



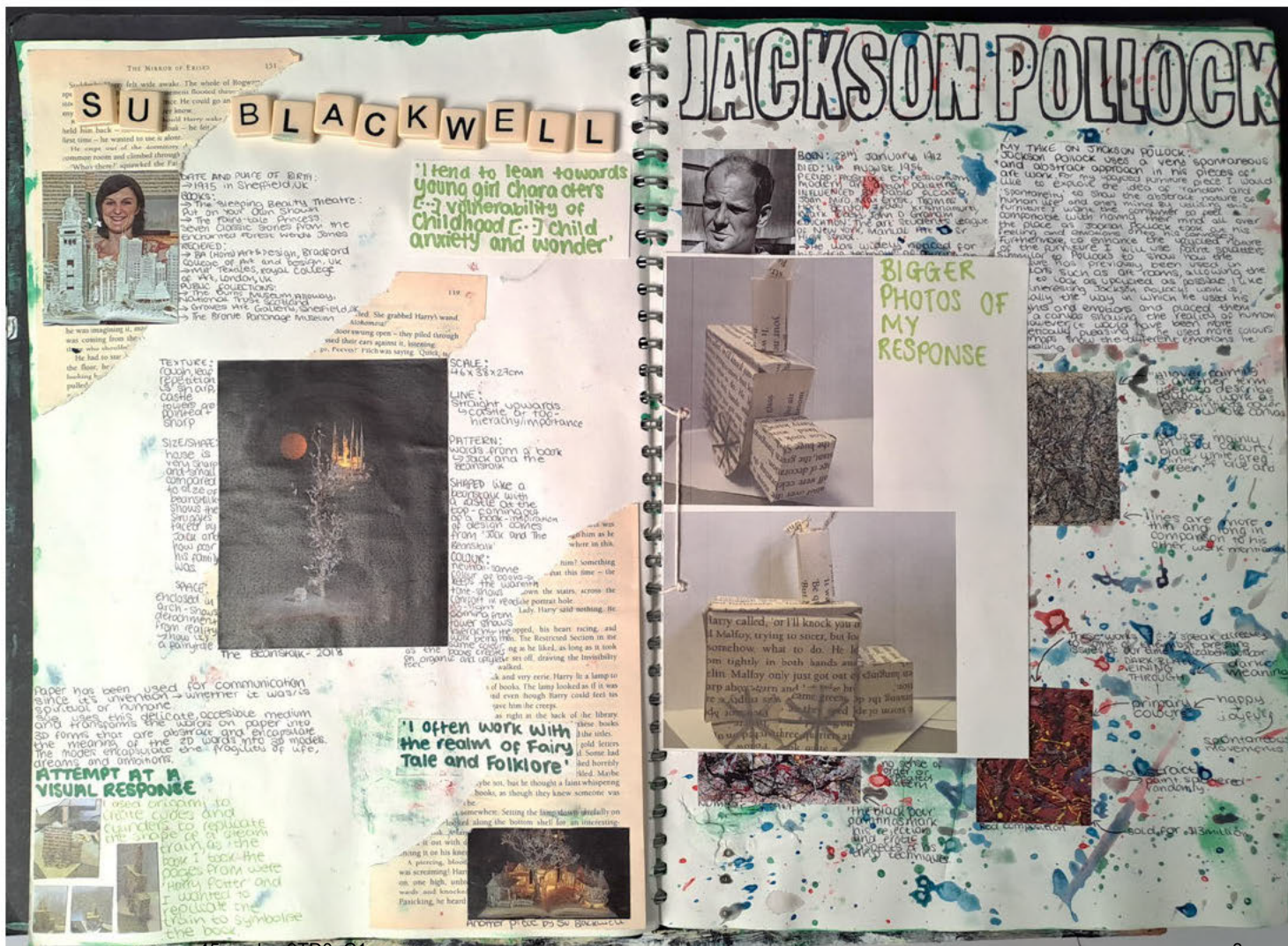
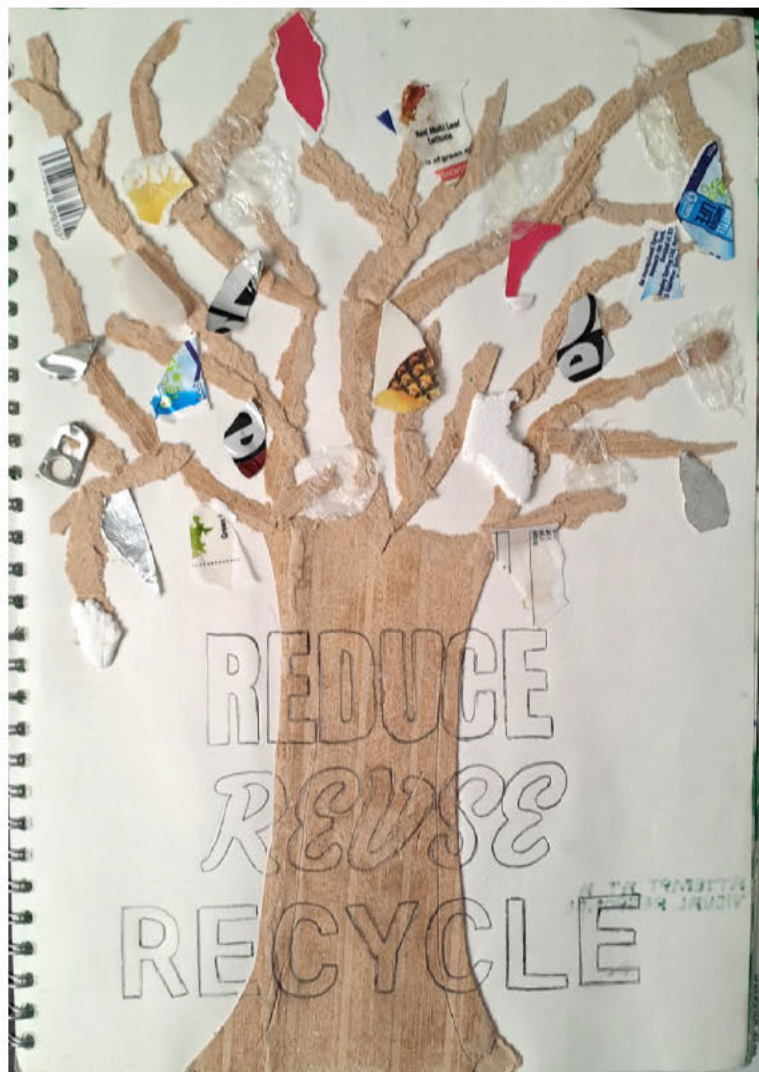
Pearson

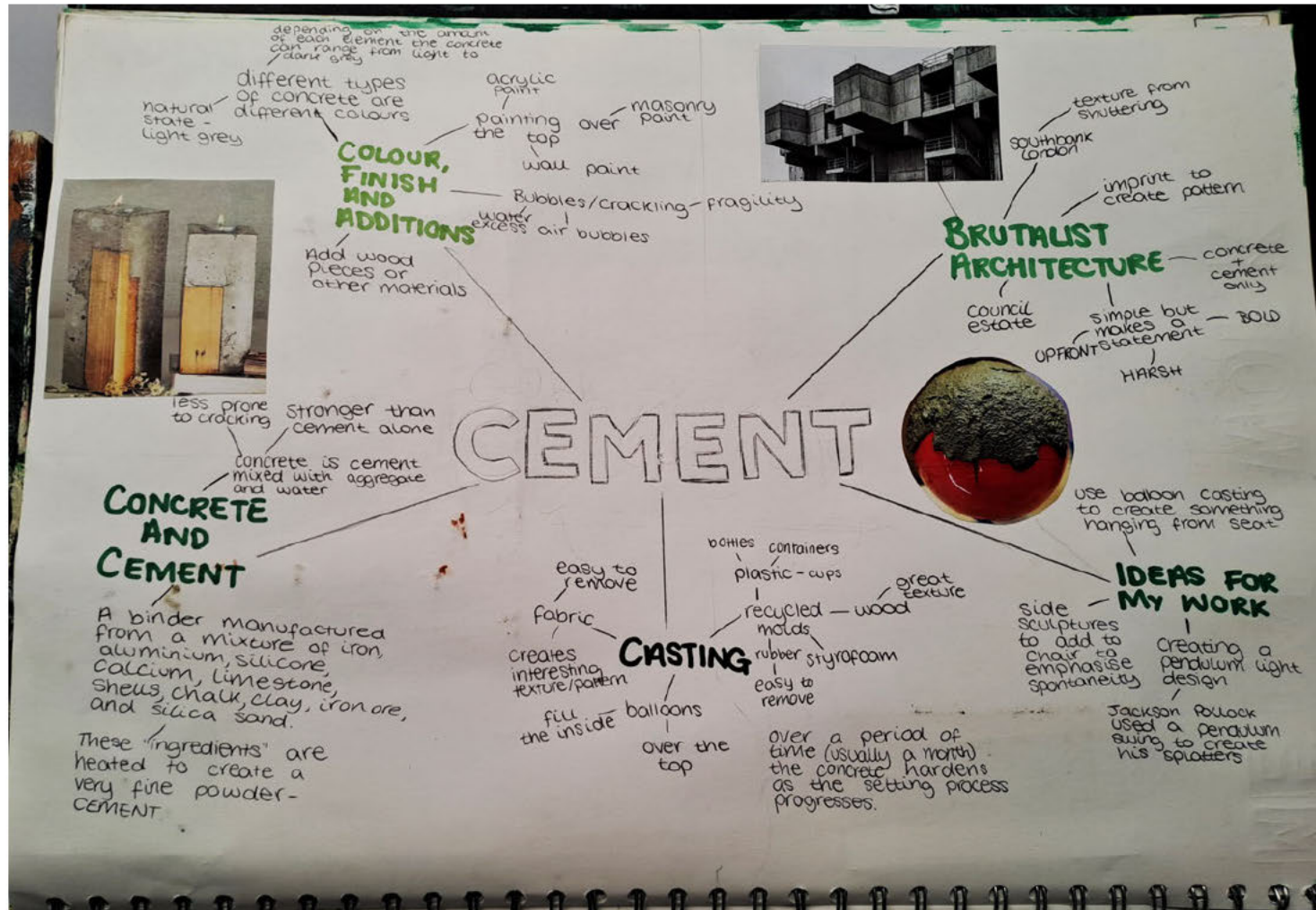
GCE A Level Advanced Art and Design

**Three-dimensional Design
Component 1
Cal**

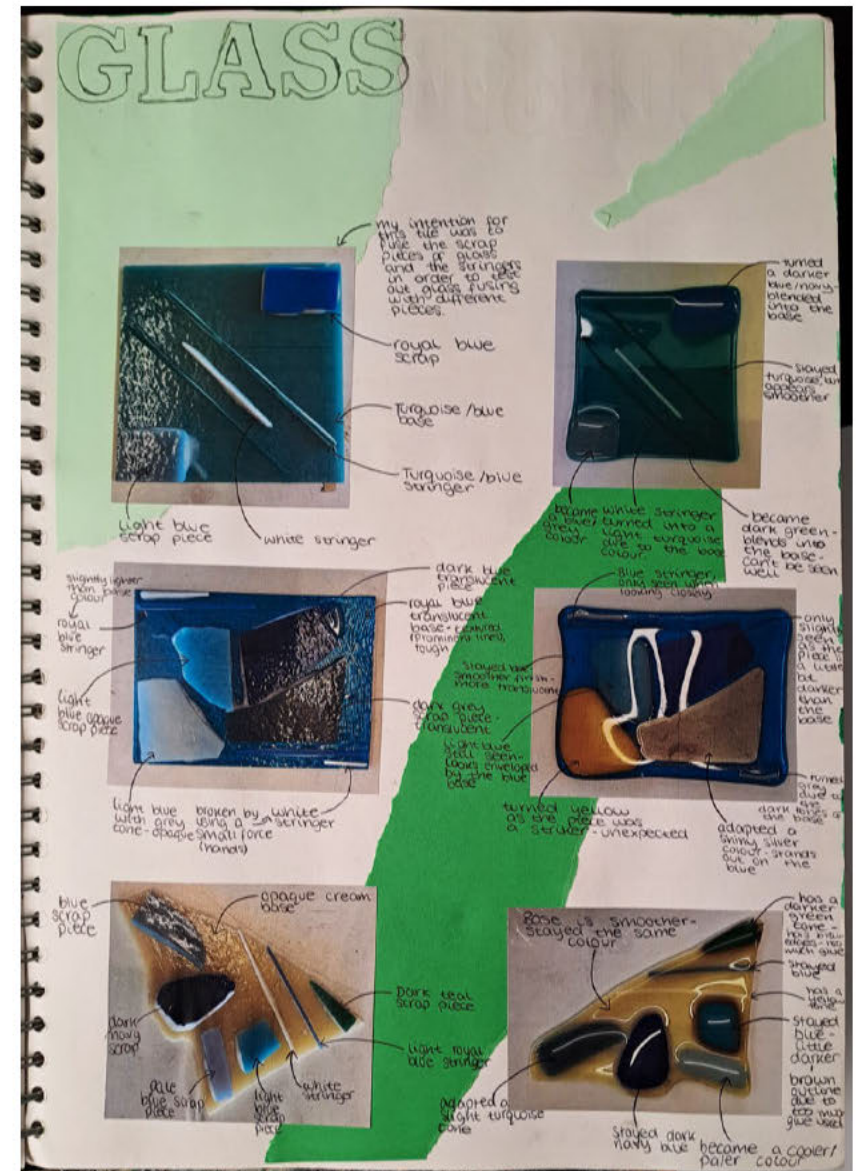
Total Mark 45 (37+PS8)

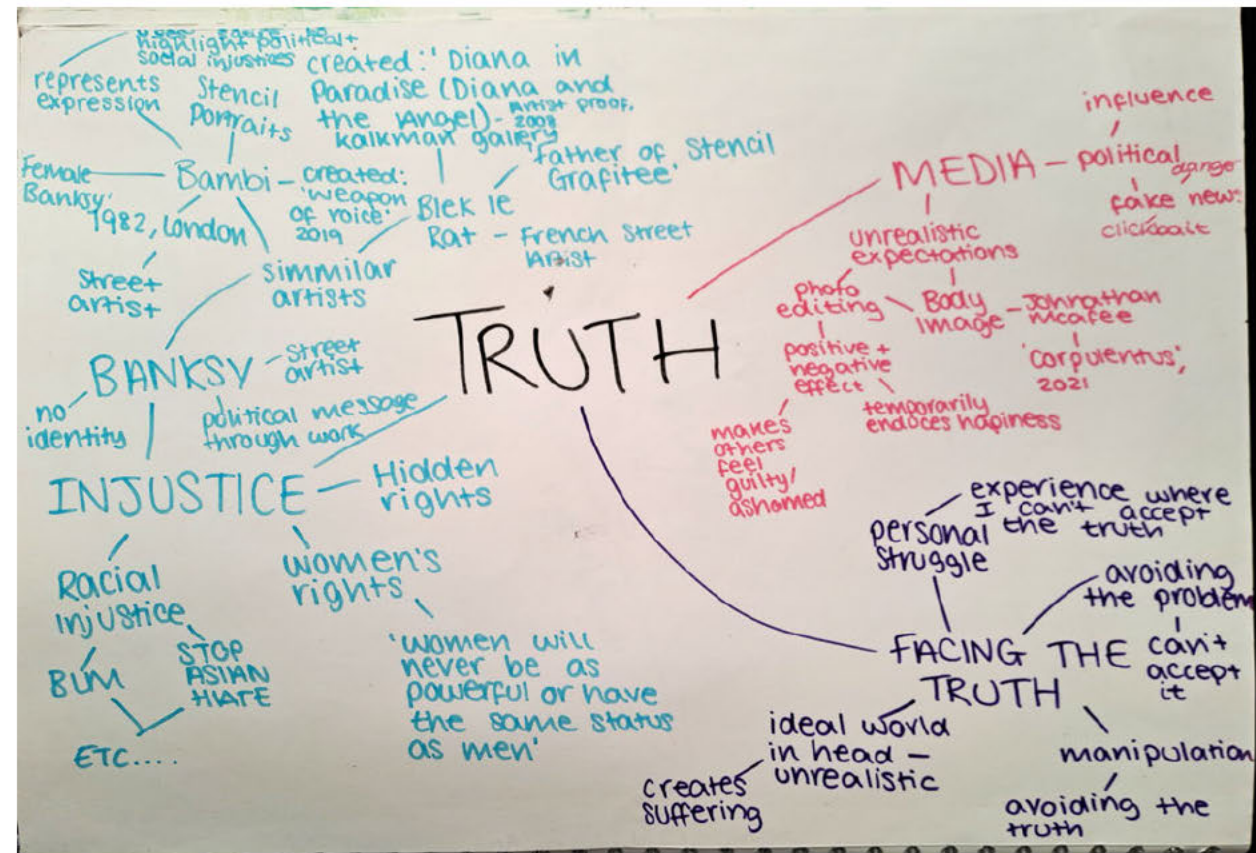
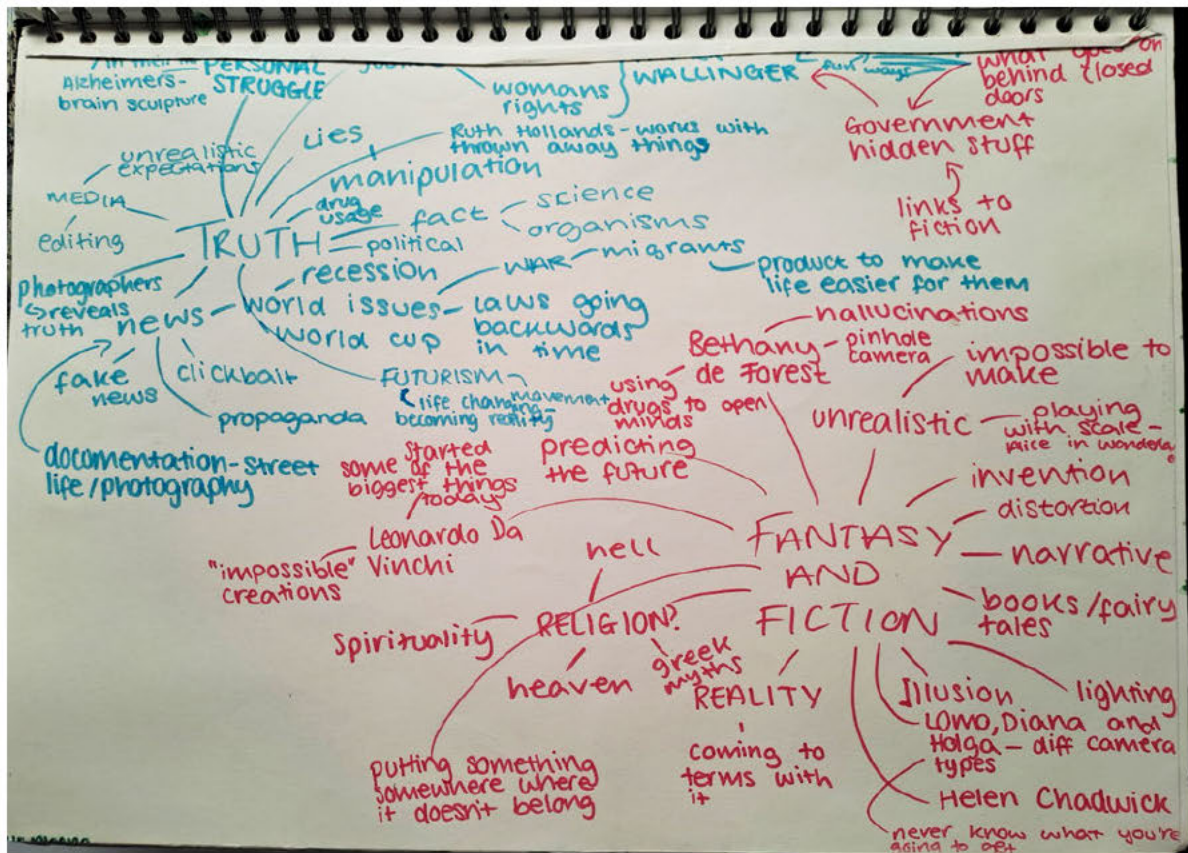
	AO1 Develop	AO2 Explore and Select	AO3 Record	AO4 Realise	Personal Study
Mark	9	10	9	9	8
Performance Level	3	4	3	3	3
				Total out of 90	45

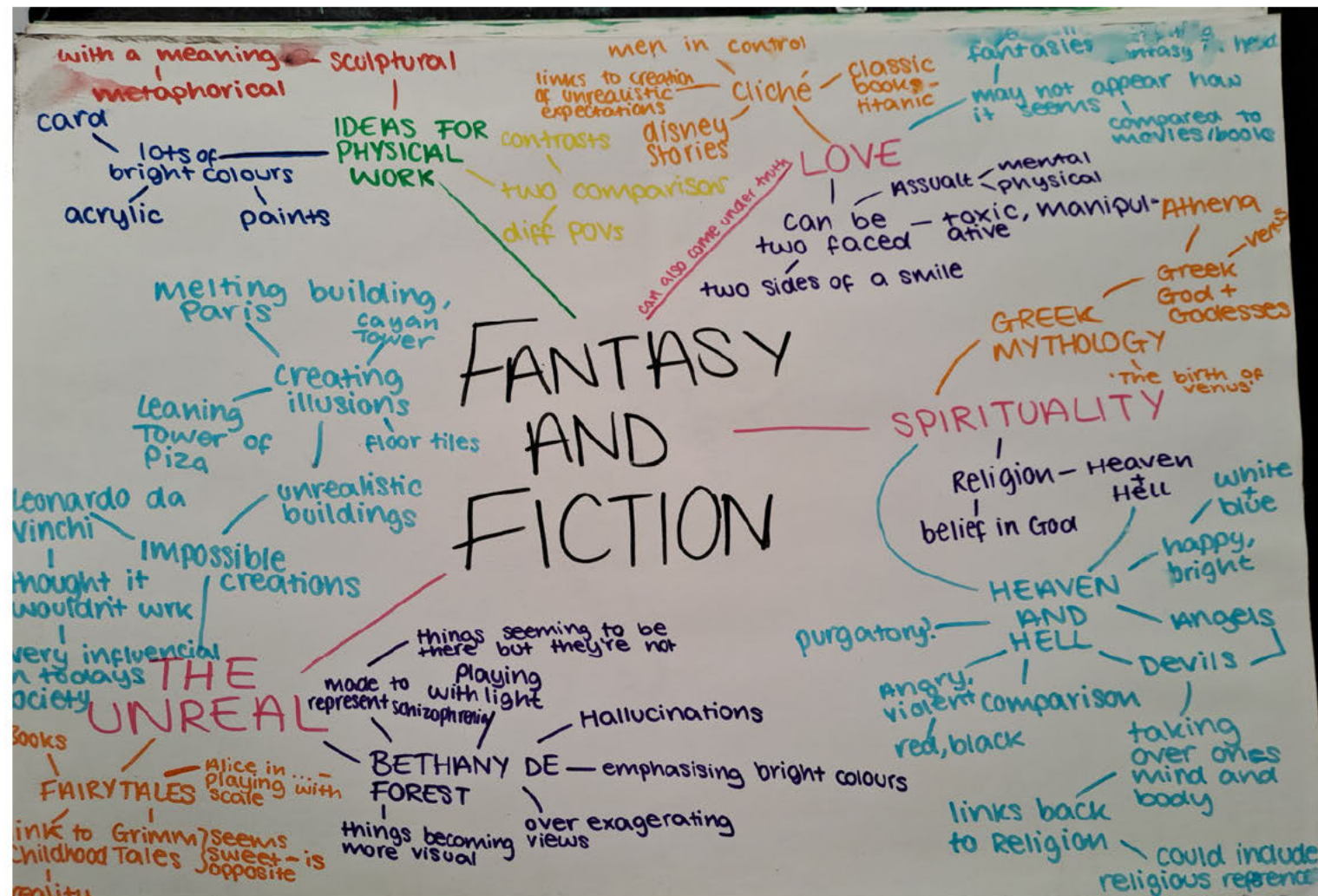
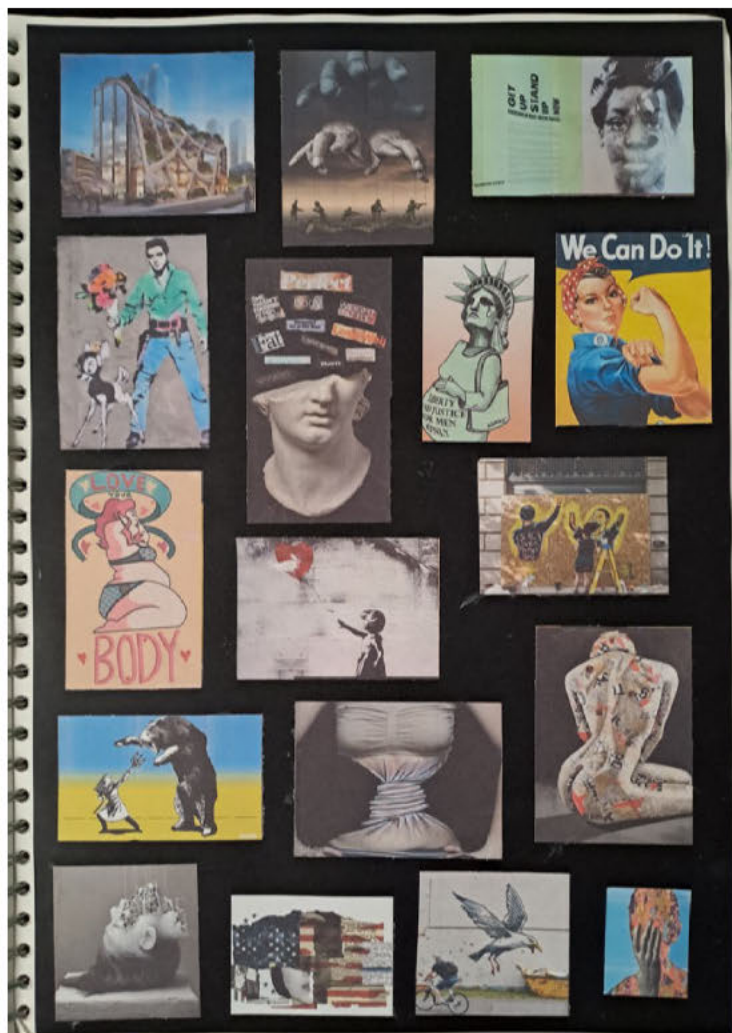


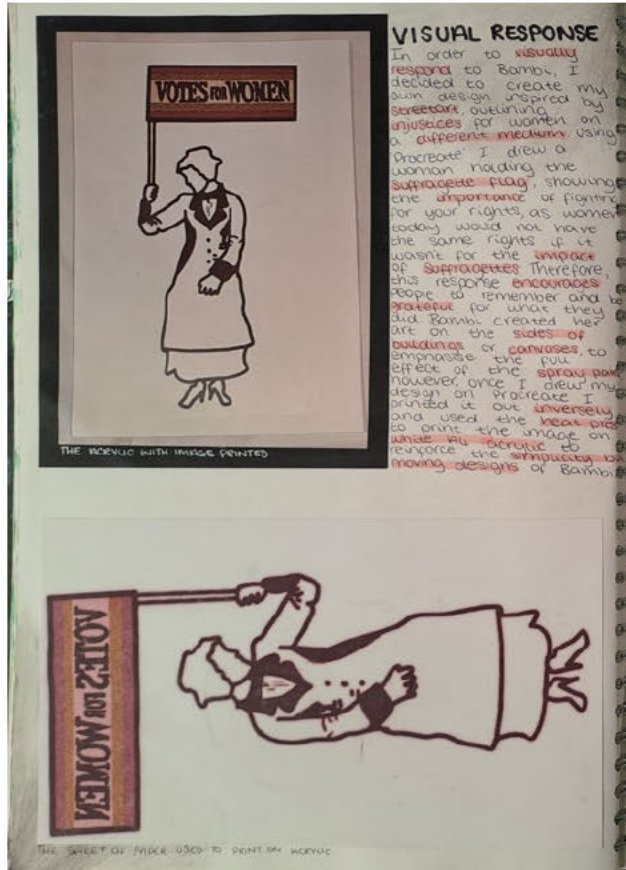


45 marks, 9TD0, C1









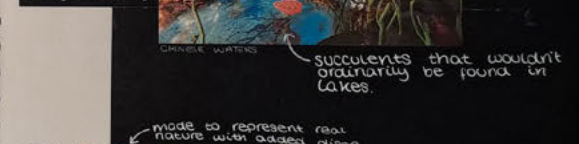
VISUAL RESPONSE

In order to visually respond to Bambi, I decided to create my own design inspired by Bambi's outlandish injustices for women on a different medium using Procreate. I drew a woman holding the suffragette flag, showing the importance of fighting for your rights as women today would not have the same rights if it wasn't for the suffragettes. Therefore this response encourages people to remember and be grateful for what they did. Bambi created her art on the sides of buildings or canvases, to emphasize the pull effect of the spray-paint design on Procreate. I printed it out universally and used the nearest white ink to create a realistic effect to reinforce the importance of moving designs of Bambi.

Bethany De Forest

Bethany De Forest was born in 1984 and lives in Amsterdam. She is a pinhole photographer and film maker. De Forest wanted to show a realistic but absurdist view of an imaginary world. She uses 3D illusions to make her photos feel like you can't actually visit the world that is being portrayed. Bethany also uses mirrors to create the illusion of space and primarily works with nearby objects like candle-wax.

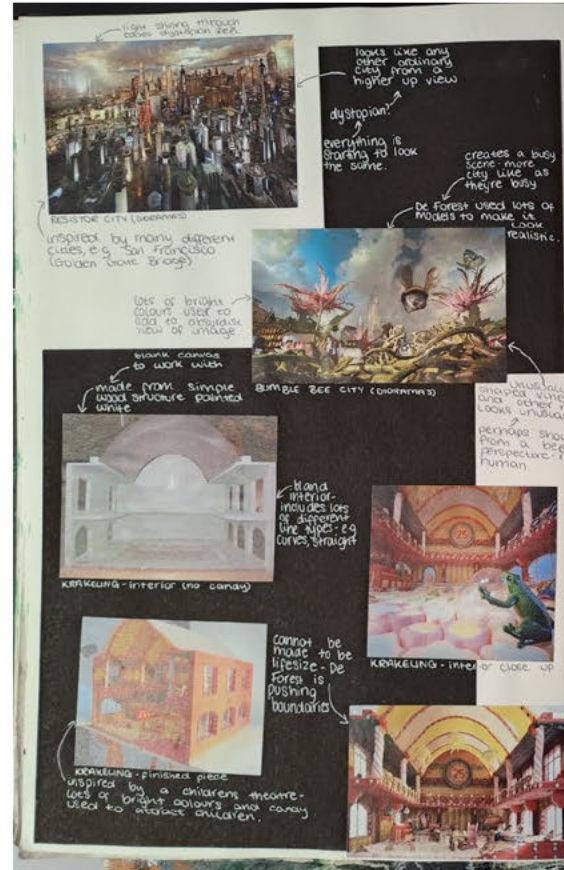
dull background draws focus to objects in centre of the image/setting



made to represent nature with added real object

Bethany De Forest uses a pinhole camera in her pieces of art work. This type of photography gives an enormous depth of the field making the objects in the image look sharper and the colours more vivid. De Forest says "The constructed world appears life-sized as if you have shrunk yourself."

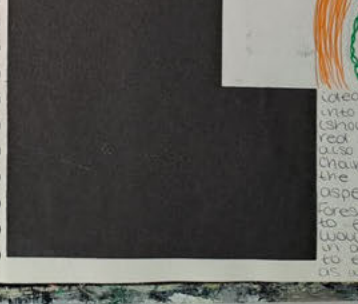
completely enclosed small setting scaled down to be photographed



MY RESPONSE



Due to the un-natural shape of the building for it to inhabit humans, it wouldn't be able to have anyone physically take up the whole space - as the interior wouldn't work to its full capacity

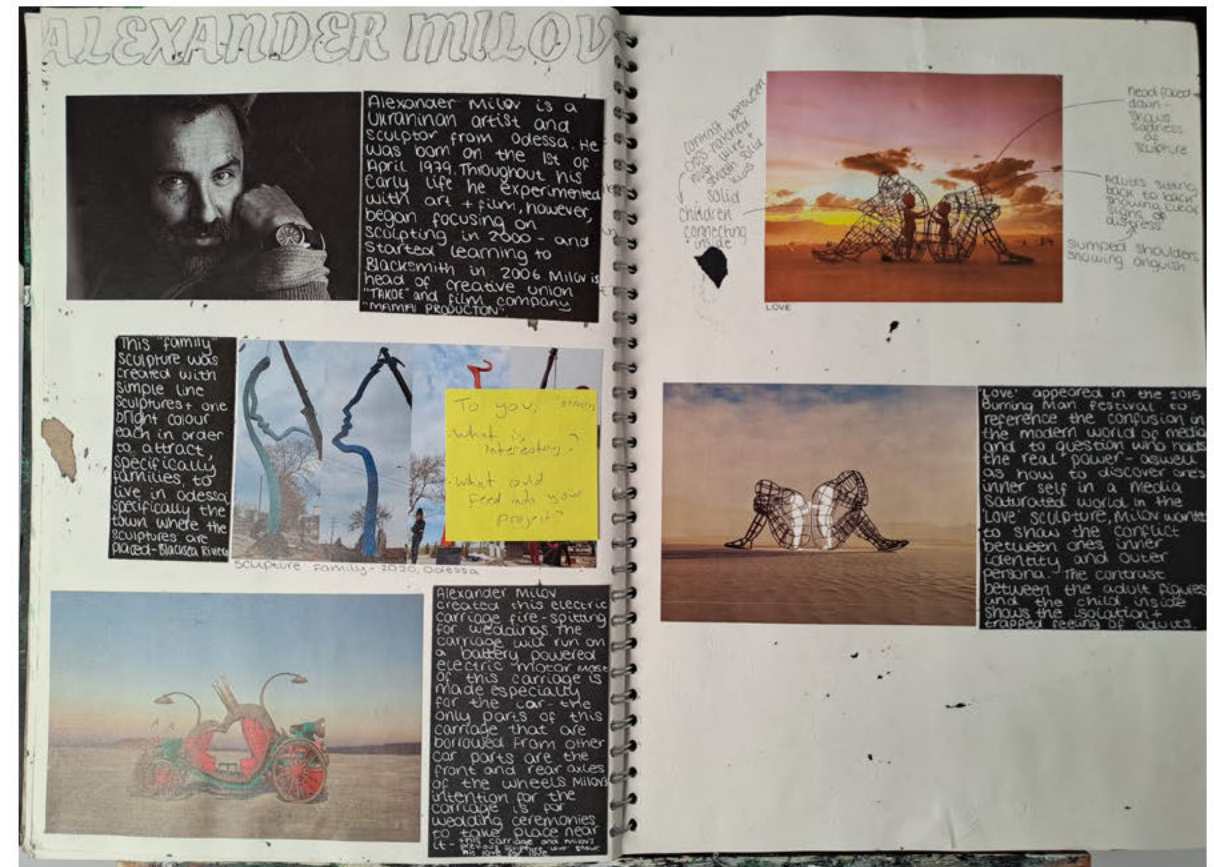
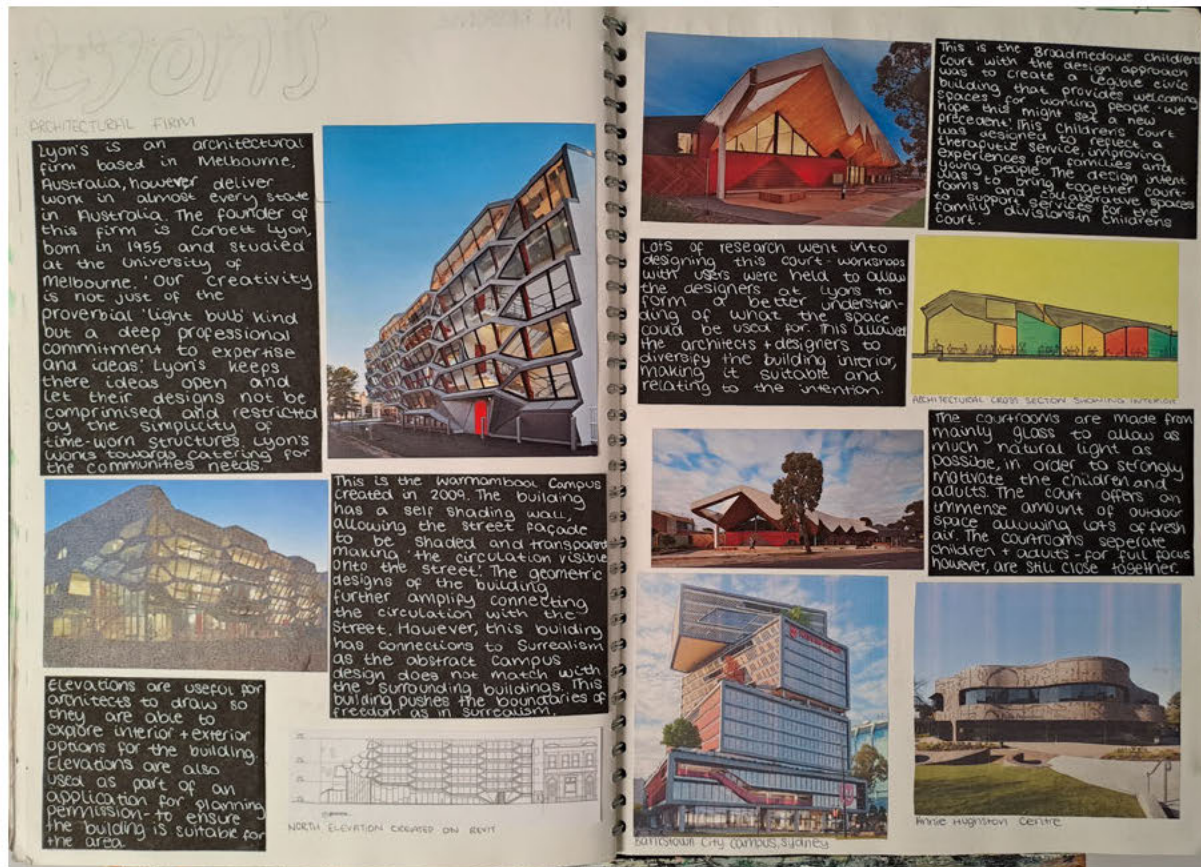


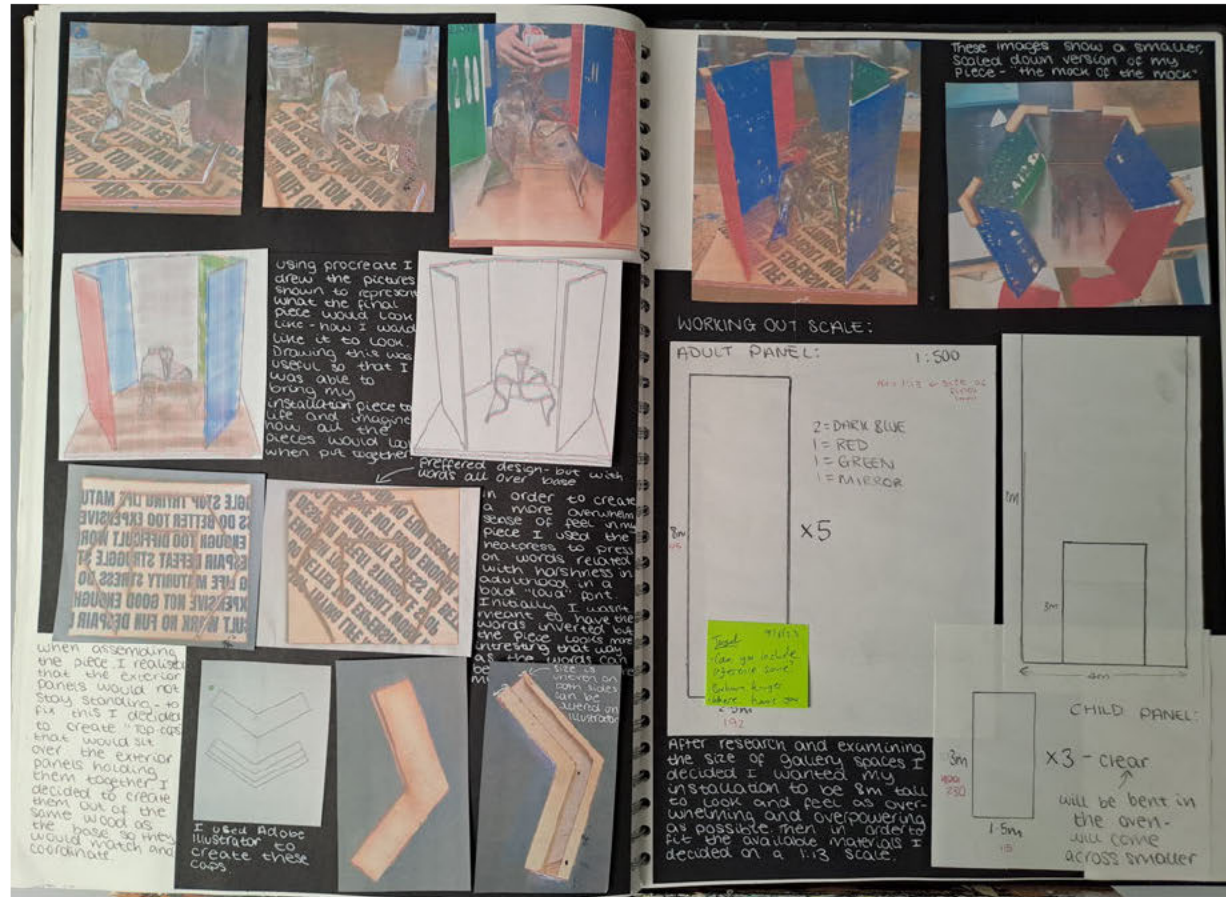
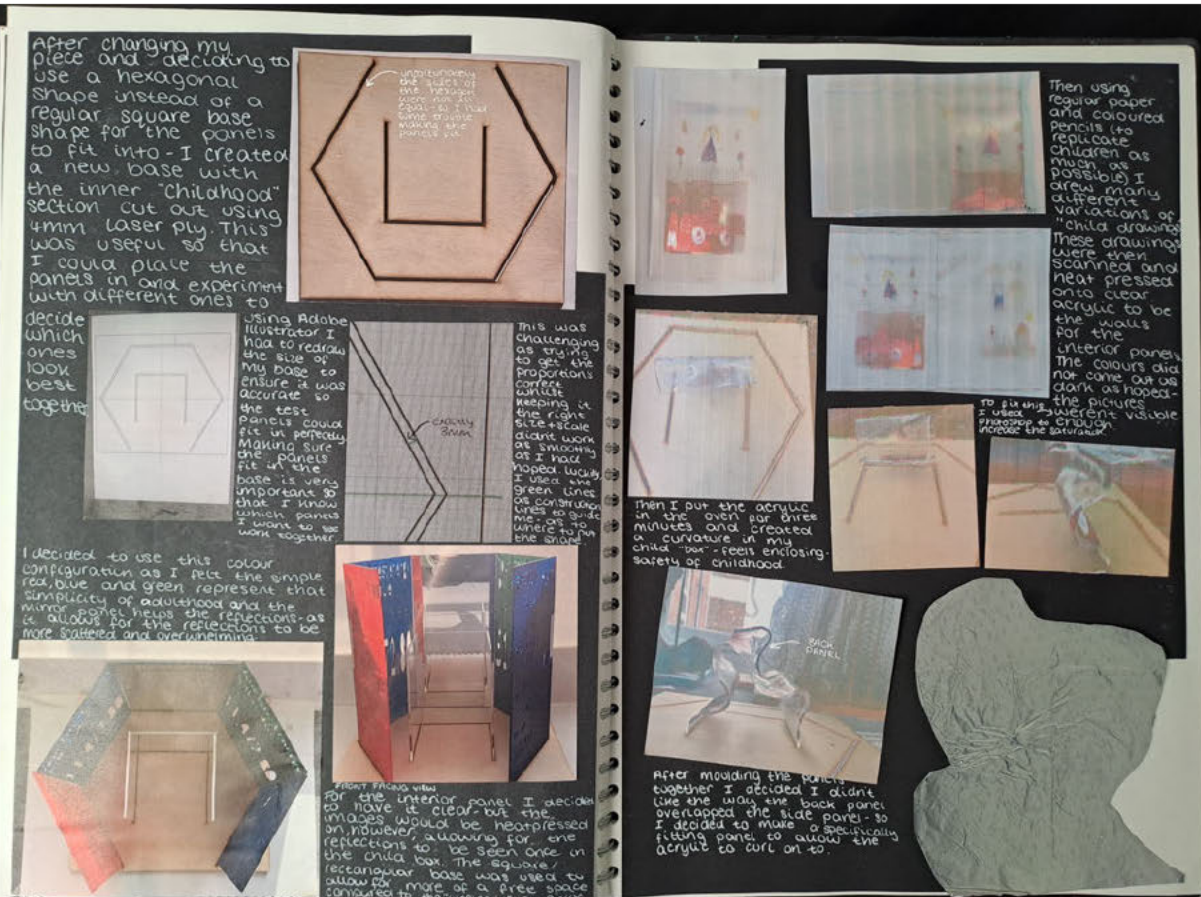
My idea for this response was to create something un-natural and unrealistic. The same way Bethany De Forest takes real life scenes and "warps" them to look unusual. For this design I decided to create a weird, uncommon looking building that shouldn't be physically possible to create in life-size - due to its unnatural curved shape that is physically impossible as it would fall over.

Building two - construction to look exactly the same as the other building

Other building - not seen behind building one

In order to develop my idea, I split the buildings into two separate structures (shown by the orange and red colours). Furthermore, I also added the green chain leaves to replicate the forest and natural aspect of Bethany De Forest's designs in order to enhance my design. I would place this building in a green environment to enhance the natural aspect as well as make it look like a forest.





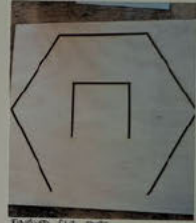
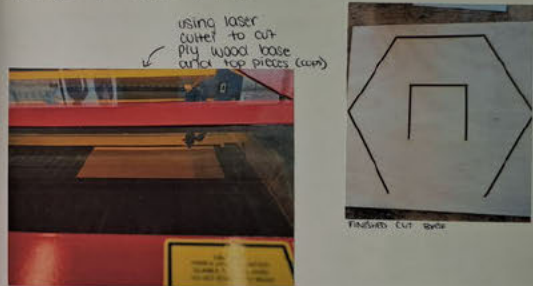
DAY 1

Time	Action What will I be working on?	Outcome What do I want my work/pieces to look like at the end of this interval?
period one	laser cutting base from plywood and joints that sit on top of installation - cut two bases	base is finished (hexagon shape with smaller square inside)
period two	laser cutting large exterior panels	exterior panels are cut with the negative word
period three	laser cutting large exterior panels	exterior panels are cut with the negative word
period four	laser cutting the smaller interior panels	all interior panels are the correct size
period five	ensure pictures for heat pressing are prepared and correct size	

DAY 2

Time	Action What will I be working on?	Outcome What do I want my work/pieces to look like at the end of this interval?
period one	heat press words onto plywood base - stick two bases together with pva	base is finished with words on it and stuck together
period two	heat press the child photo collages onto acrylic	child panels are complete without being warped
period three	use oven to bend interior panels into the correct shape	interior panels are completed
period four	assemble all the final pieces (using glue if necessary)	
period five	assemble all the final pieces (using glue if necessary)	project finished

MAKING THE FINAL PIECE



caps for top of structure



side panels (big, tall structure)



also cut with laser cutter
mirror was not long enough so small one on the side had to be cut and stuck on the side of the panel



use of sublimation paper and wrapping it around the base - to be neat



using books to keep the base flat after the heat from the press - otherwise shape would be lost



Due to issues at the sublimation paper and printer - I could not print my images for the inside box, instead gave acrylic was the temporary option.

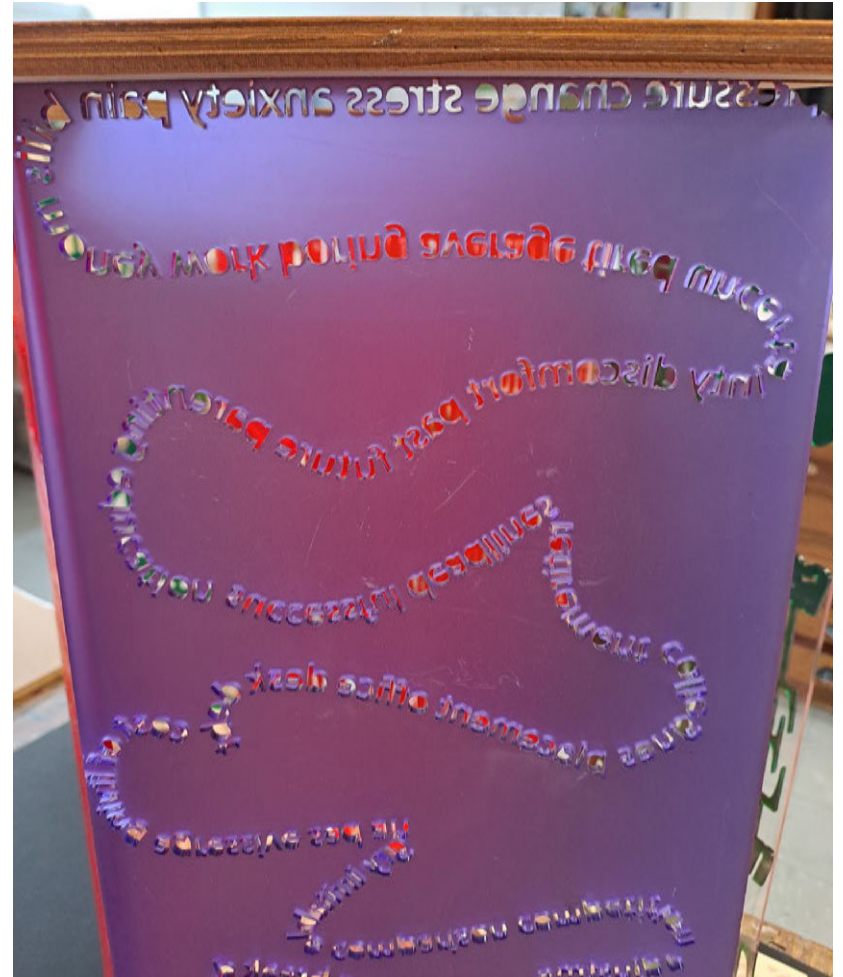


The images printed onto the heat pressed acrylic (seen) - to be bent

THE INSIDE PANELS AFTER BEING BENT IN OVEN

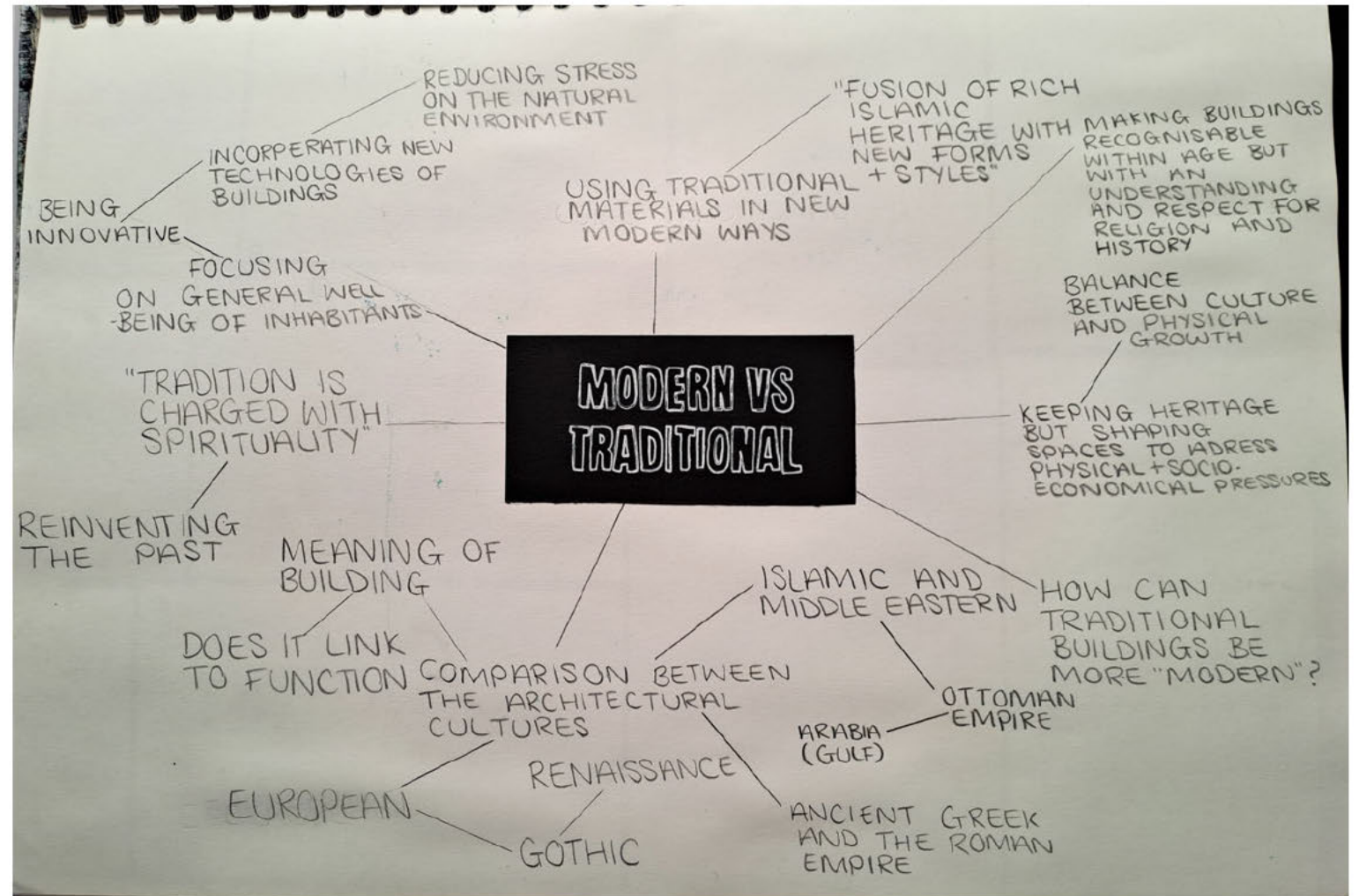


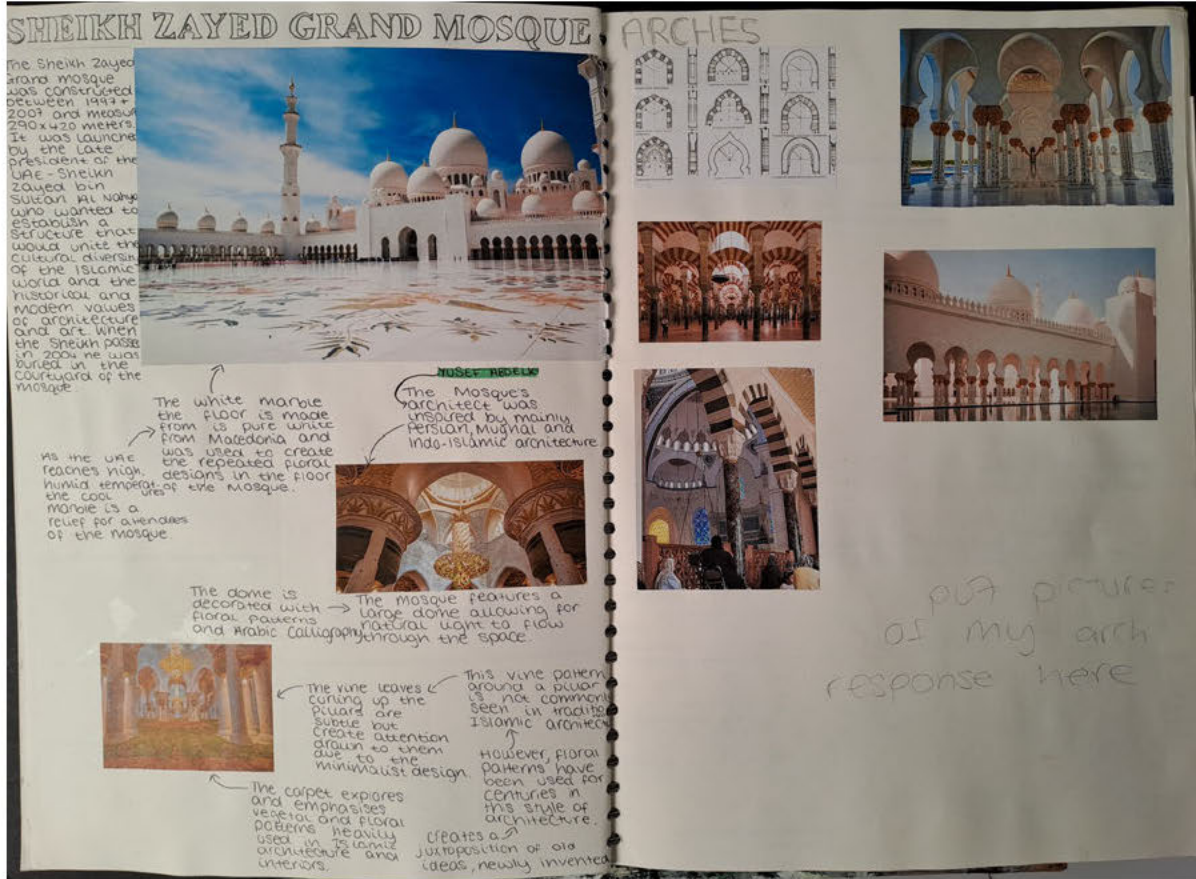






MODERN VS TRADITIONAL





BURJ DOHA



Originally made from wood - also known as **shamsa** screens

The Burj Doha was designed by French Architect **Jean Nouvel** and was inspired by the **Autonomous Structure** of the Torre Agbar in Barcelona. The aims of this building was to **connect culture with modern high rise** aims for Qatar.



original function of mashrabiya screens = gives protection from **heat** and sun but **allows air** through

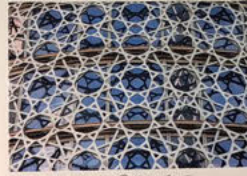
patterned cladding allows for shade but still breeze



The Burj Doha uses a **complex** **inspired cladding** with a **delicate layered paper**

This allows a **climate** **function** for the cladding protection from sun and **glazing** from high winds

Allows for a **protection** **function**



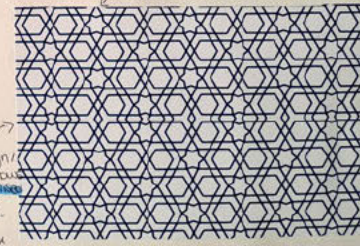
MY RESPONSE

'cladding design described as: playful network of shadow designs on the interior'

Using **procreate** on my iPad I created many different **patterns** and used the **symmetry** tool to create this **pattern** inspired by the Burj Doha

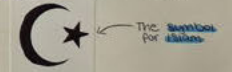


The pattern consists of 12 sided stars that extend with a **hexagonal** **pattern**



The pattern can be interpreted in many different ways depending on how you look at it

My interpretation comes from the **star** and **geometric** from the **architecture**. Perhaps this is why stars are so common in **Islam**



The symbol for **Islam**

However compared to more traditional designs of Mashrabiya they are all incredibly **different** and are **unique** each individual

EL SEED



El Seed is a French-Tunisian calligrapher artist who uses **Arabic** calligraphy to spread messages of peace and unity to **diverse** and **reconciling** communities

Examples of traditional Arabic calligraphy in Middle Eastern buildings



Door of the Rock



El Seed calls this art **calligraphy** form of **graphic**

free movement of the line - no **restriction**

possible **symbol** used to create **black** **quintessence**

The outside of the main focus point of the mural is also **Arabic** calligraphy but in **grey** - no **shape** that it is **non-descript** and to **blend** **into** **background**

All of Seed's work has a **transformation** **meaning** **to** **the** **viewer**

Good chose to use **geometric** **different** **patterns** to draw **attention** to the **message** and **show** the **importance** of it

Translation of text = "It is one thing to show a man that he is in error and another to put him in possession of truth"



Mural for the **Shoebat** **festival** **London**

Line is **thick** and **free-flowing** around the **shape** **however** it is **something** **different** due to the **use** of the **Arabic** **language**

MY RESPONSE TO EL SEED



El Seed - response - ink (brush + water)

This attempt was done with **one** **stroke** and **one** **stroke** of water. I like how this design turned out due to the **brush** allowing me to create **different** **shapes** **representing** the **calligraphy** **however** and I like the **use** of **ink** on my **paper** it is **obvious** that the design was done with a **brush** which is not my **intention** - I wanted the calligraphy to look as if it was **done** **with** **ink** - as **seed** **so** it looks **as** **if** **it** **was** **done** **with** **ink**

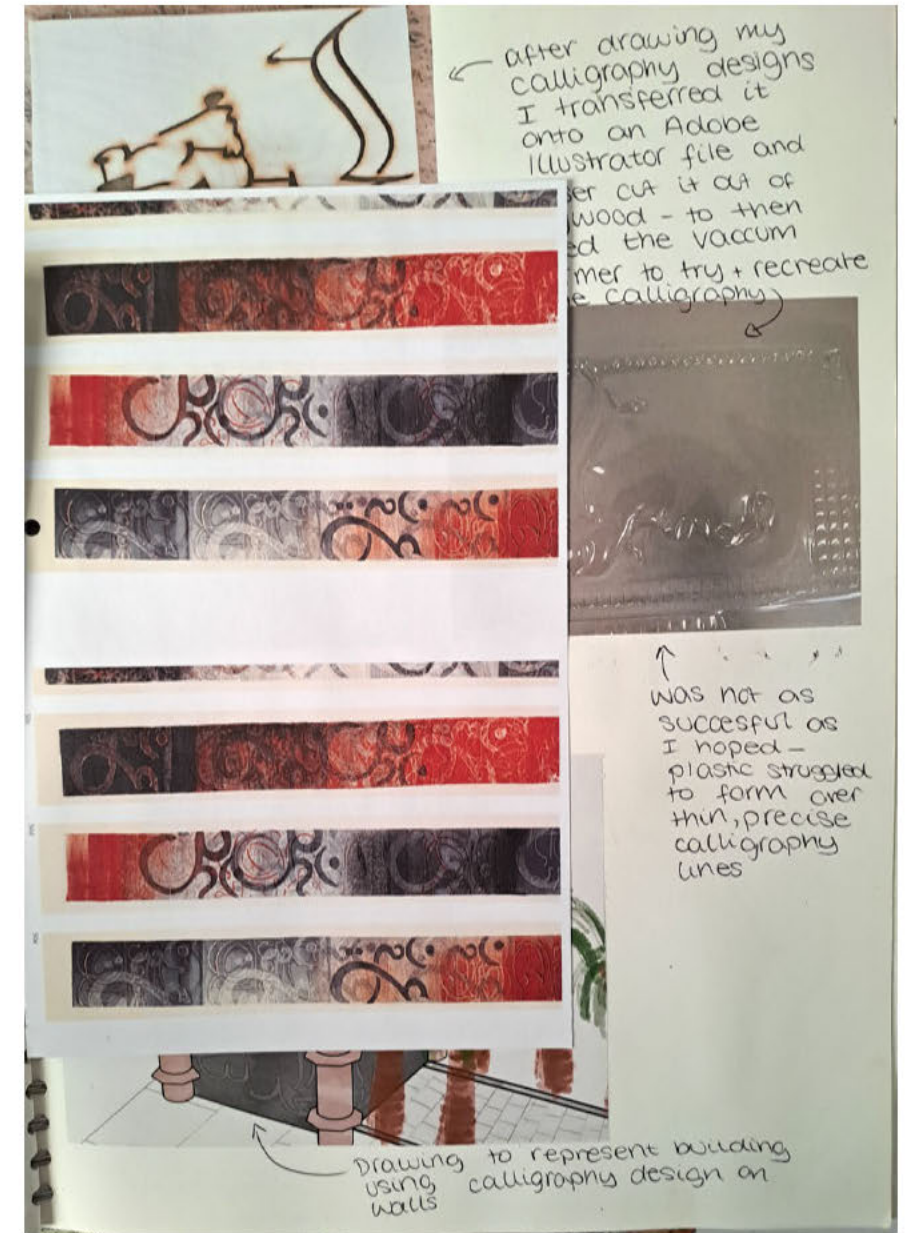
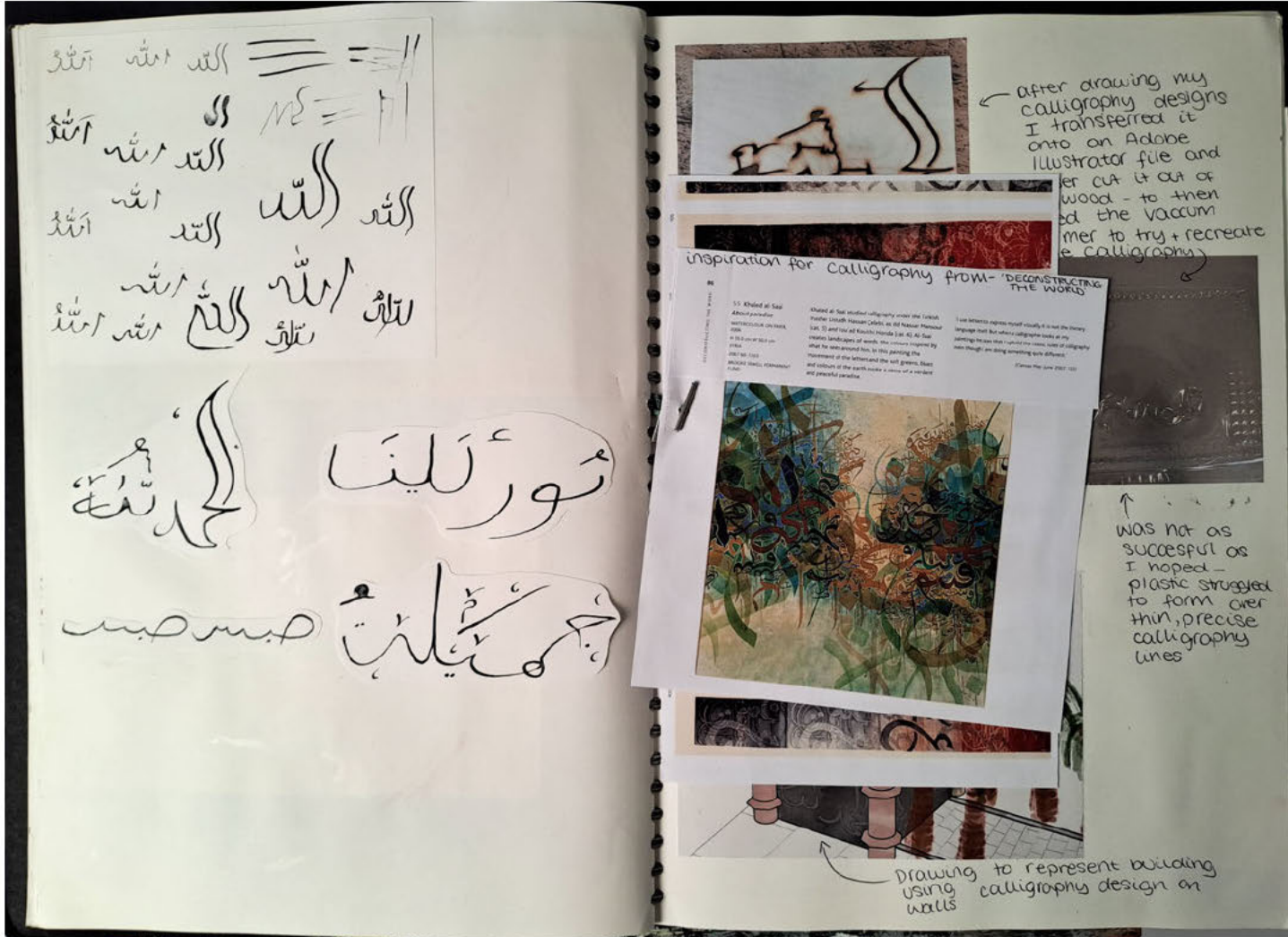
To create these designs I tried to show inside the **idea** to replicate how most of El Seed's work involves **calligraphy** **and** **art**

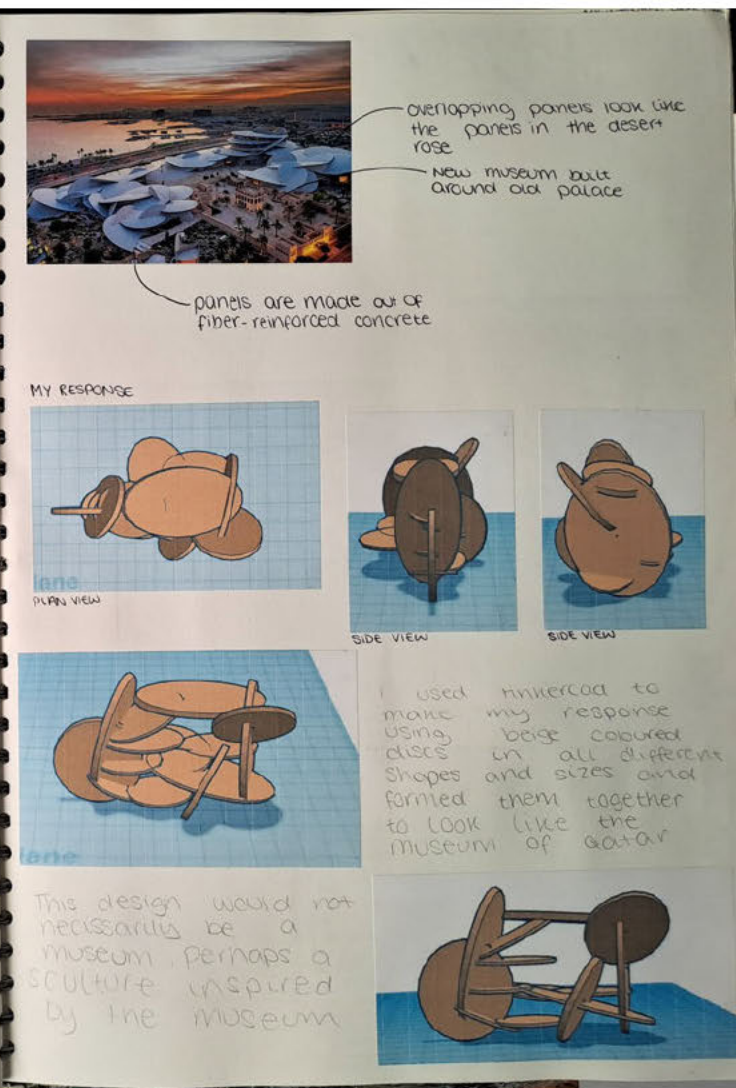
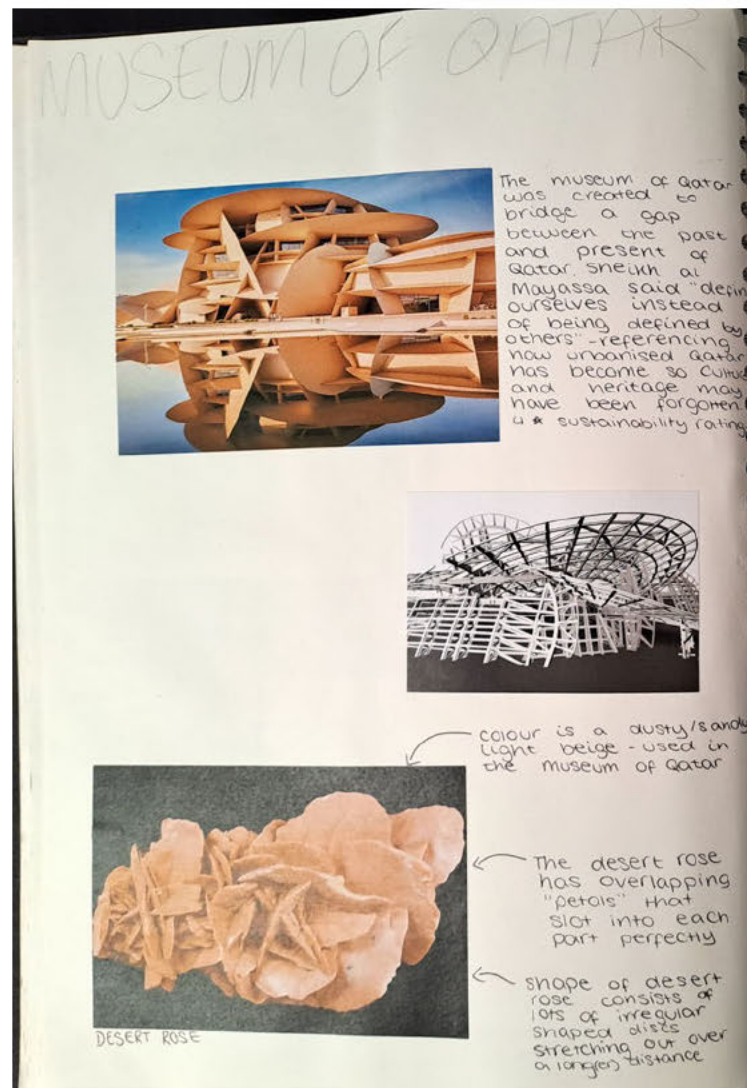
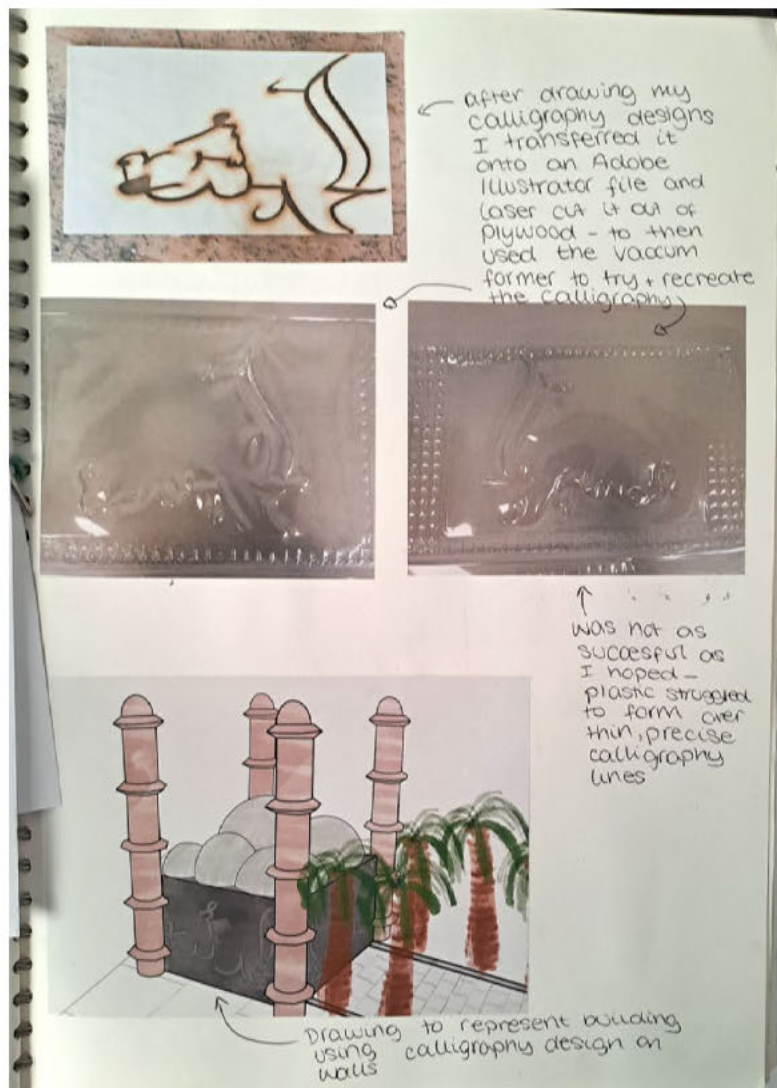


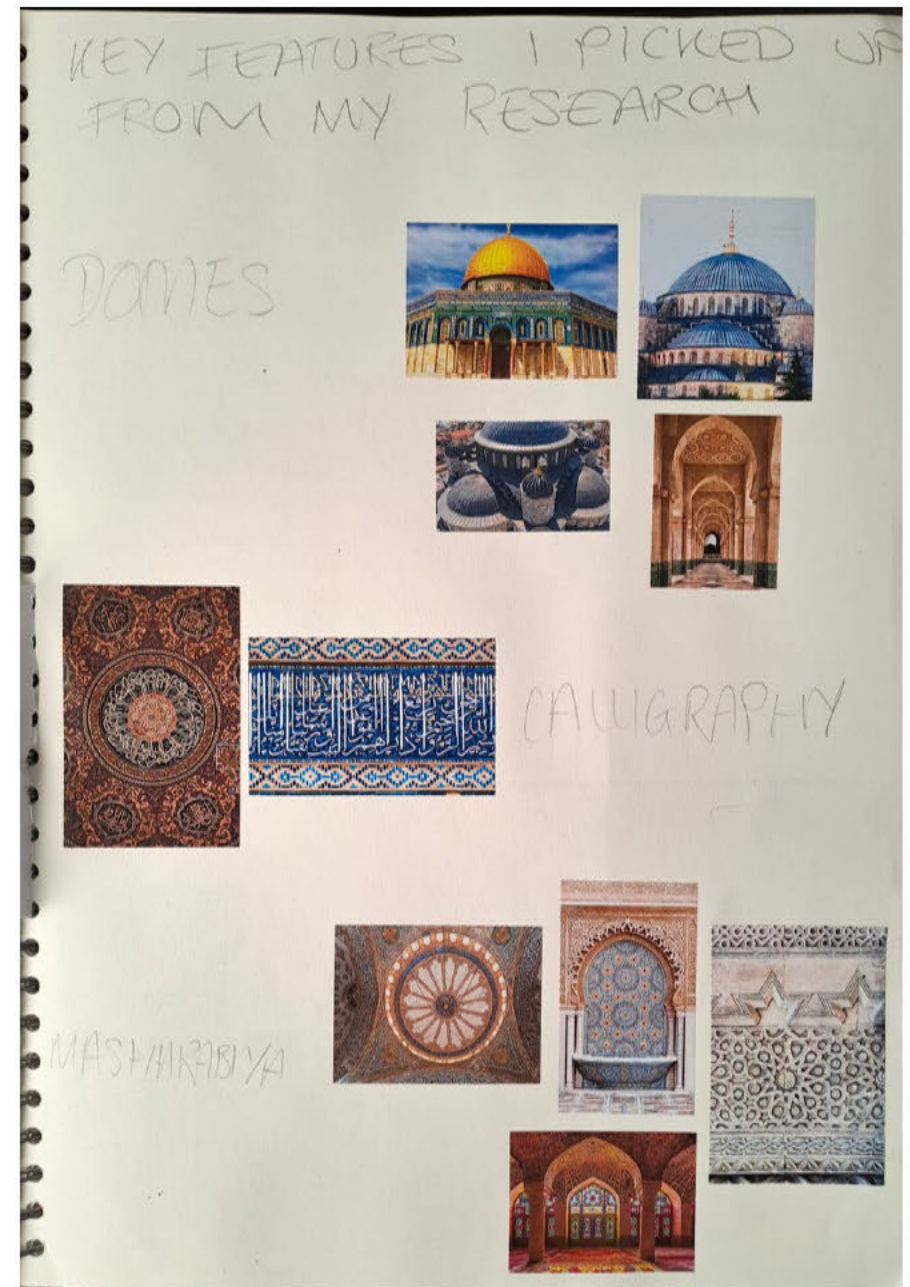
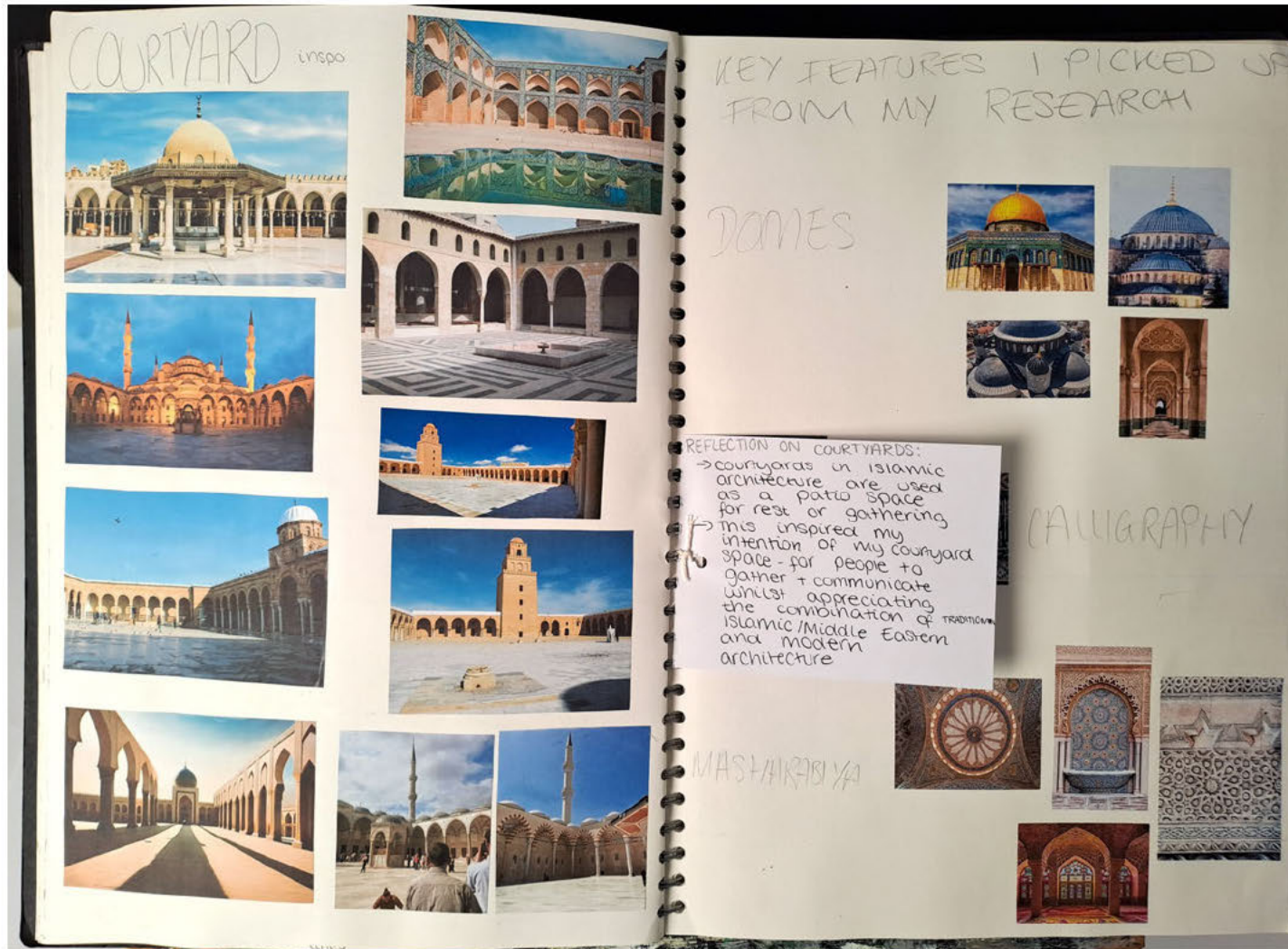
These attempts were done with **water** and **different** **colours** **water** - I drew the design with **water** and **coloured** **ink** on top to create an **effect** - I liked the **more** **lock** **however** the **ink** **was** **not** **as** **consistent** **or** **clear** **the** **calligraphy** **in** **black** **ink**

Chose this quote after the **mosque** in **Tunisia** **London** and the **show** in **London** **some** **months** **ago** - I was **inspired** **and** **always** **put** **the** **same** **on** **someone** **else**

Shows the **simplicity** and **importance** **behind** the **meaning** of his work







INTENTION

- Sheikh Zayed Grand Mosque - domes + arches + floral patterns
 - Suri Doha - mashrabiya pattern
 - Museum of Qatar - calligraphy art
 - intention of restoring culture
 - allows for exposure to be restored/ emphasized to remind people of the country in their own outdoor/ indoor multi-purpose space
 - modern day mosque/ community space
 - inspired by Middle Eastern architecture
 - OPEN AREA
 - used to allow people to gather whether it's for wedding celebrations or prayers or large gatherings of people
 - E.g. Doha, Saudi Arabia, Dubai, Port of Saudi

WHERE?

- place where culture is as strong as possible
 - used to have a key of a place
 - E.g. Doha, Saudi Arabia, Dubai, Port of Saudi
 - my intention is to weave together modernity and Middle Eastern architectural heritage by combining domes, arches, and the intricate mashrabiya patterns. I am to create a contemporary communal space that resonates with the spirit of the Middle East in a place where cultural essence is not as strong.

Drawing inspiration from iconic structures like the Sheikh Zayed Grand Mosque, Suri Doha and the Museum of Qatar, my design will blend the use of new tech and traditional to create my piece. I will use materials such as terracotta tiles for creating extravagant shapes and patterns used in Middle Eastern architecture. I will also use foam board to create the main wall structures of my mosque and wooden glass use the glass in the wall at home mosque in Shiraz City, emphasizing the pattern but in the Middle East. Furthermore to create the courtyard of my building, I will use terracotta to replicate the floor used in buildings such as the Sheikh Zayed Grand Mosque.

INITIAL IDEAS

IDEA INCORPORATING TEXT (عبر)

The Arabic word **صبر** translates to "patience" and is pronounced as "Sabr". This word holds a lot of significance in the Middle East as it says that no matter the struggle it restores faith + strength that it will work out.

I imagine as I build more to be inspired by the importance of patience especially as a large communal space where people are gathered, the word should be repeated.

I want these images to be a large communal space where I can work on / reworking in my final piece.

These images are Mosques of Mosques. I used them to reference how I want my building to look / how I want my final model to look.

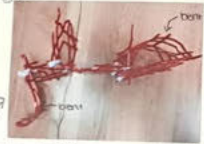
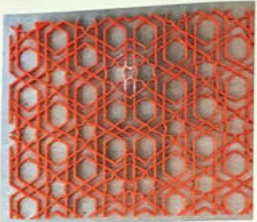
FOURTH DRAWING OF POTENTIAL BUILDING

Purpose of the building - communal space for people to gather - can be for religious events or festivals or even as a space to relax / take some time in.

Acres represent walkways and how the building can be separated / structured into different areas.

POTENTIAL IDEAS FOR STRUCTURE OF BUILDING (INTERNAL AND EXTERNAL)

TESTING



masking tape was used to hold pieces in place so they would form the word in arabic from a birds eye view - however, does not look aesthetically as pleasing



however, wire is not very strong due to being thin and trying to not be visible

much more ergonomically pleasing - some colour of wire as acrylic + thin so isn't seen from far away

much more aesthetically
pleasing - same colour of
wire as acrylic + thin
so isn't seen from far
away



However, to make sure the acrylic goes in the right place, it is difficult to be exact when aligning the notes




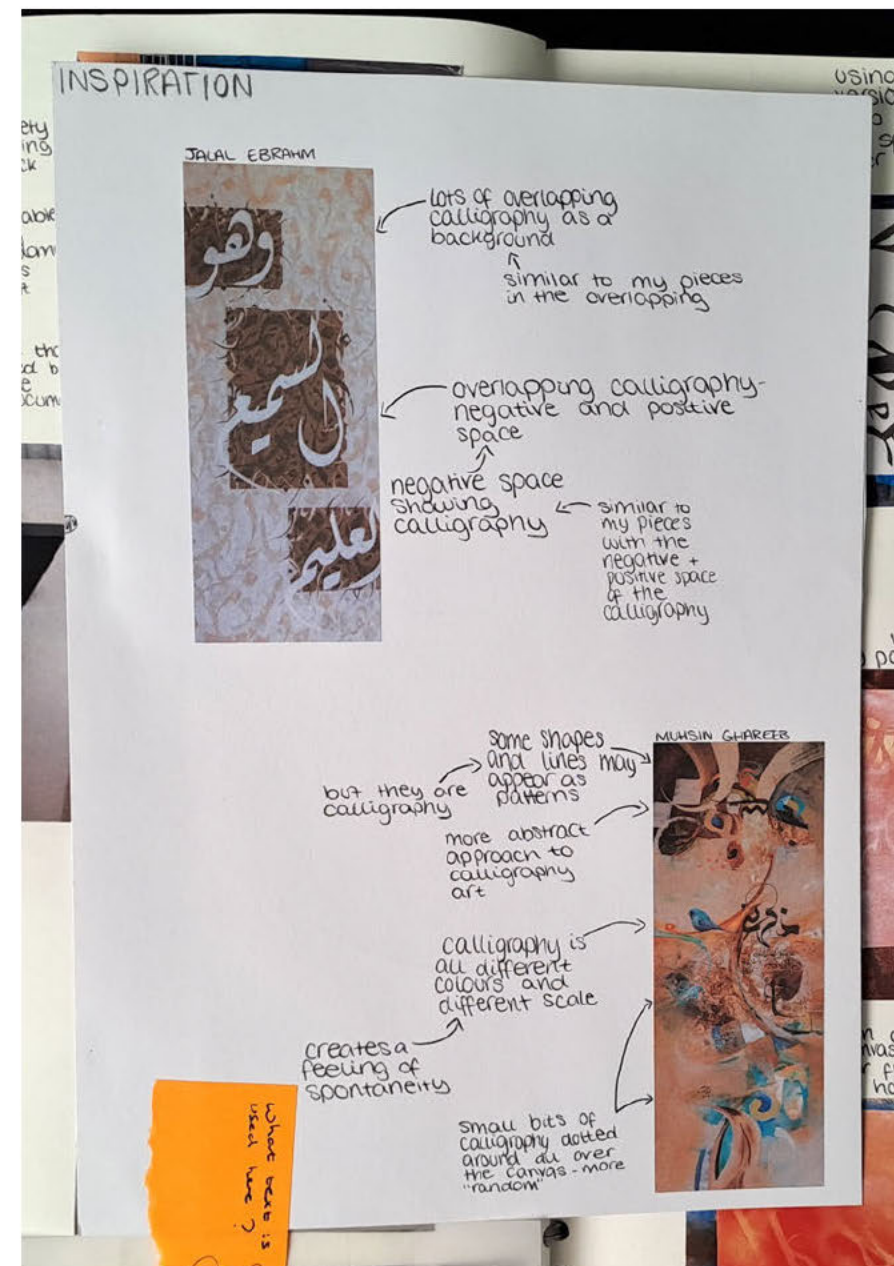
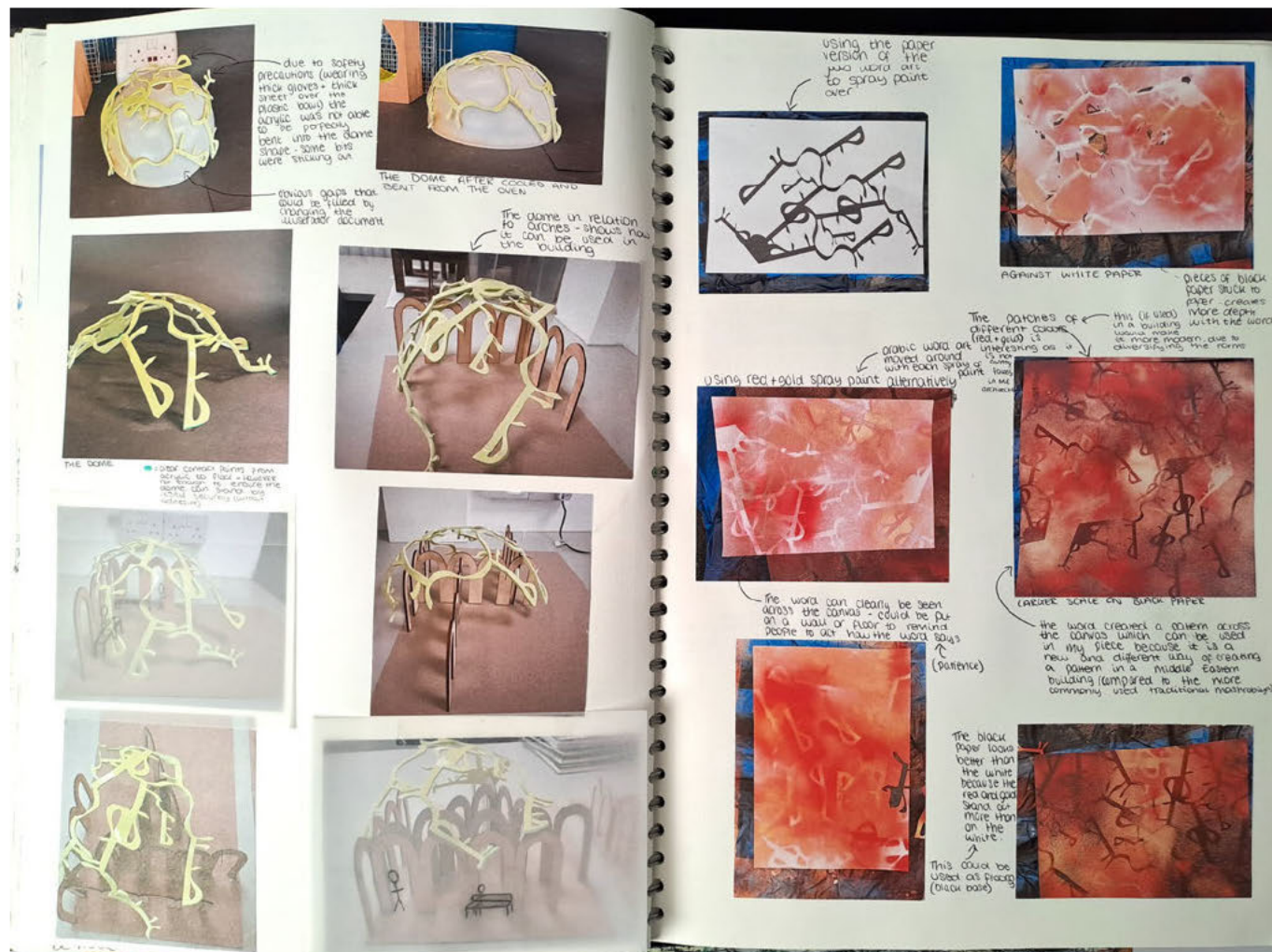
However, to make sure the acrylic goes in the right place, it is difficult to be exact when creating the holes



This Scripture was created on Adobe Illustrator using the same word again (highlighted)

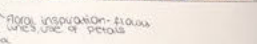
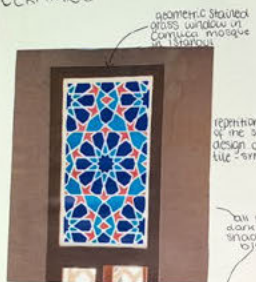
word was repeated +
Scale + rotation
were explored to create this shape.





CERAMICS

For the floor of my courtyard I wanted to incorporate a traditional ME patterned tiles which were sometimes very influenced by floral designs.



1+2+3 \rightarrow ties with slip (coloured)

Limitations of using ceramic tiles for floor:

- ↳ creating a relief would be difficult to wave or however possibility of filling with regular
- ↳ to create size floor needed for model large size floor would be needed and would not fit in mill

Next was figuring out the configuration of
arrows for my courtyard:



↳ basic configuration, sectioned spaces
but could have more of an
interesting plan - to make the
courtyard more aesthetically pleasing
and attract more people



Walls put on the sides to create more of an idea as to how the courtyard will form as a whole



configuration no. 2 is more exciting than no. 1 due to the addition of extra arches and more clear spaces on to where people could gather.



However, there is still lots of open space where nothing is allowed - could use a more intricate + detailed configuration in order for the courtyard to fulfill its purpose (to gather people)



configuration no 3 is more detailed than 1+2, it creates dedicated spaces across the courtyard in a way that uses the whole area of the space but leaves lots of room for other activities such as clothes or benches.

However, the design is very parallel which may not be as exciting for people to come and visit.



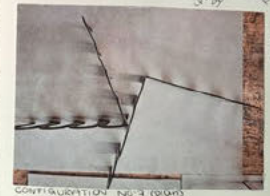
configuration is more abstract - unique to traditional ME architecture



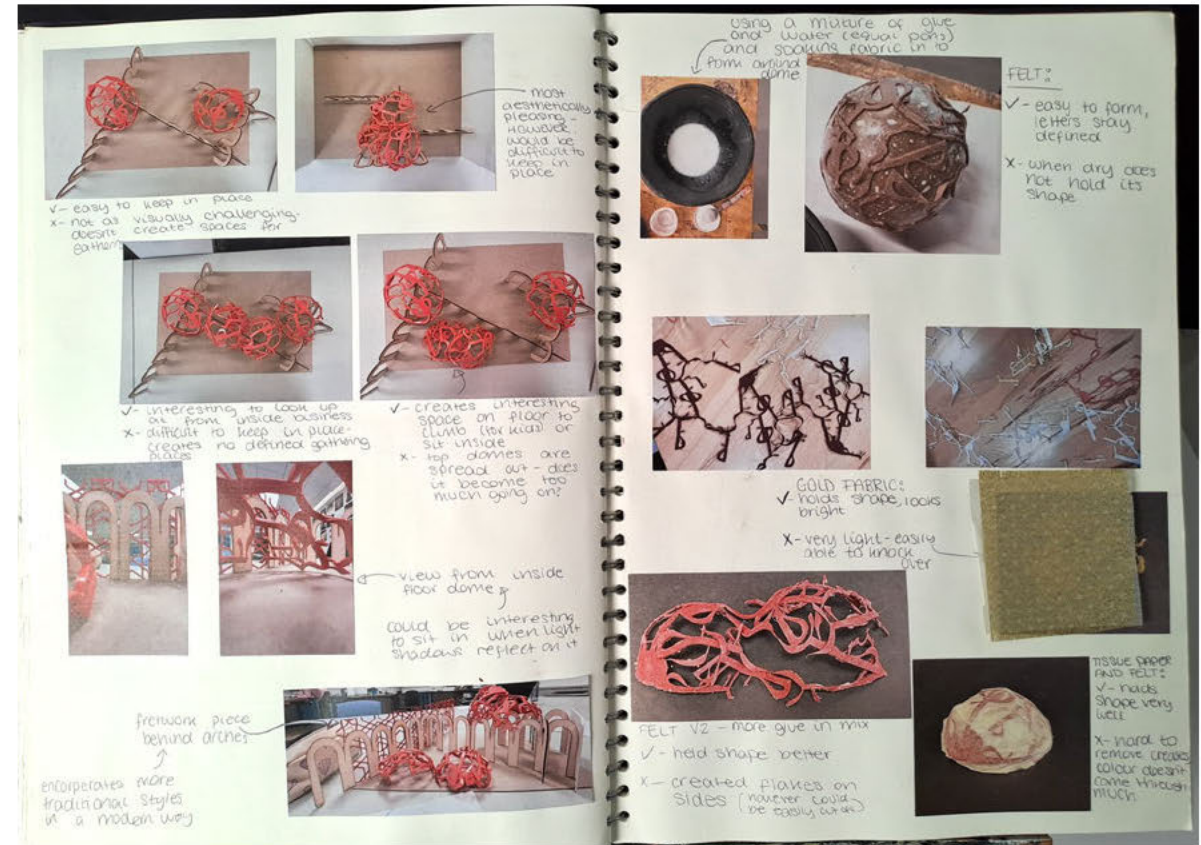
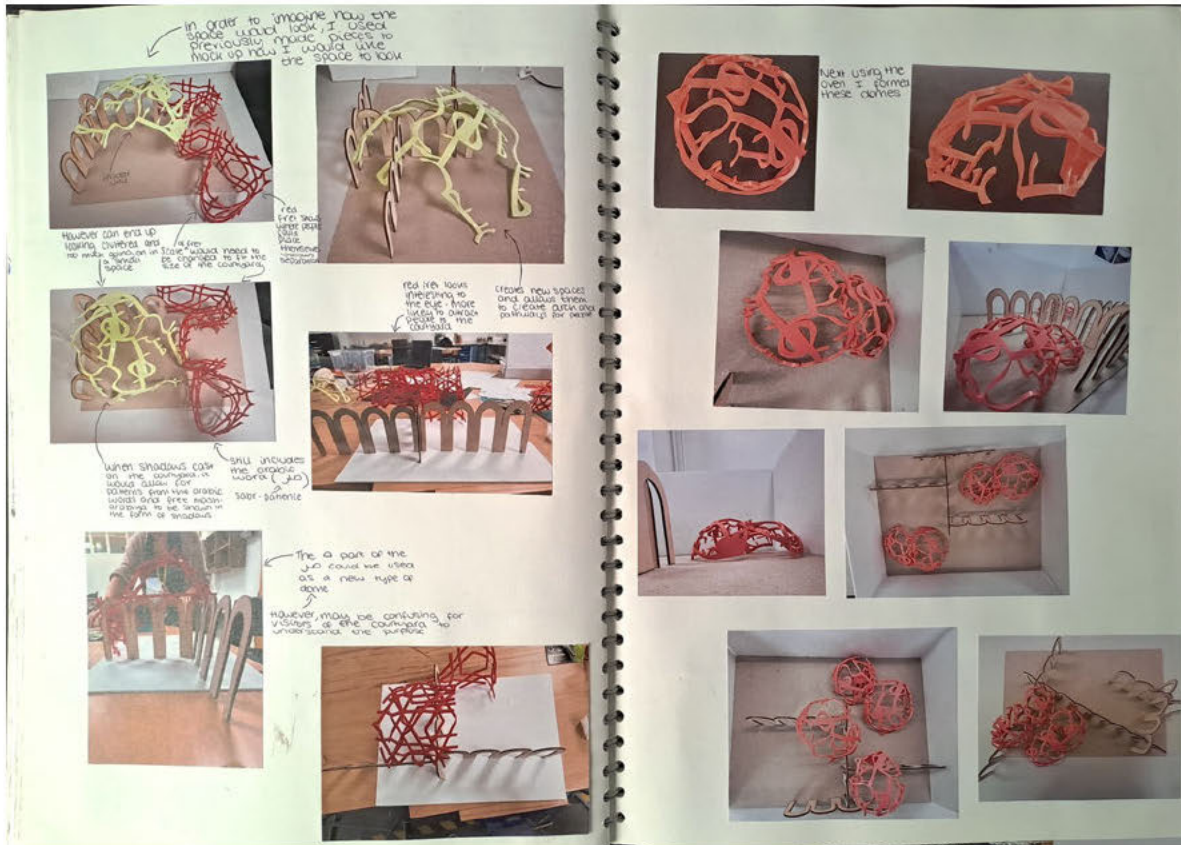
- ← creates clear defined spaces and has paralinguistic interesting
- ← are all the arches can't be used to walk through

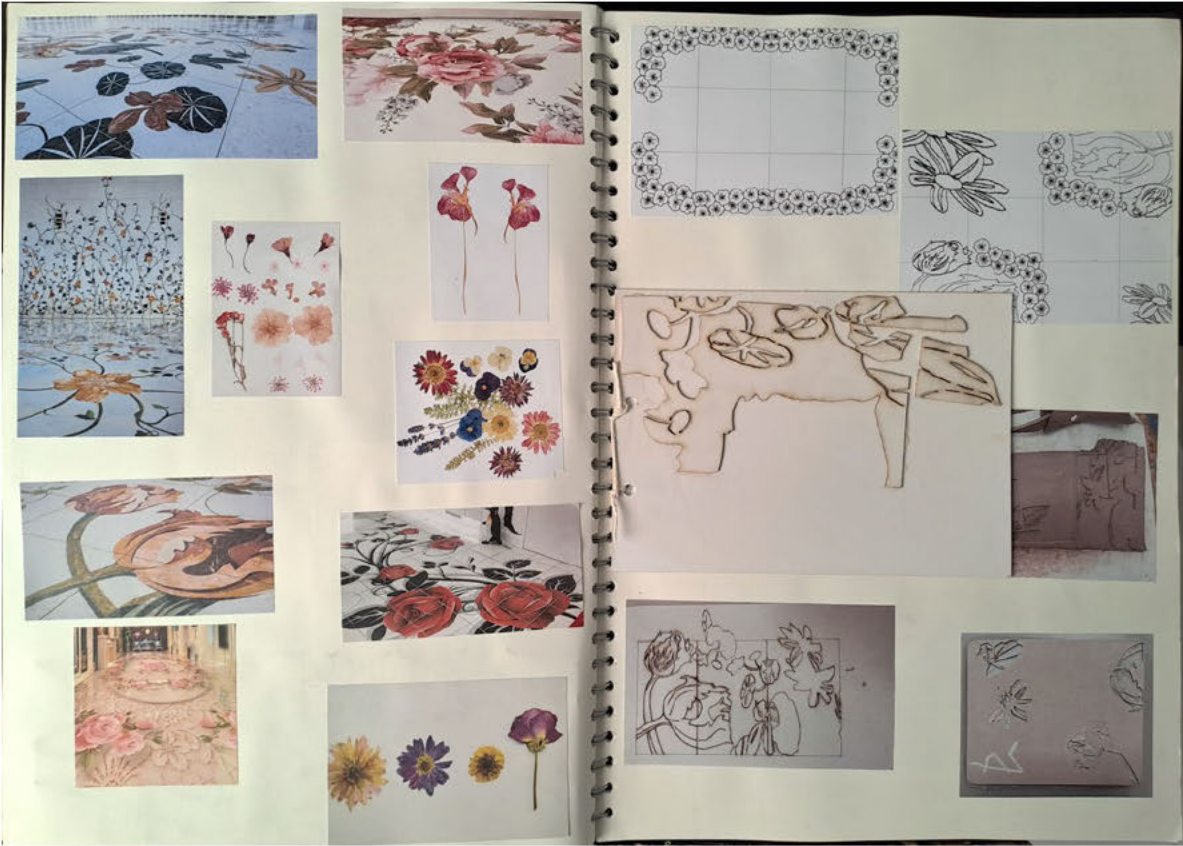
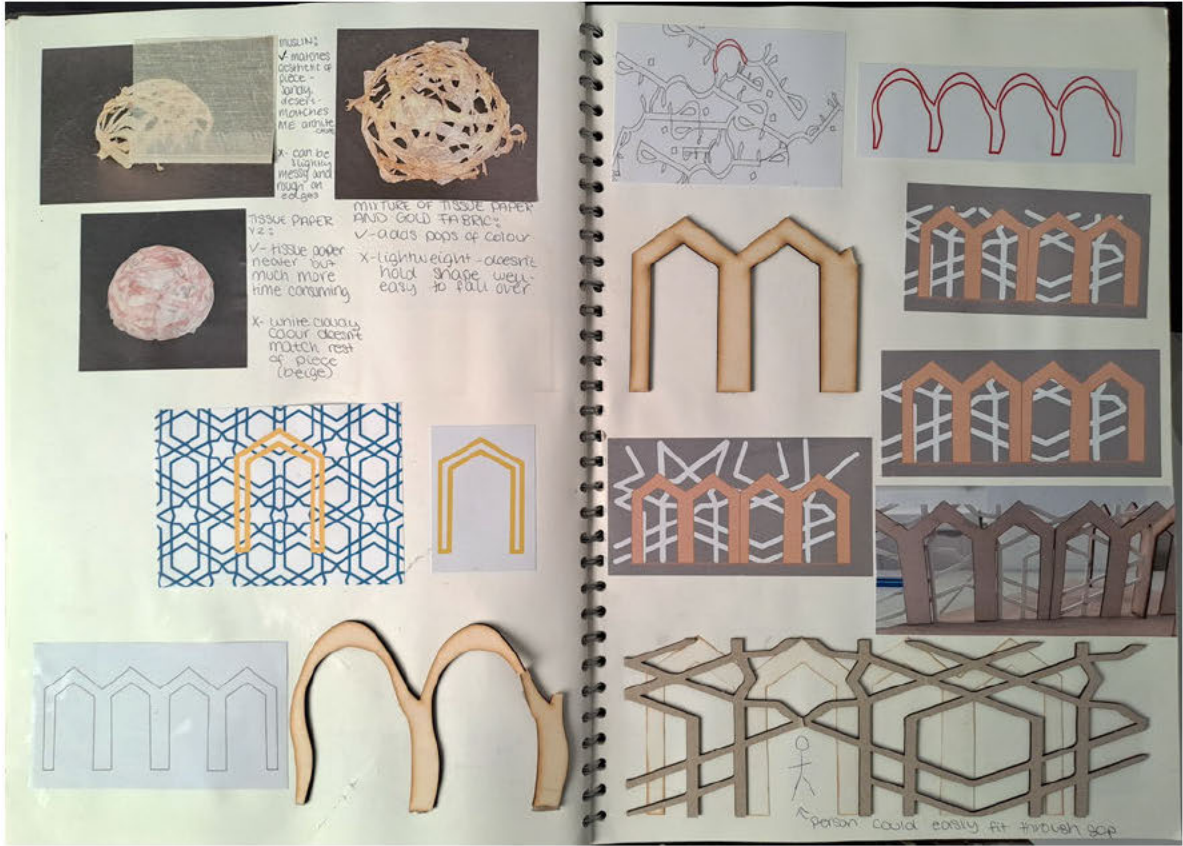


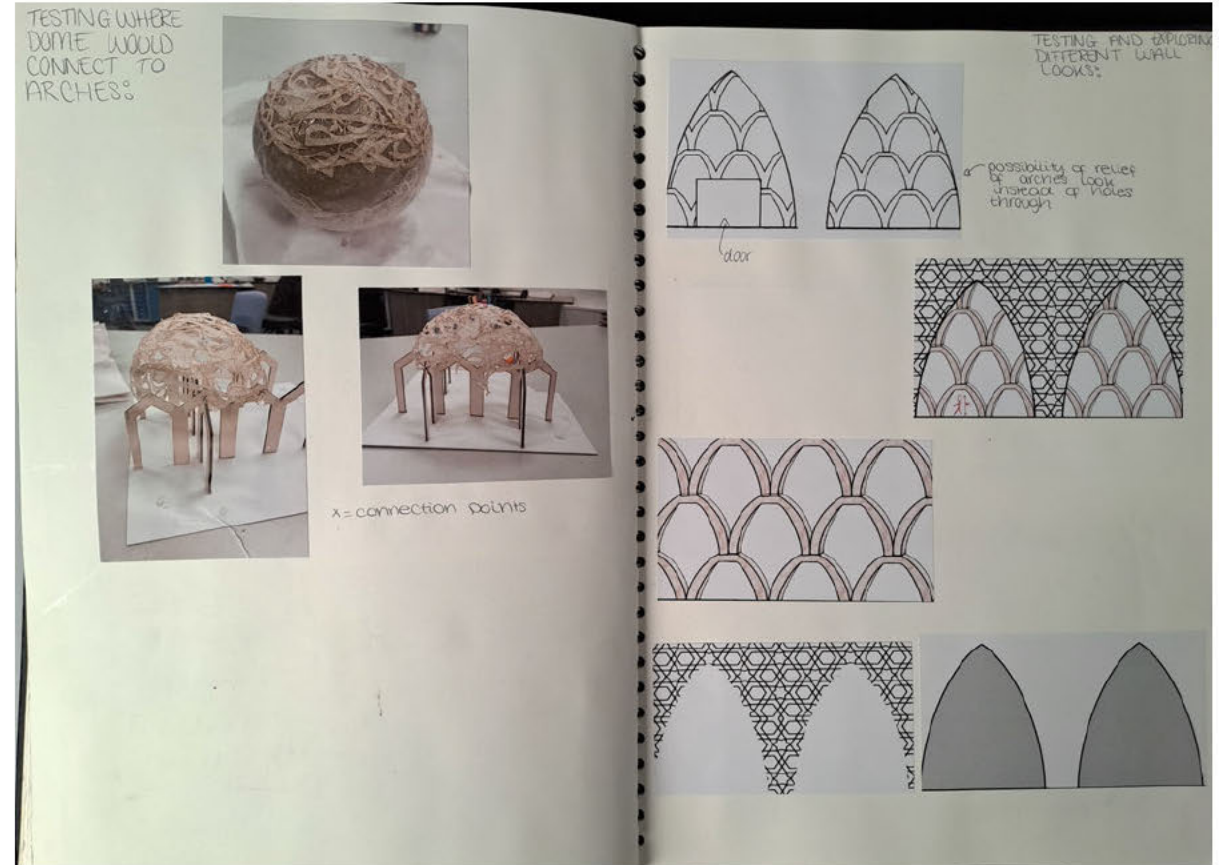
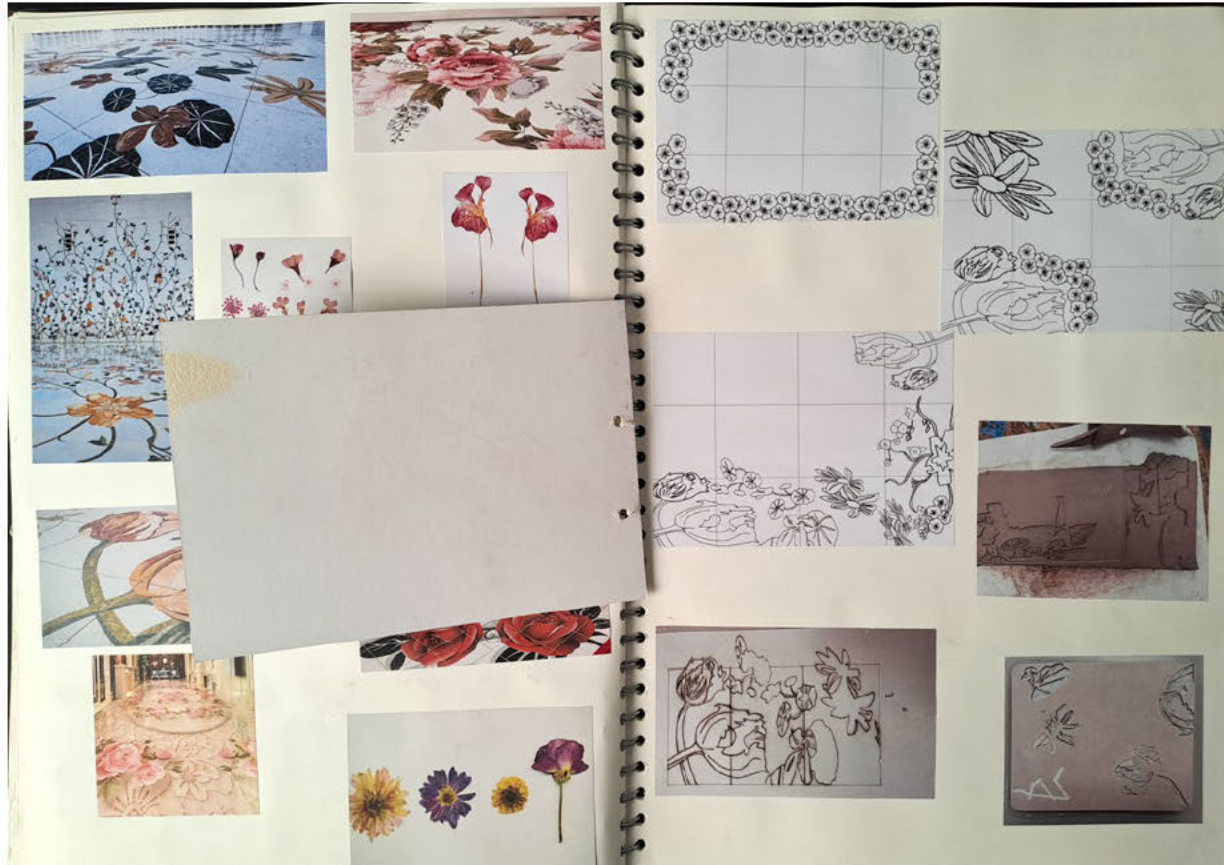
Diagram of a ruffled skirt pattern piece. Annotations include: "order for waistband" pointing to the top edge, "order for pleats" pointing to the ruffled edge, and "order for seam" pointing to the side edge.



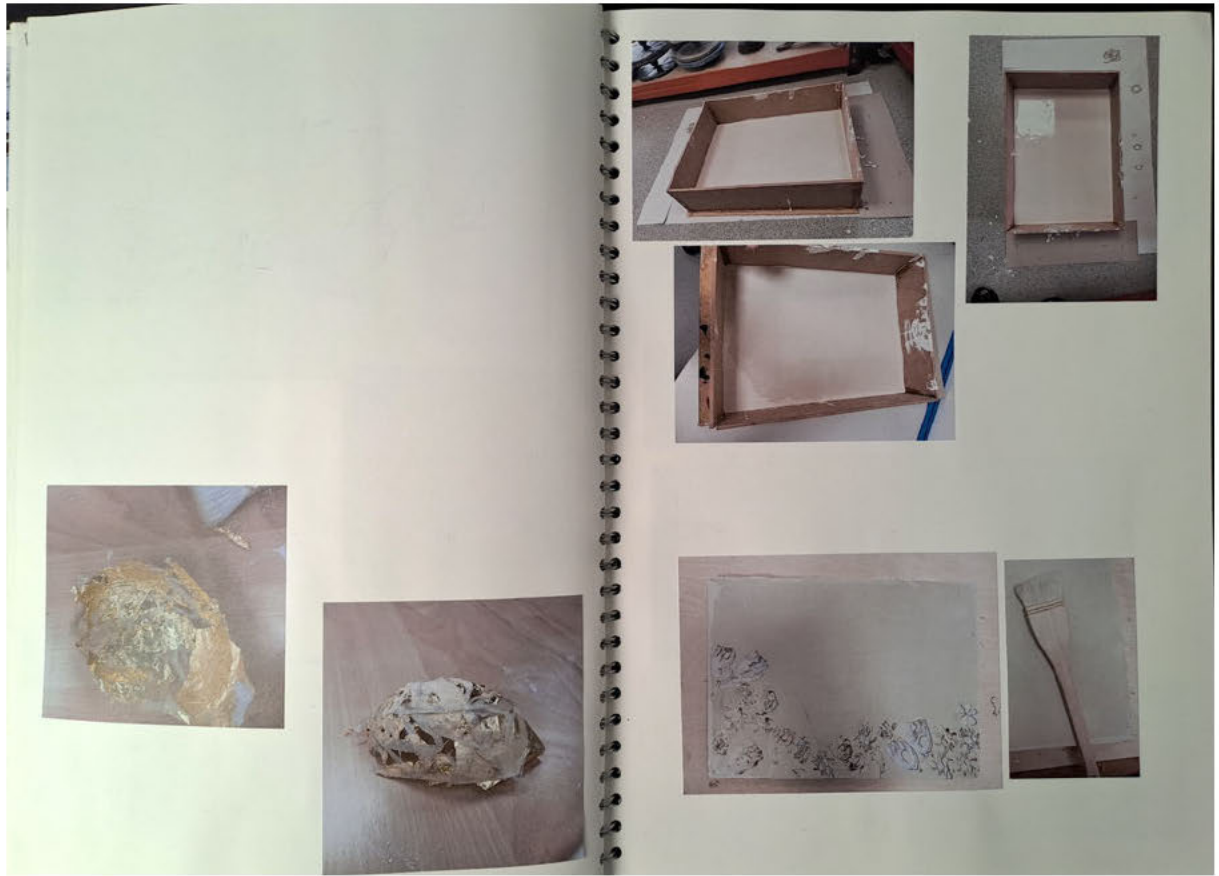
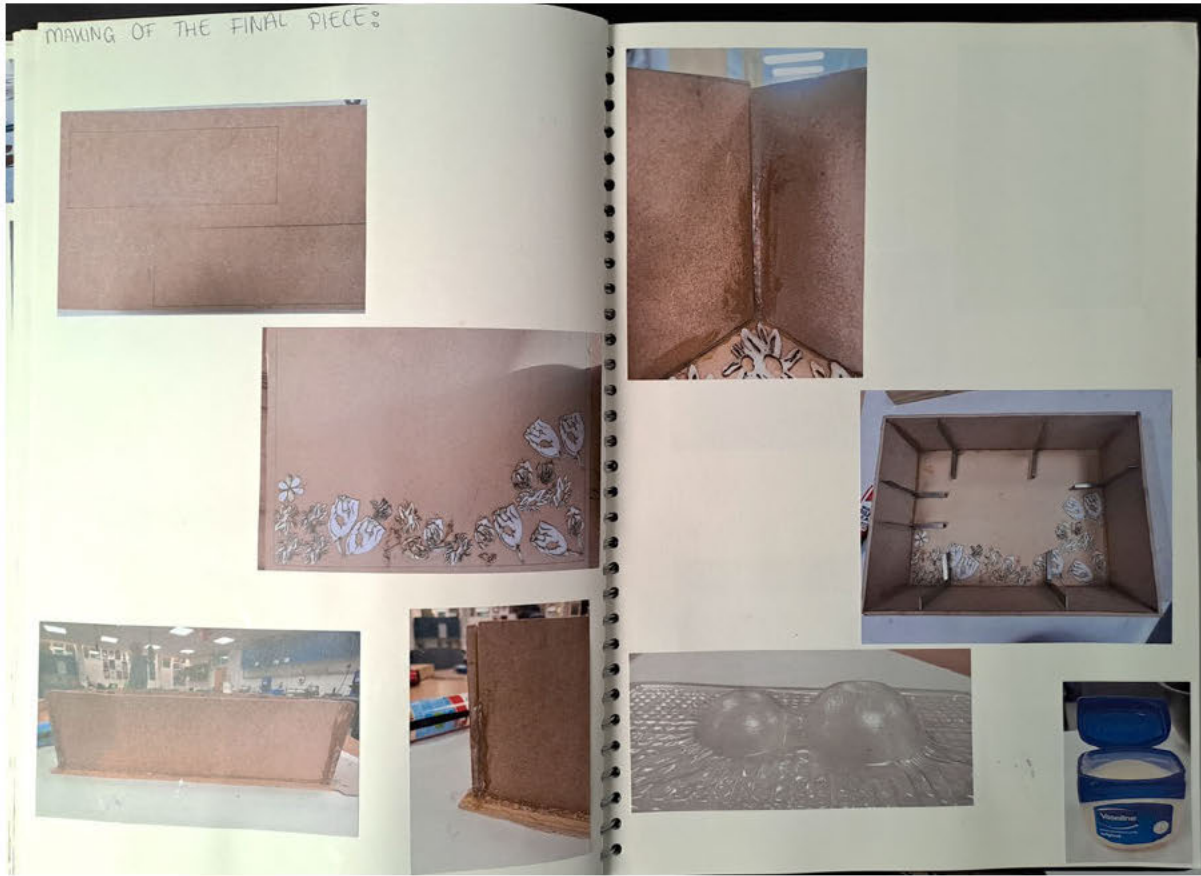
ability to walk through arches

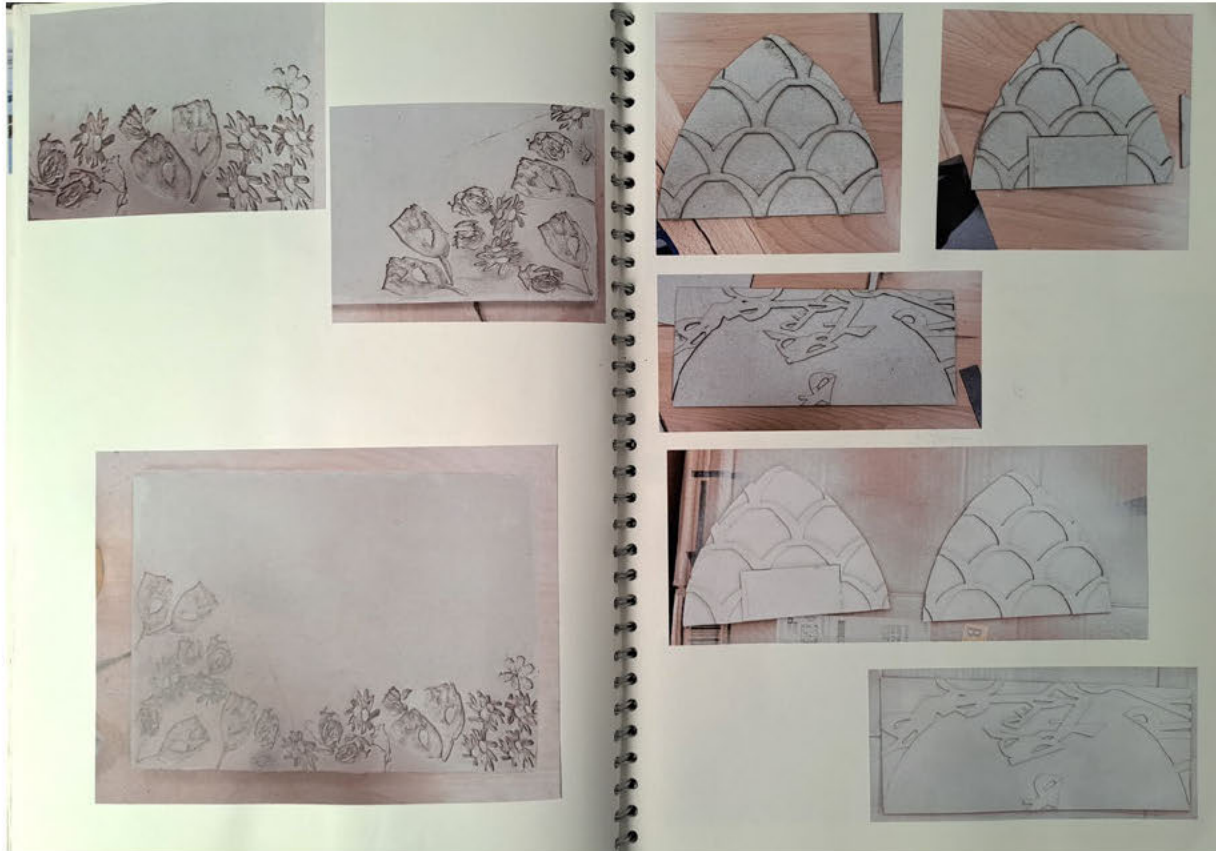














Title at the moment:

MODERN VS TRADITIONAL

in
architecture

- comparison
- how they can be linked
- current styles
- How can tradition be kept whilst still relating to upcoming trends + necessities for the current generation?
- modern ≠ modernism

FREEDOM IN
EXPRESSION

Architecture
designed +
built within
the social,
artistic +
cultural ^{economic}
attitude. ^{eco friendly}

current
attitudes
what do
people see
care abt?

Sharp clean
lines

asymmetry

WHAT COUNTS AS MODERN?

MATERIALS:

- reinforced concrete
- glass
- steel - frames
- stone
- plastic
- curtain walls
- ribbon windows

Functionality,
Flowing, open
spaces allowance
of natural light
interpretation of
traditional

CONTEMPORARY

current
trending
high-tech
architecture

leaving
the
past
behind

Bringing in new
ideas

CHARACTERISTICS

relationship
with
outside
environment

DYNAMIC
CONCEPT
/
dependent
on society
+ culture

WHAT STYLES/
VISUALS WOULD
YOU SAY IS
TRADITIONAL?

EUROPEAN

Ancient
Greek

Classical

ISLAMIC/
MIDDLE-EASTERN

domes

arches

minarets

ornamental
details

girih
tiles

intricate
geometric
tiles +
patterns

NATIONAL MUSEUM OF QATAR

→ Contradictions + contrasts between
Qatar's past + present

→ Inspired by a flower-like
aggregate of mineral crystals -
DESERT ROSE

occurs when crystals form
in sandy arid conditions -
like Qatar - lots of desert

appears →

like a rose blossom } petals + bloom
of roses or singular } shape inspired
the look of the
museum.

→ bridge between past + present
to "define ourselves instead of
being forever defined by others"
↳ Sheikha al Mayassa

→ made up of interlocking discs
that creates cavities to
protect visitor from heat.

→ Emerges from a desert that
has made its way up to the
sea.

→ made to evoke the deserts
eternal dimension + fluidity.

→ large inwardly curving
discs - defines museums

formal approach + spacial experience.

→ ^{SAND} Has same colour - interior + exterior

→ When the sun hits the building from the East or West - disks cast long protective shadows that help keep interior cool.

→ Mix of international and ARABIC architecture.

→ BUILT WITH THE MOTIVE: bringing people of Qatar closer to their heritage + history → whilst also generating "self-pride".

→ Envelopes palace of Sheikh Abdulla bin Jassim Al Thani - former ruler of the country.

→ Efficiently air conditioned

4★ sustainability rating

→ QATAR NEW PLANNING POLICY - more engaged

in cultural planning that corresponds with the requirements of the contemporary world.

THINGS IN THE INTERIOR - one room themed around sustainability - e.g playground pump, crank handle pump etc...

→ be informed
Allows users to be informed about different sustainable practises that have been implemented in Qatar.

IMAGES OF THE MUSEUM OF QATAR



spread over a large range of land

panels layer over layer over each other

looks like desert rose - over time



Built around the old palace



Dome of the Rock

JERUSALEM, ISRAEL

used to be direction of prayer before the Ka'aba (Mecca)

IMAGINE A BUILDING that is at the heart of the holiest place of both Judaism and Islam. The Dome of the Rock (Qubbat al-Sakhra) in Jerusalem was completed in 691 AD. The first Umayyad caliph, Abd al-Malik ibn Marwan (reigned 685-705), on the former site of Solomon's Temple, called the Holy of Holies. As such, it is the second holiest mosque in Islam. Not a mosque but a shrine for pilgrims, it covers a rock called the Foundation Stone, or the Plumed Stone, thought in Judaism to be the point of spiritual junction between heaven and earth, where the Ark of the Covenant containing the Ten Commandments was placed. It lies above a natural cave that is said to contain the Well of Souls, where Jews believe Abraham almost sacrificed Isaac. According to tradition, it is also the point of departure of the Prophet Muhammad on his "Night Journey" (al-'Isra' and Mi'raj) to heaven, erected on a raised platform at the center of the Temple Mount - Haram ash-Sharif, or the Noble Sanctuary, in Arabic, the Dome of the Rock is second most sacred mosque first completed in 705, considered the third holiest place of Islam by Sunni Muslims.

Thought to be designed by the engineers, Umayyad and Abbasid dynasties, the structure may well have been created to diminish the superiority of Islam over both Judaism and Christianity. In 1970, Shlomo Dov Goitein, then a professor at Hebrew University wrote:

In a well-known passage of his Book of Geography, al-Maqdisi tells us how his uncle rescued Abd al-Malik and al-Walid I for spending so much good Muslim money on buildings. They intended to remove the five temples constituted by the existence of the many fine buildings of worship of other religions. The very form of a rebuke, given to the Qubbat al-Sakhra, although it was foreign to Islam, was designed to rival the great Christian domes. The inscriptions decorating the interior clearly display a spirit of polemic against Christianity, while stressing at the same time the Qur'anic doctrine that Jesus Christ was a true prophet.

The celebrated dome of the shrine is approximately 66 feet (20.1 meters) in diameter and 67 feet (20.5 meters) tall, giving it almost exactly the same dimensions as the dome of the early



Context - brief

1994 = Saudi Arabia donated
80kg of gold to red gold
dome — mainly Quranic verses

inscriptions have special meaning relating to importance of God and The Prophet.



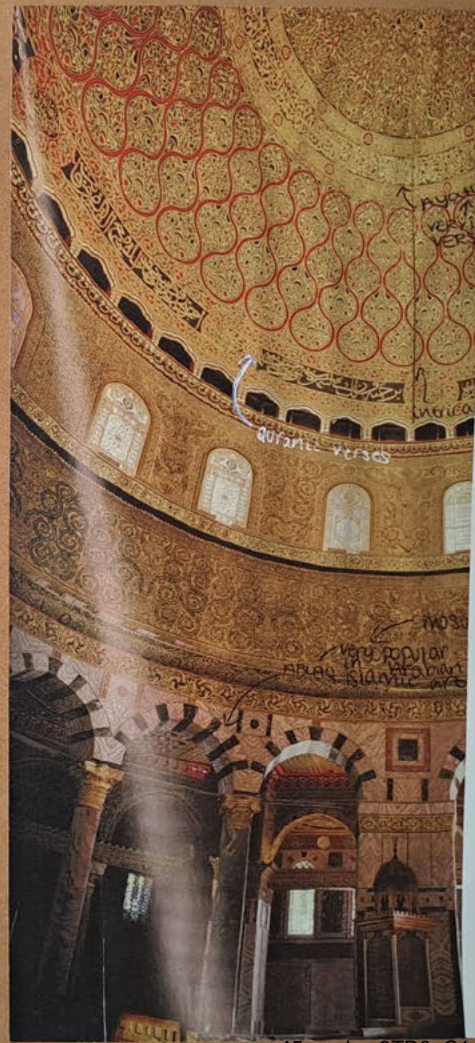
THE DOUBLE-SHELLED DOME IS SHEATHED IN SCULPTED PLASTER THAT HAS BEEN PAINTED AND GILDED. PANELS OF CALLIGRAPHY CONVEY RELIGIOUS MESSAGES.



INTERIOR DECORATIVE WORK IS MADE
OF MARBLE AND COLORED STONES,
GLASS MOSAIC WITH GOLD
BACKGROUND, MOTHER OF PEARL,
AND BRONZE REPOUSSÉ.



ANALYZE THE USE OF BLACK AND WHITE STONE, AS FOUND IN ROMAN, ISLAMIC AND ROMANESQUE ARCHITECTURE IN VARIOUS SITES THROUGHOUT THE MEDITERRANEAN WORLD.



45 marks, 9TD0, C1

Theme: The Middle East

Islamic architecture: elemental rebirth

Ian Bampton sees the fashioning of a truly indigenous style for modern Islam as an exciting challenge to architectural creativity.

In the present wave of enthusiasm for Islamic architecture and concern to introduce Islamic derivatives into new buildings in the Middle East and other developing areas it is as well to appraise the situation; to identify the sources of the influence, and assess the requirements of those for whom the new architecture is being created.

[illegible]

Main Gate, Blue Mosque, Isfahan

sick of the modern alternative, are they searching for new forms and another stimulus—reflective of a period considered by its adherents to have been rich and full of grace? ← ismic-

Islam in transition

It is clear that many of the prerequisites that led to the highly developed and beautiful features of the great Islamic building are no longer valid when related to the modern world. The mosque of the Imam Shams al-Musayyid Majlis-e Shahi Isfahani, a fine example of the peak of decorated Islamic architecture, often finds that many features of the construction relate directly to the use of the building. The dome is not a structural requirement to roof a large space, and to light it from above, also the necessity to throw the human voice so that it should be heard by a large assembly of people. The dome is a result of the construction today of minarets based on the concept of calling the faithful to prayer is no longer justified, the only person likely to climb to the top now is the person who wishes to see the city from above. Speakers through which the call to prayer is relayed from below, where it may be intoned or broadcast from a pre-recorded tape. The minaret and in fact the whole dome, which is a decorative screen or facade, has become a barrier to the view of the city from above, and a barrier to the view of the mosque from below.


Built Environment Quarterly June 1976 117

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the present, the only way to meet the needs of the world is to produce more food and clothing than we can consume. This is the only way to ensure that we have enough to eat and wear. The production of food and clothing is a process that involves many steps, from the planting of seeds to the harvesting of crops. It is a process that requires a lot of labor and resources. The production of food and clothing is a process that is essential for the survival of the human race. Without it, we would not be able to live. The production of food and clothing is a process that is essential for the survival of the human race. Without it, we would not be able to live.

Theodore M. Clark, screen writer—Oscar 1971; John R. Harris, architect

43



Hagia Sophia, Istanbul, Turkey, 537

Perhaps the most important observation that can be gleaned from the fifty examples selected for this book—all dating from the Christian era to the present—is that each and every one of them is invested with life. Far from being curious unapproachable works of art, these examples of architecture are the very places in which our civilisations are founded; they are the crucible not only of esthetics and culture but also of politics, religion, and history. As such, great architecture is by no means the preserve of an elite; it is the tangible proof of where we come from and who we are.


The buildings in this book are organized, to the greatest extent possible, by their date of completion. Of course, many buildings, especially the older ones, have had various functions and forms and cannot be dated with such precision. This is in fact the great conundrum of architectural restoration of ancient buildings. Which Versailles does one restore—that of Louis XIV (1638–1715) or that, a world apart, of Louis-Philippe (1773–1830)?

Cathedral, Mosque, Museum, Temple

A first concrete example of the different avatars of a single building is Hagia Sophia (Istanbul, Turkey; 537). It served as an Eastern Orthodox cathedral, a Catholic cathedral, an imperial mosque, and finally, since 1935, as a museum. Located on the site of two earlier churches, the basilica was built on the order of Justinian I, the Byzantine emperor, from 527 to 565. It was inaugurated by the emperor and Eutychius, ecumenical patriarch of Constantinople, on December 27, 537. Ancient by the standards of any existing building, Hagia Sophia contains even older architectural elements, such as eight Corinthian columns even older than the building itself.

Justinian on the order of the emperor and used in construction. Hovering above Hagia Sophia, its dome, with an interior height of 32.4 feet (9.9 meters), is a symbol retained for many churches, mosques, and government buildings over time. The dome can be seen as a symbol of the heavens, or even of the human skull, which renders life possible.

The dome of the heavens does not seem to have been as much of a preoccupation in the Far East. Todaiji Temple (Nara, Japan; 714) is one of the great monuments of Buddhism. Here, the extent of faith and the importance of Nara as the brief capital of Japan were expressed in the construction of temples and, in the case of Todaiji, of a likeness of the Buddha, housed in the largest wooden building in the world, of 148 feet (45 meters) high. The Great Buddha was inaugurated in 752. Five and a half centuries later, in 1374, the temple complex was destroyed by earthquakes; the better parts of the temple complex, but most of the Great Buddha, were rebuilt, again and again, as required. Aside from the main



Todaiji Temple, Nara, Japan, 8th century

ARCHES IN ISLAMIC ARCHITECTURE

Author et al. 2016 A Template for the CIB W78 Conference 2016

1 Introduction

There are many papers and primary architectural references that outline the fact that arches are one of the main components of Islamic architecture (IA). Every style of Islamic architecture (IAS) is well known for particular types of architectural components that can be used to differentiate and distinguish that Islamic style based on historical era, design, demands, place, facade, and other architectural requirements. Every IAS is well known for using certain types of arches that are well incorporated into their architectural structure and construction design demands. The example applied in this paper is of the **Hejazi Islamic Architecture Character (HIAC)** which is derived from the **Ottoman Islamic style**. The Ottoman empire ruled many Arabic and non-Arabic regions of the Islamic realm which resulted in increased homogeneity that unified the Ottoman Khilafah (rulers) architectural style among the Ottoman buildings.

Gruha (1987) defined IA as a set of architectural and spatial features, such as introspection, that are inherent in Islam as a cultural phenomenon. Hence, establishing a digital library of IA will assist in enabling a better understanding of IA while also providing a resourceful library for practical applications in the IA design domain. Currently, data and research efforts in digital Islamic Architecture are scarce. Examples of these research efforts comprise the work of **Alkhateeb et al. (2006)** who developed a region-based indexing and classification system for Islamic architectural images using rotational symmetry information. Their classification system is based on the number of folds by which an image is characterized and the image's fundamental region and class. **Chamara et al. (2007)** have likewise established similar digital resources of Islamic historical buildings focusing on Islamic architecture in **Safwan, Iraq**. Their research work revealed that a topic image-based semantic model applied to collaborative metadata management paradigms can be easily exploited as a tool to enhance traditional architectural designs and interdisciplinary studies. Further efforts are shown in the work conducted by **Debel et al. (2008)**, who examined geometrical patterns in IA and developed an indexing and classification system using discrete symmetry groups. It is a general computational model for the extraction of symmetry features of Islamic Geometrical Pattern (GIP) images. GIPs are classified into three pattern-based categories. The first pattern category describes the **symmetry generated by translation** along one direction. The second pattern contains **non-directional symmetry** in two independent directions. The third, which is called **point**, describes patterns that begin at a central point and grow radially outward.

Furthermore, **MA et al. (2013)** conducted research focusing on the conservation of traditional wooden buildings in Taiwan. They demonstrated BIM technology as an effective solution for documenting, managing, and preparing full engineering drawings and relevant information of these historic buildings.

In other recent research conducted by **MA et al. (2016)**, they focused on some common issues that occur during the restoration and maintenance of wooden structures that represent the architectural heritage of Taiwan. These problems vary between recording the information of geometric and non-geometric objects, controlling the phases of construction, and the occurrence of structural damage during disassembly. They demonstrated a method by which BIM was used to bridge the gap in communication between designers and builders by developing a software plug-in to guide the restoration process.

The purpose sought after in this research is to complete the library of Building Information Modeling for Islamic Architecture styles (BIM-IAS) as seen in previously published researched papers. This paper focuses its efforts on Arches of Ottoman Islamic Architecture components of the Hejazi Islamic Architecture Character. As described previously, the BIM-IAS library classifies and labels architectural components chronologically based on their appearance in the IA timeline. The HIAC arches that are to be included in this library were built as parametric three-dimensional architectural and structural elements and appended with schemas and data.

Proc. of the 33rd CIB W78 Conference 2016, Oct. 31st – Nov. 2nd 2016, Brisbane, Australia

ARCHES IN ISLAMIC ARCHITECTURE

Author et al. 2016 A Template for the CIB W78 Conference 2016

2.3 BIM Components

There are four main types of arches according to **Ching (2012)** in his book "A Visual Dictionary of Architecture": there is the flat arch, the triangular arch, the pointed arch, and the round arch. The **Hejazi Islamic Architecture Character (HIAC)** BIM components library contains eight types of arches (between parentheses in the Arabic names):

1. **Round Arch**
 - a. **Symmetrical Arch (Qasbiya)**
 - b. **Tribal Arch (Tribal)**
2. **Pointed Arch (Mushabbi)**
 - a. **Traditional Arch (Mushabbi)**
 - b. **Open Arch**

These arches are just a sample from the Islamic Architecture Arches Library, provided by the main library of the BIM-IAS Islamic Architecture, which is classified, organized, derived from and according to the Islamic style from the Great Khilafah to the Ottoman Khilafah styles. The figure below appears some of these types.

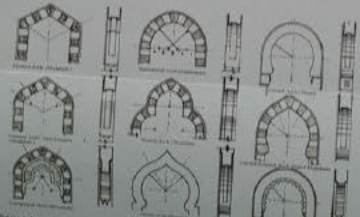


Figure 3: Examples of Islamic Arch (Fakhry, 1980)

Figure 3 shows twelve cross-sections of the most common arches included in the HIAC BIM library. Arches are classified into two main types: **Symmetrical** and **Asymmetrical**. The **Symmetrical** arches are further divided into **Round** and **Pointed** arches. The **Asymmetrical** arches are further divided into **Triangular** and **Open** arches. The figure shows the cross-sections of these arches, along with their corresponding names in Arabic and English.

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FLORAL / VEGETAL ELEMENTS IN ISLAMIC ART / ARCHITECTURE

NATIONAL FLOWER OF QATAR



DESERT ROSE - links back to Museum of Qatar



colour is dusty/sandy/
light beige - used in
Museum - Qatar is a
desert (before modernisation)
overlapping
small 'panels' /
discs
focus +
commitment to
what they
are
used throughout
Museum of Qatar
where they
come from etc

"Desert rose inspires focus + commitment
[...] true meaning of perseverance"
(prismscape)

Guides people of
Qatar back to
heritage



larger desert rose -
takes up more space
linear (ish)
similar
shape to
MoQ

HEIKH ZAYD GRAND MOSQUE



coloured floral
patterns - less
blockiness -
white, solid, blocky -
harsh
floral allows to
feel more
natural and
calm



Floral + green
feels more natural - inviting



vines arcing
around pillars

VERY FLORAL
INSPIRED CARPET

could make a
response from local weaving

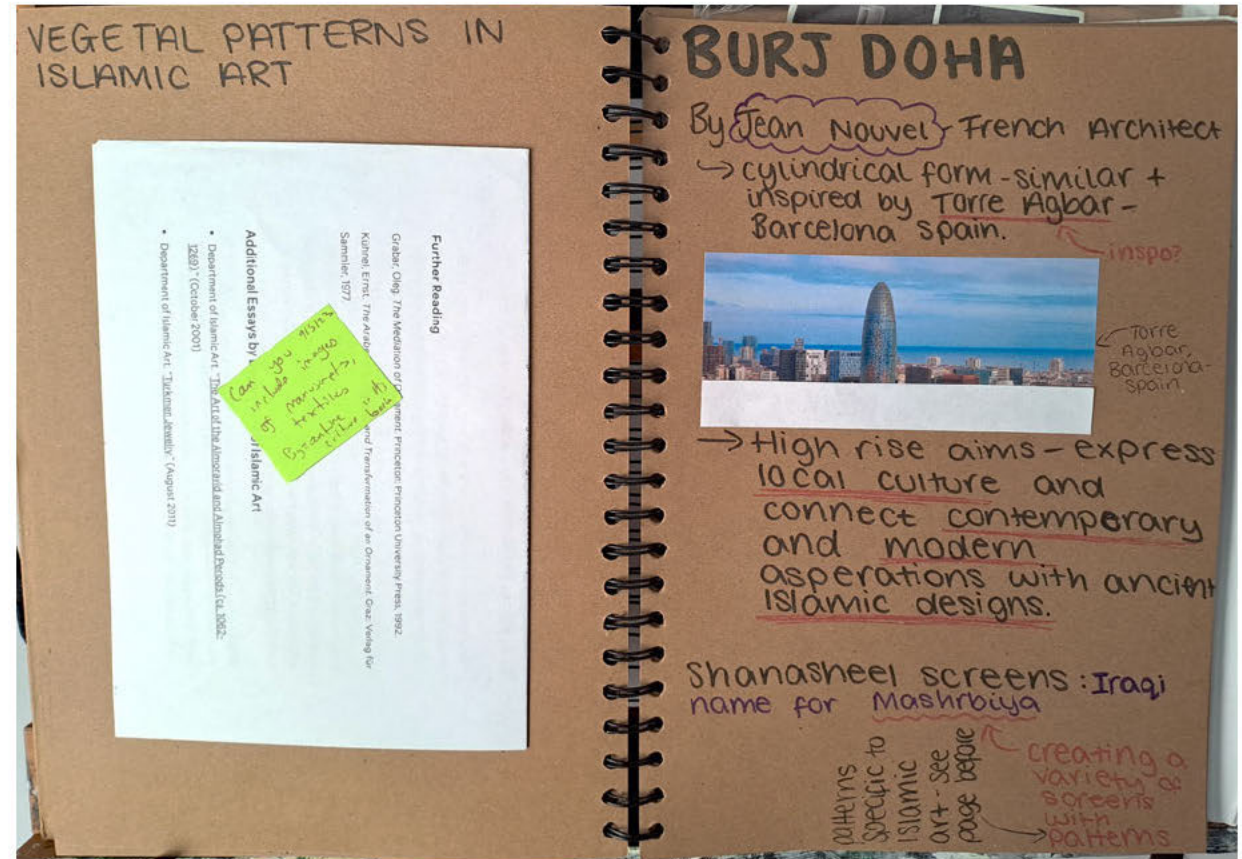
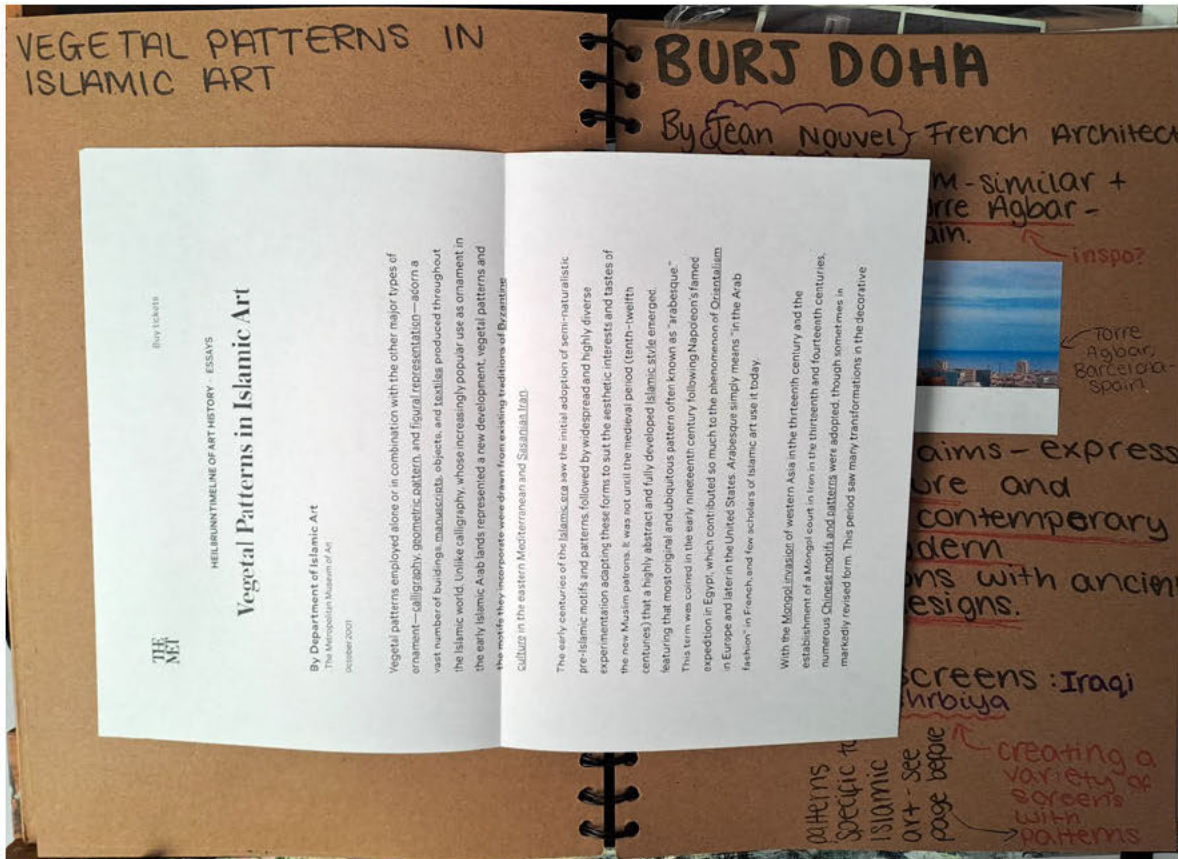


THE ARDABIL CARPET



MINBAR (PRAYER PULPIT)
The Met view from
gallery
↑
symbolises
prayer direction





→ Formally, the Mashrabiya is: a wooden screen with openable windows gives shade and protection from the hot sun, but allowing cool street air to flow through.

possible motive for Burj Doha? - Qatar = hot - Mashrabiya pattern exterior used for cooling?

PRACTICAL AND VISUAL FUNCTION

→ Lattice cladding - delicate lace-like layered façade

DOUBLE FUNCTION

protection from sun and guards the glazing from high winds.

Allows for pleasant working function

Burj Doha = office space

cladding design allows for 'playful network of shadow designs on the interior'

MASHRABIYA EXAMPLES



interior dome creates reflections of patterns



EXTERIOR VIEW

→ 6th LONGEST BUILDING IN QATAR

located over the West Bay addition to the skyline

Make page or use of floor / vegetation in Middle Eastern architecture

MAINLY OFFICE BUILDING BUT top floor has private luxury residence and restaurant and overlooking deck

360 Aerial views of city

TOURIST ATTRACTION

Designed in 2004

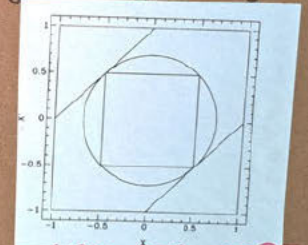
→ 238m from base to spire

→ Tall cylindrical building with dome

no central core - service core is off centre - adds more interior space

Series of reinforced concrete columns - designed in a diagonal grid form - built adjacent to the inner side of the curtain wall

FIRST skyscraper that uses integral diagonal grid system.



Allowing for more interior space

TOWERS FACADE = made from two layers (inner + outer).

Inner → typical sheet wall

Outer → Steel panel with exquisite patterns



Inner Panel

THE STRUCTURE

Use of non-traditional concrete and composite steel - made the floor design sturdy

EQUALLY DISTRIBUTED LOAD ON FOUNDATION

MAIN FRAME = double reinforced concrete propeller

How the tube was made - allowed the building stand up to 75% of the lateral wind loads.

FACTS ABOUT THE BURJ DOHA:

→ Translation - "tower"

→ Screens intended to shield the tower from the sun

simple geometric motif of various scales on the exterior

Aids reduction of internal temperatures

and shading of sand residue on the facade's panes

Thickness of the motif layers - planned to be varied on all 4 sides.

Facade screen has a lighting system built in.

Burj Doha at night

CAMBRIDGE MOSQUE

→ UK's first green mosque



→ planning began in 2007 - existing mosque (Mawson Road) began to experience capacity issues

important to be able to fit everyone in to pray

→ innovative ideas to fill 1000 people - that is TRULY SUSTAINABLE and ARCHITECTURALLY INTEGRATING INTO THE SOCIAL WORLD

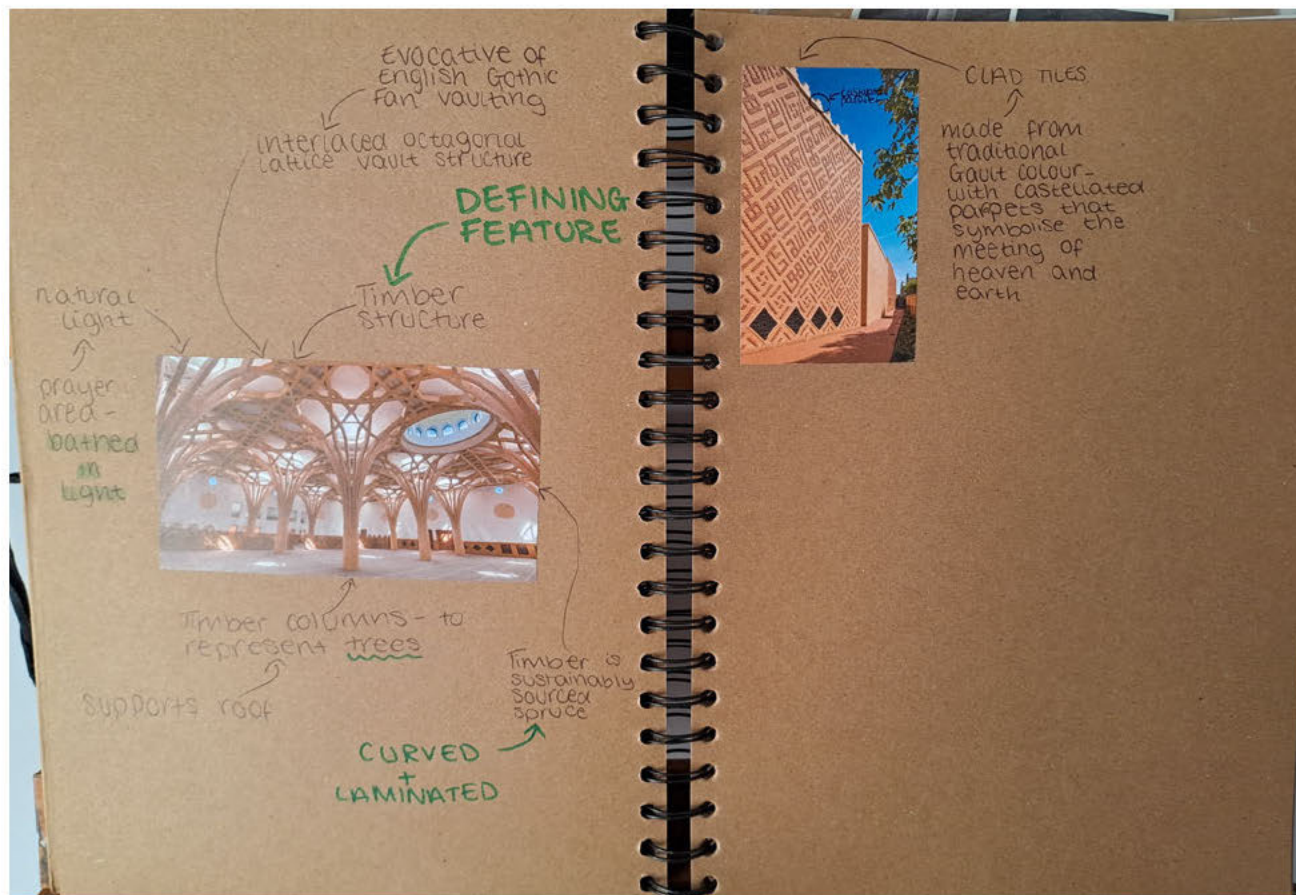
intended to: announce Muslim presence in Cambridge - SPIRITUAL + CULTURAL CENTRE - wider community as well as Muslims

CONCEPT → Calm Oasis within a grove of trees

link between Islamic + local expressed through THE NATURAL WORLD

→ For centuries, mosques have adapted to their local building materials, vernacular and climate conditions

inspired by both Islamic + English architectural conditions











45 marks, 9TD0, C1



55

Component One – Personal Study

Exploring how traditional Middle Eastern architecture is used in modern day society.

Middle Eastern architecture is diverse and influenced by various cultural, religious, and environmental factors (Hohenadel, 2022). It is characterised by its strong connection to Islamic art and design, featuring geometric patterns, intricate ornamentation, and calligraphy. Mosques, palaces, fortresses, and traditional houses with courtyards are prominent architectural structures in the region (Bampton, 1976). Modern Middle Eastern architecture, seen in countries like the UAE, showcases innovative designs and skyscrapers. Overall, Middle Eastern architecture reflects the rich heritage and creativity of the region's civilisations throughout history.

The Arabian Gulf and other surrounding Middle Eastern countries are more recently known for collecting large amounts of oil, allowing them to economically flourish and build new creations that allow modernity but keep traditional elements custom to Middle Eastern architecture (Middle East Institute, n.d.). Due to the religious heritage of the Middle East, Islamic architectural elements that hold significance such as calligraphy phases of important phrases from the religious text – the Quran.

Chapter one: What counts as traditional Middle Eastern Architecture?



Figure 1 (Zeyna Saripol, 2021)

One significant feature commonly found in traditional Middle Eastern Architecture is the dome, used in religious contexts, such as the Mosque or in other places of worship found in different cultures (Grabar, 1963). In the Middle East where Islam is the most common religion since the 7th century, domes have been repeatedly used in Mosques and occasionally palaces or areas to show wealth (Grabar, 1963). Domes found in Mosques can vary in sizes and come with different designs including patterns and finials (Figure 1), occasionally found. In some respects, domes have been considered to be seen as a 'vault to heaven' signifying how Muslims have a strong goal and passion to be accepted into heaven, which could be achieved or helped by attending the Mosque where the dome would be present or including the dome in one's house with the intention of making it to heaven.



The Dome of the Rock in Jerusalem (Figure 2), considered the first monumentalisation of a new civilisation, holds great historical and religious importance whilst also containing architectural significance, through the gold dome, allowing the structure to stand out and become instantly recognisable. The interior of the Dome of the Rock is an octagonal space with a large central dome. The dome is adorned with colourful and intricate mosaics, featuring geometric patterns, floral motifs, and calligraphic inscriptions. The central space is surrounded by arcades and columns, adding to the architectural beauty. The Dome of the Rock holds historical and religious importance due to it being one of the first Islamic buildings ever constructed, by Abd al-Malik between 685 and 691/2. The beginning of the build of this beautiful structure was built when Abd al-Malik, one of the most important Umayyad caliphs, as a religious focal point for his supporters whilst the holiest shrine in Islam, The Kaaba, was out of control for this Umayyad caliph (Macaulay, 2015). At the centre of the dome is a large Rock where it is believed Abraham was ready to sacrifice his son Ismail, today Muslims believe that this Rock commemorates the night journey of Muhammad (pbuh), where he ascended to Heaven.



Figure 2

The interior colonnades of the building (Figure 4) hold immense prominence both structurally and aesthetically, due to the curve of the arches using a famous Arabic technique called Ablaq, where a darker and lighter stone are alternated, commonly featured in Middle Eastern Architecture (Hiscox, n.d.). Furthermore, the interior of the Dome (Figure 5) is made from gold donated from Saudi Arabia, and contains Islamic inscriptions having special relations to God, or The Prophet (pbuh). The gold decorative work was made intricately from marble and coloured stones to show the power and mighty the structure holds to followers of Islam (Jodidio, 2013).

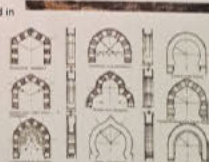


Figure 5

Arches are predominantly used in Middle Eastern Architecture, originally for their structural purpose, but have now become a common staple in most Middle Eastern inspired buildings/structures. There are no spiritual/historical purposes of arches, however, arches and domes are commonly



Figure 4



found together, where arches are responsible for holding the structure of the domes, which have the spiritual meaning of being the Vault for Heaven (Almaimani & Nawari, 2016). The arch used in buildings of spiritual value can also be seen in the gothic architecture era, where pointed arches were commonly used in Churches and Cathedrals, possibly inspiring the use of arches in Islamically spiritual buildings, such as Mosques. Furthermore, the arches used in Middle Eastern architecture, are also commonly used to separate spaces in a secular or religious manner; for example, in a Mosque, arches could be used to separate the Women's and Men's section. (Shaltout, 2021)

To conclude, Middle Eastern architecture holds significant value, due to the structural, cultural, or religious meaning, through the use of certain forms/structures. When creating a design of an architectural building inspired by Middle Eastern architecture, features such as the dome and the arch should be included and emphasised, to ensure that the aspects of this culture are fully included; allowing tourists to use the space to discover new parts of the world, whilst restoring heritage for those who live in the area and have lost their sense of culture and tradition due to the vast urbanism of the modernised version of the country they live in. Furthermore, the traditional forms used in buildings such as the Dome of the Rock including the strong use of the Ablaq tile, is one that is seen throughout traditional and modern versions of Middle Eastern architecture, meaning that it could be largely influential when creating a modern day communal space inspired by the Middle East; it could keep and the commonly used design, whilst being used in an area surrounded by forms it is not usually seen with.

Chapter 2: How is traditional Middle Eastern Architecture used throughout the Middle East?

The National Museum of Qatar is an example of how Middle Eastern Architecture and tradition can be infused in an innovated, modernised way. The museum built in 2005 and designed by Jean Nouvel, had the intention of creating a space to connect museums, cultural institutions, and heritage sites, and to bridge a gap between the past and present of Qatar (Murphy, 2019). The modernised museum goes holds the intention of instilling the important heritage of Qatar, further due to the fact it was built around the restored Palace of Sheikh Abdullah bin Jassim Al Thani, as seen in figure one. Due to the building being dedicated to the history of Qatar, ensuring the historic Palace was kept allows for the heritage to be celebrated, whilst urbanism can still occur around it.



Furthermore, the Museum of Qatar is created from interlocking discs with the function of allowing shade from the hot Middle Eastern sun, as the discs cast long protective shadows, contributing to the cooling mechanisms of the interior of the museum (Broome, 2019). Moreover, Nouvel's main inspiration when creating the aesthetics of the building was the desert rose. A desert rose is a rose-like formation of gypsum crystal clusters, that contain abundant grains of sand (Geology Page, 2020) (figure two). Since Qatar is a desert, the desert rose is a crystal commonly found in the area, representing how Nouvel was keen on restoring not only the historical but also the geographical culture of Qatar, representing the emphasis on Qatar's heritage, in a modernised way. In conclusion, the Museum of Qatar encapsulates the heritage of Qatar and the Middle East, through the restoring of the Palace and the inspiration from the desert rose, as well as weaving in modernised techniques and features such as the interlocking discs, to allow the country to grow economically and urbanely, whilst holding on to their past.



Figure 2

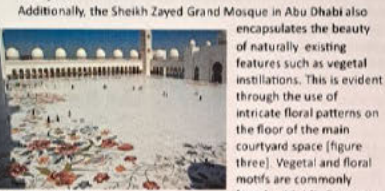


Figure 3 (Oajjani, 2020)

geometrical and symmetrical form. Vegetal patterns are also used in the decoration of rugs, such as the Ardabil Carpet (figure 4) and other traditional Courtyards such as The Souq Waqif mosque (figure 5).

Whereas, the Sheikh Zayed Grand Mosque takes up the form of a much freer design, with no geometrical/symmetrical restraints like the traditional designs shown below (Invaluable, 2020).



Figure 4



Figure 5 (Maccubay-Lewis, 2013)

Mashrabiya, seen in Shanasheel screens, are another type of pattern commonly used in Middle Eastern Architecture, with the function of allowing shade and protection from the hot sun, whilst also allowing cool street air to flow through, due to the extreme heats of the Middle East (Demet Tajkan, 2022). The look of Mashrabiya patterns uses a lattice cladding, with a delicate lace façade, which are composed of simple geometric shapes. The Burj Doha perfectly executes the use of Mashrabiya in a modern-day setting, due to its high rise aims and expression of local culture connecting with the contemporary high-rise aspirations of Doha (Bisht, 2021) (figure six).



Figure 6

Chapter 3: Why have the traditional aspects of Middle Eastern been kept and why?



Figure 7

The demographic landscape of the Middle East has experienced notable shifts in recent years, largely influenced by the hosting of significant events such as the Dubai Expo 2020 and the FIFA World Cup 2022. Due to the huge influx of modernity and tourism in the Middle East, I believe, has put pressure on architects to create and design buildings to fit the high modernistic standards of the Middle East (including being the most visited holiday destination and one of the fastest rising cities). Buildings in the Middle East have to include modernity and embrace the contemporary world, done by including new technological advancements and the popular materials of the current day. This includes buildings such as the Centre Point in Riyadh (figure 7) and the Burj Khalifa (figure 8) which uses popular materials and styles of the current world such as glass, steel, and timber, used in different circumstances to create different shapes and patterns to form the famous skyscrapers.



Figure 8

However, the adoption of these innovative styles and materials raises questions about their real impact on the increase of tourism and population influx in the Middle East. The use of modern buildings such as the new and upcoming Mirror Line skyscraper, being constructed in Saudi Arabia, has the aims of creating a whole new city, in an attempt to increase controlled immigration (Chappell, 2022). This raises an interesting point into the amount of people of Arab ethnicity living in the Middle East. For example, the UAE, named the number one global destination to visit (Kickham, 2023) only inhabits an 11.6% population of Emiratis as of 2015. In the past eight years, the Middle East, Dubai specifically has had a population influx, going from 2,401,000 in 2015 to currently standing at 3,526,000, therefore, the percentage of Emiratis in Dubai has only decreased. This presents the question of the identity of the Middle East and Arab people, are they losing their identity as Arabs?

In my project I am to reinforce the culture in the Middle East where architects are increasingly choosing to integrate traditional elements into their contemporary designs. This deliberate architectural choice is driven by a variety of factors that encompass mainly cultural considerations. I will do this by creating a courtyard space that incorporates the materials of the modern Middle Eastern world but embodies the traditional cultural building aspects (such as domes and arches) but in a contemporary way, as seen with newer buildings and materials.

Conclusion

Overall, I have come to an understanding that the use of modern architecture techniques, such as the use of glass and steel, is influential in the development of cities in the Middle East, such as Dubai and Riyadh, however, cultural impacts such as using traditional Middle Eastern architecture is important to ensure the history and heritage of these places predominant, to avoid complete removal of the civilisations and values of the Middle East.

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