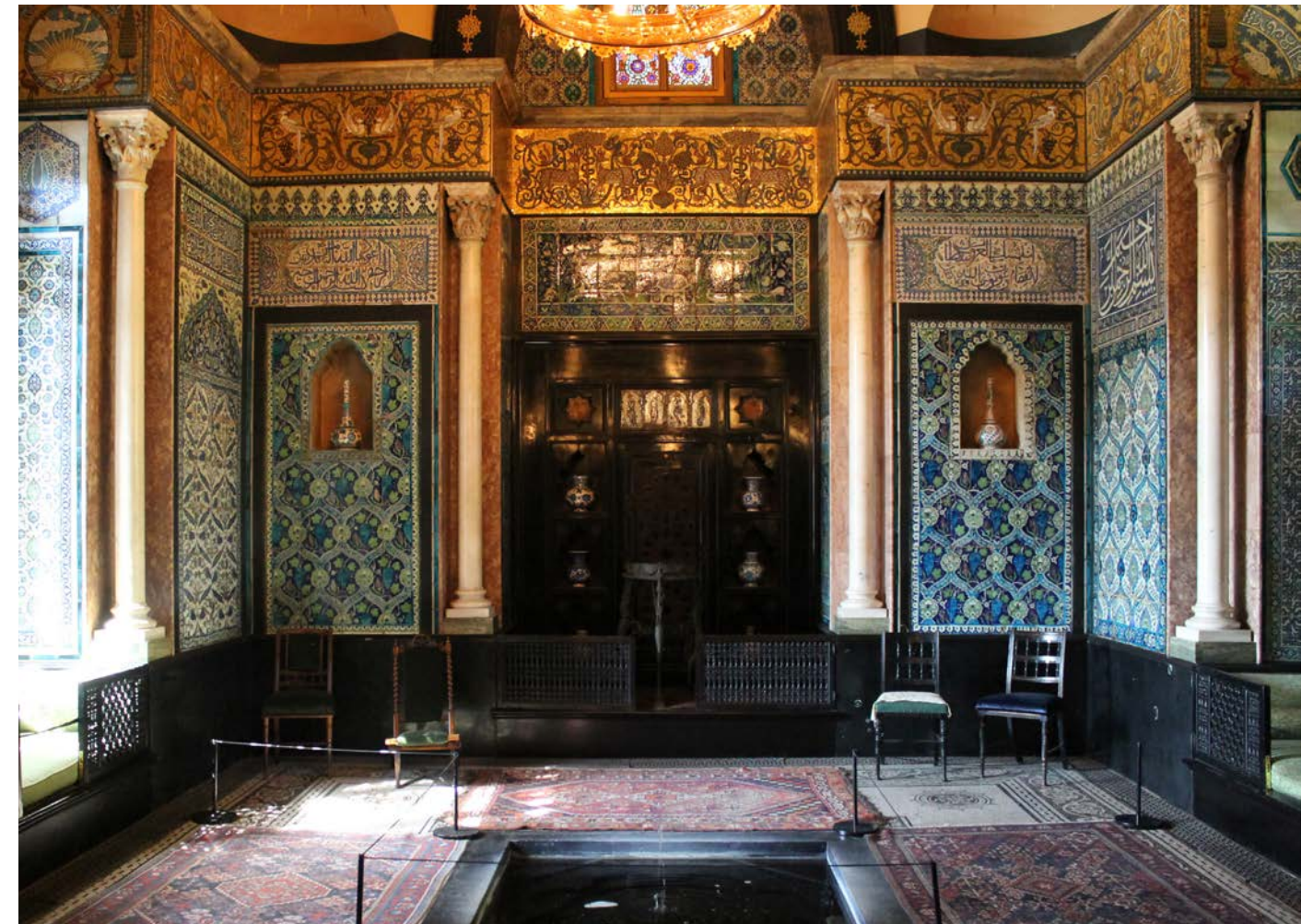
Ceramics are made with the process of firing (heating) clay in an oven. The objects are then painted with a number of glazes in varying colours and fired again. The firing process hardens the glaze and gives it a glossy appearance, making the object stronger and suitable for both hot and cold conditions. As a result, ceramics have survived hundreds of years with the colours retaining their brightness despite the duration of time.



Moroccan Ceramics, c.late 19th Century, Fez, Morocco.

Clockwise from top: Object No. EWT/03351, EWT/03344, EWT/03350, EWT/02052, EWT/02125

Tiles and Symmetry



View of 19th century Arab Hall at Leighton House Museum which is covered with Damascene tiles

Iznik

Iznik was a town within the Ottoman Empire, a location in present day Turkey. In the 16th century this became a hub for high-quality ceramic production. Tiles, jars, dishes, bowls, jugs, there seemed to be no item left untouched by the rich decorative arts of Islamic pattern. The variety in form and colour was highly appealing and led to the wares being sent to all corners of the Ottoman empire. Tiles were used to decorate the sacred and holy sites within Islam such as the Dome of the Rock in Palestine. Dishes and bowls made their way to royal residences, to the highest of noblemen, and to the leaders of neighbouring lands.

Similar tiles were also produced in Damascus, present day Syria. This city was also part of the Ottoman empire and so the Iznik styled

ceramics produced here became distinguished by their origin, known as 'Damascene'. One of the differences was that the colours used here tended to be blues, whites, and greens.

By the time Emery Walker and his family travelled to Turkey, the Iznik period had long passed, the last of the Iznik ware being produced in late 16th century. However, the major sites the Walkers visited, such as the famous Blue Mosque in Istanbul, Turkey, were still covered in these bright and colourful tiles. In order to maintain such historical sites, including the Topkapi Palace, repairs and replacements would have had to be continued, therefore keeping the tradition of decorative ceramic production alive to the present day.

Let's take a close look at this ceramic tile from the Emery Walker House. This is a modern replica of an Iznik style tile.

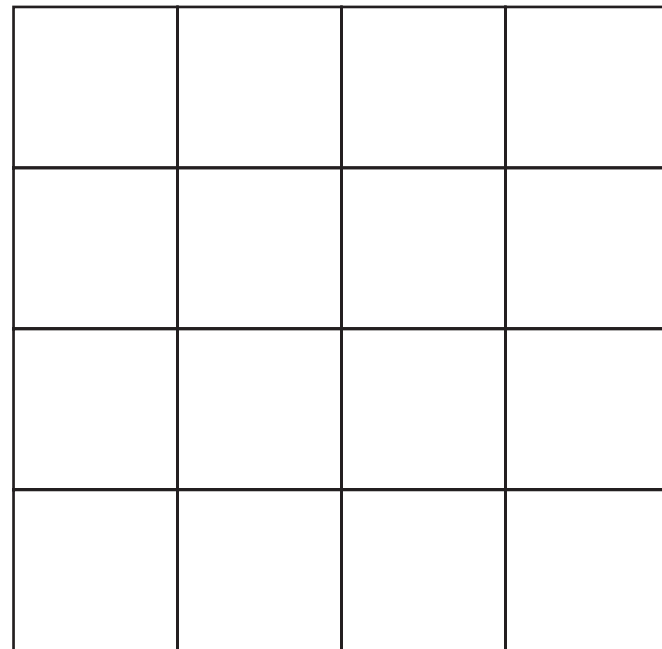
The design is made up of a number of flowers, leaves and buds all set upon a curving vine-like base. Just like the original Iznik tiles, the design is a mirrored format, with a vertical line of symmetry in the middle.



Tile depicting Iznik design. Object No. EWT/03859

As the tile is a square shape (with all four edges of equal size) it is possible to create a larger grid of squares without distortion.

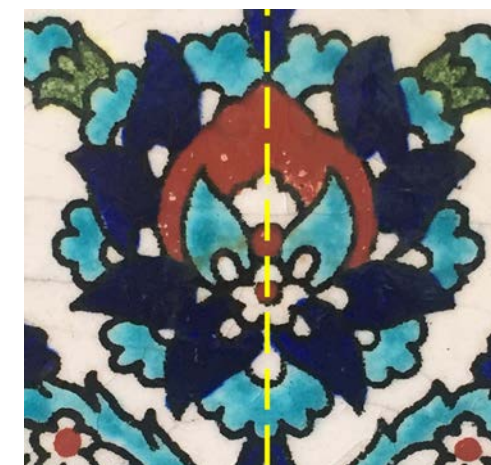
The tile has been designed in this manner to allow for coverage of large surfaces. A square fits perfectly against the edge of another square. Joining multiple squares means a larger and larger square grid can be created.



Therefore, if the owner wanted to cover a wall with tiles, they could keep filling up the space with more tiles without the design looking as if it has been cut off.

So how did artisans design a pattern that could be tiled infinitely without making the edges stand out?

Here is an image showing how the tile would appear when joined edge by edge with 3 more tiles:



If you look closely, you'll notice that the single tile is made up of a number of components. The most focus is drawn to the central floral motif, known as a *hatayi* flower in the Turkish language. These motifs are said to be inspired by the lotus flower.

Take a close look at the hatayi flower motif: it can be seen that mirror symmetry along a vertical axis has been used here too.

This process was also used for the hatayi flower motif sitting on the left and right edges of the tile:



Have you noticed the other flowers on the tile?



Carnation (*karanfil*)



A flowering bud (*goncagul*)

Let's not forget the all-important leaves; known as *Saz* leaves in the Turkish language. The design of the *Saz* leaf is often combined with smaller flower motifs.

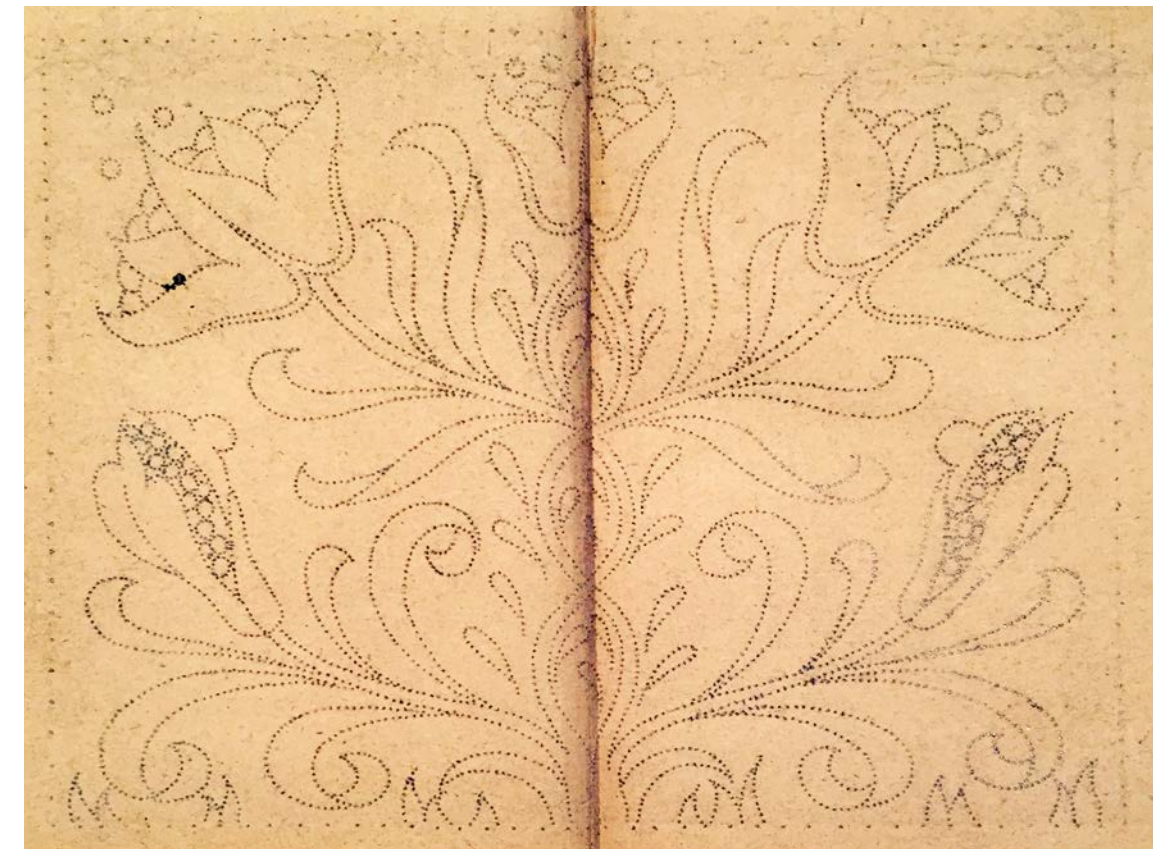


The floral motif seen at the top and bottom edges has also been cut along its midsection, this time the line of symmetry is the x-axis. When the tiles are joined up, they complete the motifs on all edges, allowing the composition to appear whole.

The carnation petals in the Iznik style tile feature a spiky edge. These look very similar to the petals used in one of William Morris' embroidery designs shown on the right (Object No. WMS/D139.6).

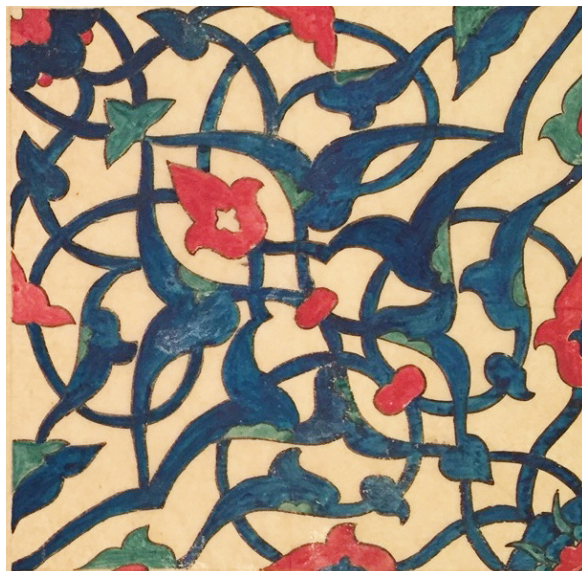


Below we see another of William Morris' drawings used for embroidery (Object No. WMS/D138). The paper has been folded in half, possibly to help trace the design from one side onto the other. The fold of the paper helps to highlight the vertical line of symmetry that was used to complete the design.



Spirals and Curves

These drawings from the William Morris Society's Collection show that a study of existing designs from the Iznik design tradition was of interest to local artisans. The drawings have been applied to tracing paper, then painted with watercolours very accurately matching those found on Iznik tiles. Object No. WMS/P36.



Below is a 16th Century Iznik tile in the V&A Museum's collection matching the design of the painting on the left.

The area of the painting has been highlighted. This one section has been rotated 4 times to fill each quarter of the tile. V&A Museum No. 411-1900.



A tile-based drawing depicting saz leaves, half lotus motifs and red tulips on a spiral base. Object No. WMS/P40.



Above is an example of a diagonal composition designed by William Morris for the ceiling of No.1 Holland Park in 1883. The underlying lines for the composition were drawn in pencil (highlighted in blue) before the finalised floral pattern was painted. Object No. WMS/D29.

William Morris' designs feature striking similarities with those seen on Islamic artefacts, most notably the use of symmetry and floral motif based patterns. Morris had a very close relationship with the South Kensington Museum (now the V&A) which had started collected many items of Ottoman origin (present day Turkey) and further afield of Persian origin (Iran).

Morris was very interested to learn about how the Persians produced their high-quality woven rugs and even recommended the South Kensington museum purchase one of their star pieces still viewable in the museum's Islamic art gallery to this day. Morris was also present at the Great Exhibitions held in London which brought together arts and crafts from all over the world, therefore his exposure to designs beyond British arts and crafts would have provided much inspiration.



A Persian ceramic *kashkul* (beggar's bowl).
Object No. EWT/03603



A miniature David Bryce Qur'an featuring spiral design embossed into the case and cover.
Object No. EWT/01470

Geometry and Number

Morris' many designs were developed with a similar purpose to those of Islamic art, designs that could be applied to almost any surface. In Morris' case these designs were applied to curtains, cushions, ceramics and more famously wallpapers.

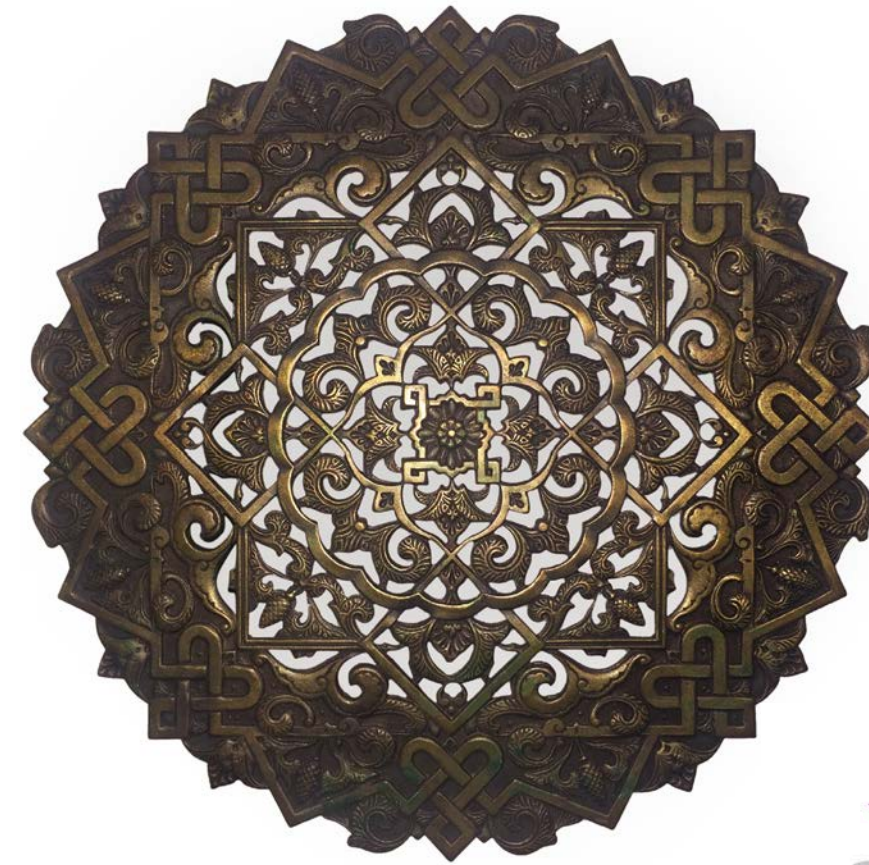
Some of the most distinguishable elements within William Morris' designs were floral motifs, depicted as if growing from swirling vines. A number of original Morris drawings can be found at The William Morris Society, showing his process for developing some of these beautiful patterns.



The image on the left highlights the directional growth of the spiralling curves of William Morris' embroidery design 'January' (Object No. WMS/D65).

The arrows indicate the direction of the main vine growth with the lighter shades of green indicating where the vine branches off with smaller stems spiralling and then flowering themselves.

Upon the vines are both large and small flowers surrounded by many leaves.

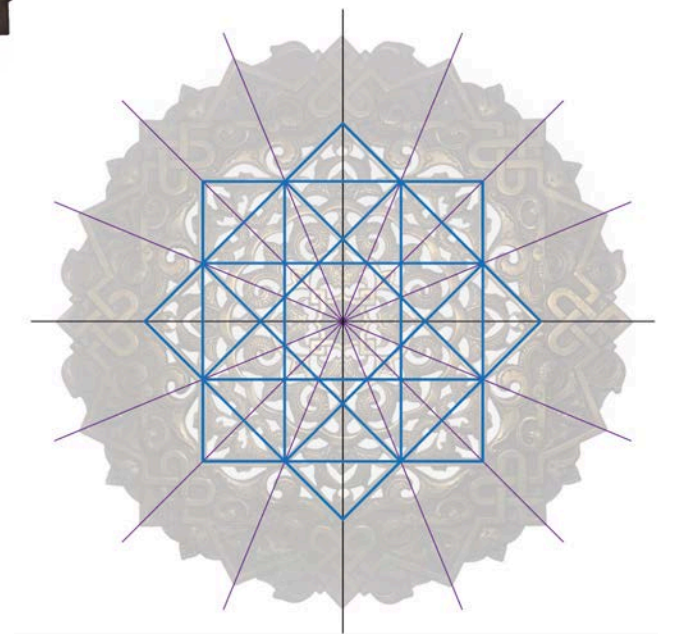


Many of the objects within the Emery Walker House feature geometric patterns, from simplified designs as seen earlier on the Moroccan dishes, to more complex designs which combine floral motifs as seen in the belt buckle above (Object. No. EWT/03222).

The design of this buckle is based on a geometric grid, made up of equally divided segments of a circle. The shapes formed of various sized and rotated squares around the centre point are filled with floriated motifs reminiscent of the stucco carvings seen at the palaces of medieval Spain. One of the greatest examples of Islamic architecture, The Alhambra Palace, can be found in Granada in southern Spain, a city visited by Emery Walker back in 1905.

The root of the design in this buckle is based on the square. Therefore, the value of 4 becomes a root for all the subsequent divisions used to plot and draw all the shapes.

The design features divisions of 4, 8, 16 and 32.



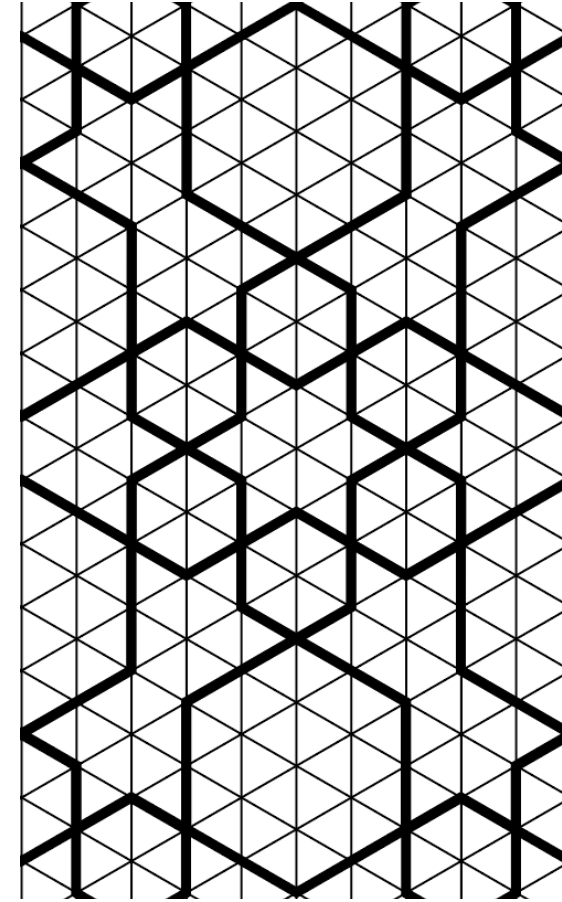
Even the small flower in the centre has 16 petals. This consistency in the design provides a sense of harmony and proportion to all parts of the design.



A camel saddle from the Emery Walker House, believed to be from Morocco, featuring an embossed leather cushion and wooden legs embellished with inlaid mother of pearl in a geometric design. Object No. EWT/00424



Detail of geometric design on the saddle leg.



By picking out the shapes of the saddle leg pattern on the isometric grid it becomes easier to see how the smaller shapes relate to the larger shapes.

By counting the number of triangles that make up one side of the large hexagon (2 triangles) and comparing it to the number of triangles that make up the side of the smaller hexagon (1 triangle), we understand that the larger hexagon is exactly double the size of the smaller hexagon.

Because all the shapes in the pattern use the same triangle unit on the grid, we can say that the shapes are proportional to each other.

Many geometric patterns are based on tiling shapes on grids. Here is an example of an isometric grid, made up of equilateral triangles (of equal length sides).

If you look carefully you will see that 6 triangles placed together create a 6 sided polygon, a hexagon (with 6 equal length sides).

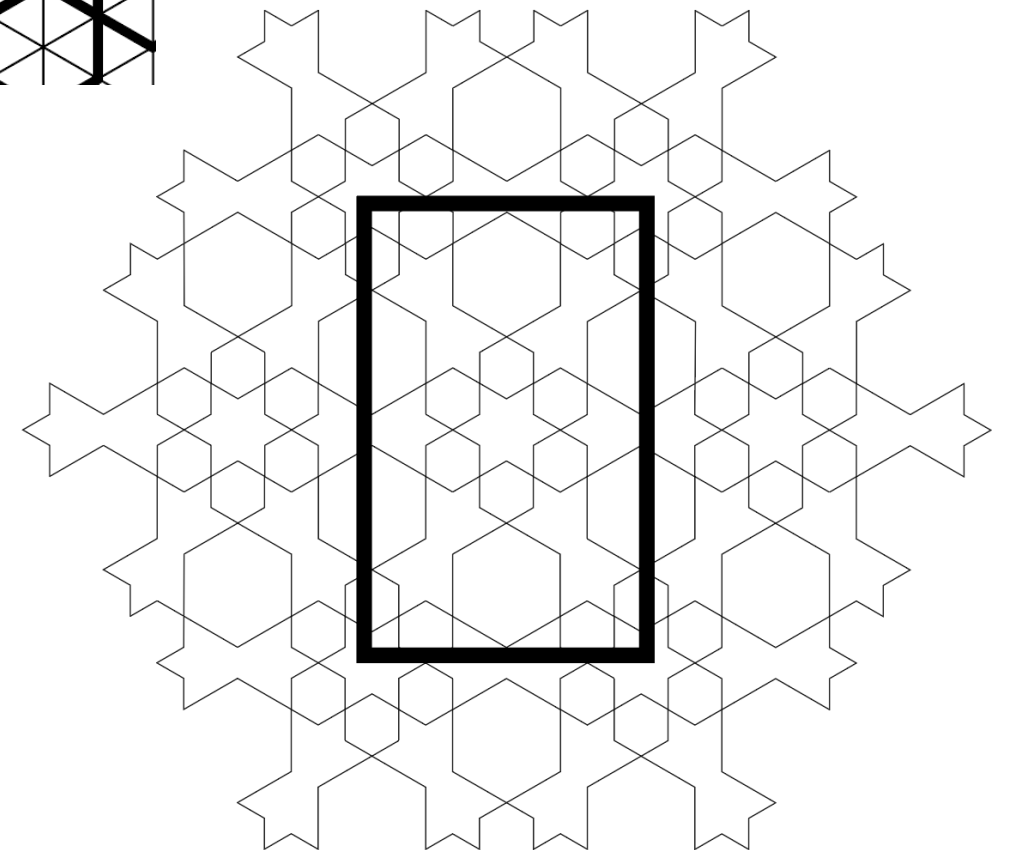
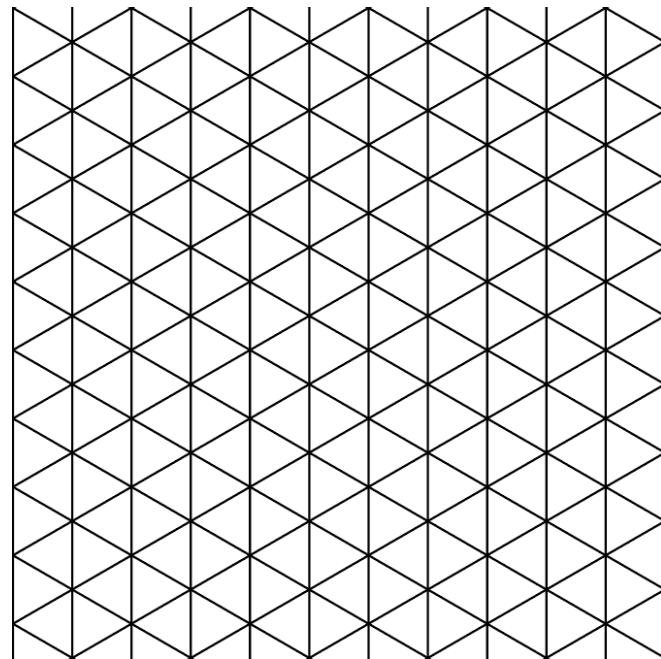
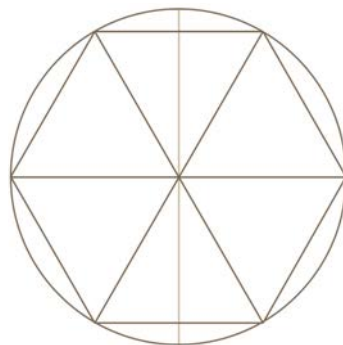


Diagram showing a continuous rendition of the saddle leg pattern. The rectangle highlights the section that was used for the decorative embellishment. This is a 6-fold pattern as the hexagons and bow-shapes have been rotated 6 times around the central star.

Further Resources

The online exhibition The Walkers and Islamic Art is viewable on the Emery Walker's House website:
<http://www.emerywalker.org.uk/islamic-art-collection>

Museum Collections (Islamic art and British Arts & Crafts at local museums):

- Leighton House Museum
- V&A
- British Museum
- De Morgan Foundation

Websites:

The Islamic World - British Museum: <http://islamicworld.britishmuseum.org>

A Journey Through the Islamic World in Eight Objects:
<https://blog.britishmuseum.org/a-journey-through-the-islamic-world-in-eight-objects/>

Museum with no Frontiers - Islamic Art Collection: <http://islamicart.museumwnf.org/>

Learning resources:

Art and Maths In the Courtauld Collection Learning Resource (Courtauld Institute):
<https://courtauld.ac.uk/wp-content/uploads/2015/06/Art-and-Maths-Learning-Resources-Final.pdf>

Sublime Symmetry, The Mathematics Behind De Morgan's Ceramic Designs (De Morgan Foundation):
http://www.demorgan.org.uk/sites/default/files/education_pack_guildhall.pdf

Exploring plant-based design in Islamic Art (V&A Learning Resource):
https://vanda-production-assets.s3.amazonaws.com/2016/09/20/11/11/34/609b923f-fe4a-4cfa-8929-4cc99acb91a7/IAD_Plants.pdf

Exploring Plant-Based Design in Islamic Art Resource (V&A Learning Resource):
https://vanda-production-assets.s3.amazonaws.com/2016/09/20/11/11/34/609b923f-fe4a-4cfa-8929-4cc99acb91a7/IAD_Plants.pdf

Visit Us

The Emery Walker Trust

Emery Walker's House
7 Hammersmith Terrace, W6 9TS

www.emerywalker.org.uk
+44 (0)208 741 4104

The Trust runs pre-booked one hour guided tours.
Please check website for availability and bookings.

Group tours and venue hire can be booked by
appointment.

The William Morris Society

26 Upper Mall, Hammersmith, W6 9TA

www.williammorrissociety.org
+44 (0)208 741 3735

The Society's premises are open to the public as
a museum on Thursday and Saturday afternoons
from 14.00 to 17.00 and at other times by
appointment.

The Coach House is closed on days when we have
events. We recommend that you check our events
page before planning your visit.

The Society's premises are in the coach house
and basement. Kelmscott House itself is privately
owned and not open to the public.

School Visits

Visits from schools and local children are vital in
strengthening The William Morris Society's links
to the community. Over the past 10 years, curator
Helen Elletson has been working hard to expand
our programme of educational activities.

If you would like to arrange an educational visit
please contact admin@williammorrissociety.org.uk.



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Author: Sara Choudhrey

Photography and artwork author's own, except:

Page 2 photo of Dining Room, Emery Walker's House © Emery Walker Trust

Page 12 photo of object from V&A Museum No. 411-1900 © Victoria and Albert Museum, London

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