FYP Presentation No.4

Project title: That brown alternative material

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Recap from previous presentation

- introduction of some chosen concepts & ideas
- the functionality of the initial design
- the technical details of design (dimensions, types of cardbaord and its thickness .etc)

product testing video
- construction of full scale prototype
- first product testing (how it works/assembly/durability/functionality)

-observations made from the test
-manufacturing and materials considerations (cardboard, textiles & velcro)
-points for further improvement and the next step

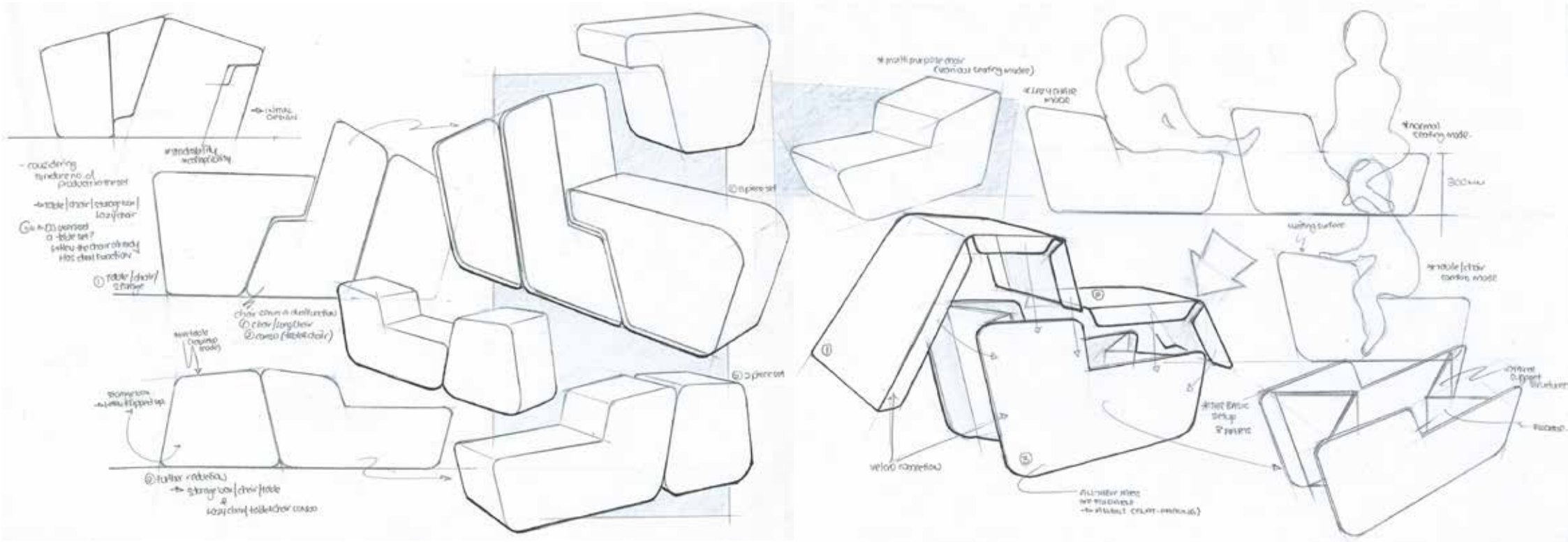
Recap from previous presentation

Design Objective

- To design a play furniture set for Pre-school kids. (3-5 years old)
- To use cardboard as the main material (explained on 2nd presentation)
- A crucial stage of early childhood.
  (curious, willingness to learn, adapt new skills and qualified to play with most toys .etc)
- Elements of Childhood development in Design.
  (Creativity, Learning, Management, Fun, Puzzle & Games)
- A design which allows interaction between parents and child/ siblings or friends.
- A design that fits in any interior space or environment.
- A design that could be flat-packed when not in use to save space.
- A design that is safe, eco-friendly, durable .etc
- A design that is cheap to produce and easily replaceable.
  (an alternative to the more costly common plastic products)

Keywords:

Cardboard, Interaction, Modularity, Construction, Collapsible, Multifunction, Simplicity, Growth, Replacable



Initial Design

first stages of concept development before initial product testing

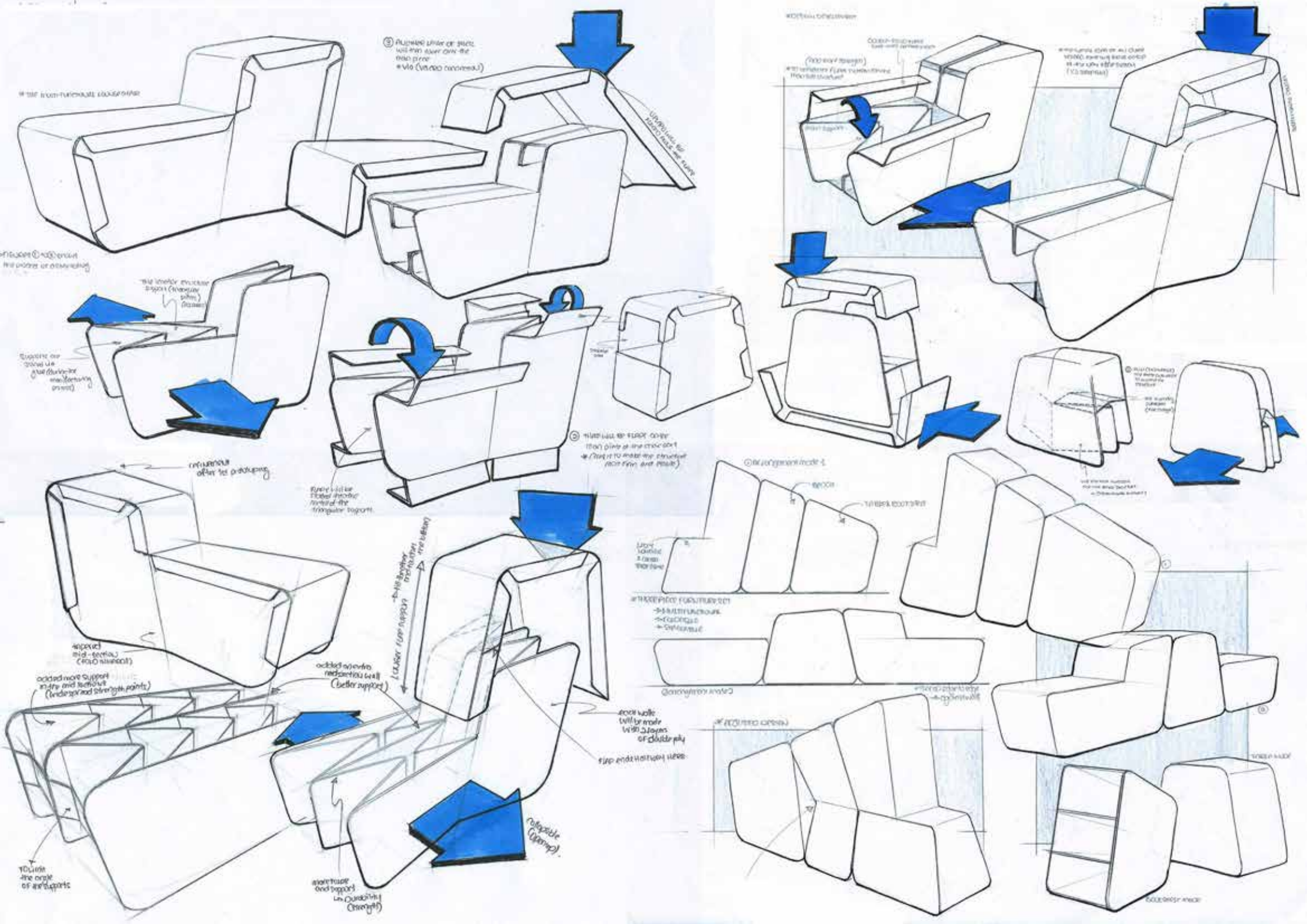
Initial Product Testing

documentation for further improvements and design refinements

Documentation of the various possible ways of using the Lounge/Lazy chair/multifunction table & chair combo.
The different sitting postures. (Normal seating bench-style) (Normal seating with back rest lounge-style) (Chair and Table-top combo) (Normal seating side-chair style) (interaction mode) .etc

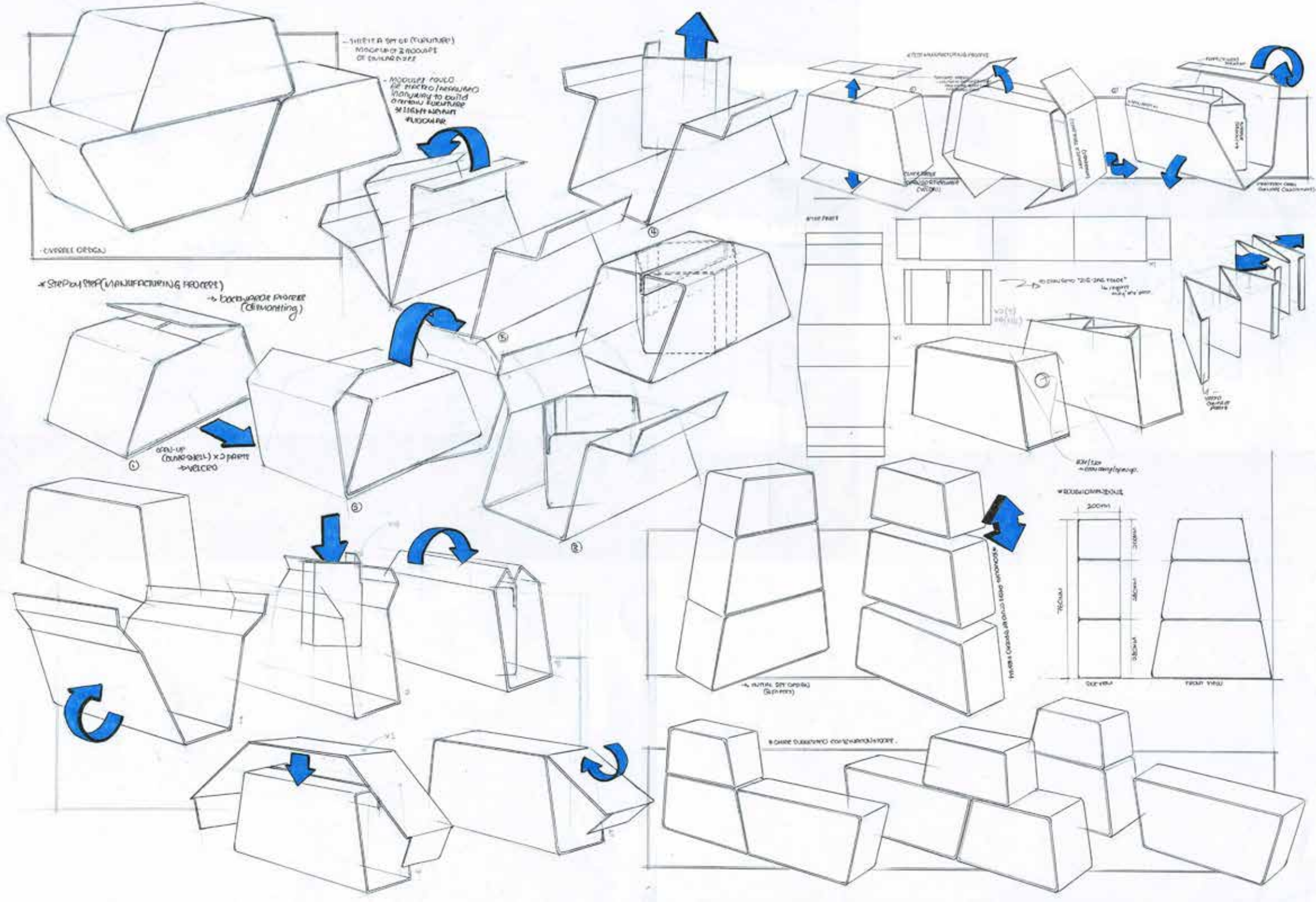
The Design Journey

searching for the best manufacturing method through experimentations
(more sketches & prototypes)


(3) Plywood plate or sheet will then cover the main piece
*Via (video conceal)
(5) Plywood will be fixed cover (flat) plate of the chair seat
*(Trying to make the structure more firm and stable)
(6) Plywood model 4
(7) Plywood model 5
(8) Plywood model 6
(9) Plywood model 7
added more support in-fix and leftover (underspread strength points)
added more reclamation wall (better support)
(Lower flap support)
(Upper flap support)
rectangular (Upright)
(Strength)
(Strength)
(Strength)

OVERALL OUTLOOK
* CLIP BY STEP PROCESS
SCORVABLE BRACE UP OF 2x LAYER WALL ALLOWS TO ALLOW FLAPS TO ENTER & LOCK.
FLAPS (FROM BODY (SMALL)
* A SIMILAR FORM ASHIE V0.2 PROTOTYPE - BUT WITH OPEN TOP PART
SIDE VIEW
FLAPS
OUT-WARD.

DESIGN REFINEMENT



Prototyping Documentation Video

in search for the best method of assembly

Observations made

some important notes when constructing:
- number of steps involved in building up the product
- main manufacturing process
- *extra work (gluing/folding process .etc)
- amount of cardboard used for a single module
  (are all pieces able to fit in a piece of cardboard sheet)
- number of parts
- cost of manufacturing (lesser parts, lesser process is cheaper)
- method of bonding materials (glue, tapes, velcro .etc)
- size and weight
- ease of assembly

Prototypes (1 to 4) vs Prototypes (5 & 6)

- pre-gluing process
- more material usage
  (layers of cardboard-P2-4)
  (strips of velcro-P.1-3)
- Idea is possible for DIY
  (however not easy for everyone)

- no gluing needed
- cut and fold (use of more inter-locking flaps)
- minimal use of velcro (on contact points)
- parts come in pieces
  (produced from a single sheet of cardboard)
- material/mould

- Most of the pre construction to be done in factory
  (the main frame structure)
- material/mould/glue (additional cost and work)

(brief points)

**prototypes are just 1/3 part of the entire furniture set design*

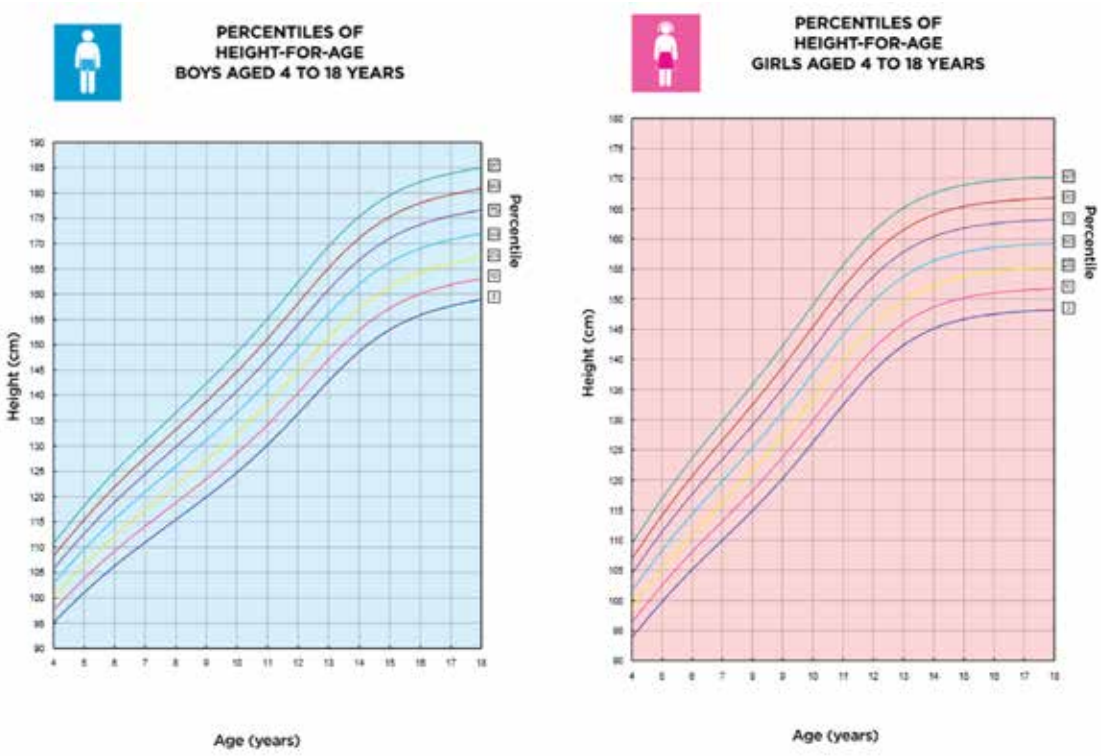


Figure 1.0
Singapore HPB Growth Chart of Boys & Girls aged 4 to 18 years (height)

estimated values to work with:
chair height : 11'' - 280mm
table top height : 19'' - 480mm

children ages 3 to 5 years old

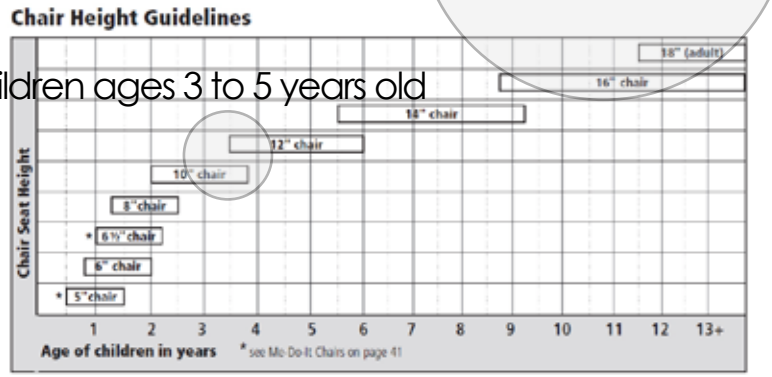


Table Top Height Guidelines

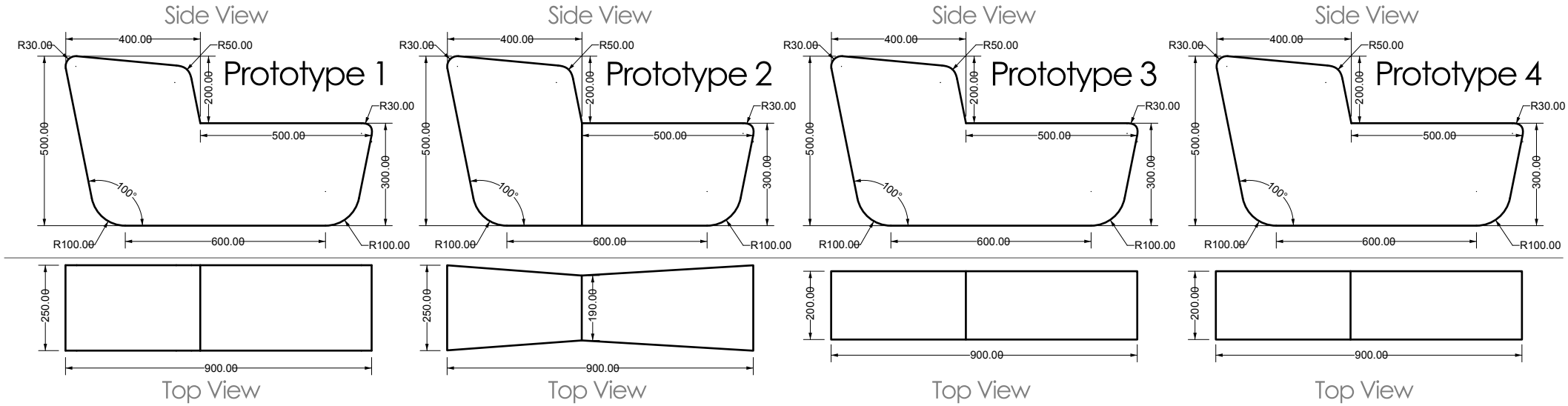
Chair Seat Height	5"	6"	6½"	8"	10"	12"	14"	16"	18"
Table Top Height	12"	13"	14"	16"	18"	20"	22"	24"–26"	26"–30"
Desk Top Height with allowance for storage compartment	NA	NA	NA	NA	NA	22"	24"	26"–28"	28"–30"

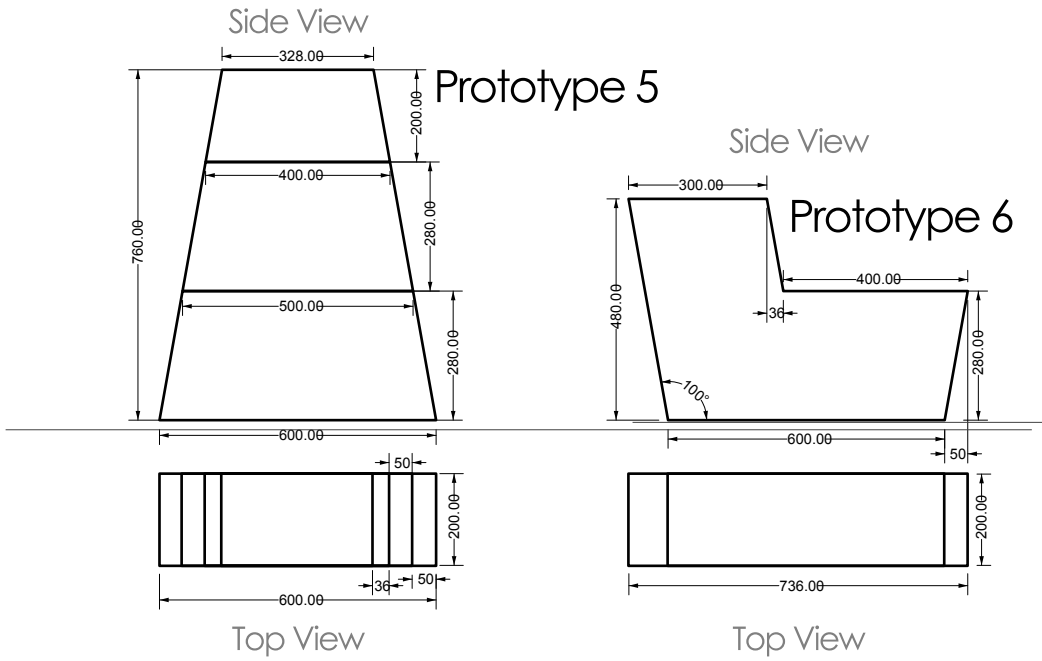
Figure 1.1
Chair & Table top height Guidelines by communityplaythings

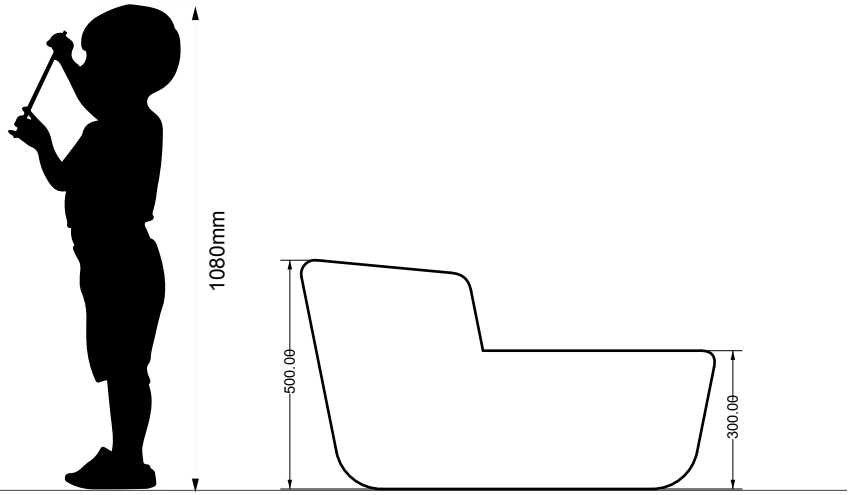
Significant Research Data

information for proper sizing of design

DIMENSIONS (basic overall)







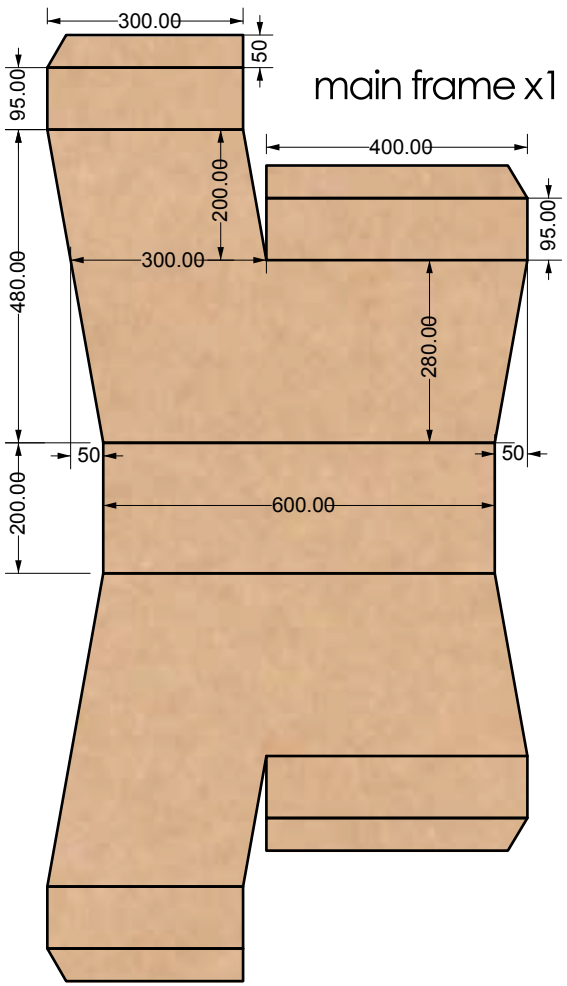
Side View
a 4 year old boy

Proportion comparison

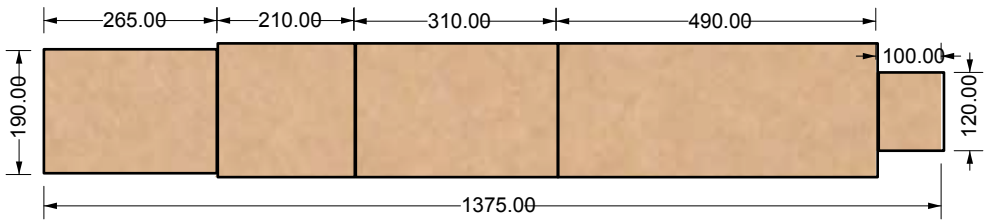
*all dimensions are in (mm) millimeters

DIMENSIONS (disassembled parts)

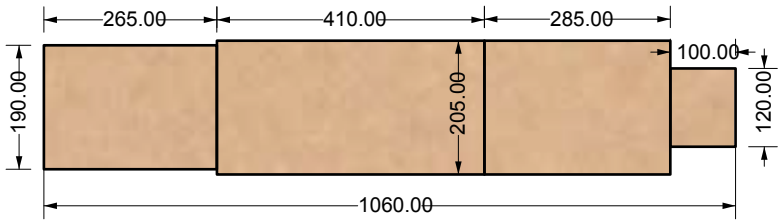
Prototype 6



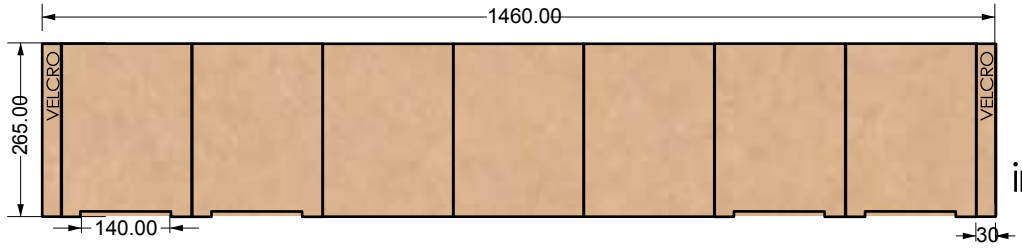
main frame x1



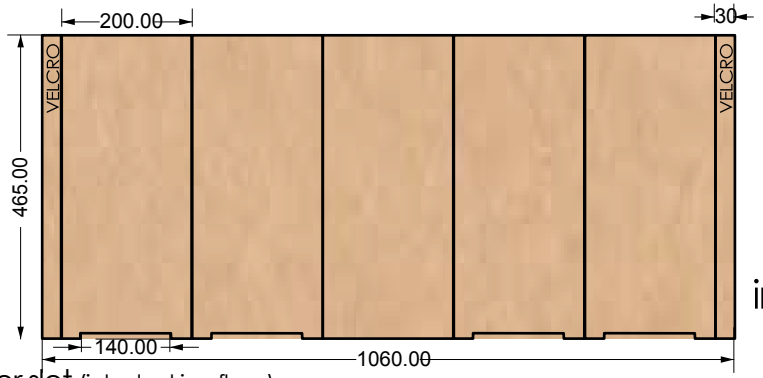
front side outer shell x1



back side outer shell x1



interior back side x1



interior front side x1

for slot (inter-locking flaps)

*all dimensions are in (mm) millimeters

Materials, Manufacturing, Textures & Colours

‘not just another brown carton’
- it is a well thought structure with strong platform
- strong enough for a mom to sit with her child
- customizable to fit any function or consumer* (future plans)
  (initially for kids but possible for adults when design is blown up)
- has an element of fun/play but also functionality
- easy shapes allow modularity and expandability
  in reference back to the idea of building blocks and tetris P.1

-pieces of parts to be manufactured out from a single large cardboard sheet
 (save time and cost) (no need glue prior to assembly) (flat-packed)
- replaceable parts (cardboard are cheap to produce)
- thus, cheap to replace entire product instead of parts.

Materials, Textures & Colours

Cardboard (main material)

- moving towards an eco-concept (cost saving/reduced carbon footprint) as mentioned in P.1

Velcro (bonding material)

- a chosen reliable concept (durable and firm)

Textiles/Fabric *

- faux fur, synthetic fabric, carpet textiles (animal skin tones/colours/repeated patterns)
- this material will be wraped around the shell part pieces (removable via a zipper/velcro that holds the fabric in place with the cardboard)
- this helps to soften the product edges
- removable, interchangable and washable

eg. the animal furniture blocks
'hmmm... kids can read their books while resting on the giraffe lounge .etc'

Materials, Textures & Colours

*just a rough idea to move on with the chosen concept

Final Prototype-Making Plan (a rough timeline)

Sourcing for materials (cost and delivery)	by mid Febuary
Finalize idea, methods of making and design	by 26 Febuary
Finalize dimensions and quantity	by early March
Start drafting on materials	-
Start constructing	11 March - 25 March
Product documentation	26 March - 1st April

FYP Report Compilation Plan

Compilation of relevant research materials	-
Compliation of initial design sketches and thoughts	-
Documentation of first prototype & initial testing	-
Results from initial testing and further steps	-
Compliation of development design sketches	ongoing
Photo documentation of experimental prototypes	ongoing
Materials, cost and manufacturing study	ongoing
Compliation of design refinement sketches	
Final design thougths	
Final prototype construction process	
Final prototype/usage study photos & thoughts	

Thank You!