EXPLORING SPACES IN CHILDREN'S FURNITURE

PRODUCT DESIGN PROJECT II

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EXPLORING SPACES IN

CHILDREN'S FURNITURE

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APPROVAL SHEET

Industrial Design Project 02
Exploring spaces in Children's Furniture

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M.Des Product Design 2017-19
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Is approved as a partial fulfillment of requirement of post graduate degree in Industrial Design.

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External Examiner:

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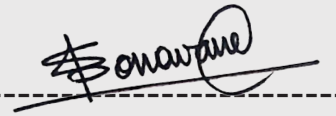
DECLARATION

I declare that this written submission represents my ideas in my own words and where other ideas or words are included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea / data / fact / source in my submission. I understand that any violation of the above will cause for disciplinary action by the institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.



(Signature)

Archana Sonavane

(Name of the Student)

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(Roll. No)

06.07.2019

Date:

First Twelve Months of a Child's Life Are Spent In

Teaching Them How to Walk and Talk and The Next

Twelve Years in Telling Them To Sit Down and Be Quiet !!!

ABSTRACT

The aim of this project is to design a furniture for children between the age group of 6 to 10 years, that also challenges the conventional kid's furniture available in the market today.

The design process involves the translation of "playfulness" as an experience rather than just a formal expression. It also takes into account the need for a design solution, that is space saving and grows with the child, while giving them a sense of independence and belonging.

As a part of the process, studies were conducted directly with the children, in their homes. This helped in providing clarity on their requirements and also established spatial context. A major challenge was in tackling aspects of packaging, transportation and assembly. The exploration takes all of this into consideration and provides the user with a simple, playful and practical solution that effectively caters to a child's growing needs.

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INTRODUCTION

Maria Montessori (1870-1952)

A Montessori Classroom

The Concept of Children's Furniture

The concept of children's furniture was first introduced by Maria Montessori.

About Maria Montessori
Maria Montessori was an Italian physician and educator who developed the Montessori Method of teaching. The Montessori Method is based on the idea that children learn best when the environment supports their natural desire to acquire skills and knowledge

The Montessori Theory
In her observations of children, Dr. Montessori identified developmental phases, each with its own set of goals for learning: the development of an individual self, social development, the 'birth' of the adult phase and the mature phase.
During each phase, children are driven to acquire certain skills. For example, a very young child is driven to develop language and speech. These phases, or stages, are what Dr. Montessori called 'windows of opportunity,' and she designed the classroom with age-appropriate tasks and materials to maximize learning during these stages.

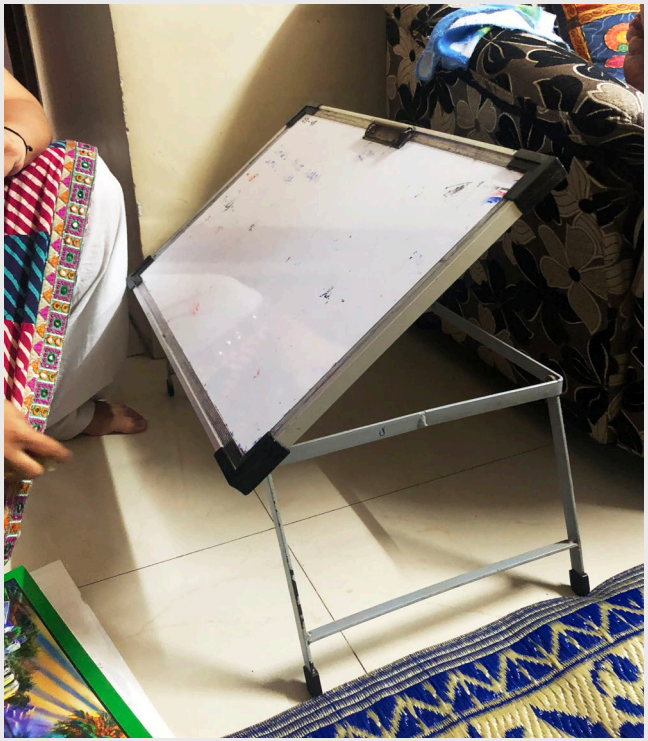
Need for children's furniture

Being around furniture that is best suited for adults can cause children to be too dependent on adults to help them learn, explore, and move around. Incorporating child-sized furniture into their environment (a concept first introduced by Maria Montessori) will give children more access to learning materials and more opportunities to explore their environment. Using child-sized furniture will also help children build self-confidence and become more independent, which is important for their overall growth and development.

Another advantage which comes with children's furnishing is that it teaches them to care for their own things. This can be a valuable lesson because a child will learn to take responsibility at a young age. Safety is also a plus point for child sized furniture. Children's products are free from things which can cause children to choke or be injured. In addition, some furniture items, like beds, come with safety railings to make sure that children do not fall off and hurt themselves.

In most households, the space and its furniture is designed specifically for the average adult. As children grow older, they naturally start using the existing furniture and space, due to lack of an alternative. However, this can be detrimental to their physical development. Hence, it is important to support their growth by introducing furniture that is designed to meet their needs.

USER STUDY



Commonly found collapsible table found in most homes during visits.

Collapsible dining table was also used as a study table to save space.

Visiting Homes

A user study was conducted in 15 homes located in Mumbai to understand the existing scenarios in relation to children's furniture and to study the users in their immediate environment.

Observations were made based on the following parameters -

- Primary and Secondary Users -

The role of parents in helping the child with the furniture and interaction of children with adult furniture.

- Parents as buyers -

Interviews of parents to understand their opinions regarding furniture for children.

- Homes – Space and furniture available -

What is the kind of furniture that is used currently and the availability of space.

- Pattern and frequency of use -

How often do children use furniture, for what durations and in what way?

Most children had the child sized chair. However, this was not used for study purposes as the table was not sized for it. Other space saving options available were wall mounted tables or extension of box window to be used as a study cum leisure space with storage below.

Inferences

Following inferences were made from the user study -

Children do not sit in the same place for the purpose of study. They tend to switch places based on their mood and convenience.

Most children had a fold-able small size study table which they can carry anywhere in the house to sit and study or draw.

This table also was a white board on which children can draw and scribble. The table and sometimes a small sized chair were the only pieces of furniture exclusively meant for children.

Most children use the Indian style of seating with legs crossed on the floor or bed for study

Only two homes had a designated study area for children but unfortunately they were designed for an adult considering that children will use it when they grow up - 'Abhi toh bacche chhote hai' (The kids are still small - as said by one of the parents)

People used the same furniture for multiple purposes - for example a dining table also doubles up as a study table and vice versa. Collapsibility was majorly used to save space.

Problems

Space constraints - most homes were small and too cramped up to accommodate separate furniture for children.

Lack of awareness - Parents lacked awareness regarding the importance of children's furniture.

Children grow but furniture does not - The parents were also concerned that children grow quickly and the furniture bought for them at a particular age soon becomes redundant and has to be given away. Hence, they considered buying children's furniture a waste of money and space.

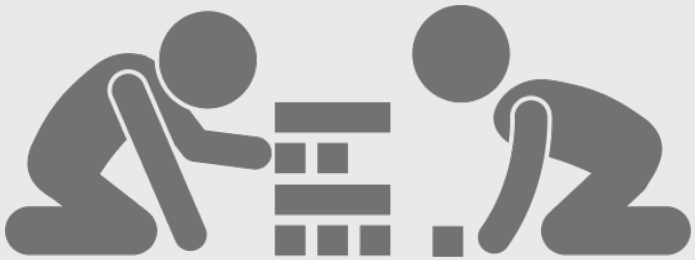
Different activities require different furniture - Parents spoke about how different activities require different furniture. For example - furniture for study, sleep, storage, play, etc.

Affordability - This was in relation to how furniture is too expensive for the amount of time it lasts. So, the parents prefer in investing on something that is of a size bigger to make it last longer (eg- school shoes for children and same applies to furniture). Another important concern was that the more adjustability the furniture has the more expensive it becomes.

Defining Age Group

Child supportive environments are a must for children to learn and grow up to be confident and independent adults.
Children have a natural desire to -
Acquire skills
Explore
Attempt to become independent
Learn by imitating their immediate surroundings (role play)

Hence it is important to make the space around them conducive to their growth and natural instincts.



Characteristics of age groups in children

Children in different ages groups focus on different kind of learning. The skills they acquire and the challenges they face become complex as they grow.

One - two year olds-
Lingual Skills
Awareness of surroundings
Require constant attention and are generally with the mother.

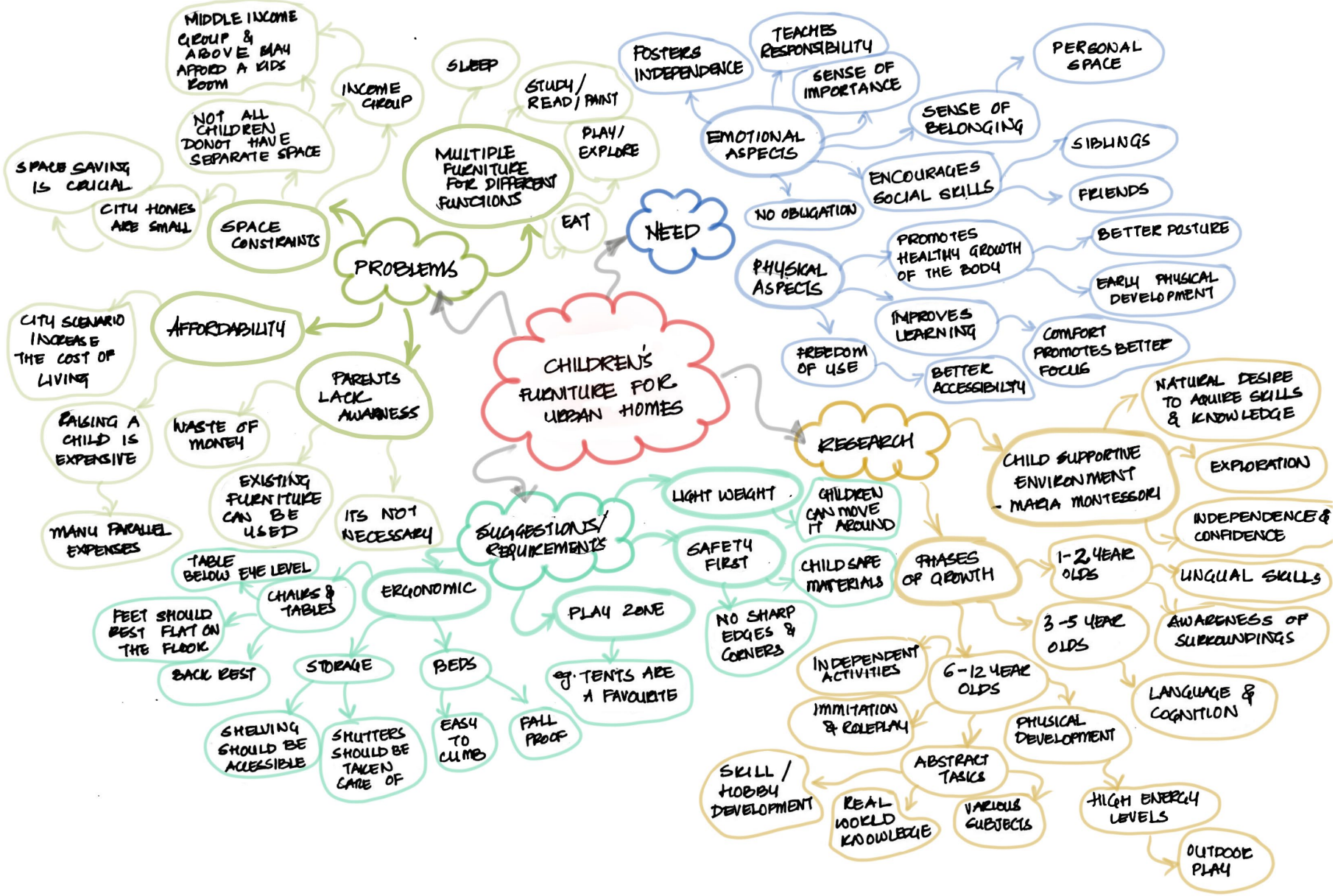
Three - five year olds-
Speaking
Walking
Cognitive and perceptive skills
They recognize other family members and start becoming social

Six - twelve year olds-
Abstract Tasks
Physical Development – High energy levels

This age group need not have constant attention, they tend to be more independent and social and hence this age group is the user group that I am designing for.

MIND MAP

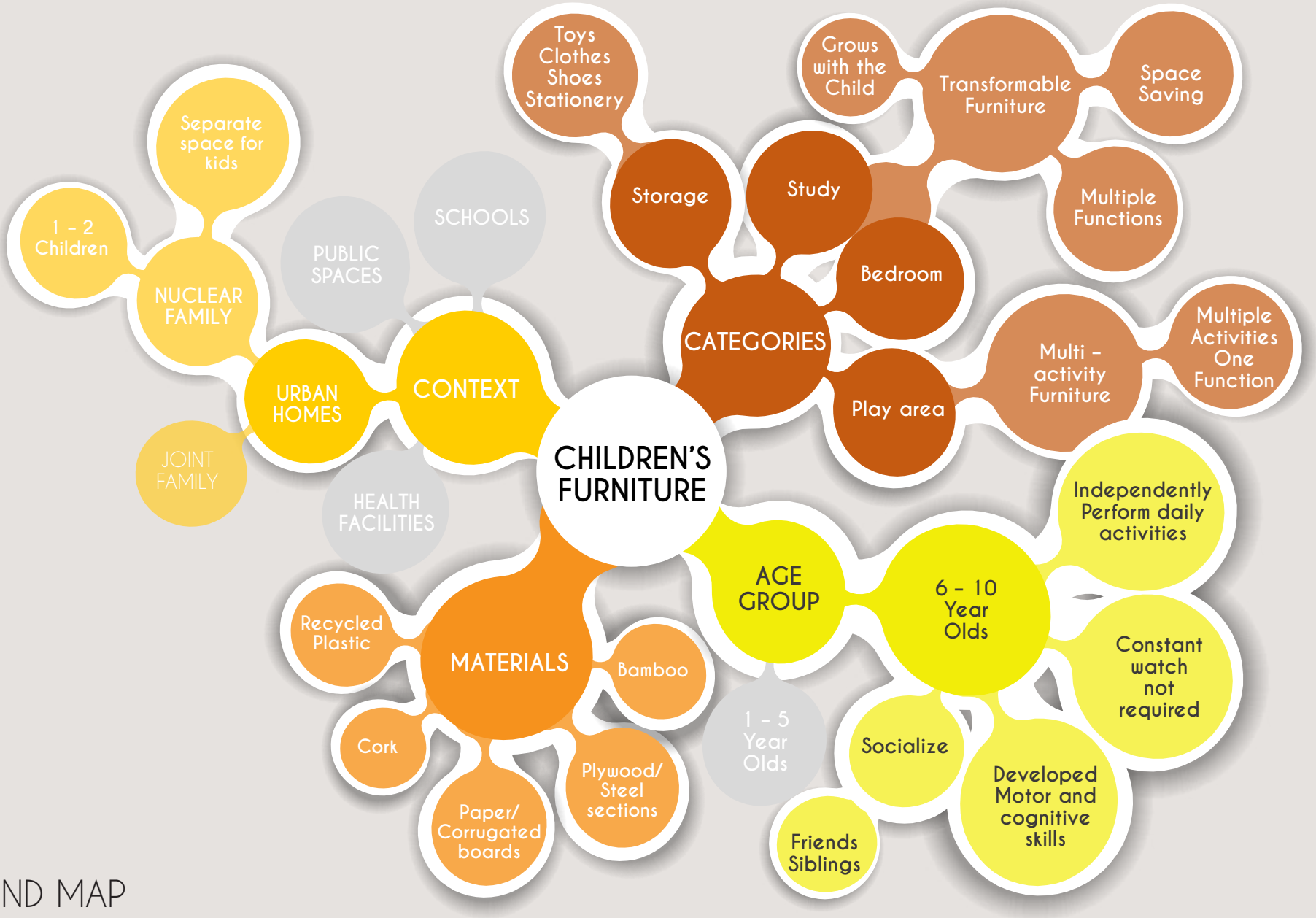
This mind map was done to understand the various aspects related to children's furniture and give context to the project.


CHILDREN'S FURNITURE FOR URBAN HOMES
PROBLEMS
SPACE CONSTRAINTS
SPACE SAVING IS CRUCIAL
CITY HOMES ARE SMALL
NOT ALL CHILDREN DONOT HAVE SEPARATE SPACE
INCOME GROUP
MIDDLE INCOME GROUP & ABOVE MAY AFFORD A KIDS ROOM
AFFORDABILITY
CITY SCENARIO INCREASE THE COST OF LIVING
RAISING A CHILD IS EXPENSIVE
MANY PARALLEL EXPENSES
PARENTS LACK AWARENESS
WASTE OF MONEY
EXISTING FURNITURE CAN BE USED
ITS NOT NECESSARY
NEED
MULTIPLE FURNITURE FOR DIFFERENT FUNCTIONS
SLEEP
STUDY / READ / PAINT
PLAY / EXPLORE
EAT
EMOTIONAL ASPECTS
FOSTERS INDEPENDENCE
TEACHES RESPONSIBILITY
SENSE OF IMPORTANCE
SENSE OF BELONGING
PERSONAL SPACE
NO OBLIGATION
ENCOURAGES SOCIAL SKILLS
SIBLINGS
FRIENDS
PHYSICAL ASPECTS
PROMOTES HEALTHY GROWTH OF THE BODY
BETTER POSTURE
EARLY PHYSICAL DEVELOPMENT
IMPROVES LEARNING
COMFORT PROMOTES BETTER FOCUS
FREEDOM OF USE
BETTER ACCESSIBILITY
RESEARCH
CHILD SUPPORTIVE ENVIRONMENT - MARIA MONTESSORI
NATURAL DESIRE TO ACQUIRE SKILLS & KNOWLEDGE
EXPLORATION
INDEPENDENCE & CONFIDENCE
LINGUAL SKILLS
AWARENESS OF SURROUNDINGS
LANGUAGE & COGNITION
PHASES OF GROWTH
1-2 YEAR OLDS
3-5 YEAR OLDS
6-12 YEAR OLDS
INDEPENDENT ACTIVITIES
IMMITATION & ROLEPLAY
ABSTRACT TASKS
SKILL / HOBBY DEVELOPMENT
REAL WORLD KNOWLEDGE
VARIOUS SUBJECTS
PHYSICAL DEVELOPMENT
HIGH ENERGY LEVELS
OUTDOOR PLAY
SUGGESTIONS/ REQUIREMENTS
LIGHT WEIGHT
CHILDREN CAN MOVE IT AROUND
SAFETY FIRST
CHILD SAFE MATERIALS
NO SHARP EDGES & CORNERS
PLAY ZONE
eg. TENTS ARE A FAVOURITE
ERGONOMIC
TABLE BELOW EYE LEVEL
CHAIRS & TABLES
FEET SHOULD REST FLAT ON THE FLOOR
BACK REST
STORAGE
SHELVING SHOULD BE ACCESSIBLE
SHUTTERS SHOULD BE TAKEN CARE OF
BEDS
EASY TO CLIMB
FALL PROOF

Existing products in the market were studied to understand concepts like multi - functional furniture and transformable furniture. Some furniture transformed immediately to serve multiple functions while some furniture transformed with age of the child.

EXISTING PRODUCTS

DESIGN PROCESS



MIND MAP

This mind map graphically represents the context for the design solution.

Design Statement

Spatially explore Children's furniture to design a solution that is playful, affordable and grows with the child of the age group of 6 – 10 year.
The furniture should imbibe a sense of belongingness in the child and encourage the attributes such as socializing and also the independence of this age group.

Design Brief

USERS
Primary Users – 6 – 10 Year Olds
Secondary Users – Parents

USER REQUIREMENT
Playful, affordable kids furniture that grows with the child

MICRO ENVIRONMENT
Homes

BROAD PRODUCT SPECIFICATIONS
Safe and Child friendly
Adapt to the growing age
Playful and interesting
Multi-functional
Easy to use
Adapt to the growing age
Should last at least 5 years
Easy to use
Encourages group play

KEYWORDS

FUNCTIONALITY BASED

Ergonomic
Space Saving
Safe
Light Weight
Affordable
Playful
Movable

FORMAL LANGUAGE

Playful
Colorful
Fun
Soft / Rounded
Lightweight
Dynamic

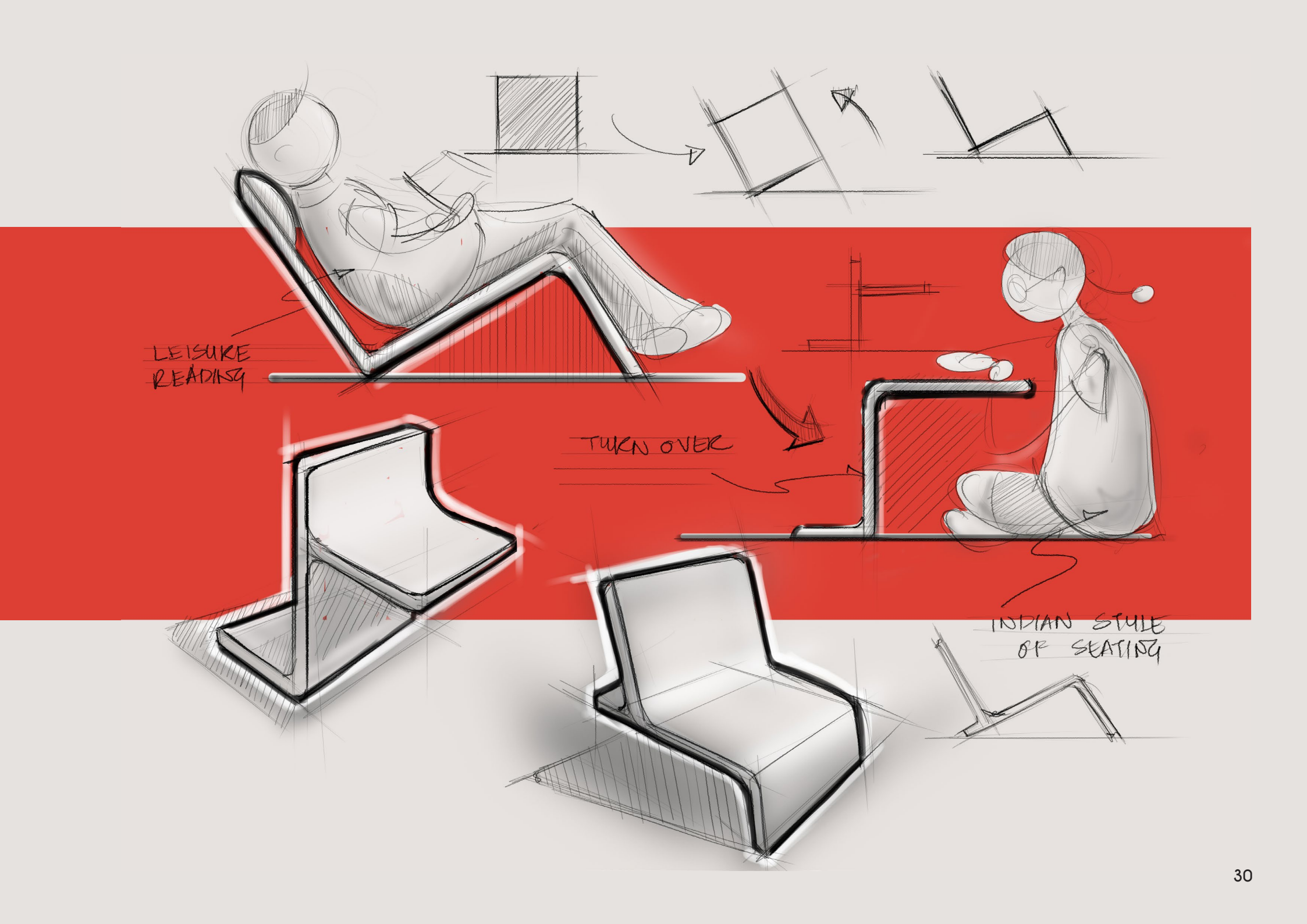
LOOK And FEEL

Minimal
Colorful

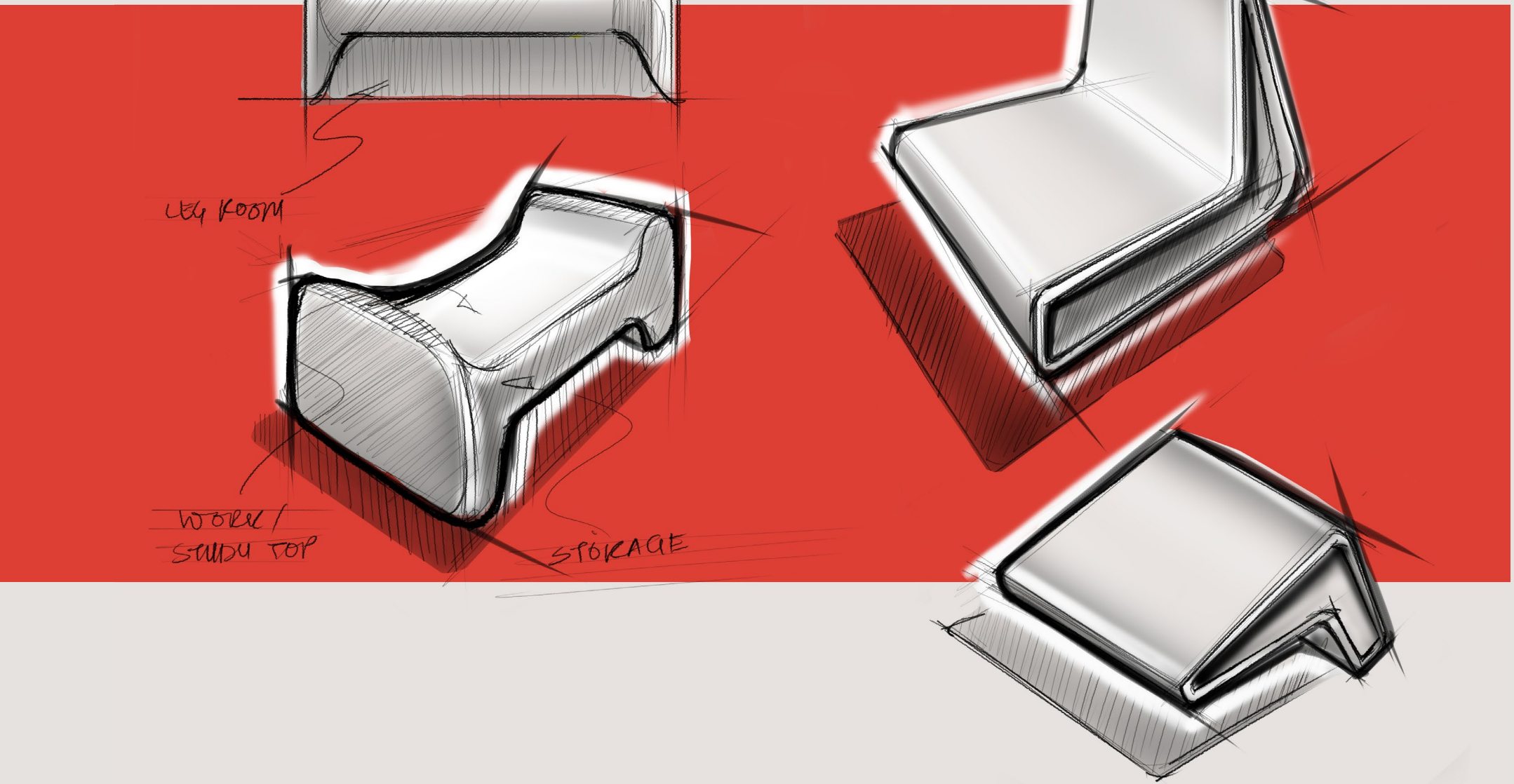
These keywords are a result of an initial brain storming session done with peers, where words they associated with children's furniture were recorded.
The words were then grouped into under categories to further derive a design direction.

INITIAL IDEATION

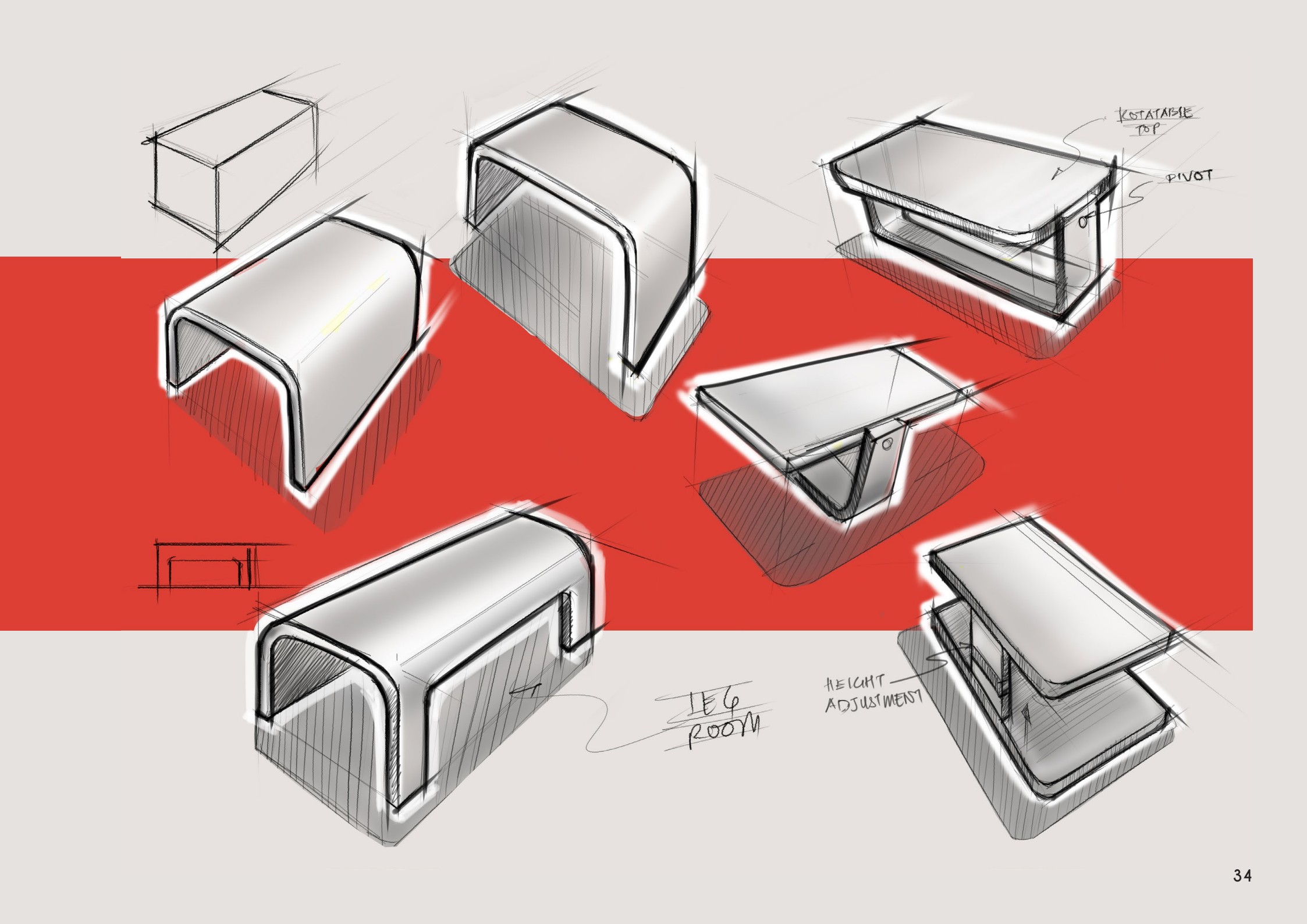
This idea involved exploring the aspect of multi - functionality through Form.
It was an attempt to understand how the same form when placed in different orientations could be used for different functions.
Here the arm chair can also function as a table for writing, drawing, etc.


LEISURE
READING
TURN OVER
INDIAN STYLE
OF SEATING

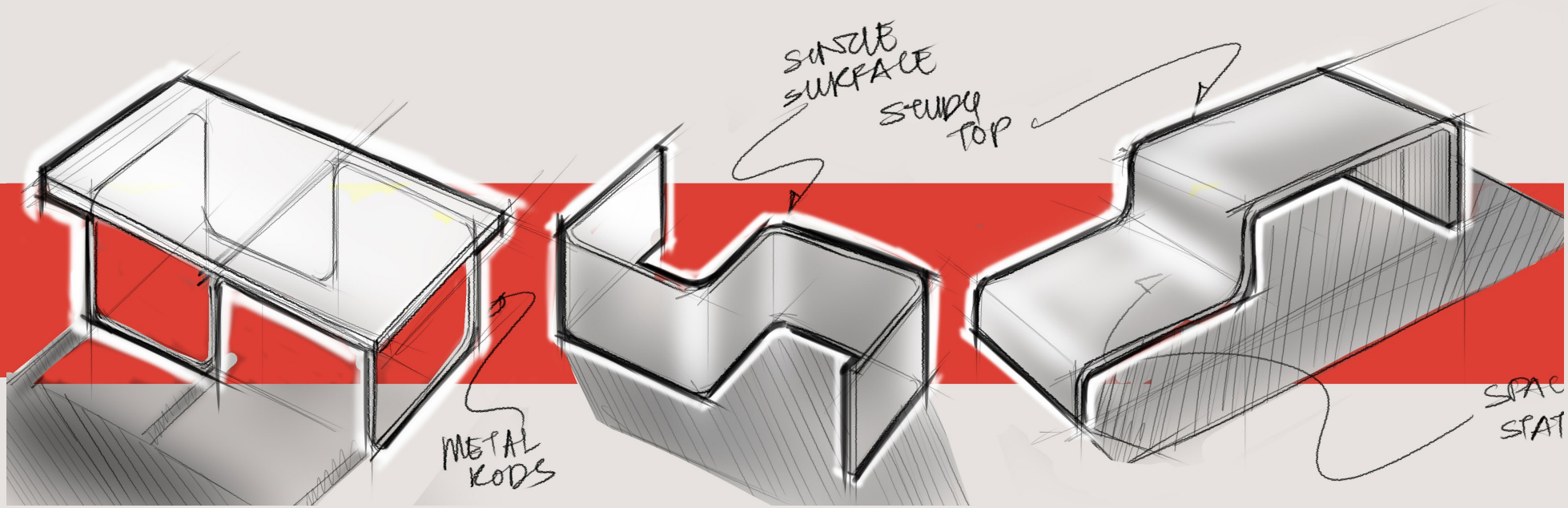
Like the previous idea, this also was based on formal exploration for multi
- functionality
Different orientation serves multiple purposes.


LEG ROOM
WORK/
STUDY TOP
STORAGE

This idea involved manipulating the surfaces of a cuboid to be used a study table.
Eliminating surfaces to create leg room or adding the ability to fold to make it space saving were the thoughts that guided this exploration.

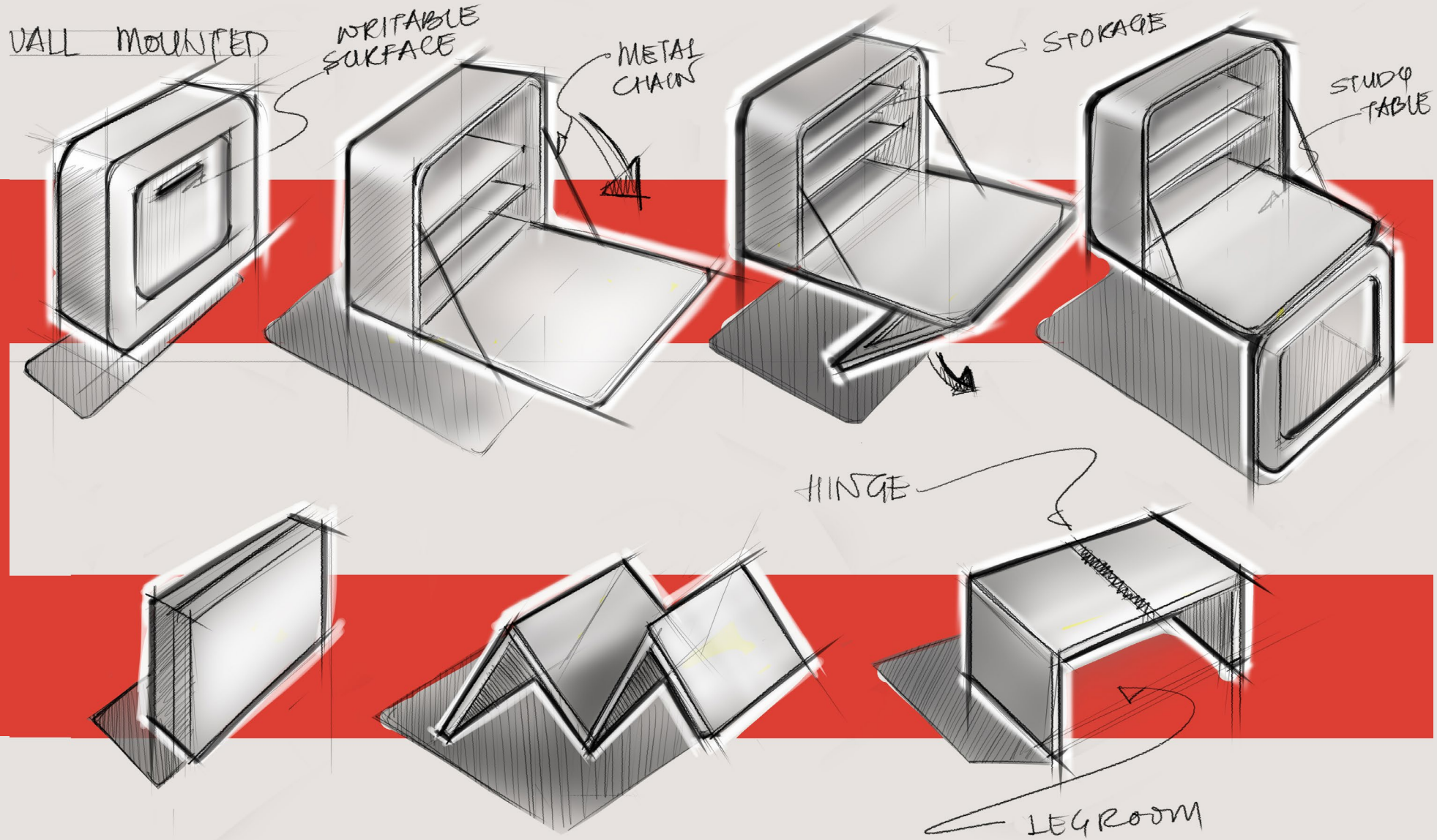

ROTATABLE TOP
PIVOT
LEG ROOM
HEIGHT ADJUSTMENT

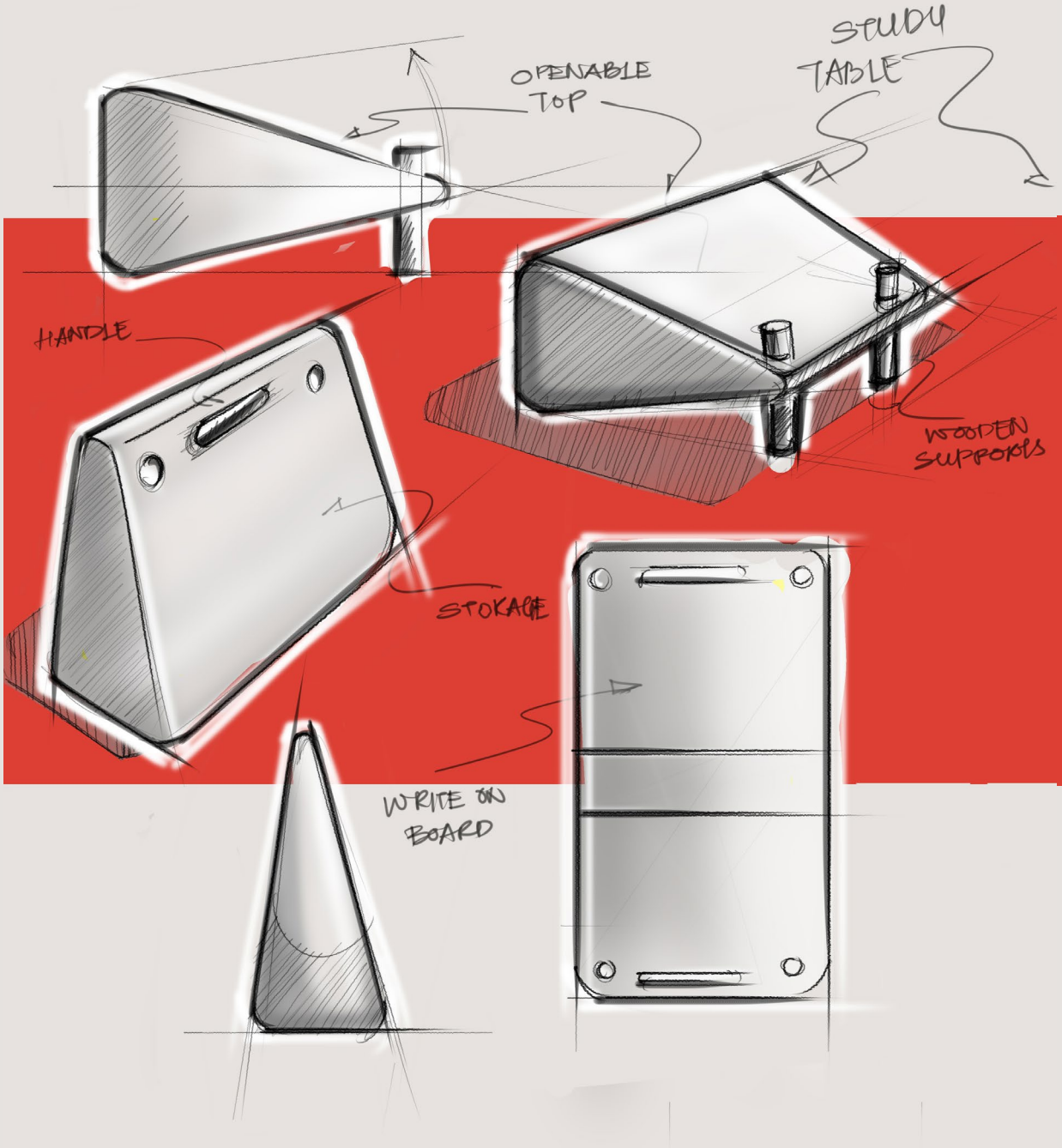
This exploration was to see if a single surface could be bent to serve multiple purposes.


METAL RODS
SUEDE SURFACE
SUEDE TOP

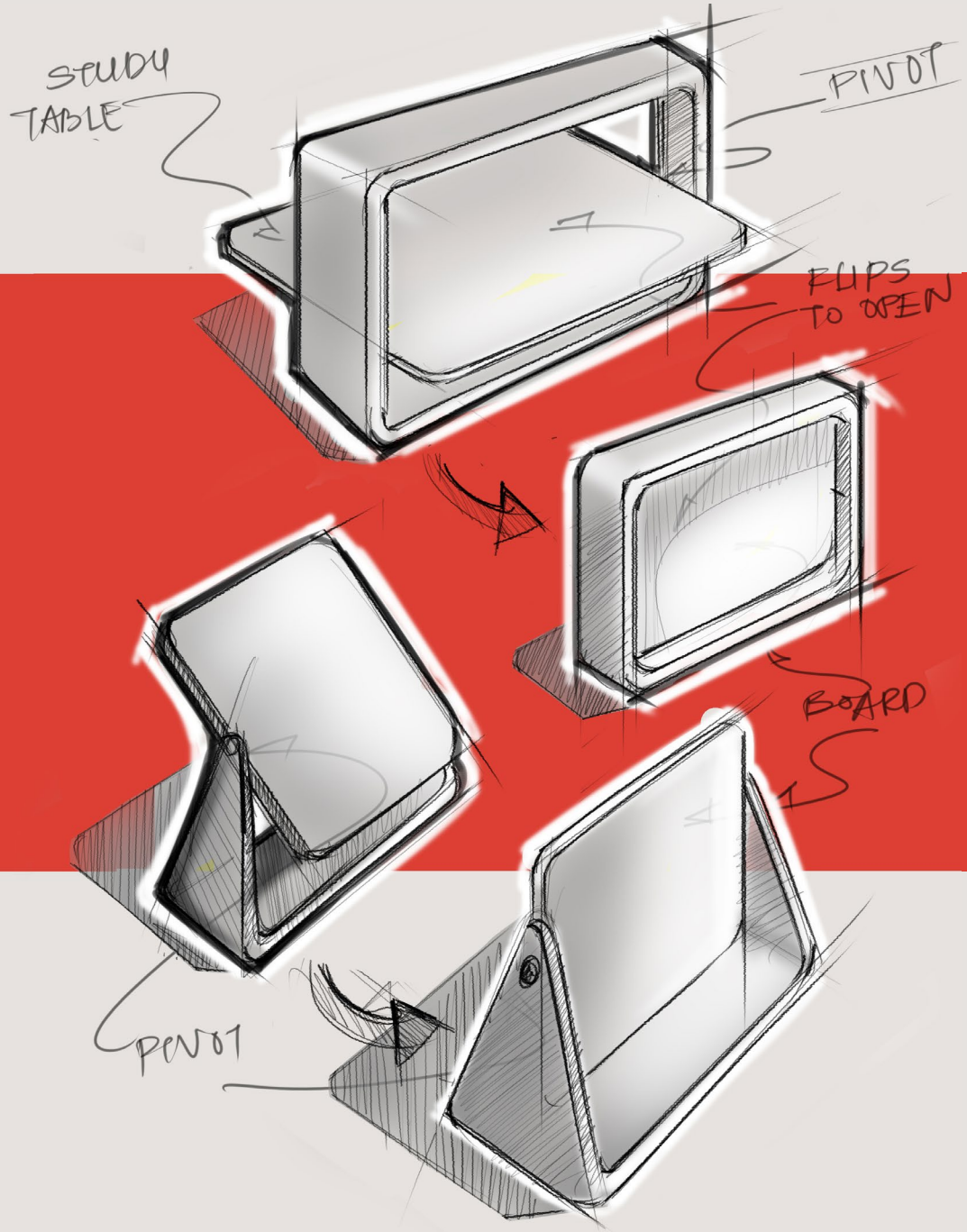
The idea was to make use of vertical space in a room. Wall mounted cabinet used as storage could open up to become study table.

Collapsibility using unidirectional hinges as a part of the form, where the surfaces open up to become a table and also occupy less space in the house when not in use.


WALL MOUNTED
WRITABLE SURFACE
METAL CHAIN
STORAGE
STUDY TABLE
HINGE
LEGROOM



Here storage could be used as a study table.
It could also completely open and become a board that could be hung to write or draw.
The table could be supported by wooden supports and they could also function as a locking mechanism for the folding of the sheet to form a table.



The thought involved having a surface pivoted at two points to function as writing board as well as a study table. This could also act as a space saving option as the space occupied by the assembly when the surface is vertical is very less.

Playfulness As An Experience

Initial explorations were based on the concept of multi - functional and space saving furniture. 'Playfulness' was explored only as an attribute of form in these ideas. However, deeper thought to the aspect of desirability of a product initiated the idea of exploring playfulness as an 'experience'.

When thinking about what brought a feeling of playful to us as children, childhood experiences such as - sitting on a swing or a rocking horse, hanging from anything that was at a reachable height, jumping on a trampoline or spending some quiet time drawing or reading inside a DIY tent made from bedsheets at home come to the mind.

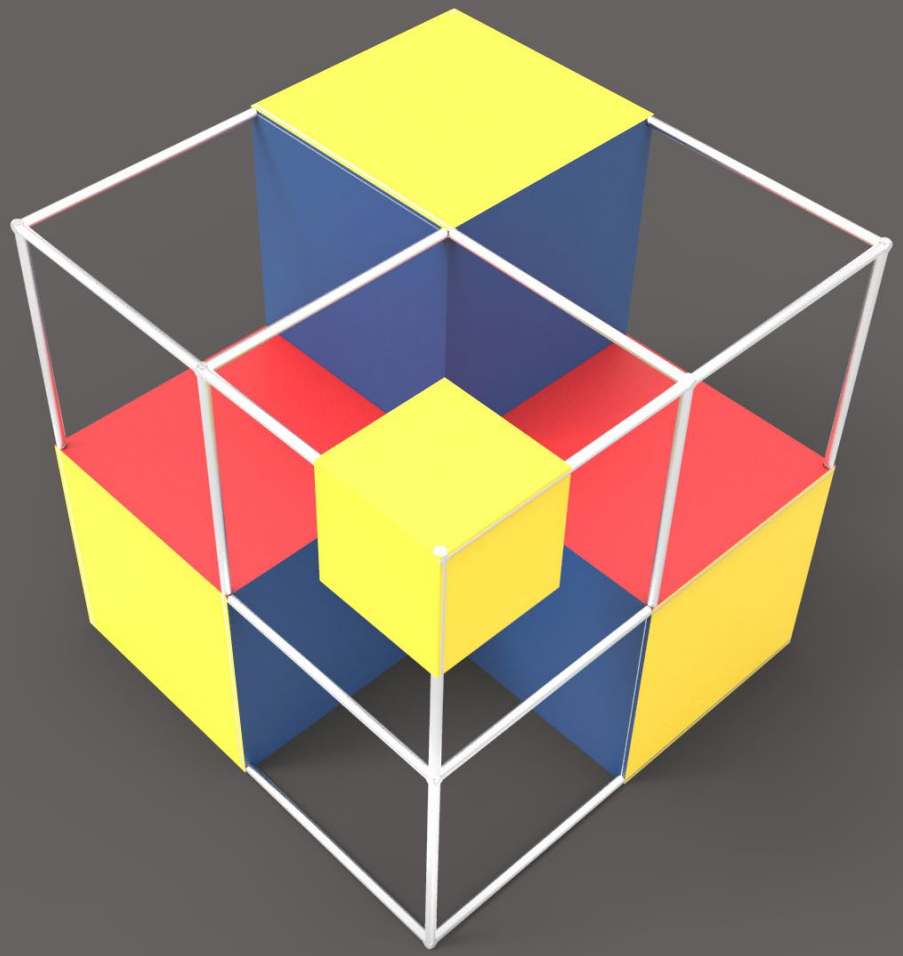
An attempt was therefore made to incorporate these elements of fun and surprise in the ideation that followed.








Hammock, Swing, Bean Bags, Peek-a-boo, Tents, Monkey bars were to be explore as part of this furniture for children to create an element of surprise.



BAUHAUS
AS INSPIRATION

The design of this cube was a part of the Semester II "Forms" module. It included exploration of the formal representation of a cube, to showcase the attributes of the Bauhaus art movement.
This exploration of a cube, is a continued inspiration for the furniture for two reasons -

1. The study of form could be applied to a product

2. The key ideas of the Bauhaus movement complement what this product requires i.e. a practical product that is easy to manufacture, without compromising on its artistic value.

MOOD BOARDS

Based on the attributes of Bauhaus

Understanding *Minimalism* in Children's Furniture

minimal

Visually *Lightweight* to make smaller spaces appear bigger and spacious

balance of mass

lines

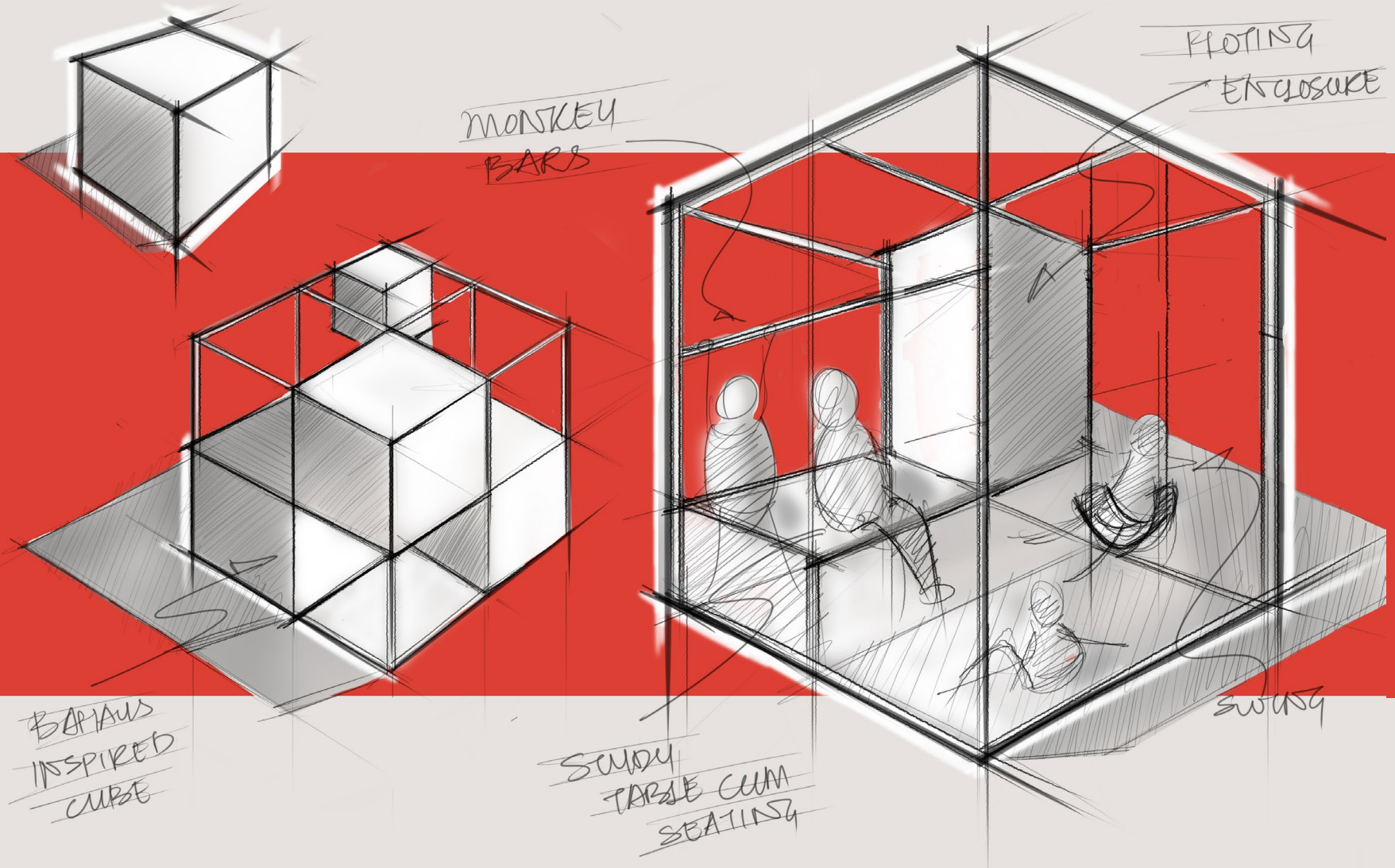
sheer

airy

lightweight

Playful as a functional experience and formal expression

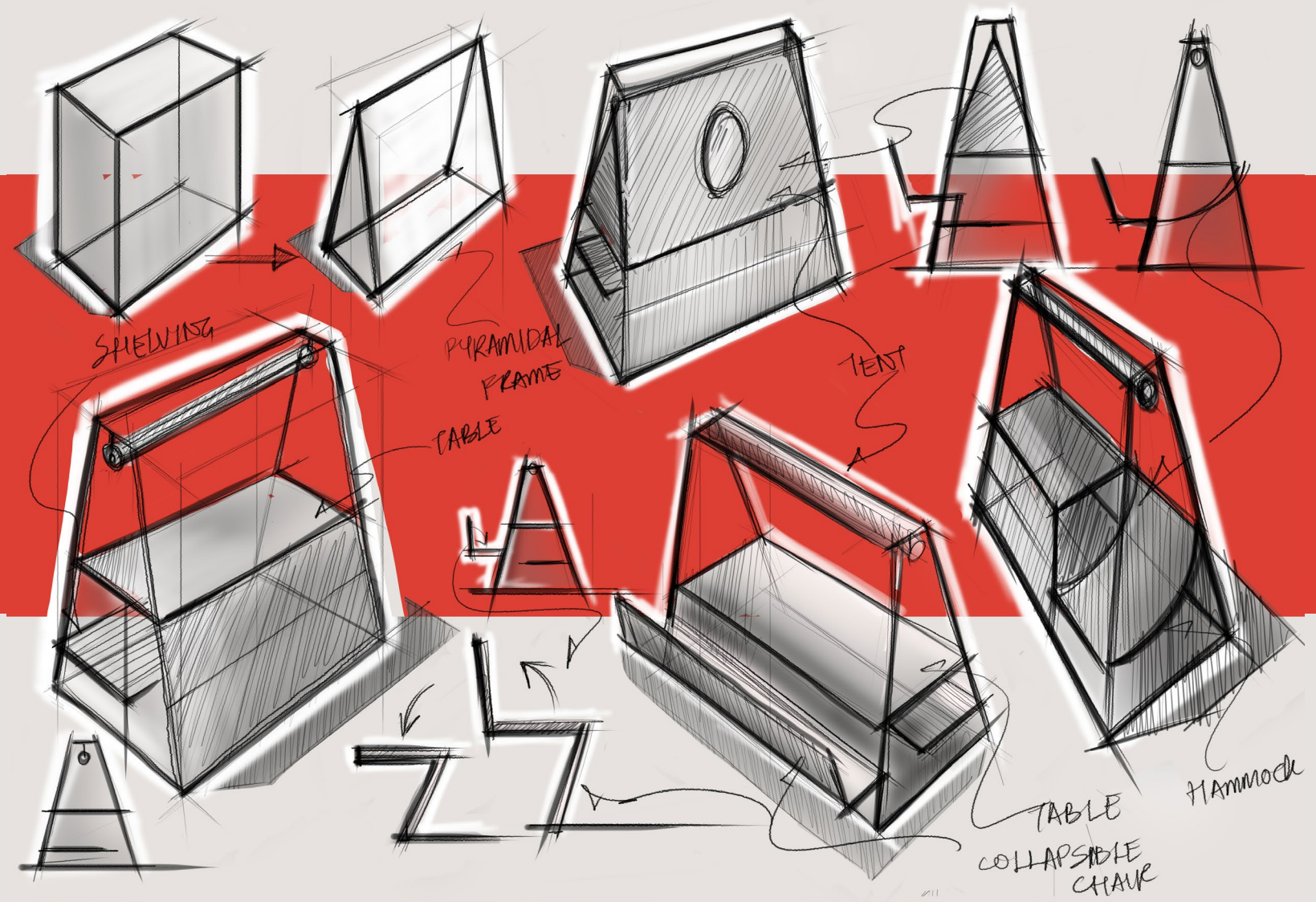

fun
adaptive
surprise
novelty
playful


MONKEY BARS
ROOFING ENCLOSURE
BAUHAUS INSPIRED CUBE
STUDY TABLE CUM SEATING
SWING

INSPIRATION BASED IDEA GENERATION

Based on the inspiration and the mood board study this option was developed to explore how spaces could be incorporated in furniture, without occupying a lot floor space.

This assembly was imagined to be a space of 2m by 2m to incorporate the experience of playfulness and the necessary functions would be a part of it. It would also incorporate a swing and monkey bars for children.


SHELVING
PYRAMIDAL FRAME
TABLE
TENT
TABLE
COLLAPSIBLE CHAIR
Hammock

Working on similar lines this option was developed to reduce the foot print of the furniture to occupy the space that a closet would take.
This assembly measures 1.5m by 0.5m with a height of 1.8m
This also incorporated a hammock for leisure and tent to create more intimate spaces for the child.

ADDING FUNCTIONS

ERGONOMIC DATA FOR 6 - 10 year olds

Height

Girls : 1- 1.5m
Boys : 1-1.5m

Weight

Girls : 1- 1.5m
Boys : 1-1.5m

Chair height
0.35m - 0.45m

Table top Height
0.55 - 0.70m

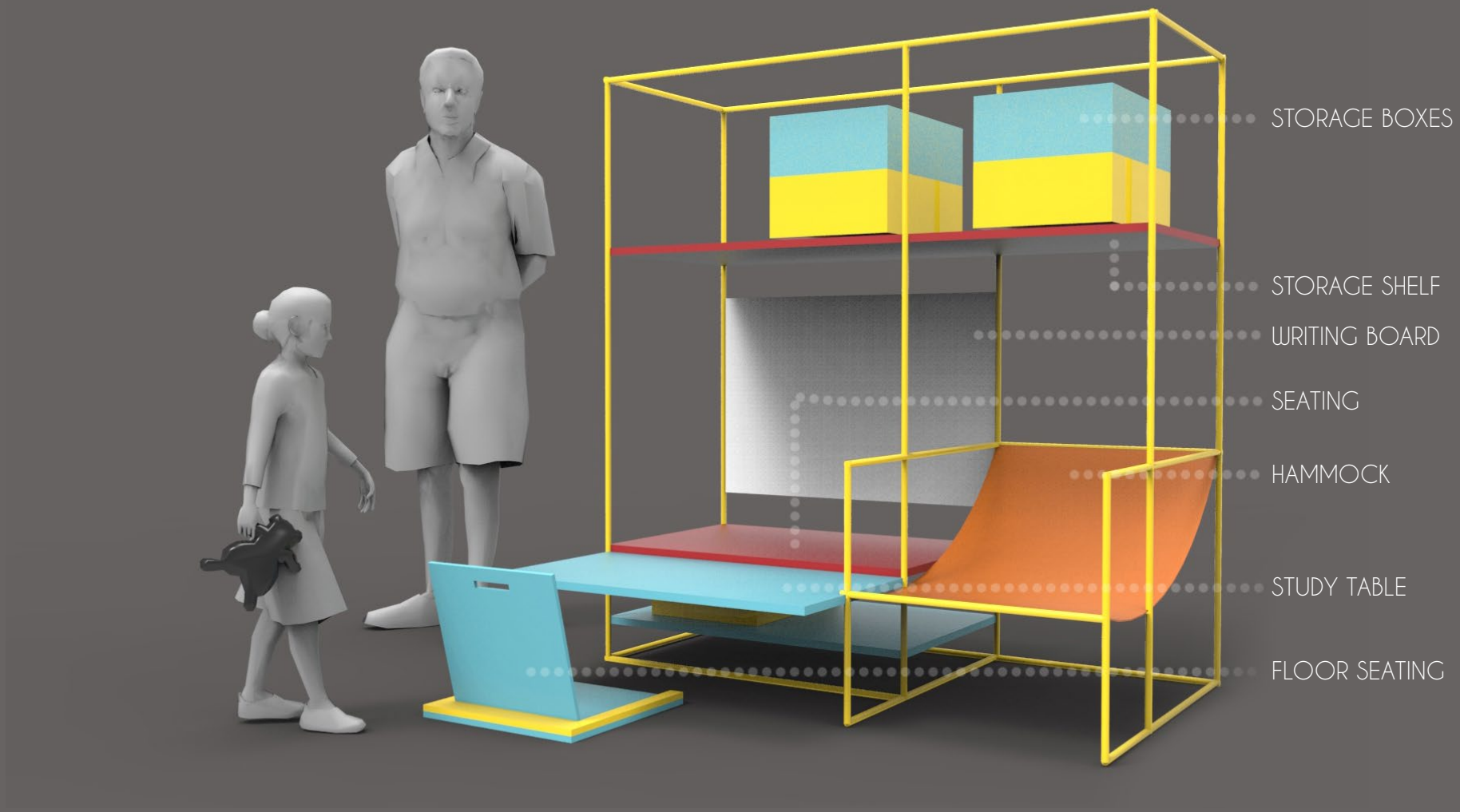
Backrest angle

0-5 degrees from vertical for formal seating

Bed sizes

Single bed - 0.9m width
Length - 1.3m - 1.9m

Data above was collected and used to design a basic rig (image on the right) with all the functions required .
This rig was built and tested with the users and their parents to understand proportions and take their feedback.



The design was developed by putting the necessary functions together in a basic cuboid to build a rig for user testing. The size of this cuboid was to be close to the footprint of a worktable or closet in a household for the purpose of saving space. The functions incorporated in this assembly include a slide out table with floor seating, a sitting space above the table that could double up as a tent, a hammock for relaxed sitting based activities, a white board to write or draw on and storage shelf on top where in books or toys could be stored into designated boxes and placed. The assembly was also accompanied by a floor chair as an accessory. Flexibility of adjusting the table at various heights for multiple age groups was also provided.

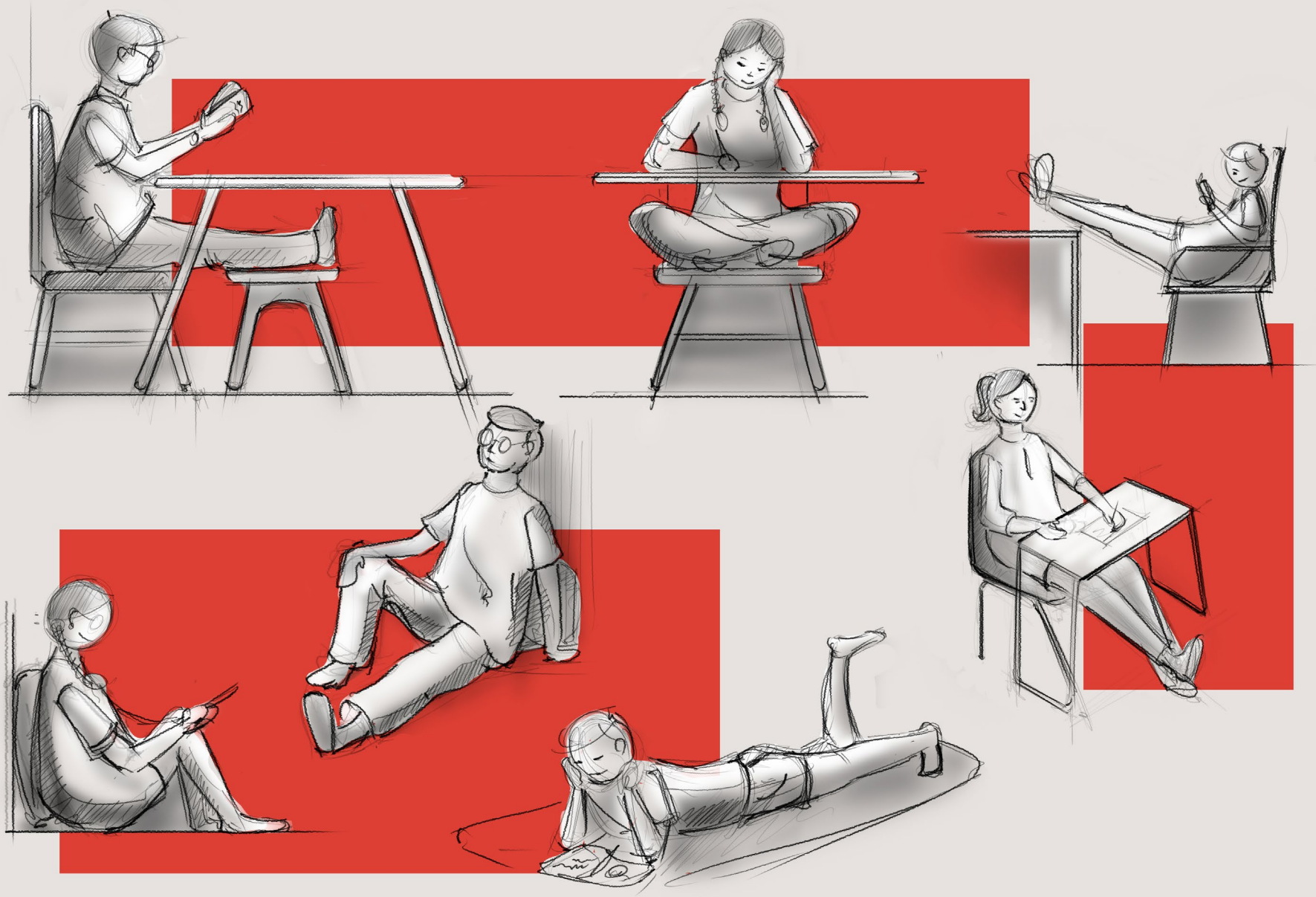
Why Floor Seating ?

Sitting cross legged on the floor has been a part of the Indian tradition for centuries. People here are often seen siting up on train seats or benches in the cross-legged position, which they find more comfortable than sitting with feet hanging down.

As the sketch here also shows how even after sitting on a chair we feel the need for a foot rest in order to have the flexibility of stretching our feet which sitting on the floor naturally gives.

Sitting on the floor has been proved to have many health benefits including healthy growth of the spine and prevention of lower back problems caused by sitting for long hours in chair.

Also the user study that was conducted at the beginning of this project suggested that in most households children tend to sit on the floor to study (using the small foldable table) and play. Hence this solution incorporates flooring seating along with an option to sit on a chair while studying.



RIG BUILDING AND USER TESTING

Building of the Rig

The rig was built in the metal studio at IDC with the help of the studio staff.

The material used for the rig include 25mm dia aluminum box sections and plywood.
The joints were secured using a temporary detail of screws and metal L connectors.

The hammock was machine stitched in cotton cloth for the purpose of testing.

The rig was also spray painted to understand how the colors behave in the real surrounding and also to make it more relevant in the user testing that was conducted.

Learning from the build

Building the rig gave a better sense of space and proportions with respect to the user scale.

It helped understanding the amount of stability required and the role the weight of the plywood members played in the stability.

The strength required for the stitching in the hammock and how colors can completely change the experience of the product.






USERS

The users that are seen in the adjacent pictures are
Anay , 7
Brahmori, 10
Aditya, 8

FEEDBACK

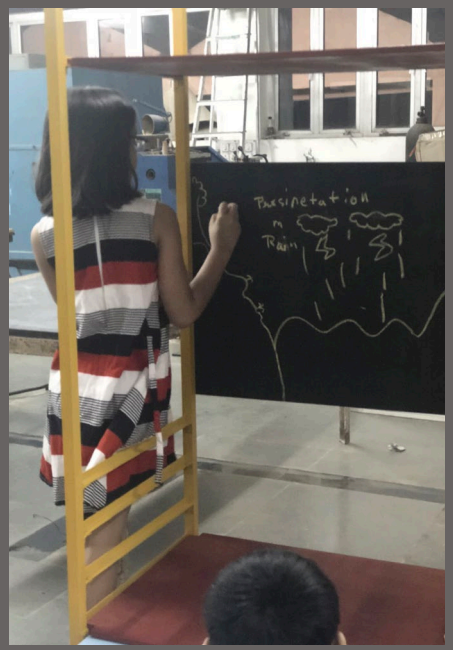
Hammock was a favorite. The children wanted to experience the hammock and when asked if they like to own one of these they were quite excited about it. The parents were also surprised as it took them back to their childhood days when arm chairs used to be a part of everyday furniture in ancestral homes.

Climbing on top was not a comfort zone. As opposed to a common notion that we have with that children would love to climb on top, most kids were hesitant and they were not happy with the idea of sleeping or sitting on top due to fear of falling.

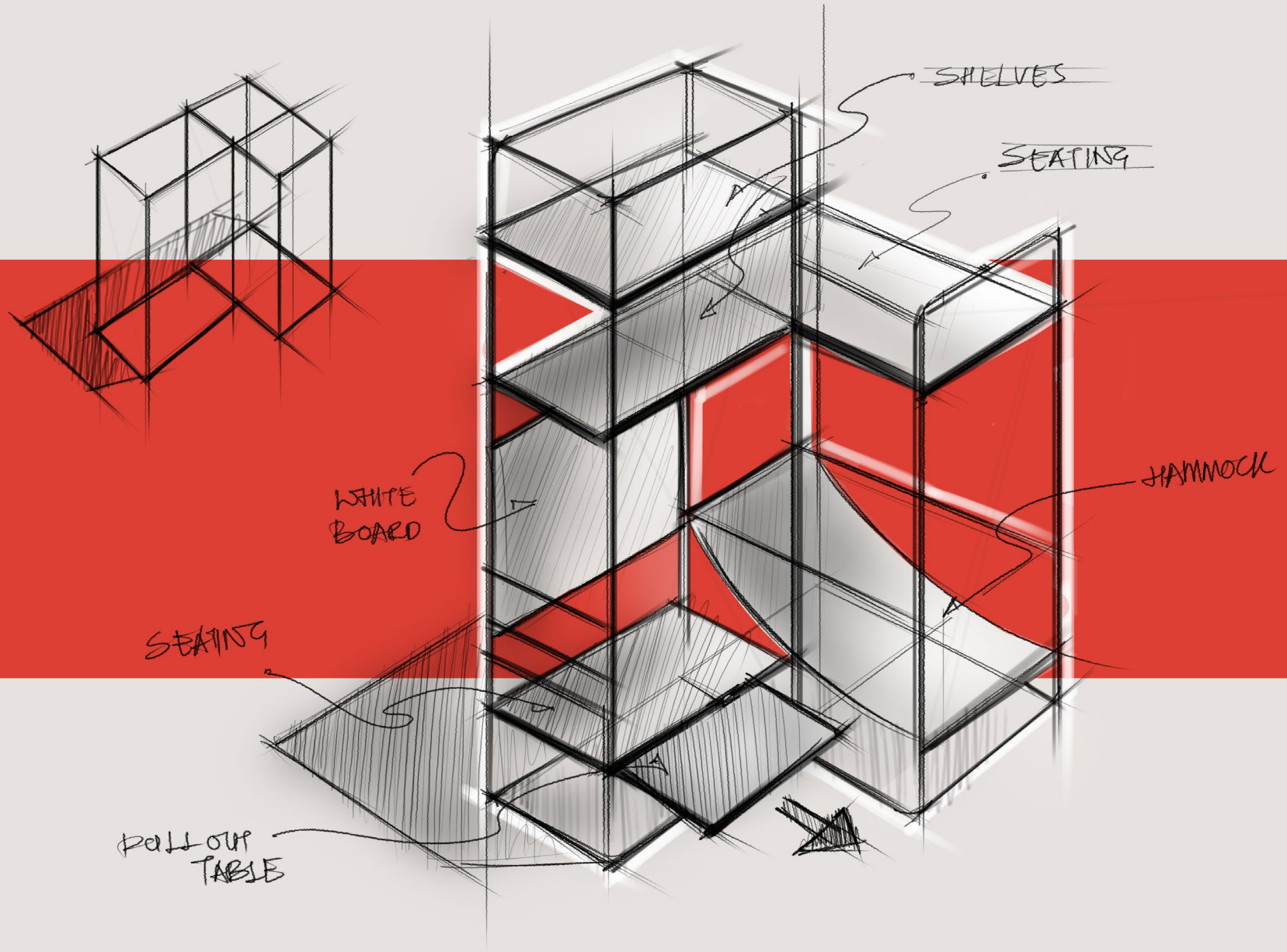
Preference of floor seating over a chair. Most of these children used the Indian style of seating at home to study or play. Only one of them had a study table and chair. The parents agreed to this as children like to sit in their comfort spots for studying or playing which could be bed or floor

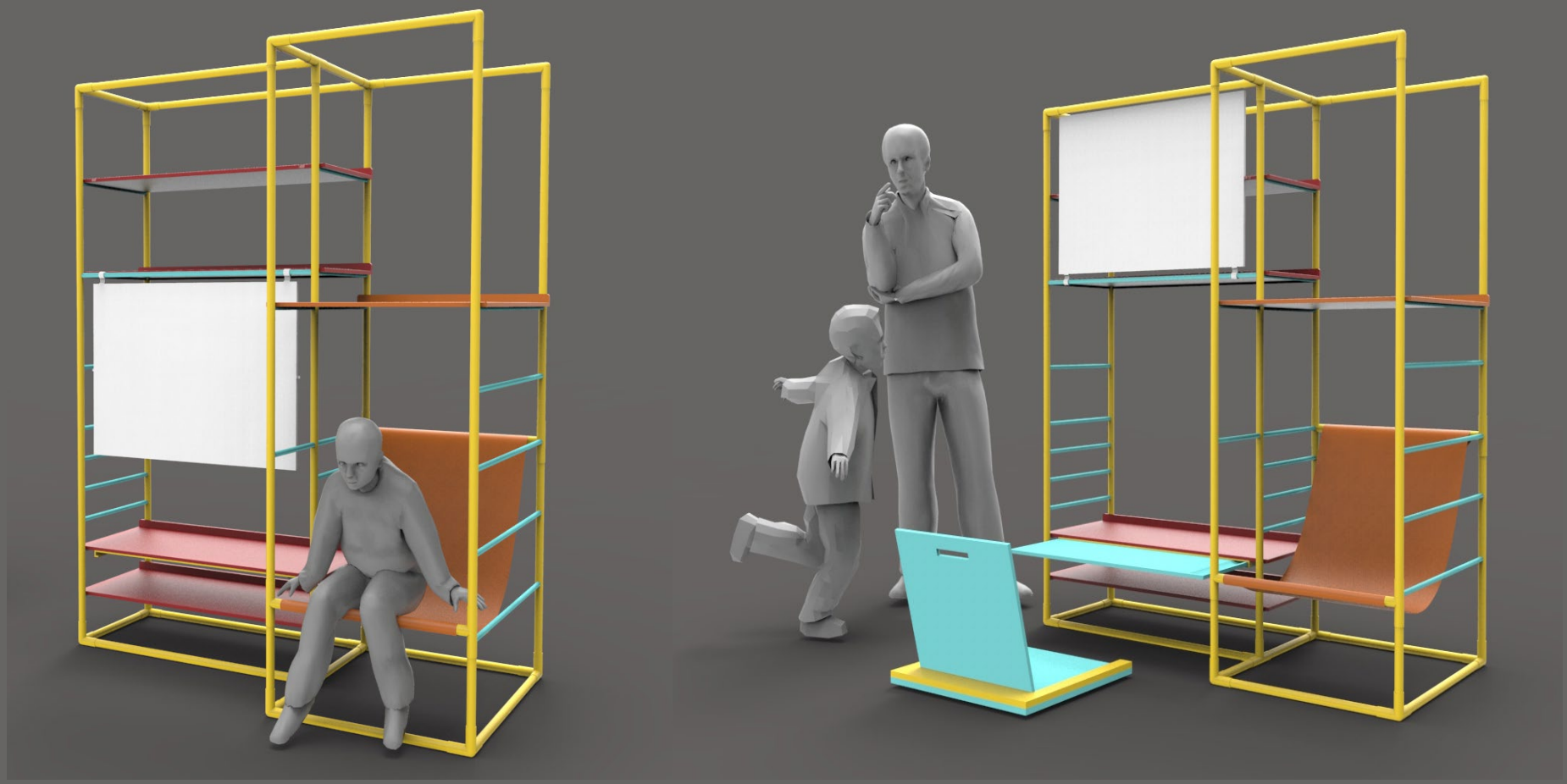
Drawing on the board was also an attraction. parents however preferred white boards over black chalk boards.

Bed could be a part of the assembly. There was also a suggestion to make bed a part of this whole assembly.

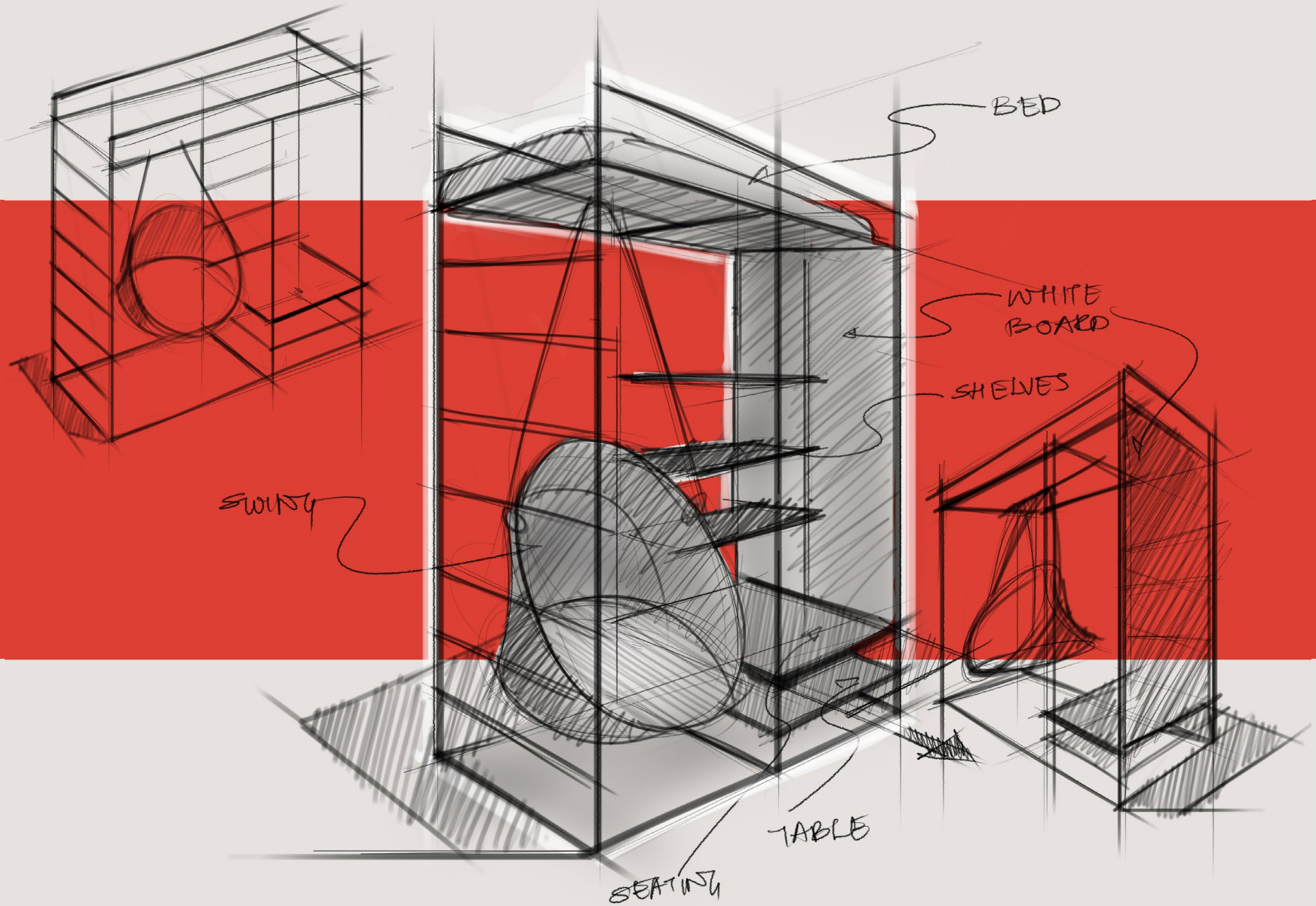


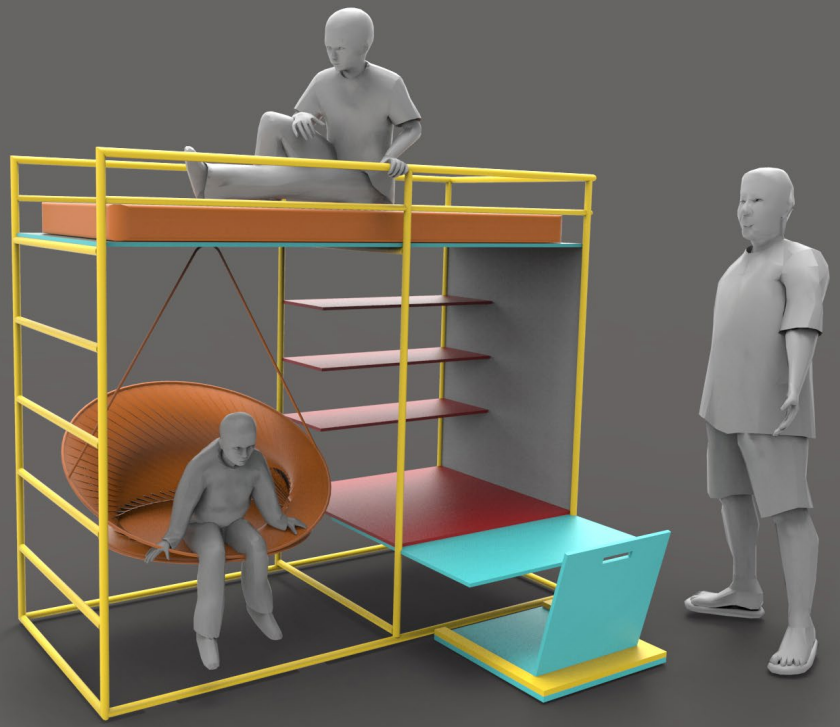
IDEA REFINEMENTS

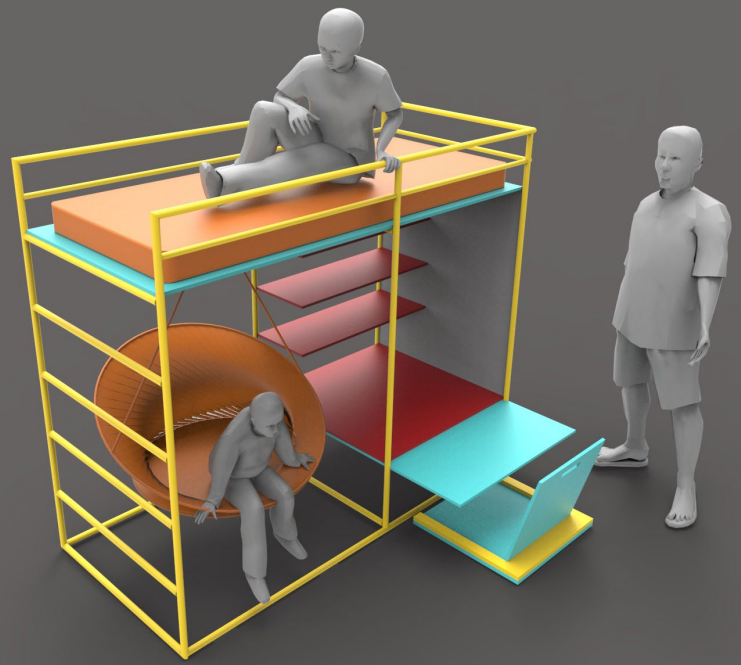




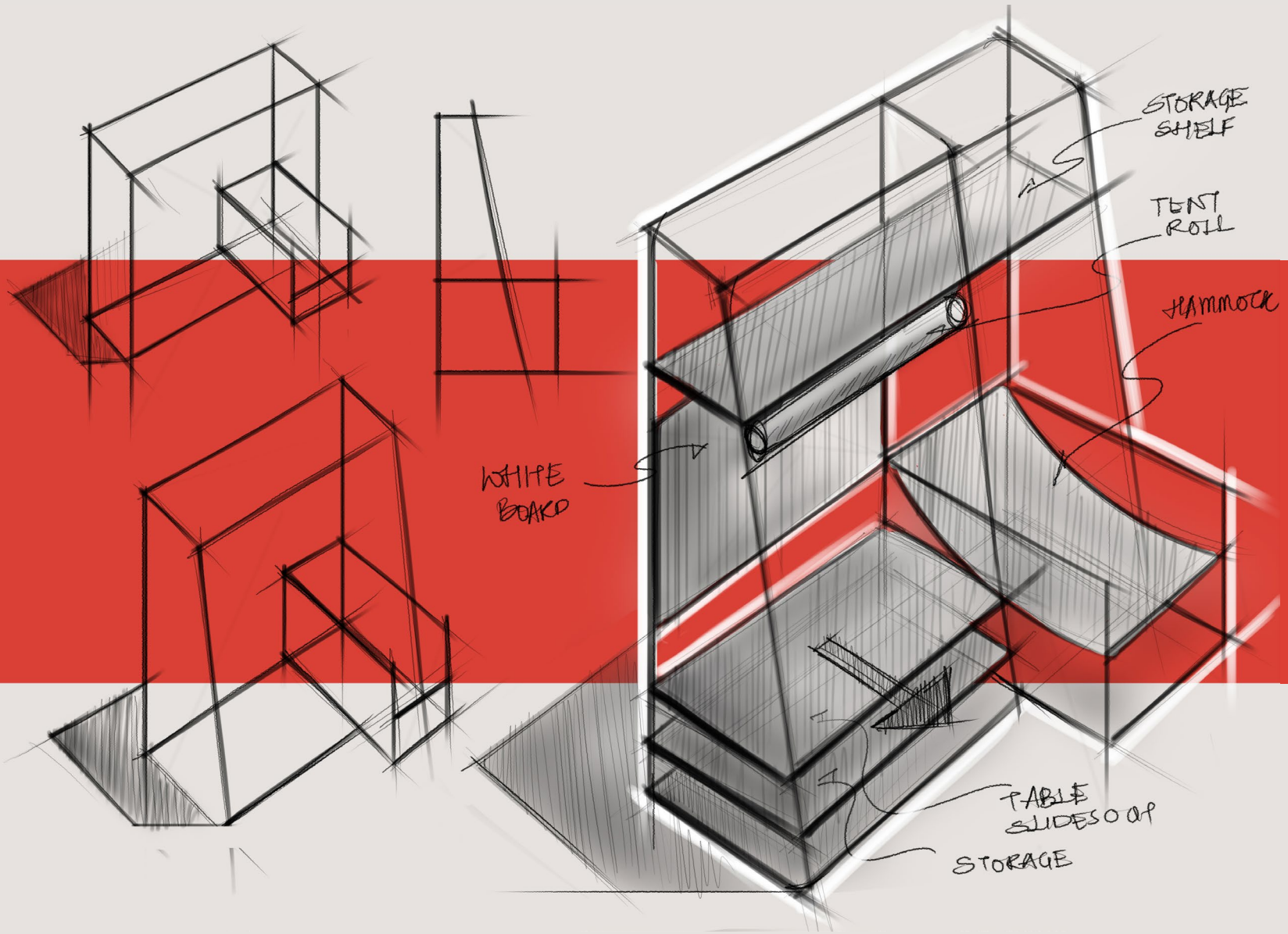
This option considered a sitting space on top which could be doubled up a tent for children to climb and sit on top. The thought was triggered by the experience of sitting on upper berths in long distance trains.

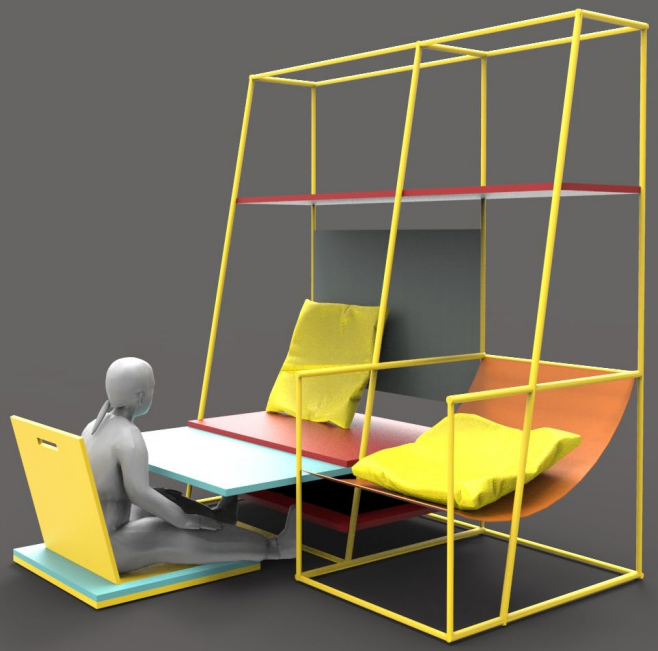

BED
WHITE BOARD
SHELVES
SWING
TABLE
SEATING

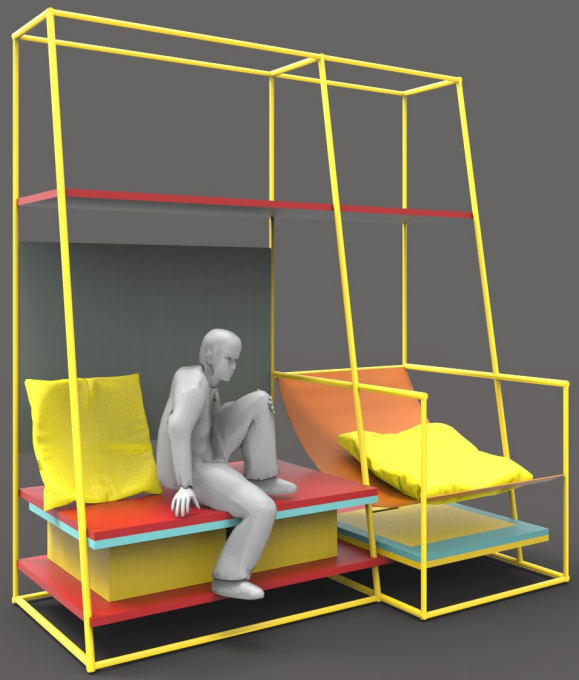




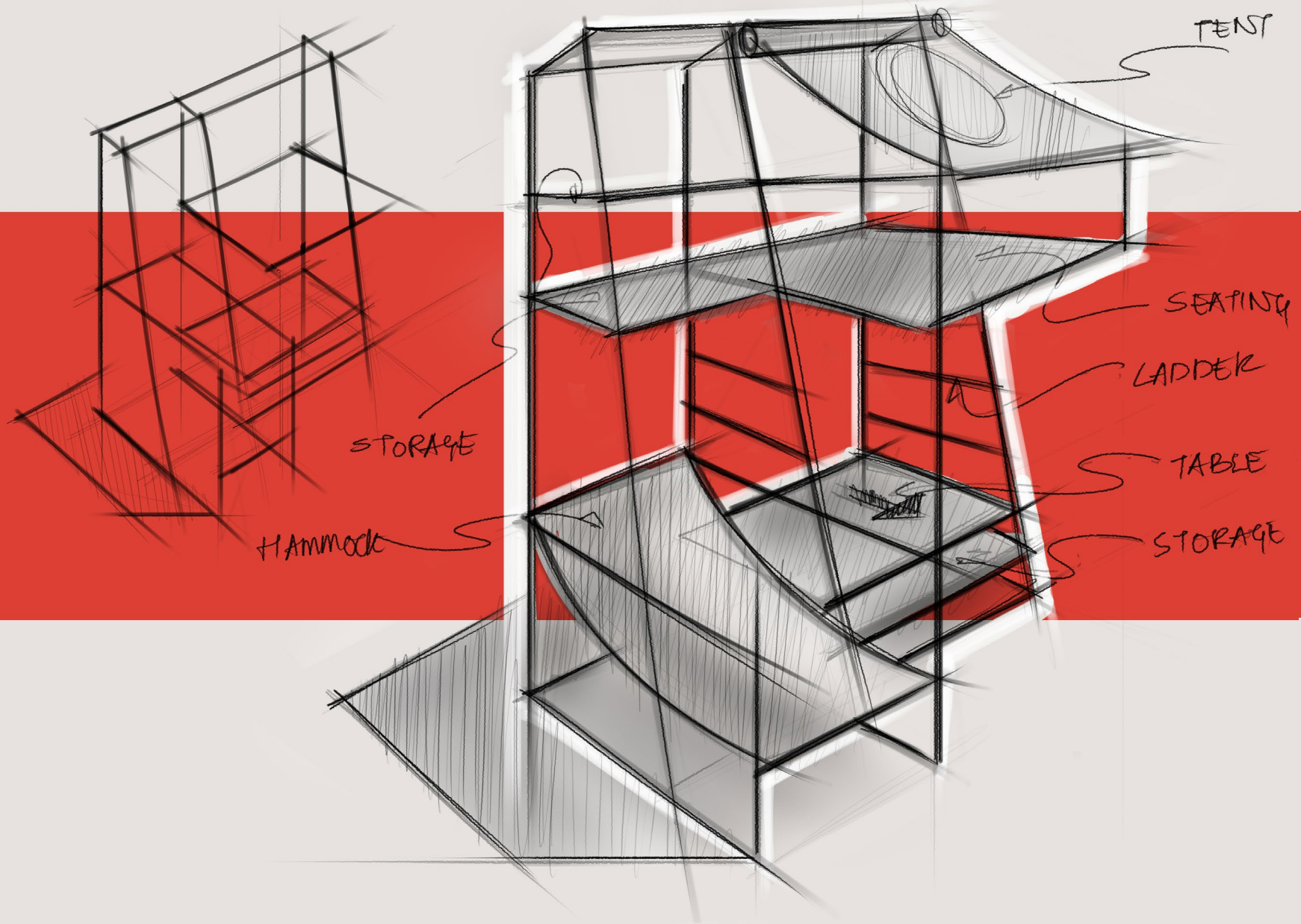
The idea of bunk bed was explored in this option. A full size bed on top with other functions lying below it. The round swing is provided to break the monotony in the form.

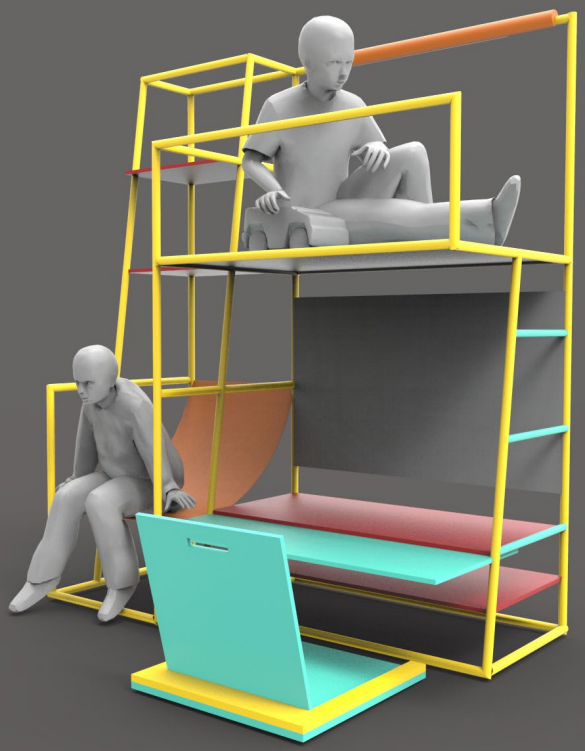

STORAGE SHELF
TENT ROLL
HAMMOCK
WHITE BOARD
TABLE SLIDES OUT
STORAGE

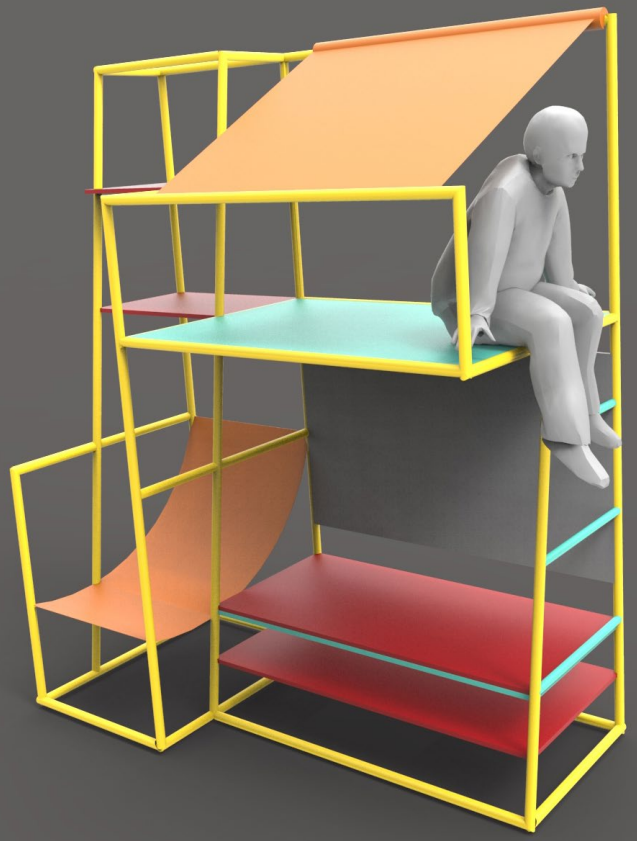




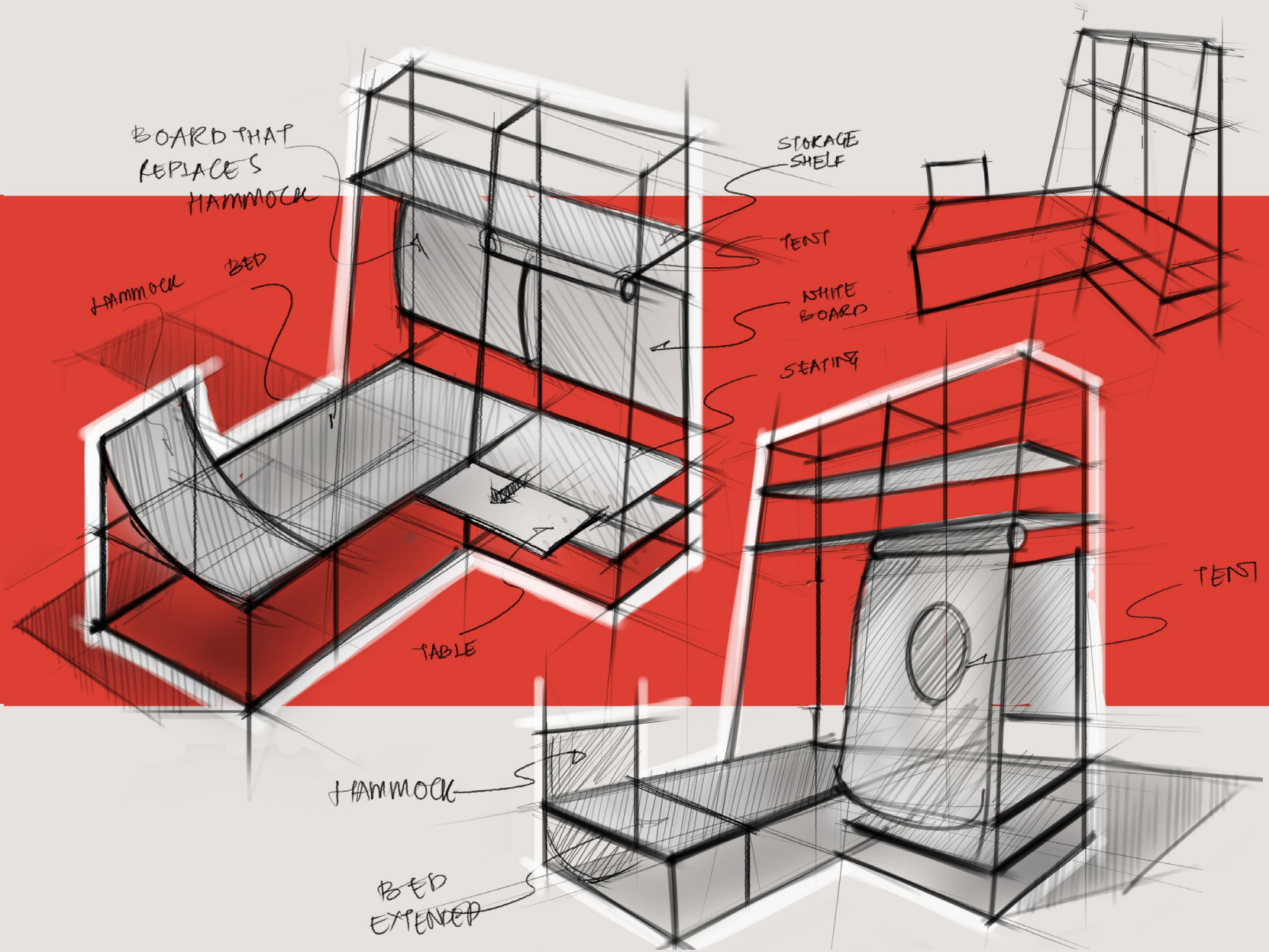
From the rig that was built it was observed that storage shelves did not need the same depth as the sitting space below. Also greater the depth of the shelves, the more difficult it is to reach the items at the back. Therefore in this option the depth of the top shelves was reduced. It also helped the form to break away from the box like look and gave a dynamism to visual lines to make the overall form more interesting. This option also prevented the space below the shelves from completely getting covered to allow light to reach it better.


TENT
SEATING
LADDER
TABLE
STORAGE
STORAGE
HAMMOCK





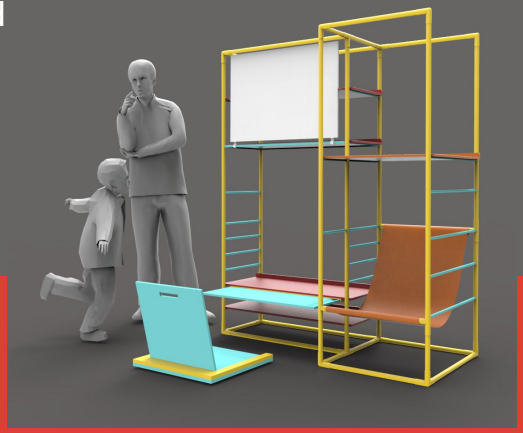
In this option an attempt was made to formally balance the hammock that was that projected out from rest of the assembly on the opposite top corner. This also gave more space for the child to sit on top and could become a tent. However it covered up the space below it which would make it difficult for the light to reach there if the child was studying there. The storage was also considerably reduced in this option.


BOARD THAT REPLACES HAMMOCK
HAMMOCK
BED
STORAGE SHELF
TENT
WHITE BOARD
SEATING
TABLE
TENT
HAMMOCK
BED EXTENDED

Based on user feedback an attempt was made to incorporate a bed in the assembly. The idea was to have an assembly which could be placed anywhere in the house that became a complete space for the child. Another reason to incorporate the bed was that a lot of times children tend to use the bed or floor to study or sit and play. They could also lie down and read a book. Socially this assembly made it possible for more children to sit together and play or interact.

CONCEPT EVALUATION

Evaluation of the concepts was done by sending out a Google form to the Parents and also students here at IDC.
Following were the criteria for evaluation and to be rated between 1- 5 where one is least and 5 is highest:



COMPACT	This concept was found to be compact and space saving. • • • •	Bed did not need a separate space in the room. • • • •
PLAYFUL	The playfulness quotient was enough for most users • • •	The idea of a swing was liked. • • •
SAFETY	Safety was an issue because the fixing of the board was risky and climbing was not safe. • •	Most kids found unsafe to sleep on a height the swing did not have enough space to move. • • •
FORMAL	A lot of users found it to be very regular and mundane • •	Addition of a round swing made it interesting • • •
SOCIAL	It did not allow more than two children to interact or play • •	The space did not allow more that two children to play. • • •
	25	13	16

This concept was also found to be compact

• • • •

The hammock and seating made it playful

• • •

It was safer than prior concepts because no climbing was involved.

• • • •

The formal language was interesting and added a static dynamism.

• • • •

The space was not very interactive

• • •

16

The shelf jutting out at the top made it appear less compact

• • •

The idea of tent on top was appreciated

• • • •

Stability would be compromised because of cantilever

• •

The storage shelves were reduced and the lines were not as clean

• •

The tent space could only house one child

• • •

14

This concept was found to be compact and space saving

• • •

The tent hammock and the freedom to sit on the bed

• • • •

Safety was taken care of the bed gave a better stability and no climbing involved

• • • •

The overall combination of spaces was found to interesting

• • • •

Socially it had a better potential

• • • •

19

FINAL CONCEPT

A *POD* Sized World

This concept was chosen to be detailed out further. The image above shows that the hammock can be detached to make a full sized bed when the child grows up.

Here the bed extension becomes a backrest for the bed. The hammock need not be detached on a regular basis while the child is still small. The assembly also encloses a space where children sit on the floor and study or play. This option makes the space more social as it can accommodate more than a child. Its orientation improves interaction.

If a child does not like to use to floor seating it also gives an option of adjusting the table to higher level to be used with a kids chair.

DETAILS

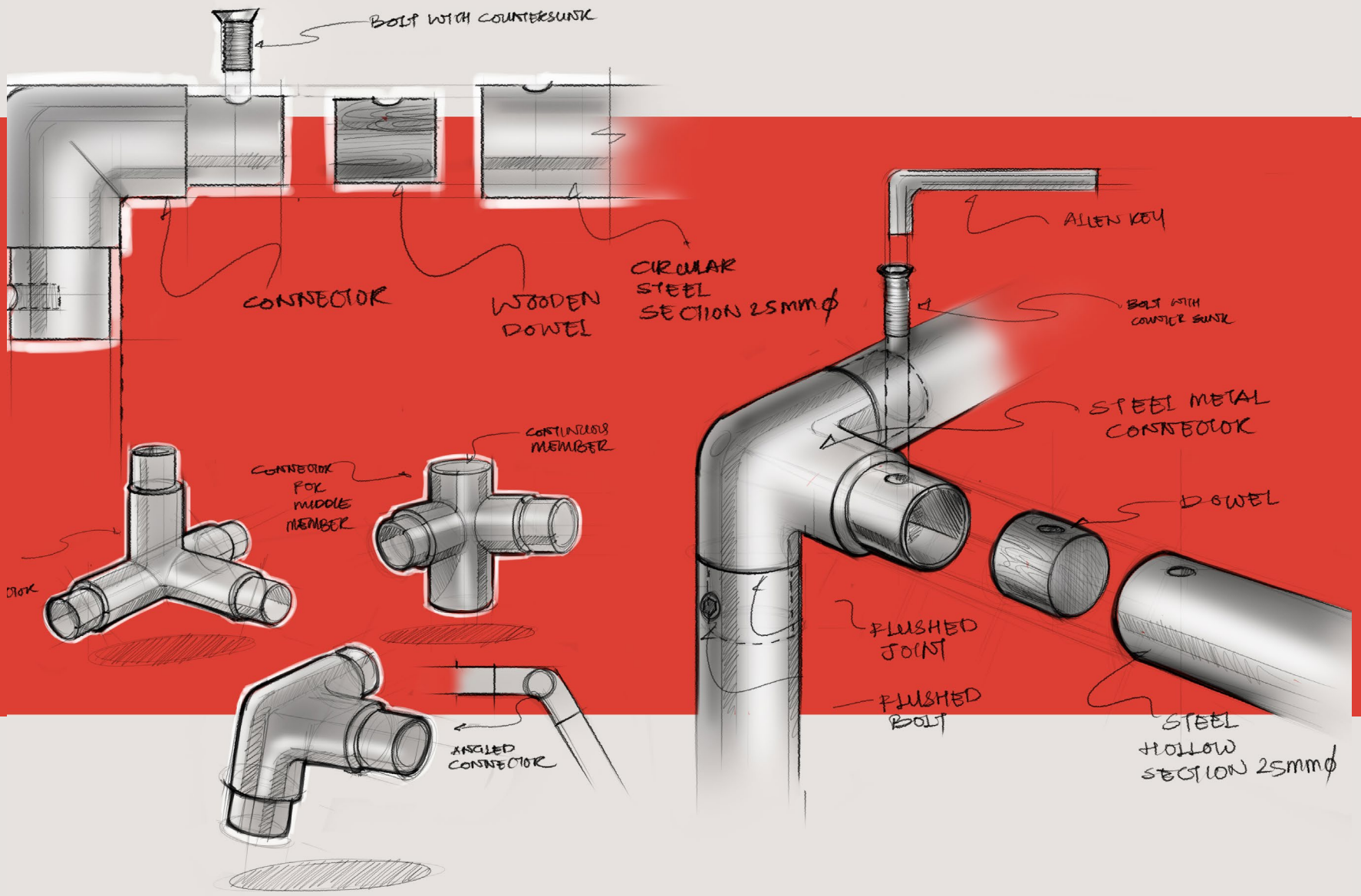
JOINERY OF HOLLOW GI MEMBERS

The details had to be worked out in such a way that with minimum instruments the whole frame work could be assembled. The joinery for the GI circular sections (25mm dia) consists of a GI connector with wooden dowels fitted in them as shown in the adjacent sketch.
The dowel houses the bolt which holds the hollow section and connector together, thus providing a stable joint with no play.

Powder coated GI Hollow sections(25 mm diameter).

GI connector to give a clean flushed joint.

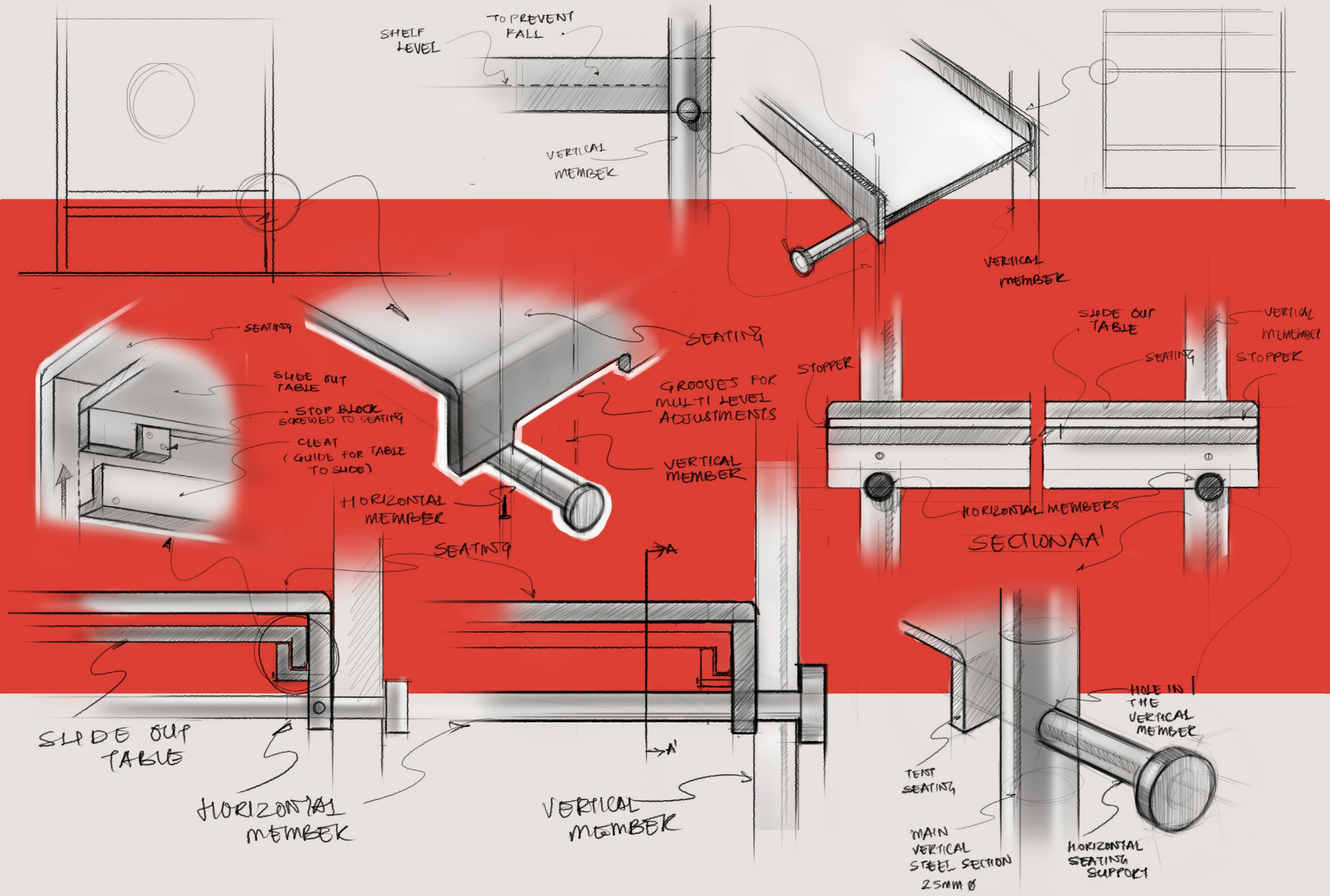
Steel bolts with counter sunk

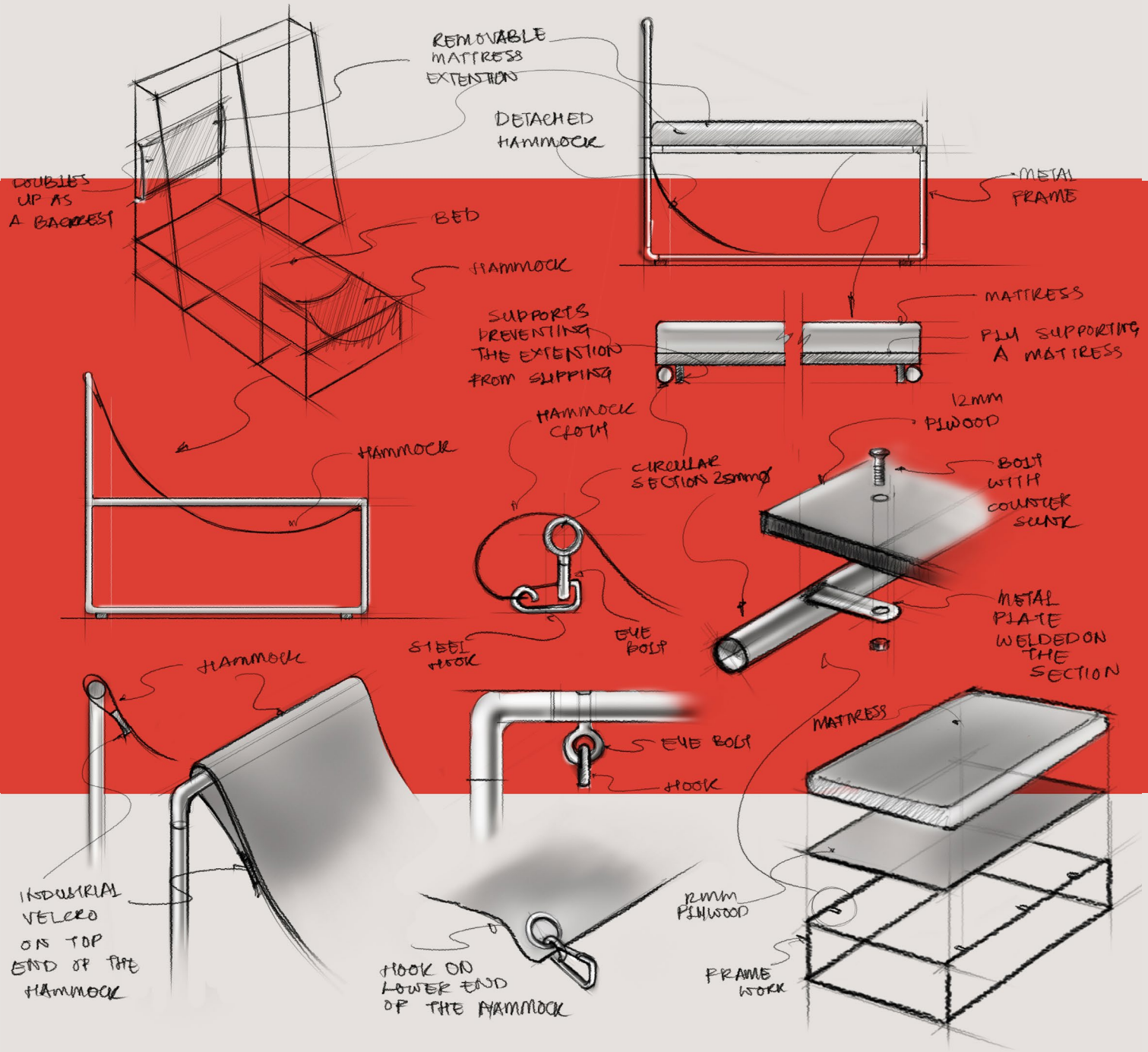

BOLT WITH COUNTERSUNK
CONNECTOR
WOODEN DOWEL
CIRCULAR STEEL SECTION 25mm ϕ
CONTINUOUS MEMBER
CONNECTOR FOR MIDDLE MEMBER
DISK
ANGLED CONNECTOR
ALLEN KEY
BOLT WITH COUNTER SUNK
STEEL METAL CONNECTOR
DOWEL
FLUSHED JOINT
FLUSHED BOLT
STEEL HOLLOW SECTION 25mm ϕ

SHELF and TABLE DETAILS

Fixing of the shelves and the study table had to be simple and easy to move as the height adjustment is an important part of the assembly. The groove in ply allows efficient support over the steel member, prevents sliding of the shelf and also facilitates easy lifting.
The shelves are further bolted to the steel member to prevent the edge from lifting when pressure is applied to the opposite edge.
The table slides out and is fixed onto the seating above it. Simple sliders in wood help the function.

Example of metal member that is used to secure the shelves in place

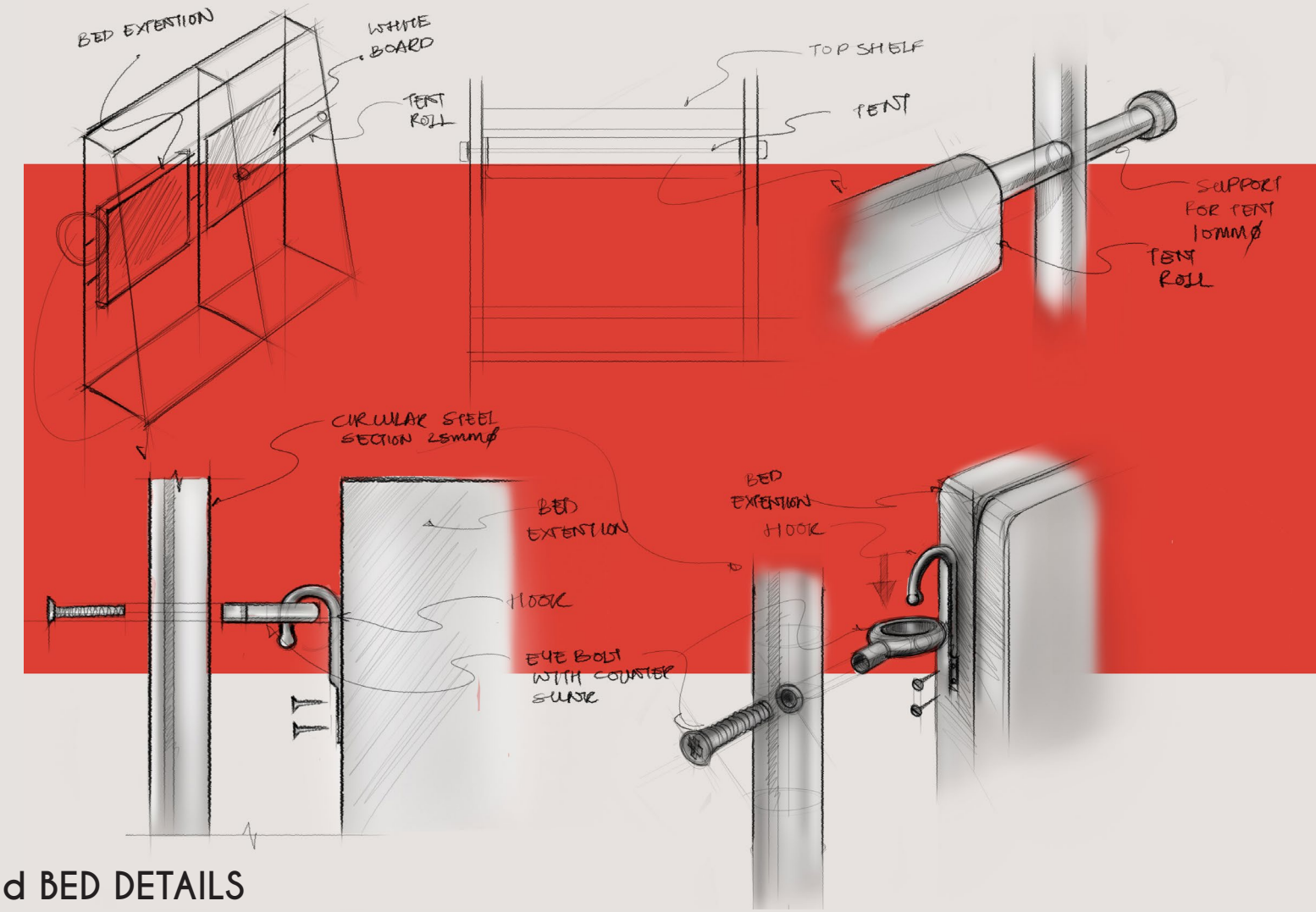

SHELF LEVEL
TO PREVENT FALL
VERTICAL MEMBER
SEATING
SLIDE OUT TABLE
STOP BLOCK SCREWED TO SEATING
CLEAT (GUIDE FOR TABLE TO SLIDE)
GROOVES FOR MULTI LEVEL ADJUSTMENTS
VERTICAL MEMBER
HORIZONTAL MEMBER
SEATING
A
A'
SLIDE OUT TABLE
HORIZONTAL MEMBER
VERTICAL MEMBER
VERTICAL MEMBER
STOPPER
SLIDE OUT TABLE
SEATING
VERTICAL MEMEMBER
STOPPER
HORIZONTAL MEMBERS
SECTIONAA'
HOLE IN THE VERTICAL MEMBER
TEST SEATING
MAIN VERTICAL STEEL SECTION 25MM Ø
HORIZONTAL SEATING SUPPORT


REMOVABLE MATTRESS EXTENTION
DETACHED HAMMOCK
DOUBLES UP AS A BACKREST
BED
HAMMOCK
METAL FRAME
MATTRESS
SUPPORTS PREVENTING THE EXTENTION FROM SLIPPING
PLY SUPPORTING A MATTRESS
HAMMOCK CLOTH
12mm PLYWOOD
HAMMOCK
CIRCULAR SECTION 25mmØ
BOLT WITH COUNTER SUNK
METAL PLATE WELDEDON THE SECTION
STEEL HOOK
EYE BOLT
HAMMOCK
EYE BOLT
HOOK
MATTRESS
INDUSTRIAL VELCRO ON TOP END OF THE HAMMOCK
HOOK ON LOWER END OF THE HAMMOCK
12mm PLYWOOD
FRAME WORK

Hooks screwed onto the board and the backrest

Eye Bolts

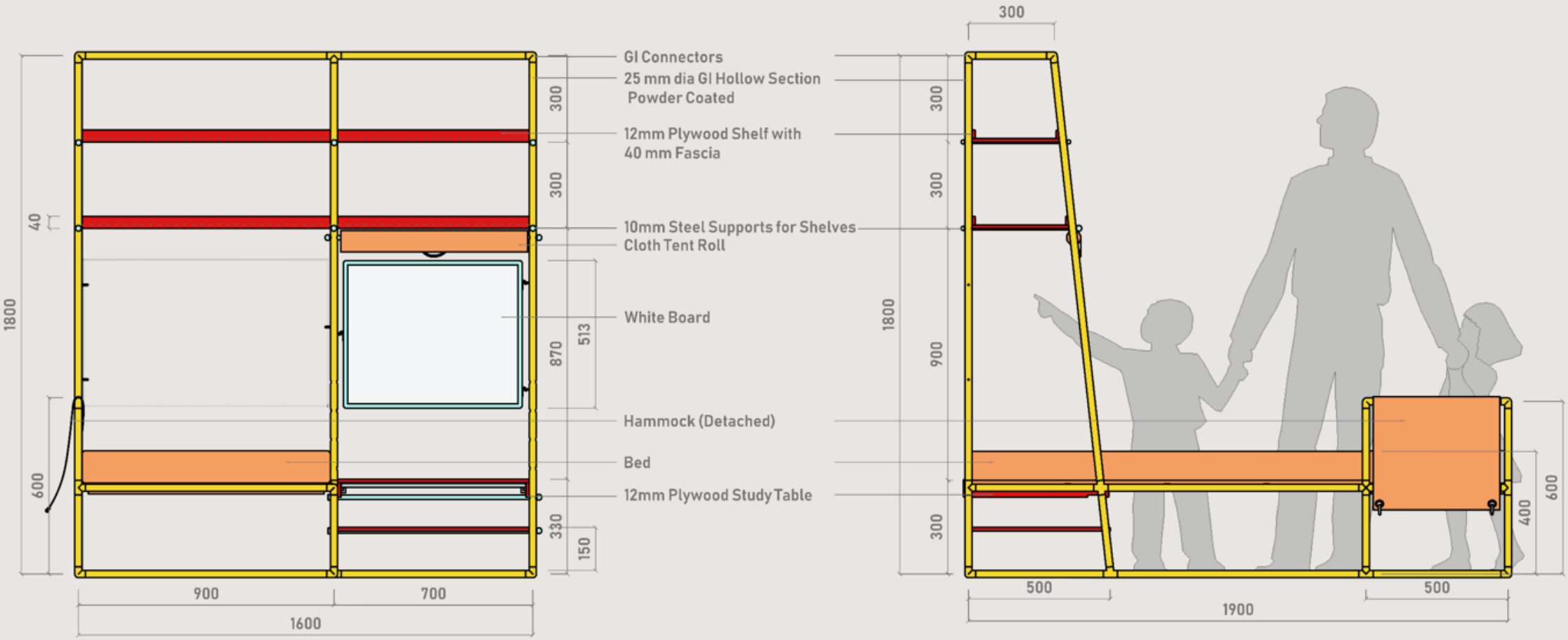
Hooks used to secure the hammock



HAMMOCK, BOARDS and BED DETAILS

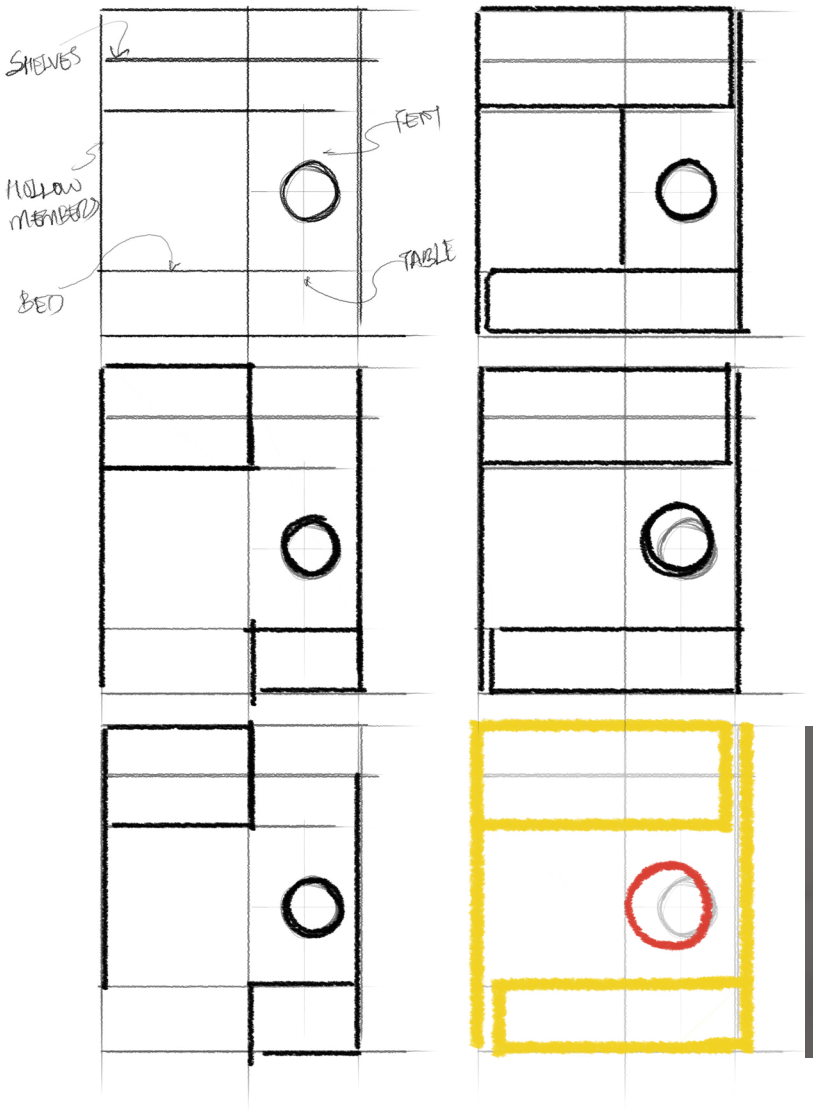
The detail of the hammock was thought of in a way that it could be easily removed to extend the bed when needed. The hooks on the edge of the hammock cloth can be fixed onto the eye bolts at the base of the member as showed in the adjacent sketch.
The extension of the bed was designed to prevent it from sliding when placed on the members. It does not need any bolting to be done to secure it in place. When not being used as a bed the extension functions as a backrest for the bed. To be used a backrest the extension is hooked onto the vertical members using eye bolts. The fixing of the while board uses a similar detail as shown in the sketch above.

MEASURED DRAWINGS



All dimensions are in mm

BRANDING



A POD SIZED WORLD

The process to design the logo involved an attempt to depict the formal language of the product graphically.

Brand Name

The product is named 'Pod'. It is a 'Pod sized world' that the children can call their own. This world has no boundaries as its utility is left to the child's imagination. It can be a space for study during the day or a camp for bed time stories by night. Pod adapts to the child as he grows, making it long lasting and reliable.

Brand Logo

The logo is inspired from the front elevation of the product. The idea was to showcase the brand name and philosophy (the element of space) of the furniture graphically while keeping it minimal and playful.
The color yellow of the letters 'P' and 'D' is inspired from the hollow pipe members of the furniture and the letter 'O' comes from the opening in the tent and is colored red like the shelves in the furniture.
The appearance of the letters resemble the hollow sections used to build the framework of the furniture.

Final Form Model

Learnings

Creating an experience through form.

Incorporating knowledge of architecture into industrial design.

Understanding children as users.

Understanding of buyers perspective in the market.

Better understanding of scale and proportions through rig building and user testing.

Co-working with the users to validate design through their feedback.

Understanding the process of sourcing materials.

It was an enriching experience.

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https://2.imimg.com/data2/HF/GU/MY-4301919/cone-point-grub-screw-500x500.jpg
https://2.imimg.com/data2/HF/GU/MY-4301919/cone-point-grub-screw-500x500.jpg

Books

Art with Children - Daphne Plaskow
Transmaterials – volume 1,2,3 - Blaine Erickson Brownell
Collapsibles - Per Mollerup

Google Form - https://docs.google.com/forms/d/14UlErDuscT_IfmYhfR6Uc2p-QR9pPrjWm43EvHZms4A/edit