

# TEAM 2 | Skill Development Centre

Ammar Taher

Ivneet Singh Bhatia

Jeroen de Bruijn

Preethvi Raj

Yamuna Sakthivel

# **Programme & Problem Identify**

## AL ZAATARI | Context

**78,994** Refugees

**41%** People between 15 - 45

**40%** No Access to Income

## ISSUES | Context

Increase in Crime rates

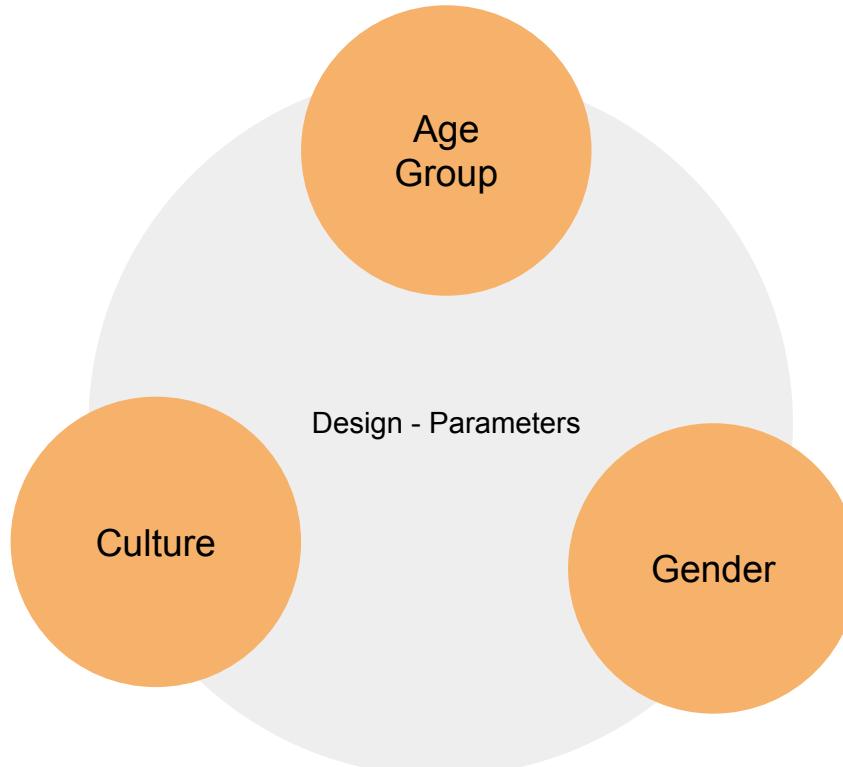
Child labour

Loss of Skill/Culture

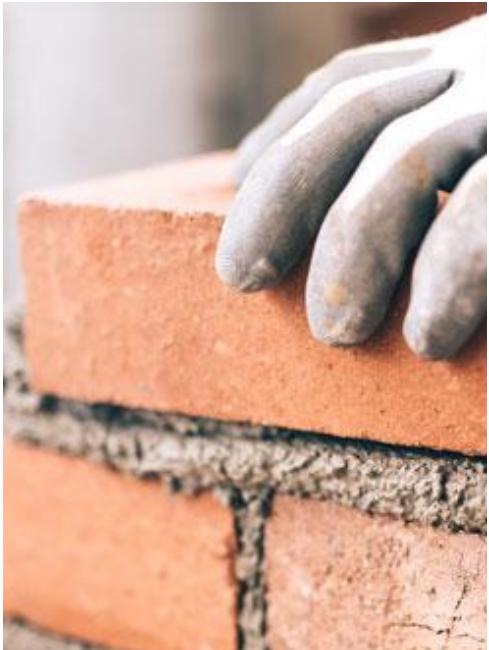


## SKILL CENTRE | Design Goals

A skill development center would help projecting their rich culture of the past and create a sense of security for the future. This center would offer a balance between the necessary skills and cultural development.



## PROGRAMS | Classifications



### CONSTRUCTION

Masonry  
Carpentry  
Electrical  
Plumbing

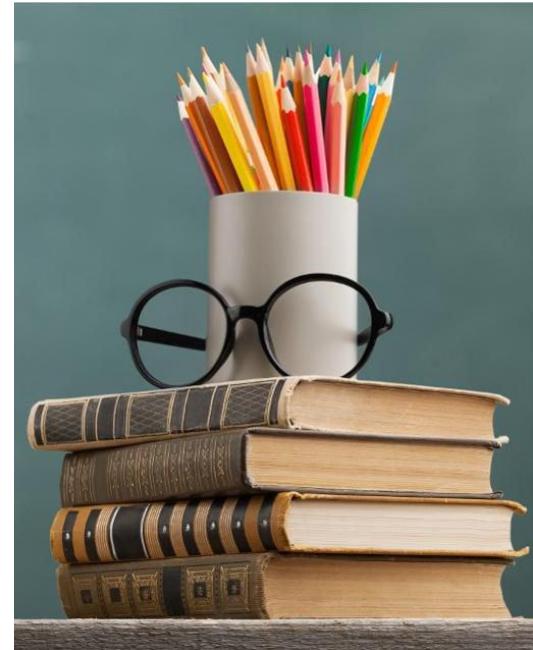


### CRAFT

Stitching  
Handcrafts  
Art

More open spaces

Spatial Quality

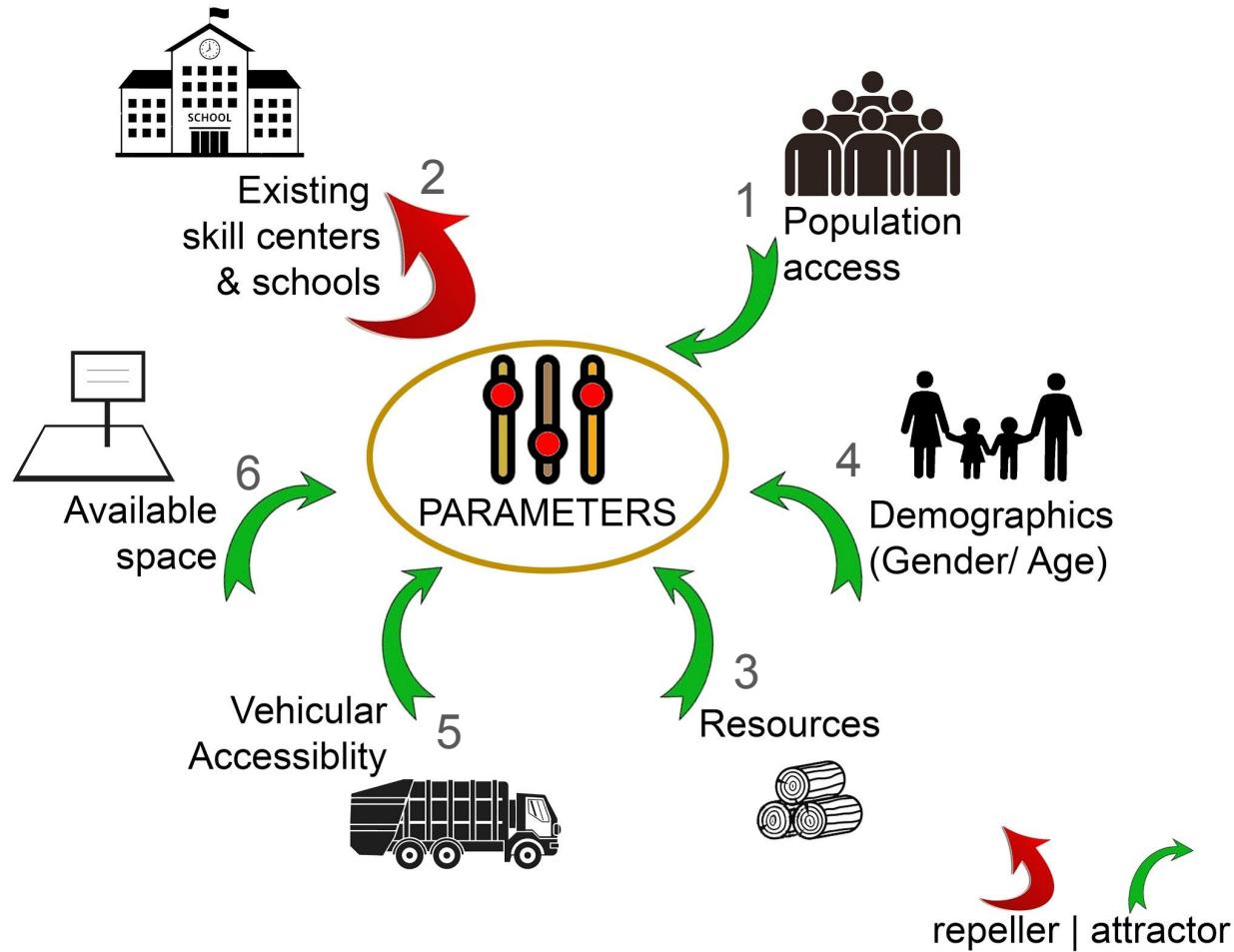


### EDUCATION

English Coaching  
Computer Programming  
Entrepreneurship  
Soft Skills

More closed spaces

## VISUALISED PARAMETERS | Site Identification



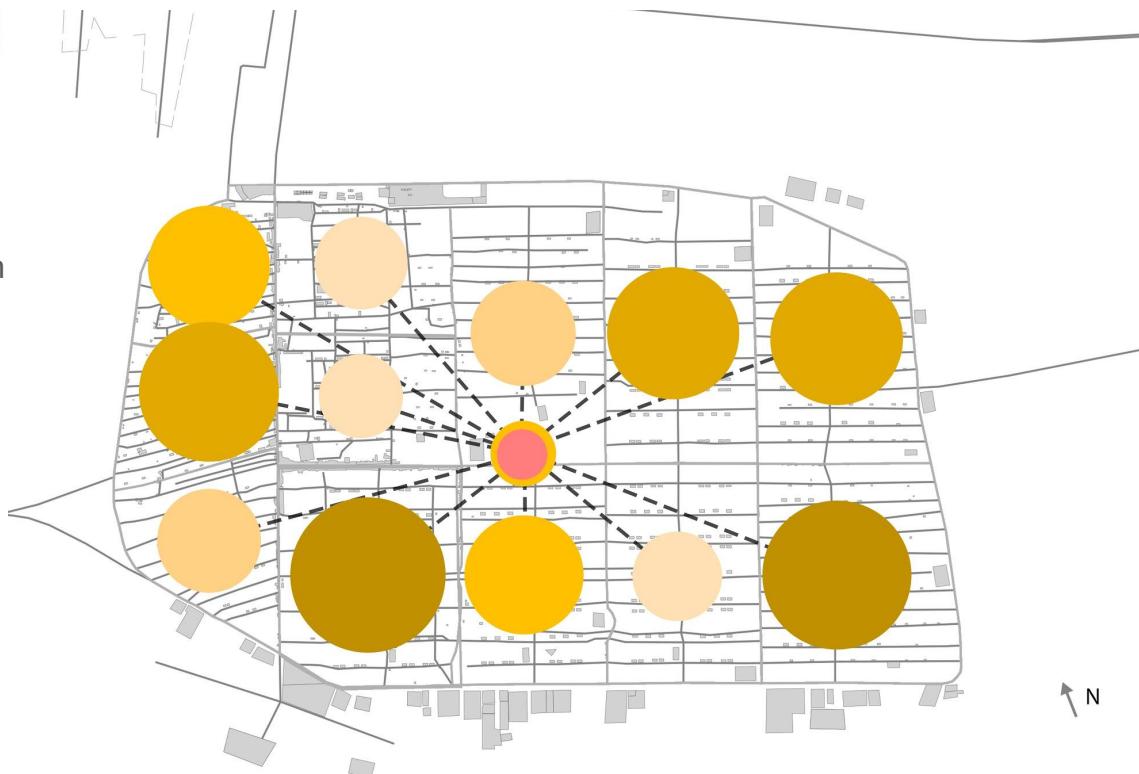
## STEP 1: EXPOSURE TO CROWD | Site Analysis

The first step provides a starting location. It calculates the centre of the population, so not the geographical centre.

The parameter is defined to provide maximum exposure to the population. This creates an awareness about the events in the skill development centre and attracts people.

### Code snippet to calculate the center of mass from point masses:

```
31. # Loop through ordered list of district center points.  
32. # The list of points need to be ordered from district 1 to  
33. # 12 so it will be multiplied with the right population p.  
34. for i, pnt in enumerate(ordered):  
35.     # Multiply the x, y or z value of the point with the  
36.     # population p of the district and place it in a list.  
37.     x_weigt.append( pnt[0]*p[i] )  
38.     y_weigt.append( pnt[1]*p[i] )  
39.     z_weigt.append( pnt[2]*p[i] )  
40.  
41. # Calculate x, y or z values of center point  
42. point_x = np.sum(x_weigt)/np.sum(p)  
43. point_y = np.sum(y_weigt)/np.sum(p)  
44. point_z = np.sum(z_weigt)/np.sum(p)
```



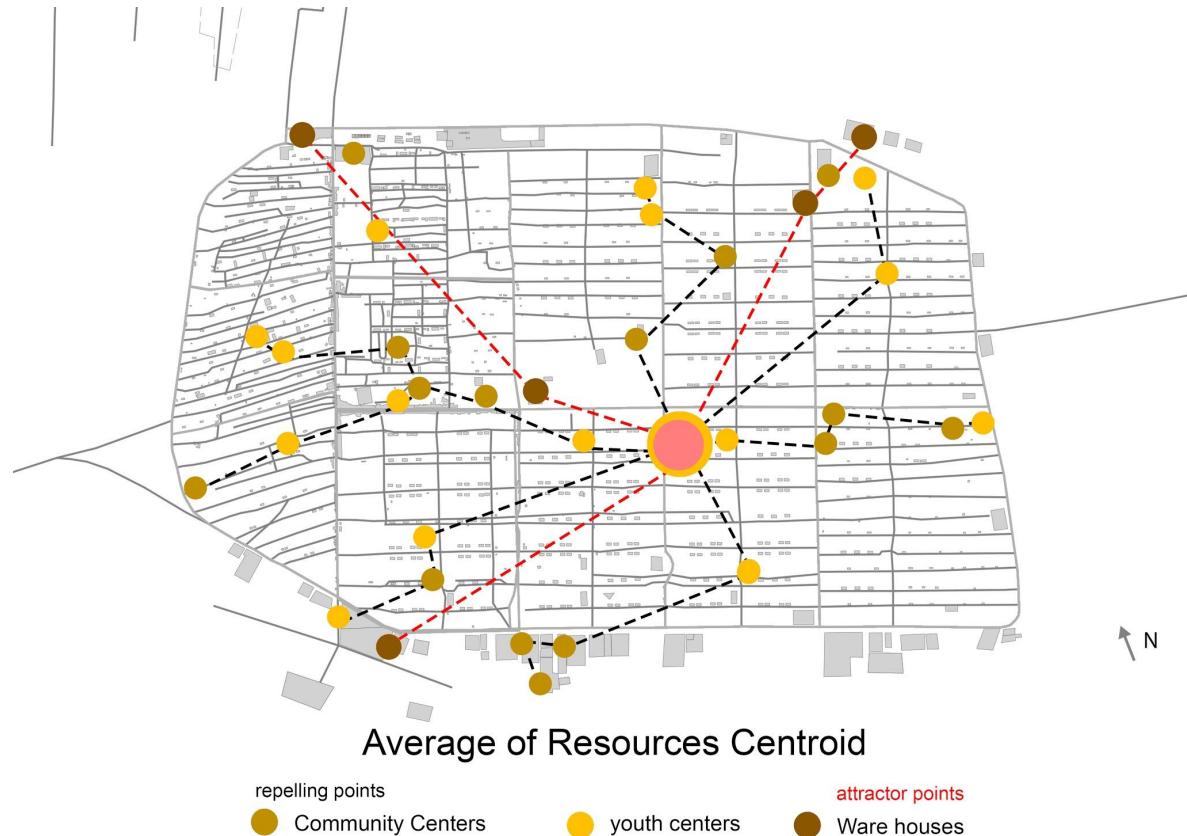
Exposure Weight to Population

● Average weight in relation to density

## STEP 2 + 3: RESOURCES | Site Analysis

Step 2 and 3 move the location while taking into account existing resources. The location shifts away from the centre of the population.

In order to provide more livability in all neighbourhoods the existing social nodes are acting as repelling points. The resources for the workshops are acting as attracting points and an average is calculated accordingly.

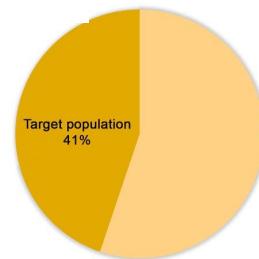


## STEP 4: TARGET GROUP | Site Analysis

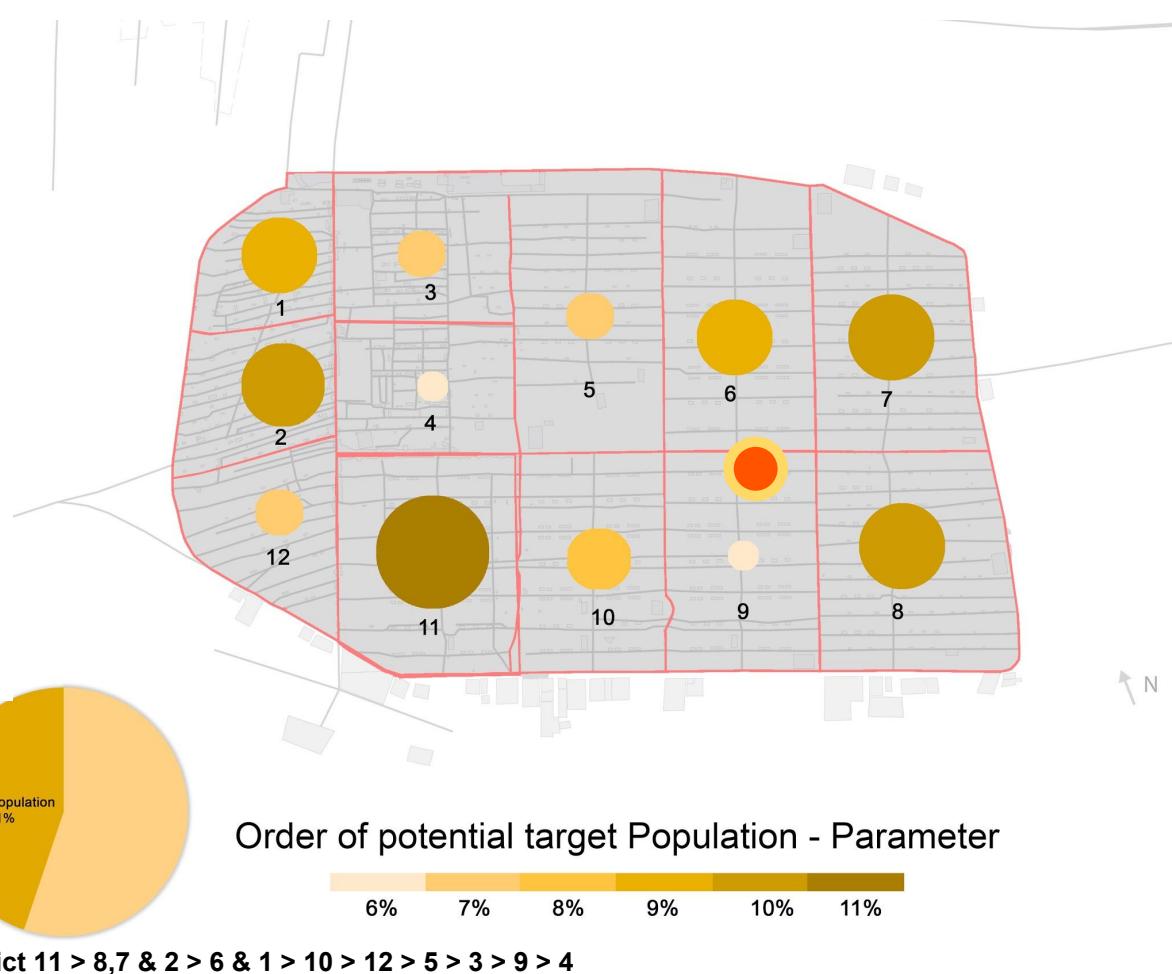
This step moves the location closer to the target group. The people in the target group are young and mobile, so they are able to cover distances on a normal pace. Thus it is not necessary to have the location directly next to them and therefore this step does not have one of the highest priorities. The location shifts a bit to the east.

The map shows the concentration of the target group(15-45 years old) in every district.

The districts are prioritised in the descending order of the target groups.



District 11 > 8,7 & 2 > 6 & 1 > 10 > 12 > 5 > 3 > 9 > 4



## STEP 5: ACCESS | Site Analysis

The fifth step involves site access.

In order to move raw material like sand, clay, wood etc., from the entrance to the skill center, the location of the site needs to be in vicinity of primary roads where goods can easily be moved around by vehicles.

Based on all steps two possible sites on the eastern side of the camp along the main street are viable options.



Location Based on Vehicular Accessibility



Access point

Road Access



Potential Site Area

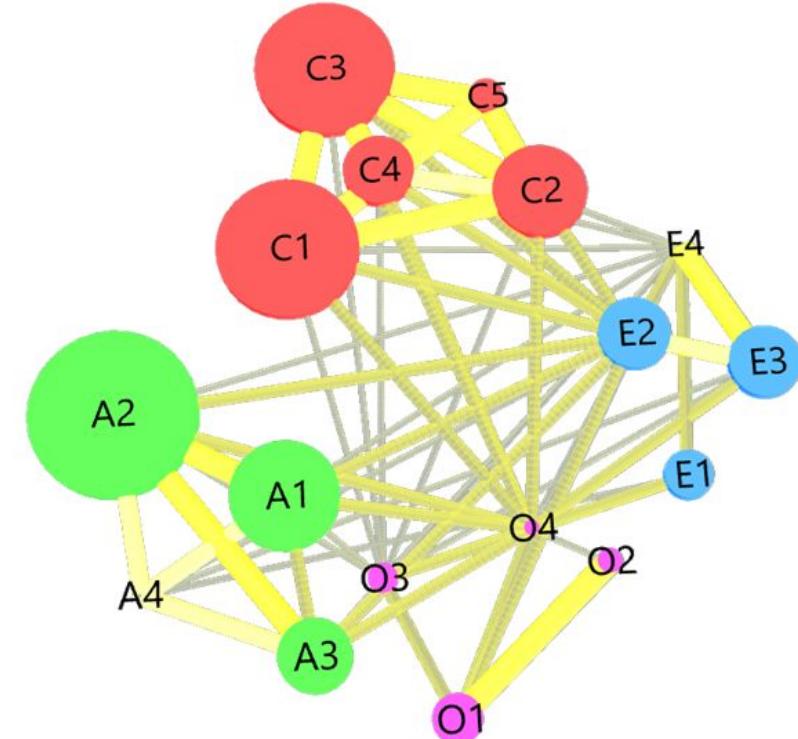
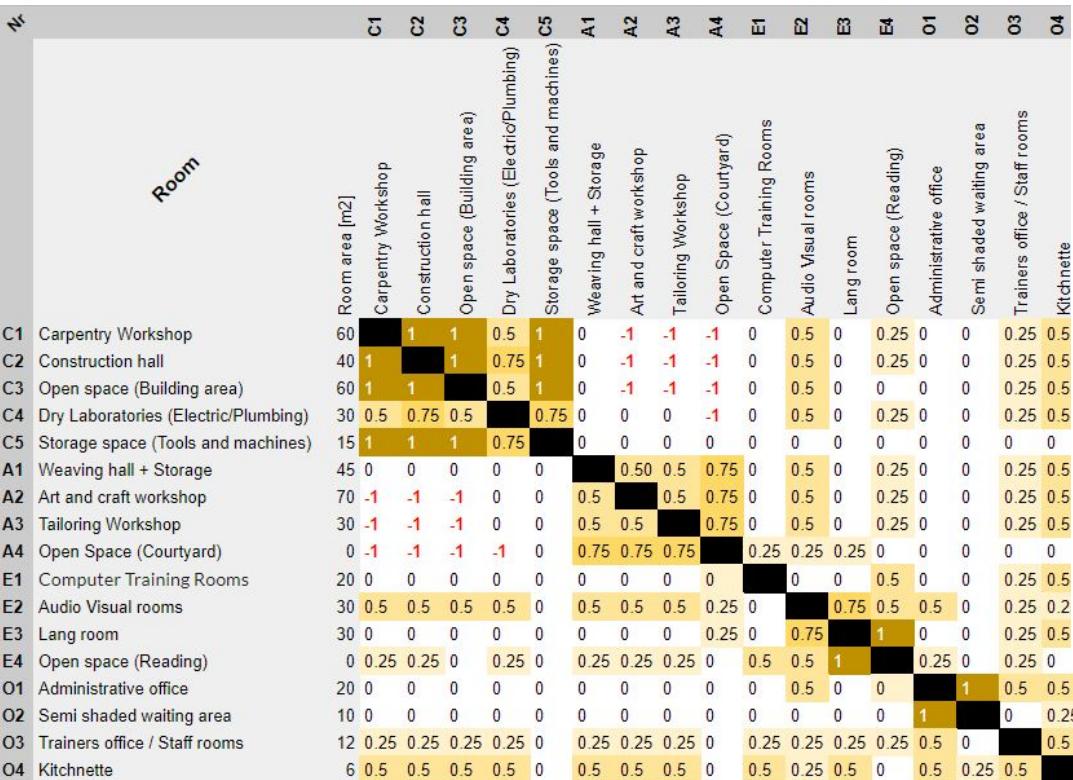


Possible site location

## Rating Description

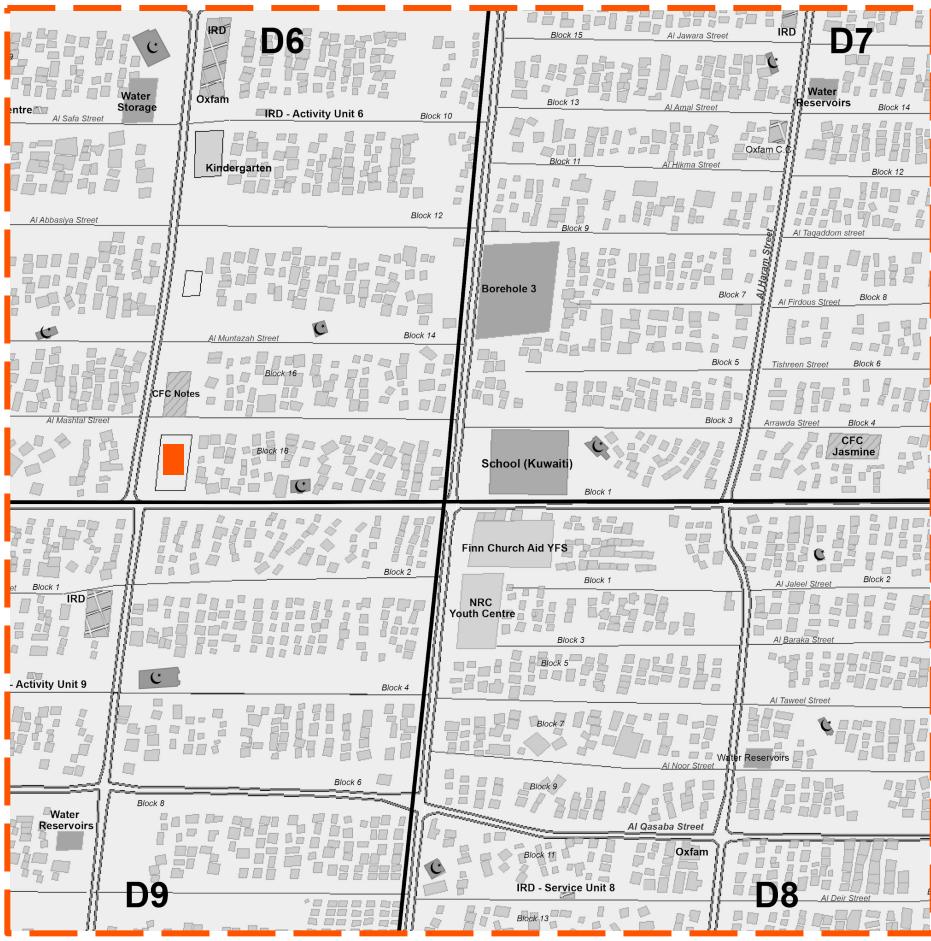
1	Absolutely necessary
0.75	Especially important
0.5	Important and core
0.25	Ordinary
0	Unimportant
-1	Undesirable

## ZONING | Relation Chart



Bubble chart - Computational Zoning  
Based on area and connectivity

## STEP 6: AVAILABLE SPACE | Site Analysis



= Final location (35 \*45 m)

Google Earth link: <https://earth.app.goo.gl/eMBuPR>

## PARAMETERS USED TO DEFINE THE LOCATION | Site Identification

Step	Name	Refine the location of the Skill Development Centre based on the: ...	Priority
1	Population access, attractor	... distance to the centre of mass from the centrepoint of each district using its population as weight	0.6
2	Existing schools, repelling	... distance to the existing Skill Centres and schools	1.0
3	Resources, attractor	... distance to social or logistics resources inside the camp, like: community center, warehouse, etc.	0.5
4	Demographics, attractor	... distance to the centre of mass from the centrepoint of each district using the target age groups as weight	0.8
5	Entrance gates, attractor	... length of the route to useful access gates for importing and exporting of goods	0.4
6	Space, attractor	... available area with minimal disrupting of current buildings	0.3

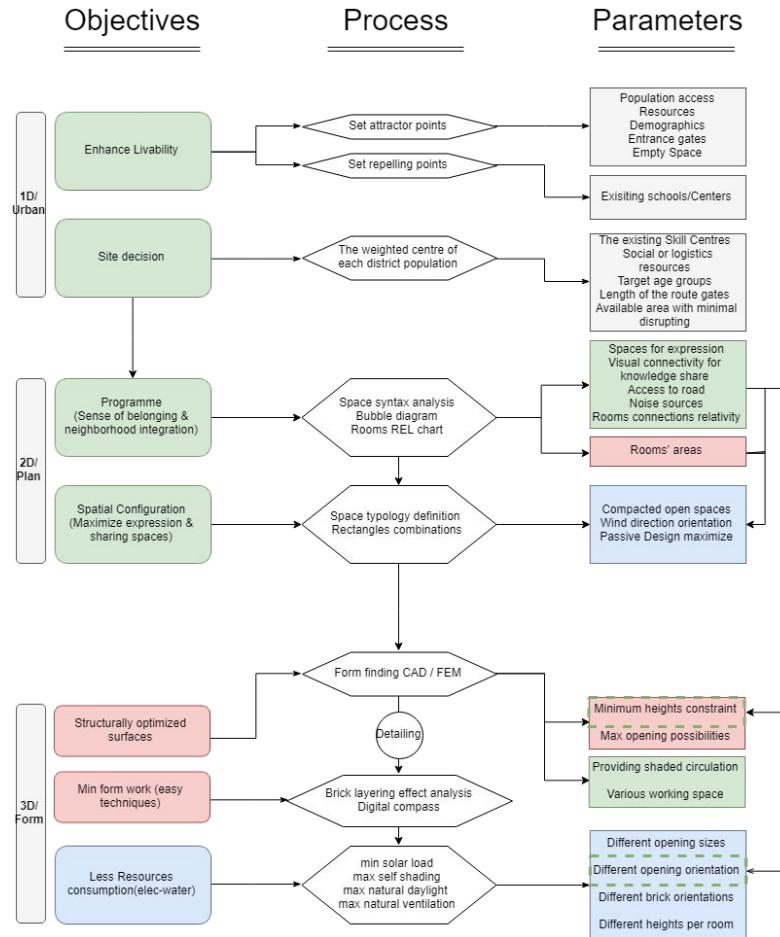
# **Configuring & Forming**

## Forming | Skill Center

War has moved their life away from home and people have lost a sense of identity, culture and livelihood. It's important to regain their past and secure their future. A center that could provide them employment and enrich them with culture is quintessential.

The dual nature of the centre as an expression space and knowledge hub induces a sense of belongingness to the community. Hence, this built form becomes a part of their lifestyle targeting the neighborhood. The programme is arranged around three courtyards which act as interactive workshop areas. Two clusters consisting of workshops and art classes are interconnected by their respective courtyards. While, the cluster with educational classrooms are given more privacy. Mastabas have been provided on the inside and outside for people to gather and express their culture. Not only does the configuration of the building addresses passive climate design but also adapts Islamic design elements like Mastaba as a defense against structural erosion due to weathering. Special attention has been given in orienting the form considering the wind and shading on the southern façade. A python script has been developed to formulate the compass to position the bricks on site. An old technique of using compass would make a friendly construction process.

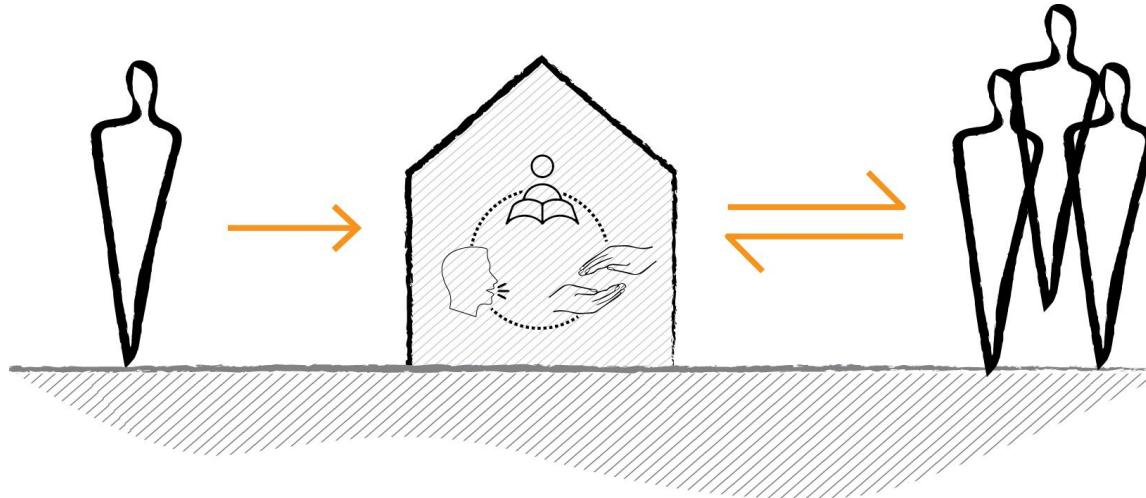
# Work Flow-strategy



Setting the objectives for each Phase of the project to keep track of the integration of different elements of design

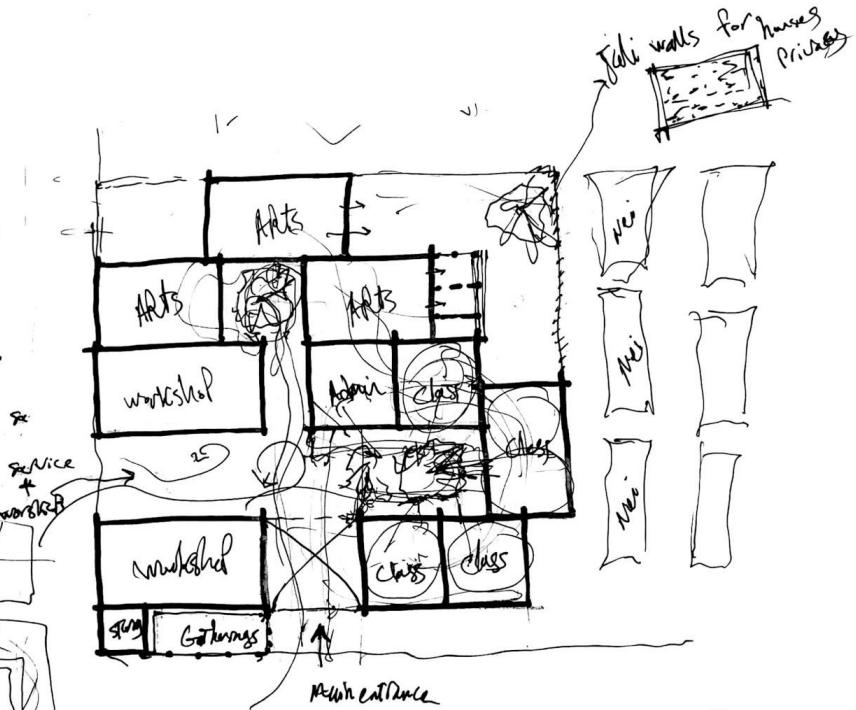
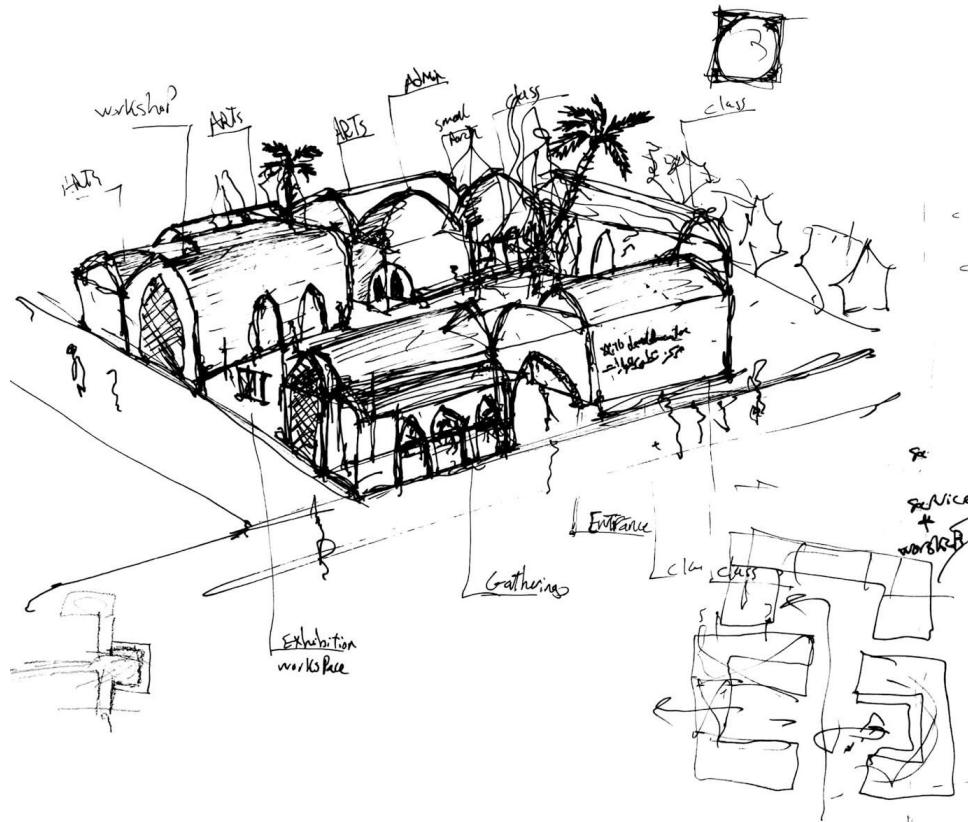
Functionality  
Climate  
Structure

## Forming | Ideas



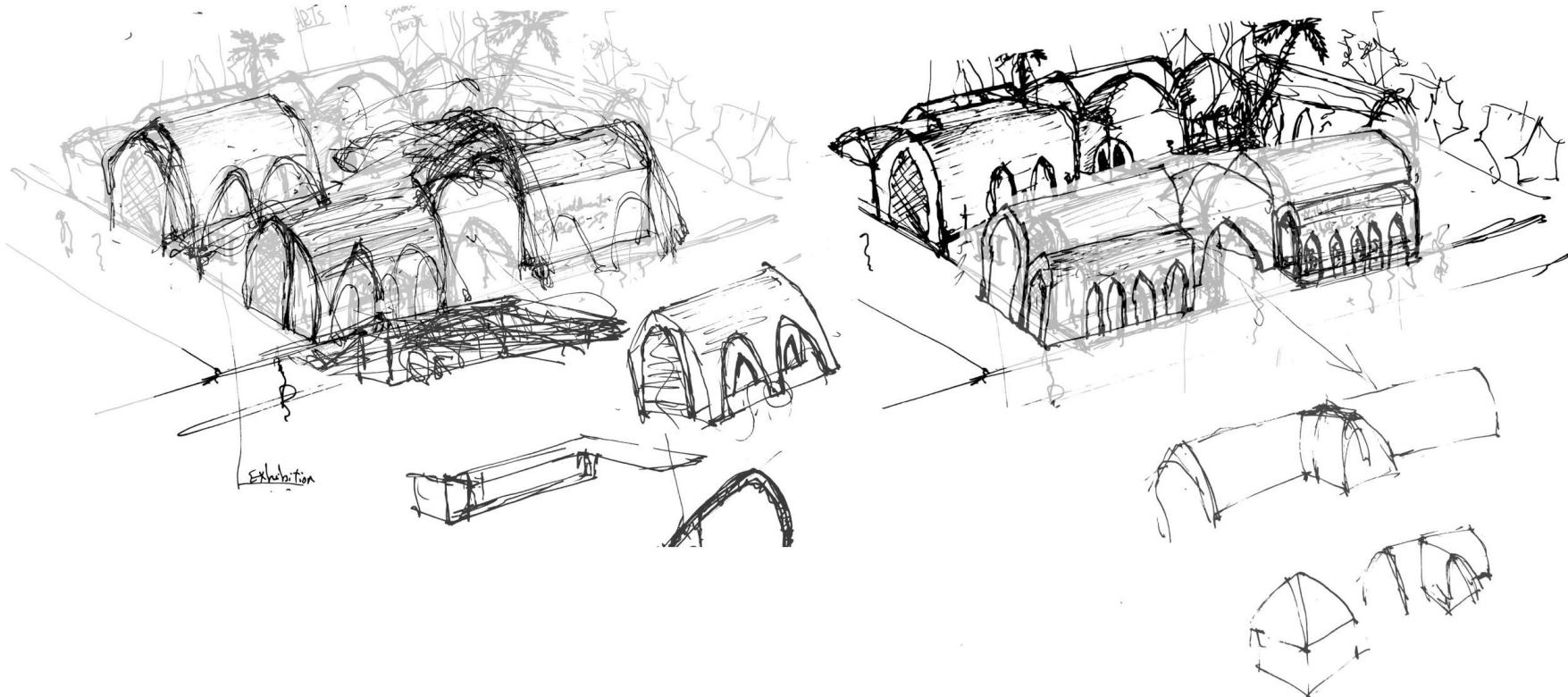
The built form enables the people to learn, share and express, which in-turns creates an attachment among themselves and to the spaces. This enables a collective responsibility of people over the building and to their future - **TOGETHER.**

## Forming | initial sketches

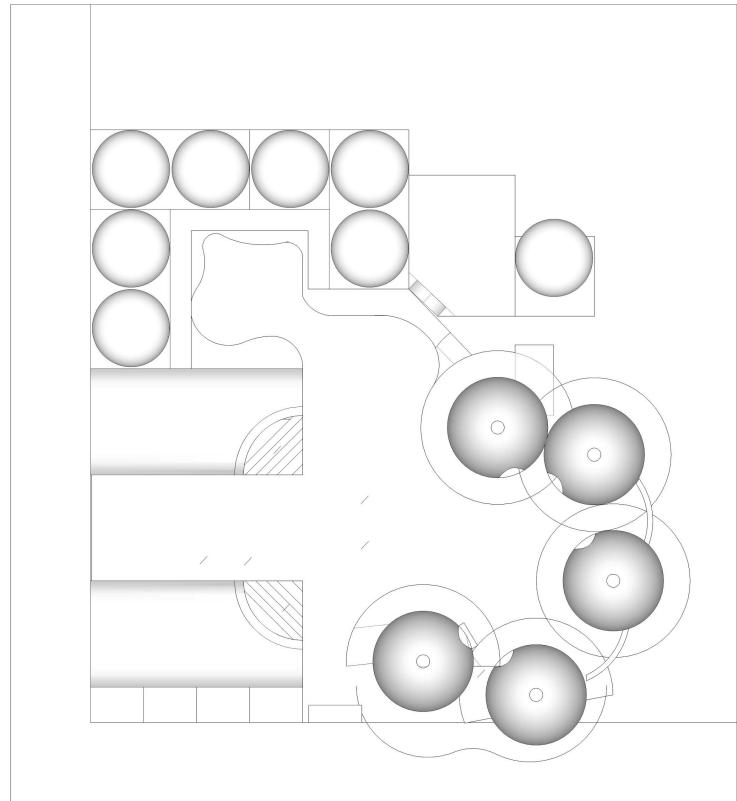
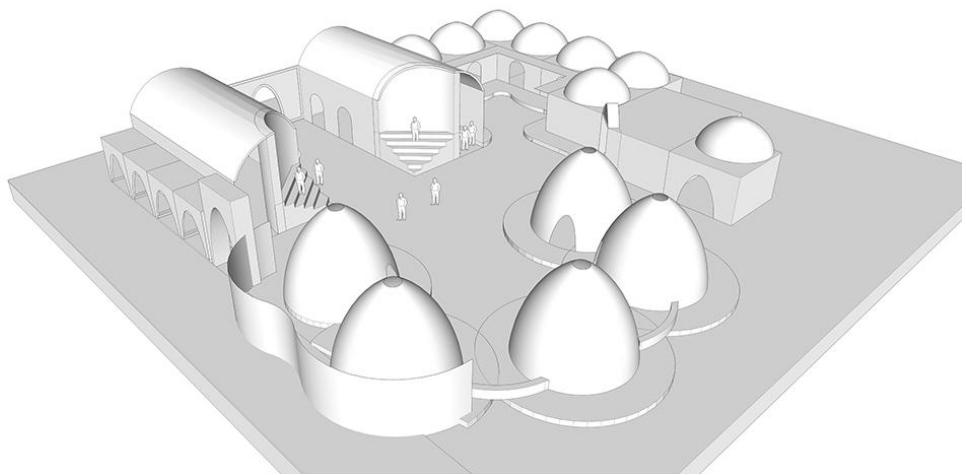


# Forming | initial sketches

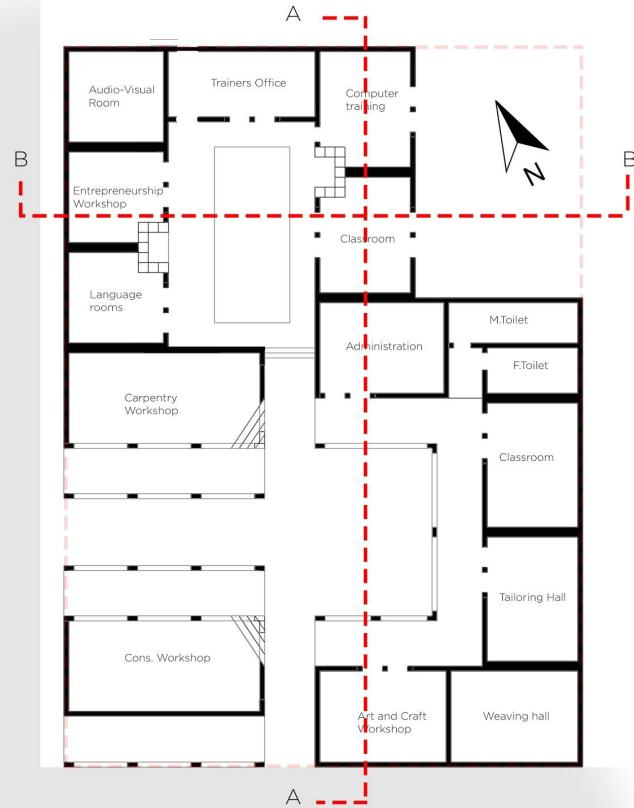
## Architectural language



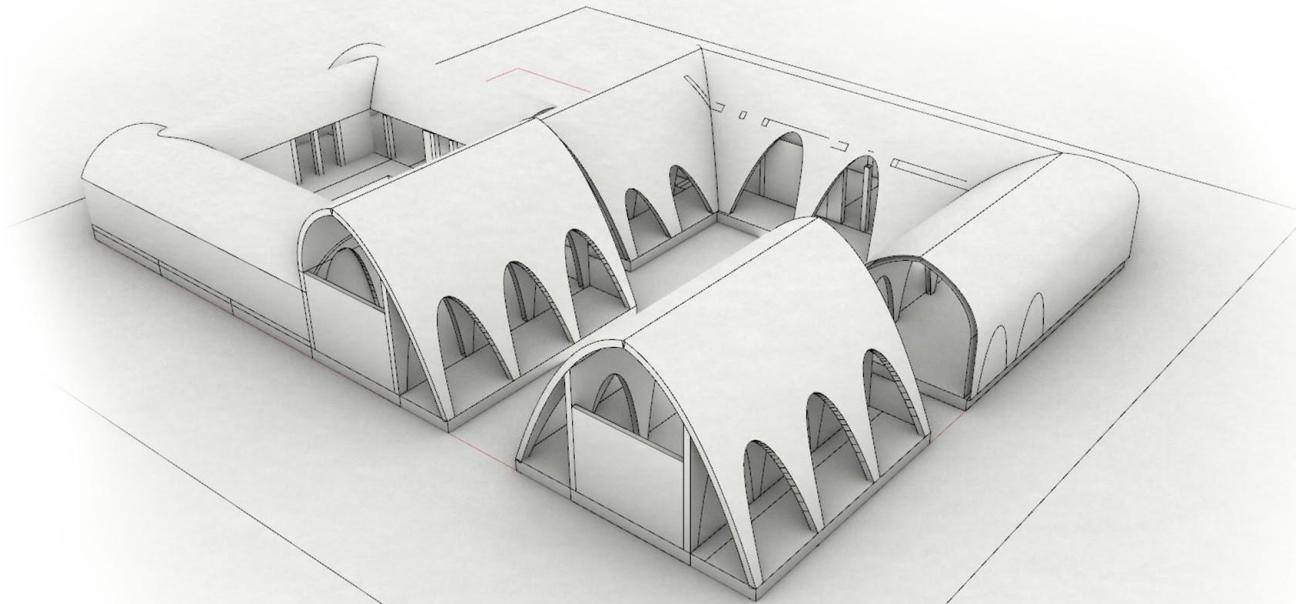
## Forming | initial Design



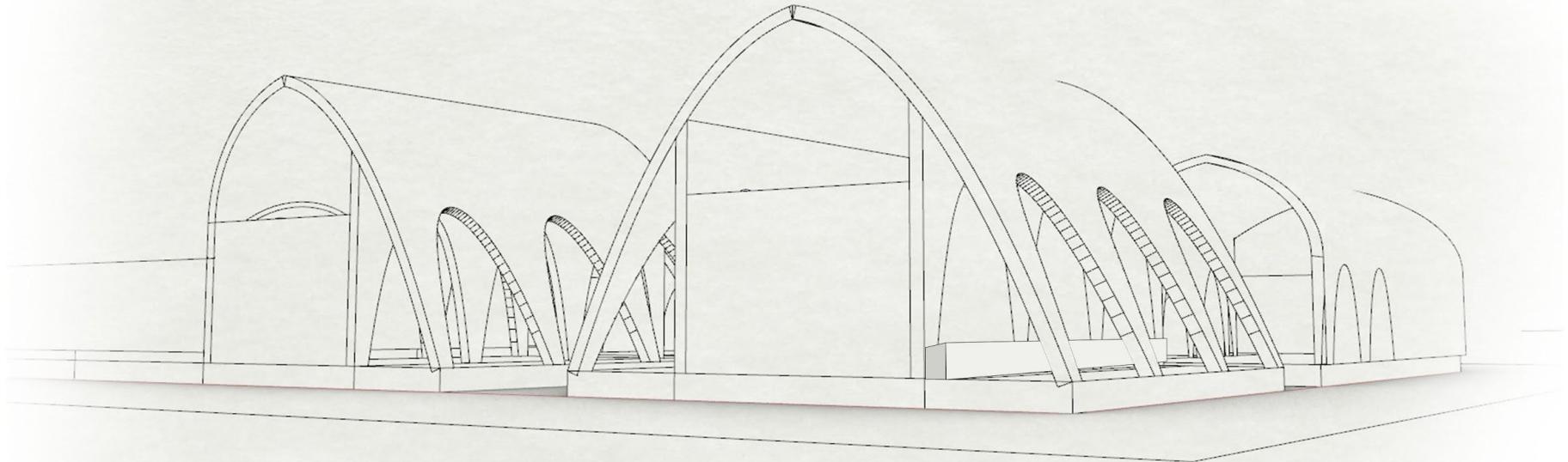
# Forming | Plan



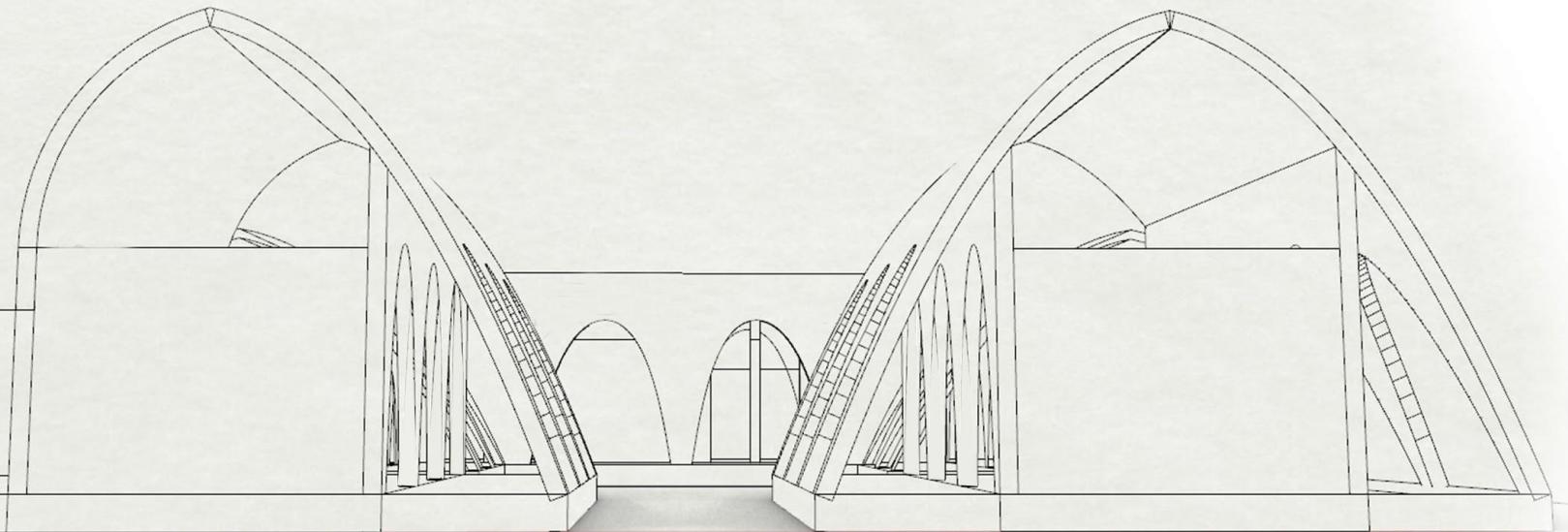
## Forming | Outdoor Activities



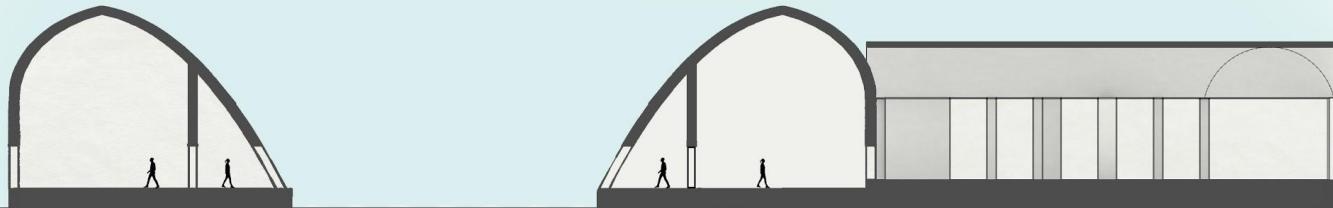
## Forming | view from corner street



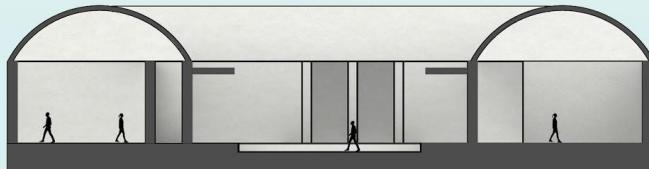
## Forming | View to the node



## Forming | Sections

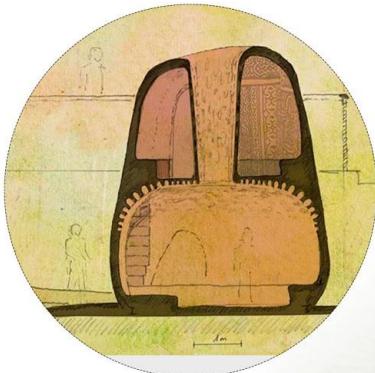


SECTION AA'



SECTION BB'

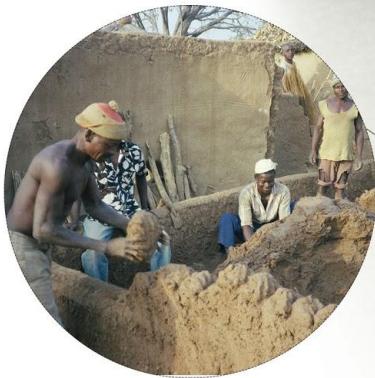
## Forming | Outdoor Activities



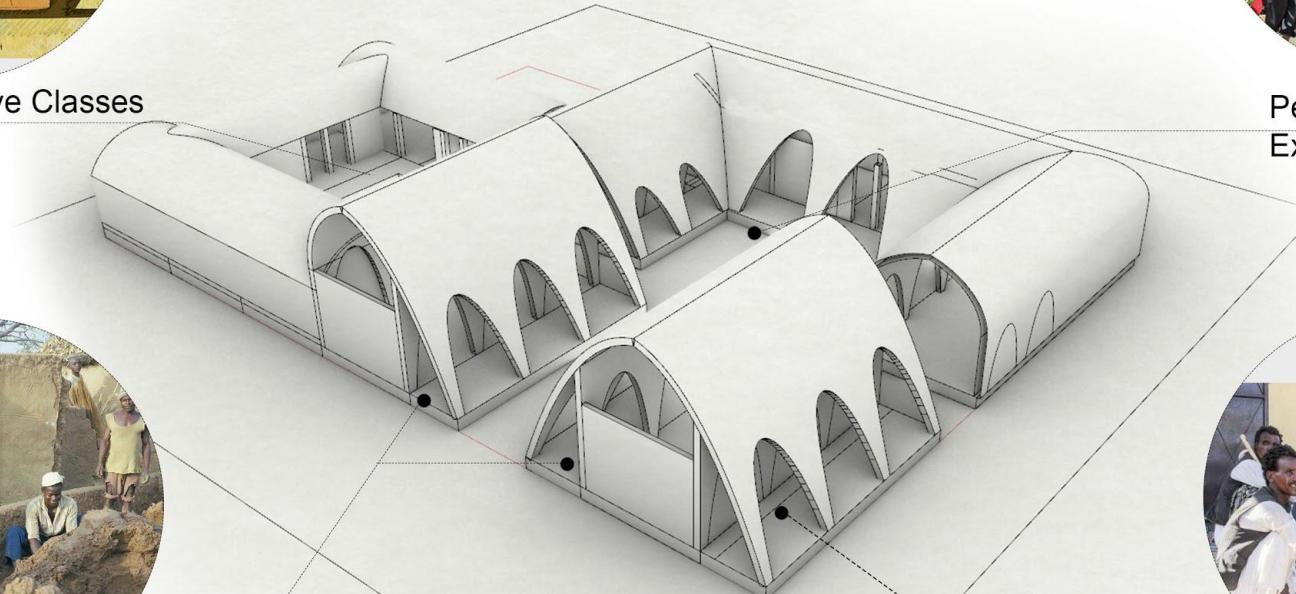
More inclusive Classes  
courtyard



Performance platform  
Expression Space

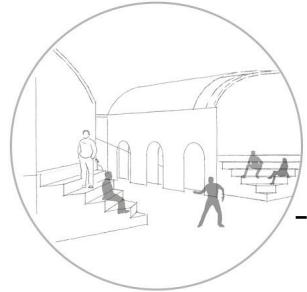


Outdoor working space

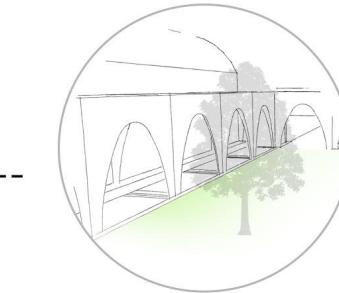
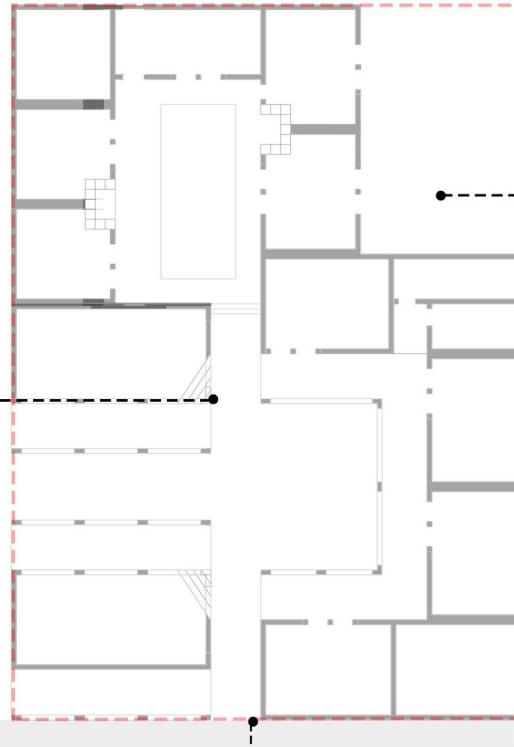


Mastaba for Neighbourhood  
sunset Gathering

## Forming | Configuring concept



Creating stepped corners for gathering and nodes activity

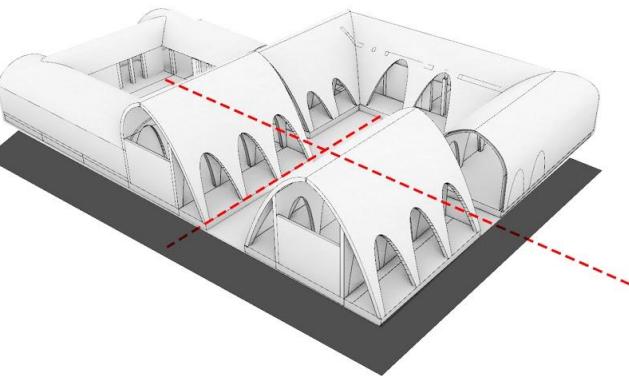


Backyard for outdoor classes

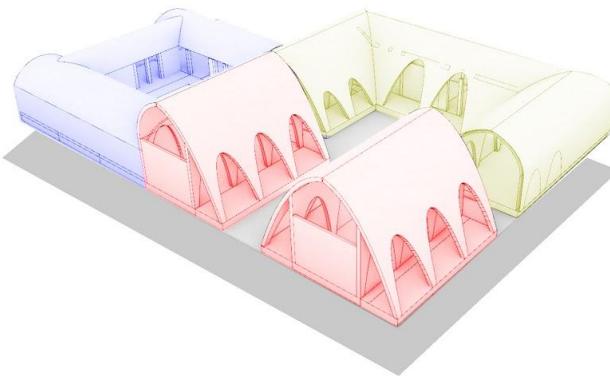


Wall patterns on the walls to reduce erosion & created by the art classes

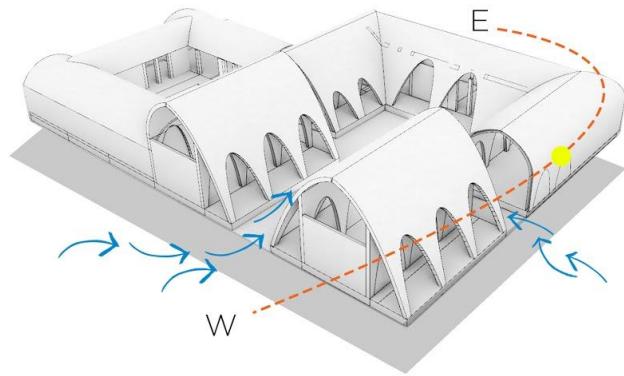
## Forming | configuring



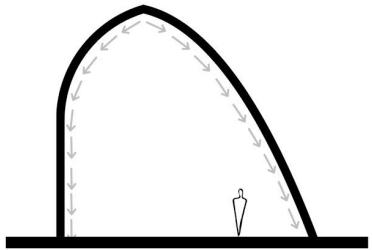
Two axis provides visual connectivity to the activities happening inside the complex



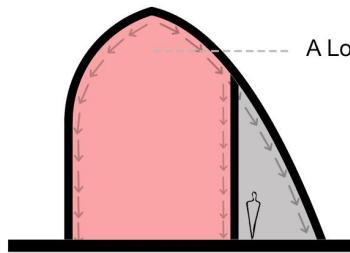
Clustering around courtyards according to functions



-The two axis oriented towards the wind direction  
-Shared walls and walkways assures less thermal load on the indoor



Option 1: The assymetrical vault is treated as a continuous structure



Option 2: The structure is broken down into a lopsided vault and a buttress

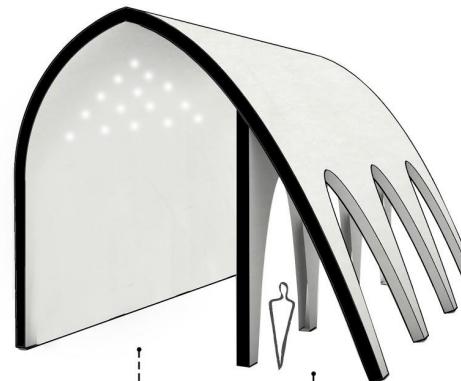
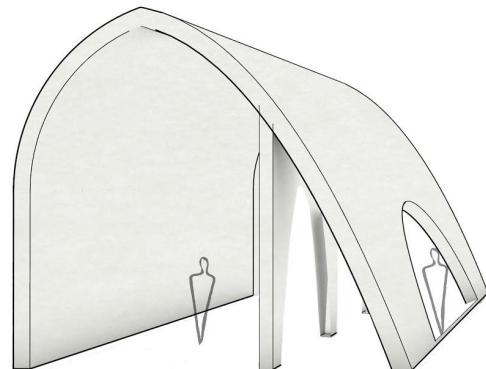
A Lopsided vault

Optimise the form of the assymetrical vault.

A perforated structure to satisfy lighting requirements

GOAL

Maximise the openings on the corridor that connects to the courtyard.



Classrooms

Corridor

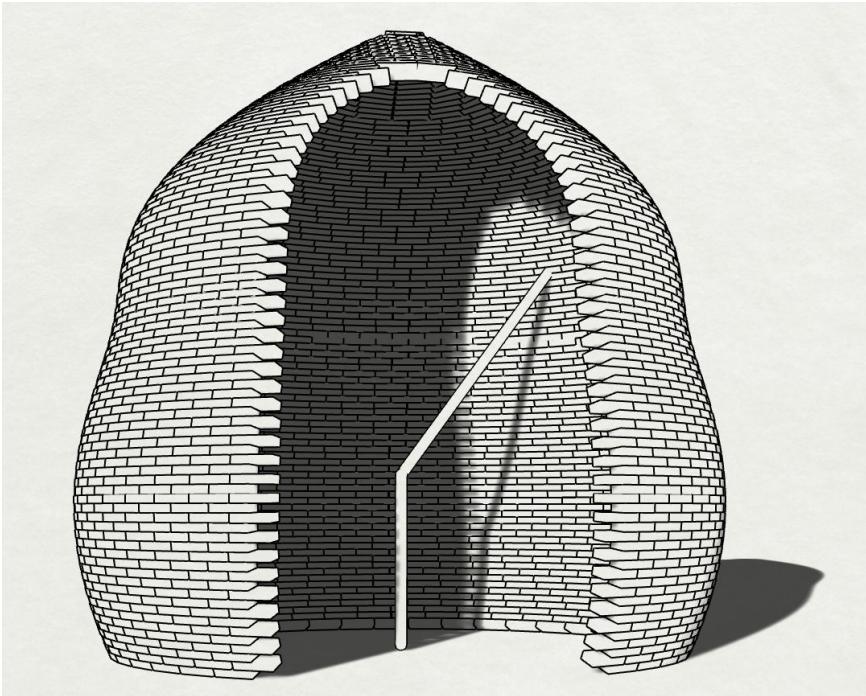
Optimisation from solid mass to a perforated geometry

## Building | Compass Technique



Old Nubian compass technique will be used in a modified version to produce the proposed vaults easily

## Building | Compass Script



The proposed Script generates staggered bricks

The script can be found here: <https://gitlab.com/Prethvi/team2-skill-centre/tree/master/Skill%20Center>

OUTPUT: Compass data

Brick row	Brick number	Total amount of bricks
54	22	2958
Arm length	Inclination	Azimuth
2313.524595	47.3364	-47.628078
Arm length	Inclination	Azimuth
{0;0}	{0;0}	{0;0}
0 2118.020937	0 121.240226	0 143.845043
1 2117.839075	1 121.243129	1 135.626557
2 2117.980401	2 121.240873	2 127.408327
3 2118.151257	3 121.238146	3 119.186702
4 2117.931001	4 121.241661	4 110.966062
5 2117.852221	5 121.242919	5 102.748043
6 2118.072314	6 121.239406	6 94.529095
7 2118.096366	7 121.239022	7 86.30663
8 2117.864488	8 121.242723	8 78.087384

Output for each brick's compass settings

**Thank You**